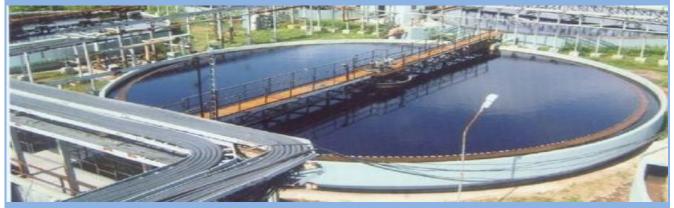
DPR ON SEWERAGE SCHEME FOR ALAPPUZHA MUNICIPALITY- PHASE 1





PREPARED BY

KERALA WATER AUTHORITY

SEWERAGE CIRCLE, KOCHI

KERALA

A DETAILED PROJECT REPORT ON SEWERAGE SCHEME FOR ALAPPUZHA MUNICIPALITY- PHASE 1



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NOVEMBER 2022

EXECUTIVE SUMMARY

Kerala Water authority is a public sector undertaking under the Government of Kerala formulated for the development and regulation of water supply and wastewater collection and disposal in the state of Kerala and for matters connected therewith. The statutory autonomous body, established on 1st April 1984 by converting the erstwhile Public Health Engineering Department, is the key in the planning, execution, operation and maintaining water supply and sewerage schemes throughout Kerala.

During the last two decades during which urbanization increased, and the consumptive nature of society became more apparent, the State has been challenged by the second generation of issues: significant increase in the generation of solid and liquid wastes, contamination of sub-surface water flows impacting groundwater stocks and shallow drinking water sources like wells, and the decreased assimilative capacity of water resource stocks and flows. Hence a proper strategy for treating liquid waste generated is essential. Providing Sewerage network in major cities and towns is given utmost importance by Government of Kerala. In this limelight, Alappuzha local urban body (ULB) of Alappuzha district has been selected for implementation of sewerage scheme and the same is prepared by Sewerage Circle Kochi-11.

The Municipal area as a whole has been divided into four network zones and two septage zones. Out of the 52 wards in the municipality, wards 32 to 36& 43are fully and 37,38,42 & 44 are partially considered to have sewer network system as Alissery Zone in Zone 2 and thereby proposing 5 MLD STP at Alissery Store compound of KWA. The projected population of Alissery zone as on 2054 is 28686 in which network coverage covering an area of 2.645 sq km and the estimated sewage load is 4.54 MLD including septage provision for the balance area. At present, ward 34 and 35 is only considered for the network implementation as Phase 1 which is covering 0.475 sqkm with network length of 9.79km.

The whole sewerage scheme is bifurcated into different phases for the ease of planning and execution. In phase 1 of Alappuzha sewerage scheme, a single subzone (subzone 1) of Alissery Zone in zone 2 is considered. Two wards were taken in Phase 1, mainly Town ward, Alissery ward and Lajaneth ward. The population for phase 1 (subzone 1 of Alissery

DPR on Sewerage Scheme for Alappuzha Municipality - Phase I

zone) is 8032 as on 2022 and projected to 8191 for the year, 2054.

The treatment technology for the proposed STP adopted in this DPR is Moving Bed Bio Reactor (MBBR), as it is suitable for accepting shock loads and flexible in nature. Apart from sewage treatment plant, a co-treatment facility is also proposed to treat the septage to be collected from the non-network areas.

In phase 1 of the sewerage system sewer network of 9790m consisting of 384 manholes, and pumping main of 800m is taken into consideration. The proposed collection well1for subzone 1 is located at Alissery STP site. The treatment plant proposed having 5MLD capacity will be set up in Kerala Water Authority's (KWA) own land at Alissery. The sewer network lines proposed are HDPE PE100 PN8 and pumping mains HDPE PE100 PN10. As the sewerage connection to the households are to be provided in parallel with the construction of STP for the timely commissioning of the plant, provision for giving sewer connections to households are included in the estimate.

The sewage treatment plant is planned to provide eco-friendly units for the system with vertical garden. For conserving energy and optimizing performance of the system solar energy source is also planned to be used. Also, for trouble free performance of the system, at all points of influence, sensors for measuring values of flow and required parameters are to be installed. Using Internet of Things (IoT) enabled software system; the control of the entire process can be performed effectively. It has been planned to implement the project within a short span of time.

Total estimated cost is observed to be Rs. Sixty Eight crores only including 5 years operation maintenance expenses excluding power charges.

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ABSTRACT

Sl. No.	Item	Amount (Rs.)
1	Cost of STP including electro mechanical items	₹ 23,93,61,962
2	Cost of Sewer Network	₹ 30,55,27,323
3	O&M Charges For 5 Years (STP + Network)	₹ 2,66,75,037
	Total Cost	₹ 57,15,64,322
	GST @18% (1+2+3)	₹ 102881578
	Contingencies and unforeseen	₹ 55,54,100
	Grand Total	₹68,00,00,000
Sixty Eight Crores Only		

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PROJECT AT A GLANCE

Sl. No.	Item	Description
1	Name of the Project	Detailed Engineering Report for the Sewerage scheme in Alappuzha Municipality with STP - Phase 1
2	Name of District	Alappuzha
3	Name of Municipality	Alappuzha
4	Project area covered	0.473 Sq. Km (Subzone 1 of Alissery Zone)
5	Population benefitted from phase 1	8032Nos. (Year 2054 Projected)
6	STP Capacity	5 MLD
7	Total Network Length	9790m
8	Number of Wells	1
9	Number of Pumping Stations	1
10	Number of Manholes	384
11	Number of Connections	2048
12	O&M cost for 5 Years including 18% GST (including electricity charges)	Rs. 19,90,00,000
13	Electricity charge for one year	Rs 2,41,02,900
14	Amount required for Land acquisition for Phase 1	Nil
15	Total cost including 5 years O&M cost(excluding power charges)	Rs. 68,00,00,000
16	Implementation agency	Kerala Water Authority
17	Period of execution	2 years

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CHAPTER 1

INTRODUCTION

1.1. BACKGROUND OF THE PROJECT

Government of Kerala has launched the "Rebuild Kerala Initiative (RKI)" for infrastructure development of Kerala, providing Sewerage network in major cities and towns is given utmost importance considering the increasing pollution of water bodies due to lack of proper disposal of sewage. Correspondingly, The Honorable National Green Tribunal (NGT) have given directions to implement sewerage system for various cities of Kerala to control pollution of major water bodies. The KWA is the largest institutional entity in the field of water supply, and implemented thousands of small, medium and large urban and rural piped water supply schemes in Kerala. However, the presence of KWA in the field of sewerage schemes has been limited. Due to the growing needs of planning and design of systems which serves healthy environment, the role of sewerage systems with meticulous planning and design is a must. Moreover, there are NGT Interventions and guidelines for pollution abatement for natural water bodies and environment. All these factors paved the way for the proposal of sewerage schemes which can cover every human habitation for the entire State of Kerala in a scientific and systematic way. KWA as knowledge partner, service provider and central agency for coordinating the activities related to the planning and implementation of sewerage systems for LSGIs can contribute in many ways.

As per the vision of Kerala State Sanitation Strategy, all cities and towns in Kerala become totally clean, sanitized, healthy, habitable, ensuring and sustaining good public health and environmental outcomes for all citizens, with a special focus on hygienic and affordable sanitation for the urban poor and women with specific focus on the diverse topography of the state and its implications. Hence the overall vision can be defined as the achievement of an urban Kerala ensuring environmentally safe disposal of solid and liquid waste. Similarly, to formulate a vision for sewage strategy for each habitation of the State it is imperative to develop a scientific, sustainable and effective sewage system covering directly or indirectly every human settlement. Improved Institutional governance and enhanced human resource capacities for planning and maintaining the sewerage is also coming under the goal. Capacity

DPR on Sewerage Scheme for Alappuzha Municipality - Phase I

building for adoptability to modern technologies and applications for the service providers is also another goal.

On this prominence, as per the direction of KWA, a comprehensive sewerage plan has been developed in the year 2020 for Alappuzha District. As per the initiative, a pilot project for two local urban bodies (ULBs) of Alappuzha district has been selected for implementation of sewerage scheme and the groundwork for the same is conducted by Sewerage Circle, Kochi - 11. This project report is prepared for implementation of sewerage scheme planned in Alappuzha municipality.

1.2. EXISTING SCENARIO OF SEWERAGE SYSTEM IN ALAPPUZHA

As per the Socio-economic survey conducted by the Town and Country Planning Department (2016), for the preparation of master plan for Alappuzha it is inferred that 33.23% of houses have septic tank, 64.55% of houses have pit latrine. Most of the houses in the urban areas have on site sanitation system like septic tanks or leach pit which do not comply with standards in most cases.

The municipality has no facilities for the treatment and disposal of septage collected from the septic tank from the households which results in the open dumping of septage. Currently, most of the grey water generated in the core commercial area is drained off directly into the nearby lakes and lagoons without treatment causing serious water pollution. Hence a proper strategy for treating liquid waste generated in the city is essential. This has caused pollution of water posing a public health hazard. It is necessary to plan and implement proper sewerage scheme to the area for reducing water pollution.

1.3. NEED FOR THE PROJECT

The colossal volume of sewage is generated in the urban area as an outcome of the rapid growth of the society and industrialization in the past few decades. Most of the wastewater generated is left untreated or is thrown into the nearby water bodies resulting in their pollution. Despite the Environment Protection Act, 1986 forbidding disposal of waste into water bodies, septage and other types of liquid waste are being dumped everywhere, polluting water sources (both surface water and groundwater), leading to severe health

DPR on Sewerage Scheme for Alappuzha Municipality - Phase I implications.

Alappuzha is a city and a municipality in Kerala with and urban population of 174, 164 (2011 census) and is one among the two municipalities from the state included in the List of cities having population 1 Lakh and above. In 2016, the Centre for Science and Environment rated Alappuzha city as the first among the cleanest cities in India on the basis of the Municipal solid waste management. Nevertheless, the town lacks underground sewerage network and sewage treatment facilities. The high population growth rate and fast development of the city results in the increased quantity of sewage generated.

Almost the entire household in the urban area has onsite sanitation systems which do not comply with the standards and as of now no Sewerage Treatment Plants (STPs) is working in the Alappuzha municipality. The conventional mode of disposal through septic tanks etc. often results in the suboptimal functioning of the treatment system and resulting in the improper disposal of grey water to the environment. The lack of a scientifically constructed sewerage system is evident in the area causing poor sanitation, pollution of surface and ground water resources, unhygienic environment ultimately leading to a threat to the society. By taking into account of the specific local contexts and the multi-dimensional nature of the problems, a systematic and scientific step wise approach is indispensable.

1.4. SCOPE OF THE PROJECT

The main objective of the present work is to design a comprehensive sewerage network and Sewage Treatment Plant (STP) for a portion of Alappuzha Municipality to treat the effluent (untreated wastewater) generated and to avoid its direct release into natural environment. Other general objectives of the present works are:

- 1. To find appropriate methods for collection, treatment and disposal of wastewater generated from the project area of Alappuzha Municipality.
- 2. Treat all the wastewater generated from houses, commercial establishments and public institutions etc. as per the norms laid by KPCB and other regulations.
- 3. To design a proper network system for the conveyance of the wastewater generated in the municipal area.

1.5. LOCATION OF THE PROJECT

Alappuzha Municipality, established in 1919, is a Municipality governed under the Kerala Municipal Act 1994. The Municipality manages the civic activities of the Alappuzha town and also serves as the district headquarters for the Alappuzha district. It is one of the first planned towns in India. Alappuzha town is 28km from Changanassery, 46km from Kottayam and 53km from Kochi and 155km north of Thiruvananthapuram. The town is intertwined with a canal network of inland waterways and is near to the backwaters of Kerala, which is a major tourist destination. According to Census 2011, the city had a total population of 176,164 and an area of 46.77 sq km. Lord George Curzon, Viceroy of India, described Alappuzha as the "Venice of the East", a town with canals, backwaters, beaches and lagoons.

The economy of the town is depended on agricultural trading, marine products and tourism. The Alappuzha backwaters is one of the most popular tourist destination attracting millions of international and domestic tourists. It connects Kumarakom and Kochi to the North and Kollam to the South. It is also the access point of Nehru Trophy Boat race held on the Punnamada Lake near Alappuzha, which is the most competitive and popular boat race in Kerala.

The National Highway NH-47, the Main Central Road (M.C road) and the Delhi - Mumbai - Trivandrum broad-gauge railway line is passing through the district. There are 8 state highways goes through the Alappuzha district in which 3 of them originates from Alappuzha town. State Highway 11 starts from Kalarcode and ends at Perunnai, popularly known as AC road (Alappuzha - Changanassery Road) and it covers a distance of 24.2 km. AC Road is an important road connecting Alappuzha town with Kottayam district. State Highway 40 is an interstate Highway in Alappuzha district which connects Alappuzha town with Madurai in Tamil Nadu. Alappuzha Bypass is a part of NH 66 that bypasses the central business district of Alappuzha city. The 6.8 Km long bypass is the first elevated beach highway starting at Kalarcode in the south to Kommady in the north. The 44 Km long State Highway 66 originates from Alappuzha town and terminates at Thoppumpady. Alappuzha town is crisscrossed by navigable canals that are connected to Cochin in the north and other important towns in the east.

Alappuzha municipality comes under Ambalappuzha Taluk. The project area comes under Alappuzha parliament Constituency and in both Alappuzha (Alappuzha Municipalities ward no. 1 to19 and 45 to 52) and Ambalappuzha (Alappuzha Municipalities ward no. 20 to 44) legislative constituencies. The municipal town is divided into 52 municipal wards. The STP is designed for Alissery Zone encompassing 2.645 Sq. Km of the total municipal area and the network is planned for 0.473 Sq. Km as Phase 1 (Ward 34 and 35)

The Fig. 1 shows the location map of Alappuzha municipality (project area) and the ward wise map is illustrated in Fig. 2.

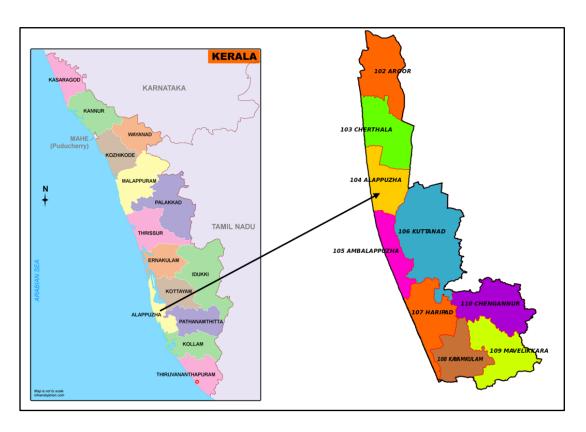


Fig. 1: Location map of Alappuzha Municipality

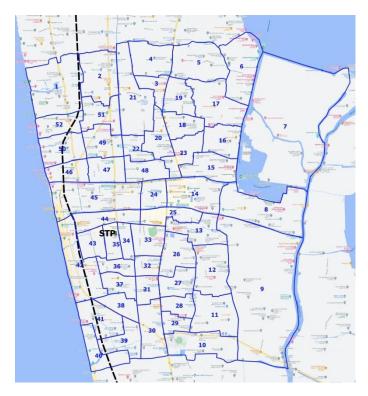


Fig. 2: Ward wise map of Alappuzha Municipality

1.6. SITE INVESTIGATION DETAILS

1.6.1. Topography

Alappuzha is a sandy strip of land bounded by the Lakshadweep Sea on its West and the municipal town is knotted by a network of canals, lagoons, rivers. The sector of water bodies (13% of the district) and paddy field constitute a major portion in the geographical area of the district, is more than that of any other districts in Kerala. Coastal region covers 80% of the district area and the rest is in midlands. The district is unique for its contiguous long coastal plains of 82 Km. Other than some scattered hillocks lying between Bharanicavu and Chengannur block panchayaths in the easter part of the district, there is no area under highland division. It is the only district in the state without public forest land.

1.6.2. Soil Properties

The Soil Survey Division of Department of Agriculture, Govt. of Kerala has categorized the soil types of the district into four based on the morphological and physio-chemical properties. They are (1) Coastal alluvium, (2) Riverine alluvium, (3) Brown hydromorphic soil and (4) Laterite soil. Coastal Alluvium are seen along the western parts of the district all along the coast and have been developed from recent marine and estuarine deposits. The

DPR on Sewerage Scheme for Alappuzha Municipality - Phase I

texture is dominated by sand fraction and low water holding capacity, is slightly acidic in nature (pH less than 6.5). Its texture varies from loamy sand to sandy loam. These soils have low content of organic matter and deficient in plant nutrients. The Riverine alluvium soils is distributed along the river valleys having a wide variation in their physio-chemical chemical properties depending on the nature of the alluvium that is deposited and the characteristics of the catchments area drained by the river. Its texture varies from sandy loam to clay loam and is known for its high water-retention capacity and high nutrients content. This soil type is supporting the cultivation of paddy in Alappuzha.

The Brown hydromorphic soil is mostly seen in the western low-lying areas along the district coast (wetlands). They are moderately rich in organic matter and other nutrients, but deficient in lime and phosphate. It is deep brownish in colour and its texture varies from sandy loam to clay. It is also acidic in reaction with pH of 5.2. It is formed due to the transportation and deposition of soil from adjoining hill slopes. Laterite soil formed as the result of intensive and prolonged weathering of the underlying parent rock under humid tropical conditions. The texture of the soil varies from gravelly loam to gravelly clay loam having a reddish brown to yellowish red colour. It is acidic in reaction (pH 4.3.) and poor in available nutrients, but it is well drained and supports the coconut cultivation in district with the proper application of fertilizers.

1.6.3. Geography

Alappuzha district, the smallest district according to the area located in the southwestern part of the state, bounded by the Lakshadweep Sea in the west, Kottayam and Pathanamthitta districts in the east, Ernakulam district in the north and Kollam district in the south. The district lies between North latitudes 90 05′ and 90 54′ and East longitude 760 17′ and 760 40′. The total geographical area of the district is 1414 sq. Km in which Alappuzha Municipal town is about 35.6 sq. Km, bounded by:

North - Aryad Panchayath

East - Pallathurathi River

South - Punnapra Panchayath

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West - Lakshadweep (Arabian) sea.

1.6.4. Climate and Rainfall

A tropical humid climate with a domineering summers and plentiful seasonal rainfall are the characteristic climatic features of the district. The hot season extends for a period from March to the end of May with an average high temperature of 32°C. The percentage of humidity is very high during summers.

Alappuzha experiences a long monsoon with heavy monsoon showers as both the south-west and north-east monsoons hits the coast. This is followed by the south-west monsoon season (Edavapathi), which continues till the end of September. The south-west monsoon retreats during October and major parts of November, followed by the north-east monsoon (Thulavarsham) is responsible for the rainfall up to December. The southwest monsoon season from June to September contributes nearly 60.3% of the annual rainfall. This is followed by the northeast monsoon season from October to December, which contributes about 20.9% of the annual rainfall, and the balance 18.8% is received during the period from January to May months. The region receives an average annual rainfall of 2965.4 mm.

1.6.5. Meteorological Parameters

Generally, March and April months are hottest and December and January months are coldest. At Alappuzha the maximum temperature ranges from 28.8°C to 32.7°C whereas the minimum temperature ranges from 22.6°C to 25.5°C. The average annual maximum temperature is 30.7°C and the average annual minimum temperature is 23.9 °C. the diurnal variation of temperature seldom exceeds 10°C. The region experiences a high humidity during the monsoon seasons and is 87% at Alappuzha. Humidity is high during morning time through the year. The climate is moist and hot in the coast and slightly cool and dry in the interior of the district. The wind is predominantly from east and northeast during morning hours and during the evening hours the predominant wind direction is from west and northwest. The wind speed is high during May (13.6 kmph) and is low in Kayamkulam.

1.6.6. Ground Water Potential

Ground water occurs in unconfined condition in the top alluvial zones and confined condition in the Tertiary sequences. Among the deeper confined aquifers of Tertiary group, Warkali and Vaikom aquifers are potential. The Quilon bed is a poor aquifer and is not being developed much. As Alleppey bed contains brackish formation water, this aquifer is also not being developed. Ground water is extracted from the Warkali aquifer having the most potential fresh water. The total groundwater potential available in the aquifer has been computed as about 36 MCM. Next to Warkali aquifer, Vaikom aquifer is highly potential. The total groundwater potential available in this aquifer is of the order of 10 MCM.

Alappuzha district consists of two hydrological zones, (i) moderate to low permeability zone and (ii) fairly good ground water potentiality zone. The Pamba river flows in the area forms a part of the deltaic region. As most of the area is underlain by Tertiary sediments, the ground water potential is fair to good. The entire area is an airable land, except the coastal tract where coconut plantation is predominant. The ground water is shallow in Haripad region and the available water is loaded with iron, fluoride, and saline content particularly in the open wells

1.6.7. Surface source

One of the Kerala's major rivers, the river Pamba flows through the eastern region of the Municipality. Pamba,the third longest river in Kerala is formed by several streams originating from Peerumedu plateau in Idukki district, enters Alappuzha district at Chengannur and flows through Pandanad, Veeyapuram, Thakazhy, and Champakulam through a distance about 177.08 Km and plunges into Vembanad lake through several branches such as PallathuruthiAr, NedumudiAr and Muttar. The river has a length of 117 Km and is navigable to a length of 73 Km. The catchment area of this river is 1987.17 Sq. Km

1.6.8. Demography

As of 2011 India census, Alappuzha district accommodates a population of 2,127,789 of which male and female 1,013,142 and 1,114,647 respectively. Alappuzha has a sex ratio of

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1100 females for every 1000 males. The density of population is 1504 persons per sq. Km and the district is 29.46% urbanized.

1.6.9. Literacy

The average literacy rate of the district is 95.72% with male literacy 97.36% and female literacy rate 94.24%. The average literacy rate of the municipality is 97.02%. The educational status of the constituent areas was evaluated based on a survey conducted by the municipality, there is only negligible percentage of the population who are illiterate, about 3 % of the population.

1.6.10. Industries / Agriculture

There are no major industrial areas in the vicinity of the Haripad Municipality's administrative area. Paddy and tapioca are the major cultivations in the area.

1.6.11. Survey Details

Topographical Survey using DGPS: For ascertaining accurate reduced levels of all points in the model, Real Time Kinematic Survey (RTK) using DGPS was performed. DGPS is an improved autonomous Global Positioning which reduces the effect of correlated errors from two or more receivers only if they are all observing the same satellites. The DGPS data was retrieved in a computer system and subsequently used for hydraulic simulation of the network. The DGPS survey in the project area has been conducted under RKI head.

Social Survey: Social aspects of the sewage load generation have been examined in detail by performing social survey for the project area. Various teams comprising of people intended to gather information regarding presence of houses, commercial establishments and other public institutions were set up and extensive field survey was conducted. The variations of sewage flow and expected abnormalities were also studied and incorporated in the sewer network design. The ward wise population demand is assessed and being distributed in the network considering the social survey pattern.

CHAPTER 2

APPROACH AND METHODOLOGY

Sewage is 99 % water carrying domestic wastes originating in kitchen, bathing, laundry, urine and night soil. It also contains salts used in cooking, sweat, bathing, laundry and urine. It also contains waterborne pathogenic organisms from the night soil of already infected persons. The wastewater from toilets is usually referred to as black water and the rest of the wastewater from all other activities is referred to as grey water.

2.1. WASTE WATER GENERATION AND CAPACITY DETERMINATION

2.1.1. Population Forecasting

The design population should be estimated by paying attention to all the factors governing the future growth and development of the project area in the industrial, commercial, educational, social, and administration spheres. The anticipated population, its density and its waste production are generally estimated for a specified planning period. The recommended planning period is 30 years. Water supply projects and sewerage projects are designed for 30 years. After 30 years the system needs renovation or to make a new system to accommodate load at that time. There are several methods developed for forecasting population but none of them are perfect. The population growth may change based on several factors such as attitude of community, social status, onset of pandemic diseases, war etc. which are unpredictable.

During the 2011 census, Alappuzha municipality has a population of 240,991. Normally owing to urbanization, the Municipality shows a positive trend in population growth, the district averagedecadal growth of 0.61% (2011 census of Alappuzha district) is considered in the population forecasting and the data calculated for Alissery zone is given in **Table 1**. The sewage treatment plant is designed based on this forecasting.

Table 1: Population Forecasting

Population of Alissery Zone of Alappuzha Municipality			
As per census 2011 Population(Alappuzha Municipality)	2011	240991	
Total population to the year (Alissery Zone)	2022	28133	
Total population to year	2039	28425	
Total population to year	2054	28686	

2.1.2. Estimation of Non-domestic Sewage

The industries and commercial buildings often use water other than the municipal supply and may discharge their liquid wastes into the sanitary sewers. Estimate of such flows has to be made separately as in **Table 2** for their potable water supply as per CPHEEO. However, in general the quantity of non-domestic sewage may be taken 80 to 90% of quantity of water supplied through public water supply system. Some units develop their own source of water supply and may discharge their liquid waste into sewers. This should be estimated separately for large units/ industries. It may, however, be stated that industrial sewage should be treated to the standards prescribed by the Pollution Control Boards before being discharged into sewers. This quantity is assessed to be 20% of the sewage load.

Table 2: Institutional needs of potable water

Sl.No.	Institutions	Water Supply
31.140.	mstitutions	(litres)
1	Hospital including laundry and beds exceeding 100	450 per bed
2	Hospital including laundry and beds not exceeding 100	340 per bed
3	Lodging houses / hotels	180 per bed
4	Hostels	135 lpcd
5	Nursing homes and medical quarters	135 lpcd
6	Boarding schools / colleges	135 lpcd
7	Restaurants	70 per seat
8	Airports and sea ports, duty staff	70 lpcd
9	Airports and sea ports, alighting and boarding persons	15 lpcd

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10	Train and bus stations, duty staff	70 lpcd
11	Train and bus station, alighting and boarding persons	15 lpcd
12	Day schools / colleges	45 lpcd
13	Offices	45 lpcd
14	Factories, duty staff	45 lpcd
15	Cinema, concert halls and theatres	15 lpcd

Of all the industries, this shall strictly apply to the automobile service stations and machine shops from where the spent metal plating baths and oil & grease shall be prevented from entering the sewers as it comes under trade effluents.

2.1.3. Estimation of Sewage

Sanitary sewers are provided to carry the used water of the community with some ground water and fraction of storm run-off, to the point of treatment and disposal. The factors affecting sewage flow are

- a. Per capita Sewage flow
- b. Peak factor
- c. Ground water infiltration
- d. Unauthorized roof water connection.

2.1.3.1. Per capita Sewage flow

The entire used water of a community should normally contribute to the total flow in a sanitary sewer. However, the observed dry weather flow quantities usually are slightly less than the per capita water consumption, since some water is lost in evaporation, seepage into ground, leakage etc. As such 80% of quantity of water supply can be taken as sewage generation. The per capita water consumption of Alappuzha Municipality is considered as 150 lpcd. So, the per capita sewage flow is taken as 120 lpcd (DWF).

Table 3: Sewage generation in project area

Water consumption @ 150 lpcd		4.3	
Add 20% for Non-Domestic water demand		0.86	
Total water Consumption in the year	2054	5.16	
Sewerage generated (@ 80% of Water Consumption)		4.13	MLD
Add 10% infiltration		0.41	
Total sewage demand as on 2054	4.54		

2.1.3.2. Peak factor

The flow in sewers varies from hour to hour and seasonally. However, for the purpose of hydraulic design estimated peak flows are adopted. The peak factor or the ratio of maximum to average flows depends upon contributory population. The peak factor also depends upon the density of population, topography of the site, hours of water supply and the minimum flow may vary from 1/3 to 1/2 of average flow.

Table 4: Peak factor for the contributory population

Sl. no.	Population	Peak factor
1	Up to 20,000	3.00
2	Above 20,000 to 50,000	2.50
3	Above 50,000 to 7,50,000	2.25
4	Above 7,50,000	2.00

2.1.3.3. Ground Water Infiltration

Some quantity of ground water or subsoil water may infiltrate into sewers through defective joints, broken pipes etc. This is significant when water table is high and head of ground water is more than the head of sewage in sewers. Since sewers are designed for peak discharges, allowances for groundwater infiltration for the worst condition in the area should be made as in **Table 5**. Once the flow is estimated as the above criteria, the design infiltration value shall be limited to a maximum of 10% of the design value of sewage flow.

Table 5: Ground water infiltration

	Minimum	Maximum
Litres/ha/day	5,000	50,000
Litres/Km of sewer/day	500	5,000
Litres/day/manhole	250	500

A value of 5000 litres/ha/ day is adopted for design as per CPHEEO manual. However, a higher infiltration rate is expecting due to higher ground water table and proximity to the back waters.

2.1.3.4. Unauthorized roof water connection

The flows due to unauthorized roof water connection from the household also need to be considered. Whereas the CPHEEO is of opinion that with strict rules and regulations, this should be banned. Hence this flow is taken as zero Hence the flow through the sewer is calculated as shown in **Table 6**.

Table 6: Sewage calculation at peak flow

1.	Peak flow	PF × DWF + GW Infiltration
2.	Average flow	2 DWF + GW Infiltration
3.	Minimum flow	DWF + GW Infiltration

Expected sewer load for all wards for Alappuzha municipality is calculated in the total project area with forecasted population with the present population obtained from municipality and considering 0.61% decadal growth whose calculation is attached in Annexure I. This total load obtained is adopted for the STP design.

The population covered in the Alissery zone network area is forecasted to 28686 in 2054 and the sewage load estimated as 4.54 MLD. Septage facility is provided for the non-network area which comprises a load 13.01KLD and the plant is designed for a capacity of 5MLD. The network for subzone 1 of Alissery Zone is designed for the area of 0.473 Sq. Kms accordingly in Phase 1 expecting a load of 1.3MLD.

2.2. DETAILED DESCRIPTION OF SEWERAGE NETWORK

2.2.1. Sewerage System

A sewerage system, or wastewater collection system, is a network of pipes, pumping stations, and appurtenances that convey sewage from its points of origin to a point of treatment and disposal. When this is operated correctly and the waste is treated in proper manner, sewerage system is an effective way of waste disposal. The advantage of the sewerage system is that it can remove large amount of waste water and it provides great user convenience. There are three types of sewerage system viz separate system, combined system and partially separate system. Separate system of sewerage is being proposed in the case of Alappuzha Municipality.

2.2.1.1. Separate Sewer System

In this system, two sets of sewers are provided for the separate collection of municipal wastewaters (black water from toilets, grey water and industrial wastewater) and surface run-off (rain water and storm water). The separate collection prevents the overflow of sewer systems and treatment stations during rainy periods and the mixing of the relatively little polluted surface run-off with chemical and microbial pollutants from the municipal wastewater. The design of the sewers and the treatment stations thus needs to consider the volume of the wastewater only and the surface run-off and rainwater can be reused (e.g., for landscaping or agriculture) after a simplified treatment. The layout of the system is as shown in Fig. 3.

Owing to the diversity in geographical features, the climatic condition in Kerala is diverse Four seasonal variations are experienced viz. the South West monsoon season from June to September, North East monsoon season from October to December, a cool and pleasant climate during January and February and summer season. Since the incessant rain occur in only for six months in a year, separate sewerage system is feasible for our climatic condition. Hence, only dry weather flow is considered for the proposed sewerage project.

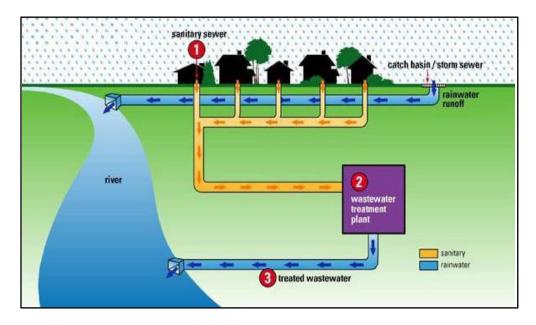


Fig. 3: Layout of separate sewerage system

2.2.2. Layout of Sanitary Sewer System

The sewer system layout involves the following steps:

- a) Selection of an outlet or disposal point
- b) Prescribing limits to the drainage valley or Zonal Boundaries
- c) Location of Trunk and Main Sewers
- d) Location of Pumping Stations if found necessary

In general, the sewers will slope in the same direction as the street or ground surface and will be connected to trunk sewers. The discharge point may be a treatment plant or a pumping station or a water course, a trunk sewer or intercepting sewer. It is desirable to have discharge boundaries following the property limits. The boundaries of sub zones are based on topography, economy or other practical consideration. Trunk and main sewers are located in the valleys. The most common location of sanitary sewer is in the center of the street. A single sewer serves both sides of the street with approximately same length for each house connection.

In very wide streets it may be economical to lay a sewer on each side. In such cases, the sewer may be adjacent to the road curb or under the footpath & interference with other utilities has to be avoided. Sewers as a rule are not located in proximity to water supplies.

When such situations are unavoidable the sewers may be encased in sleeve pipes or encased in concrete. A tentative layout is prepared by marking sewer lines along the streets or utilities. The direction of flow is shown using arrows.

The components of the sewage collection and carriage network consist of the following elements as given in **Table 7**. Manholes are provided at all sewer intersections, changes in horizontal direction, major change in slopes, change in size and at regular intervals. The depth of cut is dictated by the need to ensure a minimum cover and the desirability of mandatory cushion depending upon the pipe size and expected loads. It is the standard design practice to provide a minimum cover of 1 m at the starting point in the case of sanitary sewer network and 0.5 m for storm drainage system

Table 7: Components of sewerage network

Sl. No.	Type of element	Material	Function
1	Chambers	Reinforced concrete	Collection of sewage from individual units for transferring to manholes
2	Sewer pipelines	High Density Polyethylene (HDPE)	Transfer of sewage by gravity flow from one point to other
3	Manholes	Reinforced concrete	Sewage collection points and inspection areas for removing blocks and cleaning of lines
4	Lift manholes	Reinforced concrete	Sewage collection points and inspection areas for removing blocks and cleaning of lines and lifting of sewer load to the next manhole. Submersible pump sets are installed inside in such manholes.
5	Collection well	Reinforced concrete	Centralised collection point for sewer load from a sub- zone in the project area.
6	Pumping station	Reinforced concrete	Centralised collection point for sewer load from a sub- zone in the project area and pumping of sewage to the next well or STP.

2.3. SEWAGE TREATMENT PROCESSES

The composition of sewage is complex and the treatment processes is broadly classified as primary, secondary and tertiary treatments (**Table8**). Primary treatment refers to the physical unit operations which are based on physical forces like screening, mixing, flocculation, sedimentation, floatation, filtration. Secondary treatment refers to the chemical and biological unit processes. Treatment methods in which removal or conversion of contaminant is brought by addition of chemicals or by other chemical reaction are known as chemical unit

processes, for example, precipitation, gas transfer, adsorption, and disinfection. Treatment methods in which the removal of contaminants is brought about by biological activity are known as biological unit processes. Tertiary treatment refers to the any one or combination of chemical and biological processes used after secondary treatment.

Table 8: Unit operations and functions

S1. No.	Unit	Function	Unit Operations /Phases
1	Primary	Removal of rags, floating matter, grit, oil and grease etc.	ScreeningGrit removalOil and grease trap
2	Secondary	Removal of Bio degradable organic matter and suspended solids. Also include nutrient removal (Nitrate and Phosphate) in advanced technologies	 Aerobic suspended growth (Aerobic and anaerobic) Lagoon Chemical oxidation process Nitrate and phosphate removal Chemical oxidation Suspended growth Nitrification/Denitrificat ion Air stripping Ion exchange Chemical treatment Biological nutrient removal system
3	Tertiary	Polishing the effluent for reuse application	 Pathogen removal Chlorine compounds O₃,UV Radiation Membrane filtration Filtration variation Carbon Adsorption Iron exchange

Wastewater contains a lot of dirty substances that cause a foul smell over time. To ensure that the surrounding areas are free of the foul smell, odour treatment processes are also initiated at the treatment plant. All odour sources are contained and treated using chemicals to neutralize the foul smell producing elements before the treatment. The main contaminants in domestic sewage to be removed are biodegradable organics, as usually measured by BOD,

suspended solids and pathogens with the first two having been traditionally considered as the performance indicators for various treatment units. It is generally the objective of domestic sewage treatment plant to produce treated effluent having BOD_5 of 30 mg/1 or less and suspended solids of 50 mg/l or less for disposal into inland water bodies.

2.3.1 Primary Treatment Units

Primary treatment consists solely separating the floating materials and also the heavy settable organic and inorganic solids. It also helps in removing the oils and grease from the sewage. This treatment reduces the BOD of the wastewater by about 15 to 30%. The operations used are screening for removing floating papers, rages, cloths, etc., grit chambers or detritus tanks for removing grit and sand, and skimming tanks for removing oils and grease; and primary settling tank is provided for removal of residual suspended matter. The organic solids, which are separated out in the sedimentation tanks in primary treatment, are often stabilized by anaerobic decomposition in digestion tank or incinerated. After digestion the sludge can be used as manure after drying on sludge drying beds or by some other means. The influent passes through a bar screen to remove all large objects like cans, rags, sticks, plastic packets, etc. carried in the sewage stream. Bar screen is a set of inclined parallel bars, fixed at a certain distance apart in a channel. These are used for removing larger particles of floating and suspended matter. The wastewater entering the screening channel should have a minimum self-clearing velocity. Also, the velocity should not rise to such extent as to dislodge the screenings from the bars. This is most commonly done with an automated mechanically raked bar screen in modern plants serving large populations, while in smaller or less modern plants, a manually cleaned screen may be used. The slope of the hand-cleaned screens should be between 30° and 45° with the horizontal and that of mechanically cleaned screens may be between 45° and 80°. The raking action of a mechanical bar screen is typically paced according to the accumulation on the bar screens and/or flow rate. The solids are collected and later disposed of in a landfill, or incinerated.

2.3.1.2. Grit Removal

Grit chambers are designed for the removal of grit consists of sand, gravel, cinders or other inert solid materials having specific gravity about 2.65, which is much greater than those of the organic solids present in sewage. Grit removal is necessary to

- Reduce formation of heavy deposits in aeration tanks, aerobic digesters, pipelines, channels, and conduits
- ➤ Reduce the frequency of digester cleaning caused by excess excessive accumulations of grit and
- ➤ Protect moving mechanical equipment from abrasion and accompanying abnormal wear.

In this chamber particles settle as individual entities and there is no significant interaction with the neighboring particles. This type of settling is referred as free settling or zone-I settling. For proper functioning of the grit chamber, the velocity through the grit chamber should not be allowed to change in spite of the change in flow. One of the most satisfactory types of automatic velocity control is achieved by providing a proportional weir at the outlet. Grit chambers come in 3 types: horizontal grit chambers, aerated grit chambers, and vortex grit chambers. The horizontal flow grit chambers should be designed in such a way that under the most adverse conditions, all the grit particles of size 0.20 mm or more in diameter should reach the bed of the channel prior to reaching outlet end. The length of the channel depends on the depth required which again depends on the settling velocity. A minimum allowance of approximately twice the maximum depth should be given for inlet and outlet zones.

2.3.1.3. Oil and Grease Removal

The floating solid materials such as soap, vegetables, debris, fruit skins, pieces of corks, etc. and oil and grease are removed from the wastewater in skimming tanks. A skimming tank is a chamber designed so that floating matter rises and remains on surface of the wastewater until removed, while the liquid flows continuously through outlet or partition below the water lines. The detention time in skimming tank is 3 minutes. To prevent heavy solids from settling at the bed, compressed air is blown through the diffusers placed in the floor of the

tank. Due to compress air supply, the oily matters rise upward and are collected in the side trough, from where they are removed. In conventional sewage treatment plant separate skimming tank is not used and these materials are removed by providing baffle ahead of the effluent end of the primary sedimentation tank.

2.3.1.4. Primary Sedimentation Tanks

The wastewater after grit removal in grit chamber mainly contains light weight organic matter is settled in the primary sedimentation tanks. The primary sedimentation tank (PST) generally removes 30 to 40% of the total BOD and 50 to 70% of suspended solids from the raw sewage. The flow through velocity of 1 cm/sec at average flow is used for design with detention period in the range of 90 to 150 minutes. This horizontal velocity will be generally effective for removal of organic suspended solids of size above 0.1 mm. Effluent weirs are provided at the effluent end of the rectangular tanks, and around the periphery in the circular tanks. The sludge collection hopper is provided near the centre in circular tank and near the influent end in rectangular tanks. A baffle is provided ahead of the effluent weir for removal of floating matter. This scum formed on the surface is periodically removed from the tank mechanically or manually.

Particles in relatively dilute concentration with smaller size sometimes will not act as discrete particles (as the grit particles behave in grit chamber) but these particles will coalesce during sedimentation. As flocculation occurs, the size of the particle increases and it settles faster. The magnitude of flocculation will depend upon the opportunity for contact between the particles, which depends upon overflow rate, temporal mean velocity gradient in the system (representing mixing) and concentration and size of the particles. Although, settling rate of particle is independent of depth of basin, the basin depth will decide liquid detention time in the tank and sufficient depth should be provided for settling to separate it from sludge settled zone. The effect of these variables on settling can only be determined by sedimentation tests, and classical laws of sedimentation are not applicable, due to change in characteristics of the particle during settling. Settling column studies are used to determine the settling characteristics of the suspension of flocculant particles.

Primary sedimentation tanks can be circular or rectangular tanks designed using average dry weather flow and checked for peak flow conditions. In lets for both rectangular and circular tanks are to be designed to distribute the flow equally across the cross section. Scum removal arrangement is provided ahead of the effluent weir in all the PST. The detention time usually provided is between 1.5 and 2.5 h at average flow. To avoid resuspension (scouring) of settled particles, horizontal velocities through the PST should be kept sufficiently low.

2.3.1.5. Equalization

Equalization is a means of buffering or equalizing the characteristics of the wastewater prior to entering the treatment plant. Equalization tanks are provided to

- Balance fluctuating flows or concentrations
- Assist self-purification
- Even out the effect of a periodic slug discharge from a batch process

Industrial waste streams vary considerably in both level of contaminants (pH, total suspended solids, etc.) and flow rates. The equalization tanks are used to limit the effects of sudden and unexpected spikes in pollution loads (shock loads). During the peak hours sewage comes at high flow rate. The equalization tank stores this effluent and lets it out during the non-peak time when there is no /little incoming effluent. The tank is rectangular in shape to provide placement of air diffusers for full floor coverage. Diffusers are to be checked and cleaned at regular intervals to prevent from excessive odour and insufficient mixing/aeration. It is advised to keep the equalization tank nearly empty before the expected peak hours otherwise it will overflow and manually remove the sediments at least once a year. A part of recirculated sludge from secondary sedimentation, can be sent upstream to equalization tank. This operation gets a good pre-oxygenation and reduces odours.

Location of equalization basin after primary treatment and before biological treatment is appropriate. This arrangement considerably reduces problem of sludge and scum in the equalization basin. If the equalization basin is placed before primary treatment, it must be provided with sufficient mixing to prevent solids deposition and concentration variations, and aeration to prevent odour problem.

2.3.2. Secondary Treatment

Secondary treatment of the wastewater could be achieved by chemical unit processes such as chemical oxidation, coagulation-flocculation and sedimentation, chemical precipitation, etc. or by employing biological processes (aerobic or anaerobic) where bacteria are used as a catalyst for removal of pollutant. For removal of organic matter from the sewage, biological treatment processes are invariably used either in single stage or in multi stage as per the requirements to meet the discharge norms.

The objective of biological treatment is to remove organic matter which is present in soluble and colloidal form or to remove nutrients such as nitrogen and phosphorous from the wastewater. The microorganisms (principally bacteria) are used to convert the colloidal and dissolved carbonaceous organic matter into various gases and into cell tissue. Hence, the complete will not be achieved unless the cell tissues are ultimately removed. In the biological reactors under proper environmental conditions, the soluble organic substances of the wastewater are completely destroyed by biological oxidation; part of it is oxidized while rest is converted into biological mass. The end products of the metabolisms are either gas or liquid and on the other hand, the synthesized biological mass flocculates easily and it can be easily separated out in clarifiers. Therefore, the biological treatment system usually consists of (1) a biological reactor, and (2) a sedimentation tank, to remove the produced biomass called as sludge.

2.3.2.1. Types of Biological Reactors

Depending upon availability of oxygen or other terminal electron acceptor the biological reactors are classified as aerobic, anaerobic, anoxic or facultative process. Depending on how the bacteria are growing in the reactors they can be classified as

- a) Suspended growth process: Bacteria are grown in suspension in the reactor without providing any media support (E.g., Activated sludge process)
- b) Attached growth process: where microorganism growth occurs as a biofilm formed on the media surface provided in the reactor (E.g., Trickling filters)

The media surfaces provided for the growth of microorganisms could be made from rocks or synthetic plastic offering very high surface area per unit volume. The media could be stationary in the reactor, as in trickling filter, which is called as fixed film reactor or it could be moving media as used in moving bed biofilm reactor (MBBR).

One of the most challenging aspects of a sustainable sewage treatment system design is the analysis and selection of the treatment processes and technologies capable of meeting the requirements. The process is to be selected based on required quality of treated water. While treatment costs are important, other factors should also be given due consideration. For instance, effluent quality, process complexity, process reliability, environmental issues and land requirements should be evaluated and weighted against cost considerations. Among the various available technologies MBBR technology is found suitable in this project.

2.3.2.2. Secondary Clarifier with Plate Settler

Secondary clarifiers are to separate biological floc from the treated liquid waste stream. Plate settlers are also being proposed in the clarifier to get more clarified water. Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation. A clarifier is generally used to remove solid particulates or suspended solids from liquid for clarification. Necessary coagulants are being added before feeding the clarifier.

2.3.3. Tertiary Treatment

Tertiary treatment refers to secondary treatment followed by a filtration step, such as media filtration, so that the turbidity and TOC concentrations are generally lower, and if coagulation with metal salts is used, then the phosphate concentration will also be reduced.

2.3.3.1. Pressure sand Filter

The Pressure Sand Filter consists of a multiple layer of sand with a variety in size and specific gravity. These Filters are designed to remove turbidity and suspended particles present in the feed water with minimum pressure drop. Raw water flows downwards through the filter

bed and as the suspended matter, which is treated by addition of a coagulant like alum or poly electrolyte, is retained on the sand surface and between the sand grains immediately below the surface. There is steady rise in the loss of head over a period of time and the flow reduces once the pressure drop across the filter is excessive. The filter is then taken out of service and cleaning of the filter media is affected by flow reversal also called as backwash. To assist in cleaning the bed, the backwash operation is sometimes preceded by air scouring by way of agitation through the under-drain system. The air scouring agitates the sand with a scrubbing action, which loosens the intercepted particles.



Fig. 4: Pressure Sand Filter

2.3.3.2. Activated Carbon Filter (ACF)

Filtered wastewater from Pressure sand filter is then passed through the Activated Carbon Filter. They are generally employed in the process of removing organic compounds and/or extracting free chlorine from water, thereby making the water suitable for discharge. Carbon filtering is a method of filtering that uses a bed of activated carbon to remove contaminants and impurities, using chemical adsorption. Each particle/granule of carbon provides a large surface area/pore structure, allowing contaminants the maximum possible exposure to the active sites within the filter media.



Fig. 5: Activated carbon filter

2.3.3.3. Chlorination

Chlorination is by far the most common method of wastewater disinfection and is used worldwide for the disinfection of pathogens before discharge into receiving streams, rivers or oceans. Chlorine is known to be effective in destroying a variety of bacteria, viruses and protozoa, including Salmonella, Shigella and Vibrio cholera. Disinfection is achieved at this facility through chlorination using chlorine gas. The purpose of the Chlorine Contact Tanks is to allow sufficient time for the chlorine to disinfect the water.

2.4. MOVING BED BIOFILM REACTOR TECHNOLOGY (MBBR): AN OVERVIEW

The moving bed biofilm (MBBR) technology has been applied to the treatment of wastewaters over the past 30 years, establishing itself as a simple, flexible and compact technology. It is proven to be successful in removing the BOD, COD, ammonia and nitrogen both in municipal and industrial wastewaters. The main difference between MBBR technology when compared to other biofilm systems is that it combines the advantages of the traditional activated sludge system with the advantages offered by biofilm systems while minimizing the disadvantages of both. Some of the inherent advantages of using MBBR includes,

- compact units with small size
- high volumetric efficiency

- > enhanced process stability
- minimal head loss without requiring periodic backwashing
- flexibility and simplicity of operation
- compatibility with a variety of solid separation techniques
- reduced sludge production and no issues of sludge bulking
- not prone to clogging
- availability of spare parts
- no odour nuisance and other environmental hazards

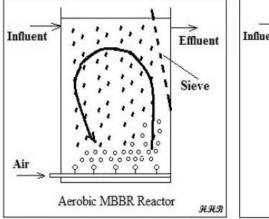
The MBBR is based on the use of a biofilm that grows attached to the surface area of specifically designed carriers made of polyethylene or polypropylene with a density close to that of water. The carriers are designed to provide a large protected surface for bacterial growth. The reactor volume is filled with carriers up to a maximum value of 67%. Due to their density being close to that of water and the fact that only part of the reactor volume is filled with carriers, the packed bed is allowed to move freely in the reactor. In this system the biological mass grows both suspended flocs and also as attached biofilms. Hence, a higher biomass concentration is maintained in the reactor compared to the suspended processes such as Activated sludge. This increases the treatment capacity of the given reactor volume.



Fig. 6: Moving Bed Bio Reactor

In MBBR (**Fig. 6**), more than 90% of the biomass are likely to trapped and cultivated in the media and this can be associated with the facts that (i) the carriers are made to remain in suspensions within the reactors due to perforations or screen arrangement at the discharge; (ii) the carrier is deliberately designed with a small polyethylene cylinder- like materials with potentials to have a high specific surface area to accommodate biofilm growth. Furthermore, the increase of overall sludge age in the system leads to a favorable environment for the growth of nitrifying bacteria.

In general, the reactors are simple to install and maintain. The MBBR processes takes place in a tank similar to activated sludge serration tank. The carrier media are kept suspended by a diffused air aeration system for an aerobic process or by a mechanical system for an anoxic or anaerobic process as shown in **Fig. 7**. A sieve is used typically used at the exit of the tank to keep the carrier media in the tank. Primary clarification is normally used ahead of the MBBR tank. Secondary clarification is also typically used, but there is no activated sludge is recycled into the process. MBBR processes uses plastic media support carriers similar to those shown in **Fig. 8**.



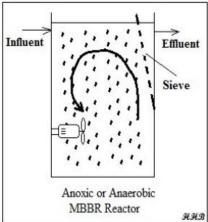


Fig. 7: Operating principle of the MBBR process with Aerobic reactors (left) and anoxic anaerobic reactors (right)

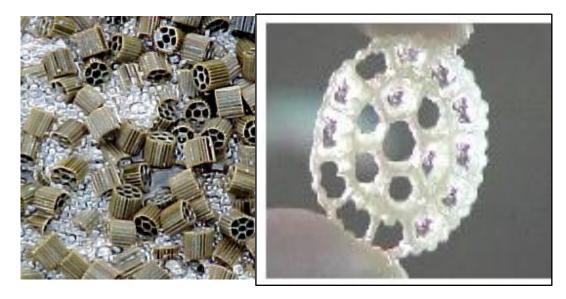


Fig. 8: Media support carriers used in MBBR

2.4.1. MBBR wastewater Treatment Process Alternatives

The MBBR wastewater treatment process is quite flexible and can be used in several different ways. The figure shows the flow diagram of the options adopted for the proposed treatment plant, with single stage BOD removal, nitrification, post anoxic denitrification with raw sewage feeding for carbon source and thereafter removing low grade BOD in the subsequent reactor.

2.4.1.1. Post Anoxic Denitrification Alternative

In order to carry out denitrification of a wastewater, it is necessary to nitrify the wastewater initially i.e., to convert the ammonia nitrogen present in the influent to nitrate. In an MBBR denitrification process three reactor are necessary, one for BOD removal, one for nitrification and one for denitrification. The nitrification reactor will always follow the BOD removal reactor because of the need for a low BOD level in the nitrification reactor. Denitrification reactor is provided after the nitrification reactor as the post anoxic denitrification.

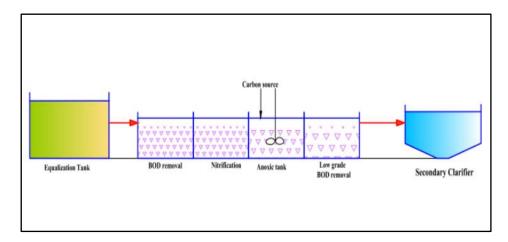


Fig. 9: Nitrification and De-nitrification reactors.

2.4.1.2. Nitrification Tank

Nitrification is the biological conversion of ammonium to nitrate nitrogen. It is autotrophic process i.e., energy for bacterial growth is derived by oxidation of nitrogen compounds such as ammonia. Nitrification is two-step process. Two species of bacteria are involved in the process – Nitrosomonas and Nitrobacter. These bacteria are collectively known as nitrifiers and are autotrophic, i.e., they get their carbon source from inorganic carbon (carbonates, bicarbonates) or carbon dioxide. In first step, bacteria known as Nitrosomonas can convert ammonia and ammonium to nitrite and are strictly aerobes. This process is limited by the relatively slow growth rate of Nitrosomonas. Next, bacteria called Nitrobacter finish the conversion of nitrite to nitrate.

First step:
$$NH_4^+ + \frac{3}{2}O_2 \xrightarrow{Nitrosomanas} NO_2^-$$
 (Nitrite) $+ 2H^+ + H_2O$

Second step:
$$NO_2^- + \frac{1}{2}O_2 \xrightarrow{\text{Nitrobacter}} NO_3^-(\text{Nitrate})$$

Overall reaction:
$$NH_4^+ + 2O_2 \rightarrow NO_3^- + 2H^+ + H_2O$$

Nitrosomonas and Nitrobacter use the energy derived from the reactions for cell growth and maintenance. Some of ammonium ions are assimilated into cell tissues. Neglecting the ammonium ion used in cell synthesis the O_2 required to oxidize ammonia to nitrate is 4.57 mg O_2 /mg ammonium nitrogen. If the ammonium used in cell, O_2 required is considered it is 4.3 mg O_2 /mg ammonium nitrogen and about 7.14 mg of alkalinity is needed to neutralize the H+ produced.

2.5. FINAL ACHIEVABLE WASTEWATER CHARACTERISTICS

Sewer loads generated from individual households, commercial establishments, public institutions etc. in the project area of the Haripad municipality is collected from the source nodes and carried through pipes and concrete chambers to the nearest manholes. From there it is transported through a network of pipes towards the Sewage Treatment Plant (STP). The objective of sewage treatment is to reduce the polluting substances to (a) the standards laid down by the Ministry of Environment and Forests (MoEF) of the Government of India (GOI) and these cannot be relaxed by the State Pollution Control Boards (PCB), but they can prescribe more stringent standards specific to the discharge environment and (b) the specified limits of fecal coliforms laid down by the National River Conservation Directorate (NRCD). These standards are as mentioned as in **Table 9**.

Table 9: Effluent Discharge standards

		Standards					
No.	Characteristics	Inland	Public	Land	Marine		
140.	Characteristics	surface	sewers	for	coastal		
		water	(A)	irrigation	areas		
1	Colour and odour	(B)		(B)	(B)		
2	SS	100	600	200	(C), (D)		
3	Particle size of SS	(E)	-	ı	(F), (G)		
4	pH value		5.5 t	o 9.0			
5	Temperature	(H)	-	-	(H)		
6	Oil and grease	10	20	10	10		
7	Total residual chlorine	1.0	-	ı	1.0		
8	Ammoniacal nitrogen (as N)	50	50	-	50		
9	Total Kjeldahl Nitrogen, (TKN) (as N)	100	-	-	100		
10	Free ammonia (as NH ₃)	5.0	-	-	5.0		
11	Biochemical Oxygen Demand	30	350	100	100		
12	Chemical Oxygen Demand	250	-	-	250		
13	Arsenic (as As)		0	.2			
14	Mercury (as Hg)	0.01	0.01	-	0.01		
15	Lead (as Pb)	0.1	1.0	-	2.0		
16	Cadmium (as Cd)	2.0	1.0	-	2.0		
17	Hexavalent Chromium (as Cr 6+)	0.1	2.0	-	1.0		
18	Total Chromium (as Cr)	2.0	2.0	-	2.0		
19	Copper (as Cu)	3.0	3.0	-	3.0		

20	Zinc (as Zn)	5.0	15.0	-	15.0	
21	Selenium (as Se)	0.05	0.05	-	0.05	
22	Nickel (as Ni)	3.0	3.0	-	5.0	
23	Cyanide (as CN)	0.2	2.0	0.2	0.2	
24	Fluoride (as F)	2.0	15.0	-	15.0	
25	Dissolved phosphates (as P)	5.0	-	-	-	
26	Sulphide (as S)	2.0	-	-	5.0	
27	Phenolic compounds (as C ₆ H ₅ OH)	1.0	5.0	-	5.0	
	Radioactive materials					
28	Alpha emitters, micro curie/L	10-7	10-7	10-8	10-7	
20	Beta emitters, micro curie/L	10-6	10-6	10-7	10-6	
29	Bio-assay test		(1)		
30	Manganese (as Mn),	2.0	2.0	-	2.0	
31	Iron (as Fe),	3.0	3.0	-	3.0	
32	Vanadium (as V),	0.2	0.2	-	0.2	
33	Nitrate Nitrogen (as N),	10.0	-	-	20.0	
	Easal Californa MDNI/100mal	onto	onto land		vater	
34	Fecal Coliform, MPN/100ml for discharge	(J)	(K)	(J)	(K)	
	101 discharge	1,000	10,000	1,000	10,000	

(A) These standards shall be applicable only if such sewer leads to a secondary treatment including biological treatment system; otherwise, the discharge into sewers shall be treated as discharge into inland surface waters. (B). All efforts should be made to remove colour& unpleasant odour as far as practicable. (C) For process wastewater 100 mg/l (D) For cooling water effluent 10% above total suspended matter of influent. (D) Shall pass 850 micron IS Sieve (E) Floatable solids max. 3mm (F) Settleable solids max. 850 microns (G) Shall not exceed 5°C above the receiving water temperature (H) 90 % survival of fish after 96 hours in 100 % effluent (J) Desirable (K) Maximum permissible

2.6. DISPOSAL OF WASTEWATER INTO STREAMS

In several cases streams are used for receiving waste waters. Under such a situation it is important to ensure that the receiving body of water does not become a source of public nuisance because of complete absence of oxygen. High degree of treatment would be needed in regions where sources of water are limited, stream flows are insufficient and loads of waste water are high. When waste waters are intended for reuse, the extent of treatment needed would depend upon the specific use for which they are intended.

2.6.1. Assimilative Capacity of Streams

Assimilative capacity is defined as the ability of the natural system to absorb various materials, including anthropogenic wastes, at certain concentrations without itself being

tainted. This term was particularly used to describe the use of water bodies like streams, lakes and oceans to process simple organic wastes and to determine the volume waste or sewage that may be discharged into the receiving water without lowering the ambient Dissolved oxygen (DO) level. The capability of the streams to assimilate the wastes and restore its own quality is termed as self-purification and is a complex process and involves physical, chemical and biological processes working simultaneously.

When organic water is discharged, the settleable solids, if present in settle at the bed of the river, near the outfall, thus helping in self-purification process. The organic matter undergoes biochemical processes of decay with the utilization of DO, provided by the natural aeration of the stream. Due to oxidation, the river DO depletion occurs and the rate of oxidation is faster at high temperature than at low temperature. DO is replenished primarily though the reaeration from the atmosphere. The quantity of dissolved oxygen available in stream water is higher at colder temperatures. The maximum value of DO in water at 0°C is 14.6 mg/L and at 25°C is 8.24 mg/L. However, the activity of microorganisms is higher at high temperature and the process of self-purification is carried out quickly in summers than in winters. Sunlight helps certain microorganisms to absorb CO₂ and give out oxygen, thus resulting in self- purification. Sunlight also acts as disinfectant and stimulates the growth of algae which produces oxygen during photosynthesis. Hence wherever there is algal growth, water contains more DO during day time.

Accordingly, the self-purification capacity depends on the dilution of the stream, time of passage down the stream, water temperature, characteristics of waste and microorganisms. Water assimilation capacity, controlled by self-purification processes, depends on the size and behavior of the receiving waterbody which in turn depends on the configuration of the drainage area and the physical characteristics of the channel along its course.

A river stream undergoing self-purification can be divided into four zones of pollution viz; zone of degradation, zone of active decomposition, zone of recovery and zone of clear water. As the influent wastewater travels through these 4 zones from the point of sewage outfall, the organic matter undergoes various decomposition process. At the end of clear

zone, the river attains its original state and the aquatic life prevails the DO level reaches its saturated value. Because of the mineralization occurred in the previous zones, water is now richer in nutrients than before the pollution and the production of algae is higher. There is the re-establishment of the normal food web. The ecosystem becomes stable and reaches its climax again. Thus, the assimilative capacity of the waterbody can be used up to a level that is acceptable and non-detrimental. Beyond this level no discharge could be allowed.

2.7. SLUDGE MANAGEMENT

The solids that are settled and separated during wastewater treatment referred as sludge should be treated properly. The sludge generated during the various stages of wastewater treatment like primary sedimentation, secondary sedimentation and sludge generated from advanced (tertiary) treatment, if any ought to be disposed efficiently and is essential to the overall success if the plant. The sludge generated during the wastewater treatment can be classified into three categories:

- *Primary sludge*: Sludge settled in primary settling tanks comes under this category which contains 3% to 7% solids out of which approximately 60% to 80% are organic. Primary sludge solids are usually gray in color, slimy, fairly coarse, and with highly obnoxious odors.
- *Secondary sludge*: This type of sludge from secondary settling tanks has commonly a brownish, flocculent appearance and an earthy odor. It consists mainly of microorganism containing 75% to 90% organic fraction and remaining inert materials. The organic matter may be assumed to have a specific gravity of 1.01 to 1.05, depending on its source, whereas the inorganic particles have high a specific gravity of about 2.5.
- Tertiary sludge: The nature of sludge from the tertiary (advanced) treatment process
 depends on the unit process followed like membrane processes or chemical methods,
 etc.Tertiary sludge from biological nitrification and denitrification is similar to waste
 activated sludge.

The water content of the sludge is very high, and solids constitute very small part of it. Therefore, before final disposal further treatment is required for this sludge to reduce water content and oxygen demand. Sludge is stabilized to (i) reduce pathogens, (ii) eliminate

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odours, (iii) inhibit, reduce, or eliminate the potential for decomposition, and (iv) improve dewatering characteristics of the sludge to reduce volume for disposal. There are four means to eliminate this nuisance condition through stabilization. They are (1) biological reduction of volatile solids, (2) chemical oxidation of volatile solids, (3) addition of chemicals to make conditions not suitable for bacterial growth, (4) application of heat to disinfect or sterile the sludge. In order to reduce the volume of sludge, dewatering process is done with the help of centrifuges, sludge thickening units and sludge press. After this process, it is converted in the form of cake. The sludge from sewage is rich with nitrogen, phosphorous, Sulphur and other minerals which are essential for the growth of plants. Hence it can be used as a manure. Further, researches are going on this field, to make this cake as a construction material but is in its infant stage.

CHAPTER 3

ENGINEERING DESIGN

3.1. SEWERAGE SYSYTEM OF ALAPPUZHA MUNICIPALITY

The sewerage scheme of Alappuzha Municipality is planned as the whole Municipal area has been divided into four network zones and two septage zones as shown in fig10. Out of the 52 wards in the municipality, wards 32 to 36 & 43 fully and 37, 38, 42 & 44 partially is now considered to have sewer network system as Alissery Zone in zone 2 and thereby proposing 5 MLD STP at Alissery Store compound of KWA as shown in fig11. At present, ward 34 and 35 is only considered for the network implementation as Phase 1 which is covering 0.475 sqkm with network length of 9.79km. For the planning and execution lenience, the total scheme is bifurcated into various phases. The network for the rest of the area can be implemented in different phase. As the decadal growth considered is 0.61% only which reflects the minor variation in the load calculation for 15 years design period and 30 years design period. Hence the entire system components are envisaged with design period of 30 years.

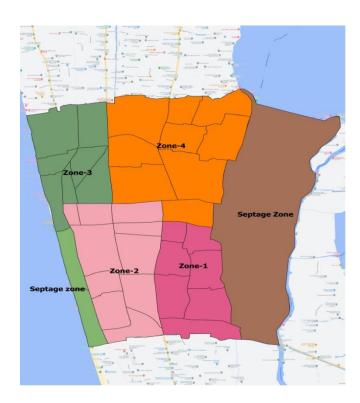


Fig.10: Sewage Network Zones of Alappuzha Municipality

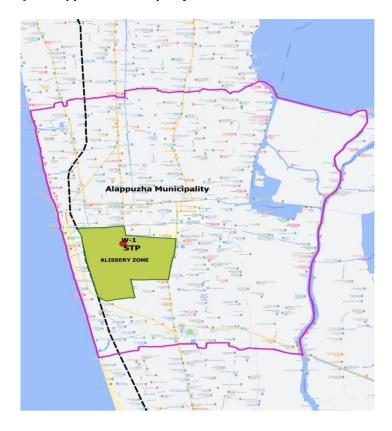


Fig.11: Alissery Zone and STP Location

The projected population of Alissery zone as on 2054 is 28686 in which network coverage covering an area of 2.645 sq km and the estimated sewage load is 4.54 MLD including septage provision for the balance area. Two wards were taken in Phase 1, mainly Town ward, Alissery ward and Lajaneth ward. The population for phase 1 (subzone 1 of Alissery zone in zone2) is 8032 as on 2022 and projected to 8191 for the year, 2054. In phase 1 of the sewerage system sewer network of 9790m consisting of 384 manholes, and pumping main of 800m is taken into consideration. The proposed collection well1 for subzone 1 is located at Alissery STP site. The treatment plant proposed having 5 MLD capacity will be set up in Kerala Water Authority's (KWA) own land at Alisserry. The sewer network lines proposed are HDPE PE100 PN8 and pumping mains HDPE PE100 PN10. As the sewerage connection to the households are to be provided in parallel with the construction of STP for the timely commissioning of the plant, provision for giving sewer connections to households are included in the project.

Co-treatment facility is also providing here to treat the septage waste in the treatment plant to cater non covered households. The septage load assessed to around 13 KLD is meant to

be treated at the proposed STP. For time being, in phase 1, the network coverage considered only for the subzone 1 and the sewage load expected from the network is only 1.3 MLD. Eventually, to deal more septage load additional dilution facility considered in this project.

3.2. DESIGN OF SEWERAGE NETWORK

For the design of sewage network, hydraulic analysis was performed and the pipelines are designed for gravity flow conditions except for lifting and collection points. Minimum outer diameter of the pipeline was taken as 200 mm for main lines along the roads and for carriage from chambers to manholes, it is taken as 160 mm with material as PE. The slope was taken as a minimum value of 1 in 250 in general and care has been taken to provide sufficient slopes to generate self-cleansing velocities during peak flow conditions when the pipe is near to full in load. The manholes are located at spacing around 30m and at all junctions, bend etc. All stipulations given by the relevant Indian Standard Codes of practice and CPHEEO Manual have been adopted in design

3.2.1. Pipes

The pipes proposed for the sewerage network is PE (Polyethylene) pipes with size ranging from 200 mm to 355 mm (outer diameter). The details of pipes used in the gravity flow and pressurized flow sewerage network of subzone I are given in **Table 10 and 11** respectively. When compared to other common wastewater piping system materials, such as PVC, ductile iron, or concrete, HDPE pipe offers significant benefits.

HDPE pipes are known for its light weight as compared to iron or concrete alternatives, hence, easy to install and transport. These pipes are joined by heat fusion. Butt, socket, sidewall fusion and electrofusion create a joint that is as strong as the pipe itself, and is virtually leak free. This unique joining method produces significant cost reductions compared to other materials. These flexible and highly durable pipes come with unmatched corrosion and chemical resistances. In addition, polyethylene is unaffected by bacteria, fungi, etc. and has smoother texture. Its superior chemical resistance and non-stick surface

combine to almost eliminate scaling and pitting and preserve the excellent hydraulic characteristics throughout the pipe service life.

Table 10: HDPE Pipes proposed for gravity flow sewerage network (Subzone I)

Sl. No.	Internal dia.	Outer dia.	Pressure rating	Total length
	(mm)	(mm)		(m)
1	168.5	200	PN8	9202
2	236.1	280	PN8	133
3	265.6	315	PN8	255
4	299.5	355	PN8	200

Table 11: HDPE Pipes proposed for pressurized flow sewerage network (Subzone I)

Sl. No.	Internal dia.	Outer dia.	Pressure rating	Total length
	(mm)	(mm)		(m)
1	254.5	315	PN10	150
2	286.9	355	PN10	650

3.2.2. Hydraulic Simulation of Sewage network

Hydraulic simulation of sewage network was performed after collection of all basic input data like sewage inflow at all points, expected routing plan for easy carriage of sewer load towards a common collection point and location of STP. A suitable peak factor 3 to accommodate sewage flow variations are provided in the hydraulic analysis. The sewer flow is expected to be carried out in gravity conditions through a network of pipelines, manholes and lifting stations. The maximum depth of cutting is limited below 4.5 m and hence sewage lifting stations are provided making use of the manholes itself.

As per the CPHEEO Manual on Sewerage and Sewage Treatment Systems, a minimum slope is provided for all the pipelines to generate gravity flow. The invert levels are fixed with minimum cover 0.70 m above the sewer lines and zones to maintain the minimum slopes wherever natural slopes are not supporting. Keeping the maximum depth of cutting, the manholes are converted to lifting stations with 1 m storage below the invert levels of the

pipe. The model generated is being analyzed and corrected for designed flow with flow routing error below tolerance limit meeting velocity criteria between 0.6m/s and 3 m/s. The link capacity also checked and kept below 60%.

Considering the versatility in hydraulic modelling using dynamic flow routing conditions US Environmental Protection Agencies' (USEPA) Storm Water Management Model (SWMM) is adopted for hydraulic simulation of the sewage network comprising of pipelines, manholes and lifting stations. The SWMM is used throughout for planning, analysis, and design related to storm water runoff, combined and sanitary sewers, and other drainage systems. The map area plotted in SWMM model for the subzone I are given from Fig. 12 to 15.

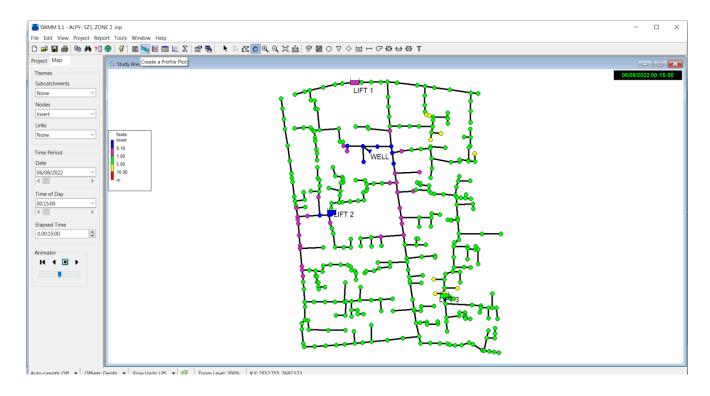


Fig. 12: Map area in SWMM model with invert levels of nodes in sub zone I

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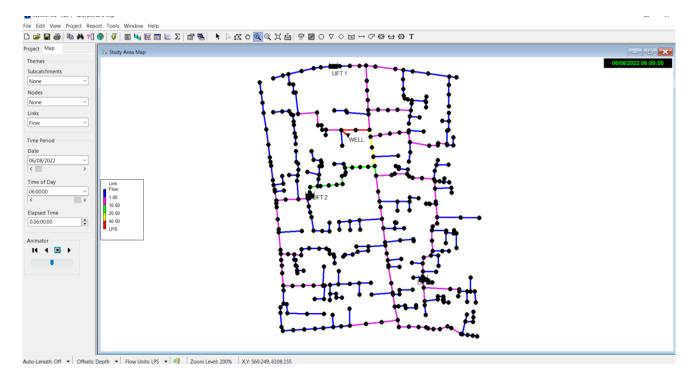


Fig. 13: Map area in SWMM model with flow routing in gradation towards outflow in sub zone I

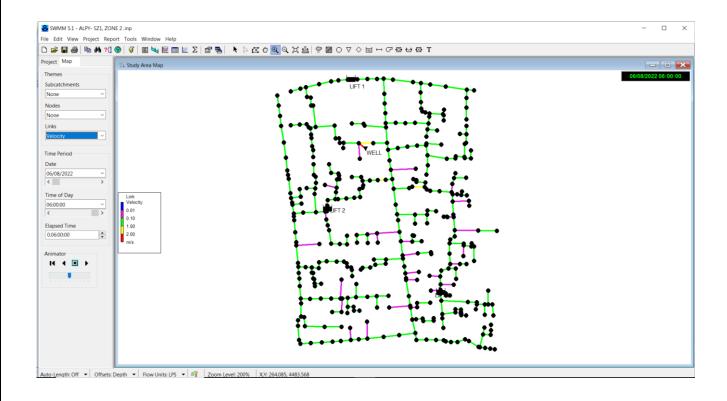


Fig.14: Map area in SWMM model with velocity profiles in sub zone I

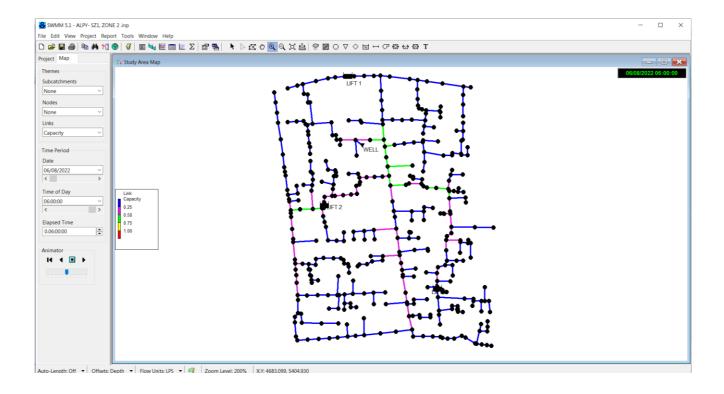


Fig. 15: Map area in SWMM model with capacities of pipe line during peak flow in sub zone I

3.2.3. Design of Manholes and Lifting Stations

A manhole, also known as inspection chambers, provides access to underground utilities in sewer systems fitted with a removable cover to withstand traffic load in sewers. It enables operatives to undertake inspections, make modifications, carry out cleaning and maintenance. Manholes should be built to cause minimum head loss and interference with the hydraulics of the sewer line. One way to maintain a relatively smooth flow transition through the manhole, when a small sewer joins one with a larger diameter is to match the pipe crown elevations at the manhole. Precast rings for shaft can be done to manage inlet and out portions and house sewer connections through chambers. The diameters of circular manholes for stated depths of sewers are shown in **Table 12**. There are 384 manholes in subzone 1.

Table 11: Classifications of manholes in subzone I

Sl. No.	Type of Manhole	Internal Dia. (m)	External Dia. (m)	No. of manholes	Average Depth (m)	Average Volume (m³)	Total Volume (m³)	% of Total No.
1	CLASS 1	0.9	1.4	183	1.132	1.022	187.14	47.66
2	CLASS 2	1.2	1.8	68	1.959	2.77	188.4	17.7
3	CLASS 3	1.5	2.2	133	3.195	6.5	864.48	34.64

Lift stations are hydraulic structures that are used to move waste water from a lower to higher elevation particularly where the elevation of the sources is not sufficient for the gravity flow and/or when the use of gravity conveyance will result in excessive excavation depths and high sewer construction costs. These can be operated by mercury float switches and powered by dedicated feeder lines from the local electrical authority like the lines given to the hospitals, etc. These pump sets can also be connected to solar panels. The pump pit can be covered with pedestrian grade walkway slabs which are of reinforced cement concrete and with adequate lifting arrangements to permit the lowering and lifting the submersible pump sets. With the advancement in technology, the IoT enabled sensors can be installed in these lift manholes and connected to a remote-control station using cloud data transfer. The details of lift manhole are given in **Table 13**. Three lift stations are provided in subzone 1

Table 12: Details of lift manholes pumping main for subzone 1

Description	Discharge (LPS)	Head (m)	Power (HP)
LIFT 1, Pump 1	0.84	5	0.5
LIFT 2, Pump 2	9.97	5	1.5
LIFT 3, Pump 3	3.03	5	0.5

3.2.4. Design of Collection Well

The location of the proposed collection well for subzone 1 is in the proposed STP compound and marked in Fig. 16. The sewage load is pumped from collection well 1 to STP. The collection well is designed to have adequate storage of 30 minutes during peak hours of flow. Submersible centrifugal pumps are provided to cater the peak hours of flow and the average

flow whenever the situation demands for it. The detailed design of the collection well is given below.



Fig. 16: Subzone I of Alissery zone with collection well marked

3.2.4.1. Design of Collection Well in Subzone I

DESIGN OF COLLECTION WELL No.1				
Average inflow into well from network	14.97	LPS		
Peak inflow into well from network	44.72	LPS	PF	2.99
Average flow into well from other well	0	LPS		
Peak flow into well from other well	0	LPS		
Total average inflow into well from network+other well	14.97	LPS		
Total peak inflow into well from network+other well	44.72	LPS		
Peak hours	4			
Number of pumps operated in peak hours	1			
Rated outflow during peak hours/pump in parallel	44.72	LPS		
Total rated outflow in peak hours	44.72	LPS		
Rated outflow during non peak hours/pump in parallel	14.97	LPS		
Total rated outflow in non peak hours	14.97	LPS		
Rated outflow during non peak hours with lean flow	7.49	LPS		
Total rated outflow in non peak hours	7.49	LPS		
Intermittantpummping in hours	0.50			
Inflow converted into storage during peak hours due to				
intermittancy in pumping	22.36	LPS		

Volume of sewage to be stored in well	80.50	m^3		
Diameter of collection well-inner	7	m		
Depth of collection well for storage	2.1	m		
Volume of sewage actually stored in well	80.82	m^3	ok	
Wall thickness of collection well	0.45	m		
Base slab thickness	0.45	m		
Offset to base slab	0.45	m		
Outer dia of collection well	7.9	m		
Freeboard of collection well	0.5	m		
Distance of travel in pumping to next station	100	m		
Velocity of travel adopted	1	m/sec		
Diameter of pumping line required	238.62	mm	fix OD	315
		pressure	rating	PN 10
Total head for the pump set	12.5	m		
Discharge for the pump set	44.72	LPS	efficiency	0.5
Power required for pump set/number	14.91	HP	fix HP	15
INCOMING MANHOLE DEPTH	4.923			
TOTAL DEPTH	7.023			

3.3. THE PROPOSED TREATMENT PLANT

The proposed treatment plant is designed for a capacity of 5MLD which is to cater 4.54 MLD of sewerage network load and a septage load of 13KLD. The major bottleneck while designing the Sewage treatment plant is the constraint in land availability. Hence, proposed for multi-tier sewage treatment plant. The major components incorporated as multilevel components are equalization tank, MBBR units and tertiary treatment units. In order to handle the septage treatment, septage receiving chamber and dilution tank are proposed. The diluted sludge is pumped into the receiving chamber of the STP in addition to the sewage load from the two streams of pumping mains from collection wells.

The primary treatment units such as receiving chamber, screens, oil and grease, grit separator is aligned above the underground equalization tank. The effluent from equalization tank will be pumped into the multitier MBBR units. The multitier MBBR units consist of different stages such as BOD removal (MBBR1), nitrification (MBBR2), post anoxic denitrification (MBBR3) and BOD removal for recycled raw sewage as carbon source(MBBR4). The MBBR 1 is placed in top level, MBBR2 in intermediate level and MBBR3 and MBBR 4 in bottom level. The effluent from equalization tank first reaches MBBR1 for BOD removal, subsequently for nitrification and post Denitrification. The effluent after

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Denitrification will be fed into 4^{th} MBBR tank if BOD is not within the limit. If it is within the limit unit can be bye passed to secondary clarifier with plate settlers.

The clarified effluent is collected in the filter feed tank. After that it will be pumped to tertiary units (PSF, ACF). The tertiary units PSF, ACF (2 units each) are arranged on the top of the underground treated water tank and chlorine contact tank which are separated by a wall. The treated water is proposed to dispose into the commercial canal near Kannan Varkey bridges by laying 355 mm PE Pipe for a length of 650m.

The sludge from the secondary clarifier collected in the sludge sump which is fed into the sludge thickener. Thickened sludge is pumped into the centrifuge and squeezed into the cake form. The overflow from the thickener and the filtrate from the centrifuge is recycled into the equalization tank. The solid waste generated can be used as manure or otherwise it has to be managed by the solid waste management system of municipality.

According to the soil investigation report, the foundation of heavy load structures like multi-level MBBR unit and tertiary unit structures are proposed with group of piles. The rest units are given raft and beam foundations. The detailed flow diagram and the process layout of the proposed plant is as shown in Fig. 17 and 18 respectively.

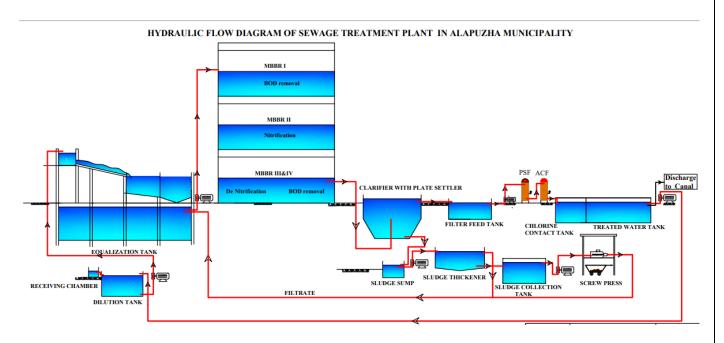


Fig. 17: Hydraulic flow diagram of the proposed STP plant

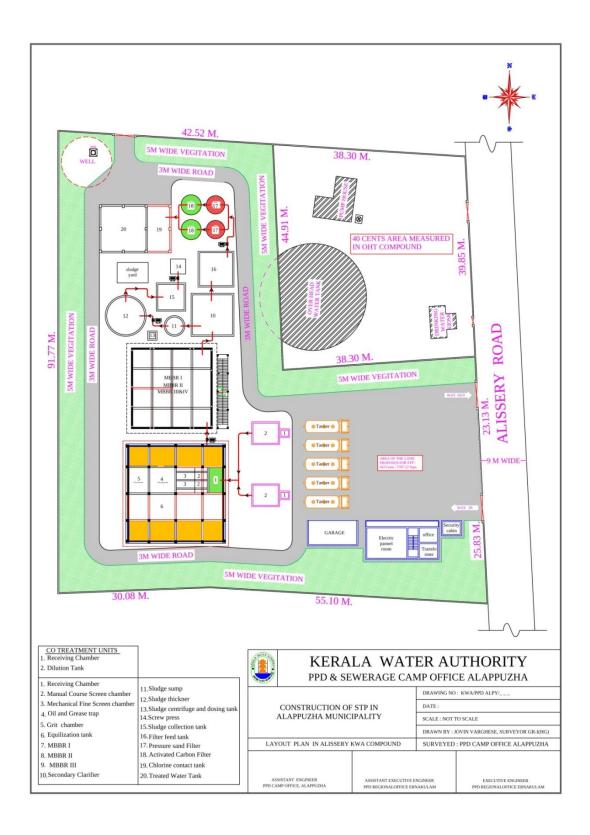


Fig. 18: Process layout of the proposed STP

3.4. ENGINEERING DESIGN OF THE UNITS

DESIGN OF STP WITH MOVING BED BIOFILM-REACTOR (MBBR)									
Average flow from network	4.5	MLD							
Working hours	23								
Flow from septage dilution tank	13.04	m ³ /hour	0.31	MLD					
Design flow	5.00	MLD	5000000	LPD	5000	m ³ /day			
			5000	KLD	208.33	m ³ /hour			
Assumed peak factor	2.25								
Peak design flow	11.250	MLD	11250000	LPD	11250	m ³ /day			
					468.75	m ³ /hour			

3.4.1. Sewage Characteristics

Raw Sewage Characteristics					
Average sewage flow entering the STP	208.33	m ³ /hour			
Peak flow entering the STP	468.75	m ³ /hour			
COD	500	mg/l			
Primary ST/ET effluent BOD	250	mg/l			
Thickener overflow return as fraction of plant flow	0.15				
Thickener overflow return	0.750	MLD			
Thickener overflow return BOD	350	mg/l			
Centrate from sludge dewatering as fraction of plant flow	0.006				
Centrate from sludge dewatering return	0.03000	MLD			
Centrate from sludge dewatering return BOD	280	mg/l			
Influent BOD to aeration tank	263.1	mg/l			
TSS	400	mg/l			
Total Nitrogen (As N)	40	mg/l			
Total Phosphorous (As P)	7	mg/l			
Faecal Coliform	30000000	mpn/100 ml			
E Coliform	40000000	mpn/100 ml			
Chlorides as Cl	125	mg/l			
рН	6				

Treated Sewage Characteristics (after filtration)				
COD	50	mg/l		
BOD	10	mg/l		
TSS	20	mg/l		
Total Nitrogen (As N)	10	mg/l		
Total Phosphorous (As P)	1	mg/l		
E Coliform	100	mpn/100 ml		
рН	7			

3.4.2. Oil and Grease Trap

Oil and Grease Trap						
Average quantity of flow	208.33	m ³ /hour	grid panel	4.5	m	
Peak flow	468.75	m ³ /hour	column	0.45	0.45	m
	0.1302	m ³ /sec	beams	0.3	0.6	m
Average Retention Time for peak flow	300	sec	offset to wall	0.15	m	
Volume of the inlet chamber	39.06	m^3	free board	0.5	m	
Assumed depth of flow	2	m	total height	2.5	m	
Area required for inlet chamber	19.53	m^2	wall thickness	0.25	m	
Length of the tank	4.5	m	slab thickness	0.3	m	
Breadth of the tank	4.34	fix	4.5	m	area in m ²	28.09
Breadth of baffle wall inside	4.5	m				

3.4.3. Receiving Chamber

Receiving Chamber						
Average quantity of flow	208.33	m ³ /hour				
Peak flow	468.75	m ³ /hour				
	0.1302	m ³ /sec				
Average Retention Time for peak flow	120	sec	offset to wall	0.3	m	
Volume of the inlet chember	15.63	m^3	free board	0.5	m	
Assumed depth of flow	1.5	m	total height	2	m	
		_	wall			
Area required for inlet chamber	10.42	m^2	thickness	0.25	m	
			slab			B56 is
Length of the tank	4.5	m	thickness	0.3	m	c/c
					area in	
Breadth of the tank	2.31	fix	2.5	m	m^2	20.16

3.4.4. Manual Coarse Screen Channel

Manual Coarse Screen Channel						
	0.130					
Peak design flow	2	m ³ /sec				
Number of screen	1					
	0.130					
Peak flow rate per screen	2	m ³ /sec				
Velocity at peak flow	1	m/sec	assumed			
Velocity through clean bar	1.10	m/sec				

screen					
Length of channel U/S	1	m	wall thickness	0.25	m
Width of channel provided	0.75	m	offset to wall	0.25	m
Depth of flow	0.17	m	slab thickness	0.30	m
Area required for screen	0.13	sqm			
			assuming head loss		
Headloss through bar screen	0.02	m	coefficient = 0.7		
Assumed depth of flow after				(contro	
inserting bar screen	0.2	m	0.19	1 value)	
Width of channel required	0.65	m	fix	0.9	m
Clear bar spacing	20	mm	(20 to 50 mm)		
Bar thickness	12	mm	(5 to 15 mm)		
Number of bars	28				
Clear bar spacing obtained	21	mm	OK		
Inside width of screen					
(openings)	0.564	m	area in m ²	4.75	
Full height of channel	1	m	fb	0.5	
Angle of inclination	45	degree	0.79	rad	
		(between 0.60 m/sec			
Actual velocity at peak flow	1.22	and 0.90 m/sec)			
Length of channel required					
D/S	1.00	m	fix	1.5	m

3.4.5. Mechanical fine Screen Channel

Mechanical Fine Screen Char	nnel					
	0.13					
Peak design flow	0	m ³ /sec				
Number of screen	1					
	0.13					
Peak flow rate per screen	0	m ³ /sec				
Velocity at peak flow	0.8	m/sec	assumed			
Velocity through clean bar						
screen	0.85	m/sec				
Length of channel U/S	1	m	wall thickness	0.25	m	
Width of channel provided	0.75	m	offset to wall	0.25	m	
Depth of flow	0.22	m	slab thickness	0.30	m	
Area required for screen	0.16	sqm				
			assuming head			
			loss coefficient =			
Headloss through bar screen	0.01	m	0.7			
Assumed depth of flow after				(contro		
inserting bar screen	0.3	m	0.22	l value)		
Width of channel required	0.54	m	fix	0.9	m	
Clear bar spacing	6	mm	(up to 6 mm)			
Bar thickness	10	mm	(5 to 15 mm)			
Number of bars	56					
Clear bar spacing obtained	6.2	mm				

DPR on Sewerage Scheme for Alappuzha Municipality - Phase I

Inside width of screen						
(openings)	0.34	m				
Full height of channel	1	m	fb	0.5		
Angle of inclination	70	degree	1.22	rad		
		(between 0.60				
		m/sec and 1.20				
Actual velocity at peak flow	1.72	m/sec)				
Length of channel required						
D/S	2.74	m	fix	3	m	3.6

Daily screening quantity						
Daily sewage quantity	5000.00	m ³ /day				
Rate of screening quantity	0.015	$m^3/1000 m^3$				
Daily screening quantity	0.0750	m ³ /day				

3.4.6. Grit Separator

Grit Separator						
Number of grit						
units	1	SB	0			
Peak flow	0.1302	m ³ /sec				
Flow in one unit	0.1302	m ³ /sec				
Grit particle size	0.15	mm				
HRT	60	sec	(45 to 90 sec, typical 60)			
Volume of grit chamber	7.81	m^3				
SOR	900	$m^3/m^2/day$	(empirical, from observations)			
	0.010	$m^3/m^2/sec$				
Area required	12.50	m^2	wall thickness	0.25	m	
SWD	2.50	m	slab thickness	0.30	m	
Side of square channel	3.54	m	offset to bottom	0.3	m	
Fix length	4.5	m	freeboard	0.5	m	
Fix width	4.5	m	area given	20.25	m ²	OK
Shape factor	0.85		volume given	50.6250	m^3	OK
Specific gravity of liquid	2.65					
Kinematic		2.				
viscosity	1E-06	m ² /sec				
		let Nr < 1, apply Stoke's law to get				
V _p in m/sec	0.020	terminal velocity vp				

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		apply Newton's				
$N_{\rm r}$	3	equation				
assumed velocity						
in m/sec	0.0146					
Nr	2				area	31.36
drag coefficient Cd	15.47					
vp in m/sec	0.014					
Critical						
displacement						
velocity, Vc	0.0145	m/sec		R_t	1.8	
Horizontal velocity						
of flow, Vh	0.0116	m/sec	OK	$R_{\rm v}$	1.25	

3.4.7. Equalization Tank

Equalization Tank						
Average design flow	208.33	m ³ /hour				
Volume of tank required	1271.61	m^3	from detailed a	nalysis	1	
HRT	6.10	hours	inner column	0.45	0.45	
SWD	4	m	outer column	0.45	0.6	
Area required for equalization tank	317.90	m^2	free board	0.50	m	
Number of tanks proposed	1		offset to wall	1	m	
Area required for each tank	317.90	m^2	wall thickness	0.3	m	
Diameter of circular tank	20.12	m	fix	20.5	m	
Side if square tank	17.83	m	fix length	18	m	1
Thickness of foundation slab	0.45	m	fix breadth	18	m	
Actual capacity provided	1320.3	m^3	circular	OK		
					area in	
	1296	m^3	rectangular	OK	m^2	424.36

3.4.8. Sewage Pump – for Pumping to MBBR

Sewage pump- for p	umping to MBBR tank					
Number of pumps	1	SB	1			
	submersible centrifugal sewage transfer-					
Type of pump set	non clog					
Average flow	5000.00	m ³ /day				
Peak design flow	11250.00	m ³ /day				
Working hours	23					
Flow capacity of						
each pump	217.39	m ³ /hour				
Peak factor	1.20					
Discharge	72.46	LPS	0.0725	m ³ /sec	·	
Head required	32	m				

Efficiency	50%					
Power required	61.84	HP	fix	62	HP	
Energy	1060.98	kwh				

3.4.9. Moving Bed Bio Reactor (MBBR) - Single Stage

Moving Bed Bio-Reactor (MBBR)-Single Sta	ge				
Average design flow	5000.00	m ³ /day				
Number of streams	1	,				
BOD of incoming sewage	263.13	mg/l				
TSS of incoming sewage	400	mg/l				
BOD expected after treatment	10	mg/l				
BOD to be removed	253.13	mg/l				
BOD removal % expected	96.20					
Number of tanks proposed	1					
BOD loading rate/volume Actual BOD loading rate	4 1315.66	kg/m³/da y kg/day	4-7 kg/m³/day as per M&E			
Quantity of BOD to be removed	1313.00	Kg/ day				
per day	1265.66	kg/day				
Volume of reactor required	328.91	$\frac{\mathcal{E}}{\text{m}^3}$				
Surface area loading rate (SALR) for BOD removal	7.50	g/m²/day				
	175420.9	2				
Required carrier surface area	9	m ²				
Specific surface area of carrier	600.00	m^2/m^3				
Required carrier volume	292.37	m^3				
Volume of media required	40%		c/c	16	16	
	131.57	m^3	depth of base	0.6	m	
Volume of tank required-BOD loading rate/volume method	460.48	m^3	slab thickness	0.45	m	
Volume of tank required- SALR method	730.92	m^3	offset to wall	0.45	m	
		m^3	+			
Volume of each tank	730.92	m	total height	3.50	m	
SWD	3	m	wall thickness	0.30	m	
Area of each tank	243.64	m^2	fix dia	17.7	m	
Diameter of circular tank	17.61	m	length	16	m	
Side of square tank	15.61	m	breadth	16	m	
Actual capacity provided-circular	738.17	m^3	OK			
Actual capacity provided-		_				
rectangular	768.00	m ³	OK			
Fix capacity	768.00	m^3				
Actual volume of media obtained	307.20	m^3				

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Actual carrier surface area	184320.0	m^2				
Volume of liquid in the tank	645.12	m^3				
Hydraulic Retension Time at						
design average flow	3.10	hours	185.8	minutes		
Hydraulic Retension Time at peak						
flow	1.38	hours	82.6	minutes		
		_			area	
SARR for the given SALR	6.94	g/m²/day			m^2	306.25
Estimated BOD removal rate	1278.72	kg/day				
		BOD of			mg/	
Actual BOD removal rate %	97.19	effluent		7.39	1	ok

3.4.10. MBBR Single Stage Nitrification

Moving Bed Bio-Reactor (MBBR)-Single Stage Nitrification							
Average design flow	5000.00	m ³ /day					
Number of streams	1	-					
BOD of incoming							
sewage	20.00	mg/l					
NH ₄ -N of incoming							
sewage	40.00	mg/l					
Alkalinity as CaCO ₃	140.00	mg/l					
Target effluent NH ₃ -							
N	3.30	mg/l	% removal	91.75			
DL level to be							
maintained in tank	2.00	mg/l					
Design minimum							
waste water							
temperature	20.00	°C					
			SARR temp				
SARR _{max}	0.61		coefft. θ		1.058		
Minimum NH ₃ -N at							
SARR _{max}	0.50		SARR _T	0.81	g/m²/day		
Design value of		2					
SALR	0.88	g/m²/day					
NH ₃ -N loading rate	200.00	kg/day					
Required carrier	226922.6						
surface area	8	m ² /day					
Specific surface area		2 2					
of carrier	750.00	m^2/m^3					
Required carrier		2					
volume	302.56	m ³ /day	depth of base	0.60	m		
Volume of media							
required	40%		slab thickness	0.45	m		

Volume of tank						
required- SALR method	756.41	m^3	offset to wall	0.45	m	
Volume of each tank	756.41	m^3	total height	3.50	m	
SWD	3	m	wall thickness	0.30	m	
Area of each tank	252.14	m^2	fix dia	18	m	
Diameter of circular						
tank	17.92	m	length	16	m	
Side of square tank	15.88	m	breadth	16	m	
Actual capacity provided-circular	763.41	m^3	OK			
Actual capacity	705111					
provided-						
rectangular	768.00	m^3	OK			
Fix capacity	768.00	m^3				
Actual volume of						
media obtained	307.20	m^3				
Actual carrier	230400.0	2			2	
surface area	0	m^2			area in m ²	306.25
Volume of liquid in		2				
the tank	645.12	m^3				
Hydraulic Retension						
Time at design				minute		
average flow	3.10	hours	185.79	S		
Hydraulic Retension				minute		
Time at peak flow	1.38	hours	82.58	S		
			should be < 0.5			
		. 2	to achieve good			
BOD SALR	0.43	g/m ² /day	nitrification			

Using the equivalent weight of $CaCO_3$ as 50, the equivalent weight of $NaHCO_3$ as 84, the alkalinity use for nitrification as 7.14 g $CaCO_3$ /g NH_3 -N and the target effluent alkalinity as 80 mg/L as $CaCO_3$, give the calculated alkalinity requirement as 118.5 mg/L as $CaCO_3$.

140.00	mg/l
80.00	mg/l
	g CaCO ₃ /g
7.14	NH ₃ -N
202.04	mg/l
1010.19	kg/day
	g/equivalen
50.00	
	g/equivalen
84.00	t
	kg/day
1697.12	NaHCO ₃
	80.00 7.14 202.04 1010.19 50.00 84.00

3.4.11. MBBR Post Anoxic Denitrification

Moving Bed Bio Reactor (MBBR))-post-anoxi	c denitrificati	on			
Carbon:Nitrogen ratio (C/N)	6.58					
Average design flow	5000	m ³ /day				
Number of post-anoxic tanks	1.00	-				
Target effluent NO ₃ -N						
concentration	4.00	mg/l				
		$g NO_3 N$				
SALR for post-anoxic stage	2.00	/m ² /day				
Estimate of SARR/SALR ratio	0.886	mg/l				
Target % N removal	91.75					
Specific surface area of carrier	750.00	m^2/m^3				
NO ₃ -N daily loading rate	183.50	kg/day				
Required carrier surface area	91750	m^2				
Required carrier volume	122.33	m^3				
			depth of			
Volume of media required	35%		base	0.60	m	
Volume of tank required- SALR		2	slab			
method	349.52	m ³	thickness	0.45	m	
		3	offset to			
Volume of each tank	349.5	m ³	wall	0.45	m	
CMD	2		total	2.50		
SWD	3	m	height wall	3.50	m	
Area of each tank	116.51	m^2	thickness	0.30	m	
Diameter of circular tank	12.18	m	fix dia	12.2	m	
Side of square tank	10.79	m	length	16	m	
Actual capacity provided-circular	350.70	m ³	breadth	8	m	
Actual capacity provided-						
rectangular	384.00	m^3	OK			
Fix capacity	384.00	m^3	OK			
Actual volume of media obtained	134.40	m ³				
	100800.0					
Actual carrier surface area	0	m^2				
					area	
	_	3			in	
Volume of liquid in the tank	330.24	m ³			m ²	166.25
Hydraulic Retension Time at	1.50	,	05.11	,		
design average flow	1.59	hours	95.11	hours		
Hydraulic Retension Time at peak flow	0.70	hours	42.27	hours		
SARR	1.77	g/m ² /day	72.21	nouis		
Estimated NO ₃ -N removal rate	178.64	kg/day				
Estimated NO3-14 Tellioval Tate	1/0.04	kg/uay				

NO ₃ -N of effluent	0.97	mg/l					
		g CaCO ₃ /g					
Alkalinity produced by		NO ₃ -N					
denitrification	3.57	removed					
Actual alkalinity to be added	74.49	mg/l					
Rate of alkalinity addition needed							
as CaCO ₃	372.45	kg/day					
Equiv wt. of CaCO ₃	50.00	g/equivalent					
Equiv wt. of NaHCO ₃	84.00	g/equivalent					
		kg/day					
Daily NaHCO ₃ requirement	625.71	NaHCO ₃					
4.6 lb COD/lb NO ₃ -N removed and 1.5 lb COD/lb Methanol. The required methanol dosage is then							
calculated as: $4.6/1.5 = 3.1$ lb methanol /lb NO ₃ -N removed. The methanol requirement in lb/day is							
then equal to 3.1 times the previously calculated NO ₃ -N removal rate							
Methanol requirement in kg/day	568.85	kg/day					

Considering toxicity, economy and safety considerations it is better to adopt retrun activated sludge feed into anoxic tank for carbon source. Alkaline fermentation can be adopted for better results.

3.4.12. MBBR Chamber After Denitrification

Moving Bed Bio-Reactor (MBBR)	chamber a	fter de-nitr	ification			
Average design flow	5000.00	m ³ /day				
Number of streams	1					
BOD of incoming sewage	87.71	mg/l				
TSS of incoming sewage	50	mg/l				
BOD expected after treatment	7	mg/l				
BOD to be removed	80.71	mg/l				
BOD removal % expected	92.02					
Number of tanks proposed	1					
			4-7			
		kg/m³/da	kg/m³/day as			
BOD loading rate/volume	4	у	per M&E			
Actual BOD loading rate	438.55	kg/day				
Quantity of BOD to be removed						
per day	403.55	kg/day				
Volume of reactor required	109.64	m^3				
Surface area loading rate (SALR)						
for BOD removal	15.00	g/m²/day				
	29236.8					
Required carrier surface area	3	m^2				
Specific surface area of carrier	600.00	m^2/m^3				
Required carrier volume	48.73	m^3				
Volume of media required	27%					
			depth of			
	29.60	m^3	base	0.6	m	
Volume of tank required-BOD		2	slab			
loading rate/volume method	139.24	m^3	thickness	0.45	m	

Volume of tank required- SALR			offset to			
method	180.47	m^3	wall	0.45	m	
Volume of each tank	180.47	m^3	total height	3.50	m	
			wall			
SWD	3	m	thickness	0.30	m	
Area of each tank	60.16	m^2	fix dia	8.8	m	
Diameter of circular tank	8.75	m	length	8	m	
Side of square tank	7.76	m	breadth	8	m	
Actual capacity provided-circular	182.46	m^3	OK			
Actual capacity provided-						
rectangular	192.00	m^3	OK			
Fix capacity	192.00	m^3				
Actual volume of media obtained	51.84	m^3				
	31104.0	_				
Actual carrier surface area	0	m^2				
Volume of liquid in the tank	171.26	m^3				
Hydraulic Retension Time at				minute		
design average flow	0.82	hours	49.3	S		
Hydraulic Retension Time at peak				minute		
flow	0.37	hours	21.9	S		
		2			area	
SARR for the given SALR	13.13	g/m ² /day			in m ²	90.25
Estimated BOD removal rate	408.24	kg/day				
		BOD of				
Actual BOD removal rate %	93.09	effluent		6.06	mg/l	ok

3.4.13. Blower Air Requirement

Blower air requirement MBBR BOD removal IV stage, Equalisation tank, Sludge tank							
BOD loading	438.55	kg/day					
NH ₃ -N loading rate	0.00	kg/day					
Oxygen uptake ratio-BOD	1.50	kg of O ₂ /kg of BOD					
Oxygen uptake ratio-NH ₃ -N	4.57	kg of O ₂ /kg of NH ₃ -N					
Oxygen required for BOD loading	657.83	kg/day					
Oxygen required for NH ₃ -N loading	0.00	kg/day					
Percentage of O ₂ in air	21.00						
Weight of air required-BOD loading	3132.52	kg/day					
Weight of air required-NH ₃ -N loading	0.00	kg/day					
Density of air	1.225	kg/m ³					
Volume of air-BOD loading	2557.16	m ³ /day					
Volume of air-NH ₃ -N loading	0.00	m ³ /day					
Air transfer efficiency of diffuser	0.075						
Quantity of air required-BOD loading	34095.43	m ³ /day					
Quantity of air required-NH ₃ -N loading	0.00	m ³ /day					
Factor of saftey	1.20						

Volume of air required-BOD loading	1704.77	m ³ /hour		
Volume of air required-NH ₃ -N loading	0.00	m ³ /hour		
Volume of equalisation tank	1271.61	m^3		
Normal inflow	0.058	m ³ /sec		
Air requirement for equalisation tank	1.25	m ³ /m ³ /hour		
Air requirement for sludge tank	3.00	m ³ /m ³ /hour		
Volume of ET	1271.61	m^3		
Volume of air required for ET	1589.51	m ³ /hour		
Volume of air required for ST	29.75	m^3		
Total air required	3324.04	m ³ /hour		
Capacity of blower	3324.00	m ³ /hour		
Number of blowers working	3.00	SB	2	
Air required per blower	1108.00	m ³ /hour		
Pressure given	0.60	kg/cm ²	5.89	m
Volumetric efficiency	50%			
Power required for blower motor	48.65	HP	36.29	kw
Fix power of blower motor	49.00	HP		
Energy	2631.89	kwh		

Blower air requirement MBBR Nitrification IInd stage						
BOD loading	0.00	kg/day				
NH ₃ -N loading rate	200.00	kg/day				
Oxygen uptake ratio-BOD	1.50	kg of O ₂ /kg of BOD				
Oxygen uptake ratio-NH ₃ -N	4.57	kg of O ₂ /kg of NH ₃ -N				
Oxygen required for BOD loading	0.00	kg/day				
Oxygen required for NH ₃ -N loading	914.00	kg/day				
Percentage of O ₂ in air	21.00					
Weight of air required-BOD loading	0.00	kg/day				
Weight of air required-NH ₃ -N loading	4352.38	kg/day				
Density of air	1.225	kg/m ³				
Volume of air-BOD loading	0.00	m ³ /day				
Volume of air-NH ₃ -N loading	3552.96	m³/day				
Air transfer efficiency of diffuser	0.075					
Quantity of air required-BOD loading	0.00	m ³ /day				
Quantity of air required-NH ₃ -N loading	47372.85	m³/day				
Factor of saftey	1.20					
Volume of air required-BOD loading	0.00	m ³ /hour				
Volume of air required-NH ₃ -N loading	2368.64	m ³ /hour				
Volume of equalisation tank	0.00	m ³				
Normal inflow	0.000	m ³ /sec				
Air requirement for equalisation tank	1.25	m ³ /m ³ /hour				

Air requirement for sludge tank	3.00	m ³ /m ³ /hour		
Volume of ET	0.00	m^3		
Volume of air required for ET	0.00	m ³ /hour		
Volume of air required for ST	0.00	m^3		
Total air required	2368.64	m ³ /hour		
Capacity of blower	2369.00	m ³ /hour		
Number of blowers working	2.00	SB	1	
Air required per blower	1184.50	m ³ /hour		
Pressure given	0.80	kg/cm ²	7.85	m
Volumetric efficiency	50%			
Power required for blower motor	69.34	HP	51.73	kw
Fix power of blower motor	70.00	HP		
Energy	2506.56	kwh		

Blower air requirement	Blower air requirement MBBR BOD removal Ist stage								
BOD loading	1315.66								
NH ₃ -N loading rate	0.00	kg/day							
Oxygen uptake ratio-BOD	1.50	kg of O ₂ /kg of BOD							
Oxygen uptake ratio-NH ₃ -N	4.57	kg of O ₂ /kg of NH ₃ -N							
Oxygen required for BOD loading	1973.49	kg/day							
Oxygen required for NH ₃ -N loading	0.00	kg/day							
Percentage of O ₂ in air	21.00								
Weight of air required-BOD loading	9397.55	kg/day							
Weight of air required-NH ₃ -N loading	0.00	kg/day							
Density of air	1.225	kg/m ³							
Volume of air-BOD loading	7671.47	m ³ /day							
Volume of air-NH ₃ -N loading	0.00	m³/day							
Air transfer efficiency of diffuser	0.075								
Quantity of air required-BOD loading	102286.29	m ³ /day							
Quantity of air required-NH ₃ -N loading	0.00	m³/day							
Factor of saftey	1.20								
Volume of air required-BOD loading	5114.31	m ³ /hour							
Volume of air required-NH ₃ -N loading	0.00	m ³ /hour							
Volume of equalisation tank	0.00	m ³							
Normal inflow	0.000	m ³ /sec							
Air requirement for equalisation tank	1.25	m ³ /m ³ /hour							
Air requirement for sludge tank	3.00	m ³ /m ³ /hour							
Volume of ET	0.00	m^3							
Volume of air required for ET	0.00	m³/hour							
Volume of air required for ST	0.00	m ³							
Total air required	5114.31	m ³ /hour							

Capacity of blower	5114.00	m ³ /hour		
Number of blowers working	4.00	SB	3	
Air required per blower	1278.50	m ³ /hour		
Pressure given	0.80	kg/cm ²	7.85	m
Volumetric efficiency	50%			
Power required for blower motor	74.84	HP	55.83	kw
Fix power of blower motor	75.00	HP		
Energy	5371.20	kwh		

3.4.14. Alum and Lime Solution Tanks

Alum solution tank				
number of units	1			
dosage of alum	25	ppm		
requirement for 8 hours	41.670	kg		
volume of solution at 10% strength/unit	0.38	m^3		
length of tank	0.6	m		
breadth of tank	0.6	m		
liquid depth	1.06	m		
total depth	1.2	m		
solution flow rate	0.0475	m ³ /hour		

Lime solution tank				
number of units	1			
dosage of lime	15	ppm		
requirement for 8 hours	25	kg		
volume of solution at 10% strength/unit	0.23	m3		
length of tank	0.6	m		
breadth of tank	0.6	m		
liquid depth	0.64	m		
total depth	1	m		
solution flow rate	0.02875	m ³ /hour		

3.4.15. Secondary Clarifier with Plate settler

Secondary Clarifier with Plate/Tube Settler					
Average output required from tube settler in	5.000	208.33	m ³ /hour	57.87	LPS
MLD					
Number of batteries	1				
Average design flow as input in MLD/unit	5.00	208.33	m ³ /hour	57.87	LPS
Width of plates in mm	900	space betw	een plates	20	mm
Length of plates adopted in m	0.75				23.10
Angle of inclination of tubes adopted in deg.	60	1.05	rad		
Relative length of settler (dimensionless) Lr =	37.5		wall	0.3	m
L/d			thickness		
Relative length is changed by $L' = 0.058 x$ [Vo x	d/v]		column	0.35	m
			size		
Where Vo is velocity of flow along tube settler			offset to	0.6	m
			wall		
v is kinematic viscosity of water			depth of	0.75	m
T200 1 1 1 1 1 0 1 7 7 50 0.70	** 1/ 3		raft	0.05	
Effective relative length of tube, $L = Lr - [0.058 x]$	Vo x d/v]		slab	0.35	m
	0.0072	T	thickness	0.45	
Kinematic viscosity of water in m/day	0.0872		r-beam	0.45	m
Effective velotive length of tells / plate. I	64	()	depth	X 7 -	
Effective relative length of tube/plate, L	37.5	(-)	0.013	Vo	
1	31.36	0 1 1	40		
desirable value of relative length = for one unit:	arouna 2	0 but below	freeboard	0.5	
	2.4		t-beam	0.35	m
Vertical water height in chamber in m	2.4		width	0.35	m
Height of chamber in hopper portion in m	3.1		t-beam	0.45	m
Treight of chamber in hopper portion in in	3.1		depth	0.43	111
Side of large square in m	8		r-beam	0.35	m
Side of large square in in	Ü		width	0.00	***
Side of small square in m	4.5		inlet pipe	0.2	m
7-10-11-11-11-11-11-11-11-11-11-11-11-11-			dia		
h ₃ in m (height of the truncated cone)	3.99				
Angle of inclination of hopper side to vertical	0.514	29.46	degree	60.54	deg.
					with
					hor.
Larger inclined length L _i of slanting slab in m	8.14	area in	32.55		
		m^2			
Smaller inclined length l _i of slanting slab in m	4.58	area in	10.30		
		m^2			
Contact area in m ²	89.00				
SOR in m ³ /m ² /day for upflow clarifier	56.18	<	50		
Trial volume in m ³ of one unit	276.62		hopper in m	5	123.02
Detention time in hours	1.33	in square	0.74	in	0.59
		2		hopper	
Fix volume	276.62	m^3			

Performance parameter of tube settler $S = Vs/Vo$	$x [\sin\theta + I]$	Lx cosθ]			
For laminar flow regime, critical performance par	ameter val	lue for comp	olete remova	l of partic	le,
Critical value of performance parameter, Sc =	1.333	circular		_	
	1.375	square			
	1	parallel pla	ates		1
Particle size in mm	0.025				1
Settling velocity of particle in m/sec, V _s (laminar)	0.0006	m/sec	48.08	m/d	
Reynolds number, Nr	0.014				1
Trial value of flow along plate settler V _o in m/day	462				
Shape of cross section of tubes	plates	(square, ci	rcular, or pla	ites)	
Critical of performance parameter obtained, Sc	[(Vs/Vo)	x (sinθ+Lc	osθ)		
	1.72	Ì			1
Plate entrance area/one unit	10.37	m^2			1
Number of modules of plates	3				
Number of plates required/module	192.07				
Fix number of plates required/module	192				
Length/module of tray holding plates	4700	mm			1
Thickness of plate	1.5	mm			1
Number of plates configured in one module	192.05	OK			1
Height of plate module for 1m length of tubes	0.87				1
inclined:					
Hence height of tube module	0.65	m			
Fix length of plate module	0.75	m			
Fix height of plate module	0.65	m			
Fix number of plates required per module	192				
Angle of inclination	60	degree to l	orizontal		
Contact area	388.8	m ²		area in m ²	96.04
SOR in m ³ /m ² /day for plate settler	12.32	<	40		
Total plate entrance area	10.37	m^2			
Actual velocity of flow in m/day	462.16	now corre	ct velocity		

3.4.16. Design of Sludge Treatment Facilities

Sludge Sump		
	5000.0	
Average flow	0	m ³ /day
TSS	400	mg/l
BOD	350.84	mg/l
Assumed TSS Sludge	30%	
Assumed BOD Sludge	35%	
Sludge generated-TSS	600.0	kg/day
Sludge generated-BOD	614.0	kg/day
Total sludge	1213.9	kg/day

	7					
% sludge with 1.02 specific gravity	10%					
Sludge volume per day	119.02	m ³ /day				
	4.96	m ³ /hour				
Assumed HRT	2	hours	freeboard	1.2	m	
Volume of tank	9.92	m^3	slab thickness	0.3	m	
Assumed SWD	1.5	m	offset to wall	0.3	m	
Area of the tank	6.61	m^2	wall thickness	0.25	m	
Diameter of circular tank	2.90	m	fix	3	m	
		2			area in	
Actual capacity provided	10.60	m^3			m^2	4.10

Pump for Sludge transfer t	o Thickner					
Number of pumps	1.00	W	1	SB		
Specific gravity of liquid	1.03					
Tipe of pump set	submersible centrifugal sewage transfer-non clog					
Working hours	5.00	hours				
		m ³ /hou	0.00661	m ³ /se		
Discharge required	23.80	r	2	c		
Required head	15.00	m				
Velocity in sludge transfer						
pipe adopted	0.70	m/sec				
					m	
Pipe diameter required	109.67	mm	fix	120	m	
Efficiency	50%					
Power required	2.64	HP	fix	2.70	HP	
Energy	9.87	kwh				

Sludge Thickener						
Number of units	1					
	1213.9					
Total sludge	7	kg/day				
Solids Loading Rate	40	kg/m ² /day				
Thickening area required	30.35	m^2				
Surface Loading Rate	12	$m^3/m^2/day$				
Thickening area required	9.92	m^2	freeboard	0.5	m	
			slab	0.3		
Maximum area	30.35	m^2	thickness	5	m	
			offset to	0.3		
Area of distribution chamber	20%		wall	5	m	
			wall			
Total area required	36.42	m^2	thickness	0.3	m	
Diameter of circular tank	6.81	m	fix	6.9	m	
Thickening area available	37.39	m^2				

SWD	2	m			
Actual volume provided	74.79	m^3			
Thickened sludge		of total sludge			
consistency	3%	volume			
				area in	
Thickened sludge volume	36.42	m ³ /day		m^2	8.2

Pump for Sludge transfer to Centrifuge	Pump for Sludge transfer to Centrifuge								
Type of pump set	Screw pump								
Number of pumps	1.00	W	1	SB					
Volume of thickened sludge to be pumped	36.42	m ³ /day							
Working hours of centrifuge	5.00	hours							
Discharge required	7.28	m ³ /hour	2.0E-03	m ³ /sec					
Head required	15.00	m							
Efficiency	50%								
Power required	0.809	fix	1.00	HP					
Energy	3.019	kwh							

Sludge Centrifuge and Dosing Tanks	Sludge Centrifuge and Dosing Tanks								
Number of centrifuges	1	SB	1						
Capacity of centrifuge	0.25	m ³ /hour							
Poly electrolyte dozing for centrifuge & thickener	10%								
Sludge volume	1213.97	kg/day							
		kg/1000							
Dose	2	kg							
Quantity of Poly Electrolyte	2.43	kg/day							
Concentration	0.1								
Volume of tanks @ 24 hour	2.43	m^3							
	2427.95	litres							
Volume	101.16	litres/hour							
Volume required for 8 hours	0.81	m^3							
Liquid depth of tank	1	m							
Area required	0.81	m^2							
					area in				
side of square tank	0.90	m	fix	1	m^2	2			

3.4.17. Tertiary Treatment Facilities

Filter feed tank									
HRT	20	minutes	offset to wall	0.3	m				
Average flow	208.33	m ³ /hour	wall thickness	0.25	m				
Volume of tank	69.44	m^3	slab thickness	0.3	m				
Assumed liquid depth	2	m	freeboard	0.5	m				
Area of the tank	34.72	m^2							
side of square tank	5.89	m	fix length	6	m				
			fix breadth	6	m				
Volume provided	72.00	OK			area in m ²	50.41			

Pressure Sand Filter						
Average flow	5000.00	m ³ /day				
Filter operating hours	20	hours				
Operating flow	250.00	m ³ /hour				
Filter Loading Rate	12	m ³ /m ² /hour				
Area of the filter required	20.83	m^2				
Number of filters	2					
Area of each filter	10.42	sqm				
Diameter of filter required	3.64	m	fix	3.65	m	
Height of the filter	2.5	m	offset to wall	0.5	m	
Operating pressure	3.5	Bar				
Filter media	Sand	-			area in m ²	43.25

Activated Carbon Filter						
Average flow	5000.00	m ³ /day				
Filter operating hours	20	hours				
Operating flow	250.00	m ³ /hour				
Filter Loading Rate	10	$m^3/m^2/hour$				
Area of the filter required	25.00	m^2				
Number of filters	2					
Area of each filter	12.50	sqm				
Diameter of filter required	3.99	m	fix	4	m	
Height of the filter	2.5	m	offset to wall	0.5	m	
Operating pressure	3.5	Bar				
					area in	
Filter media	Activated Carbon				m^2	50.00

Pump for clarified water to PSF and ACF								
Type of pump set	CF							
Number of pumps	1.00	W	1	SB	1			
Discharge of clarified water required	208.33	m ³ /hour						
Working hours of pumps	20.00	hours						
Discharge required	250.00	m ³ /hour	6.9E-02	m ³ /sec				
Head required	35.00	m						
Efficiency	50%							
Power required	64.81	fix	65.00	HP				
Energy	967.04	kwh						

Chlorine contact tank						
HRT	30	minutes	offset to wall	0.3	m	
Average flow	208.33	m ³ /hour	wall thickness	0.25	m	
Volume of tank	104.17	m^3	slab thickness	0.3	m	
Assumed liquid depth	3	m	freeboard	0.5	m	
Area of the tank	34.72	m^2			area in m ²	50.35
side of square tank	5.89	m	fix length	8.4	m	
	•		fix breadth	4.2	m	

Treated Water Tank						
			offset to			
HRT	60	minutes	wall	0.3	m	
		_	wall			
Average flow	208.33	m ³ /hour	thickness	0.25	m	
		_	slab			
Volume of the tank	208.3	m^3	thickness	0.3	m	
Assumed liquid depth	3	m	freeboard	0.5	m	
Area of the tank	69.44	m^2				
Number of tanks	1		fix length	8.4	m	
Area of one tank	69.44	m^2	fix breadth	8.4	m	
Side of square tank	8.33	m				
		_			area in	
Volume provided	211.68	m^3	OK		m^2	90.25
Administrative bldg, lab, chemical store						
etc(30*25)	750.00					
Transformer yard (15*15)	225.00					
Total area of units	2929.99	m^2				
Movement space factor	1.6					
Total area rquired	4687.99	m^2	1.16	Acre		

3.5. DESIGN OF CO-TREATMENT UNIT FOR SEPTAGE WITH MOVING BED BIOFILM-REACTOR (MBBR)

DESIGN OF CO-TREATM	DESIGN OF CO-TREATMENT UNIT FOR SEPTAGE WITH MOVING BED BIOFILM- REACTOR (MBBR)							
Design population	50000							
		litres/pe	rson/yea					
Sludge deposit coefficient	95	r	•					
Sludge deposit	13.01	KLD						
Average septage flow	13.01	KLD						
Working hours	24							
Design flow	13.01	KLD	13010	LPD	13.0	m ³ /day		
						m ³ /ho		
Assumed peak factor	1.5		13	KLD	0.54	ur		
Peak design flow	19.52	KLD	19515	LPD	20	m ³ /day		
						m ³ /ho		
					0.81	ur		
					0.0002	cum/se		
Number of trips/day	10				3	c		
			Tanker					
Quantity of septage obtained		3	capacit					
in single trip with peak factor	1.95	m ³	у	3000	litres			
Raw Septage Characteristics			ı	T	I			
COD	25000	mg/l						
BOD	5000	mg/l						
TSS	7000	mg/l						
Treated Sewage Characterist			I	l				
COD	50	mg/l						
BOD	10	mg/l						
TSS	20	mg/l						
Receiving Chamber		3 ,,	I	T	T T			
	0.54	m ³ /ho						
Average quantity of flow	0.54	ur 3 n						
D. 1. fl	0.01	m ³ /ho						
Peak flow	0.81	ur						
Tanker disposing quantity	0.00217	m ³ /sec						
with in 10 minutes	0.00217	m /sec	offoot					
Average Retention Time for	600	300	offset	0.3				
peak flow	000	sec	to wall free	0.3	m			
Volume of the inlet chember	1.3010	m^3	board	0.45	m			
. stante of the finet enember	1.5010		total	0.10				
Assumed depth of flow	0.75	m	height	1.2	m			
•			wall					
Area required for inlet			thickne					
chamber	1.73	m^2	SS	0.25	m			

ix ole mg/l mg/l itres	thickne ss 1.2	0.3	m area in m ²	5.98
ix ple mg/l mg/l			area in	5.98
mg/l mg/l	1.2	m		5.98
mg/l mg/l	1.2	m	m ²	5.98
ng/l ng/l				
ng/l				ļ
ng/l				l
itres				
itres				
_				
n^3	ratio of d	ilution	23.06	
ng/l	ok			
ng/l	ok			
n^3				
	side of sq	uare		
n	-		4.33	m
n				
n	volume	50.00	m^3	ok
n ³ /ho				
ır				
n ³ /ho	% of dilu	ted sepa	tge to	
ır		1	\mathcal{C}	6.26
SB	1			
n³/ho				
ır				
n³/ho				
ır				
n ³ /ho				
ır				
		m ³ /se		
LPS	0.0068	c		
n				
НP	fix	3.5	HP	
wh				
				<u>. </u>
m m m m m m m m m m m m m m m m m m m	g/l 3 3/ho 3/ho 3/ho 3/ho PS	g/l ok 3 side of sq tank volume 3/ho sewage B 1 3/ho - 3/ho - 3/ho - 3/ho - 4 B 1 4 B 1 4 B 1 B B	g/l ok 3 side of square tank volume 50.00 3/ho sewage B 1 3/ho mathridge B 0.0068 c P fix 3.5	g/l ok

Recycled water pump- for pu	imping to dilution tank					
Number of pumps	1	SB	1			
	submersible centrifugal					
	sewage transfer-non					
Type of pump set	clog					
		m ³ /ho				
Average flow	12.50	ur				
		m ³ /ho				
Peak design flow	18.75	ur				
Working hours	23					
		m ³ /ho				
Flow capacity of each pump	19.57	ur				
Peak factor	1.20					
				m ³ /se		
Discharge	6.52	LPS	0.0065	c		
Head required	20	m				
Efficiency	50%					
Power required	3.48	HP	fix	3.5	HP	
Energy	59.68	kwh	_			

3.6. SIZING OF THE TREATMENT UNITS

SIZIN	G OF STP UNITS			
S1. No.	COMPONENT	SIZING (m)	Nos.	METHOD OF CONSTRUCTION
	CIVIL CONSTRUCTION UNITS		·	
	Co Treatment units			
1	Receiving Chamber	1.2 x 0.9 x 1.2	1	RCC
2	Dilution Tank	5 x 4 x 3	1	RCC
	STP units			
1	Receiving Chamber	4.5 x 2.5 x 2	1	RCC
2	Manual Coarse Screen Channel	2.5 x 0.75x 1.5	1	RCC
3	Mechanical Fine Screen Channel	4 x 0.75 x 1.5	1	RCC
4	Oil and Grease Trap	4.5 x 4.5 x 2.5	1	RCC
5	Grit Separator	4.5 x 4.5 x 3	1	RCC
6	Equalisation Tank	18 x 18 x 4.5	1	RCC
7	Moving Bed Biofilm Reactor-1	16 x 16 x 3.5	1	RCC
8	Moving Bed Biofilm Reactor-2	16 x 16 x 3.5	1	RCC
9	Moving Bed Biofilm Reactor-3	16 x 8 x 3.5	1	RCC
10	Moving Bed Biofilm Reactor-4	8 x 8 x 3.5	1	RCC
11	Clarifier with Plate Settler	8 x 8 x 6	2	RCC
12	Sludge Sump	3 m dia x 2.7	1	RCC
13	Sludge Thickener	6.9m dia x 2.5	1	RCC
14	Chlorine contact Tank	8.4 x 4.2 x 3.5	1	RCC

16 Pressure Sand Filter 3.65m dia x 2.5 1 Pre-Fabricated 17 Activated Carbon Filter 4m dia x 2.5 1 Pre-Fabricated 18 Treated Water Tank 8.4 x 8.4 x 3.5 1 RCC 19 Sludge Centrifuge 1 x 1 1 RCC/FRP Administrative building, indoor transformer, control panel room, lab, office space etc ELECTRO-MECHANICAL UNITS 2 Submersible Centrifugal 2 Manual Coarse Screen 62 HP (1 W+1 SB) 2 Submersible Centrifugal 2 Manual Coarse Screen 62 HP (1 W+1 SB) 2 Submersible Centrifugal 3 System for EI, MBBR Tanks and Sludge Tank As per design PVC 4 MBBR carrier As per design PVC/HDPE 5 Air Blowers for MBBR IV, ET and Sludge Tank 1108 m³/hour,49 HP 2+1 SB 6 Air Blowers for MBBR stage I 184 m³/hour,70 HP SB SB 7 Air Blowers for MBBR stage I 1878.5 m³/hour,75 3+2 Positive HP SB Sludge transfer pump to thickener 2.7 HP (1 W+1 SB) 2 Submersible Centrifugal Sludge transfer pump to centrifuge 1 HP (1 W+1 SB) 2 Submersible Centrifugal 1 Sludge Centrifuge 1 HP (1 W+1 SB) 2 Centrifugal 1 Sludge Centrifuge 1 HP (1 W+1 SB) 2 Centrifugal 1 Sludge Centrifuge 1 HP (1 W+1 SB) 2 Centrifugal 1 Sludge Centrifuge 1 HP (1 W+1 SB) 2 Centrifugal 1 Sludge Centrifuge 1 HP (1 W+1 SB) 2 Centrifugal 1 Pressure Sand Filter (Dual media) 1 m³/m²/hour, sand 2 MS with all specials 1 Activated Carbon Filter 10 m³/m²/hour, 1 MS with all specials 10 m³/m²/hour, 1 1 10 m³/m²/hour, 1 10 m²/m²/hour, 1	15	Filter Feed Tank	6 x 6 x 2.5	1	RCC
17 Activated Carbon Filter					
18 Treated Water Tank 8.4 x 8.4 x 3.5 1 RCC 19 Sludge Centrifuge 1 x 1 x 1 1 RCC/FRP Administrative building, indoor transformer, control panel room, lab, office space etc					
19 Sludge Centrifuge 1 x 1 x 1 1 RCC/FRP					
Administrative building, indoor transformer, control panel room, lab, office space etc ELECTRO-MECHANICAL UNITS 1 Sewage pump set to MBBR 62 HP (1 W+ 1 SB) 2 Submersible Centrifugal 2 Manual Coarse Screen Compatible to channel, 0.462 m wide 1 SS 304, Clear Spacing 20 mm Air Grid and Diffused aeration system for ET, MBBR Tanks and Sludge Tank As per design PVC 4 MBBR carrier As per design PVC/HDPE 5 Air Blowers for MBBR IV, ET and Sludge Tank 1108 m³/hour,49 HP 2+1 SB 6 Air Blowers for MBBR Nitrification Second stage 11278.5 m³/hour, 75 HP SB displacement 1278.5 m³/hour, 75 B B DD removal 1278.5 m³/hour, 75 B B B DD removal 1278.5 m³/hour, 75 B B B DD removal 14 Dos Mos./module 15 Sludge transfer pump to thickener 16 Sludge transfer pump to thickener 17 Sludge transfer pump to thickener 18 Sludge Centrifugal 19 Sludge transfer pump to thickener 19 Sludge transfer pump to thickener 10 Sludge Centrifuge 10 Sludge transfer pump to thickener 10 Sludge Centrifuge 11 Sludge Centrifuge 12 Pump set for clarified water to PSF and ACF 12 m³/m²/hour, and 2 MS with all specials 14 Activated Carbon Filter 10 m³/m²/hour, 1 MS with all specials 14 Activated Carbon Filter 14 ms in the sum of the sum o					
1 Sewage pump set to MBBR 62 HP (1 W+ 1 SB) 2 Submersible Centrifugal 2 Manual Coarse Screen Compatible to channel, 0.462 m wide Air Grid and Diffused aeration system for ET, MBBR Tanks and Sludge Tank 4 MBBR carrier As per design PVC/HDPE 5 Air Blowers for MBBR IV, ET and Sludge Tank 6 Air Blowers for MBBR Nitrification Second stage 7 Air Blowers for MBBR stage I 1184 m³/hour, 70 HP SB displacement 8 Plate Settlers 1278.5 m³/hour, 75 SB displacement 9 Sludge transfer pump to thickener 2.7 HP (1 W+ 1 SB) 2 Submersible Centrifugal 11 Sludge Centrifuge 1.1 HP (1 W+ 1 SB) 2 Submersible Centrifugal 11 Sludge Centrifuge 1.2 Pump set for clarified water to PSF and ACF 10 m³/m²/hour, and pressure Sand Filter (Dual media) 10 m³/m²/hour, 1 MS with all specials		Administrative building, indoor transformer, control panel room,		1	RCC/TRI
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media) 12 m³/m²/hour, sand 2 specials 14 Activated Carbon Filter 10 m³/m²/hour, 1 MS with all	12	-	65 HP (1 W+ 1 SB)	2	Centrifugal
1 14 ACTIVATEGICATOON FIITET 1 1 1	13	•	12 m ³ /m ² /hour, sand	2	
Activated Carbon specials	14	Activated Carbon Filter	10 m ³ /m ² /hour, Activated Carbon	1	
15 Jetting/Cleaning machine 1 High pressure	15	Jetting/Cleaning machine		1	High pressure

				pump
16	Generator		1	
17	Chlorinator	Electro type of similar		
18	IoT based sensors	BOD, DO, TSS, ph sensors		

3.7. REUSE PROPOSAL OF TREATED SEWAGE

A portion of the treated water will be used for diluting the septage collected from the non-network area. The treated water is proposed to be discharged into the commercial canal near Kannan Varkey bridges in turn can be utilized for the canal rejuvenation. The treated water can be used for irrigation purpose, gardening, construction purpose, road washing, firefighting, etc. If required the treated water can be supplied for industrial purposes of NTPCL Kayamkulam or any industries nearby.

Note: -Detailed structural design has not been done in this DPR and it is advisable to conduct detailed structural design, proto type construction of STP before actual execution of the work. The technology adopted in the proposed project shall be modified with suitable advanced compact versions if available.

CHAPTER 4

COST ESTIMATION

4.1. DETAILED ESTIMATE OF THE COMPONENTS

The detailed estimates have been divided into four sections: a] civil construction b] mechanical works c] electrical and instrumentation works d] operation and maintenance. The rates adopted in the estimate are based on DSR 2018 and market rates. In following sections, the detailed estimates are illustrated.

In civil construction all basins for the unit operation of the treatment plant are considered. All allied works for treatment other than electrical and mechanical is considered under this head. The treatment plant is given a provision for administrative block including lab facilities, chemical store, sludge handling units of which rate is catered. The sewer network estimate including wells provided is also included in the same. The road restoration provisions also catered. The amount for sewer connections to the households is also included. The plant is given provision for eco-friendly items like vegetation, odour mitigation measures etc. The compound wall as well as road provision is also considered.

In mechanical works considered screens, pumps, blower arrangements for aeration, media for MBBR, Pressure sand filter, activated carbon filter, centrifuge, chemical dosing provisions and other movable or immovable mechanical items.

In electrical works all electrical items, gen set, automatic control systems, all instrumentation, solar power, transformer provisions etc. are considered. The detailed estimate of all the components of the treatment plants is given as Annexure II and that of the sewer network is given in Annexure III.

4.2. ABSTRACT ESTIMATE

Sl. No.	ITEM	AMOUNT
CIVIL I	TEMS	
1	Receiving Chamber	₹ 10,72,623
2	Screen channel	₹ 5,67,350
3	Oil and Grease trap	₹ 9,90,743
4	Grit separator	₹ 9,89,579
5	Equalisation Tank	₹ 1,74,22,699
6	Dilution tank for co treatment	₹ 28,22,975
7	MBBR Tank	₹ 8,03,57,063
8	Clarifier with Tube/Plate Settler	₹ 39,67,888
9	Sludge Sump and Thickener	₹ 5,60,789
10	Sludge Thickener	₹ 17,34,849
11	Filter feed tank	₹ 13,81,773
12	Chlorine Contact Tank and Treated Water Tank	₹ 1,64,04,495
13	Ecofriendly and administrative units	₹ 2,83,50,737
14	Compound wall and internal road for STP	₹ 40,00,000
15	Site clearance	₹ 25,00,000
16	Statutory charges	₹ 15,00,000
17	Sewer network with pipelines, chambers and wells Zone1	₹ 30,2729435
	TOTAL OF CIVIL ITEMS	₹ 46,73,52,998
MECHA	ANICAL ITEMS	
1	Bar Screens	₹ 13,16,150
2	Pump sets	₹ 2,19,96,436
3	PSF & ACF	₹ 96,53,355
4	Centrifuge	₹ 3,44,382
5	Bypass arrangements, steel ladder, piping and valves	₹ 8,11,116
6	MBBR Carrier and other items	₹ 1,98,58,570
7	Tube settler media	₹ 1,33,928
8	Alum, Lime and hypo dosing systems	₹ 8,50,000
9	Odor control unit	₹ 52,267
10	Aeration system	₹ 4,82,141
11	Mechanical arrangement for oil & grease trap, sludge thickner	₹ 5,25,000
12	Electro magnetic flow meter	₹ 1,03,705
13	Mechanical arrangement for cleaning & flushing manhole	₹ 40,00,000
15	Mechanical arrangement for network and collection wells	₹ 23,04,968
	TOTAL OF MECHANICAL ITEMS	₹ 6,24,32,018
	RICAL ITEMS	I = .= = . =
1	Diesel Generator	₹ 45,61,349
2	Electrical works, IoT based sensor, control and transformer unit	₹ 90,50,000
3	Solar units	₹ 10,00,000
4	Electrical arrangement for network and collection wells	₹ 4,92,920
	TOTAL OF ELECTRICAL ITEMS	₹ 1,51,04,269

4.3. ACTION PLAN FOR IMPLEMENTATION

The following sequence of implementation plan for the institution may be more effective in realizing the goals of providing the sewerage system.

Priority	Plan
I.	Preparation of detailed engineering report
II.	Appraisal of the report
III.	Sanction of the project
IV.	Fund Mobilization
V.	Invitation of Tender for work
VI.	Execution of work
VII.	Formation of Monitoring Committee
VIII.	Regular Maintenance
IX.	Assessment of Performance
X.	Modifications in Process/unit Operations

4.3.1. Time schedule

Gantt chart showing construction and commissioning of treatment plant

		TIME IN MONTHS																						
ACTIVITY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Basic																								
planning																								
and																								
discussions																								
with																								
government																								
departments																								
Survey on																								
related plans																								
Survey on																								
Existing																								
facilities																								
Survey on																								
Resources of																								
Sewerage																								

systems												
Finalization												
of design												
and Detailed												
Engineering												
Report												
Appraisal of												
the report												
Sanction of												
the project												
Fund												
Mobilization												
Implementat												
ion												
Trial run												
and												
Commission												
ing												

CHAPTER 5

OPERATION AND MAINTENANCE PLAN

5.1. POWER REQUIREMENT OF THE TREATMENT PLANT

The hydraulic flow of effluent through the units in STP is proposed mainly by pumping with suitable pump sets which are electrically operated. As the main treatment process involved in the STP is MBBR which is aerobic in nature, and providing more retention time in the equalization tank leads to usage of more air blowers. Also, most of the instrumentation equipment is pneumatically operated, instrument air compressors are required. Plant lighting, draft fans, room fans, air conditioners etc. also require considerable electric power.

The total power requirement for running STP is 756.7 HP/564.45 kW and the installed capacity is 756.7 HP/564.45 kW. The single largest motor capacity is 75HP (Air blower). As per the rules of Kerala State Electrical Inspectorate, HT connection and an indoor type 3 phase transformer having a capacity of 1000 kVA and for making uninterrupted power supply, a Diesel-Generator set having 550 KVA capacity is proposed.

a. Transformer: 1000kVA

b. Generator :550 kVA

The power requirement at the well site in subzone III is for the pump set and to maintain control unit of 3 lifting manholes with power of 27.5HP/20.515 KW at peak flow and 7.5 HP/5.595 KW at average flow. Solar panel provision also included at both well site and STP.

5.2. COST ESTIMATE FOR O&M CHARGES FOR FIRST YEAR

	OPERATION & MA	AINTENANCE CO	OSTS		
SI.	Item		Unit		Expenditure
No.					
1	Power Charges for STP @ Rs.5 for kwh @	396120		kwh/month	1980600
2	Power Charges for network @ Rs.5 for	5595		kwh/month	27975
	kwh @				
3	Operators rate/month	25000	3	Nos.	75000
4	Unskilled Worker	8000	3	Nos.	24000
5	Chemist	20000	1	Nos.	20000
6	Driver	15000	1	Nos.	15000
7	Fuel for generator/month				6000
8	Gas Chlorine/month				3500
9	Alum and Lime ,polyelectrolyte				154729
	dosing/month				
10	Spares and replacements/month				5000
11	Network routine inspection, flushing,	0.3% of cost			
	cleaning including for manholes/month@	of			
		network/yr			75682
12	Total per month				2387486
13	Total per month excluding power charges				378911
14	Annual Operation & Maintenance Charge				28649832
15	Annual Operation & Maintenance Charge				
	excluding power charges				4546932
16	Treatment Cost per Day				78493
17	Unit Cost of Treatment per Kilo Litre				16

5.3. OPERATION AND MAINTENANCE COST FOR 5 YEARS

	5 YEAR ANNUAL O&M COST CONSIDERING 8% ANNUAL INCREAS	E EV	/ERY	YEAR								
	Excluding power charges											
1	1st year			4546932								
2	2nd year			4910687								
3	3rd year			5303542								
4	4th year			5727825								
5	5th year			6186051								
	Total O&M cost for 5 years			26675037								
	GST @ 18% 4801507											
	Unforseen			523456								
	Total O&M cost for 5 years including GST			32000000								

5.4. ABSTRACT OF COST

	ABSTRACT OF COST									
Sl. No.	ITEM	AMOUNT								
1	Civil Works	₹ 46,73,52,998								
2	Mechanical Works	₹ 6,24,32,018								
3	Electrical Works	₹ 1,51,04,269								
4	Total O&M cost for 5 years	₹ 2,66,75,037								
	GST Component (18%)	₹ 10,28,81,578								
	Contingency and unforeseen	₹ 55,54,100								
	GRAND TOTAL	₹ 68,00,00,000								
	Rupees Sixty Eight Crores only									

Assistant Engineer PPD Camp Office Kerala Water Authority Alappuzha

ASSISTANT EXECUTIVE ENGINEER-II
SEWERAGE CIRCLE
KERALA WATER AUTHORITY
KOCHI-11

Executive Engineer Sewerage Circle Kochi - 11 Superintending Engineer Kerala Water Authority Sewerage Circle Kochi - 11

CHAPTER 6

ENVIRONMENTAL IMPACT ASSESSMENT

6.1. INTRODUCTION

In Alappuzha Municipality, wastewater disposal is the main environmental issue that has created unsanitary conditions, odour and pollution to the nearby water bodies like canals, rivers as the wastes are disposed of directly, which causes nuisance to the residents and affects their health. Hence a proper strategy for treating liquid waste generated in the city is essential. Therefore, it is planned for the construction of new Sewage Treatment Plant (STP).

The project involves the planning, designing, constructing, erection, commissioning, operation and maintenance of 5MLD capacity STP at Kerala Water Authority's (KWA) own land at Alisserry.

6.2. BRIEF DESCRIPTION OF PROPOSED PROJECT

Wastewater from each house will collect in proposed collection wells cum pump houses by gravity and thereafter by pumping up to the new STP at various locations. The wastewater treatment technology to be used at the newly constructing STP is envisaged as MBBR Technology. It significantly reduces the BOD, nitrogen, phosphorous, toxic substances and other pollutants found in the wastewater. The technology adopted is very compact and required fewer footprints. The lack of awareness of human use is also major bottle neck of the project which may leads to the public protest for the project which needs to be properly addressed. The treated water can be reused for agriculture purpose as per the need.

6.3. FEATURES OF THE PROPOSED PROJECT SITE

The project area comes under Alappuzha parliament Constituency and in both Alappuzha and Ambalapuzha legislative constituencies. The municipal town is divided into 52 municipal wards. The STP is designed for Alissery Zone encompassing 2.645 Sq. Km of the total municipal area and the network is planned for 0.473 Sq. Km as Phase 1 (Ward 34 and 35). The nearby establishments of the site are market, small shops, National Highway and

some houses. There are no notable industrial activities in the project area. The wastewater generates from these places will not affect wastewater characteristics arriving to the STP. Farming activities near the site are nil.

Mandatory Clearance

The project would need the clearances from GoK and PCB Clearance from the Kerala State Pollution Control Board under the Air Act, the Water Act and the Cess Act, if stipulated by the State Pollution Control Board (PCB) while giving the NOC.

6.4. ENVIRONMENTAL SETTLLING

The ecologically significant systems within the study area of the project site like archaeological monuments, national parks, wild life sanctuary, core zone of biosphere reserve/ habitat for migratory birds, estuary and mangroves etc. are absent in the nearby 10 Km radius. There is no defence installation nearby the project site.

6.5. ASSESSMENT OF ANTICIPATED IMPACTS

Based on the magnitude and duration of the project activities and the environmental attributes of the receiving environment presented earlier in this DPR on environmental setting, the nature, duration and extent of impact are assessed. Minor project impacts have also been identified and basis for their insignificance has been provided. Where relevant, the EIA also addresses the minor impacts and provides environmental mitigation or environmental enhancement measures.

6.5.1. Impact During Construction and Operation of Networks

During the construction phase of the project, moderate quantities of earth will be excavated and soil disturbance will take place. There will be chances of sliding earth when the earthwork excavation takes place for networks and minor damages can be expected to compound walls and drains. To avoid such situations adequate measures will be taken for side protections. The traffic diversions cause inconvenience to pedestrians and nearby inhabitants for taking own vehicles during those days, dust and noise also to bear during earthwork excavation for pipe laying. But maximum care is to be taken to avoid damages

and disruptions to the utilities are planned and minimum diversions and inconvenience will help to achieve the goal.

6.5.2. Impact on Physical Resources

6.5.2.1. Impact on topography

The proposed construction is planned on flat terrain. There are a few public toilets and a temporary market is now present in the site. The municipality has already planned to relocate the market and the unauthorized businesses running in the proposed site. The project will not alter the topography of the site if planned and executed aesthetically will improve the visual appeal of the area.

6.5.2.2. Impact on climate

The proposed site is already a part of the developed area. Other than a few trees present in the boundary of the site, there are no vegetation present which needs clearance. The project therefore, is unlikely to have any micro-climatic impacts.

6.5.23. Impact on Geology, Soil and Mineral Resources

As no new quarries are envisaged for the project the environmental impacts due to procurement of construction material for the project are insignificant.

6.5.2.4. Impact on Air quality

The project entails movement of significant quantities of the construction material and operation of construction machinery at the site. The project therefore has potential for construction phase negative impacts on air quality. During the operation phase, however decrease movement of vehicular traffic to the site.

Construction phase impacts: During the construction phase, operation of construction machinery at the site and use of vehicles for transporting the construction material are the primary sources of air pollution. Combustion of diesel will be the principal cause of air pollution during the construction phase.

6.5.2.5. Impact on Noise Levels

During the construction phase, the major sources of noise pollution are movement of vehicles transporting the construction material to the project site and the noise generating activities at the site. Primary noise generating activities during the construction are concreting, mixing, casting and materials handling. The noise likely to be generated during excavation, loading and transportation of material. The construction equipment that has high noise emissions levels can affect the personnel operating the machines. Use of proper personal protective equipment will mitigate any adverse impact of the noise generated by such equipment.

Noise generated during operation phase will not be significant. It is, however, required that adequate green cover to the site is provided.

6.5.2.6. Impact on Water Resources

Water requirement during the construction phase has been met by procuring water through tankers. The water demand during the operation phase will be mainly to provide water to the employees involved in the administration, operation and maintenance of the STP.

6.5.2.7. Impact on Water Quality

The project therefore will not have any adverse impact on local ground water and/or surface water resources. Few of the options where treated sewage may be put to beneficial uses include:

- Sale to industries requiring huge quantity of water to meet the cooling water need.
 Tertiary treatment may be done to meet standards.
- To be made use by various government departments for the development of social farm forest thus achieving afforestation goals.
- Irrigation of traffic islands using treated sewage

Since the treated sewage is not let out to reach the soil and underground aquifer, there will not be negative impact on the water resources. On the contrary, due to structured collection

of household sewage and treatment indiscriminate mixing of sewage in many water bodies are eliminated.

6.5.2.8. Impact on Land Environment

The land identified for the project development falls under Alappuzha Municipality in Alappuzha District. Since, the entire land area for the project is part of government lands, acquisition of private lands is not entailed for the project.

Surrounding areas are already in commercial area. Hence, no disturbance to the local ecology is expected. There will not be any change in the topography of the region, as the land coverage area of STP units will be of small area.

6.5.2.9. Impact on Ecological Resources

As there are no endangered/ threatened species in the vicinity of the proposed project site, there will not be any concern for the loss of important species that needs conservation.

6.5.2.10. Impact on Socio-Economic Environment

Local people would also get job opportunities during construction phase of the project. Thus, the project is expected to contribute to the overall development of the area. There is no issue of resettlement or rehabilitation as the proposed site belongs to the municipality.

6.6. MITIGATION MEASURES

It is observed that most of the project impacts are related to construction phase activities and are minor and transient in nature. All of these impacts can be mitigated following good construction practices.

6.6.1. Impact on Air Quality

Impact on the air quality at the construction site and its adjoining areas during the construction phase would be mainly due to the operation of construction machinery at the site and use of vehicles for transporting the construction material. The following measures are suggested for the mitigation of these impacts.

- Vehicles used for transportation of construction material, will be covered to avoid fugitive emission.
- Idling of delivery trucks or other equipment will not be done during loading and unloading of materials.
- All construction vehicles will be maintained in such a way so as to comply with air emission standards.
- Dust suppression measures such as sprinkling of water will be carried out regularly.

6.6.2. Impact on Noise Levels

The generation of noise during the construction phase would be mainly due to movement of vehicles transporting the construction materials and also due to the noise generating activities in the site itself. To mitigate these impacts during this phase the following measures are suggested.

- Restriction on the usage of noise generating activities and traffic movement in the residential areas to day light hours. Contracts should specify that the construction equipment should meet the noise and air emission levels as per EPA Rules, 1986.
- Generator sets should be enclosed with noise shields.
- Vehicles used for the transportation of construction materials should be well maintained.
- The workers operating high noise machinery or operating near it should be provided with ear plugs.

6.6.3. Impact on Micro Climate

The project area is a part of an already developed area of the municipality. On site planting of shading trees and vegetation along the designated open spaces is envisioned, to ensure the improvement of microclimatic condition of the project site.

6.6.4. Impact on Water Resources

Wastewater discharges from construction site should not be directly let into the nearby water body. It has been proposed to procure water through bore wells or the well already

present in the site to meet the requirement during construction. The impact on water resources due to the operation of sewage treatment plant is insignificant due to the reason that, in the absence of the STP plant, at present the sewage generated in the Alappuzha Municipal area is discharged haphazardly without any treatment.

6.6.5. Health, Safety and Sanitation

- During the construction and operational phase, safety precautions will be practiced in order to prevent any possible occurrence of accident. For this, it will be ensured that all machines used shall confirm to the relevant Indian standards Code and undergo regular inspection.
- During construction phase, Personal Protective Equipment (PPE) such as Protective footwear and protective goggles, Welder's protective eye-shields shall be provided to workers who are engaged in welding works, earplugs shall be provided to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation.
- The workers will also be provided all necessary safety appliances such as helmets, safety belts, earplugs, mask etc.
- A well-maintained first aid kit including an adequate supply of sterilized dressing materials and appliances will be made available.
- Only the working staff and authorized personnel will only be allowed inside the STP premises.
- Drinking water facility will be made available. Also, Adequate ablutions and change facilities to promote appropriate occupational health and safety (OHS) will be provided.

6.6.6. Plant Operation and Maintenance

- The manuals grading Operations and maintenance procedures will be developed and maintained to ensure optimum environmental management of the activity will be produced.
- The workers involved in O& M will be adequately trained to operate the plant and also trained in environmental management requirements of the plant.

6.6.7. Odour Control Measures

The STP consists of raw sewage pumping, screening, grit chamber, MBBR reactor, sedimentation tanks, filter press etc. The planned secondary treatment system is MBBR has been proposed in view of its advantages of land requirement, low odour, high effluent quality, ease of operation etc. Therefore, apart from the preliminary treatment consisting of screening and grit removal, the treatment system is purely aerobic thus resulting in minimal offensive odour. The need therefore is to minimize any offensive odour in and near the preliminary treatment structures. This is proposed by taking the following measures:

- The odour produced in the primary treatment units due to inlet sump, pump house, screens, approach channels, grit chamber etc. would be maintained on a regular basis by regular cleaning and proper housekeeping to be done.
- All screenings and grit would be properly collected through chutes into trolleys and disposed off as per laid down procedures.
- A green belt with suitable plantation would be provided in the area between treatment units and public to control and reduce odour.

6.6.8. Safety Measures

A detailed precautionary measure has been planned in the various process stages in case of any emergencies. Solids are generated by microorganism growth and reproduction. The influent BOD Supplies the food for the growth and reproduction. As microorganisms' population multiply, excess solids must be removed. If excess solids are not removed, the mixed liquor suspended solids (MLSS) and sludge age will increase and process efficiency will be lowered. Sludge settling rates are affected. Eventually, if excess solids do not get wasted, they can overflow the clarifier weirs and into the receiving water. These operating parameters are widely used and the details of the operating procedure will vary accordingly.

Other precautions will also be carried out as follows:

- Sufficient aeration will be provided throughout the aeration tanks of at least 2 mg/l to maintain the dissolved oxygen concentration.
- Dissolved oxygen will be present at all times in the treated wastewater in the final settling tanks.

The quality of the treated water will be continuously monitored as this is the basic indicator of the normal plant operation.

6.7. PROJECT BENEFITS

6.7.1. Effective Technology

The project uses MBBR technology which is a space saving and is better alternative to conventional treatment plants that are large sized, power intensive and require a lot of monitoring. It has odorless operations, with a self-regulating system, reduced power consumption, simple to operate, low maintenance requirements and removes pathogenic coli forms.

6.7.2. Improvement of Environmental Status

The project will contribute to the substantial decrease of pollution caused by the discharge of untreated sewage into the environment. This in turn would improve the quality of water resources such as ground as well as surface water. The contamination of the region's soil is also prevented by the proper collection and disposal of waste water.

6.7.3. Health Benefits

The proposed project which would ensure the efficient disposal of the waste generation will ultimately bring about social, economic and health benefits to the community. The allied benefits include reduction in health-care costs related with waterborne and related diseases.

6.7.4. Generation of Employment

During the construction phase of the project, service of local sub-contractors will be used which will generate job opportunities for skilled and unskilled workers in addition to professional engineers and others.

6.7.5. Socio-economic Benefits

The project will help in maintaining the sustainability of water and wastewater infrastructure through high standards of O & M and environmental mitigation and management. The project aids to the proper wastewater collection and disposal enriching the aesthetic appearance of the overall region. The project will promote domestic wastewater management, as a result of discharge their wastewater into the proposed sewer systems.

6.7.6. Reuse of treated effluent

The project will promote water conservation measures such as water reuse that will reduce future increases in water demand. The proposed STP project will ensure beneficial reuse of treated sewage for various uses of industry and agricultural activities in and around the project site. The treated sewage sludge which is rich in organic content would serve as low-cost organic manure.

6.8. PUBLIC CONSULTATION

Public hearing with public and various stakeholders should be conducted and the details about the proposed STP in Alissery should be explained. The matters of concern like rehabilitation or resettlement and monetary compensation for the land acquirement for the well site should be discussed in the meetings under the supervisory of Municipal council and KWA officials. The details of public consultation and the notices issued, venue details and list of participants and minutes of meeting should be recorded.

CHAPTER 6

CONCLUSION

6.1. CONCLUSION

Safe water supply and hygienic sanitation facilities are the two basic essential amenities the community needs on a top priority for healthy living. Sanitation has always been more unfortunate than its twin brother water supply. The water supply will have a measurable impact on health only if it is linked with sanitation facilities. The Alappuzha Municipality currently lacks a proper wastewater management system. The Municipal area as a whole has been divided into four network zones and two septage zones. Out of the 52 wards in the municipality, wards 32 to 36 & 43 is fully and 37,38,42 & 44 is partially considered to have sewer network system as Alissery Zone in Zone 2.At present, ward 34 and 35 is only considered for the network implementation as Phase 1 which is covering 0.475 sqkm with network length of 9.79km. Subzone 1 of Alissery zone includes two town wards namely, Alissery ward and Lajaneth ward. The STP design for Alissery zone of 5 MLD capacity and for a design period of 30 years is considered. The treatment plant proposed having 5 MLD capacity will be set up in Kerala Water Authority's (KWA) own land at Alisserry. The estimated sewage load from the project area of 2.645 Sq. km is 4.54 MLD and balance for the septage provision .The treatment technology for the proposed STP adopted in this DPR is Moving Bed Bio Reactor, as this technology is suitable for adopting shock loads and flexible in nature. Apart from sewage treatment plant, a co-treatment facility is also proposed to treat the septage to be collected from the non-network areas. Due to the space constraints components, it is designed as multi-tier STP. The main advantage of multitier STP is minimal use of land area; capital cost can be reduced to a great extent by avoiding individual foundations. But the O&M cost will be more as more energy will be required for pumping the influents to various components at different heights from the ground level. The sewer network lines proposed are HDPE PE100 PN8 and pumping mains HDPE PE100 PN10. As the sewerage connection to the households are to be provided in parallel with the network implementation and the construction of STP for the timely commissioning of the plant, provision for giving sewer connections to households are included in the estimate.

Total estimated cost is Rs.**68,00,00,000** (Rupees Sixty Eight crores only) including 5 years operation maintenance expenses excluding power charges.

6.2. RECOMMENDATIONS

The awareness program of the project is the first step needed. The environment impact study needs to be properly dealt with. The detailed structural design needs to be carried out before implementation. The technology adopted in the proposed project shall be modified with suitable advanced compact versions if available. The necessary mandatory permissions may be taken in prior. The proper co-ordination with all departments needed to be dealt with to avoid undue delay in the project.

Assistant Engineer PPD Camp Office Kerala Water Authority Alappuzha ASSISTANT EXECUTIVE ENGINEER-II
SEWERAGE CIRCLE
KERALA WATER AUTHORITY
KOCHI-II

xecutive Engineer Sewerage Circle Kochi - 11 Superintending Engineer Kerala Water Authority Sewerage Circle Kochi - 11



ANNEXURES	

ANNEXURE I POPULATION LOAD CALCULATION

Ward No	Ward Name	Total Populatio n (2011 census)	Populatio n as on 2022	Network coverage in wards	Population in Alissery zone as on 2022	Population Projected as on 2039	Domestic water demand
Increa	ase in population adopted	0.61%	dist	rict growth	rate		
32	Valiya Maram	3474	3497	100	3497	3533.00	0.53
33	Municipal Stadium	3357	3380	100	3380	3415.00	0.51
34	Alissery	3606	3630	100	3630	3668.00	0.55
35	Lajaneth	4373	4402	100	4402	4448.00	0.67
36	Valiyakulam	2443	2459	100	2459	2485.00	0.37
37	Vattayal	3331	3353	60	2012	2033.00	0.30
38	Kuthirapanthi	3936	3962	25	991	1001.00	0.15
42	Railway Station	3175	3196	40	1278	1291.00	0.19
43	Zacharia Bazar	4401	4431	100	4431	4477.00	0.67
44	Civil Station	3399	3422	60	2053	2074.00	0.31
		35495	35732		28133	28425.00	4.26

Ward No	Ward Name	Populatio n Projected as on 2054	Domestic	Non domestic water demand	Total water demand	Sewage load DWF (MLD)	Infiltration
32	Valiya Maram	3565.00	0.53	0.11	0.64	0.51	0.05
33	Municipal Stadium	3446.00	0.52	0.10	0.62	0.50	0.05
34	Alissery	3702.00	0.56	0.11	0.67	0.53	0.05
35	Lajaneth	4489.00	0.67	0.13	0.81	0.65	0.06
36	Valiyakulam	2508.00	0.38	0.08	0.45	0.36	0.04
37	Vattayal	2052.00	0.31	0.06	0.37	0.30	0.03
38	Kuthirapanthi	1010.00	0.15	0.03	0.18	0.15	0.01
42	Railway Station	1303.00	0.20	0.04	0.23	0.19	0.02
43	Zacharia Bazar	4518.00	0.68	0.14	0.81	0.65	0.07
44	Civil Station	2093.00	0.31	0.06	0.38	0.30	0.03
		28686.00	4.30	0.86	5.16	4.13	0.41

Sub Zone	Ward included	Calculated total Sewage load in each ward	% of ward in each Zone	% of ward in each Zone	Total Sewage load in each Sub Zone in MLD	
1	34	0.59	100	0.59	1.30	
	35	0.71	100	0.71		
2	44	0.33	100	0.33		
	43	0.72	100	0.72	1.42	
	42	0.21	45	0.09		
	36	0.40	70	0.28		
3	32	0.56	100	0.56	1.23	
	33	0.55	100	0.55		
	36	0.40	30	0.12		
4	37	0.33	100	0.33		
	38	0.16	100	0.16	0.60	
	42	0.21	55	0.11		
Total-					4.54	

 $EST~No.:WRD/KWA-CESEWA/EST/4946/2022_12_1_1~(Edit~Id:1)\\ (Dsor~year:2018,Cost~Index~(Place:Alleppy,Value:141.53),GST:18\%$

GENERAL ABSTRACT

Others-DPR PREPARATION OF ALAPPUZHA MUNICIPALITY SEWERAGE SCHEME-

Detailed estimate of Sewage treatment plant and co-treatment unit-phase 1 Alappuzha municipality-DPR Preparation Work

Sl No	Head Description	Amount	
1	RECEIVING CHAMBER	1072622.59	
2	SCREEN CHANNEL	567350.38	
3	OIL AND GREASE TRAP	990743.23	
4	GRIT SEPERATOR	989579.23	
5	EQUALISATION TANK	17422698.85	
6	DILUTION TANK FOR CO TREATMENT-	2822974.64	
7	MOVING BED BIOFILM REACTOR TANK	80357063.19	
8	SECONDARY CLARIFIER WITH PLATE S	3967888.21	
9	SLUDGE SUMP	560788.54	
10	SLUDGE THICKENER-Circular	1734849.20	
11	FILTER FEED TANK-Rectangular	1381773.18	
12	TREATED WATER TANK-CHLORINE CO Rectangular	16404495.19	
13	ECO-FRIENDLY AND ADMINISTRATIVE	28350736.95	
14	MECHANICAL ITEMS-STP	60127051.50	
15	ELECTRICAL WORKS-STP	14611348.74	
16	COMPOUND WALL FOR STP SITEA AND	4000000.06	
17	SITE CLEARANCE	2500000.00	
18	SATUATORY CHARGES	1499999.99	
	Т	otal Estimation PAC	239361963.6 7
C	Extra Charges		
C.001	Provision for GST		
	239361963.67	18.00%	43085153.46
		Grand Total	0.00
		0.00	
		Rounded Total(Rs)	282447117.1 3
	Rupees Twenty Eight Crore Twenty Four La Hundred and Seventeen	kh Forty Seven Thousar	nd One

DETAILED ESTIMATE

Others-DPR PREPARATION OF ALAPPUZHA MUNICIPALITY SEWERAGE SCHEME-

Detailed estimate of Sewage treatment plant and co-treatment unit-phase 1 Alappuzha municipality-DPR Preparation Work

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity					
1	RECEIVING CHA	AMBER										
1.001	2.6.1											
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil											
	RECEIVING CHAMBER											
	For receiving chamber-CTU	2	2.600	2.300	0.450		5.382					
	Total		441		-01	FI	5.382					
				To	otal Quantity	y in cum	5.382					
1.002	4.1.6			3								
	Providing and layi of centering and sh sand: 6 graded sto	nuttering -	- All work up	to plinth lev	rel:1:3:6 (1 d							
	RECEIVING CH	AMBER										
	For receiving chamber -CTU	2	2.600	2.300	0.150		1.794					
	Total						1.794					
				To	otal Quantity	y in cum	1.794					
1.003	5.37.1											
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:-Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately.All wiork upto plinth level											
	RECEIVING CHA			0.700	2 222		2075					
	Columns(outer)	2	0.450	0.600	3.800		2.052					
	Inner columns	2	0.450	0.450	3.800		1.539					
	Beams	2	4.050	0.300	0.750		1.823					

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
		2	4.050	0.300	0.600		1.458
	Bottom slab	1	5.400	3.700	0.300		5.994
	Long wall	2	4.750	0.250	2.000		4.750
	Short wall	2	2.500	0.250	2.000		2.500
	Total						20.116
	RECEIVING CH	AMBER-	CTU				
	Bottom slab	2	2.000	1.700	0.300		2.040
	Long wall	4	2.000	0.250	1.200		2.400
	Short wall	4	1.200	0.250	1.200		1.440
	Total						5.880
				To	tal Quantity	in cum	25.996
1.004	5.34.1						
	specified cement of grade concrete ins in M-30 is @ 340	tead of Makes/cum).	-25 grade BM				
	FOR RECEIVIN	IG CHAN	IBER-CTU	711		2 0 400	
	QTY as per item code5.37.1	1		\prec		2.9400	2.940
	Quantity as per item No. 5.37.2	1	e-PLATFO OF PUBL	RM FOR THE C WORKS	MANAGEMEN	3.5090	3.509
	Total						6.449
	FOR RECEIVING	G CHAM	BER-STP				
	QTY AS PER ITEM NO.5.37.1	1				20.116 000	20.116
	Quantity as per item No. 5.37.2	1			1.000	3.5090 00	3.509
	Total						23.625
				To	tal Quantity	in cum	30.074
1.005	OD53391/2022-20)23				•	
	Extra for providing		resistant cen	nent for the	structures		
	Extra for providing FOR RECEIVIN	g sulphate		nent for the	structures		
	<u> </u>	g sulphate		nent for the	structures	2.9400	2.940
	FOR RECEIVIN	g sulphate		nent for the	structures		
	FOR RECEIVIN QTY AS PER ITEM NO.5.37.1 Quantity as per	g sulphate		nent for the	structures	3.5090	2.940 3.509 6.449
	FOR RECEIVIN QTY AS PER ITEM NO.5.37.1 Quantity as per item No. 5.37.2	g sulphate NG CHAM 1	IBER-CTU	nent for the	structures	3.5090	3.509

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	QTY AS PER ITEM NO.5.37.2	1				3.5090 00	3.509
	Total						23.625
				To	otal Quantit	y in cum	30.074
1.006	5.37.2						
	Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfus as per IS: 9103 to impairing strength Cement content coper design mix is a floor V level	vork, using ally autom all leads, had grade for it mixer to corcement accelerated and dural possidered.	g cement con natic batching aving continu r reinforced of site of laying including control fretard setting bility as per of in this item i	tent as per and the per and th	pproved designansported to mixer, manurete work incert the cost of cures in recomble, improve whe Engineer cum. Excess	gn mix, site of wo ufactured luding pu centering, nmended p workabilit - in -charg /less ceme	ork in as per mix mping of shuttering proportions y without ge. Note:-ent used as
	RECEIVING CH	IAMBER	W.	6			
	Top slab-STP	1	4.950	3.200	0.150	VL B	2.376
	Top slab-CTU	2	2.200	1.900	0.150		1.254
	Total	No.		7			3.630
	DEDUCTION		DE CONTRACTOR	ONLY COD THE		-	
	Manhole	-3	0.600	0.450	0.150		-0.121
	Total						-0.121
				To	otal Quantit	y in cum	3.509
1.007	5.22.6						
	Steel reinforcemer in position and bin bars of grade Fe-5	ding all c	omplete upto				
	RECEIVING CH	IAMBER					
	QTY.AS PER ITEM NO.5.37.1	1			25.996	120.00 0000	3119.520
	QTY. AS PER ITEM NO.5.37.2	1			3.509	100.00 0000	350.900
	Total						3470.420
				Total (Quantity in k	kilogram	3470.420
1.008	OD53791/2022-20)23					
	Extra for providing	g epoxy c	oating for rei	inforcement	bar		
	FOR MBBR						
	QTY AS PER ITEM NO.5.37.1	1	25.996			120.00 0000	3119.520

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	QTY. AS PER ITEM NO.5.37.2	1	3.509			100.00 0000	350.900
	Total						3470.420
				1	Total Quant	ity in kg	3470.420
1.009	4.12					-	
	Extra for providing doses by weight of						work in
	RECEIVING CH	AMBER					
	QTY AS PER ITEM NO.5.37.1	1			25.996	340.00 0000	8838.640
	QTY. AS PER ITEM NO.5.37.2	1	340.00 0000	1193.060			
	Total						10031.70 0
			O S		Total Quant	ity in kg	10031.70 0
1.010	5.9.1		41	A SOLD		FI)
	Centering and shur footings, bases of				removal of f	orm for:F	oundations,
	RECEIVING CH	AMBER					
	Bottom slab - CTU	4	4.900	RM FOR THE WORKS	0.300	rr	5.880
	Total						5.880
				T	otal Quantit	y in sqm	5.880
1.011	5.9.2						
	Centering and shuthickness) including						
	RECEIVING CH	AMBER					
	Columns	2	2.100		3.800		15.960
		2	1.800		3.800		13.680
	Beams	2	4.050		1.800		14.580
		2	4.050		1.500		12.150
	For walls outside -STP	2	7.500		2.000		30.000
	For walls inside- STP	2	6.750		2.000		27.000
	For walls outside -CTU	4	3.700		1.200		17.760
	For walls inside - CTU	4	2.700		1.200		12.960
	Total						144.090

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
			-	To	otal Quantit	y in sqm	144.090				
1.012	5.9.3					-					
	Centering and shufloors, roofs, landi					orm for:S	uspended				
	FOR CTU tOP SLAB 4 3.700 0.150 2										
	tOP SLAB	4	3.700		0.150		2.220				
	Bottom portion	2	1.500	1.200			3.600				
	Total						5.820				
	FOR STP										
	Top slab	2	7.900		0.150		2.370				
	Bottom portion	1	4.250	2.500			10.625				
	Total						12.995				
				To	otal Quantity	y in sqm	18.815				
1.013	2.25		-6	120		The state of the s					
	Filling available exfoundation etc. in layer by ramming	layers not	exceeding 20	0 cm in dept	h, consolidat	ing each d	of leposited				
	DEDUCTION			7							
	PCC	-1			1.794		-1.794				
	bottom slab	-1	OF PUBL	C WORKS	2.040		-2.040				
	Total						-3.834				
	RECEIVING CH	AMBER									
	QTY AS PER ITEM NO. 2.6.1	1			5.382		5.382				
	Total						5.382				
				To	tal Quantity	y in cum	1.548				
1.014	22.23.1										
	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requiremeability of co DIN 1048 and resis slurry shall be capshall be carried out engineerincharge. The produleakage. For vertical	tment to the labs, poding edeck et es slurry: 2 es slurry: 1 ee (internative ments increte by stant to 10 able of set all compact perform	he RCC structums, reservice., prepared by parts water) part water) for the structure of the part water of the structure of th	ctures like report, sewage & cor, sewage & c	taining walls camp; water to the ratio of 5 surfaces and 1 surfaces and 1 surfaces and 1 thetic fiber 3R-2010 i.e. to 1 with control on negative a width of 0 and the direct see for 10 years	s of the batreatment 5:2 (5 pa 3:1 (3 pa d applying brush. The by reducing cl concrete side. The 50mm. The	rts arts g the ne material ng e as per crystalline he work				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	RECEIVING CH	AMBER					
	Inside of walls - STP	2	6.750		2.000		27.000
	Inside of walls - CTU	4	2.700		1.200		12.960
	Total						39.960
				To	otal Quantity	y in sqm	39.960
1.015	22.23.2						
	Providing and app waterproofing trea water tanks, roof stunnels / subway and bridgintegral crystalline integral crystalline same from negative shall meet the requiremental permeability of co DIN 1048 and resistancy shall be cap shall be carried out engineerincharge. The produleakage.For horizon FOR CTU	ge deck et e slurry : 2 e slurry : 1 ve (interna uirements oncrete by istant to 1 able of se at all comp	the RCC structums, reservice., prepared by the parts water) part water) for the part water of the part	etures like report, sewage & or, sewage & or, sewage & or, sewage & or, sewage & or, sewage & or, sewage & or, sewage or,	the ratio of 5 surfaces and l surfaces and rethetic fiber 3R-2010 i.e. be width of 0 and the directive for 10 years	s of the bacreatment 5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir l concrete side. The 50mm. The	rts arts g the ne material g as per crystalline he work
	Bottom slab	2	1.500	1.200			3.600
	inside		1.500	1.200			
	Total						3.600
	FOR STP						
	Bottom slab	1	4.250	2.500			10.625
	Total					_	10.625
				To	otal Quantity	y in sqm	14.225
1.016	13.7.1 12 mm cement pla cement : 3 fine sar FOR STP		ned with a flo	ating coat of	neat cement	of mix:1	:3 (1
	Columns	2	2.100		3.800		15.960
		2	1.800		3.800		13.680
	Beams	2	4.050		1.800		14.580
		2	4.050		1.500		
	l		1.050	I	1.500		12.150
	Inside of walls	2	6.750		2.000		12.150 27.000

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Base slab inside and botom of top slab	1	4.200	2.200			9.240
		1	4.800	2.800			13.440
	Top and bottom slab	2	4.950	3.200			31.680
	Total						167.730
	FOR CTU	<u> </u>					
	Inside of walls	4	2.700		1.200		12.960
	Outside of walls	4	3.700	1.200			17.760
	Base slab inside and bottom oftop slab	4	1.500	1.200			7.200
	Top slab	2	2.000	1.700			6.800
	Total			M		1-17-	44.720
	DEDUCTION		1	3		THE REAL PROPERTY.	
	Manhole	-4	0.600	0.450	501	VE B	-1.080
	Total					100	-1.080
				To	otal Quantit	y in sqm	211.370
1.017	19.18.1						
	Supplying and fixi cover (light duty)	ng C.I wi	ith out frame ht of the cove	for manhole er to be no le	s:455 x 610 ss than 23 kg	mm rectai	ngular C.I
	RECEIVING CH	AMBER					
		4	1.000				4.000
	Total						4.000
				To	tal Quantity	y in each	4.000
1.018	OD53942/2022-20)23					
	Supply of uPVC P	ipe, IS 49	85:2000,10K	g/cm2,110m	mDiaand f	ixing	
	RECEIVING CH	AMBER					
	STP	1	0.450				0.450
	CTU	2	0.450				0.900
	Total						1.350
	Total			Tota	al Quantity	in metre	1.350 1.350

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Providing orange of as per IS: 10910 of cross section as 23 165 mm with minitop surface by ribb projections on tail stand the bend test manufactures per fixing in manholes sand: 6 graded sto	n 12 mm of 3 mm x 25 mm x 12 mm 112 mm 112 mm 112 mm che length on a and chen nanent ides with 30x ne aggreg	dia steeel bar mm and ove mm space be equering bes 138 mm as p nical resistan entification m 20x15 cm ce	conforming er all minimu etween protr ides necessar per standard ce test as per ark to be vis	to IS:1786, im length 26, uded legs hary and adequate drawing and respectification ible even aft te block 1:3:	having mi 3 mm and ving 2 mr ate anchor suitable t ns and haver fixing in 6 (1 ceme	nimum width as n tread on ring o with ving ncluding ent: 3 coarse
	RECEIVING CH For STP	AMBER 6					6.000
	For CTU	6					6.000
	Total						12.000
				To	tal Quantity	y in each	12.000
1.020	100.36.1			M			
	of 5 km (average) height not less tha and other applience RECEIVING CH	n 3 m usir	ng 5 HP diese	el engine pun	ne water into np set, hire t	the reserve for tanker	v <mark>o</mark> ir of lorry, tools
	For STP	1	4.500	2.500	2.000		22.500
	For CTU	2	1.500	1.200	1.200	er .	4.320
	Total						26.820
				Total (Quantity in 1	Kilo litre	26.820
1.021	13.52.2						
	Finishing with Epoper manufacturer& of surface, etc. con	z#39;s spe	ecifications in	ncluding app			
	RECEIVING CH	IAMBER					
	QTY AS PER ITEM NO.13.7.1R	1	211.370				211.370
	Total						211.370
				To	otal Quantit	y in sqm	211.370
2	SCREEN CHANN	NEL					
2.001	5.37.1						

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfas per IS: 9103 to impairing strength Cement content coper design mix is per design mix is per second content coper design mix is per second content content coper design mix is per second content	rork, using ally auton all leads, hall grade for it mixer to orcement accelerate and dura onsidered	g cement con natic batching aving continu r reinforced of o site of layin including control e/ retard setting bility as per of in this item i	tent as per aper plant and transport and tra	pproved designation and an apported to mixer, many the cost of cares in recome, improve whe Engineer turn. Excess	gn mix, site of wo afactured luding pu centering, mended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:- ent used as
	For coarse screen	channel					
	Bottom slab	1	2.500	3.750	0.300		2.813
	Wall	3	2.500	0.250	1.500		2.813
	beams	1	4.050	0.300	0.600		0.729
	Total			0.0			6.355
	For fine screen cha	annel	75			-	1
	Bottom slab STP	1	4.000	3.750	0.300	FT	4.500
	Wal-ISTP	3	4.000	0.250	1.500	A P	4.500
	Total			3-1			9.000
				To	tal Quantit	v in cum	15.355
2.002	Extra for providing specified cement of grade concrete instead in M-30 is @ 340	ontent us tead of M	ed is payable	/ recoverable	e separately.I	Providing	M-30
	FOR SCREEN CH	IANNEL					
	QTY AS PER ITEM NO.5.37.1	1				15.350 000	15.350
	Total						15.350
				To	tal Quantit	y in cum	15.350
2.003	OD54060/2022-20)23					
	Extra for providing	g sulphate	resistant cei	ment for the	structures		
	FOR SCREEN CH						
	QTY AS PER ITEM NO.5.37.1	1				15.350 000	15.350
	Total						15.350
				To	tal Quantit	y in cum	15.350
2.004	5.22.6						
	Steel reinforcemer in position and bin bars of grade Fe-5	ding all c	omplete upto				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	FOR SCREEN CH	IANNEL		-			
	QTY AS PER ITEM NO.5.37.1	1		15.350		120.00 0000	1842.000
	Total						1842.000
				Total Q	Quantity in l	kilogram	1842.000
2.005	OD54067/2022-20)23					
	Extra for providing	д ероху со	oating for rei	nforcement b	oar		
	FOR SCREEN CH	IANNEL					
	QTY AS PER ITEM NO.5.37.1	1			15.350	120.00 0000	1842.000
	Total						1842.000
				ŗ	Total Quant	ity in kg	1842.000
2.006	4.12						
	Extra for providing doses by weight of						work in
	FOR SCREEN CH	IANNEL	4	TANK I	-51	FI)
	QTY AS PER ITEM NO.5.37.1	1	15.350	3-11		340.00 0000	5219.000
	Total			T			5219.000
							0 = = > 1000
			e-PLATFO	ORM FOR THE	Fotal Quant	ity in kg	5219.000
2.007	5.9.2	-	e-PLATFO	DRM FOR THE	Fotal Quant	ity in kg	
2.007	Centering and shut	ttering inc	luding strutt	ing, etc. and	removal of f	orm for:W	5219.000 Valls (any
2.007		g attached	luding strutt	ing, etc. and	removal of f	orm for:W	5219.000 Valls (any
2.007	Centering and shut thickness) including	g attached	luding strutt	ing, etc. and	removal of f	orm for:W	5219.000 Valls (any
2.007	Centering and shut thickness) including FOR SCREEN CH	g attached	luding strutt d pilasters, b	ing, etc. and	removal of f	orm for:W	5219.000 Valls (any setc.
2.007	Centering and shut thickness) including FOR SCREEN CH Beams For walls inside	ig attached IANNEL 1	luding strutt d pilasters, b 4.050	ing, etc. and	removal of finth and stri	orm for:W	5219.000 Valls (any setc.
2.007	Centering and shut thickness) including FOR SCREEN CH Beams For walls inside coarse channel For walls outside	ag attached IANNEL 1 4	luding strutt d pilasters, b 4.050 2.500	ing, etc. and	removal of finth and stri	orm for:W	7alls (any setc. 6.075
2.007	Centering and shut thickness) including FOR SCREEN CHE Beams For walls inside coarse channel For walls outside coarse channel For walls outside coarse channel	IANNEL 1 4	luding strutt d pilasters, b 4.050 2.500 2.500	ing, etc. and	removal of finth and stri 1.500 1.500 1.800	orm for:W	5219.000 Valls (any setc. 6.075 15.000 9.000
2.007	Centering and shut thickness) includir FOR SCREEN CH Beams For walls inside coarse channel For walls outside coarse channel For walls outside fine channel For walls inside	ag attached IANNEL 1 4 2	1 luding strutt d pilasters, b 4.050 2.500 2.500 4.000	ing, etc. and	removal of finth and stri 1.500 1.500 1.800	orm for:W	5219.000 Valls (any setc.) 6.075 15.000 9.000 14.400
2.007	Centering and shut thickness) including FOR SCREEN CHE Beams For walls inside coarse channel For walls outside coarse channel For walls outside fine channel For walls inside fine channel	ag attached IANNEL 1 4 2	1 luding strutt d pilasters, b 4.050 2.500 2.500 4.000	ing, etc. and utteresses, pl	removal of finth and stri 1.500 1.500 1.800	Form for: Wing courses	5219.000 Valls (any setc.) 6.075 15.000 9.000 14.400 24.000
2.007	Centering and shut thickness) includir FOR SCREEN CH Beams For walls inside coarse channel For walls outside coarse channel For walls outside fine channel For walls inside fine channel Total	ag attached IANNEL 1 4 2	1 luding strutt d pilasters, b 4.050 2.500 2.500 4.000	ing, etc. and utteresses, pl	removal of finth and stri 1.500 1.500 1.800 1.800 1.500	Form for: Wing courses	5219.000 Valls (any setc.) 6.075 15.000 9.000 14.400 24.000 68.475
	Centering and shut thickness) includir FOR SCREEN CH Beams For walls inside coarse channel For walls outside coarse channel For walls outside fine channel For walls inside fine channel Total	IANNEL 1 4 2 2 4 ttering inc	1 luding strutt d pilasters, b 4.050 2.500 2.500 4.000 4.000	ing, etc. and utteresses, pl	1.500 1.800 1.500 1.500 1.800 1.600 1.700 1.700 1.700 1.700	orm for:W	5219.000 Valls (any setc.) 6.075 15.000 9.000 14.400 24.000 68.475 68.475

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	STP Bottom slab coarse screen channel	1	2.500		3.750		9.375	
	STP Bottom slab fine screen channel	1	4.000		3.750		15.000	
	Bottom slab- course screen channels STP	2	2.500	2.500			0.750	
	Bottom slab-fine screen channels STP	2	4.000		0.150		1.200	
	Total						26.325	
				To	tal Quantit	y in sqm	26.325	
2.009	22.23.1							
	Itunnels				m D L		plant,	
	tunnels / subway and bridg integral crystalline integral crystalline same from negativ shall meet the requ permeability of co DIN 1048 and resi slurry shall be cap shall be carried ou engineerin- charge. The produ- leakage.For vertice	e slurry: 2 e slurry: 1 re (interna nirements ncrete by stant to 10 able of sel t all comp	parts water) for part water han 90% for hydrostalf-healing of collete as per speciance shall car	y mixing in For vertical sor horizonta e help of sy ACI-212-3% compared tic pressure racks up to ecification a	the ratio of 5 surfaces and I surfaces an nthetic fiber BR-2010 i.e to with contro on negative a width of 0. and the direct	5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir l concrete side. The 50mm. T ion of the	rts arts g the ne material ng e as per c crystalline he work	
	/ subway and bridg integral crystalline integral crystalline same from negative shall meet the requested permeability of condition of condition of conditions. In 1048 and resistant shall be capshall be carried out engineerincharge. The production of the condition of the conditi	e slurry: 2 e slurry: 1 e (interna nirements ncrete by stant to 10 able of sel t all comp ct perform al surface	parts water) for part water han 90% for hydrostalf-healing of collete as per speciance shall car	y mixing in For vertical sor horizonta e help of sy ACI-212-3% compared tic pressure racks up to ecification a	the ratio of 5 surfaces and I surfaces an nthetic fiber BR-2010 i.e to with contro on negative a width of 0. and the direct	5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir l concrete side. The 50mm. T ion of the	rts arts g the ne material ng e as per c crystalline he work	
	/ subway and bridg integral crystalline integral crystalline same from negative shall meet the requested permeability of condition of c	e slurry: 2 e slurry: 1 e (interna nirements ncrete by stant to 10 able of sel t all comp ct perform al surface	parts water) for part water han 90% for hydrostalf-healing of collete as per speciance shall car	y mixing in For vertical sor horizonta e help of sy ACI-212-3% compared tic pressure racks up to ecification a	the ratio of 5 surfaces and I surfaces an nthetic fiber BR-2010 i.e to with contro on negative a width of 0. and the direct	5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir l concrete side. The 50mm. T ion of the	rts arts g the ne material ng e as per c crystalline he work e	
	/ subway and bridg integral crystalline integral crystalline same from negative shall meet the requested permeability of condition of the DIN 1048 and resistance of the capsular shall be carried out engineering the production of the capsular of the production of the capsular of the cap	e slurry: 2 e slurry: 1 re (interna nirements ncrete by stant to 10 able of sel t all comp ct performal surface	parts water) for part water water water water for part water wat	y mixing in For vertical sor horizonta e help of sy ACI-212-3% compared tic pressure racks up to ecification a	the ratio of surfaces and I surfaces an other of the BR-2010 i.e by with contro on negative a width of 0 and the direct of the for 10 years of the surface o	5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir l concrete side. The 50mm. T ion of the	rts arts g the ne material ng e as per crystalline he work any	
	/ subway and bridg integral crystalline integral crystalline same from negative shall meet the requipermeability of condition DIN 1048 and resistance of the capshall be carried out engineering the capshall be carried out engineering. The production of the course screen channels STP Inside of wallsfine screen	e slurry: 2 e slurry: 1 re (interna nirements ncrete by stant to 16 able of sel t all comp ct performal surface HANNEL	parts water) for part water was specified in more than 90% to bar hydrostal ferbealing of collete as per specific water wate	y mixing in For vertical sor horizonta e help of syn ACI-212-3% compared tic pressure racks up to ecification a try guarante .70 kg per s	the ratio of surfaces and I surfaces an other of the BR-2010 i.e by with contro on negative a width of 0 and the direct of the for 10 years of the surface o	5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir l concrete side. The 50mm. T ion of the	rts arts g the ne material ng e as per c crystalline he work	
	/ subway and bridg integral crystalline integral crystalline same from negative shall meet the requipermeability of co DIN 1048 and resistance shall be carried out engineerincharge. The product leakage. For verticate FOR SCREEN CHINSING of wallscourse screen channels STP Inside of wallsfine screen channels STP	e slurry: 2 e slurry: 1 re (interna nirements ncrete by stant to 16 able of sel t all comp ct performal surface HANNEL	parts water) for part water was specified in more than 90% to bar hydrostal ferbealing of collete as per specific water wate	y mixing in For vertical sor horizonta e help of syn ACI-212-3% compared tic pressure racks up to ecification a rry guarante .70 kg per s	the ratio of surfaces and I surfaces an other of the BR-2010 i.e by with contro on negative a width of 0 and the direct of the for 10 years of the surface o	5 : 2 (5 pa 3 : 1 (3 pa d applyin brush. The by reducin I concrete side. The 50mm. T ion of the	rts arts g the ne material ng e as per crystalline he work any	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requiremeability of co DIN 1048 and resistalline capshall be carried out engineerincharge. The producted water producted and the producted a	tment to the labs, poding edeck et es slurry: 2 es slurry: 1 es (internativements norete by stant to 1 eable of set all compact performents of the labs of the lab	the RCC structums, reserving c., prepared to parts water) part water) l) side with the as specified more than 906 bar hydrosolf-healing of polete as per speakers.	ctures like re or, sewage & by mixing in for vertical for horizonta he help of sy in ACI-212-70% compared tatic pressure cracks up to pecification a	the ratio of surfaces and surfaces and surfaces and the ratio fiber 3R-2010 i.e. It with control a width of 0 and the directed for 10 years	s of the batreatment 5:2 (5 pa 3:1 (3 p d applyin brush. The by reducir cl concrete side. The 50mm. The	arts g the ne material ng e as per c crystalline the work
	FOR SCREEN CH	IANNEL					
	Bottom slab inside-channels STP	1	2.500	2.550		ET	6.375
		1	4.000	2.550	DK	4.5	10.200
	Total			3-11			16.575
				To	otal Quantit	y in sqm	16.575
	12 mm cement pla cement : 3 fine sar FOR STP		ned with a flo	pating coat of	f neat cement	t of mix:1	:3 (1
	Outside of walls- coarse channel	2	2.500		1.800		9.000
	Inside of walls- coarse channels	2	3.000		2.500		15.000
	Base slab inside- coarse channel	2	2.500	0.900			4.500
	Bottom - coarsechannels	1	2.500	3.750			9.375
	Slab projection- top	2	2.500	0.600			3.000
	Outside of walls - fine channel	2	4.000		1.800		14.400
	Inside of walls- fine screen channel	2	3.000		4.000		24.000
	Base slab inside- fine channels	2	4.000	0.900			7.200
	Bottom-fine channel	1	4.000	3.750			15.000

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
	Slab projection- top	2	4.000	0.600			4.800				
	Total						106.275				
				To	otal Quantit	y in sqm	106.275				
2.012	19.16										
	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS: 10910 on 12 mm dia steeel bar conforming to IS:1786, having minimum cross section as 23 mm x 25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufactures permanent identification mark to be visible even after fixing including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size) Complete as per design										
	FOR SCREEN CH	IANNEL	-	190							
	Coarse screen	4	W.	610			4.000				
	Fine screen	4	UT-L		BR	1 - 1	4.000				
	Total						8.000				
		-		То	tal Quantity	y in each	8.000				
2.013	Filling water with	5000 litre	tankers fited	in lorry and	conveying v	water fron	n a distance				
2.013	Filling water with of 5 km (average) height not less that and other applience	to the resender and cos	ervoir site and ng 5 HP diese	d pumping th I engine pun	ne water into	the reserv	voir of				
2.013	Filling water with of 5 km (average) height not less that and other applience	to the rese n 3 m usin es and cos HANNEL	ervoir site and ag 5 HP diese st of water etc	d pumping the lengine punction complete.	ne water into np set, hire f	the reserv	voir of lorry, tools				
2.013	Filling water with of 5 km (average) height not less that and other applience	to the resen 3 m using es and contact the HANNEL	ervoir site and ag 5 HP diese st of water etc	d pumping the lengine punction complete.	ne water into np set , hire f	the reserv	voir of lorry, tools 3.375				
2.013	Filling water with of 5 km (average) height not less that and other applienc FOR SCREEN CH	to the resen 3 m using es and contact the HANNEL	ervoir site and ag 5 HP diese st of water etc	d pumping the length engine punction complete. 0.900 0.900	ne water into np set , hire f	the reserv	3.375 5.400				
	Filling water with of 5 km (average) height not less that and other applienc FOR SCREEN CH Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. cor	to the resen 3 m using es and constant of the resent of the second of th	ervoir site and g 5 HP diese st of water etc 2.500 4.000 (two or more ecifications in	d pumping the lengine pumping the lengine pumping the lengine pumping the lengine pumping the length of the length	1.500 1.500 2 uantity in I	the reserve for tanker Kilo litre	3.375 5.400 8.775 8.775				
	Filling water with of 5 km (average) height not less that and other applience FOR SCREEN CH Total 13.52.2 Finishing with Epoper manufacturer&	to the resen 3 m using es and constant of the resent of the second of th	ervoir site and g 5 HP diese st of water etc 2.500 4.000 (two or more ecifications in	d pumping the lengine pumping the lengine pumping the lengine pumping the lengine pumping the length of the length	1.500 1.500 2 uantity in I	the reserve for tanker Kilo litre	3.375 5.400 8.775 8.775				
	Filling water with of 5 km (average) height not less that and other applienc FOR SCREEN CH Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. cor FOR SCREEN CH QTY AS PER	to the resen 3 m using es and constanNEL 1 1 0xy paint of the properties of the p	ervoir site and g 5 HP diese st of water etc 2.500 4.000 (two or more ecifications in	d pumping the lengine pumping the lengine pumping the lengine pumping the lengine pumping the length of the length	1.500 1.500 2 uantity in I	Kilo litre epared and aing coat,	3.375 5.400 8.775 8.775 d applied as preparation				
	Filling water with of 5 km (average) height not less that and other applienc FOR SCREEN CH Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. cor FOR SCREEN CH QTY AS PER ITEM NO.5.37.1	to the resen 3 m using es and constanNEL 1 1 0xy paint of the constant of t	ervoir site and g 5 HP diese st of water etc 2.500 4.000 (two or more ecifications in	d pumping the lengine pumping the lengine pumpers of the lengine pumpers of the length	1.500 1.500 2 uantity in I	Kilo litre epared and ling coat, 106.28 0000	3.375 5.400 8.775 d applied as preparation				
2.014	Filling water with of 5 km (average) height not less that and other applienc FOR SCREEN CH Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. cor FOR SCREEN CH QTY AS PER ITEM NO.5.37.1	to the resen 3 m using es and constant of the resent of the sea of	ervoir site and g 5 HP diese st of water etc 2.500 4.000 (two or more ecifications in	d pumping the lengine pumping the lengine pumpers of the lengine pumpers of the length	1.500 1.500 2.500 2.500 2.500 2.500 2.500 2.500	Kilo litre epared and ling coat, 106.28 0000	3.375 5.400 8.775 8.775 d applied as preparation 106.280 106.280				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:-Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately.All wiork upto plinth level FOR OIL AND GREASE TRAP-STP									
	Bottom slab	1	4.200	4.200	0.300		5.292			
	Long wall	2	4.750	0.250	2.500		5.938			
	Short wall	2	4.250	0.250	2.500		5.313			
	Cloumns	4	0.450	0.450	2.000		1.620			
	Beams	4	4.050	0.300	0.600	-	2.916			
	Total			THE TOTAL	- 1	FI	21.079			
	Total Quantity in cum									
3.002	5.34.1 Extra for providing			oor levels. No	ote:- Excess/	less ceme				
3.002	5.34.1 Extra for providing specified cement of grade concrete insi in M-30 is @ 340	content use tead of M kg/cum).	ed is payable -25 grade BN	oor levels. No	ote:- Excess/	less ceme	nt over the M-30			
3.002	5.34.1 Extra for providing specified cement of grade concrete ins in M-30 is @ 340 FOR OIL AND GOTY AS PER	content use tead of M kg/cum).	ed is payable -25 grade BN	oor levels. No	ote:- Excess/	less ceme Providing t content	nt over the M-30 considered			
3.002	5.34.1 Extra for providing specified cement of grade concrete ins in M-30 is @ 340 FOR OIL AND G	content use tead of M kg/cum).	ed is payable -25 grade BN	oor levels. No	ote:- Excess/	less ceme Providing t content	nt over the M-30 considered			
3.002	5.34.1 Extra for providing specified cement of grade concrete ins in M-30 is @ 340 FOR OIL AND GOTY AS PER ITEM NO.5.37.1 QTY AS PER	content use tead of M kg/cum).	ed is payable -25 grade BN	oor levels. No	ote:- Excess/	less ceme Providing t content 21.080 000 3.0240	nt over the M-30 considered 21.080			
3.002	5.34.1 Extra for providing specified cement of grade concrete insin M-30 is @ 340 FOR OIL AND GOTY AS PER ITEM NO.5.37.1 QTY AS PER ITEM NO5.37.2	content use tead of M kg/cum).	ed is payable -25 grade BN	oor levels. No / recoverable MC/RMC. (N	ote:- Excess/	21.080 000 3.0240 00	nt over the M-30 considered 21.080 3.024 24.104			
	5.34.1 Extra for providing specified cement of grade concrete insin M-30 is @ 340 FOR OIL AND GOTY AS PER ITEM NO.5.37.1 QTY AS PER ITEM NO5.37.2	content use tead of M kg/cum). GREASE 7	ed is payable -25 grade BN	oor levels. No / recoverable MC/RMC. (N	ote:- Excess/ e separately.I lote:- Cemen	21.080 000 3.0240 00	nt over the M-30 considered 21.080 3.024 24.104			
	5.34.1 Extra for providing specified cement of grade concrete ins in M-30 is @ 340 FOR OIL AND GOTY AS PER ITEM NO.5.37.1 QTY AS PER ITEM NO5.37.2 Total	content usite ad of M kg/cum). GREASE T 1 1	ed is payable -25 grade BN ΓRAP	oor levels. No / recoverable MC/RMC. (N	ote:- Excess/e separately.Hote:- Cemen	21.080 000 3.0240 00	nt over the M-30 considered 21.080 3.024 24.104			
	5.34.1 Extra for providing specified cement of grade concrete ins in M-30 is @ 340 FOR OIL AND GOTY AS PER ITEM NO.5.37.1 QTY AS PER ITEM NO5.37.2 Total	content usite ad of M kg/cum). SREASE 1 1 1 223 g sulphate	ed is payable -25 grade BM FRAP e resistant cer	oor levels. No / recoverable MC/RMC. (N	ote:- Excess/e separately.Hote:- Cemen	21.080 000 3.0240 00	nt over the M-30 considered 21.080 3.024 24.104			
	5.34.1 Extra for providing specified cement of grade concrete insi in M-30 is @ 340 FOR OIL AND GOOD OF THE STAND OF THE	content usite ad of M kg/cum). SREASE 1 1 1 223 g sulphate	ed is payable -25 grade BM FRAP e resistant cer	oor levels. No / recoverable MC/RMC. (N	ote:- Excess/e separately.Hote:- Cemen	21.080 000 3.0240 00	nt over the M-30 considered 21.080 3.024 24.104			
	5.34.1 Extra for providing specified cement of grade concrete insi in M-30 is @ 340 FOR OIL AND GOTY AS PER ITEM NO.5.37.1 QTY AS PER ITEM NO5.37.2 Total OD54273/2022-20 Extra for providing FOR OIL AND GOTY AS PER	ontent usite ad of M kg/cum). GREASE 1 1 1 223 g sulphate	ed is payable -25 grade BM FRAP e resistant cer	oor levels. No / recoverable MC/RMC. (N	ote:- Excess/e separately.Hote:- Cemen	21.080 000 3.0240 00 y in cum	nt over the M-30 considered 21.080 3.024 24.104 21.080			
	5.34.1 Extra for providing specified cement of grade concrete ins in M-30 is @ 340 FOR OIL AND GOTY AS PERITEM NO.5.37.1 QTY AS PERITEM NO5.37.2 Total OD54273/2022-20 Extra for providing FOR OIL AND GOTY AS PERITEM NO.5.37.1 QUY AS PERITEM NO.5.37.1 Quantity as per	content usite ad of M kg/cum). GREASE 7 1 1 223 g sulphate GREASE 7	ed is payable -25 grade BM FRAP e resistant cer	oor levels. No / recoverable MC/RMC. (N	ote:- Excess/e separately.Hote:- Cemen	21.080 000 3.0240 000 y in cum	nt over the M-30			
	5.34.1 Extra for providing specified cement of grade concrete insi in M-30 is @ 340 FOR OIL AND GOTY AS PERITEM NO.5.37.1 QTY AS PERITEM NO5.37.2 Total OD54273/2022-20 Extra for providing FOR OIL AND GOTY AS PERITEM NO.5.37.1 Quantity as peritem No. 5.37.2	content usite ad of M kg/cum). GREASE 7 1 1 223 g sulphate GREASE 7	ed is payable -25 grade BM FRAP e resistant cer	Toment for the	ote:- Excess/e separately.Hote:- Cemen	21.080 000 3.0240 00 y in cum	nt over the M-30 considered 21.080 3.024 24.104 21.080 3.024			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per design of specified grade for reinforced cement concrete work including pumping R.M.C. from transit mixer to site of laying, excluding the cost of centering, shutte finishing and reinforcement including cost of admixtures in recommended propor as per IS: 9103 to accelerate/ retard setting of concrete, improve workability with impairing strength and durability as per direction of the Engineer - in -charge. No Cement content considered in this item is @330 kg/cum. Excess /less cement use per design mix is payable/recoverable separately. All work above plinth level upto floor V level									
	FOR OIL AND G	REASE T	RAP							
	Top slab -STP	1	4.550	4.550	0.150		3.105			
	Total						3.105			
	DEDUCTION			(3)(3)(3)(3)						
	Manhole	-2	0.600	0.450	0.150		-0.081			
	Total		AT	DATA!	No.	F	-0.081			
			40.9	To	tal Quantity	y in cum	3.024			
3.005	5.22.6			7						
	Steel reinforcemer in position and bin bars of grade Fe-5 FOR OIL AND G	ding all c	omplete upto ore	plinth level	Thermo - Me	echanicall	y Treated			
	QTY AS PER ITEM NO.5.37.1	1		21.080		120.00 0000	2529.600			
	QTY. AS PER ITEM NO.5.37.2	1		3.030		100.00 0000	303.000			
	Total						2832.600			
				Total (Quantity in k	ilogram	2832.600			
3.006	OD54277/2022-20)23								
	Extra for providing	g epoxy c	oating for rei	nforcement l	oar					
	FOR OIL AND G	REASE T	RAP							
	QTY AS PER ITEM NO.5.37.1	1	21.080			120.00 0000	2529.600			
	QTY. AS PER ITEM NO.5.37.2	1	3.030			100.00 0000	303.000			
	Total						2832.600			
				,	Fotal Quant	ity in kg	2832.600			
3.007	4.12				*					
	Extra for providing doses by weight of						work in			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	FOR OIL AND G	REASE 7	TRAP					
	QTY AS PER ITEM NO.5.37.1	1		21.080		340.00 0000	7167.200	
	QTY. AS PER ITEM NO.5.37.2	1		3.030		340.00 0000	1030.200	
	Total						8197.400	
				7	Total Quant	ity in kg	8197.400	
3.008	5.9.2					-		
	Centering and shuttering including strutting, etc. and removal of form for:Wal thickness) including attached pilasters, butteresses, plinth and string courses et							
	FOR OIL AND G	REASE T	RAP					
	For walls outside- STP	4	4.750		2.500		47.500	
	For walls inside- STP	4	4.250	M	2.500		42.500	
	For columns	4	1.800		2.000		14.400	
	Total		454		501	1 1 1	104.400	
				To	tal Quantit	y in sqm	104.400	
3.009	5.9.3	100		$\overline{}$				
	Centering and shut floors, roofs, landi				removal of f	orm for:S	uspended	
	FOR OIL AND G	REASE T	RAP					
	Top slab-STP	2	9.100		0.150		2.730	
	Top slab bottom portion-STP	1	4.550	4.550			20.703	
	Bottom slab	2	10.800		0.150		3.240	
	Bottom portion	1	4.200	4.200			17.640	
	Total						44.313	
				To	tal Quantit	y in sqm	44.313	
3.010	22.23.1							

Cf Sl No No Length Width **Depth** Quantity **Specification** Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & podiums, water treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm FOR OIL AND GREASE TRAP Inside of walls-4.250 2.500 42.500 **STP Total** 42.500 **Total Quantity in sqm** 42.500 3.011 22.23.2 Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Damp; water treatment plant, / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For horizontal surface one coat @1.10 kg per sqm. FOR OIL AND GREASE TRAP Bottom slab 4.250 4.250 18.063 inside -STP Total 18.063 **Total Quantity in sqm** 18.063 3.012 | 13.7.1 12 mm cement plaster finished with a floating coat of neat cement of mix:1:3 (1) cement: 3 fine sand) FOR STP

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Inside of walls	1	17.500		2.500		43.750
	Outside of walls	2	9.500		2.650		50.350
	Base slab inside⊤	2	4.550	4.550			41.405
	Base slab inside ⊥ portion	2	4.200	4.200			35.280
	Columns	4	1.800		2.000		14.400
	Total						185.185
	DEDUCTION						
	Manhole	-2	0.600	0.450			-0.540
	Total						-0.540
				To	otal Quantit	y in sqm	184.645
3.013	19.18.1						
	Supplying and fixi cover (light duty)						ngular C.I
	FOR OIL AND G	REASE T	RAP	AND M	-01	FI	
		2	1.000	Name of the last o	DIE		2.000
	Total			_			2.000
				To	tal Quantity	y in each	2.000
3.014	19.16		e-PLATFO OF PUBLI	RM FOR THE C WORKS	MANAGEMEN	IT	
	Providing orange of as per IS: 10910 or cross section as 23 165 mm with minitop surface by ribb projections on tail stand the bend test manufactures pern fixing in manholes sand: 6 graded stores.	n 12 mm c mm x 25 mum 112 sing or che length on and chem nanent ide with 30x ne aggrega	dia steeel bar mm and ove mm space be equering besi 138 mm as p nical resistand ntification m 20x15 cm ce ate 20 mm no	conforming or all minimulative protrides necessar oer standard oe test as per ark to be vis ment concre	to IS:1786, im length 26, uded legs hary and adequate drawing and respectification ible even aft te block 1:3:	having mid and wing 2 mrate anchorsuitable to and haver fixing if 6 (1 ceme	inimum width as n tread on ring o with ving including ent: 3 coarse
	FOR OIL AND G	REASE T	RAP				
	For STP	7					7.000
	Total						7.000
				To	tal Quantity	in each	7.000
3.015	OD54332/2022-20)23					
	Supply of uPVC P	ipe, IS 49	85:2000,10K	g/cm2,110m	mDiaand f	ïxing	
	FOR OIL AND G	REASE T	RAP			,	
	STP	1	0.450				0.450
	Total						0.450
				Tota	al Quantity	in metre	0.450

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity						
3.016	100.36.1												
	of 5 km (average) height not less that and other applience	Filling water with 5000 litre tankers fited in lorry and conveying water from a distance of 5 km (average) to the reservoir site and pumping the water into the reservoir of height not less than 3 m using 5 HP diesel engine pump set, hire for tanker lorry, tools and other appliences and cost of water etc. complete. FOR OIL AND GREASE TRAP											
	FOR OIL AND G	REASE T	RAP			Ī							
	For STP	1	4.500	4.500	2.500		50.625						
	Total						50.625						
		Total Quantity in Kilo litre											
3.017	13.52.2												
	per manufacturer&	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work											
	FOR OIL AND G	REASE T	RAP										
	QTY AS PER ITEM NO.13.7.1	1	a constant			184.65 0000	184.650						
	Total		414			1 - 1	184.650						
				To	otal Quantit	y in sqm	184.650						
3.018	10.26.3			7									
	Providing and fixidal balcony railing, state approves steel prin	aircase rai	ling and sim	ed <mark>size</mark> by we ilar works, ir	elding etc. to acluding appl	steel ladd lying prim	ler railing, ning coat of						
	50mm DIA GI 5.1	7Kg/m.32	2mm DIA GI	-317 Kg/m									
	1m c/c vertical 50mm dia	36			0.750	5.1700 00	139.590						
	HORIZONTAL .25m c/c 32mm dia	3	36.400			3.1700 00	346.164						
	Total						485.754						
				,	Total Quant	ity in kg	485.754						
3.019	13.48.3												
	Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications:Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture												
	FOR OIL AND G				0.4.50		4.000						
	Vertical pipe	36	0.750		0.160		4.320						
	Horizontal pipe	3	36.400		0.100		10.920						
	Total				. 10		15.240						
				To	otal Quantit	y in sqm	15.240						
1	GRIT SEPERATO)R											

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
4.001	5.37.1									
	Providing and layi cement concrete w manufactured in futransit mixer for aldesign of specified R.M.C. from transfinishing and reinfas per IS: 9103 to impairing strength Cement content coper design mix is per design mix is per second and secon	ork, using ally automall leads, had grade for it mixer to orcement accelerate and dural onsidered.	g cement con natic batching aving continu r reinforced co o site of layir including co / retard settin bility as per c in this item is	tent as per ap g plant and tr g plant and tr g plant and tr g our agitated cement concrete, excluding st of admixtung of concrete direction of the s @330 kg/c	pproved designansported to mixer, manurate work incompared to the cost of course in recompe, improve whe Engineer form. Excess of the example	gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:- ent used as			
	DEDUCTION									
	Manhole	-2	0.600	0.450	0.150		-0.081			
	Total						-0.081			
	FOR GRIT SEPEI	RATOR		100						
	Walls	4	4.500	3.000	0.250		13.500			
	Walls (inclined)	4	3.000	1.580	0.250	FI	4.740			
	Columns(outer)	2	0.450	0.600	1.000		0.540			
	Column(inner)	2	0.450	0.450	1.000		0.405			
	Column(bottom)	4	0.300	0.300	0.500		0.180			
	Beams(outer)	4	3.900	0.300	0.600	IT	2.808			
	Beams(inner)	4	1.200	0.300	0.300		0.432			
	Beams(inclined)	4	2.180	0.300	0.300		0.785			
	Top slab	1	4.950	4.950	0.150		3.675			
	Total						27.065			
				To	tal Quantity	y in cum	26.984			
4.002	5.34.1 Extra for providing specified cement of grade concrete insign M-30 is @ 340	content use tead of M	ed is payable	/ recoverable	e separately.F	Providing	M-30			
	FOR GRIT SEPEI	RATOR								
	QTY AS PER ITEM NO.5.37.1	1				26.990 000	26.990			
	Total						26.990			
				To	tal Quantity	y in cum	26.990			
4.003	OD54408/2022-20)23								
	Extra for providing		resistant cer	ment for the	structures					
	FOR GRIT SEP									
	QTY AS PER ITEM NO.5.37.1	1				26.990 000	26.990			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity					
	Total						26.990					
				To	tal Quantit	y in cum	26.990					
4.004	5.22.6											
	in position and bin	Steel reinforcement for R.C.C work including straightening, cutting, bein position and binding all complete upto plinth levelThermo - Mechanibars of grade Fe-500D or more FOR GRIT SEPERATOR										
	FOR GRIT SEPERATOR											
	QTY AS PER ITEM NO.5.37.1	1	26.990			120.00 0000	3238.800					
	Total						3238.800					
				Total Q	Quantity in k	kilogram	3238.800					
4.005	OD71095/2022-20)23										
	Extra for providing	g epoxy c	oating for rei	nforcement b	oar							
	FOR GRIT SEPE	RATOR		An.								
	Qty as per item 5.37.1	1	26.984	041		120.00 0000	3238.080					
	Total		~0.93	Milko.	DK	4.	3238.080					
				3-16	<mark>Fotal Quant</mark>	ity in kg	3238.080					
4.006	4.12											
	Extra for providing doses by weight of	g and mix cement a	ing water pro as per manufa	oofing materi acturer'	ial in cement s specification	concrete on .	work in					
	FOR GRIT SEPE	RATOR										
	QTY AS PER ITEM NO.5.37.1	1		26.990		340.00 0000	9176.600					
	Total						9176.600					
				r	Fotal Quant	ity in kg	9176.600					
4.007	5.9.2											
	Centering and shut thickness) including	ttering inc ng attache	cluding strutt d pilasters, b	ing, etc. and utteresses, pl	removal of f inth and stri	orm for:W	Valls (any s etc.					
	FOR GRIT SEPEI	RATOR				г т						
	For walls outside- grit seperator	4	4.500		3.000		54.000					
	Wall(inclined)	4	3.000		1.580		18.960					
	For walls inside- grit seperator	4	4.250		3.000		51.000					
	Wall(inclined)	4	2.750		1.580		17.380					
	Total						141.340					
				To	otal Quantit	y in sqm	141.340					
4.008	5.9.3											

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
	Centering and shuttering including strutting, etc. and removal of form for:Suspended floors, roofs, landings, balconies and access platform										
	FOR GRIT SEPE	RATOR									
	Top slab -grit seperator	0.150			2.970						
	Total						2.970				
				To	tal Quantity	y in sqm	2.970				
009	22.23.1										
	tunnels / subway and bridg integral crystalline integral crystalline same from negativ shall meet the requ permeability of co DIN 1048 and resi slurry shall be caps shall be carried ou engineerin- charge. The product leakage.For vertica	slurry: 2 slurry: 1 e (interna prements ncrete by stant to 10 able of se t all comp ct perform al surface	parts water) part water) fl) side with tl as specified i more than 905 bar hydrostaf-healing of clete as per spance shall ca	for vertical solutions for horizontal solution	surfaces and l surfaces and nthetic fiber BR-2010 i.e bl with contro on negative a width of 0. and the direct the for 10 years	3:1(3 pad applying brush. The py reducing l concrete side. The 50mm. The ion of the	arts g the e material g as per crystalline he work				
	FOR GRIT SEPER	RATOR									
	Inside of walls- grit seperator	2	8.500		3.000		51.000				
	Inside of inclined walls-grit seperator	4	3.000		1.580		18.960				
	Total						69.960				
				To	tal Quantity	y in sqm	69.960				
010	22.23.2		· · ·								

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requiremeability of co DIN 1048 and resistancy shall be carried out engineerincharge. The production of	timent to the labs, poding ge deck et en slurry: 2 en slurry: 1 en slurry: 1 en slurry in the (internative ments increte by entant to 1 en able of set all compact performations).	the RCC structums, reservice., prepared let parts water) to part water) to side with the as specified more than 906 bar hydrost lf-healing of polete as per specifications.	ctures like report, sewage & by mixing in for vertical after help of syin ACI-212-30% compared attic pressure cracks up to pecification after guarante	the ratio of surfaces and surfaces and surfaces and thetic fiber 3R-2010 i.e. It with control on negative a width of 0 and the directed for 10 years	s of the batreatment 5:2 (5 pa 3:1 (3 p d applyin brush. The by reducir of concrete side. The .50mm. T	arts g the ne material ng e as per c crystalline the work
	FOR GRIT SEPER		ee one cour v	e 1.10 kg per	. sqiii.		
	Bottom slab inside -grit box	1	4.500	4.500			20.250
	Total				501	IF B	20.250
				To	otal Quantit	y in sqm	20.250
4.011	13.7.1 12 mm cement pla cement : 3 fine sar FOR GRIT SEPEI	nd)	ned with a flo	pating coat of	neat cement	t of mix:1	:3 (1
	For walls outsidegrit seperator	4	4.500		3.000		54.000
	Wall(inclined)	4	3.000		1.580		18.960
	For walls inside - grit seperator	4	4.250		3.000		51.000
	Wall(inclined)	4	2.750		1.580		17.380
	Base slab inside- grit seperator	1	4.250	4.250			18.063
	Top slabbottom- grit box	1	4.250	4.250			18.063
	Top slab top -grit box	1	4.950	4.950			24.503
	Total						201.969
	DEDUCTION						
	Manhole	-2	0.600	0.450			-0.540
	Total						-0.540
				To	otal Quantit	y in sqm	201.429
4.012	19.18.1						

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Supplying and fixi cover (light duty)	ng C.I w	ith out frame ht of the cov	for manhole er to be no le	es:455 x 610 ess than 23 kg	mm recta	ngular C.I			
	FOR GRIT SEPE	RATOR								
	STP	2					2.000			
	Total						2.000			
	Total Quantity in each									
4.013	OD54500/2022-20)23								
	Supply of uPVC Pipe, IS 4985:2000,10Kg/cm2,110mmDiaand fixing									
	FOR GRIT SEPE	RATOR								
	STP	1	0.450				0.450			
	Total						0.450			
				Tot	al Quantity	in metre	0.450			
4.014	19.16									
	projections on tail stand the bend test manufactures pern fixing in manholes sand: 6 graded stor FOR GRIT SEPER	and chennanent ide with 30xne aggreg	nical resistan Intification m 20x15 cm ce	ce test as per nark to be vis ement concre	specification lible even aft te block 1:3:	ns and ha er fixing i 6 (1ceme	ving including ent: 3 coarse			
	For STP	9					9.000			
	Total						9.000			
				To	tal Quantity	y in each	9.000			
4.015	Filling water with of 5 km (average) height not less that and other applience	to the resence of the total to	ervoir site an ng 5 HP diese	d pumping the el engine pur	ne water into	the reserv	voir of			
	FOR GRIT SEPE	RATOR	1							
	For STP-top portion	1	4.250	4.250	2.500		45.156			
	Hopper portion	1	8.896		0.500		4.448			
	Total						49.604			
				Total (Quantity in 1	Kilo litre	49.604			
4.016	13.52.2									
	Finishing with Epoper manufacturer& of surface, etc. cor	:#39;s spe	ecifications in	ncluding app						

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
	FOR GRIT SEPE	RATOR									
	QTY AS PER ITEM NO.13.7.1	1	201.450				201.450				
	Total						201.450				
				To	otal Quantit	y in sqm	201.450				
5	EQUALISATION	TANK									
5.001	2.6.1										
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil										
	Shape of Tank 1(1	Put 1 for r	ectangular ar	nd 2 for circu	ılar)	Г					
	Equalisation Tank	1	21.400	21.400	1.500		686.940				
	Total			M		-	686.940				
			M	OA LITO	otal Quantit	y in cum	686.940				
5.002	OD54720/2022-20)23	400	Spiller.	MRA	AF	-				
	over areas (exceed plan)including dis ,disposed earth to 3m	posal of e	xcavated ear	th ,lead up to	50m and lif	t up to 1.5	m lift 1.5to				
	Equalisation Tank										
	Equalisation Tank	1	21.400	21.400	1.500		686.940				
	Total						686.940				
				To	otal Quantit	y in cum	686.940				
5.003	OD54726/2022-20)23									
	Earth work in exca over areas (exceed including disposal earth to be levelled	ing 30 cm of excava	n in depth, 1.a ated earth, lea	5 m in width ad up to 50 n	as well as 10 and lift up	0 sqm on j to 1.5 m, o	plan) disposed				
	Equalisation Tank			1							
	Equalisation Tank	1	21.400	21.400	1.500		686.940				
	Total						686.940				
				To	otal Quantit	y in cum	686.940				
5.004	OD54733/2022-20										
	Earth work in exca over areas (exceed including disposal earth to be levelled	ing 30 cm of excava	n in depth, 1.a ated earth, lea	5 m in width ad up to 50 n	as well as 10 and lift up	0 sqm on to 1.5 m, o	plan) disposed				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Equalisation Tan	k								
	Equalisation Tank	1	21.400	21.400	1.050		480.858			
	Total						480.858			
				To	tal Quantity	y in cum	480.858			
5.005	4.1.6					L.				
	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level:1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 40 mm nominal size)									
	Eualisation Tank									
	Equalisation Tank	1	21.400	21.400	0.150		68.694			
	Total						68.694			
				To	tal Quantity	y in cum	68.694			
5.006	5.37.1		18	180		-	1			
	manufactured in fu	ılly auton	iatic batching	piant and th	ansported to	SHE OF WO	ork in			
	manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is per design mix is pe	Il leads, had grade for it mixer to forcement accelerate and dural onsidered	aving continuer reinforced continuer of laying including contract retard setting bility as per continuer in this item is	ous agitated ement concreg, excluding st of admixture of concretification of the @330 kg/c	mixer, manuete work included the cost of cures in recome, improve whe Engineer - um. Excess /	Ifactured a luding pure entering, amended provided in -chargary less ceme	as per mix mping of shuttering proportions y without ge. Note:- ent used as			
	transit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to a impairing strength	Il leads, had grade for it mixer to orcement accelerate and dural onsidered bayable/re	aving continuer reinforced continuer of laying including contract retard setting bility as per continuer in this item is	ous agitated ement concreg, excluding st of admixture of concretification of the @330 kg/c	mixer, manuete work included the cost of cures in recome, improve whe Engineer - um. Excess /	Ifactured a luding pure entering, amended provided in -chargary less ceme	as per mix mping of shuttering proportions y without ge. Note:- ent used as			
	transit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is p	Il leads, had grade for it mixer to orcement accelerate and dural onsidered bayable/re	aving continuer reinforced continuer of laying including contract retard setting bility as per continuer in this item is	ous agitated ement concreg, excluding st of admixture of concretification of the @330 kg/c	mixer, manuete work included the cost of cures in recome, improve whe Engineer - um. Excess /	Ifactured a luding pure entering, amended provided in -chargary less ceme	as per mix mping of shuttering proportions y without ge. Note:- ent used as			
	transit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per Legualisation Tank	I leads, had grade for it mixer to corcement accelerate and dural onsidered bayable/reaccelerate	aving continuer reinforced continuer reinforced continuer continue	ement concrege, excluding st of admixture of concretification of the contraction of the c	mixer, manuete work include the cost of cures in recome, improve whe Engineer - um. Excess / wiork upto pl	Ifactured a luding pure entering, amended provided in -chargary less ceme	as per mix mping of shuttering proportions y without ge. Note:- ent used as			
	transit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per Legualisation Tank	I leads, had grade for it mixer to orcement accelerate and dural onsidered bayable/reas	aving continuer reinforced continuer reinforced continuer continue	ous agitated ement concreg, excluding st of admixture of concrete direction of the contraction of the contra	mixer, manuete work include the cost of courses in recome, improve whe Engineer um. Excess / wiork upto pl	Ifactured a luding pure entering, amended provided in -chargary less ceme	as per mix mping of shuttering proportions y without ge. Note:- ent used as 1			
	transit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is proper design mix is properties. Equalisation Tank Inverted beam	Il leads, had grade for it mixer to corcement accelerate and dural onsidered bayable/rest	aving continuer reinforced continuer reinforced continuer continue	ous agitated ement concreg, excluding st of admixtured of concrete lirection of the ement of the	mixer, manuete work include the cost of courses in recome, improve whe Engineer um. Excess / wiork upto plants of the cost of	Ifactured a luding pure entering, amended provided in -chargary less ceme	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638			
	transit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to simpairing strength Cement content coper design mix is per Legualisation Tank Inverted beam Bottom slab cum raft	Il leads, had grade for it mixer to corcement accelerate and dural onsidered bayable/rest	aving continuer reinforced con	ous agitated ement concreg, excluding st of admixture of concrete lirection of the ement concrete of a 230 kg/c contract of a 21.200	mixer, manuete work include the cost of cures in recome, improve whe Engineer - um. Excess / wiork upto plants of the cost of	Ifactured a luding pure entering, amended provided in -chargary less ceme	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638 202.248 5.832			
	transit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is proper design mix is pro	Il leads, had grade for it mixer to corcement accelerate and dural onsidered bayable/rest	aving continuer reinforced con	ous agitated ement concreg, excluding st of admixture of concrete direction of the ement concrete of the ement	mixer, manuete work include the cost of cures in recome, improve whe Engineer - um. Excess / wiork upto plants of the cost of	Ifactured a luding pure entering, amended pure vorkabilities of the control of th	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638 202.248 5.832 233.028			
5.007	transit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is proper design mix is pro	Il leads, had grade for it mixer to forcement accelerate and dural onsidered bayable/rest	aving continuer reinforced con	ous agitated ement concreg, excluding st of admixture of concrete direction of the ement concrete of the ement	mixer, manuete work include the cost of courses in recome, improve whe Engineer - um. Excess / wiork upto plants of the cost of the cost of courses in recome and the cost of	Ifactured a luding pure entering, amended pure vorkabilities of the control of th	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638			
5.007	transit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to simpairing strength Cement content coper design mix is per Legualisation Tank Inverted beam Bottom slab cum raft Haunge Total	Il leads, had grade for it mixer to forcement accelerate and dural onsidered bayable/rest	aving continual reinforced continual reinforced continual reinforced continual reinforced continual reinforced retard setting bility as per continual reinforced rein	ous agitated ement concreg, excluding st of admixtured of concrete direction of the emant of the	mixer, manuete work include the cost of courses in recome, improve whe Engineer um. Excess / wiork upto plant of the cost of t	Ifactured a luding pure entering, amended pure vorkabilities of the control of th	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638 202.248 5.832 233.028			
5.007	transit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is proper design mix is pro	Il leads, had grade for it mixer to forcement accelerate and dural onsidered bayable/rest. 5 4 1 8 023 g sulphate	aving continual reinforced continual reinforced continual reinforced continual reinforced continual reinforced retard setting bility as per continual reinforced rein	ous agitated ement concreg, excluding st of admixtured of concrete direction of the emant of the	mixer, manuete work include the cost of courses in recome, improve whe Engineer um. Excess / wiork upto plant of the cost of t	Ifactured a luding pure entering, amended pure vorkabilities of the control of th	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638 202.248 5.832 233.028			
5.007	transit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is proper design mix is pr	Il leads, had grade for it mixer to forcement accelerate and dural onsidered bayable/rest. 5 4 1 8 023 g sulphate	aving continual reinforced continual reinforced continual reinforced continual reinforced continual reinforced retard setting bility as per continual reinforced rein	ous agitated ement concreg, excluding st of admixtured of concrete direction of the emant of the	mixer, manuete work include the cost of courses in recome, improve whe Engineer um. Excess / wiork upto plant of the cost of t	Ifactured a luding pure entering, amended pure vorkabilities of the control of th	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638 202.248 5.832 233.028			
5.007	transit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to a impairing strength Cement content coper design mix is proper design mix is pr	l leads, had grade for it mixer to forcement accelerate and dural onsidered bayable/rest. 5 4 1 8 023 g sulphate	aving continuer reinforced continuer reinforced continuer reinforced continuer reinforced continuer reinforced continuer reinforced retard setting bility as per continuer in this item is excoverable set at 12.200 and 19.700 and 19.	ous agitated ement concreg, excluding st of admixtured of concrete direction of the emant of the	mixer, manuete work include the cost of courses in recome, improve whe Engineer um. Excess / wiork upto plant of the cost of t	Ifactured a luding pure entering, amended pure vorkabilities of the control of th	as per mix mping of shuttering proportions y without ge. Note:-ent used as 1 14.310 10.638 202.248 5.832 233.028 233.028			

_ ~	Specification	No	Length	Width	Depth	Cf	Quantity				
5.008	5.34.1										
	Extra for providing richer mixes at all floor levels. Note:- Excess/less cement over the specified cement content used is payable/ recoverable separately. Providing M-30 grade concrete instead of M-25 grade BMC/RMC. (Note:- Cement content considered in M-30 is @ 340 kg/cum).										
	Equalisation Tank	ζ.									
	Quantity as per item code no 5.37.1&5.37.2ed beam	1	463.720				463.720				
	Total										
				To	tal Quantit	y in cum	463.720				
5.009	5.37.2					· ·					
	transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:-Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All work above plinth level upto floor V level										
	per design mix is per floor V level	payable/re	coverable se	parately.All	work above _l	plinth leve	ent used as				
			coverable se	parately.All	work above p	plinth leve	ent used as				
	floor V level		coverable se 0.450	parately.All	work above j	plinth leve	ent used as el upto				
	floor V level Equalisation Tank		coverable se	parately.All	work above j	plinth leve	ent used as el upto 23.328				
	floor V level Equalisation Tank Outer Columns	16 9 3	0.450 0.450 16.650	0.600 0.450 0.300	5.400 5.400 0.650	plinth leve	23.328 9.842 9.740				
	floor V level Equalisation Tank Outer Columns Inner Columns	16 9 3 12	0.450 0.450	0.600 0.450 0.300	5.400 5.400	plinth leve	23.328 9.842 9.740 9.477				
	floor V level Equalisation Tank Outer Columns Inner Columns	16 9 3 12 2	0.450 0.450 16.650 4.050 16.650	0.600 0.450 0.300 0.300 0.300	5.400 5.400 0.650 0.900	plinth leve	23.328 9.842 9.740 9.477 8.991				
	floor V level Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side	16 9 3 12 2 8	0.450 0.450 16.650 4.050 16.650 4.050	0.600 0.450 0.300 0.300 0.300 0.300	5.400 5.400 0.650 0.650 0.900	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748				
	floor V level Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side Long Wall	16 9 3 12 2 8 2	0.450 0.450 16.650 4.050 16.650 16.650	0.600 0.450 0.300 0.300 0.300 0.300 0.300	5.400 5.400 0.650 0.650 0.900 4.500	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748 44.955				
	floor V level Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side Long Wall Short Wall	16 9 3 12 2 8 2	0.450 0.450 16.650 4.050 16.650 16.650 16.650	0.600 0.450 0.300 0.300 0.300 0.300 0.300 0.300	5.400 5.400 0.650 0.900 0.900 4.500 4.500	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748 44.955 44.955				
	floor V level Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side Long Wall	16 9 3 12 2 8 2 2	0.450 0.450 16.650 4.050 16.650 16.650 19.800	0.600 0.450 0.300 0.300 0.300 0.300 0.300 0.300 9.450	5.400 5.400 0.650 0.650 0.900 4.500 4.500 0.200	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748 44.955 44.955 37.422				
	floor V level Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side Long Wall Short Wall	16 9 3 12 2 8 2 2 1 4	0.450 0.450 16.650 4.050 16.650 16.650 16.650 19.800 5.550	0.600 0.450 0.300 0.300 0.300 0.300 0.300 0.300 9.450 5.550	5.400 5.400 0.650 0.650 0.900 4.500 4.500 0.200 0.150	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748 44.955 44.955 37.422 18.482				
	Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side Long Wall Short Wall Cover slab	16 9 3 12 2 8 2 2 1 4	0.450 0.450 16.650 4.050 16.650 16.650 16.650 19.800 5.550 5.550	0.600 0.450 0.300 0.300 0.300 0.300 0.300 0.300 9.450 5.550 4.950	5.400 5.400 0.650 0.650 0.900 4.500 4.500 0.200 0.150	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748 44.955 44.955 37.422 18.482 16.484				
	Floor V level Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side Long Wall Short Wall Cover slab M H Grating	16 9 3 12 2 8 2 2 1 4	0.450 0.450 16.650 4.050 16.650 16.650 16.650 19.800 5.550	0.600 0.450 0.300 0.300 0.300 0.300 0.300 0.300 9.450 5.550	5.400 5.400 0.650 0.650 0.900 4.500 4.500 0.200 0.150	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748 44.955 44.955 37.422 18.482 16.484 -1.728				
	Equalisation Tank Outer Columns Inner Columns Beams (inside) Out side Long Wall Short Wall Cover slab	16 9 3 12 2 8 2 2 1 4	0.450 0.450 16.650 4.050 16.650 16.650 16.650 19.800 5.550 5.550	0.600 0.450 0.300 0.300 0.300 0.300 0.300 9.450 5.550 4.950 1.200	5.400 5.400 0.650 0.650 0.900 4.500 4.500 0.200 0.150	plinth leve	23.328 9.842 9.740 9.477 8.991 8.748 44.955 44.955 37.422 18.482 16.484				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
	Steel reinforcement in position and bin bars of grade Fe-50	ding all c	omplete upto								
	Equalisation Tank										
	QTY AS PER ITEM NO.5.37.1	1	233.028	120.000			27963.36 0				
	QTY AS PER ITEM NO.5.37.2	1	230.696	120.000			27683.52 0				
	Total										
	Total Quantity in kilogran										
5.011	OD56162/2022-20)23									
	Extra for providing	Extra for providing epoxy coating for reinforcement bar									
	Equalisation Tank			M							
	QTY as per item Code 5.22.6	1	55646.88 0	047		FT	55646.88 0				
	Total	55646.									
					Fotal Quant	ity in kg	55646.88 0				
5.012	4.12		OF PUBL	C WORKS	MANAGEMEN						
	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer's specification.										
	Equalisation Tank										
	QTY as per code no.5.37.1&5.37.2	1	463.720			340.00 0000	157664.8 00				
	Total						157664.8 00				
	Total Quantity in kg										
5.013	5.9.1					•					
	Centering and shut footings, bases of	ttering inc	cluding strutti etc for mass	ing, etc. and concrete	removal of f	orm for:F	oundations,				
	Equalisation Tank										
	Bottom Slab	2	42.400		0.450		38.160				
	Beam side	5	21.200		1.200		127.200				
		4	19.700		1.200		94.560				
	Total						259.920				
				To	otal Quantit	y in sqm	259.920				
5.014	5.9.2										

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	Centering and shut thickness) including	ttering inc	luding strutti d pilasters, bu	ng, etc. and a	removal of finth and stri	orm for:V	Valls (any s etc.		
	Equalisation Tank								
	Outer Columns	16	1.500		5.400		129.600		
	Inner Columns	9	1.800		5.400		87.480		
	Beams (Inside)	3	16.650	1.600			79.920		
	Inside	12	4.050	1.600			77.760		
	Beam(Outer)	2	16.650	2.100			69.930		
	Outer	8	4.050	2.100			68.040		
	For Walls Out side	2	33.300		4.500		299.700		
	For Walls inside	2	32.700		4.500		294.300		
	Total						1106.730		
				To	tal Quantit	y in sqm	1106.730		
5.015	5.9.3		a s			STATE OF THE PARTY.			
	Centering and shuttering including strutting, etc. and removal of form for:Suspended floors, roofs, landings, balconies and access platform								
	Equalisation Tank			<u> </u>					
	Bottom Portion top slab	1	19.800	9.450	MANAGEMEN	II t	187.110		
	•	4	5.550	5.550		2 V*	123.210		
		4	5.550	4.950			109.890		
	Total						420.210		
				To	tal Quantit	y in sqm	420.210		
5.016	22.23.1 Providing and app	lvina inta	amal amyatallin		-				
	waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requiremental permeability of condition DIN 1048 and resistance shall be carried out engineerincharge. The product leakage. For vertical	tment to the labs, podicing edeck etc. slurry: 2 slurry: 1 e (internal irements ancrete by stant to 16 able of selt all comport perform	he RCC structums, reservice, prepared be parts water) part water) for side with the part water is specified in more than 90 bear hydrostaf-healing of collete as per specification.	etures like report, sewage & or, sewage & or, sewage & or, sewage or, sewage or, sewage in for vertical sor horizontane help of syn ACI-212-30% compared atic pressure cracks up to secification and arry guarante	taining walls amp; water to the ratio of surfaces and I surfaces an othetic fiber BR-2010 i.e. to with control on negative a width of 0 and the direct of the for 10 years	s of the battreatment 5:2 (5 pa 3:1 (3 p d applyin brush. The by reducir cl concrete side. The 50mm. The	arts arts g the ne material ng e as per c crystalline the work		
	Equalisation Tank	Г	1	I					
	Inside Walls	2	36.000		4.500		324.000		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Total						324.000			
				To	otal Quantit	y in sqm	324.000			
5.017	22.23.2									
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the bas water tanks, roof slabs, podiums, reservior, sewage & Damp; water treatment punnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 par integral crystalline slurry : 2 parts water) for vertical surfaces and 3 : 1 (3 par integral crystalline slurry : 1 part water) for horizontal surfaces and applying same from negative (internal) side with the help of synthetic fiber brush. The shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against a									
	leakage.For horizo		ce one coat (@1.10 kg per	sqm.	FT	_ ر			
	Equalisation Tank			September 1	DK					
	Bottom slab inside	1	18.000	18.000			324.000			
	Total 3									
			OF PUBL	C WORKS TO	otal Quantit	y in sqm	324.000			
5.018	13.7.1									
		12 mm cement plaster finished with a floating coat of neat cement of mix:1:3 (1 cement: 3 fine sand)								
	Equalisation Tank					Г				
	Out side Walls	2	37.200		5.400		401.760			
	In side of Walls	2	36.000		5.400		388.800			
	Base slab InsideIn side of Walls	1	18.000	18.000			324.000			
	Top slab	1	19.800	9.300			184.140			
		8	5.550	5.550			246.420			
	Outer Column	16	1.500		5.400		129.600			
	Inner Columns	9	1.800		5.400		87.480			
	Beams	3	16.650	1.600			79.920			
		12	4.050	1.600			77.760			
		2	16.650	2.100			69.930			
		8	4.050	2.100			68.040			
	MH Grating	-8	1.200	1.200			-11.520			
	Total						2046.330			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
				To	otal Quantit	y in sqm	2046.330
5.019	2.25						
	Filling available expoundation etc. in layer by ramming	layers not	exceeding 20	cm in dept	h, consolidat	ing each o	of leposited
	Equalisation Tank						
	QTY as per item No 1	1	2541.680				2541.680
	Deduction for PCC	-1	68.690				-68.690
	Bottom Slab and Beams	-1	233.028				-233.028
	Tank	-1	18.600	18.600	3.550		1228.158
	Total			00			1011.804
			00	To	otal Quantit	y in cum	1011.804
5.020	19.16		41		501	FI	١
	165 mm with mini top surface by ribb projections on tail stand the bend test manufactures pern fixing in manholes sand: 6 graded stores.	oing or che length on and chem nanent ide with 30x	equering besi 138 mm as paical resistand ntification m 20x15 cm ce	des necessar per standard ce test as per ark to be vis ment concre	y and adequate drawing and specification in the specification in the specific at the specific and the specif	ate anchor suitable t ns and haver er fixing i 6 (1ceme	ring o with ving ncluding nt: 3 coarse
	Equalisation Tank					<u> </u>	
		14					14.000
	Total		<u>'</u>				14.000
				To	tal Quantity	y in each	14.000
5.021	100.36.1						
	Filling water with of 5 km (average) height not less that and other applience	to the rese n 3 m usir	ervoir site and 1g 5 HP diese	d pumping the l engine pur	ne water into	the reserv	voir of
	Equalisation Tank						
	For STP	1	17.700	17.700	4.500		1409.805
	Total						1409.805
				Total (Quantity in I	Kilo litre	1409.805
5.022	10.26.3						<u></u>

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	Providing and fixing balcony railing, standard approves steel principle.	aircase rai	ling and simi						
	50mm dia GI 5.17	KG/M ,32	mm dis GI3.	17kg/m		-			
	1m c/c vertical 50mm dia	76			0.750	5.1700 00	294.690		
	Horizontal.25mc/ c-32mmdia	3	75.600			3.1700 00	718.956		
	50mm dia GI @.075mc/c	8	4.800			5.1700 00	198.528		
		112	1.200			5.1700 00	694.848		
	Total						1907.022		
				,	Fotal Quant	ity in kg	1907.022		
5.023	13.48.3			0.0	•				
	Surface Paint to gi an under coat of pr Equalisation Tank	rimer appl	ied @ 0.80 lt	r/10 sqm of	approved bra	and and m	anufacture		
	<u> </u>		0.750	\prec	0.157		0.040		
	Vertical Pipe	76	0.750 75.600	RM FOR THE	0.157 0.100	T	8.949 22.680		
	Horizontal Pipe	8	4.800	WORKS	0.160	579	6.144		
	Grating	112	1.200		0.160		21.504		
	Total	112	1.200		0.100		59.277		
	Total			Т	-4-1 O4:4-				
	12.52.2			10	otal Quantity	y in sqm ₁	59.277		
5 001	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work								
5.024	Finishing with Epoper manufacturer&	z#39;s spe	cifications in	cluding app			l applied as		
5.024	Finishing with Epoper manufacturer&	z#39;s spe nplete.On	cifications in	cluding app			l applied as		
5.024	Finishing with Epoper manufacturer& of surface, etc. cor	z#39;s spe nplete.On	cifications in	cluding app			l applied as preparation		
5.024	Finishing with Epoper manufacturer& of surface, etc. cor Equalisation Tank QTY as per item	z#39;s spe nplete.On	cifications in concrete wor	cluding app			l applied as preparation 2057.850		
5.024	Finishing with Epoper manufacturer& of surface, etc. cor Equalisation Tank QTY as per item code no.13.7.1 Deduct area	z#39;s spe mplete.On	2057.850	cluding app	ropriate prim		applied as preparation 2057.850 -145.080		
5.024	Finishing with Epoper manufacturer& of surface, etc. cor Equalisation Tank QTY as per item code no.13.7.1 Deduct area below earth	z#39;s spe mplete.On	2057.850	cluding app	ropriate prim	ing coat,	l applied as		
	Finishing with Epoper manufacturer& of surface, etc. cor Equalisation Tank QTY as per item code no.13.7.1 Deduct area below earth	z#39;s spe mplete.On 1	2057.850 37.200	cluding app	3.900	ing coat,	2057.850 -145.080		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Earth work in exca over areas (exceed including disposal earth to be levelled	ling 30 cm of excava	n in depth, 1 ated earth, lea	5 m in width ad up to 50 n	as well as 10 and lift up t	sqm on	plan)			
	FOR DILUTION	TANK-R	ECTANGUI	LAR						
		2	6.400	5.400	1.500		103.680			
	Total						103.680			
	Total Quantity in cum 103.680									
6.002	OD55372/2022-20)23								
	Earth work in exca over areas (exceed plan)including dis ,disposed earth to 3m	ling 30cm posal of e be levelle	in depth,1.5 xcavated eard d and neatly	m in width a th ,lead up to dressed .All	swell as 10 s 50m and lif	qm on t up to 1.5	5 m			
	FOR DILUTION	TANK-R	ECTANGUI	LAR						
		2	6.400	5.400	1.650		114.048			
	Total		111		-01	FI	114.048			
				To	otal Quantit	y in cum	114.048			
	of centering and sl sand : 6 graded sto FOR DILUTION	ne aggreg TANK-R	gate 40 mm n	nominal size) LAR		tement.				
		2	6.400	5.400	0.150		10.368			
	Total						10.368			
				To	otal Quantit	y in cum	10.368			
6.004	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:-Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately.All wiork upto plinth level									
	per design mix is p	oayable/re	coverable se	parately.All						
	per design mix is p FOR DILUTION	oayable/re TANK-F	coverable se	parately.All LAR	wiork upto p		1			
	per design mix is p	payable/re TANK-F	coverable se RECTANGU 6.400	parately.All LAR 0.350	wiork upto p 0.350		3.136			
	per design mix is p FOR DILUTION	oayable/re TANK-F	coverable se	parately.All LAR	wiork upto p		1			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	Long wall	4	5.500	0.250	3.000		16.500		
	Shortwall	4	4.000	0.250	3.000		12.000		
	Total						65.043		
				To	tal Quantity	y in cum	65.043		
6.005	5.37.2								
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per manufactur								
	FOR DILUTION	TANK-R	ECTANGUI	AR		ET	1		
	Top slab	2	5.500	4.500	0.150	AF	7.425		
	Walkway	4	11.200	0.600	0.100		2.688		
	Total	100					10.113		
	DEDUCTION		e-PLATFO	ORM FOR THE	MANAGEMEN	/T			
	Manhole	-4	0.600	0.450	0.150	2.65	-0.162		
	Total						-0.162		
				To	tal Quantity	y in cum	9.951		
6.006	5.34.1								
	Extra for providing specified cement c grade concrete inst in M-30 is @ 340	ontent use tead of M	ed is payable	/ recoverable	separately.F	Providing	M-30		
	FOR DILUTION	TANK-I	RECTANGU	LAR		· · · · · · · · · · · · · · · · · · ·			
	QTY AS PER ITEM NO.5.37.1	1	65.043				65.043		
	QTY AS PER ITEM NO.5.37.2	1	9.951				9.951		
	Total						74.994		
				To	tal Quantity	y in cum	74.994		
6.007	OD55377/2022-20)23							
	Extra for providing	g sulphate	resistant cer	ment for the	structures				
	FOR DILUTION	TANK-F	RECTANGU	LAR	1				
	QTY AS PER ITEM NO.5.37.1	1	65.043				65.043		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
	QTY AS PER ITEM NO.5.37.2	1	9.951				9.951				
	Total						74.994				
				Te	otal Quantit	y in cum	74.994				
6.008	5.22.6										
	Steel reinforcement for R.C.C work including straightening, cutting, bending, placing in position and binding all complete upto plinth levelThermo - Mechanically Treated bars of grade Fe-500D or more FOR DILUTION TANK-RECTANGULAR										
	QTY AS PER	N IANK-	RECTANGU	LAK		120.00					
	ITEM NO.5.37.1	1	65.043			0000	7805.160				
	QTY AS PER ITEM NO.5.37.2	1	9.951			120.00 0000	1194.120				
	Total		8999.280								
				Total (Quantity in l	kilogram	8999.280				
6.009	OD55381/2022-20)23		(OAL)		ET	\				
	Extra for providing epoxy coating for reinforcement bar										
	FOR DILUTION	I TANK-	RECTANGU	ILAR							
	QTY AS PER ITEM NO.5.37.1	1	65.043			120.00 0000	7805.160				
	QTY AS PER ITEM NO.5.37.2	1	9.951	C WORKS	MANAGEMEN	120.00 0000	1194.120				
	Total						8999.280				
				l	Total Quant	ity in kg	8999.280				
6.010	4.12										
	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer's specification.										
	FOR DILUTION	TANK-F	RECTANGU	LAR	Т	г					
	QTY AS PER ITEM NO.5.37.1	1	65.043			340.00 0000	22114.62 0				
	QTY AS PER ITEM NO.5.37.2	1	9.951			330.00 0000	3283.830				
	Total						25398.45 0				
				ı	Total Quant	ity in kg	25398.45 0				
6.011	5.9.1					<u>.</u>					
	Centering and shur footings, bases of				removal of f	orm for:Fo	oundations,				
	FOR DILUTION	TANK-R	ECTANGUI	_AR							
	Bottom slab	4	11.800		0.450		21.240				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Beam side	4	6.400		0.700		17.920			
		4	5.500		0.700		15.40			
	Total						54.56			
				To	tal Quantity	y in sqm	54.56			
6.012	5.9.2									
	Centering and shuttering including strutting, etc. and removal of form for:Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.									
	FOR DILUTION TANK-RECTANGULAR									
	For walls outside	4	10.000		3.000		120.00			
	For walls inside	ls inside 4 9.000 3.000				108.00				
	Total						228.00			
				To	tal Quantity	y in sqm	228.00			
6.013	5.9.3									
	Centering and shufloors, roofs, landi	tering inc ngs, balco	luding strutti nies and acce	ng, etc. and ess platform	removal of fo	orm for:S	uspended			
	FOR DILUTION	TANK-R	ECTANGUL	AR	BRA	AF	-			
	Walkway	4	11.200	0.600			26.88			
	Top slab	2	24.800		0.150		7.44			
	Bottom portion	2	5.500	4.500	MANAGEMEN	T .	49.50			
	Total OF PUBLIC WORKS 8									
				To	tal Quantity	y in sqm	83.82			
6.014	22.23.1									
	Providing and app waterproofing trea water tanks, roof s tunnels	tment to the labs, poding	he RCC struc ums, reservic	tures like re	taining walls	of the ba	sement,			
	/ subway and bridg integral crystalline integral crystalline same from negative shall meet the requested permeability of conditional substantial becapes shall be capes and the components of the production of th	slurry: 2 slurry: 1 e (internal irements a ncrete by stant to 16 able of sel t all comp	parts water) part water) fl) side with the as specified is more than 90 bar hydrostaf-healing of clete as per speance shall ca	for vertical sor horizontal ne help of syn ACI-212-3% compared atic pressure cracks up to ecification a	surfaces and l surfaces and nthetic fiber BR-2010 i.e bl with control on negative a width of 0. and the direct te for 10 year	3:1(3 pad applying brush. The sy reducing concrete side. The 50mm. The ion of the	arts g the e material g as per crystalline he work			
	integral crystalline integral crystalline same from negative shall meet the requiremental permeability of control DIN 1048 and resistance shall be carried out the engineering charge. The product leakage. For vertical crystalline integral production in the production of the producti	slurry: 2 slurry: 1 e (internal prime ents a ncrete by a stant to 16 able of sel t all comp ct performal surface	parts water) part water) f part water) f l) side with th as specified i more than 90 bar hydrosta f-healing of c lete as per sp ance shall ca two coats @0	for vertical sor horizontal and help of syn ACI-212-3% compared atic pressure cracks up to ecification and arry guarante 0.70 kg per sor horizontal pressure solution and the so	surfaces and l surfaces and nthetic fiber BR-2010 i.e bl with control on negative a width of 0. and the direct te for 10 year	3:1(3 pad applying brush. The sy reducing concrete side. The 50mm. The ion of the	arts g the e material g as per crystalline he work			
	integral crystalline integral crystalline same from negative shall meet the requiremental permeability of control DIN 1048 and resistance shall be carried out engineering. The product leakage. For vertication of the product of the	slurry: 2 slurry: 1 e (internal prime ents a ncrete by a stant to 16 able of sel t all comp ct performal surface	parts water) part water) f part water) f part water) f l) side with the as specified i more than 90 bar hydrostaf-healing of a lete as per speciance shall catwo coats @(ECTANGUL	for vertical sor horizontal and help of syn ACI-212-3% compared atic pressure cracks up to ecification and arry guarante 0.70 kg per sor horizontal pressure solution and the so	surfaces and I surfaces and nthetic fiber BR-2010 i.e b I with control on negative a width of 0. and the direct the for 10 year	3:1(3 pad applying brush. The sy reducing concrete side. The 50mm. The ion of the	arts g the ne material g as per crystalline he work any			
	integral crystalline integral crystalline same from negative shall meet the requiremental permeability of control DIN 1048 and resistance shall be carried out the engineering charge. The product leakage. For vertical crystalline integral production in the production of the producti	slurry: 2 slurry: 1 e (internal direments a ncrete by a stant to 16 able of sel t all comp ct performal surface	parts water) part water) f part water) f l) side with th as specified i more than 90 bar hydrosta f-healing of c lete as per sp ance shall ca two coats @0	for vertical sor horizontal and help of syn ACI-212-3% compared atic pressure cracks up to ecification and arry guarante 0.70 kg per sor horizontal pressure solution and the so	surfaces and l surfaces and nthetic fiber BR-2010 i.e bl with control on negative a width of 0. and the direct te for 10 year	3:1(3 pad applying brush. The sy reducing concrete side. The 50mm. The ion of the	arts g the e material g as per crystalling he work			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
6.015	22.23.2						
	waterproofing treatment to the RCC structures like retaining walls of the base water tanks, roof slabs, podiums, reservior, sewage & DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The cultury shall be capable of self-healing of cracks up to a width of 0.50mm. The shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against at leakage. For horizontal surface one coat @ 1.10 kg per sqm.						
	FOR DILUTION					-	
	Bottom slab inside	2	5.000	4.000	501	TET	40.000
	Total			200	DIV		40.000
				To	o <mark>tal Quantit</mark>	y in sqm	40.000
6.016	13.7.1						
	12 mm cement pla cement : 3 fine sar		ned with a flo	oating coat of	f neat cemen	t of mix:1	:3 (1
	FOR DILUTION	TANK-R		LAR			
	Inside of walls	4	9.000		3.000		108.000
	Outside walls	4	10.000		3.000		120.000
	Baseslab inside and top slab	6	5.000	4.000			120.000
	Walkway	4	11.200	1.300			58.240
	Total						406.240
				To	otal Quantit	y in sqm	406.240
6.017	2.25						
	Filling available ex foundation etc. in layer by ramming	layers not	exceeding 2	0 cm in dept	h, consolidat	ing each o	
	FOR DILUTION	TANK-	RECTANGU	JLAR			
	Quantity as per item no.1 &2	1	217.728				217.728
	Total						217.728
	DEDUCTION						
	PCC	-1				10.368 000	-10.368

	Specification	No	Length	Width	Depth	Cf	Quantity
	Bottom slab cum raft (as per item no.5.37.1)	-1				18.270 000	-18.270
	Tank	-2	5.500	4.500	2.550		-126.225
	Total						-154.863
				To	otal Quantity	y in cum	62.865
6.018	19.18.1						
	Supplying and fixicover (light duty)	ng C.I w	ith out frame ht of the cov	for manhole er to be no le	es:455 x 610 ess than 23 kg	mm recta	ngular C.I
	FOR DILUTION						
		4					4.000
	Total						4.000
				To	tal Quantity	y in each	4.000
6.019	OD55499/2022-20)23		AND.			
	Supply of uPVC P	ipe, IS 49	85:2000,10K	(g/cm2,110m	nmDiaand f	ixing	1
	FOR DILUTION		7.8-17	ALCONO LINES	-01	FI)
		2	0.450	2000	10 17		0.900
	Total			3			0.900
				Tota	al Quantity	in metre	0.900
			FE-121 ATTE		E		
6.020	19.16		OF PUBL	C WORKS	MACHAGENIEN		
6.020	Providing orange of as per IS: 10910 of cross section as 23 165 mm with minitop surface by ribb projections on tail stand the bend test manufactures per fixing in manholes sand: 6 graded storage of the projection of the projecti	m 12 mm of mm x 25 mum 112 mm 112 mm or che length on and chen hanent ide with 30x me aggreg	dia steeel bar mm and ove mm space b equering best 138 mm as p nical resistan entification m 20x15 cm ce ate 20 mm no	conforming er all minimu etween protr ides necessar per standard ce test as per hark to be vis ement concre ominal size)	to IS:1786, Im length 260 uded legs hary and adequate drawing and respectification in the block 1:3:	having mi 3 mm and ving 2 mr ate anchor suitable t ns and hav er fixing i 6 (1 ceme	inimum width as n tread on ring o with ving including ent: 3 coarse
6.020	Providing orange of as per IS: 10910 of cross section as 23 165 mm with minitop surface by ribb projections on tail stand the bend test manufactures per fixing in manholes sand: 6 graded stores.	mm x 25 mum 112 oing or che length on and chen hanent ide with 30x ne aggreg	dia steeel bar mm and ove mm space be equering best 138 mm as p nical resistan entification m 20x15 cm ce ate 20 mm no ECTANGUI	conforming er all minimu etween protr ides necessar per standard ce test as per hark to be vis ement concre ominal size)	to IS:1786, Im length 260 uded legs hary and adequate drawing and respectification in the block 1:3:	having mi 3 mm and ving 2 mr ate anchor suitable t ns and hav er fixing i 6 (1 ceme	inimum width as n tread on ring o with ving including ent: 3 coarse n
6.020	Providing orange of as per IS: 10910 of cross section as 23 165 mm with minitop surface by ribb projections on tail stand the bend test manufactures per fixing in manholes sand: 6 graded sto. FOR DILUTION	mm x 25 mum 112 oing or che length on and chen hanent ide with 30x ne aggreg	dia steeel bar mm and ove mm space be equering best 138 mm as p nical resistan entification m 20x15 cm ce ate 20 mm no ECTANGUI	er conforming er all minimu etween protr ides necessar per standard ce test as per nark to be vis ement concre ominal size)	to IS:1786, Im length 260 uded legs hary and adequate drawing and respectification in the block 1:3:	having mi 3 mm and ving 2 mr ate anchor suitable t ns and haver fixing i 6 (1 ceme per desig	inimum width as n tread on ring o with ving including ent: 3 coarse n
	Providing orange of as per IS: 10910 of cross section as 23 165 mm with minitop surface by ribb projections on tail stand the bend test manufactures per fixing in manholes sand: 6 graded sto. FOR DILUTION	m 12 mm x 25 mum 112 ping or che length on and chen hanent ide with 30x ne aggreg TANK-R 2 5000 litre to the resen 3 m using the second sec	dia steeel bar mm and ove mm space b equering bes 138 mm as p nical resistan entification m 20x15 cm ce ate 20 mm no ECTANGUI 9.000 e tankers fited ervoir site an ng 5 HP diese	conforming er all minimule etween protrictes necessar per standard ce test as per nark to be visuement concressional size) LAR To d in lorry and d pumping the engine puri	to IS:1786, im length 26; unded legs had a dequation and expecification in the block 1:3: Complete as to a least of the block 1:3: Complete as to a least of the block 1:3: Complete as	having mi 3 mm and ving 2 mr ate anchor suitable t ns and haver fixing i 6 (1 ceme per desig	width as n tread on ring o with ving including ent: 3 coarse n 18.000 18.000
	Providing orange of as per IS: 10910 of cross section as 23 165 mm with minit top surface by ribb projections on tail stand the bend test manufactures pern fixing in manholes sand: 6 graded stores FOR DILUTION Total 100.36.1 Filling water with of 5 km (average) height not less that	mm x 25 mum 112 mm x 25 mum 112 oing or che length on and chen hanent ides with 30x ne aggreg TANK-R 2 5000 litre to the resen 3 m usir es and come	dia steeel bar mm and ove mm space b equering besi 138 mm as p nical resistan entification m 20x15 cm ce ate 20 mm no ECTANGUI 9.000 e tankers fited ervoir site an ng 5 HP diese st of water et	conforming er all minimule etween protrictes necessar per standard ce test as per nark to be visement concretional size) LAR To d in lorry and d pumping the lengine purice, complete.	to IS:1786, im length 26; unded legs had a dequation and expecification in the block 1:3: Complete as to a least of the block 1:3: Complete as to a least of the block 1:3: Complete as	having mi 3 mm and ving 2 mr ate anchor suitable t ns and haver fixing i 6 (1 ceme per desig	width as n tread on ring o with ving including ent: 3 coarse n 18.000 18.000

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	Total						120.000		
				Total (Quantity in I	Kilo litre	120.000		
6.022	10.26.3				·	•			
	Providing and fixing balcony railing, standard approves steel principle.	aircase rai	ling and simi						
	50mm dia G.I5.	17Kg/m,3	2mmdia G.I.	-3.17Kg/m					
	Outer total - 20m/1m/c/c vertical 50mm dia	50			0.750	5.1700	193.875		
	Horizontal 0.25m c/c -32mmdia	6	24.800			3.1700 00	471.696		
	Total						665.571		
				An.	Total Quant	ity in kg	665.571		
6.023	13.48.3		019			THE REAL PROPERTY.	\		
	primer as per manufacturers specifications: Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture FOR DILUTION TANK-RECTANGULAR								
	Vertical pipe	50	0.750	CWORKS	0.157	-	5.888		
	Horizontal pipe	6	24.800		0.100		14.880		
	Total	0	21.000		0.100		20.768		
				T	otal Quantit	v in sam	20.768		
6.024	13.52.2			1	otai Qualiti	y III Sqiii	201700		
0.021	Finishing with Epoper manufacturer& of surface, etc. cor	z#39;s spe	ecifications in	ncluding app			• •		
	FOR DILUTION	TANK-R	ECTANGUI	LAR					
	Qty as per item no.13.7.1	2	203.120				406.240		
	Total						406.240		
	DEDUCTION		Т			· · · · · ·			
	Face to earth	-2	20.000		2.550		-102.000		
	Total						-102.000		
				To	otal Quantit	y in sqm	304.240		
7	MOVING BED B	IOFILM I	REACTOR T	'ANK-BOD	REMOVAL				
7 001	2.6.1			<u> </u>			<u> </u>		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil										
	FOR MBBR										
	MBBR Tank - base	1	17.650	17.650	0.300		93.457				
	Columns of staircase	15	1.400	1.400	0.900		26.460				
	Total						119.917				
				To	tal Quantity	y in cum	119.917				
7.002	4.1.6										
	Providing and layi of centering and sh sand: 6 graded sto FOR MBBR	nuttering -	All work up	to plinth lev	pecified grad rel:1:3:6 (1 c	de excludi cement : 3	ing the cost 3 coarse				
		1	17.650	17.650	0.150	The same	16 709				
	MBBR tank-base Columns of	1	17.650	17.650	0.150	AFE	46.728				
	staircase	15	1.400	1.400	0.150		4.410				
	Total			71			51.138				
	Total		CPLATES	To	otal Quantity	y in cum	51.138 51.138				
7.003	Total 5.37.1		of Pueu	DEM SOR TITO	tal Quantity	y in cum					
7.003	5.37.1 Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinflas per IS: 9103 to a impairing strength Cement content co	ork, using ally autom I leads, ha I grade for it mixer to orcement accelerate and dural	g cement con latic batching aving continu- reinforced co o site of layin including co / retard settin bility as per continuity as per continuity	ixed M-25 g tent as per ap g plant and tr lous agitated cement concrete, excluding st of admixture ing of concrete direction of the	rade concrete oproved design ansported to mixer, manu- ete work incomes the cost of concessin recom- e, improve vone Engineer- um. Excession	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions y without ge. Note:- ent used as				
7.003	5.37.1 Providing and laying cement concrete with manufactured in full transit mixer for all design of specified R.M.C. from transifinishing and reinfold as per IS: 9103 to a simpairing strength	ork, using ally autom I leads, ha I grade for it mixer to orcement accelerate and dural	g cement con latic batching aving continu- reinforced co o site of layin including co / retard settin bility as per continuity as per continuity	ixed M-25 g tent as per ap g plant and tr lous agitated cement concrete, excluding st of admixture ing of concrete direction of the	rade concrete oproved design ansported to mixer, manu- ete work incomes the cost of concessin recom- e, improve vone Engineer- um. Excession	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions y without ge. Note:- ent used as				
7.003	5.37.1 Providing and laying cement concrete with manufactured in future transit mixer for all design of specified R.M.C. from transifinishing and reinform as per IS: 9103 to a simpairing strength Cement content co	ork, using ally autom I leads, ha I grade for it mixer to orcement accelerate and dural	g cement con latic batching aving continu- reinforced co o site of layin including co / retard settin bility as per continuity as per continuity	ixed M-25 g tent as per ap g plant and tr lous agitated cement concrete, excluding st of admixture ing of concrete direction of the	rade concrete oproved design ansported to mixer, manu- ete work incomes the cost of concessin recom- e, improve vone Engineer- um. Excession	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions ty without ge. Note:- ent used as				
7.003	5.37.1 Providing and layicement concrete with manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinflus per IS: 9103 to a simpairing strength Cement content coper design mix is per IS: FOR MBBR	ork, using ally autom I leads, ha I grade for it mixer to orcement accelerate and dural	g cement con natic batching aving continu- reinforced co o site of layin including co / retard settin pility as per continuity as per continuity as per continuity	ixed M-25 g tent as per ap g plant and tr lous agitated cement concrete, excluding st of admixtung of concrete direction of the s@330 kg/c parately.All	rade concrete oproved designants ansported to mixer, manuate work income the cost of courses in recome e, improve vane Engineer um. Excess wiork upto p	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions by without ge. Note:- ent used as l				
7.003	5.37.1 Providing and layicement concrete with manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfas per IS: 9103 to a simpairing strength Cement content coper design mix is per IS: POR MBBR Base slab	ork, using ally autom I leads, ha I grade for it mixer to corcement accelerate and dural onsidered in bayable/re	g cement con natic batching aving continu- reinforced co o site of layin including co retard setting oility as per continuity as per conti	ixed M-25 g tent as per ap g plant and tr lous agitated cement concrete, excluding st of admixture ag of concrete direction of the s @330 kg/c parately.All	rade concrete oproved designsported to mixer, manuete work incurred the cost of corres in recome, improve whe Engineer um. Excess wiork upto p	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions ty without ge. Note:- ent used as 1 93.457				
7.003	5.37.1 Providing and layicement concrete with manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfas per IS: 9103 to a simpairing strength Cement content coper design mix is per IS: POR MBBR Base slab	ork, using ally automal leads, had grade for orcement accelerate and dural maidered in ayable/re	g cement contactic batching aving continuous reinforced continuous including continuous retard setting including continuous per contact in this item is coverable setting 17.650	ixed M-25 g tent as per ap g plant and tr lous agitated cement concr large, excluding st of admixturing of concret direction of the s @330 kg/c parately.All	rade concrete oproved designs an apported to mixer, manuete work incentes in recome, improve when Engineer turn. Excess wiork upto p	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 93.457 17.903				
7.003	5.37.1 Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfeas per IS: 9103 to a impairing strength Cement content coper design mix is properties. FOR MBBR Base slab Beam	ork, using ally automal leads, had grade for it mixer to orcement accelerate and durationsidered in bayable/re	g cement contactic batching aving continuous reinforced continuous site of laying including conformation as per contact and the second setting coverable second setting coverable second setting second setting second seco	ixed M-25 g tent as per ap g plant and tr lous agitated cement concrete, excluding st of admixtung of concret direction of the s @330 kg/c parately.All	rade concrete oproved designsported to mixer, manuete work incures in recome, improve value Engineer um. Excess wiork upto p	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions ty without ge. Note:- ent used as 1 93.457 17.903 16.065 16.538				
7.003	5.37.1 Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfeas per IS: 9103 to a impairing strength Cement content coper design mix is properties. FOR MBBR Base slab Beam	ork, using ally automal leads, had grade for it mixer to orcement accelerate and dural onsidered in bayable/re	g cement connatic batching aving continuous reinforced continuous	ixed M-25 g tent as per ap g plant and traces agitated cement concrete, excluding st of admixture ag of concrete direction of the s @330 kg/c parately.All v	rade concrete oproved designsported to mixer, manuete work incorres in recome, improve when Engineer um. Excess wiork upto p	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions ty without ge. Note:- ent used as 1 93.457 17.903 16.065 16.538 13.680				
7.003	5.37.1 Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfeas per IS: 9103 to a impairing strength Cement content coper design mix is properties. FOR MBBR Base slab Beam	ork, using ally automal leads, had grade for it mixer to corcement accelerate and dural ansidered in the sayable/resident of the sayable of the say	g cement contactic batching aving continuous reinforced contact reinforced contact reinforced reinf	ixed M-25 g tent as per ap g plant and tr nous agitated cement concrete, excluding st of admixture ag of concrete direction of the s @330 kg/c parately.All v 17.650 0.350 0.350 0.950	rade concrete oproved designsported to mixer, manuete work incertification the cost of corres in recome, improve when Engineer with the cost of corres in recome, improve when Engineer with the cost of corresponding to the cost of corresponding to the cost of corresponding to the cost of cost o	e for reinf gn mix, site of wo afactured luding pu centering, nmended p workabilit in -charg /less ceme	forced ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 93.457 17.903 16.065				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Columns of staircase	15	0.450	0.450	0.450		1.367
	plinth of beam	5	1.500	0.300	0.450		1.013
		3	13.350	0.300	0.450		5.407
	Total						177.040
				To	tal Quantity	y in cum	177.040
7.004	5.37.2						
	Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinfas per IS: 9103 to impairing strength Cement content coper design mix is per IS: 9103 to impairing strength Cement content coper design mix is per IS: 9103 to impairing strength Cement content coper design mix is per IS: 9103 to impairing strength Cement content coper design mix is per IS: 9103 to impairing strength Cement content coper design mix is per IS: 9103 to impairing strength Cement content coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Content Coper design mix is per IS: 9103 to impairing strength Cement Coper design mix is per IS: 9103 to impairing strength Cement Coper design mix is per IS: 9103 to impairing strength Cement Coper design mix is per IS: 9103 to impairing strength Cement Coper design mix is per IS: 9103 to impairing strength Cement Coper design mix is per IS: 9103 to impairing strength Cement Coper design mix is per IS: 9103 to impairing strength Cement Coper design mix is per IS: 9103 to impairing strength Mix is per IS: 9103 to impairing strength Mix is 9103 to impairing strength Mix is 9100 to impairing strength Mix is 9100 to impairing strength Mix is 9100 to impairing strength Mix	rork, using ally automal leads, had grade for it mixer to corcement accelerate and dural	g cement con natic batching aving continu- r reinforced co o site of layin- including co retard settin- bility as per continuity as per continuity	tent as per ap g plant and tr nous agitated cement concr ag, excluding st of admixtung of concret direction of the s @330 kg/c	pproved designansported to mixer, manuete work incures in recome, improve value Engineer um. Excess	gn mix, site of wo afactured luding pu centering, mended pworkabilite in -charg/less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-
	floor V level SECOND FLOOR				DR	4	
	Tank walls	2	32.000	0.300	3.500		67.200
	Beams alround	4	14.600	0.350	0.750		15.330
	Candileverbeam	20	1.200	0.350	0.530		4.452
	Walkway	2	34.400	1.200	0.150		12.384
	Columns	16	0.350	0.750	6.450		27.090
		9	0.350	0.350	6.450		7.111
	Beams	5	14.200	0.300	0.450		9.585
		5	14.200	0.450	0.600		19.170
	Haunge	2	14.600	0.300	0.600		5.256
	Roof slab	1	19.150	19.150	0.200		73.345
	Total						240.923
	STAIRCASE						
	Columns of staircasef staircase	15	0.450	0.450	6.450		19.592
	Tie beam	6	13.350	0.300	0.450		10.814
		10	1.500	0.300	0.450		2.025
	Landing	2	2.400	1.200	0.150		0.864
	Inclined portion	22	0.336	1.200	0.150		1.33
		11	1.200	0.300	0.150		0.594
	Inclined portion	18	0.338	1.200	0.150		1.095

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
		9	1.200	0.300	0.160		0.518
	Total						36.833
	STAIRCASE						
	Columns of staircase	15	0.450	0.450	6.450		19.592
	Tie beam	6	13.350	0.300	0.450		10.814
		10	1.500	0.300	0.450		2.025
	Landing	2	2.400	1.200	0.150		0.864
	Inclined portion	22	0.336	1.200	0.150		1.331
		11	1.200	0.300	0.150		0.594
	Inclined portion	18	0.338	1.200	0.150		1.095
		9	1.200	0.300	0.160		0.518
	Total						36.833
	FRIST FLOOR		-60	18		-	
	Tank walls	2	32.000	0.300	3.500	ET	67.200
	Beams alround	4	14.200	0.350	0.750	VI.	14.910
	Cantilever beams	20	1.200	0.350	0.530		4.452
	Walkway	2	34.400	1.200	0.150		12.384
	Columns	16	0.450	0.750	6.450	T.	34.830
		9	0.450	0.450	6.450	37	11.755
	Beams	5	13.900	0.450	0.600		18.765
		5	13.900	0.450	0.600		18.765
	Haunge	2	14.200	0.450	0.600		7.668
	Floor slab	1	16.750	16.750	0.300		84.169
	Total						274.898
	GROUND FLOOF	₹					
	Tank walls	2	27.200	0.300	3.500		57.120
	Additional wall in GF	1	6.800	0.300	3.500		7.140
	Beam airound	4	13.600	0.350	0.750		14.280
	Cantilever beam	16	1.200	0.350	0.530		3.562
	Walkway	1	51.600	1.200	0.150		9.288
	Columns	16	0.600	0.750	6.450		46.440
		9	0.600	0.600	6.450		20.898
	Beams	5	13.450	0.350	0.600		14.123
		5	13.450	0.350	0.600		14.123
	Haunge	2	13.600	0.450	0.600		7.344

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Anoxic tank beam	1	13.450	0.350	0.450		2.118
		3	6.800	0.350	0.450		3.213
	Anoxic tank slab	1	16.000	8.000	0.150		19.200
	Tie beam of blower room	2	6.800	0.350	0.450		2.142
	Floor slab	1	16.750	16.750	0.300		84.169
	Total						305.160
	STAIRCASE						
	Columns of staircase	15	0.450	0.450	6.450		19.592
	Tie beam	6	13.350	0.300	0.450		10.814
		10	1.500	0.300	0.450		2.025
	Landing	2	2.400	1.200	0.150		0.864
	Inclined portion	22	0.336	1.200	0.150		1.331
		11	1.200	0.300	0.150	ET	0.594
	Inclined portion	18	0.338	1.200	0.150	4.5	1.095
		9	1.200	0.300	0.160		0.518
	Columns of staircase to roof	15	0.300	0.300	3.200		4.320
	item beam	3	14.800	0.300	0.450	72	5.994
		5	1.800	0.300	0.450		1.215
	Inclined portion	22	0.336	1.200	0.150		1.331
		11	0.450	0.750	6.450		23.946
	Inclined portion	18	0.338	1.200	0.150		1.095
		9	1.200	0.300	0.160		0.518
	Roof	2	1.200	1.200	0.150		0.432
	Total						75.684
				To	tal Quantity	in cum	970.331
7.005	5.34.1						
	Extra for providing specified cement of grade concrete institution in M-30 is @ 340	ontent use tead of M	ed is payable	recoverable/	separately.P	roviding	M-30
	FOR MBBR	, , , , , , , , , , , , , , , , , , ,					
	QTY AS PER ITEM NO.5.37.1	1	177.038				177.038
	QTY AS PER ITEM NO.5.37.2	1	970.170				970.170
	Total						1147.208

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
				To	otal Quantit	y in cum	1147.208
7.006	OD55694/2022-20)23					
	Extra for providing	g sulphate	resistant cer	nent for the	structures		
	FOR MBBR		T		Г	Г	
	QTY AS PER ITEM NO.5.37.1	1	177.038				177.038
	QTY AS PER ITEM NO.5.37.2	1	970.170				970.170
	Total						1147.208
				To	otal Quantit	y in cum	1147.208
7.007	5.22.6						
	Steel reinforcemer in position and bin bars of grade Fe-50	ding all c	omplete upto	ading straigh plinth level	tening, cutting Thermo - Mo	ng, bendin echanicall	g, placing y Treated
	PILE REINFORC	EMENT 1	150Kg/m3				\
	500mm	8	0.196	A THE	45.000	150.00 0000	10584.00
	750mm	24	0.442	3-1	45.000	150.00 0000	71604.00 0
	600mm	36	0.283	ORM FOR THE	45.000	150.00 0000	68769.00 0
	Total		0, 1000				150957.0 00
	FOR MBBR						
	QTY AS PER ITEM NO.5.37.1	1	177.038			120.00 0000	21244.56 0
	QTY AS PER ITEM NO.5.37.2	1	970.170			120.00 0000	116420.4 00
	Total						137664.9 60
_				Total (Quantity in l	kilogram	288621.9 60
7.008	OD55693/2022-20)23					
	Extra for providing FOR MBBR	g epoxy co	oating for rei	nforcement	bar		
	QTY AS PER		288621.9				288621.9
	ITEM NO.5.22.6	1	60				60
	Total						288621.9 60
				ı	Total Quant	tity in kg	288621.9 60

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
7.009	4.12		-				
	Extra for providing doses by weight of						work in
	FOR MBBR						
	QTY AS PER ITEM NO.5.37.1	1	177.038			340.00 0000	60192.92 0
	QTY AS PER ITEM NO.5.37.2	1	970.170			340.00 0000	329857.8 00
	Total						390050.7 20
				•	Fotal Quant	ity in kg	390050.7 20
7.010	5.9.1						
	Centering and shut footings, bases of				removal of f	orm for:F	oundations,
	FOR MBBR		119			THE REAL PROPERTY.	
	Bottom slab	2	35.300		0.300	1 - 1	21.180
	Beam	5	17.050		1.200		102.300
		5	15.300	7	1.200		91.800
	Pile cap	9	7.000		0.600		37.800
		12	5.900	C WORKS	0.600		42.480
		4	4.500		0.600		10.800
	Columns footing	15	4.800		0.300		21.600
	Pedestral	15	2.400		0.600		21.600
	Columns of staircase	15	1.800		0.450		12.150
	Plinth beam	3	13.350		1.200		48.060
		5	1.500		1.200		9.000
	Total						418.770
				To	otal Quantit	y in sqm	418.770
7.011	5.9.2						
	Centering and shut thickness) including						
	GROUND FLOOR	2					
	For walls outside	2	27.500		3.500		192.500
	For walls inside	2	26.300		3.500		184.100
		2	6.800		3.500		47.600
	Walk way	1	51.600	1.200			61.920
	Cantilever beams	16	1.200	1.410			27.072

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Columns	16	2.700		6.450		278.640
		9	2.400		6.450		139.320
	Beams	5	13.450		1.550		104.238
		5	13.450		1.550		104.238
	Anoxic tank beam	1	13.450		0.450		6.053
		3	6.800		0.450		9.180
	Anoxic tank slab	1	16.000	8.000			128.000
	Tie beam of blower room	4	6.800		0.450		12.240
	Floor slab	1	16.750	16.750			280.563
	Total						1575.664
	STAIRCASE						
	Columns of staircase	15	1.800	1	6.450		174.150
	Tie beam	6	13.350	MANUAL PARTY	1.200	ET	96.120
		10	1.500	KERKO.	1.200	2 -	18.000
	Landing	2	2.400	1.200			5.760
	Inclined portion	22	0.336	1.200			8.870
		22	0.336	RM FOR THE	MANA 0.150	TT.	1.109
		11	1.200		0.150		1.980
		22		0.300	0.150		0.990
	Inclined portion	18	0.338	1.200			7.301
		18	0.338		0.150		0.913
		9	1.200		0.160		1.728
		18		0.300	0.160		0.864
	Total						317.785
	STAIRCASE	Г		Г			
	Columns of staircase	15	1.800		6.450		174.150
	Tie beam	6	13.350		1.200		96.120
		10	1.500		1.200		18.000
	Landing	2	2.400	1.200			5.760
	Inclined portion	22	0.336	1.200			8.870
		22	0.337		0.150		1.112
		11	1.200		0.150		1.980
		22		0.300	0.150		0.990
	Inclined portion	18	0.338	1.200			7.301
		18	0.338		0.150		0.913

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
		9	1.200		0.160		1.728
		18		0.300	0.160		0.864
	Total						317.788
	SECOND FLOOR	2					
	Tank walls outside	2	32.000		3.500		224.000
	Tankwalls inside	2	30.800		3.500		215.600
	Candilever beam	20	1.200	1.410			33.840
	Walkway	2	34.400	1.200			82.560
	Columns	16	2.200		6.450		227.040
		9	1.400		6.450		81.270
	Beams	10	14.200		0.450		63.900
		10	14.200		0.600		85.200
	Roof slab	1	19.150	19.150			366.723
	Total		AH.	OAN.		E T	1380.133
	FRIST FLOOR		424	Spides.	BRA	AF	_
	Tank walls outside	2	27.500	31	3.500		192.500
	Tank walls inside	2	26.300		3.500		184.100
	Cantilever beam	20	1.200	1.410	MANAGEMEN	T.	33.840
	Walkway	2	34.400	1.200			82.560
	Columns	16	2.400		6.450		247.680
		9	1.800		6.450		104.490
	Beams	5	13.900		0.600		41.700
		10	13.900		1.550		215.450
	floor slab	1	16.750	16.750			280.563
	Total						1382.883
	STAIRCASE	<u> </u>					
	Columns of staircase	15	1.800		6.450		174.150
	tie beam	6	13.350		1.200		96.120
		10	1.500		1.200		18.000
	Landing	2	2.400	1.200			5.760
	Inclined portion	22	0.336	1.200			8.870
		22	0.336		0.150		1.109
		11	1.200		0.150		1.980
		22		0.300	0.150		0.990
	Inclined portion	18	0.338	1.200			7.301

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
		18	0.338		0.150		0.913
		9	1.200		0.160		1.728
		18		0.300	0.160		0.864
	Columns of staircase to roof	15	1.200		3.200		57.600
	Tie beam	3	14.800		1.200		53.280
		5	1.800		1.200		10.800
	Roof	2	1.200	1.200			2.880
	Inclined portion	22	0.336	1.200			8.870
		22	0.336		0.150		1.109
		11	1.200		0.150		1.980
		22		0.300	0.150		0.990
	Inclined portion	18	0.338	1.200			7.301
		18	0.338	Mr.	0.150	-	0.913
		9	1.200	@ALD	0.160	ET	1.728
		18	4046	0.300	0.160	1	0.864
	Total			711			466.100
		100		To	tal Quantity	in sam	5440.353
	waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negativ shall meet the requ permeability of co DIN 1048 and resi slurry shall be cap shall be carried ou	labs, podi ge deck etc slurry: 2 slurry: 1 e (interna nirements ncrete by stant to 16 able of sel	ums, reservious, prepared by parts water) for part water) for part water) for part water) for side with the as specified in more than 90% bar hydrostal of control of	r, sewage &a y mixing in the for vertical sometical or horizontal e help of synth ACI-212-3 of compared tic pressure tracks up to a	the ratio of 5 urfaces and 3 surfaces and a thetic fiber by with control on negative sa width of 0.5	: 2 (5 par 3 : 1 (3 par 4 applying 5 orush. The y reducing concrete side. The 50mm. The	plant, rts arts g the e material g as per
	engineerin- charge. The produ- leakage.For vertica	ct perform	nance shall car	rry guarantee	e for 10 years		ne work
	charge. The produ	ct perform	nance shall car	rry guarantee	e for 10 years		ne work
	charge. The production charge. For vertical	ct perform	nance shall car	rry guarantee	e for 10 years		ne work
	charge. The produ- leakage.For vertica FOR MBBR	ct perform al surface	nance shall car two coats @0	rry guarantee	e for 10 years		ne work any
	charge. The produ- leakage.For vertica FOR MBBR	ct performal surface	nance shall can two coats @0	rry guarantee	e for 10 years		188.300
	charge. The produ- leakage.For vertica FOR MBBR Inside of walls Tank wall inside	ct performal surface	26.900 6.800	rry guarantee	3.500 3.500		188.300 47.600

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
				To	otal Quantit	y in sqm	604.100			
7.013	22.23.2									
	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requiremental permeability of co DIN 1048 and resistant shall be capshall be carried out	tment to the labs, poding edeck et es slurry: 2 es slurry: 1 the (internative ments increte by stant to 10 able of se.	he RCC structums, reservice., prepared le parts water) part water) side with the as specified more than 906 bar hydrostlf-healing of	ctures like report, sewage & by mixing in for vertical story here to have a compared at the help of symmetric pressure cracks up to	taining walls amp; water the ratio of surfaces and l surfaces and nthetic fiber BR-2010 i.e to with control on negative a width of 0	s of the battreatment 5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir cl concrete side. The .50mm. T	rts arts g the ne material g as per crystalline he work			
	engineerin- charge. The produ- leakage.For horizo	ct perforn	nance shall ca	arry guarante	e for 10 year					
	FOR MBBR		M	(OAL)		ET	1			
	Bottom slab inside SF	1	15.650	15.650	DRA	All	244.923			
	Bottom slab inside FF	1	15.550	15.550			241.803			
	Bottom slab inside GF	1	15.400	7.400	MANAGEMEN	rr	113.960			
		1	7.400	7.400			54.760			
	Total						655.446			
			y in sqm	655.446						
7.014	6.31.2 Brick work with common burnt clay machine moulded perforated modular bricks of class designation 12.5 conforming to IS: 2222 in exposed brick work including making horizontal and vertical grooves 10 mm wide 12 mm deep complete in cement mortar 1:6 (1 cement: 6 coarse sand)Above plinth level and upto floor V level									
	DEDUCTION		,	,						
	Openings rolling shutter	-2	2.400	0.230	2.400		-2.650			
	Total						-2.650			
	FOR MBBR		Т	I						
	Blower room	1	13.600	0.230	3.050		9.540			
	Total						9.540			
				$\mathbf{T}_{\mathbf{C}}$	tal Quantit	v in oum	6.890			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Supplying and fixilaths, interlocked tend locks, mounter arrangements for including the cost manufactured fron part 1 and M.S. tlaths with 1.25 mm	ogether the don specion of providing the high ten op cover of the done of the	arough their of the countries outside locking and fixing sile steel wire of required the	entire length d pipe shaft v ing with pusl g necessary 2 e of adequate	and jointed twith brackets and pull op 27.5 cm long estrength co	together a s, side gui- peration co wire spri- nforming	t the end by des and omplete, ngs to IS: 4454
	FOR MBBR	•					
	Blower room	2	2.400	2.400			11.520
	Total						11.520
				To	otal Quantit	v in sam	11.520
7.016	10.9				C	,	
	instead of laths as measured). FOR MBBR Blower room	per design	2.400	y Engineer -i	in-Charges, ((area of gr	rill to be
	Total	2	2.700	2.400	DE	-	11.520
	10141						
				T	tal Quantit	v in com	11 520
7.017		g and fixi	ng expanded	ORM FOR THE	of size 20x60	VT.	
7.017	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room	mm thick	weighing 3.	metal mesh o	of size 20x60 m for encasi	0 mm and ng or rolle rs.	27.880
7.017	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR	mm thick columns	weighing 3. and grillages	metal mesh of 64 kg per squeexcluding co	of size 20x60 m for encasinost of hanger 2.050	0 mm and ng or rolle rs.	strands ed steel 27.880 27.880
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room	mm thick columns	weighing 3. and grillages	metal mesh of 64 kg per squeexcluding co	of size 20x60 m for encasinost of hanger	0 mm and ng or rolle rs.	strands ed steel
7.017	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room	mm thick columns 1 aster finished)	weighing 3. and grillages	metal mesh of 64 kg per squeexcluding co	of size 20x60 m for encasinost of hanger 2.050 otal Quantit	O mm and ng or rollers.	27.88 27.88
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room Total 13.7.1 12 mm cement placement : 3 fine sar	mm thick columns 1 aster finished)	weighing 3. and grillages	metal mesh of 64 kg per squeexcluding co	of size 20x60 m for encasinost of hanger 2.050 otal Quantit	O mm and ng or rollers. y in sqm t of mix:1	27.88 27.88 27.88
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room Total 13.7.1 12 mm cement pla cement : 3 fine sar SECOND FLOOR Tankwalls	mm thick columns 1 aster finished)	and grillages 13.600 ned with a flo	metal mesh of 64 kg per squeexcluding co	of size 20x60 m for encasinost of hanger 2.050 otal Quantit	O mm and ng or rollers. y in sqm t of mix:1	27.88 27.88 27.88
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room Total 13.7.1 12 mm cement pla cement : 3 fine sar SECOND FLOOR Tankwalls outside	mm thick columns 1 ster finished)	weighing 3. and grillages 13.600 ned with a flo	metal mesh of 64 kg per squeexcluding co	of size 20x60 m for encasinost of hanger 2.050 otal Quantit and neat cement	O mm and ng or rollers. y in sqm t of mix:1	27.88 27.88 27.88 27.88
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room Total 13.7.1 12 mm cement pla cement : 3 fine sar SECOND FLOOR Tankwalls outside Tankwalls inside	mm thick columns 1 ster finish (a) 2 2	and grillages 13.600 13.000 32.000 30.800	metal mesh of 64 kg per squexcluding co	of size 20x60 m for encasinost of hanger 2.050 otal Quantit and neat cement	O mm and ng or rollers. y in sqm t of mix:1	27.88 27.88 27.88 27.88 27.88
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room Total 13.7.1 12 mm cement pla cement : 3 fine sar SECOND FLOOR Tankwalls outside Tankwalls inside Cantilever beam	mm thick columns 1 aster finish ad) 2 2 20	and grillages 13.600 13.000 32.000 30.800 1.200	metal mesh of 64 kg per squexcluding contact of the following contact o	of size 20x60 m for encasinost of hanger 2.050 otal Quantit and neat cement	O mm and ng or rollers. y in sqm t of mix:1	27.88 27.88 27.88 27.88 27.88 27.88
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room Total 13.7.1 12 mm cement pla cement : 3 fine sar SECOND FLOOR Tankwalls outside Tankwalls inside Cantilever beam Walkway	mm thick columns 1 ster finish ad) 2 2 20 4	32.000 30.800 1.200 34.400	metal mesh of 64 kg per squexcluding contact of the following contact o	of size 20x60 m for encasinost of hanger 2.050 otal Quantit 3.500 3.500	O mm and ng or rollers. y in sqm t of mix:1	27.88 27.88 27.88 27.88 27.88 27.88 27.80 215.60 33.84 165.12 227.04
	Extra for providing 3.25 mm wide 1.6 sections in beams, FOR MBBR Blower room Total 13.7.1 12 mm cement pla cement : 3 fine sar SECOND FLOOR Tankwalls outside Tankwalls inside Cantilever beam Walkway	mm thick columns 1 aster finished) 2 20 4 16	32.000 30.800 1.200 34.400 2.200	metal mesh of 64 kg per squexcluding contact of the following contact o	of size 20x60 m for encasin ost of hanger 2.050 otal Quantit 3.500 3.500	O mm and ng or rollers. y in sqm t of mix:1	27.88 27.88 27.88 27.88 27.88 27.88 165.12

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Roof slab	2	19.150	19.150			733.445
	Total						1829.415
	STAIRCASE						
	Columns of staircase	15	1.800		6.450		174.150
	Tie beam	6	13.350		1.200		96.120
		10	1.500		1.200		18.000
	Landing	2	2.400	1.200			5.760
	Inclined portion	22	0.336	1.200			8.870
		44	0.336		0.150		2.218
		11	1.200		0.150		1.980
		22		0.300	0.150		0.990
	Inclined portion	18	0.338	1.200			7.301
		36	0.338	18	0.150		1.825
		9	1.200	SOAL)	0.160	ET	1.728
		18	434	0.300	0.160	YL.	0.864
	Total			7		100	319.806
	STAIRCASE	100		\prec			
	Columns of staircase	15	1.800	ORM FOR THE C WORKS	6.450	rr	174.150
	Tiebeam	6	13.350		1.200		96.120
		10	1.500		1.200		18.000
	Landing	2	2.400	1.200			5.760
	Inclined portion	22	0.336	1.200			8.870
		44	0.336		0.150		2.218
		11	1.200		0.150		1.980
		22		0.300	0.150		0.990
	Inclined portion	18	0.338	1.200			7.301
		36	0.338		0.150		1.825
		9	1.200		0.160		1.728
		18		0.300	0.160		0.864
	Total						319.806
	GROUND FLOOF	3					
	For walls outside	2	27.500		3.500		192.500
	For walls inside	2	26.300		3.500		184.100
		2	6.800		3.500		47.600
	Base slab	1	15.400	7.400			113.960
		1	7.400	7.400			54.760

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Walkway	2	51.600	1.200			123.840
	Cantilever beam	16	1.200	1.410			27.072
	Columns	16	2.700		6.450		278.640
		9	2.400		6.450		139.320
	Beams	5	13.450		1.550		104.238
		5	13.450		1.550		104.238
	Anoxic tank beam	1	13.450		0.450		6.053
		3	6.800		0.450		9.180
	Anoxic tank slab	1	16.000	8.000			128.000
	Tie beam of blower room	4	6.800		0.450		12.240
	Blower room	2	13.600		3.050		82.960
	Floor slab	1	16.750	16.750			280.563
	Total		a si			-	1889.264
	DEDUCTION		411		500	1)
	Opening rolling shutter	-2	2.400	3-11	2.400		-11.520
	Total						-11.520
	STAIRCASE		e-PLATFO	RM FOR THE	MANAGEMEN	т	
	Columns of staircase	15	1.800	. WORLD	6.450		174.150
	Tie beam	6	13.350		1.200		96.120
		10	1.500		1.200		18.000
	Landing	2	2.400	1.200			5.760
	Inclined portion	22	0.336	1.200			8.870
		44	0.336		0.150		2.218
		11	1.200		0.150		1.980
		22		0.300	0.150		0.990
	Inclined portion	18	0.338	1.200			7.301
		36	0.338		0.150		1.825
		9	1.200		0.160		1.728
		18		0.300	0.160		0.864
	Columns of staircase to roof	15	1.200		3.200		57.600
	Tie beam	3	14.800		1.200		53.280
		5	1.800		1.200		10.800
	Roof	2	1.200	1.200			2.880
	Total						444.366

	Specification	No	Length	Width	Depth	Cf	Quantity
	FIRST FLOOR						
	Tank walls outside	2	27.500		3.500		192.500
	Tank walls inside	2	26.300		3.500		184.100
	Cantilever beam	20	1.200	1.410			33.840
	Walkway	2	34.400	1.200			82.560
	Columns	16	2.400		6.450		247.680
		9	1.800		6.450		104.490
	Beams	5	13.900		0.600		41.700
		10	13.900		1.550		215.450
	Foor slab	1	16.750	16.750			280.563
	Total						1382.883
				To	tal Quantity	y in sqm	6174.020
7.019	19.16		-6	18		-	
	stand the hend test			ci standard (mawing and	suitable t	ring o with
	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR	nanent ide with 30x	nical resistand ntification ma 20x15 cm cei	ce test as per ark to be vis- ment concret	specification ible even afto te block 1:3:0	ns and haver fixing if 6 (1ceme	o with ving including ent: 3 coarse
	manufactures perm fixing in manholes sand: 6 graded stor	nanent ide with 30x ne aggrega	nical resistand ntification ma 20x15 cm cei	ce test as per ark to be vis- ment concret	specification ible even afto te block 1:3:0	ns and haver fixing if 6 (1ceme	o with ving including ent: 3 coarse n
	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR	nanent ide with 30x ne aggrega	nical resistand ntification ma 20x15 cm cei	te test as per ark to be vis ment concret minal size)	specification ible even afton the block 1:3:0 Complete as	ns and ha er fixing i 6 (1ceme per desig	o with ving including ent: 3 coarse n 44.000
7.020	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR Total	nanent ide with 30x ne aggrega	nical resistand ntification ma 20x15 cm cei	te test as per ark to be vis ment concret minal size)	specification ible even afto te block 1:3:0	ns and ha er fixing i 6 (1ceme per desig	o with ving including ent: 3 coarse n
7.020	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR Total	anent ide with 30x ne aggrega 44 5000 litre to the rese n 3 m usin	tankers fited ervoir site and g 5 HP diese	te test as per ark to be visment concrete minal size) To in lorry and I pumping the lengine pumping the	specification ible even after block 1:3:0 Complete as tal Quantity conveying we water into	ns and haver fixing in 6 (1 cemes per designate value) value in each value reserves	o with ving including ent: 3 coarse n 44.000 44.000 44.000 a distance voir of
7.020	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR Total 100.36.1 Filling water with of 5 km (average) height not less than	anent ide with 30x ne aggrega 44 5000 litre to the rese n 3 m usin	tankers fited ervoir site and g 5 HP diese	te test as per ark to be visment concrete minal size) To in lorry and I pumping the lengine pumping the	specification ible even after block 1:3:0 Complete as tal Quantity conveying we water into	ns and haver fixing in 6 (1 cemes per designate value) value in each value reserves	o with ving including ent: 3 coarse n 44.000 44.000 44.000 a distance voir of
7.020	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR Total 100.36.1 Filling water with of 5 km (average) height not less than and other applience.	anent ide with 30x ne aggrega 44 5000 litre to the rese n 3 m usin	tankers fited ervoir site and g 5 HP diese	te test as per ark to be visment concrete minal size) To in lorry and I pumping the lengine pumping the	specification ible even after block 1:3:0 Complete as tal Quantity conveying we water into	ns and haver fixing in 6 (1 cemes per designate value) value in each value reserves	o with ving including ent: 3 coarse n 44.000 44.000 44.000 a distance voir of
7.020	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR Total 100.36.1 Filling water with of 5 km (average) height not less than and other applience.	sanent ide with 30x ne aggrega 44 5000 litre to the rese n 3 m usin es and cos	tankers fited ervoir site and g 5 HP diese st of water etc.	re test as per ark to be visment concrete minal size) To in lorry and l pumping the l engine pumping the complete.	specification ible even after the block 1:3:0 Complete as	ns and haver fixing in 6 (1 cemes per designate value) value in each value reserves	o with ving including ent: 3 coarse n 44.000 44.000 44.000 a distance voir of lorry, tools
7.020	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR Total 100.36.1 Filling water with of 5 km (average) height not less than and other applience.	sanent ide with 30x ne aggrega 44 5000 litre to the rese n 3 m usin es and cos	tankers fited ervoir site and g 5 HP diese of water etc.	re test as per ark to be visment concrete minal size) To in lorry and l pumping the lengine pumping the complete.	specification ible even after block 1:3:0 Complete as tal Quantity conveying water into ap set, hire for 3.500	ns and haver fixing in 6 (1 cemes per designate value) value in each value reserves	o with ving including ent: 3 coarse n 44.000 44.000 44.000 a distance voir of lorry, tools
7.020	manufactures perm fixing in manholes sand: 6 graded stor FOR MBBR Total 100.36.1 Filling water with of 5 km (average) height not less than and other applience.	sanent ide with 30x ne aggrega 44 5000 litre to the rese n 3 m usin es and cos	tankers fited ervoir site and g 5 HP diese of water etc. 16.000 15.400	re test as per ark to be visment concrete minal size) To in lorry and I pumping the lengine pumping the complete. 16.000 7.400	tal Quantity conveying value water into ap set, hire f	ns and haver fixing in 6 (1 cemes per designate value) value in each value reserves	o with ving including ent: 3 coarse n 44.000 44.000 44.000 a distance voir of lorry, tools 1792.000 398.860
7.020	manufactures perm fixing in manholes sand: 6 graded store FOR MBBR Total 100.36.1 Filling water with of 5 km (average) height not less that and other applience FOR MBBR	sanent ide with 30x ne aggrega 44 5000 litre to the rese n 3 m usin es and cos	tankers fited ervoir site and g 5 HP diese of water etc. 16.000 15.400	To in lorry and l pumping the lengine pumping the length len	tal Quantity conveying value water into ap set, hire f	ns and haver fixing in a fixin	o with ving including including int: 3 coarse in 44.000 44.000 44.000 a distance voir of lorry, tools 1792.000 398.860 191.660

Providing and fixing balcony railing, state approves steel pring 50mm DIA GI 5.1 Outer total	aircase rai ner.G.I. p	ling and sim			steel lado	ler railing.
	7KG/M3	ipes	mai works, ii	ncluding appl		
Outer total	/ KU/WI.3	2mm DIA G	I -317 KG/N	1		
/1m/c/c vertical 50mm dia	304			0.750	5.1700 00	1178.760
Horizontal 0.25m/c/c -32mm dia	12	76.000			3.1700 00	2891.040
Total						4069.800
				Total Quant	ity in kg	4069.800
13.48.3						
primer as per manu Surface Paint to gi an under coat of pr	ıfacturers ve an eve	specification shade. Two	ns:Painting S o or more co	Steel work wi at applied @	th Deluxe 0.90 ltr/1	Multi 0 sqm over
		456	Shiph I	TOR!	AF	
Vertical pipe			7		100	36.480
• •			\prec			91.200
-	2	e-PLATE	DRM FOR THE	MANAGEMEN	IT.	11.520
	1	13.600	C WORKS	2.050		27.880
Total						167.080
			To	otal Quantity	y in sqm	167.080
Finishing with Epoper manufacturer& of surface, etc. con	:#39;s spe	ecifications in	ncluding app			
TORWIDER	1	6173.910				6173.910
Total		01700710				6173.910
			To	otal Quantity	v in sam	6173.910
20.5.3				2 cm 2 cm	y === > q ===	02.00
Providing, driving specified diameter working load not le black pipe of dia, 2: 2 coarse sand) un centering, shuttering complete but exclushall be measured.	and lengthess than so that so	th below the pecified. Wir grouting with the positive g and removing to steel a second cost of steel and the period of steel a	pile cap in M ith a central th th cement sa pressure to d ing the steel reinforcemen	1-25 cement of through preference on grouting of the complete casing pipe and the casi	concrete to ormed hole of mix 1:2 ete filling and lifting of pile for	o carry safe e with M.S. (1 cement including casing etc. payment
	0.25m/c/c -32mm dia Total 13.48.3 Finishing with Del primer as per manusurface Paint to gi an under coat of properties of properties of properties of surface Properties of surface Properties of surface Properties of surface per manufacturer of surface, etc. conformal properties of diameter working load not black pipe of dia, and centering, shuttering complete but exclusive properties of surface, etc. conformal properties of diameter working load not black pipe of dia, and centering, shuttering complete but exclusive properties of the	12 dia Total 13.48.3 Finishing with Deluxe Multiprimer as per manufacturers Surface Paint to give an eve an under coat of primer applement FOR MBBR Vertical pipe Horizontal pipe Rilling shutters Fixed grills Total 13.52.2 Finishing with Epoxy paint per manufacturer's specified diameter and length working load not less than shall be measured from top and the shall be measured from top and the shall be measured from top and the state of the shall be measured from top and the state of the shall be measured from top and the state of the shall be measured from top and the state of the shall be measured from top and the state of th	Total 13.48.3 Finishing with Deluxe Multi surface pair primer as per manufacturers specification Surface Paint to give an even shade. Two an under coat of primer applied @ 0.80 I FOR MBBR Vertical pipe	13.48.3 Finishing with Deluxe Multi surface paint system for primer as per manufacturers specifications: Painting Surface Paint to give an even shade. Two or more coan under coat of primer applied @ 0.80 ltr/10 sqm of FOR MBBR Vertical pipe 304 0.750 Horizontal pipe 12 76.000 Rilling shutters 2 2.400 Fixed grills 1 13.600 Total	Total Total Quantit	12 76.000 3.1700 00 Total Total Quantity in kg 13.48.3 Finishing with Deluxe Multi surface paint system for interiors and exteriors primer as per manufacturers specifications: Painting Steel work with Deluxe Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/lan under coat of primer applied @ 0.80 ltr/lo sqm of approved brand and more FOR MBBR Vertical pipe 304 0.750 0.160 0.160 0.100

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
		8			45.000		360.000		
	Total						360.000		
				Tot	al Quantity	in metre	360.000		
7.025	20.2A.1								
	specified, excluding the cost bentonite solution temporary casing of length of the pile to be embedded in the pilling Rig all com- including removal payment shall be measured up to bo Note: Truck Moun	pecified diameter and length below pile cap, to carry a safe working load not less that pecified, excluding the cost of steel reinforcement but including the cost of boring with pentonite solution and emporary casing of appropriate length for setting out and removal of same and the ength of the pile to be embedded in the pile cap etc. by Crawler mounted, telescopic boom hydraulic billing Rig all complete, including removal of excavated earth with all its lifts and leads (length of pile for bayment shall be ineasured up to bottom of pile cap). Note: Truck Mounted rotary/TMR/Tube well boring machine shall not be used.600							
	mm dia piles		(1)	SAN DI	BR	FI	۷		
	FOR MBBR	36			45,000		1.620,000		
	Total	30		₹ H	45.000		1620.000 1620.000		
	Total		e-PLATFO	RM FOR TOT	al Quantity	in motro			
7.026	20.5.5		OF PUR		ar Quantity	III IIICU C	1020.000		
1.020	Providing, driving and installing driven Pre-cast reinforced cement concrete piles of specified diameter and length below the pile cap in M-25 cement concrete to carry safe working load not less than specified. With a central through preformed hole with M.S. black pipe of dia, 40 mm for grouting with cement sand grouting of mix 1:2 (1 cement 2 coarse sand) under sufficient positive pressure to ensure complete filling including centering, shuttering, driving and removing the steel casing pipe and lifting casing etc. complete but excluding the cost of steel reinforcement. (Length of pile for payment								
7.026	Providing, driving specified diameter working load not l black pipe of dia, 4: 2 coarse sand) un centering, shuttering	and lengt ess than sp 40 mm for der suffic ng, driving ding the o	h below the pecified. We grouting with ient positive g and remove cost of steel	pile cap in M th a central t th cement sa pressure to e ng the steel or ceinforcemen	1-25 cement chrough preferred grouting censure compleasing pipe ant. (Length of	concrete to ormed hole of mix 1:2 lete filling and lifting of pile for	o carry safe e with M.S. 2 (1 cement g including casing etc. payment		
7.026	Providing, driving specified diameter working load not l black pipe of dia, 2 : 2 coarse sand) un centering, shuttering complete but exclu	and lengt ess than sp 40 mm for der suffic ng, driving ding the o	h below the pecified. We grouting with ient positive g and remove cost of steel	pile cap in M th a central t th cement sa pressure to e ng the steel or ceinforcemen	1-25 cement chrough preferred grouting censure compleasing pipe ant. (Length of	concrete to ormed hole of mix 1:2 lete filling and lifting of pile for	o carry safe e with M.S. 2 (1 cement g including casing etc. payment		
7.026	Providing, driving specified diameter working load not l black pipe of dia, 4: 2 coarse sand) un centering, shuttering complete but exclushall be measured	and lengt ess than sp 40 mm for der suffic ng, driving ding the o	h below the pecified. We grouting with ient positive g and remove cost of steel	pile cap in M th a central t th cement sa pressure to e ng the steel or ceinforcemen	1-25 cement chrough preferred grouting censure compleasing pipe ant. (Length of	concrete to ormed hole of mix 1:2 lete filling and lifting of pile for	o carry safe e with M.S. 2 (1 cement g including casing etc. payment		
7.026	Providing, driving specified diameter working load not l black pipe of dia, 4: 2 coarse sand) un centering, shuttering complete but exclushall be measured	and lengt ess than spaces than spaces 40 mm for ader sufficing, driving ading the of from top of	h below the pecified. We grouting with ient positive g and remove cost of steel	pile cap in M th a central t th cement sa pressure to e ng the steel or ceinforcemen	1-25 cement hrough prefer nd grouting ensure comparising pipe ant. (Length cof pile cap).	concrete to ormed hole of mix 1:2 lete filling and lifting of pile for	o carry safe e with M.S. 2 (1 cement g including casing etc. payment ia piles		
7.026	Providing, driving specified diameter working load not l black pipe of dia, 2: 2 coarse sand) un centering, shuttering complete but exclushall be measured FOR MBBR	and lengt ess than spaces than spaces 40 mm for ader sufficing, driving ading the of from top of	h below the pecified. We grouting with ient positive g and remove cost of steel	pile cap in M th a central t th cement sa pressure to e ng the steel or einforcement the bottom	1-25 cement hrough prefer nd grouting ensure comparising pipe ant. (Length cof pile cap).	concrete to ormed hole of mix 1:2 lete filling and lifting of pile for 750 mm d	o carry safe e with M.S. 2 (1 cement g including casing etc. payment ia piles		
	Providing, driving specified diameter working load not l black pipe of dia, 2: 2 coarse sand) un centering, shuttering complete but exclushall be measured FOR MBBR	and lengt ess than spaces than spaces 40 mm for ader sufficing, driving ading the of from top of	h below the pecified. We grouting with ient positive g and remove cost of steel	pile cap in M th a central t th cement sa pressure to e ng the steel or einforcement the bottom	1-25 cement through prefer and grouting ensure complexing pipe ant. (Length of pile cap).	concrete to ormed hole of mix 1:2 lete filling and lifting of pile for 750 mm d	o carry safe e with M.S. 2 (1 cement g including casing etc. payment ia piles 1080.000 1080.000		
	Providing, driving specified diameter working load not l black pipe of dia, 2: 2 coarse sand) un centering, shutterin complete but exclushall be measured FOR MBBR	and lengtess than space of piles ling platfor test cap a ser -in-Characters than space of the ser -in-Characters than spac	h below the pecified. We grouting with the positive grouting with the pecific positive grouting and remove cost of steel to the shoe to the shoe to the shoe to the period are ground preparate test etc. arge.	pile cap in M th a central t th cement sa pressure to e ng the steel or einforcement the bottom Total ce with IS 29 aration of pil complete as	1-25 cement chrough prefer and grouting gensure completes and (Length of pile cap). 45.000 al Quantity 211(Part IV) the head or coper specifications.	concrete to primed hole of mix 1:2 lete filling and lifting of pile for 750 mm defined including instruction	o carry safe e with M.S. 2 (1 cement g including casing etc. payment ia piles 1080.000 1080.000 1080.000		
	Providing, driving specified diameter working load not l black pipe of dia, 2: 2 coarse sand) un centering, shuttering complete but exclushall be measured FOR MBBR Total 20.6.3.1 Vertical load testing installation of load and dismantling of direction of engine	and lengtess than space of piles ling platfor test cap a ser -in-Characters than space of the ser -in-Characters than spac	h below the pecified. We grouting with the positive grouting with the pecific positive grouting and remove cost of steel to the shoe to the shoe to the shoe to the period are ground preparate test etc. arge.	pile cap in M th a central t th cement sa pressure to e ng the steel or einforcement the bottom Total ce with IS 29 aration of pil complete as	1-25 cement chrough prefer and grouting gensure completes and (Length of pile cap). 45.000 al Quantity 211(Part IV) the head or coper specifications.	concrete to primed hole of mix 1:2 lete filling and lifting of pile for 750 mm defined including instruction	o carry safe e with M.S. 2 (1 cement g including casing etc. payment ia piles 1080.000 1080.000 1080.000		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	750mm	2					2.000
	600mm	4					4.000
	Total			,			8.000
				Total	Quantity in	per test	8.000
7.028	20.6.3.2						
	Vertical load testing installation of load and dismantling of direction of engine Group of two or m	ling platfo f test cap a eer -in-Ch	orm and prepa after test etc. arge.	aration of pile complete as	e head or cor per specifica	nstruction	of test cap
	FOR MBBR		Т				
	500mm	2					2.000
	750mm	4					4.000
	600mm	8		0.0			8.000
	Total		-6			THE RESERVE OF STREET	14.000
				Total	Quantity in	per test	14.000
8	SECONDARY CI	ARIFIEF	R WITH PLA	TE SETTLE	ER .	4.5	
8.001	2.6.1					_	
	Earth work in exca over areas (exceed including disposal earth to be levelled	ing 30 cm of excava	n in depth, 1.: nted earth, lea	5 m in width ad up to 50 m	as well as 10 and lift up t) sqm on p	olan)
	FOR SECONDAR	Y CLAR	IFIER WITH	I PLATE SE	ETTLER		
	For clarifier	1	9.800	9.800	0.900		86.436
	Total						0 (10 (
							86.436
				To	tal Ouantity	v in cum	
8,002	4.1.6			To	tal Quantity	y in cum	
8.002	4.1.6 Providing and layi of centering and sl sand : 6 graded sto	nuttering -	All work up	concrete of s	pecified grad	le excludi	86.436
8.002	Providing and layi	nuttering - one aggreg	All work up gate 40 mm n	concrete of s to plinth lev ominal size)	pecified gradel:1:3:6 (1 c	le excludi	86.436
8.002	Providing and layi of centering and sl sand : 6 graded sto	nuttering - one aggreg	All work up gate 40 mm n	concrete of s to plinth lev ominal size)	pecified gradel:1:3:6 (1 c	le excludi	ng the cost coarse
8.002	Providing and layi of centering and sl sand : 6 graded sto FOR SECONDAR For clarifier	nuttering - one aggreg	All work up gate 40 mm n IFIER WITH	concrete of so to plinth levominal size)	pecified gradel:1:3:6 (1 c	le excludi	86.436 ng the cost coarse
8.002	Providing and layi of centering and sl sand : 6 graded sto FOR SECONDAR For clarifier foundation	nuttering - one aggreg	All work up gate 40 mm n IFIER WITH	concrete of so to plinth levominal size) I PLATE SE 9.800	pecified gradel:1:3:6 (1 c	le excludi cement : 3	14.406

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity								
	Providing and layicement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per	rork, using ally automal leads, had grade for it mixer to orcement accelerate and dural onsidered ayable/re	g cement con natic batching aving continu- r reinforced co o site of layin including co / retard settin bility as per continuity as per co	tent as per ap g plant and tra jous agitated ement concrete, excluding st of admixture ag of concrete direction of the s @ 330 kg/c parately.All	pproved designansported to mixer, manuete work incomes in recome, improve whe Engineer um. Excess / wiork upto p	gn mix, site of wo afactured a luding pure terring, amended provided in -chargaless cemes	ork in as per mix mping of shuttering proportions y without ge. Note:-ent used as								
	FOR SECONDAL	RY CLAF	RIFIER WITI	H PLATE SI	ETTLER	Ī									
	Base slab-raft beam slab type	1	9.800	9.800	0.350		33.614								
	Base slab inverted beams	4	8.250	0.350	0.550		6.353								
	Total		-	M			39.967								
			9	To	tal Quantity	y in cum	39.967								
8.004	5.37.2		40.04	20025	ARI	A F	-								
	transit mixer for all design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per floor V level	I grade for it mixer to orcement accelerate and dural onsidered	r reinforced of site of laying including conference of retard setting bility as per conference in this item is	ement concrude, excluding st of admixturing of concretilirection of the algorithms and the algorithms are algorithms.	ete work inc the cost of courses in recome e, improve vone Engineer- um. Excess /	luding purentering, amended proorkabilities in -chargares ceme	mping of shuttering proportions y without ge. Note:-ent used as								
	FOR SECONDAL	RY CLAF	RIFIER WITI	H PLATE SI	ETTLER		floor V level FOR SECONDARY CLARIFIER WITH PLATE SETTLER								
	Columns -long	8	0.350	0.350	5.900		5.782								
	Columns -long Columns -short	8	0.350 0.350	0.350 0.350	5.900 0.400										
	1			Ī											
	Columns -short Clarifier square	4	0.350	0.350	0.400		0.196								
	Columns -short Clarifier square container Clarifier hopper	4	0.350 8.300	0.350	0.400 2.900		0.196 28.884 27.982								
	Columns -short Clarifier square container Clarifier hopper container	4 4	0.350 8.300 6.550	0.350 0.300 0.300	0.400 2.900 3.560		0.196 28.884 27.982 5.198								
	Columns -short Clarifier square container Clarifier hopper container Top beams	4 4 4	0.350 8.300 6.550 8.250	0.350 0.300 0.300 0.350	0.400 2.900 3.560 0.450		28.884								
	Columns -short Clarifier square container Clarifier hopper container Top beams Walkways	4 4 4	0.350 8.300 6.550 8.250	0.350 0.300 0.300 0.350	0.400 2.900 3.560 0.450		0.196 28.884 27.982 5.198 2.208								
	Columns -short Clarifier square container Clarifier hopper container Top beams Walkways Total	4 4 4	0.350 8.300 6.550 8.250	0.350 0.300 0.300 0.350	0.400 2.900 3.560 0.450	0.0100	0.196 28.884 27.982 5.198 2.208								

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
				To	otal Quantit	y in cum	70.250
8.005	5.34.1						
	Extra for providing specified cement of grade concrete instead in M-30 is @ 340	ontent us tead of M	ed is payable	/ recoverable	e separately.I	Providing	M-30
	FOR SECONDA	RY CLAF	RIFIER WITI	H PLATE S	ETTLER		
	QTY AS PER ITEM NO.5.37.1	1	39.970				39.970
	QTY. AS PER ITEM NO.5.37.2	1	70.240				70.240
	Total						110.210
				To	otal Quantit	y in cum	110.210
8.006	OD57007/2022-20)23					
	Extra for providing		/ 43	7 - 7 - 7 - 7		-	\
	FOR SECONDAR	Y CLAR	IFIER WITH	I PLATE SI	ETTLER	ET	\
	QTY AS PER ITEM NO.5.37.1	1	39.970	September 1	DRA	41	39.970
	QTY. AS PER ITEM NO.5.37.2	1	70.240	~			70.240
	Total		e-PLATFO	RM FOR THE	MANAGEMEN	JT.	110.210
				To	otal Quantit	y in cum	110.210
8.007	5.22.6						
	Steel reinforcemer in position and bin bars of grade Fe-5	ding all c	omplete upto				
	SECONDARY C	LARIFIE	R WITH PLA	ATE SETTI	ER		
	QTY AS PER ITEM NO.5.37.1	1	39.970			120.00 0000	4796.400
	QTY. AS PER ITEM NO.5.37.2	1	70.240			120.00 0000	8428.800
	Total						13225.20 0
				Total (Quantity in l	kilogram	13225.20 0
8.008	OD57006/2022-20)23					
	Extra for providing	g epoxy c	oating for rei	nforcement	bar		
	FOR SECONDA	RY CLAF	RIFIER WITI	H PLATE S	ETTLER		
	QTY AS PER ITEM NO.5.37.1	1	39.970			120.00 0000	4796.400
	QTY. AS PER ITEM NO.5.37.2	1	70.240			120.00 0000	8428.800

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Total						13225.20 0			
				ı	Total Quant	ity in kg	13225.20 0			
8.009	4.12									
	Extra for providing doses by weight of						work in			
	FOR SECONDARY CLARIFIER WITH PLATE SETTLER									
	QTY AS PER ITEM NO.5.37.1	1	39.970			340.00 0000	13589.80 0			
	QTY. AS PER ITEM NO.5.37.2	1	70.240			340.00 0000	23881.60 0			
	Total						37471.40 0			
			C.S.		Total Quant	ity in kg	37471.40 0			
8.010	5.9.1		4	PANTY!	-01	FI				
	Centering and shur footings, bases of				removal of f	orm for:F	oundations,			
	FOR SECONDA	RY CLAF	RIFIER WIT	<mark>H PL</mark> ATE S	ETTLER					
	Base slab-raft beam slab type	4	9.800	ORM FOR THE IC WORKS	0.350	rr	13.720			
	Base slab inverted beams	4	8.600		0.450		15.480			
	Base slab inverted beam	4	7.900		0.450		14.220			
	Total						43.420			
				T	otal Quantit	y in sqm	43.420			
8.011	5.9.2									
	Centering and shut thickness) including	ttering ind ng attache	cluding strutt d pilasters, b	ing, etc. and utteresses, p	removal of f	orm for: V	Valls (any s etc.			
	FOR SECONDAL			H PLATE S						
	Columns -long	8	1.400		5.900		66.080			
	Clarifian	4	1.400		0.400		2.240			
	Clarifier- squarecontainer	8	8.300		2.900		192.560			
	Clarifier-hopper container	8	6.550		3.560		186.544			
	top beams	4	8.250		1.250		41.250			
	Walkways	4	9.200		0.600		22.080			
	Total						510.754			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
				To	otal Quantit	y in sqm	510.754	
8.012	22.23.1							
	waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requipermeability of condition DIN 1048 and resisurry shall be capiline shall be carried out engineerincharge. The product leakage. For vertication FOR SECONDAL Inide of wallsupper	treatment 5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir ol concrete side. The .50mm. T tion of the	rts arts g the ne material ng as per crystalline he work					
	Inside of walls- lower	4	6.250	\prec	3.560		89.000	
	Total		e-PLATFO	ORM FOR THE	MANAGEMEN	JT	181.800	
				To	otal Quantit	y in sqm	181.800	
6.013	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement water tanks, roof slabs, podiums, reservior, sewage & Discourse and 3:1 (3 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The mass shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The cryst slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The worshall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any							
	slurry shall be cap shall be carried ou engineerin-	able of set t all comp ct perforn	lf-healing of plete as per sp nance shall ca	cracks up to pecification a arry guarante	a width of 0 and the directed for 10 years	.50mm. T tion of the	he work	
	slurry shall be cap shall be carried ou engineerin- charge. The produ- leakage.For horizo FOR SECONDAL	able of set t all comp ct perforn ontal surfa	If-healing of olete as per spance shall cance one coat	cracks up to pecification a arry guarante @ 1.10 kg per	a width of 0 and the directed for 10 years sqm.	.50mm. T tion of the	he work	
	slurry shall be cap shall be carried ou engineerin- charge. The produ- leakage.For horizo	able of set t all comp ct perforn ontal surfa	If-healing of olete as per spance shall cance one coat	cracks up to pecification a arry guarante @ 1.10 kg per	a width of 0 and the directed for 10 years sqm.	.50mm. T tion of the	he work	
	slurry shall be cap shall be carried ou engineerin- charge. The produ- leakage.For horizo FOR SECONDAL Bottom slab	able of set t all comp ct perform ontal surfa RY CLAF	If-healing of olete as per spenance shall cace one coat (RIFIER WIT)	cracks up to pecification a arry guarante @1.10 kg per H PLATE S	a width of 0 and the directed for 10 years sqm.	.50mm. T tion of the	he work any	

0.01.1	Specification	No	Length	Width	Depth	Cf	Quantity			
8.014	13.7.1									
	12 mm cement plaster finished with a floating coat of neat cement of mix:1:3 (1 cement : 3 fine sand)									
	FOR SECONDA	RY CLAR	IFIER WITH	PLATE SE	ETTLER					
	Inside of walls- upper	4	8.000		2.900		92.800			
	Inside of walls	4	6.250		3.560		89.000			
	Base slab inside	1	4.500	4.500			20.250			
	Outer of walls- upper	4	8.600		2.900		99.760			
	Outer of walls- lower	of walls-	5.100		3.100		63.240			
	Walkways	4	9.200		1.200		44.160			
	Total						409.210			
			-61	To	tal Quantity	in sqm	409.210			
8.015	19.16		MATE	@4F41	15	ET	1			
	top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to wistand the bend test and chemical resistance test as per specifications and having manufactures permanent identification mark to be visible even after fixing including in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement: 3 sand: 6 graded stone aggregate 20 mm nominal size) Complete as per design									
	sand: 6 graded sto	ne aggrega	20x15 cm cen nte 20 mm no	nent concrete minal size) C	ble even afte e block 1:3:6 Complete as	er fixing i 5 (1ceme	ving ncluding nt: 3 coarse			
	sand: 6 graded sto	ne aggrega RY CLAR	20x15 cm cen nte 20 mm no	nent concrete minal size) C	ble even afte e block 1:3:6 Complete as	er fixing i 5 (1ceme	ving ncluding nt: 3 coarse n			
	sand: 6 graded sto FOR SECONDA	ne aggrega	20x15 cm cen nte 20 mm no	nent concrete minal size) C	ble even afte e block 1:3:6 Complete as	er fixing i 5 (1ceme	ving ncluding nt: 3 coarse n			
	sand: 6 graded sto	ne aggrega RY CLAR	20x15 cm cen nte 20 mm no	nent concrete minal size) C PLATE SE	ble even afte e block 1:3:6 Complete as p ETTLER	er fixing i	ving ncluding nt: 3 coarse n 19.000			
	sand: 6 graded sto FOR SECONDA Total	ne aggrega RY CLAR	20x15 cm cen nte 20 mm no	nent concrete minal size) C PLATE SE	ble even afte e block 1:3:6 Complete as	er fixing i	ving ncluding nt: 3 coarse n			
8.016	FOR SECONDAL Total 100.36.1 Filling water with of 5 km (average) height not less tha	ne aggrega RY CLAR 19 5000 litre to the rese n 3 m usin	20x15 cm center 20 mm north 15	rent concrete minal size) Concrete PLATE SE Total in lorry and pumping the engine pum	ble even after block 1:3:6 Complete as particular to the conveying we water into	in each	ncluding nt: 3 coarse n 19.000 19.000 19.000 n a distance yoir of			
8.016	FOR SECONDAL Total 100.36.1 Filling water with of 5 km (average) height not less tha and other applience	ne aggrega RY CLAR 19 5000 litre to the rese n 3 m usin es and cos	tankers fited arvoir site and g 5 HP diesel t of water etc	rent concrete minal size) Concrete Minal Size Mi	ble even after block 1:3:6 complete as particular b	in each	ncluding nt: 3 coarse n 19.000 19.000 19.000 n a distance yoir of			
8.016	FOR SECONDAL Total 100.36.1 Filling water with of 5 km (average) height not less tha	ne aggrega RY CLAR 19 5000 litre to the rese n 3 m usin es and cos	tankers fited arvoir site and g 5 HP diesel tof water etc	rent concrete minal size) Concrete Minal Size Mi	ble even after block 1:3:6 complete as partition and Quantity conveying we water into p set, hire for	in each	ncluding nt: 3 coarse n 19.000 19.000 19.000 n a distance voir of lorry, tools			
8.016	FOR SECONDAL Total 100.36.1 Filling water with of 5 km (average) height not less tha and other applience	5000 litre to the rese n 3 m usin es and cos	tankers fited arvoir site and g 5 HP diesel t of water etc	rent concrete minal size) Concrete minal size mina	ble even after block 1:3:6 complete as particular b	in each	19.000 19.000 19.000 19.000 19.000 19.000 19.000 19.000 19.000			
8.016	FOR SECONDAL Total 100.36.1 Filling water with of 5 km (average) height not less tha and other applience	5000 litre to the rese n 3 m usin es and cos	tankers fited aryoir site and g 5 HP diesel t of water etc IFIER WITH	rent concrete minal size) Concrete Minal size Min	ble even after block 1:3:6 complete as complete as complete as conveying we water into p set, hire for the conveying water into p set, hire for the conveying water into p set.	in each	ncluding nt: 3 coarse n 19.000 19.000 19.000 n a distance yoir of			
8.016	FOR SECONDAL Total 100.36.1 Filling water with of 5 km (average) height not less tha and other applience FOR SECONDAL	5000 litre to the rese n 3 m usin es and cos	tankers fited aryoir site and g 5 HP diesel t of water etc IFIER WITH	rent concrete minal size) Concrete minal size mina	ble even after block 1:3:6 complete as complete as complete as conveying we water into p set, hire for the conveying water into p set, hire for the conveying water into p set.	in each	19.000 19.000 19.000 19.000 19.000 19.000 19.000 19.000 19.000 19.000 19.000 19.000			

dia Horizontal 0.25m/c/c -32mm 3 36.800 3.1700 349.968 dia Total 493.436 Total 493.436 8.018 8.018 Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications: Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture FOR SECONDARY CLARIFIER WITH PLATE SETTLER Vertical pipe 37 0.750 0.160 4.440 Horizontal pipe 3 36.800 0.100 11.040 Total 15.480 Total Quantity in sqm 15.480 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer':s specifications including appropriate priming coat, preparation of surface, etc. complete. On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 409.210 Total 409.210 Total 409.210 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 1.6.810	Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
Outer total /Im/ c/c vertical 50mm dia		balcony railing, sta	aircase rai	ling and sim				
C/c vertical 50mm 37		50mm DIA GI 5.1	7Kg/m.32	2mm DIA GI	-317 Kg/m			
0.25m/c/c -32mm 3 36.800 3.1700 349.968		c/c vertical 50mm	37			0.750		143.468
8.018 13.48.3 Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications:Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture FOR SECONDARY CLARIFIER WITH PLATE SETTLER Vertical pipe 37 0.750 0.160 4.440 Horizontal pipe 3 36.800 0.100 11.040 Total 15.480 8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 409.210 Total 409.210 Total 409.210 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810		0.25m/c/c -32mm	3	36.800				349.968
8.018 13.48.3 Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications: Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture FOR SECONDARY CLARIFIER WITH PLATE SETTLER Vertical pipe 37 0.750 0.160 4.440 Horizontal pipe 3 36.800 0.100 11.040 Total		Total						493.436
Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications:Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture FOR SECONDARY CLARIFIER WITH PLATE SETTLER Vertical pipe 37 0.750 0.160 4.440 Horizontal pipe 3 36.800 0.100 11.040 Total 15.480 Total Quantity in sqm 15.480 8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturere#39;s specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 409.210 Total 409.210 9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810					,	Total Quant	ity in kg	493.436
primer as per manufacturers specifications: Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture FOR SECONDARY CLARIFIER WITH PLATE SETTLER Vertical pipe 37 0.750 0.160 4.440 Horizontal pipe 3 36.800 0.100 11.040 Total 15.480 Total Quantity in sqm 15.480 8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 409.210 Total 409.210 Total Quantity in sqm 409.210 9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	8.018	13.48.3					·	
Vertical pipe 37 0.750 0.160 4.440 Horizontal pipe 3 36.800 0.100 11.040 Total 15.480 Total Total 15.480 Total Quantity in sqm 15.480 8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 409.210 Total 409.210 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810		primer as per manu Surface Paint to gi an under coat of pr	ufacturers ve an eve imer appl	specification shade. Two lied @ 0.80 l	ns:Painting S o or more coa tr/10 sqm of	teel work wi at applied @ approved bra	th Deluxe 0.90 ltr/1	Multi O sqm over
Horizontal pipe 3 36.800 0.100 11.040 Total 15.480 Total Quantity in sqm 15.480 8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 409.210 Total 409.210 9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810					H PLATE S		AB	4 4 4 0
Total Total Total Total Quantity in sqm 15.480 8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 Total 409.210 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810		• •			311			
8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 Total 409.210 Total 409.210 9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total		Horizontal pipe	3	36.800		0.100		11.040
8.019 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 Total 409.210 Total 409.210 9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810		T-4-1				-		
Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work FOR SECONDARY CLARIFIER WITH PLATE SETTLER 1 409.210 Total Total 409.210 9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed.All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total		Total		e-PLATFC	DRM FOR THE	4-10	77	15.480
Total 409.210 Total 409.210 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	9.010			OF PUBL	HM FOR THE C WORKS T	otal Quantit	77	
Total Quantity in sqm 409.210 9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	8.019	13.52.2 Finishing with Epoper manufacturer&	z#39;s spe	(two or more	coats) at all	locations pro	y in sqm	15.480 15.480
9 SLUDGE SUMP 9.001 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	8.019	13.52.2 Finishing with Epo per manufacturer& of surface, etc. con	z#39;s spe nplete.On	(two or more ecifications in concrete wo	coats) at all acluding app rk	locations propriate prim	y in sqm	15.480 15.480 d applied as preparation
9 SLUDGE SUMP 9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total	8.019	13.52.2 Finishing with Epo per manufacturer& of surface, etc. con	z#39;s spe nplete.On	(two or more ecifications in concrete wo	coats) at all acluding app rk	locations propriate prim	y in sqm	15.480 15.480 d applied as preparation
9.001 2.6.1 Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	8.019	13.52.2 Finishing with Epoper manufacturer& of surface, etc. conFOR SECONDAL	z#39;s spe nplete.On	(two or more ecifications in concrete wo	coats) at all acluding app rk	locations propriate prim	y in sqm	15.480 15.480 d applied as preparation 409.210
Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	8.019	13.52.2 Finishing with Epoper manufacturer& of surface, etc. conFOR SECONDAL	z#39;s spe nplete.On	(two or more ecifications in concrete wo	coats) at all ncluding app rk H PLATE S	locations pro ropriate prim	y in sqm epared and ing coat,	15.480 15.480 d applied as preparation 409.210 409.210
over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil SLUDGE SUMP-Circular For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810		13.52.2 Finishing with Epoper manufacturer& of surface, etc. correct SECONDAL Total	z#39;s spe nplete.On	(two or more ecifications in concrete wo	coats) at all ncluding app rk H PLATE S	locations pro ropriate prim	y in sqm epared and ing coat,	15.480 15.480 d applied as preparation 409.210 409.210
For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	9	13.52.2 Finishing with Epoper manufacturer& of surface, etc. conformation FOR SECONDAL Total SLUDGE SUMP	z#39;s spe nplete.On	(two or more ecifications in concrete wo	coats) at all ncluding app rk H PLATE S	locations pro ropriate prim	y in sqm epared and ing coat,	15.480 15.480 d applied as preparation 409.210 409.210
For Sludge sump 1 4.100 4.100 1.000 16.810 Total 16.810	9	13.52.2 Finishing with Epoper manufacturer& of surface, etc. conformation FOR SECONDAL Total SLUDGE SUMP 2.6.1 Earth work in excause over areas (exceed including disposal	avation by ing 30 cm of excava	two or more ecifications in concrete work and the second of the second o	coats) at all acluding appork H PLATE S To means (Hyd 5 m in width ad up to 50 n	locations proropriate prime ETTLER otal Quantity raulic excava as well as 10 and lift up 1	y in sqm epared and ing coat, y in sqm ator)/manu	15.480 15.480 1 applied as preparation 409.210 409.210 409.210
	9	13.52.2 Finishing with Epoper manufacturer& of surface, etc. conformation FOR SECONDAL Total SLUDGE SUMP 2.6.1 Earth work in excapate over areas (exceed including disposal earth to be levelled)	x#39;s spenplete.On RY CLAF 1 avation by ing 30 cm of excaval and neat	two or more ecifications in concrete work and the second of the second o	coats) at all acluding appork H PLATE S To means (Hyd 5 m in width ad up to 50 n	locations proropriate prime ETTLER otal Quantity raulic excava as well as 10 and lift up 1	y in sqm epared and ing coat, y in sqm ator)/manu	15.480 15.480 1 applied as preparation 409.210 409.210 409.210
Total Quantity in cum 16.810	9	Finishing with Epoper manufacturer& of surface, etc. con FOR SECONDAI Total SLUDGE SUMP 2.6.1 Earth work in exca over areas (exceed including disposal earth to be levelled SLUDGE SUMP-0	avation by ing 30 cm of excaval and neat	two or more ecifications in concrete work and the second state of	means (Hyd 5 m in width ad up to 50 n	locations preropriate prime ETTLER otal Quantit raulic excava as well as 10 and lift up to	y in sqm epared and ing coat, y in sqm ator)/manu	15.480 15.480 d applied as preparation 409.210 409.210 409.210 all means plan) disposed
	9	For Sludge sump	avation by ing 30 cm of excaval and neat	two or more ecifications in concrete work and the second state of	means (Hyd 5 m in width ad up to 50 n	locations preropriate prime ETTLER otal Quantit raulic excava as well as 10 and lift up to	y in sqm epared and ing coat, y in sqm ator)/manu	15.480 15.480 d applied as preparation 409.210 409.210 409.210 all means plan)

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	Providing and layi of centering and sl sand: 6 graded sto	nuttering -	- All work up	to plinth lev	vel:1:3:6 (1 c			
	SLUDGE SUMP-	Circular						
	For Sludge sump	1	4.100	4.100	0.150		2.522	
	Total							
	Total Quantity in cum							
9.003	5.37.1							
	cement concrete w manufactured in futransit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is p SLUDGE SUMP- Base slab	ally auton Il leads, had grade fo it mixer to orcement accelerate and dura onsidered oayable/re	natic batching aving continu r reinforced of o site of laying including control of retard setting bility as per of in this item in ecoverable see	g plant and training of concrete direction of the second s	ansported to mixer, manurete work ince the cost of cares in recome, improve whe Engineer cum. Excess wiork upto p	site of woufactured luding purcentering, mended powerkability in -charge/less ceme	as per mix mping of shuttering proportions by without ge. Note:- ent used as 1	
		4	2.900	0.300	0.600		2.088	
	Tank Walls	1	10.210	0.250	2.700		6.892	
	Walk Way	1	16.400	0.600	0.100		0.984	
	Total						15.007	
				To	otal Quantity	y in cum	15.007	
9.004	Extra for providing specified cement of grade concrete insi in M-30 is @ 340	content us tead of M kg/cum).	ed is payable	/ recoverable	e separately.	Providing	M-30	
	QTY as per item code no5.37.1	15.007					15.007	
	Total						15.007	
				To	otal Quantity	y in cum	15.007	
9.005	OD57071/2022-20)23						
	Extra for providing	g sulphate	resistant cer	ment for the	structures			
	SLUDGE SUMP-							
	QTY as per item code no.5.37.1	1	15.007				15.007	
	Total						15.007	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
				To	otal Quantit	y in cum	15.007		
9.006	5.22.6								
	Steel reinforcemer in position and bin bars of grade Fe-5	ding all c	omplete upto	ading straigh plinth level	tening, cuttin Thermo - Me	ng, bendin echanicall	g, placing y Treated		
	SLUDGE SUMP-	Circular							
	QTY as per item code5.37.1 1 15.000 120.00 0000								
	Total 1800.0								
				Total (Quantity in k	kilogram	1800.000		
9.007	4.12								
	Extra for providing doses by weight of	g and mix cement a	ing water pro as per manufa	oofing mater acturer'	ial in cement s specification	concrete on .	work in		
	FOR SLUDGE SU	JMP		/NAT					
	QTY as per item code5.37.1	1	15.000	OM.		340.00 0000	5100.000		
	Total		300	Steller	BR	AF	5100.000		
				7	Total Quant	ity in kg	5100.000		
9.008	OD57082/2022-20)23							
	Extra for providing	g epoxy c	oating for rei	nforcement l	oar wagemen	TT.			
	SLUDGE SUMP-	Circular	OF PUBL	C WORKS		en ur			
	QTY same as per item code no.5.22.6	1	1800.000				1800.000		
	Total						1800.000		
				,	Total Quant	ity in kg	1800.000		
9.009	5.9.1								
	Centering and shur footings, bases of				removal of f	orm for:F	oundations,		
	SLUDGE SUMP-	Circular							
	Bottom slab	4	4.100		0.300		4.920		
		4	2.900		1.200		13.920		
	Total						18.840		
				To	otal Quantit	y in sqm	18.840		
9.010	5.9.2								
	Centering and shuthickness) including								
	SLUDGE SUMP-	Circular							
	For Walls Out side	1	10.990		2.700		29.673		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	For Walls Inside	1	9.420		2.700		25.434			
	Walk Way	1	16.400		0.600		9.840			
	Total						64.947			
				To	otal Quantity	y in sqm	64.947			
9.011	waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requested permeability of co DIN 1048 and resi slurry shall be cap shall be carried out engineerin-	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & mp; water treatment plant,								
	charge. The produ leakage.For vertica SLUDGE SUMP- Inside of Walls	al surface				rs against	25.434			
	Total		OF PUBLIC	WORKS			25.434			
				To	otal Quantit	y in sqm	25.434			
9.012	22.23.2	1	1 (11'		11 '1' '	C				
9.012	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requiremeability of co DIN 1048 and resistant shall be carried out engineerincharge. The produ	tment to the labs, poding edeck et es slurry: 2 es slurry: 1 ee (internative ments increte by stant to 1 eable of set all compact performance to the label of the label edeck	the RCC structums, reservice., prepared by parts water) part water) fully side with the as specified in more than 90 for bar hydrostalf-healing of collete as per spenance shall carried.	etures like report, sewage & or, sewage & or, sewage & or, sewage	taining walls camp; water to the ratio of 5 surfaces and 1 surfaces and 1 surfaces and 1 thetic fiber 3R-2010 i.e. to 1 with control on negative a width of 0 and the directors for 10 years	of the bareatment 5:2 (5 pa 3:1 (3 pa d applying brush. The by reducing l concrete side. The 50mm. The ion of the	rts arts g the ne material g as per crystalline he work			
9.012	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requiremeability of co DIN 1048 and resistance shall be cap shall be carried out engineerin-	tment to the labs, poding edeck et es slurry: 2 es slurry: 1 to (internative ments increte by stant to 10 able of set all comportal surface	the RCC structums, reservice., prepared by parts water) part water) fully side with the as specified in more than 90 for bar hydrostalf-healing of collete as per spenance shall carried.	etures like report, sewage & or, sewage & or, sewage & or, sewage	taining walls camp; water to the ratio of 5 surfaces and 1 surfaces and 1 surfaces and 1 thetic fiber 3R-2010 i.e. to 1 with control on negative a width of 0 and the directors for 10 years	of the bareatment 5:2 (5 pa 3:1 (3 pa d applying brush. The by reducing l concrete side. The 50mm. The ion of the	rts arts g the ne material g as per crystalline he work			
9.012	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requipermeability of co DIN 1048 and resis slurry shall be cap shall be carried out engineerincharge. The produte leakage. For horizon	tment to the labs, poding edeck et es slurry: 2 es slurry: 1 to (internative ments increte by stant to 10 able of set all comportal surface	the RCC structums, reservice., prepared by parts water) part water) fully side with the as specified in more than 90 for bar hydrostalf-healing of collete as per spenance shall carried.	etures like report, sewage & or, sewage & or, sewage & or, sewage	taining walls camp; water to the ratio of 5 surfaces and 1 surfaces and 1 surfaces and 1 thetic fiber 3R-2010 i.e. to 1 with control on negative a width of 0 and the directors for 10 years	of the bareatment 5:2 (5 pa 3:1 (3 pa d applying brush. The by reducing l concrete side. The 50mm. The ion of the	rts arts g the ne material g as per crystalline he work			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
		-		To	otal Quantit	y in sqm	7.070		
9.013	13.7.1								
	12 mm cement pla cement : 3 fine sar		ned with a flo	eating coat of	f neat cemen	t of mix:1	:3 (1		
	SLUDGE SUMP-	Circular							
	Inside of Walls	1	9.420		2.700		25.434		
	Base slab inside	1	7.070				7.070		
	Out Side Wall	1	7.070		3.000		21.210		
	Walk Way	1	16.400		1.200		19.680		
	Total						73.394		
				T	otal Quantit	y in sqm	73.394		
9.014	19.16			<u> </u>					
	stand the bend test manufactures pern fixing in manholes sand: 6 graded sto SLUDGE SUMP-	nanent ide s with 30x ne aggreg Circular	entification m 20x15 cm ce	a <mark>rk to</mark> be vis ment concre	sible even aft te block 1:3:	er fixing i 6 (1ceme	including ent: 3 coarso n		
		8					8.000		
	Total						8.000		
				To	tal Quantity	y in each	8.000		
9.015	100.36.1								
	Filling water with of 5 km (average) height not less tha and other applience	to the reson 3 m using the season and co	ervoir site an ng 5 HP diese	d pumping the cl engine pur	he water into	the reserv	voir of		
	SLUDGE SUMP-	Circular							
		1	7.070		2.700		19.089		
	Total 19.0								
				Total (Quantity in 1	Silo litre	19.089		
9.016	Providing and fixi balcony railing, st								
	approves steel prin	ner.G.I. p	ipes						
	50mm dia GI-5.17	kg/m,32n	nmdiaGI -3.1	7kg/m					

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Outer total /1m c/c vertical 50mm dia	11			0.750	5.1700 00	42.653			
	Horizontal.25mc/ c-32mm dia	3	10.990			3.1700 00	104.515			
	Total						147.168			
				ı	Total Quant	ity in kg	147.168			
9.017	13.48.3									
	Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications:Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture									
	SLUDGE SUMP-									
	Vertical Pipe	11	0.750	20.02.163	0.160		1.320			
	Horizontal Pipe	3	10.990	18	0.100		3.297			
	Total		F)				4.617			
			1000	T	otal Quantit	y in sqm	4.617			
9.018	13.52.2		-			100				
	Finishing with Epoper manufacturer& of surface, etc. con	z#39;s spe nplete.On	ecifications in	ncluding app	ropriate prin	ning coat,	preparation			
	SLUDGE SUMP-0						72 200			
	Total	73.38					73.380 73.380			
	Total			T	otal Owantit	: a a	73.380			
10	CLUDGE THICK	ENIED C:	1	10	otal Quantit	y in sqin _l	73.380			
	SLUDGE THICKI	ENEK-Ci	rcular							
10.00 1							_			
1	Earth work in exca over areas (exceed including disposal earth to be levelled	ing 30 cm of excava	n in depth, 1.: ated earth, lea	5 m in width ad up to 50 n	as well as 10 as 10 and lift up t	o sqm on	olan)			
	FOR SLUDGE TH	HCKENE	ER			· · · · · · · · · · · · · · · · · · ·				
		1	8.200	8.200	1.200		80.688			
	Total						80.688			
				To	otal Quantit	y in cum	80.688			
10.00	4.1.6 Providing and layi									
	of centering and sh sand : 6 graded sto	ne aggreg	gate 40 mm n	to plinth levo nominal size)	vel:1:3:6 (1 o	cement : 3	coarse			
	FOR SLUDGE TH	HICKENE				Т				
		1	8.200	8.200	0.150		10.086			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Total						10.086			
				To	otal Quantit	y in cum	10.086			
	5.37.1									
3	Providing and laying in position ready mixed M-25 grade concrete for reinfor cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work transit mixer for all leads, having continuous agitated mixer, manufactured as design of specified grade for reinforced cement concrete work including pump R.M.C. from transit mixer to site of laying, excluding the cost of centering, sh finishing and reinforcement including cost of admixtures in recommended pro as per IS: 9103 to accelerate/ retard setting of concrete, improve workability impairing strength and durability as per direction of the Engineer - in -charge. Cement content considered in this item is @330 kg/cum. Excess /less cement per design mix is payable/recoverable separately.All wiork upto plinth level									
	FOR SLUDGE TH	HICKENE	ER							
	Base slab	1	8.200	8.200	0.350		23.534			
		4	7.200	0.300	0.600		5.184			
	Tankwalls	1	22.610	0.300	2.500	1 1 1	16.958			
	Walk way	1	51.500	0.600	0.100		3.090			
	Total						48.766			
10.00			e-PLATFO	ORM FOR THE	otal Quantity	y in cum	48.766			
10.00	5.34.1 Extra for providing specified cement of grade concrete instain M-30 is @ 340 in M-30 in M-3	content us tead of M kg/cum).	ed is payable -25 grade BN	/ recoverable	e separately.I	Providing	M-30			
							48.760			
	Total			Т.	otal Quantit	v in cum	48.760			
10.00	OD57321/2022-20)23		1(nai Qualitti	y III CUIII	70./00			
5	Extra for providing		resistant cer	ment for the	structures					
	FOR SLUDGE TH	•		nent for the	Structures					
	QTY AS PER ITEM NO.5.37.1	1	48.760				48.760			
	Total						48.760			
				To	otal Quantit	y in cum	48.760			
	5.22.6									
6	Steel reinforcement in position and bin bars of grade Fe-50	ding all c	omplete upto							

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	FOR SLUDGE TH	HCKENE	ER					
	QTY AS PER ITEM NO.5.37.1	1	48.760			120.00 0000	5851.200	
	Total						5851.200	
				Total (Quantity in l	kilogram	5851.200	
10.00	OD57320/2022-20)23						
7	Extra for providing							
	FOR SLUDGE THICKENER							
	QTY AS PER ITEM NO.5.37.1	1	48.760			120.00 0000	5851.200	
	Total						5851.200	
				ı	Total Quant	tity in kg	5851.200	
10.00	4.12							
8	Extra for providing doses by weight of						work in	
	FOR SLUDGE TH	HCKENE	ER		501	VE I		
	QTY AS PER ITEM NO.5.37.1	1		48.760		340.00 0000	16578.40 0	
	Total		CPLATE	DRM FOR THE	MANAGEMEN	VT.	16578.40 0	
			OF PUBL	C WORKS	Total Quant	tity in kg	16578.40 0	
10.00	5.9.1							
9	Centering and shur footings, bases of				removal of f	orm for:F	oundations,	
	FOR SLUDGE TH	HICKENE	ER					
	Bottom slab	4	8.200		0.350		11.480	
		8	7.200		0.600		34.560	
	Total						46.040	
				Te	otal Quantit	y in sqm	46.040	
	5.9.2							
0	Centering and shuthickness) includir							
	FOR SLUDGE TH	HCKENE	ER					
	For walls outside	1	23.550		2.500		58.875	
	For walls inside	1	21.670		2.500		54.175	
	For walkways	1	51.500		0.600		30.900	
	Total							
				Te	otal Quantit	y in sqm	143.950	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
10.01	22.23.1								
1	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and 3 to 1 (3 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The materishall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystallislurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm								
	FOR SLUDGE TH	HICKENE	ER	110	Г				
	Inside of walls	1	21.670	20ALI	2.500	FT	54.175		
	Total		-	T	4-1-044		54.175		
10.01	22.23.2			1	otal Quantit	y in sqm	54.175		
2	Providing and app waterproofing trea water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requipermeability of co DIN 1048 and resis slurry shall be capshall be carried ou engineerincharge. The producted water producted and pr	tment to the labs, poding edeck et es slurry: 2 es slurry: 1 te (internativements norete by stant to 1 able of set all compact performents	the RCC structums, reservi- tums, reservi- te., prepared to 2 parts water) 2 part water) 3 side with to as specified more than 90 6 bar hydrost 1f-healing of polete as per spenance shall co	ctures like re or, sewage & by mixing in for vertical for horizonta he help of sy in ACI-212- 0% compared tatic pressure cracks up to pecification a	the ratio of surfaces and surfaces and surfaces and the tic fiber 3R-2010 i.e. It distributes a width of 0 and the directed for 10 years	s of the batreatment 5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducir of concrete side. The .50mm. T tion of the	sement, plant, rts arts g the he material g as per crystalline he work		
	FOR SLUDGE TH			<u> </u>	•				
	Bottom slab inside 1 37.390 37.390								
	Total						37.390		
				T	otal Quantit	y in sqm	37.390		
10.01	13.7.1								
3	1 13.7.1 12 mm cement plaster finished with a floating coat of neat cement of mix:1:3 (1 cement : 3 fine sand)								

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	FOR SLUDGE TH	HICKENE	ER					
	Inside of walls	1	21.670		2.500		54.175	
	Outside of walls	1	23.550		2.800		65.940	
	Base slab inside	1	37.390				37.390	
	Walkways	1	51.500		1.200		61.800	
	Total						219.305	
	Total Quantity in sqm							
10.01	19.16							
	Providing orange of as per IS: 10910 of cross section as 23 165 mm with minitop surface by ribb projections on tail stand the bend test manufactures per fixing in manholes sand: 6 graded storage of the properties of the projection of the projecti	n 12 mm x 25 mum 112 mm 112 mm 112 ming or che length on and chem nanent ide with 30 me aggreg	dia steeel bar mm and over mm space be equering bes 138 mm as particular entification met 20x15 cm cer ate 20 mm ne	conforming er all minimu etween protrides necessar per standard ce test as per park to be visement concre	to IS:1786, and length 26 ruded legs hary and adequate drawing and respective even after block 1:3:	having mi 3 mm and ving 2 mr ate anchor suitable t ns and ha er fixing i 6 (1ceme	nimum width as n tread on ring o with ving ncluding ent: 3 coarse	
	FOR SLUDGE IF		ER	3		-	7.000	
	T-4-1	7		T			7.000	
	Total		OF OUR	K WORKS T	4.10 42	-	7.000	
10.01	100.26.1		0, 1000	10	otal Quantity	y in each	7.000	
10.01	Filling water with of 5 km (average) height not less tha and other applience	to the reson 3 m using es and co	ervoir site an ng 5 HP diese st of water et	d pumping the design of the de	he water into np set , hire i	the reserv	voir of	
	FOR SLUDGE TH	HICKENE			Ι			
		1	37.370		2.500		93.425	
	Total						93.425	
				Total (Quantity in 1	Kilo litre	93.425	
10.01 6	10.26.3							
0	Providing and fixi balcony railing, sta approves steel prir	aircase rai	lling and sim					
	50mm DIA GI 5.1	7Kg/m.32	2mm DIA GI	-317 Kg/m	T	 		
	Outer total/1m/c/c vertical 50mm dia	27			0.750	5.1700 00	104.693	
	Horizontal 0.25m/c/c -32mm dia	3	27.318			3.1700 00	259.794	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Total						364.487			
				,	Total Quant	ity in kg	364.487			
10.01	13.48.3									
7	Finishing with Del primer as per man Surface Paint to gi an under coat of pr	ufacturers ve an eve rimer app	specifications specifications shade. Two lied @ 0.80 l	ns:Painting S o or more coa	Steel work with at applied @	th Deluxe 0.90 ltr/1	Multi 0 sqm over			
	FOR SLUDGE THICKENER									
	Vertical pipe	27	0.750			0.1600 00	3.240			
	Horizontal pipe	3	27.318			0.1000 00	8.195			
	Total						11.435			
				To	otal Quantit	y in sqm	11.435			
10.01	13.52.2			18						
8	Finishing with Epoper manufacturer& of surface, etc. cor	z#39;s spe	ecifications in	ncluding app	locations propriate print	epared and ning coat,	d applied as preparation			
	FOR SLUDGE TH	HCKENE	ER	3-11						
	Base slab &inside walls	1	219.300	ORM FOR THE	MANAGEMEN	er.	219.300			
	Total		OF PUBL	C WORKS		2007	219.300			
				Te	otal Quantit	y in sqm	219.300			
11	FILTER FEED TA	ANK-Rec	tangular							
11.00	2.6.1									
1	Earth work in exca over areas (exceed including disposal earth to be levelled	ing 30 cm of excava	n in depth, 1.a ated earth, lea	5 m in width ad up to 50 n	as well as 10 and lift up	o sqm on	plan)			
	Filter Feed Tank									
	For Filter feed Tank	1	7.100	7.100	0.500		25.205			
	Total						25.205			
				To	otal Quantit	y in cum	25.205			
11.00	4.1.6									
2	of centering and sh	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level:1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 40 mm nominal size)								
	Filter Feed Tank				<u> </u>					
	For Filter feed Tank	1	7.100	7.100	0.150		7.562			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	Total						7.562	
				To	otal Quantit	y in cum	7.562	
11.00	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per design of specified grade for reinforced cement concrete work including pumpin R.M.C. from transit mixer to site of laying, excluding the cost of centering, shutt finishing and reinforcement including cost of admixtures in recommended propo as per IS: 9103 to accelerate/ retard setting of concrete, improve workability wit impairing strength and durability as per direction of the Engineer - in -charge. No Cement content considered in this item is @330 kg/cum. Excess /less cement us per design mix is payable/recoverable separately.All wiork upto plinth level							
	Filter Feed Tank Base Slab	1	7 100	7 100	0.300		15 102	
	Dase Stab	1 4	7.100 7.100	2 2 5	0.600		15.123 5.112	
	Tank Walls	2	12.500		2.500	ET	15.625	
	Walk Way	4	7.100	0.600	0.100		1.704	
	Total		7,120	2.000	0.1200		37.564	
		1		To	otal Quantit	y in cum	37.564	
11.00 4	OD57371/2022-20 Extra for providing Filter Feed Tank		e resistant cer	ment for the	structures	IT.		
	QTY as per item code5.37.1	1	37.564				37.564	
	Total						37.564	
				To	otal Quantit	y in cum	37.564	
11.00	5.34.1 Extra for providing specified cement c grade concrete insi in M-30 is @ 340	ontent use tead of M	ed is payable	/ recoverable	e separately.I	Providing	M-30	
	Filter Feed Tank							
	QTY as per item code5.37.1	37.564					37.564	
	Total						37.564	
				To	otal Quantit	y in cum	37.564	
11.00 6	5.22.6 Steel reinforcement in position and bin bars of grade Fe-50	ding all c	omplete upto					

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Filter Feed Tank						
	QTY as per item code5.37.1	1	37.564			120.00 0000	4507.680
	Total						4507.680
				Total (Quantity in l	kilogram	4507.680
11.00	OD57425/2022-20)23					
7	Extra for providing	д ероху с	oating for rei	nforcement	bar		
	Filter Feed Tank						
	QTY as per item code5.37.1	1	37.564				37.564
	Total						37.564
				,	Total Quant	tity in kg	37.564
11.00	4.12						
8	Extra for providing doses by weight of						work in
	Filter Feed Tank				501	VE I	
	QTY as per item	1	37.564		10 00	340.00	12771.76
	code5.37.1			7		0000	10771 76
	Total		e-PLATEC	RM FOR THE	MANAGEMEN	VT.	12771.76 0
			OF PUBL		Total Quant	tity in kg	12771.76 0
11.00	5.9.1						
9	Centering and shur footings, bases of				removal of f	form for:F	oundations,
	Filter Feed Tank					ı	
	Bottom slab	2	14.200		0.300		8.520
		8	7.100		0.600		34.080
	Total						42.600
				To	otal Quantit	y in sqm	42.600
	5.9.2						
0	Centering and shuthickness) including						
	Filter Feed Tank						
	For walls outside	2	13.000	2.500			65.000
	For walls inside	2	12.000	2.500			60.000
	Walkway	4	7.100	0.600			17.040
	Total						142.040
				To	otal Quantit	y in sqm	142.040

Cf Sl No No Length Width **Depth** Quantity **Specification** 11.01 122.23.1 1 Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Damp; water treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm Filter Feed Tank 2 12.000 2.500 Inside of Walls 60.000 Total 60.000 **Total Quantity in sqm** 60.000 11.01 22.23.2 Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & D, water treatment plant, / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For horizontal surface one coat @1.10 kg per sqm. Filter Feed Tank Bottom slab 1 6.000 6.000 36.000 inside

11.01

3

Total

13.7.1

cement : 3 fine sand)

12 mm cement plaster finished with a floating coat of neat cement of mix:1:3 (1

36.000 36.000

Total Quantity in sqm

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	Filter Feed Tank								
	Inside of walls	2	12.000		2.500		60.000		
	Base Slab inside	1	6.000	6.000			36.000		
	Outside wall	2	13.000		2.500		65.000		
	Total						161.000		
				To	otal Quantit	y in sqm	161.000		
4	Providing orange of as per IS: 10910 or cross section as 23 165 mm with mini top surface by ribb projections on tail stand the bend test manufactures perm fixing in manholes sand: 6 graded stor Filter Feed Tank	n 12 mm or 25 mm x 25 mum 112 ing or cholength on and chemnanent ide with 30x	mm and over mm space be equering besing 138 mm as phical resistant entification mr 20x15 cm ce	conforming er all minimu etween protrides necessar per standard ce test as per park to be vistement concre	to IS:1786, am length 26 auded legs hary and adequ drawing and r specificationsible even aft te block 1:3:	having m 3 mm and ving 2 mate ancho suitable to ns and hater fixing 6 (1ceme	inimum I width as n tread on ring to with ving including ent: 3 coarse		
		/	-	311			7.000		
	Total			T	4.10 44		7.000		
11.01	100.36.1		OF PUBL	IC WORKS	otal Quantity	y in each	7.000		
5	Filling water with of 5 km (average) height not less that and other applience. Filter Feed Tank	to the rese 1 3 m usir	ervoir site an ng 5 HP diese	d pumping tl el engine pur	he water into	the reser	voir of		
		1	6.000	6.000	2.500		90.000		
	Total						90.000		
				Total (Quantity in 1	Kilo litre	90.000		
11.01	10.26.3								
6	Providing and fixing balcony railing, state approves steel prince	nircase rai ner.G.I. p	ling and sim ipes	ilar works, ir					
	50mm dia GI-5.17	32 ₁ , kg/m	nm dia GI-3	.17kg/m					
	Outer Total 1m c/c vertical 50mm dia.	31			0.750	5.1700 00	120.203		
	Horizontal.25m c/c-32	3	30.800			3.1700 00	292.908		
	Total						413.111		
				,	Total Quant	ity in kg	413.111		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
11.01	13.48.3		_						
7	Finishing with Del primer as per man Surface Paint to gi an under coat of pr	ufacturers ve an eve	specification shade. Two	ns:Þainting S o or more coa	teel work wi at applied @	th Deluxe 0.90 ltr/10	Multi O sqm over		
	Filter Feed Tank			•					
	Vertical pipe	31	0.750			$0.0500 \\ 00$	1.163		
	Horizontal Pipe	3	30.800			0.0300 00	2.772		
	Total						3.935		
				To	otal Quantit	y in sqm	3.935		
	13.52.2								
8	Finishing with Epoper manufacturer& of surface, etc. cor	z#39;s spe	ecifications in	ncluding app					
	Filter Feed Tank		16 T	MANITH		FI			
		1	161.000	State	DIE	-	161.000		
	Total			_			161.000		
				To	otal Quantit	y in sqm	161.000		
12	TREATED WATE	ER TANK	-CHLORINI	E CONTACT	Γ TANK Red	ctangular			
12.00	2.6.1			COLUMN CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONT					
1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed								
	including disposal earth to be levelled	of excava	ited earth, lea	nd up to 50 m	n and lift up t	to 1.5 m, o	olan)		
	including disposal	of excava	ited earth, lea ly dressed.A	nd up to 50 m	n and lift up t	to 1.5 m, c	olan)		
	including disposal earth to be levelled	of excava	ited earth, lea ly dressed.A	nd up to 50 m	n and lift up t il	to 1.5 m, c	olan)		
	including disposal earth to be levelled	of excava	ited earth, lea ly dressed.A ANK	nd up to 50 m Il kinds of so	n and lift up t il	to 1.5 m, c	olan) lisposed		
	including disposal earth to be levelled FOR TREATED V	of excava	ited earth, lea ly dressed.A ANK	nd up to 50 m Il kinds of so 9.450	n and lift up t il	to 1.5 m, c	olan) lisposed 193.489		
12.00	including disposal earth to be levelled FOR TREATED V	of excava d and neat WATER T	ited earth, lea ly dressed.A ANK	nd up to 50 m Il kinds of so 9.450	n and lift up to	to 1.5 m, c	193.489		
12.00	including disposal earth to be levelled FOR TREATED V Total	of excavad and neath NATER To 1	TANK 13.650 mechanical in depth, 1.50 excavated earth, leading to the control of the control o	9.450 means (Hydra in width as h, lead up to	1.500 otal Quantity raulic excavaswell as 10 so 50m and lift	y in cum ator)/manuqm on t up to 1.5	193.489 193.489 193.489 all means		
	including disposal earth to be levelled FOR TREATED V Total OD57489/2022-20 Earth work in excaover areas (exceed plan)including disposed earth to	of excavad and neath NATER To 1 223 Exercise a varion by ling 30cm posal of each be levelle	r mechanical in depth, 1.50 xcavated earth, lead of the control of	9.450 means (Hydra in width as h, lead up to	1.500 otal Quantity raulic excavaswell as 10 so 50m and lift	y in cum ator)/manuqm on t up to 1.5	193.489 193.489 193.489 all means		
	including disposal earth to be levelled FOR TREATED V Total OD57489/2022-20 Earth work in exca over areas (exceed plan)including disposed earth to 3m	of excavad and neath NATER To 1 223 Exercise a varion by ling 30cm posal of each be levelle	r mechanical in depth, 1.50 xcavated earth, lead of the control of	9.450 means (Hydra in width as h, lead up to	1.500 otal Quantity raulic excavaswell as 10 so 50m and lift	y in cum ator)/manuqm on t up to 1.5	193.489 193.489 193.489 all means		
	including disposal earth to be levelled FOR TREATED V Total OD57489/2022-20 Earth work in exca over areas (exceed plan)including disposed earth to 3m	of excavad and neath NATER To 123 avation by ling 30cm posal of e be levelle WATER TO 1	r mechanical in depth, 1.5 x cavated earth	9.450 To means (Hydra in width as h,lead up to dressed .All	1.500 otal Quantity raulic excava swell as 10 so 50m and lift kind of soil-a	y in cum ator)/manuqm on t up to 1.5	193.489 193.489 193.489 193.189 all means m lift 1.5to		
	including disposal earth to be levelled FOR TREATED V Total OD57489/2022-20 Earth work in excaover areas (exceed plan)including disposed earth to 3m FOR TREATED V	of excavad and neath NATER To 123 avation by ling 30cm posal of e be levelle WATER TO 1	r mechanical in depth, 1.5 x cavated earth	9.450 means (Hydra in width as h, lead up to dressed .All	1.500 otal Quantity raulic excava swell as 10 so 50m and lift kind of soil-a	y in cum ntor)/manu qm on t up to 1.5 additional	193.489 193.489 193.489 193.489 193.489		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil - additional depth 3.0 to 4.5 m.									
	FOR TREATED WATER TANK									
		1	13.650	9.450	0.450		58.047			
	Total						58.047			
				To	tal Quantity	y in cum	58.047			
12.00	4.1.6									
4	Providing and layi of centering and sh sand: 6 graded sto	nuttering - one aggreg	All work up gate 40 mm n	to plinth lev						
	FOR TREATED V	VATER T	ANK							
		1	13.650	9.450	0.150		19.349			
	Total			186			19.349			
			M	To	tal Quantity	y in cum	19.349			
12.00	5.37.1		40.9	Statistics.	MR	AF				
	cement concrete w manufactured in fu	ork, using ally autom	g cement con natic batching	g plant and tr	oproved designation of the provided designation of the pro	gn mix, site of wo	ork in			
	cement concrete w manufactured in futransit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content co	rork, using ally automall leads, had grade for it mixer to corcement accelerate and dural possidered:	g cement con natic batching aving continu- r reinforced of site of laying including con- retard setting bility as per of in this item i	tent as per apy plant and true agitated cement concrus, excluding st of admixtung of concret direction of the @330 kg/c/c	proved designant and an approved to mixer, manual ete work incurs in recommendation in the Engineer et an Excess of the Engineer et an Excess of the Excess	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:- ent used as			
	cement concrete w manufactured in futransit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content co per design mix is p	rork, using ally automall leads, had grade for it mixer to corcement accelerate and dural possidered bayable/re	g cement con natic batching aving continu- r reinforced of site of laying including con- retard setting bility as per of in this item in coverable se	tent as per apy plant and true agitated cement concrus, excluding st of admixtung of concret direction of the @330 kg/c/c	proved designant and an approved to mixer, manual ete work incurs in recommendation in the Engineer et an Excess of the Engineer et an Excess of the Excess	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:- ent used as			
	cement concrete w manufactured in futransit mixer for all design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per FOR TREATED V	rork, using ally automall leads, had grade for it mixer to corcement accelerate and dural possidered bayable/re	g cement con natic batching aving continu- r reinforced of site of laying including con- retard setting bility as per of in this item in coverable se	tent as per ap g plant and tr g plant and tr g plant concrete g, excluding est of admixtung of concrete direction of the s @330 kg/c parately.All	proved designansported to mixer, manuate work incurs the cost of cares in recome, improve whe Engineer from Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:- ent used as			
	cement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinff as per IS: 9103 to impairing strength Cement content coper design mix is per TREATED V. Base slab	ork, using ally automal leads, had grade for it mixer to corcement accelerate and dural onsidered bayable/re	g cement connatic batching aving continuar reinforced consiste of laying including conference of retard setting bility as per continuity as per continuity as per continuity as per coverable secoverable second sec	tent as per apg plant and truous agitated cement concrug, excluding st of admixting of concret direction of the control of the control of the concret of the	proved designansported to mixer, manuate work incurs in recome, improve whe Engineer turn. Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:- ent used as 1			
	cement concrete w manufactured in futransit mixer for all design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per FOR TREATED V	vork, using ally automal leads, had grade for it mixer to orcement accelerate and dural onsidered bayable/rewater T	g cement contactic batching aving continuation reinforced to site of laying including continuity as per contact in this item is coverable second and the sec	tent as per apg plant and truous agitated cement concrete, excluding of concrete direction of the exclusive of a desirection of the exclusive	proved designansported to mixer, manurate work incomplete work incomplete improve whe Engineer from Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088			
	cement concrete w manufactured in futransit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content co per design mix is p FOR TREATED V Base slab Raft beam	vork, using ally automal leads, had grade for it mixer to corcement accelerate and dural payable/re WATER T 1 3	g cement connatic batching aving continuous reinforced continuous site of laying including conference of retard setting bility as per continuous site of the setting of the	tent as per apg plant and traces agitated cement concrete, excluding of concrete direction of the gast of admixtung of concreted aging of concreted aging of concreted aging of concreted aging	proved designansported to mixer, manurate work incomplete work incomplete in recomplete improve where Engineer sum. Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088 6.300			
	cement concrete we manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinff as per IS: 9103 to impairing strength Cement content coper design mix is per TREATED V. Base slab	vork, using ally automal leads, had grade for it mixer to orcement accelerate and dural onsidered bayable/rewater T	g cement connatic batching aving continuar reinforced to site of laying including confirmation of retard setting of the settin	tent as per apg plant and truous agitated cement concrete, excluding of concrete direction of the exclusive of a desirection of the exclusive	proved designansported to mixer, manurate work incomplete work incomplete improve whe Engineer from Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088 6.300 2.280			
	cement concrete w manufactured in futransit mixer for al design of specified R.M.C. from trans finishing and reinf as per IS: 9103 to impairing strength Cement content co per design mix is p FOR TREATED V Base slab Raft beam	vork, using ally automal leads, had grade for it mixer to corcement accelerate and dural possidered bayable/re WATER T 1 3 4 10	g cement connatic batching aving continuation reinforced to site of laying including confirmation of the control of the contro	tent as per apg plant and truous agitated cement concrete, excluding est of admixtung of concret direction of the early. All 9.450 0.350 0.950 0.750	proved designansported to mixer, manurate work incomplete work incomplete improve where Engineer sum. Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088			
	cement concrete w manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per IS: POR TREATED V Base slab Raft beam	vork, using ally automal leads, had grade for it mixer to forcement accelerate and dural possidered by a value of the second second force was a se	g cement connatic batching aving continuar reinforced to site of laying including confirmation of retard setting of the settin	tent as per apg plant and traces agitated cement concrete, excluding set of admixting of concrete direction of the second	proved designansported to mixer, manurate work incomplete work incomplete in recomplete, improve where Engineer turn. Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088 6.300 2.280 6.750			
	cement concrete w manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per IS: POR TREATED V Base slab Raft beam	vork, using ally automall leads, had grade for it mixer to forcement accelerate and dural payable/re WATER T 1 3 4 2 10 2	g cement contactic batching aving continuar reinforced to site of layir including continuar retard setting in this item is coverable set and the set a	tent as per ap g plant and traces agitated cement concrete, excluding st of admixtung of concrete direction of the example of	proved designansported to mixer, manurate work incomplete work incomplete in recomplete in recomplet	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088 6.300 2.280 6.750 20.650 21.131			
	cement concrete w manufactured in futransit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per TREATED V Base slab Raft beam Pile cap Tankwalls	rork, using ally automal leads, had grade for it mixer to corcement accelerate and dural possidered bayable/re WATER T 1 3 4 10 2 3 3	g cement connatic batching aving continuation reinforced to site of laying including continuation of retard setting the setting of the settin	tent as per ap g plant and traces agitated cement concrete, excluding est of admixtung of concret direction of the @330 kg/c parately.All 9.450 0.350 0.950 0.750 0.250 0.250 0.350	proved designansported to mixer, manurate work incomixer, manurate work incoming the cost of cores in recome, improve whe Engineer turn. Excess wiork upto p 0.300 0.600 0.600 0.600 0.600 3.500 3.500	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088 6.300 2.280 6.750 20.650 21.131 7.678			
	cement concrete w manufactured in futransit mixer for al design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is per TREATED V Base slab Raft beam Pile cap Tankwalls	york, using ally automall leads, had grade for it mixer to corcement accelerate and dural possidered by ayable/re WATER T 1 3 4 2 10 2 3	g cement connatic batching aving continuar reinforced of site of laying including confirmation of the control o	tent as per ap g plant and traces agitated cement concrete, excluding excluding of concrete direction of the exclusion of the	proved designansported to mixer, manurate work incomplete work incomplete in recomplete improve whe Engineer sum. Excess wiork upto p	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088 6.300 2.280 6.750 20.650			
	cement concrete w manufactured in futransit mixer for all design of specified R.M.C. from transfinishing and reinf as per IS: 9103 to impairing strength Cement content coper design mix is proper des	rork, using ally automall leads, had grade for it mixer to corcement accelerate and dural posidered by ATER T 1 3 4 2 10 2 3 4	g cement connatic batching aving continuar reinforced consiste of laying including confirmation of the control	tent as per ap g plant and traces agitated cement concrete, excluding est of admixtung of concret direction of the @330 kg/c parately.All 9.450 0.350 0.950 0.750 0.250 0.250 0.350	proved designansported to mixer, manurate work incoming the cost of cores in recome, improve where Engineer sum. Excess wiork upto provide the cost of the cost of cores in recome, improve where Engineer sum. Excess wiork upto provide the cost of	gn mix, site of wo afactured luding pu centering, amended p workabilit in -charg /less ceme	ork in as per mix mping of shuttering proportions by without ge. Note:-ent used as 1 38.698 7.088 6.300 2.280 6.750 20.650 21.131 7.678 6.825			

	Specification	No	Length	Width	Depth	Cf	Quantity			
	Total						138.882			
				To	otal Quantity	y in cum	138.882			
12.00	5.34.1									
6	Extra for providing richer mixes at all floor levels. Note:- Excess/less cemen specified cement content used is payable/ recoverable separately. Providing N grade concrete instead of M-25 grade BMC/RMC. (Note:- Cement content c in M-30 is @ 340 kg/cum).									
	FOR TREATED WATER TANK									
	QTY AS PER ITEM NO.5.37.1	1	138.880				138.880			
	Total						138.880			
				To	otal Quantity	y in cum	138.880			
_	OD57637/2022-20)23								
7	Extra for providing	g sulphate	resistant cen	nent for the	structures					
	FOR TREATED V	VATER T	ANK			-	\			
	QTY AS PER ITEM NO.5.37.1	1	138.880		DRI	FI	138.880			
	Total			31			138.880			
		100		To	otal Quantity	y in cum	138.880			
12.00	5.22.6 Steel reinforcement for R.C.C work including straightening, cutting, bending in position and binding all complete upto plinth levelThermo - Mechanically bars of grade Fe-500D or more FOR TREATED WATER TANK									
	QTY AS PER					120.00	16665.60			
	QTY AS PER ITEM NO.5.37.1	1	138.880			120.00 0000	0			
							0 16665.60			
	ITEM NO.5.37.1	1	138.880			0000	0 16665.60 0			
	Total	1	138.880		45.000		16665.60 0 16665.60 0 26460.00 0			
	Total PILE REINFORC	1 EMENT	138.880 150Kg/m3		45.000 45.000	150.00	0 16665.60 0			
	Total PILE REINFORC 500mm	1 EMENT 1 20	138.880 150Kg/m3 0.196			150.00 0000 150.00	0 16665.60 0 26460.00 0			
	Total PILE REINFORC 500mm 750mm	1 EMENT 1 20	138.880 150Kg/m3 0.196	Total (150.00 0000 150.00 0000	0 16665.60 0 26460.00 0 11934.00 0			
12.00	Total PILE REINFORC 500mm 750mm	1 EMENT 1 20 4	138.880 150Kg/m3 0.196	Total (45.000	150.00 0000 150.00 0000	0 16665.60 0 26460.00 0 11934.00 0 38394.00 0			
12.00	Total PILE REINFORC 500mm 750mm Total	1 EMENT 1 20 4	138.880 150Kg/m3 0.196 0.442		45.000 Quantity in k	150.00 0000 150.00 0000	0 16665.60 0 26460.00 0 11934.00 0 38394.00 0			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	QTY AS PER ITEM NO.5.37.1	1				55059. 60000 0	55059.60 0
	Total						55059.60 0
				,	Total Quant	tity in kg	55059.60 0
12.01	4.12					•	
0	Extra for providing doses by weight of	g and mix	ing water pro s per manufa	oofing mater acturer'	ial in cement s specification	concrete on .	work in
	FOR TREATED V	VATER T	ANK			Г	
	QTY AS PER ITEM NO.5.37.1	1	138.880			340.00 0000	47219.20 0
	Total			0.0			47219.20 0
			A		Total Quant	ity in kg	47219.20 0
12.01	5.9.1		200	Seiden.	mR/	All	
1	Centering and shut footings, bases of				<mark>removal</mark> of f	orm for:F	oundations,
	FOR TREATED V	VATER T	ANK	ON FOR THE	MANAGEMEN	-	
	Base slab	2	21.900	C WORKS	0.300		13.140
	Raft beam	6	11.250		0.600		40.500
		8	7.500		0.600		36.000
	Pilecap	4	2.950		0.600		7.080
		20	2.250		0.600		27.000
	Total						123.720
				To	otal Quantit	y in sqm	123.720
12.01 2	5.9.2						
	Centering and shut thickness) including	g attache	d pilasters, b	ing, etc. and utteresses, pl	removal of f	form for:W	Valls (any s etc.
	FOR TREATED V				2.700		1 67 200
	Tank walls	4	11.800		3.500		165.200
	Roof beam	6	8.050 11.250		3.500 0.650		169.050 43.875
	Kooi bealli	8	7.500		0.650		39.000
	Cover slab	1	13.050	8.850	0.030		115.493
	20101 5100	2	21.900	0.050	0.150		6.570
	Walkway	2	13.650	0.600	0.130		16.380
		2	9.450	0.600			11.340

Sl No No Length Width **Depth** Cf **Specification** Quantity **Total** 566.908 **Total Quantity in sqm** 566,908 12.01 22.23.1 3 Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & p; water treatment plant, / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm FOR TREATED WATER TANK 29.250 3.500 Inside of walls 204.750 Total 204.750 204.750 **Total Quantity in sqm** 12.01 | 22.23.2 Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Damp; water treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For horizontal surface one coat @1.10 kg per sqm. FOR TREATED WATER TANK Bottom slab

inside

Total

8.350

8.350

1

8.350

4.150

Total Quantity in sqm

69.723

34.653

104.376 104.376

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
12.01	13.7.1								
5	12 mm cement pla cement : 3 fine sar		ed with a flo	ating coat of	neat cement	of mix:1	:3 (1		
	FOR TREATED V	WATER T	ANK						
	Inside of walls	2	16.700		3.500		116.900		
		2	12.500		3.500		87.500		
	Outside of walls	2	21.900		3.500		153.300		
	Base slab inside and roof	2	8.350	8.350			139.445		
		2	8.350	4.150			69.305		
	Walkways	2	13.650		0.600		16.380		
		2	9.450		0.600		11.340		
	Total						594.170		
				To	tal Quantit	y in sqm	594.170		
12.01	19.16		a a	(a)			1		
	165 mm with minitop surface by ribble projections on tail stand the bend test manufactures perfixing in manholes sand: 6 graded sto	oing or che length on and chem nanent ide s with 30x ne aggrega	equering besi 138 mm as p nical resistand ntification m 20x15 cm ce ate 20 mm no	des necessar per standard of ce test as per tark to be vis ment concre	y and adequadrawing and specification ible even after block 1:3:	ate anchorsuitable to a suitable to and hare fixing for the fixing	ring o with ving including ent: 3 coarse		
		26					26.000		
	Total						26.000		
				To	tal Quantity	y in each	26.000		
12.01 7	Total Quantity in each 26.000 100.36.1 Filling water with 5000 litre tankers fited in lorry and conveying water from a distance of 5 km (average) to the reservoir site and pumping the water into the reservoir of height not less than 3 m using 5 HP diesel engine pump set, hire for tanker lorry, tools and other appliences and cost of water etc. complete.								
	FOR TREATED V	WATER T	ANK	Т	<u> </u>				
		1	8.350	8.350	3.500		244.029		
		1	8.350	4.150	3.500		121.284		
	Total						365.313		
				Total C	uantity in I	Kilo litre	365.313		
12.01	10.26.3								

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	Providing and fixing balcony railing, state approves steel print	aircase rai	ling and simi						
	50mm DIA GI 5.1	7KG/M.3	2mm DIA G	I -317 KG/N	1				
	Outer total/1m/c/c vertical 50mm dia	47			0.750	5.1700 00	182.24		
	Horizontal 0.25m/c/c -32mm 3 46.600 3.1700 00								
	Total						625.409		
				,	Total Quant	ity in kg	625.409		
12.01	13.48.3								
	Finishing with Del primer as per manu Surface Paint to gi an under coat of pr FOR TREATED V	ufacturers ve an ever imer appl	specification shade. Two ied @ 0.80 ld	s:Painting S or more coa	steel work wi at applied @	th Deluxe 0.90 ltr/10	Multi 0 sqm over		
	Vertical pipe	47	0.750	7-11	0.160		5.640		
	, ertical pipe		01750		0.100		2.01		
	Horizontal pipe	3	46,600		0.100		13.980		
	Horizontal pipe Total	3	46.600	RM FOR THE	0.100	m m			
		3		CANDONE	MANAGEMEN	v in sam	19.62		
12.02	Total	3		CANDONE	0.100 otal Quantity	y in sqm	19.62		
12.02		oxy paint	(two or more	coats) at all	otal Quantity locations pre	epared and	19.620 19.620 d applied a		
	Total 13.52.2 Finishing with Epoper manufacturer&	oxy paint c#39;s spe	(two or more ecifications in concrete wo	coats) at all	otal Quantity locations pre	epared and	19.620 19.620 d applied a		
	Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. con	oxy paint c#39;s spe	(two or more ecifications in concrete wo	coats) at all	otal Quantity locations pre	epared and	19.620 19.620 d applied a preparation		
	Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. con	oxy paint c#39;s spe	(two or more ecifications in concrete wo	coats) at all	otal Quantity locations pre	epared and	19.620 19.620 d applied a preparation 594.170		
	Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. corr FOR TREATED V	oxy paint c#39;s spe	(two or more ecifications in concrete wo	Coats) at all acluding app	otal Quantity locations pre	epared and ing coat,	19.620 19.620 d applied appreparation 594.170 594.170		
12.02	Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. corr FOR TREATED V	oxy paint c#39;s spe	(two or more ecifications in concrete wo	Coats) at all acluding app	otal Quantity locations pre	epared and ing coat,	19.62 19.62 d applied a preparation 594.17 594.17		
0	Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. conformal Total 20.5.3 Providing, driving specified diameter working load not leblack pipe of dia, 4: 2 coarse sand) un centering, shuttering complete but exclusive services and services are services and services and services are services are services and services are services and services are services are services are services and services are services are services and services are services are services are services and services are services are services are services and services are serv	and insta and lengtess than sta der sufficing, driving	(two or more ecifications in concrete wo CANK 594.170) Illing driven F h below the pecified. Wire grouting with ient positive gand removitors of steel r	coats) at all acluding apprix Pre-cast reinfoile cap in Month a central to the cement sappressure to cong the steel reinforcement.	locations pre- ropriate prime forced cement of through preforming of the prime complicating pipe and the property of the prop	y in sqm t concrete to rmed hold of mix 1:2 ete filling nd lifting f pile for	19.62 19.62 d applied a preparation 594.17 594.17 e piles of o carry safe with M.S. (1 cement including casing etc payment		
12.02	Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. cor FOR TREATED V Total 20.5.3 Providing, driving specified diameter working load not leblack pipe of dia, 2: 2 coarse sand) un centering, shuttering complete but exclushall be measured	and insta and lengt ess than s 40 mm for der suffice g, driving	(two or more ecifications in concrete wo CANK 594.170) Illing driven Fh below the pecified. Wire grouting with ient positive g and removitions of steel roof the shoe to	coats) at all acluding apprix Pre-cast reinfoile cap in Month a central to the cement sappressure to cong the steel reinforcement.	locations pre- ropriate prime forced cement of through preforming of the prime complicating pipe and the property of the prop	y in sqm t concrete to rmed hold of mix 1:2 ete filling nd lifting f pile for	19.620 19.620 d applied a preparation 594.170 594.170 e piles of o carry safe e with M.S. (1 cemen including casing etc. payment		
12.02	Total 13.52.2 Finishing with Epoper manufacturer& of surface, etc. conformal Total 20.5.3 Providing, driving specified diameter working load not leblack pipe of dia, 4: 2 coarse sand) un centering, shuttering complete but exclusive services and services are services and services and services are services are services and services are services and services are services are services are services and services are services are services and services are services are services are services and services are services are services are services and services are serv	and insta and lengt ess than s 40 mm for der suffice g, driving	(two or more ecifications in concrete wo CANK 594.170) Illing driven Fh below the pecified. Wire grouting with ient positive g and removitions of steel roof the shoe to	coats) at all acluding apprix Pre-cast reinfoile cap in Month a central to the cement sappressure to cong the steel reinforcement.	locations pre- ropriate prime forced cement of through preforming of the prime complicating pipe and the property of the prop	y in sqm t concrete to rmed hold of mix 1:2 ete filling nd lifting f pile for	594.170 594.170 594.170 e piles of o carry safe e with M.S. (1 cemen including casing etc. payment		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
				Tota	al Quantity	in metre	900.000	
12.02	20.5.5				•			
2	Providing, driving and installing driven Pre-cast reinforced cement concrete page: specified diameter and length below the pile cap in M-25 cement concrete to working load not less than specified. With a central through preformed hole black pipe of dia, 40 mm for grouting with cement sand grouting of mix 1:2 (2 coarse sand) under sufficient positive pressure to ensure complete filling is centering, shuttering, driving and removing the steel casing pipe and lifting complete but excluding the cost of steel reinforcement. (Length of pile for pashall be measured from top of the shoe to the bottom of pile cap).750 mm diameters.							
	FOR TREATED V	VATER T	CANK					
		4			45.000		180.000	
	Total						180.000	
				Tot	al Quantity	in metre	180.000	
_	20.6.3.1			141				
3	Vertical load testing installation of load and dismantling of direction of engine Group of two or manufactures.	ling platfo f test cap a eer -in-Ch	orm and preparter test etc. arge.	aration of pil complete as	e head or cor per specifica	nstruction	of test cap	
	FOR TREATED V	VATER T	CANK					
	500mm	4	e-PLATFO	ORM FOR THE	MANAGEMEN	IT	4.000	
	750mm	2					2.000	
	Total						6.000	
				Total	Quantity in	per test	6.000	
12.02	Vertical load testing installation of load and dismantling of direction of engine Group of two or many FOR TREATED V	ling platfor test cap a eer -in-Ch nore piles	orm and preparter test etc. arge. upto 50 tonn	aration of pil complete as	e head or cor per specifica	nstruction	of test cap	
			ANK				4 000	
	750 mm	2					4.000 2.000	
	Total						6.000	
	Total			Total	Quantity in	per test	6.000	
13	ECO-FRIENDLY	AND AD	MINISTRA					
	OD68432/2022-20							
1	Construction of ad		ve cum labor	ratarv buildir	 1g			
	FOR ADMINISTI			•				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
		1				300.00 0000	300.000
	Total						300.000
				To	otal Quantit	y in sqm	300.000
13.00	OD68444/2022-20)23					
2	Construction of ble	ower roon	n on roof top	of MBBR w	vith Truss ro	of	
	FOR BLOWER R	OOM					
		1				196.00 0000	196.000
	Total						196.000
				To	otal Quantit	y in sqm	196.000
13.00	OD68445/2022-20)23					
3	Equipment, labora	tory items	s , furniture a	nd computer	system for (CIPS of Io	T
	FOR EQUIPMEN	TS,AND	LABORATO	DRY ITEMS		-	
		1	W.	(D/A)		THE PERSON	1.000
	Total		404	(Major)	BRI	11 "	1.000
				To	tal Quantity	y in each	1.000
	OD68446/2022-20)23		\prec			
4	Facility for Recycl	ling purpo	se	DRM FOR THE	MANAGEMEN	VT	
	FOR RECYCLING	G PURPO	SE	C WORKS			
		1					1.000
	Total						1.000
				To	tal Quantity	y in each	1.000
13.00	OD68521/2022-20)23					
5	Green Belt, Specia in the outer periph						
	FOR GREEN B	ELT					
	Landscaping	1					1.000
	Total						1.000
				To	tal Quantity	y in each	1.000
13.00	OD82214/2022-20)23					
6	Providing and inst	alling aco	ustics service	es for necess	ary sound in	sulation st	andards.
	For acoustic service	ces					
	Acoustic services	1					1.000
	Total						1.000
				To	tal Quantity	y in each	1.000
14	MECHANICAL I	TEMS-ST	P				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
14.00	OD67391/2022-20)23				-				
1	Supply, erection, testing, and commissioning of new generation non clog m set having suitable discharge and head, including all accessories such as cospanel board with an ammeter, voltmeter, phase indicating lamps, change ov main switch, cost of soft starter, cable from panel board to starter, starter to capacitors suction pipe, foot valve, Non return valve, suction and delivery prequired length, pressure gauge, earthing and wiring materials, cables etc. c As per KWA/HO/SP-333/2014 Dtd.18-03-2016 of The Managing Director Centrifugal Pump sets									
	RAW EFFLUENT			62HP						
	72.46LPS,H-32	2	62.000				124.000			
	Total						124.000			
			Tota	l Quantity i	in HP (Hors	e power)	124.000			
_	OD67442/2022-20)23								
2	MBBR media- Suppolypropylene consurface area, lengt or as directed by E	struction h 10-20 m	Sp.Gravity 0 nm, dia 20-25	.93 for MBE	BR reactor wi	ith require	d specific			
	FOR MBBR CAR	RIER ME	EDIA	September	DIE					
	Specific surface area=600m2/m3	1	P	₹Ⅱ		359.04 0000	359.040			
	Specific surface area=750m2/m3	1	e-PLATFO OF PUBL	ORM FOR THE IC WORKS	MANAGEMEN	441.60 0000	441.600			
	Total						800.640			
				To	otal Quantity	y in each	800.640			
14.00	OD67510/2022-20)23								
3	Air Blower Supply indoor application pulleys, pressure g suitable flanges, co arrangement interco per technical speci 50m	complete gauges, pro common m connecting	with acousting with acousting with acousting with acousting time with flag with flag with flag with acousting with a constant	c canopy, air valve, acoust apressor base anges includ	r filter, moto tic hood, suc e frame with ing all access	r of 1500 tion silend motor bel sories com	rpm , cer with t tightening aplete as			
	FOR AIR BLOW	ER								
	Capacity of blower- 3324m3/hr,HP=4 9	5	49.000				245.000			
	Capacity of blower 2369m3/hr,HP- 70	3	70.000				210.000			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	Capacity of blower- 5114m3/hr,HP- 75	7	75.000				525.000	
	Total						980.000	
			Tota	al Quantity i	in HP (Hors	e power)	980.000	
14.00	OD67546/2022-2023							
4	Bubble Diffuser for MBBR- Fine Bubble Diffuser Supplying and fixing of type fine bubble diffusers of 90mm dia,1500mm length, Ethylene Propylen Monomer (EPDM) make with SStee1"x1",SS lifting hook 8 m foundation bolt 6 mm, SS C clamp suitable for 1"O.D, hose, PP Ropenut, PP sleeve, Silicone Washer, SS hos clamp, RCC block complete as perspecification compatible for specified air flow							
	BUBBLE DIFFUS	SER FOR	MBBR		<u> </u>			
		4		/6/0			4.000	
	Total		115	200		A STATE OF THE PARTY.	4.000	
			44	To	otal Quantity	y in each	4.000	
14.00	OD67563/2022-20			Seattle .	IDK.	-		
	Air Grid Pipe Suppother accessories a	s required						
	FOR AIR GRID P		e-PLATFO	ORM FOR THE	MANAGEMEN	FT	4.000	
	Total	4	0, 1000	C WORLD			4.000 4.000	
	Total			Т.	otal Quantity	v in oach	4.000	
14.00	OD67571/2022-20)22		1(nai Quantit	y iii eacii	4.000	
6	Tube settler media shaped, 750mm he fitting. The plan so at 600 slope. The 1	n- Media teight and a ettling are media is to	about 1.0mm a should be be be provided	thick and w between 10 &	ith tongue ar kndash; 12 m	nd groove n2/m3 /day	tube	
	FOR TUBE SETT	LER ME	DIA			<u> </u>		
	Total contact area-388.8m2	1					1.000	
	Total						1.000	
				To	otal Quantity	y in each	1.000	
14.00	OD67584/2022-20)23						
7	"Supply, ere pump set having so the panel board with switch, main switch motor, capacitors so of required length, - As per KWA/HC Centrifugal Pump	ection, test uitable dis th an amr ch, cost of suction pi pressure D/SP-333/	scharge and l meter, voltme soft starter, pe, foot valve gauge, earth	nead, includi eter, phase in cable from p e, Non returr ing and wirin	ng all access dicating lam anel board to valve, sucting materials,	ories such ps, change starter, st on and de cables etc	as cost of e over tarter to livery pipes c. complete.	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	FOR FILTER FEE	ED PUMP)					
	P=65HP,Q=69.44 LPS,H=35	2	65.000				130.000	
	Total						130.000	
	Total Quantity in HP (Horse power) 130.000							
14.00	OD67604/2022-20)23						
8	Pressure Sand Filter- Supply, installation and erection, testing and commissioning of of Pressure Sand Filter - MS vessel construction. Filter to be of MS construction with multiport valve for operations. Suitable stand / support should be provided along with the filter. Filtration rate should not be greater than 12 m3/hour/m2 of the filtration area. Dirt loading capacity to be sufficient to initiate backwash once in 8 hours i.e. once / shift. Filter to have inlet and outlet piping, inlet and outlet for backwash and air vent. Sand filter to be fitted with pressure guage at inlet and outlet. Sand filter main header is to be fitted with flow meter – turbine type / rotameter type with range up to minimum of 125% of the rated flow through the pipe line. Media to consist of graded pebble, coarse and fine sand. Depth of media to be as per recommendations provided in CPHEEO manual and all relevant IS Codes of prectice. Cost includes supporting foundation.							
	FOR PRESSURE	SAND FI	LTER		GRI	AF.		
	Flow250m3/hr,Di a=3.65m	2		3-1			2.000	
	Total						2.000	
				CWORKS TO	otal Quantity	v in each	2.000	
14.00	OD67645/2022-20				<u> </u>			
14.00 9	OD67645/2022-20 Carbon Filter- Sup Activated Carbon construction with a provided along with of the filtration are backwash and air to consist of grade be as per recommended of high quality for Cost includes for f	oply, Insta Filter - M multiport th the filte ea. Filter t vent. Carb d pebble, endations removal o	llation and er S composite valve for ope er. Filtration r o have inlet a pon filter to b coarse, fine s provided in C of impurities	rection, testice vessel constructions. Suite and outlet pipe fitted with sand and action of the control of the	ng and comn ruction. Filte able stand / s not be greater ping, inlet an pressure gua ivated carbor inual. Activa	nissioning or to be of support she than 10 r ad outlet for age at outl n. Depth o	of MS hould be m3/hour/m2 or et. Media of media to a should be	
	Carbon Filter- Sup Activated Carbon construction with a provided along with of the filtration are backwash and air value to consist of grade be as per recommended in the provided by the provided along with the provided along with the provided and the provided along the provided	oply, Insta Filter - M multiport th the filte ea. Filter t vent. Carb d pebble, endations removal o	llation and er S composite valve for ope er. Filtration r o have inlet a pon filter to b coarse, fine s provided in C of impurities	rection, testice vessel constructions. Suite and outlet pipe fitted with sand and action of the control of the	ng and comn ruction. Filte able stand / s not be greater ping, inlet an pressure gua ivated carbor inual. Activa	nissioning or to be of support she than 10 r ad outlet for age at outl n. Depth o	of MS hould be m3/hour/m2 or et. Media of media to a should be	
	Carbon Filter- Sup Activated Carbon construction with a provided along with of the filtration are backwash and air value to consist of grade be as per recommended of high quality for Cost includes for f	oply, Insta Filter - M multiport th the filte ea. Filter t vent. Carb d pebble, endations removal o	llation and er S composite valve for ope er. Filtration r o have inlet a pon filter to b coarse, fine s provided in C of impurities	rection, testice vessel constructions. Suite and outlet pipe fitted with sand and action of the control of the	ng and comn ruction. Filte able stand / s not be greater ping, inlet an pressure gua ivated carbor inual. Activa	nissioning or to be of support she than 10 r ad outlet for age at outl n. Depth o	of MS hould be m3/hour/m2 or et. Media of media to a should be	
	Carbon Filter- Sup Activated Carbon construction with a provided along with of the filtration are backwash and air vato consist of grade be as per recomme of high quality for Cost includes for f FOR CARBON FI Flow 250m3/hr,	oply, Insta Filter - M multiport th the filte ea. Filter t vent. Carb d pebble, endations removal o oundation	llation and er S composite valve for ope er. Filtration r o have inlet a pon filter to b coarse, fine s provided in C of impurities	rection, testice vessel constructions. Suite and outlet pipe fitted with sand and action of the control of the	ng and comn ruction. Filte able stand / s not be greater ping, inlet an pressure gua ivated carbor inual. Activa	nissioning or to be of support she than 10 r ad outlet for age at outl n. Depth o	of MS hould be m3/hour/m2 or et. Media of media to a should be rification.	
	Carbon Filter- Sup Activated Carbon construction with a provided along with of the filtration are backwash and air value to consist of grade be as per recomme of high quality for Cost includes for f FOR CARBON FI Flow 250m3/hr, Dia=4m,H=2.5	oply, Insta Filter - M multiport th the filte ea. Filter t vent. Carb d pebble, endations removal o oundation	llation and er S composite valve for ope er. Filtration r o have inlet a pon filter to b coarse, fine s provided in C of impurities	rection, testic vessel consterations. Suiterate should rand outlet pipe fitted with sand and action of the constant of the con	ng and comn ruction. Filte able stand / s not be greater ping, inlet an pressure gua ivated carbor inual. Activa	nissioning or to be of support she than 10 r ad outlet for age at outl n. Depth o ted carbon water pur	of MS would be m3/hour/m2 or et. Media of media to a should be rification.	
	Carbon Filter- Sup Activated Carbon construction with a provided along with of the filtration are backwash and air value to consist of grade be as per recomme of high quality for Cost includes for f FOR CARBON FI Flow 250m3/hr, Dia=4m,H=2.5	oply, Insta Filter - M multiport th the filter th the filter to a. Filter to vent. Carb d pebble, endations removal of coundations ILTER 2 2 23 23 23 23 23 24 25 25 26 27 28 28 28 28 28 28 28 28 28	llation and er S composite valve for oper. Filtration to have inlet a con filter to b coarse, fine sprovided in Cof impurities a also.	rection, testice vessel consterations. Suiterate should rand outlet pipe fitted with sand and action and to be used to be	ng and commruction. Filterable stand / state greater ping, inlet an pressure guaivated carbor anual. Activated for waste pressure guaivated carbor anual. Activated for waste ping for was	nissioning or to be of support she than 10 r d outlet for age at outlet. Depth of ted carbon water pur	g of MS would be m3/hour/m2 or et. Media of media to a should be diffication. 2.000 2.000 2.000 esting of alum	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
		2					2.000	
	Total						2.000	
	Total Quantity in each						2.000	
14.01	OD67702/2022-20)23						
1	Hypo Dosing System - Supply, installation, commissioning and testing of Hypo dosing tank having capacity 50lit in LLDPE/FRP/PP material and hypo dosing electronic metering type pump of 1-3lph range with 2 bar working pressure.							
	FOR HYPODOSI	NG SYST	EM					
		2					2.000	
	Total						2.000	
				To	tal Quantit	y in each	2.000	
14.01	OD67713/2022-20)23				_		
2	Odour control unit	for co-tre	eatment unit	and STP.				
	FOR ODOUR CO	NTROL	UNIT	18				
		1	A.	SOAN.		PET	1.000	
	Total		404	Spine 1	MR	AFF	1.000	
				To	tal Quantit	y in each	1.000	
14.01	OD67725/2022-20)23						
	Supply, erection, to set having suitable panel board with a main switch, cost of capacitors suction required length, procentrifuge pump of The Managing Dir	discharge n ammete of soft sta pipe, foot essure gar f screw ty	e and head, i er, voltmeter, rter, cable fro valve, Non uge, earthing pe As per	ncluding all a phase indication panel boar return valve, and wiring KWA/HO/SI	accessories sating lamps, and to starter, suction and materials, ca P-333/2014 I	uch as cos change ov starter to delivery p bles etc. c	st of the er switch, motor, pipes of omplete	
	FOR SLUDGE TE	RANSFER	R TO CENTI	RIFUGE PU	MP OF SRE	W TYPE		
	Power of pump- 1HP ,2.02lps ,H- 15	2	1.000				2.000	
	Total						2.000	
			Tota	al Quantity i	n HP (Hors	e power)	2.000	
14.01	OD67748/2022-20)23				-		
4	Supply, erection, testing, and commissioning of new generation non clog motor pump set having suitable discharge and head, including all accessories such as cost of the panel board with an ammeter, voltmeter, phase indicating lamps, change over switch, main switch, cost of soft starter, cable from panel board to starter, starter to motor, capacitors suction pipe, foot valve, Non return valve, suction and delivery pipes of required length, pressure gauge, earthing and wiring materials, cables etc. complete As per KWA/HO/SP-333/2014 Dtd.18-03-2016 of The Managing Director - for Centrifugal Pump sets.							

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	Power of pump - 3.5 HP	4	3.500				14.000		
	Total						14.000		
	SLUDGE TRANS	FER TO	THICKENER	R PUMP					
	Power-2.7HP, Q-6.61lps, H-15	2	2.700				5.400		
	Total						5.400		
	DILUTED SEPTA	AGE TRA	NSFER PUN	ЛР		Γ			
	Power of pump=3.5HP	4	3.500				14.000		
	Total								
	FILTRATE CUM DILUTION PUMP								
	Power of pump 2HP	2	2.000				4.000		
	Total		-6	18		-	4.000		
	FILTER BACKW	ASH PUN	MPS	(DALL)		The Table	\		
	Power-2HP	2	2.000	Section 1	BRI	A F	4.000		
	Total						4.000		
		100	Tota	<mark>l Qu</mark> antity i	n HP (Hors	e power)	41.400		
	OD67824/2022-20)23	e-PLATFO	RM FOR THE	MANAGEMEN	VT.			
5	Mechanical arrang	gement for	Oil and Grea	ase trap		37.74			
	FOR OIL AND G	REASE T	RAP		Г	Г			
		1					1.000		
	Total						1.000		
				To	tal Quantity	y in each	1.000		
	OD67825/2022-20)23							
6	Mechanical arrang	gements fo	or screens and	grit remova	als				
	FOR SCREEN A	ND GRIT	REMOVAL	S		Г			
		4					4.000		
	Total						4.000		
				To	tal Quantity	y in each	4.000		
	OD67826/2022-20)23							
7	Mechanical arrang	gement for	anoxic tank						
	FOR ANOXIC TA	NK			<u> </u>	Г			
		1					1.000		
	Total						1.000		
				To	tal Quantity	y in each	1.000		
14.01	OD67827/2022-20)23							

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Mechanical arrang	ement for	sludge thick	ner			
	FOR SLUDGE TH	HICKNER	<u>.</u>				
		1					1.000
	Total						1.000
				To	otal Quantity	y in each	1.000
14.01	OD67967/2022-20)23					
9	Supply and installa	ation of ce	entrifuge.				
	FOR CENTRIFUC	GE					
		2					2.000
	Total						2.000
				To	otal Quantity	y in each	2.000
14.02	OD67969/2022-20)23					
0	Piping, initial char and fire fighting ar	nnel arrang rangemen	gements, byp	ass arranger	ments, steel la	adder, fran	nework
	FOR PIPING ,INI'	TIAL CH	ANNEL AR	RANGEME	NTS	ET	
		1	709	San Span	MRA	AB	1.000
	Total						1.000
							1.000
				To	otal Quantity	y in each	1.000
14.02	OD67970/2022-20)23	e-PLATFO		otal Quantity		
14.02	OD67970/2022-20 Interconnecting pip ISI make, Class 2 ptype• For val • NRV shoul • Dosing line analysis must be defor INTERCON	ping syste minimum ves in pip d be provi es to be in one for the	m: • A • All p ing of ID &g ided at the co flexible Tefl e system bef	Il process piporocess valvegt; 150 mm, ommon dischon / rigid PVore supply a	ping is to be a s to be in PP. Butterfly valuarge header /C/HDPE. 1	in uPVC of E /PVC of E ves are pro of all prod Detailed h	of approved Ball / Globe eferred cess pumps
14.02	Interconnecting pip ISI make, Class 2 type• For val • NRV shoul • Dosing line analysis must be defined.	ping syste minimum ves in pip d be provi es to be in one for the	m: • A • All p ing of ID &g ided at the co flexible Tefl e system bef	Il process piporocess valvegt; 150 mm, ommon dischon / rigid PVore supply a	ping is to be a s to be in PP. Butterfly valuarge header /C/HDPE. 1	in uPVC of E /PVC of E ves are pro of all prod Detailed h	of approved Ball / Globe eferred cess pumps
14.02	Interconnecting pip ISI make, Class 2 type• For val • NRV shoul • Dosing line analysis must be defined.	ping syste minimum ves in pip d be provi es to be in one for the	m: • A • All p ing of ID &g ided at the co flexible Tefl e system bef	Il process piporocess valvegt; 150 mm, ommon dischon / rigid PVore supply a	ping is to be a s to be in PP. Butterfly valuarge header /C/HDPE. 1	in uPVC of E /PVC of E ves are pro of all prod Detailed h	of approved Ball / Globe eferred cess pumps ydraulic
14.02	Interconnecting pig ISI make, Class 2 type• For val • NRV shoul • Dosing line analysis must be defor INTERCON	ping syste minimum ves in pip d be provi es to be in one for the	m: • A • All p ing of ID &g ided at the co flexible Tefl e system bef	ll process pip process valve gt; 150 mm, pmmon disch lon / rigid PV ore supply a YSTEM	ping is to be so to be in PP, Butterfly valuarge header /C / HDPE. Ind installation	in uPVC of EVC of Eves are proof all proof all proof all n.	of approved Ball / Globe eferred cess pumps ydraulic 1.000
1	Interconnecting pil ISI make, Class 2 type• For val • NRV shoul • Dosing line analysis must be defor INTERCONITOTAL	ping syste minimum ves in pip d be provi es to be in one for the NECTINC	m: • A • All p ing of ID &g ided at the co flexible Tefl e system bef	ll process pip process valve gt; 150 mm, pmmon disch lon / rigid PV ore supply a YSTEM	ping is to be a s to be in PP. Butterfly valuarge header /C/HDPE. 1	in uPVC of EVC of Eves are proof all proof all proof all n.	of approved Ball / Globe eferred cess pumps ydraulic
14.02 1 14.02 2	Interconnecting pig ISI make, Class 2 type• For val • NRV shoul • Dosing line analysis must be defor INTERCON	ping syste minimum ves in pip d be provi es to be in one for the NECTINC	m: • A • All p ing of ID &g ided at the co flexible Tefl e system bef G PIPING SY	Il process pip process valve gt; 150 mm, pmmon disch lon / rigid PV ore supply a YSTEM	ping is to be so to be in PP. Butterfly valuarge header /C / HDPE. Ind installation	in uPVC of EVES are proof all proof	of approved Ball / Globe eferred cess pumps ydraulic 1.000 1.000
14.02	Interconnecting pij ISI make, Class 2 stype• For val • NRV shoul • Dosing line analysis must be different FOR INTERCONITOTAL Total OD67968/2022-20 Providing Mechan	ping syste minimum ves in pip d be provi es to be in one for the NECTINC	m: • A • All p ing of ID &gided at the cofflexible Teffle system beff FIPING SY	ll process pip process valve gt; 150 mm, pmmon disch lon / rigid PV ore supply a YSTEM	ping is to be so to be in PP. Butterfly valuarge header /C / HDPE. Ind installation	in uPVC of EVES are proof all proof	of approved Ball / Globe eferred cess pumps ydraulic 1.000 1.000
14.02	Interconnecting pij ISI make, Class 2 stype• For val • NRV shoul • Dosing line analysis must be different interconstruction of the control of	ping syste minimum ves in pip d be provi es to be in one for the NECTINC	m: • A • All p ing of ID &gided at the cofflexible Teffle system beff FIPING SY	ll process pip process valve gt; 150 mm, pmmon disch lon / rigid PV ore supply a YSTEM	ping is to be so to be in PP. Butterfly valuarge header /C / HDPE. Ind installation	in uPVC of EVES are proof all proof	of approved Ball / Globe eferred cess pumps ydraulic 1.000 1.000
14.02	Interconnecting pij ISI make, Class 2 stype• For val • NRV shoul • Dosing line analysis must be different interconstruction of the control of	ping syste minimum ves in pip d be provies to be in one for the NECTINC 1	m: • A • All p ing of ID &gided at the cofflexible Teffle system beff FIPING SY	ll process pip process valve gt; 150 mm, pmmon disch lon / rigid PV ore supply a YSTEM	ping is to be so to be in PP. Butterfly valuarge header /C / HDPE. Ind installation	in uPVC of EVES are proof all proof	1.000 of approved Ball / Globe eferred cess pumps ydraulic 1.000 1.000 1.000
14.02	Interconnecting pij ISI make, Class 2 stype• For val • NRV shoul • Dosing line analysis must be different FOR INTERCONITOTAL Total OD67968/2022-20 Providing Mechan septic waste FOR CLEANING	ping syste minimum ves in pip d be provies to be in one for the NECTINC 1	m: • A • All p ing of ID &gided at the cofflexible Teffle system beff FIPING SY	ll process pip process valve gt; 150 mm, ommon disch lon / rigid PV ore supply a YSTEM To leaning and a	ping is to be so to be in PP. Butterfly valuarge header /C / HDPE. Ind installation	in uPVC of EVEN are proof all proof	1.000 of approved Ball / Globe eferred cess pumps ydraulic 1.000 1.000 1.000 1.000

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Bar Screen-fine- S frame to be fitted i mm c/c gap betwe MS rake arm with transfer of the coll Inclination: 45 De	in bar screen bars. Tracks for ected soli	een chamber The frame to lead of control Temoval of	of specified be mounted collected soli	width, with Mon the chamb ds and trougl	MS flat ba per and pro h to be pro	rs and 20 ovided with ovided for
	Bar Screen-Fine	, , <u>, , , , , , , , , , , , , , , , , </u>					
		2					2.000
	Total						2.000
				To	tal Quantity	y in each	2.000
14.02	OD85412/2022-20)23				L.	
	electromagnetic flo control system wit flow/quality/pressi arrangements and in the incoming pi Charge.	h flow recure integrall access	corder, digita ator with sen ories includi STP or at the	al flow/qualit sors, totalise ng housing a	y/pressure in r, transmittal rrangements	dicator, and displ etc. com	ay plete to fix
	Electro magnetic f	low mete	r	Details.	ID LEV		
		2		-			
	Total	2	P	₹			2.000
14.02	Total OD85414/2022-20)23	e PLATFO	ORM FOR TTO	otal Quantity	y in each	2.000 2.000 2.000
14.02	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De	y and inst screen cha The fram as for rem ected soli gree, Space	allation, of number of spece to be moun oval of colleds. Flow Rat	nanual bar so cified width, ated on the ch cted solids an e and height	ereen, MS & with MS flat amber and pand trough to should be as	ndash; epo t bars and provided w be provide	2.000 2.000 oxy frame 20 mm c/c with MS ed for
	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll	y and instacted the screen character fram as for rem ected solingree, Spaces	allation, of number of spece to be moun oval of colleds. Flow Rat	nanual bar so cified width, ated on the ch cted solids an e and height	ereen, MS & with MS flat amber and pand trough to should be as	ndash; epo t bars and provided w be provide	2.000 2.000 2.0
	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Cours	y and inst screen cha The fram as for rem ected soli gree, Space	allation, of number of spece to be moun oval of colleds. Flow Rat	nanual bar so cified width, ated on the ch cted solids an e and height	ereen, MS & with MS flat amber and pand trough to should be as	ndash; epo t bars and provided w be provide	2.000 2.000 exy frame 20 mm c/c with MS ed for . Angle of 2.000
	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De	y and instacted the screen character fram as for rem ected solingree, Spaces	allation, of number of spece to be moun oval of colleds. Flow Rat	nanual bar so cified width, ated on the ch cted solids and the and height Bar Size: 50	ereen, MS &1 with MS flat namber and p nd trough to should be as x10 mm	ndash; epo t bars and provided w be provide s specified	2.000 2.000 2.000 2.000 2.000 2.000
5	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Cours	y and instacted the screen character of the fram as for rem ected solingree, Space 2	callation, of number of spece e to be mount oval of colleds. Flow Ratesing: 20mm,	nanual bar so cified width, ated on the ch cted solids and the and height Bar Size: 50	ereen, MS & with MS flat amber and pand trough to should be as	ndash; epo t bars and provided w be provide s specified	2.000 2.000 2.000 2.000 2.000 2.000
15	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Cours Total ELECTRICAL W	y and instacted the fram as for rem ected soli gree, Space 2	callation, of number of spece e to be mount oval of colleds. Flow Ratesing: 20mm,	nanual bar so cified width, ated on the ch cted solids and the and height Bar Size: 50	ereen, MS &1 with MS flat namber and p nd trough to should be as x10 mm	ndash; epo t bars and provided w be provide s specified	2.000 2.000 2.000 2.000 2.000 2.000
15 15.00	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Course Total ELECTRICAL WOOD68682/2022-20	y and instacted the fram sected soli gree, Space 2 ORKS-S7	callation, of number of spece to be mound of collected ds. Flow Ratering: 20mm,	nanual bar so cified width, ated on the ch cted solids and the and height Bar Size: 50	ereen, MS &n with MS flat namber and p nd trough to should be as x10 mm	ndash; epo t bars and provided w be provide s specified	2.000 2.000 2.000 2.000 2.000 2.000
15	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Cours Total ELECTRICAL W OD68682/2022-20 Supply Installation	y and instacted the fram sected solingree, Space 2 ORKS-ST O23 n and com	callation, of number of spece to be mound oval of colleds. Flow Rateing: 20mm,	nanual bar so cified width, ated on the ch cted solids and the and height Bar Size: 50	ereen, MS &n with MS flat namber and p nd trough to should be as x10 mm	ndash; epo t bars and provided w be provide s specified	2.000 2.000 2.000 2.000 2.000 2.000
15 15.00	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Course Total ELECTRICAL WOOD68682/2022-20	y and instacted the fram sected solingree, Space 2 ORKS-ST O23 n and com	callation, of number of spece to be mound oval of colleds. Flow Rateing: 20mm,	nanual bar so cified width, ated on the ch cted solids and the and height Bar Size: 50	ereen, MS &n with MS flat namber and p nd trough to should be as x10 mm	ndash; epo t bars and provided w be provide s specified	2.000 2.000 2.000 2.000 2.000 2.000 2.000
15 15.00	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Cours Total ELECTRICAL WOD68682/2022-20 Supply Installation FOR DIESEL GE	y and instacted the fram sected solingree, Space 2 ORKS-ST O23 n and com	callation, of number of spece to be mound oval of colleds. Flow Rateing: 20mm,	nanual bar so cified width, ated on the ch cted solids and the and height Bar Size: 50	ereen, MS &n with MS flat namber and p nd trough to should be as x10 mm	ndash; epo t bars and provided w be provide s specified	2.000 2.000 2.000 2.000 2.000 2.000 2.000 1.000
15 15.00	OD85414/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Cours Total ELECTRICAL W OD68682/2022-20 Supply Installation	y and instacted the fram sected solingree, Space 2 ORKS-ST O23 n and com	callation, of number of spece to be mound oval of colleds. Flow Rateing: 20mm,	nanual bar so cified width, ated on the ch cted solids and e and height Bar Size: 50	ereen, MS &n with MS flat namber and p nd trough to should be as x10 mm	ndash; epot t bars and provided we be provided s specified y in each	2.000 2.000 2.000 2.000 2.000 2.000 2.000

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	ELECTRICAL & pressure guages, le pressure gauges, le pressure gauges, le Panel shall be Non proof, with reinfor Panel shall be suit include, but not lir and contactor prov to be fabricated ba AC: MS powder confixed, floor mount CABLING &ndas based on CEIG gual conduit or (b) arm termination for each on the walls. Cable appropriate. All in	evel switch of based a compart cement of able for 4 nited to, 1 risions to sed on the oated pan ed and no h; Outgoi idelines. Outgoi cored cable ch prime ness to be m	hes, electro is sensors, electronsensors, electronsensors	magnetic flovatrical panels ree standing ree angle iron, e,50 Hz incorporated for guidelines de List as given and List as given and Education and Company and AC pane suitably protriate Cabling res should not uitable runner.	w meter, norn & ndash; Pow floor mounte channel, T - imer. Switchgor each switch of the Electron in the tech onents as per e.INTERCO I to each printected either to includes glang be run on the cable tray / cable tray	mal flow invider coated, dust and iron flats agear comply highest, suitable motor load NNECTION me mover through (anding and aground of the pround of the pr	neter, ed MCC d vermin as required. onents to table OLR ority. Panel effications ad list, NG will be or DVC or directly conduits as	
	specifications.	I AND	NICTOLIME	NIT A TION		-		
	FOR ELECTRICA		INSTRUME.	NIATION		ET	1.000	
	Total	1	1000		DR	AF	1.000	
	Total			Т	tal Quantity	y in anah	1.000	
15.00	OD68681/2022-20	123		1	tai Quantity	y III Cacii	1.000	
3	Supply,installation		amicionina o	f color unita	for CTD	VT		
	FOR SOLAR UNI			1 Solai ullits	101 511			
	I OK SOLITIK CIVI	1	. 1				1.000	
	Total	1					1.000	
	Total			To	tal Quantity	v in each	1.000	
15.00	OD85126/2022 20	123		10	otai Quantit	y III Cacii	1.000	
4	OD85126/2022-2023 Transformer unit of 500 KVA indoor type including buildings, allied works and installation							
	500 KVA Transfor	rmer						
		2					2.000	
	Total						2.000	
				To	tal Quantity	y in each	2.000	
16	COMPOUND WA	LL FOR	STP SITEA	AND WELI				
	OD71862/2022-20							
1	For the construction		pound wall a	nd road for S	STP site			
	Construction of ro							
		1					1.000	
	Total				•		1.000	
	Construction of co	mnound	xvo11					

EARANCE 0/2022-2023 aration including	1 ng cle	aring veget		otal Quanti		1.000 1.000 2.000	
0/2022-2023 aration includin	ng cle	aring veget					
0/2022-2023 aration includin	ng cle	aring veget				2.000	
0/2022-2023 aration includin	ng cle	aring veget	ation, cutting	g trees, demo	1:4: on of 1-		
aration includin	ng cle	aring veget	ation, cutting	g trees, demo	1:4:		
	ng cle	aring veget	ation, cutting	g trees, demo	1:4: a.s. a.£ 1.		
. •					iiiion of b	uildings	
aration							
	1					1.000	
						1.000	
			T	otal Quanti	ty in L.S	1.000	
ORY CHARC	SES						
OD126185/2022-2023							
ncy including	all sta	tutory charg	ges for STP a	and network	THE RESERVE OF THE PERSON OF T		
charges		141	TANKE.	- 1	FT		
	1		September 1	DK	4.	1.000	
			_			1.000	
			T	otal Quanti	ty in L.S	1.000	
		1	1 e-PLATFO	1 e-PLATFORM FOR THE OF PUBLIC WORKS	e-PLATFORM FOR THE MANAGEMEN	Total Quantity in L.S	

ABSTRACT ESTIMATE

Others-DPR PREPARATION OF ALAPPUZHA MUNICIPALITY SEWERAGE SCHEME-

Detailed estimate of Sewage treatment plant and co-treatment unit-phase 1 Alappuzha municipality-DPR Preparation Work

Sl No	Specification	Quantity	Rate	Amount			
1	RECEIVING CHAMBER						
1.001	2.6.1						
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil						
	Net Total	5.382cum	@223.41/cum	1202.39			
1.002	4.1.6	MA					
	Providing and laying in position cercost of centering and shuttering - A coarse sand : 6 graded stone aggreg	ll work up to pl	inth level:1:3:6 (1 co				
	Net Total	1.79 <mark>4</mark> cum	@7527.05/cum	13503.53			
1.003	5.37.1						
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All wiork upto plinth level						
	Net Total	25.996cum	@10319.09/cum	268255.06			
1.004	5.34.1						
	Extra for providing richer mixes at specified cement content used is par grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	yable/ recoveral	ble separately.Provid	ling M-30			
	Net Total	30.074cum	@85.68/cum	2576.74			
1.005	OD53391/2022-2023						
	Extra for providing sulphate resista	nt cement for th	e structures				
	Net Total	30.074cum	@1800.16/cum	54138.01			
1.006	5.37.2						

Sl No	Specification	Quantity	Rate	Amount
	Providing and laying in position reacement concrete work, using cement manufactured in fully automatic bat transit mixer for all leads, having codesign of specified grade for reinfor R.M.C. from transit mixer to site of finishing and reinforcement including proportions as per IS: 9103 to acceleworkability without impairing strenting - in -charge. Note: - Cement contenting /less cement used as per design mix plinth level upto floor V level	t content as per ching plant and ontinuous agitate reed cement cor laying, excluding cost of admix erate/ retard set gth and durabilic	approved design mitransported to site of ed mixer, manufacture work including the cost of center extures in recommending of concrete, implify as per direction of his item is @330 kg	f work in red as per mix g pumping of ing, shuttering led prove f the Engineer /cum. Excess
	Net Total	3.509cum	@12043.58/cum	42260.92
1.007	5.22.6 Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more	including straig upto plinth lev 3470.420kilo	ghtening, cutting, be elThermo - Mechani @102.61/kilogra	cally Treated
	Net Total	gram	m	356099.80
1.008	OD53791/2022-2023	- Marie	IDIK	
	Extra for providing epoxy coating f		nt bar	
	Net Total	3470.420kg	@2.00/kg	6940.84
1.009	Extra for providing and mixing water doses by weight of cement as per m	er proofing mat	erial in cement conc 39;s specification.	rete work in
	Net Total	10031.700kg	@1.40/kg	14044.38
1.010	5.9.1 Centering and shuttering including for:Foundations, footings, bases of	columns, etc for	r mass concrete	2070.00
1 011	Net Total	5.880sqm	@350.00/sqm	2058.00
1.011	5.9.2 Centering and shuttering including sthickness) including attached pilaste Net Total			
1.012	5.9.3	111.09054111	C 7 10.02/34III	107000.00
1.012	Centering and shuttering including sfloors, roofs, landings, balconies an			or:Suspended
	Net Total	18.815sqm	@851.49/sqm	16020.78
1.013	2.25			
	Filling available excavated earth (exfoundation etc. in layers not exceed			
	layer by ramming and watering, lea	d up to 50 m an	d lift up to 1.5 m.	

Sl No	Specification	Quantity	Rate	Amount			
1.014	22.23.1						
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and 3 to 1 (3 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3: 1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work						
	shall be carried out all complete as pengineerin-	per specification	n and the direction of	f the			
	charge. The product performance shalleakage. For vertical surface two coal	iall carry guarai its @0.70 kg pe	ntee for 10 years aga er sqm	inst any			
	Net Total	39.960sqm	@595.25/sqm	23786.19			
1.015	22.23.2		GRAF				
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., prepintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was same from negative (internal) side with shall meet the requirements as specing permeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as pengineerincharge. The product performance sheakage. For horizontal surface one of the Net Total	Estructures like servior, sewage ared by mixing vater) for verticater) for horizor with the help of lified in ACI-21: an 90% compardrostatic pressure of cracks upper specification all carry guaran	retaining walls of the & amp; water treatment in the ratio of 5:2 (all surfaces and 3:1 and surfaces and appropriate fiber brush 2-3R-2010 i.e by reduced with control concurred on negative side. To a width of 0.50mm and the direction of the for 10 years against the area of the surface of th	e basement, nent plant, 5 parts (3 parts lying the n. The material lucing crete as per The m. The work f the			
1.016	13.7.1						
	12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1			
	Net Total	211.370sqm	@418.80/sqm	88521.76			
1.017	Supplying and fixing C.I with out for cover (light duty) the weight of the			ectangular C.I			
	Net Total	4.000each	@1629.51/each	6518.04			
1.018	OD53942/2022-2023						

Sl No	Specification	Quantity	Rate	Amount			
	Supply of uPVC Pipe, IS 4985:2000),10Kg/cm2,110	OmmDiaand fixing				
	Net Total	1.350metre	@572.91/metre	773.43			
1.019	19.16						
	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS: 10910 on 12 mm dia steeel bar conforming to IS:1786, having minimum cross section as 23 mm x 25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufactures permanent identification mark to be visible even after fixing including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size) Complete as per design						
	Net Total	12.000each	@568.91/each	6826.92			
1.020	100.36.1						
	Filling water with 5000 litre tankers distance of 5 km (average) to the reservoir of height not less than 3 m tanker lorry, tools and other applien	servoir site and using 5 HP die	pumping the water i	nto the			
	Net Total	2 <mark>6.820</mark> Kilo litre	@190.05/Kilo litre	5097.14			
1.021	13.52.2						
	Finishing with Epoxy paint (two or as per manufacturer's specific preparation of surface, etc. complete	ations including	g appropriate priming				
	Net Total	211.370sqm	@232.70/sqm	49185.80			
			Heading Total(Rs)	1072622.59			
2	SCREEN CHANNEL						
2.001	5.37.1						
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All wiork upto plinth level						
	Net Total	15.355cum	@10319.09/cum	158449.63			
2.002	5.34.1						
	Extra for providing richer mixes at a specified cement content used is pay						

Sl No	Specification	Quantity	Rate	Amount	
	grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	le BMC/RMC.	(Note:- Cement cont	ent considered	
	Net Total	15.350cum	@85.68/cum	1315.19	
2.003	OD54060/2022-2023				
	Extra for providing sulphate resista	nt cement for th	e structures		
	Net Total	15.350cum	@1800.16/cum	27632.46	
2.004	5.22.6				
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more				
	Net Total	1842.000kilo gram	@102.61/kilogra m	189007.62	
2.005	OD54067/2022-2023				
	Extra for providing epoxy coating f	or reinforcemer	nt bar		
	Net Total	1842.000kg	@2.00/kg	3684.00	
2.006	4.12	TELESCOPI	DAF		
	Extra for providing and mixing wat doses by weight of cement as per m			rete work in	
	Net Total	5 <mark>219.0</mark> 00kg	@1.40/kg	7306.60	
2.007	5.9.2	ATFORM FOR TH	E MANAGEMENT		
	Centering and shuttering including thickness) including attached pilaste				
	Net Total	68.475sqm	@748.62/sqm	51261.75	
2.008	5.9.3				
	Centering and shuttering including strutting, etc. and removal of form for:Suspended floors, roofs, landings, balconies and access platform				
	Net Total	26.325sqm	@851.49/sqm	22415.47	
2.009	22.23.1				
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., preprintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was ame from negative (internal) side vishall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as pengineerin-	structures like servior, sewage ared by mixing vater) for vertica ater) for horizon with the help of diffied in ACI-21 an 90% comparatorstatic pressur-	retaining walls of the & amp; water treatment in the ratio of 5:2 (all surfaces and 3:1 (and surfaces and appropriate surfaces and appropriate fiber brush 2-3R-2010 i.e by reduced with control concurred on negative side.	e basement, ient plant, 5 parts (3 parts lying the i. The material ucing crete as per The in. The work	

Sl No	Specification	Quantity	Rate	Amount
	charge. The product performance sh leakage. For vertical surface two coa	nall carry guara ats @0.70 kg pe	ntee for 10 years aga er sqm	inst any
	Net Total	39.000sqm	@595.25/sqm	23214.75
2.010	22.23.2			
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse amp; water treatment plant, tunnels subway and bridge deck etc., prepared by mixing in the ratio of 5:2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any			
	leakage.For horizontal surface one	coat @1.10 kg r	per sqm.	,
	Net Total	16.575sqm	@458.80/sqm	7604.61
2.011	13.7.1 12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1
	Net Total	106.275sqm	@418.80/sqm	44507.97
2.012	Providing orange colour safety foot as per IS: 10910 on 12 mm dia steed cross section as 23 mm x 25 mm an 165 mm with minimum 112 mm spot top surface by ribbing or chequering projections on tail length on 138 mm stand the bend test and chemical resumanufactures permanent identificate fixing in manholes with 30x20x15 coarse sand: 6 graded stone aggregation Net Total 100.36.1 Filling water with 5000 litre tankers distance of 5 km (average) to the reservoir of height not less than 3 mm tanker lorry, tools and other applient.	el bar conforming de over all minimace between progressides necessen as per standar sistance test as prion mark to be were cement concepte 20 mm nomions 8.000each as fitted in lorry a servoir site and a using 5 HP dieses and cost of 8.775Kilo	ng to IS:1786, having num length 263 mm otruded legs having 2 sary and adequate and drawing and suitable expecifications and visible even after fixitiete block 1:3:6 (1 cmal size) Complete a @568.91/each md conveying water pumping the water it esel engine pump set water etc. complete. @190.05/Kilo	g minimum and width as 2 mm tread on choring ble to with d having ing including ement: 3 as per design 4551.28 from a nto the
		litre	litre	1067.69
2.014	13.52.2			

Sl No	Specification	Quantity	Rate	Amount
	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work			
	Net Total	106.280sqm	@232.70/sqm	24731.36
			Heading Total(Rs)	567350.38
3	OIL AND GREASE TRAP			
3.001	5.37.1			
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately.All wiork upto plinth level			x, If work in red as per mix g pumping of ing, shuttering led prove f the Engineer cum. Excess
	Net Total	21.079cum	@10319.09/cum	217516.10
3.002	5.34.1			
	Extra for providing richer mixes at all floor levels. Note:- Excess/less cement over specified cement content used is payable/ recoverable separately. Providing M-30 grade concrete instead of M-25 grade BMC/RMC. (Note:- Cement content considerin M-30 is @ 340 kg/cum).			
	Net Total	24.104cum	@85.68/cum	2065.23
3.003	OD54273/2022-2023			
	Extra for providing sulphate resistar	nt cement for th	e structures	
	Net Total	24.104cum	@1800.16/cum	43391.06
3.004	5.37.2			
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately.All work above plinth level upto floor V level Net Total 3.024cum @12043.58/cum 36419.79			
3.005	5.22.6			
	Steel reinforcement for R.C.C work	including strai	ohtening cutting he	nding placing
	Steel remissionient for R.C.C Work	morading butti	55, 5	manig, placing

Sl No	Specification	Quantity	Rate	Amount
	in position and binding all complete bars of grade Fe-500D or more	upto plinth lev	elThermo - Mechani	cally Treated
	Net Total	2832.600kilo gram	@102.61/kilogra m	290653.09
3.006	OD54277/2022-2023			
	Extra for providing epoxy coating f	or reinforcemer	nt bar	
	Net Total	2832.600kg	@2.00/kg	5665.20
3.007	4.12			
	Extra for providing and mixing water doses by weight of cement as per m			rete work in
	Net Total	8197.400kg	@1.40/kg	11476.36
3.008	5.9.2			
	Centering and shuttering including thickness) including attached pilaste			
	Net Total	104.400sqm	@748.62/sqm	78155.93
3.009	5.9.3	PET DESCRIPTION	MAF	
	Centering and shuttering including floors, roofs, landings, balconies an			or:Suspended
	Net Total	4 <mark>4.31</mark> 3sqm	@851.49/sqm	37732.08
3.010	22.23.1	ATFORM FOR TH	E MANAGEMENT	
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & water treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry : 2 parts water) for vertical surfaces and 3 : 1 (3 parts integral crystalline slurry : 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm Net Total 42.500sqm @595.25/sqm 25298.13			
3.011	22.23.2	•	•	
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., preprintegral crystalline slurry: 2 parts w	C structures like servior, sewage ared by mixing	retaining walls of the & amp; water treatment in the ratio of 5 : 2 (2)	e basement, ent plant, 5 parts

SI No Quantity **Specification** Rate Amount integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For horizontal surface one coat @1.10 kg per sqm. Net Total 18.063sqm @458.80/sqm 8287.30 13.7.1 3.012 12 mm cement plaster finished with a floating coat of neat cement of mix:1:3 (1) cement : 3 fine sand) Net Total 184.645sqm @418.80/sqm 77329.33 3.013 19.18.1 Supplying and fixing C.I with out frame for manholes:455 x 610 mm rectangular C.I cover (light duty) the weight of the cover to be no less than 23 kg Net Total 2.000each @1629.51/each 3259.02 3.014 19.16 Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS: 10910 on 12 mm dia steeel bar conforming to IS:1786, having minimum cross section as 23 mm x 25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufactures permanent identification mark to be visible even after fixing including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size) Complete as per design Net Total 7.000each @568.91/each 3982.37 3.015 OD54332/2022-2023 Supply of uPVC Pipe, IS 4985:2000,10Kg/cm2,110mmDia.-and fixing Net Total 0.450metre @572.91/metre 257.81 3.016 100.36.1 Filling water with 5000 litre tankers fited in lorry and conveying water from a distance of 5 km (average) to the reservoir site and pumping the water into the reservoir of height not less than 3 m using 5 HP diesel engine pump set, hire for tanker lorry, tools and other appliences and cost of water etc. complete. 50.625Kilo @190.05/Kilo Net Total 9621.28 litre litre 3.017 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer & #39;s specifications including appropriate priming coat,

Sl No	Specification	Quantity	Rate	Amount
	preparation of surface, etc. complete	e.On concrete v	vork	
	Net Total	184.650sqm	@232.70/sqm	42968.06
3.018	10.26.3			
	Providing and fixing hand rail of apbalcony railing, staircase railing and of approves steel primer.G.I. pipes	proved size by l similar works,	welding etc. to steel , including applying	ladder railing, priming coat
	Net Total	485.754kg	@194.15/kg	94309.14
3.019	13.48.3			
	Finishing with Deluxe Multi surface primer as per manufacturers specific Surface Paint to give an even shade over an under coat of primer applied manufacture	cations:Painting Two or more of	g Steel work with Decoat applied @ 0.90 l	luxe Multi ltr/10 sqm
	Net Total	15.240sqm	@154.59/sqm	2355.95
		M	Heading Total(Rs)	990743.23
4	GRIT SEPERATOR			T
4.001	5.37.1		GRAF	
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All wiork upto plinth level			
	Net Total	26.984cum	@10319.09/cum	278450.32
4.002	5.34.1 Extra for providing richer mixes at a specified cement content used is pay grade concrete instead of M-25 gradin M-30 is @ 340 kg/cum). Net Total	yable/ recoveral	ble separately.Provid (Note:- Cement cont	ling M-30
4.003	OD54408/2022-2023			
	Extra for providing sulphate resistar	nt cement for th	e structures	
	Net Total	26.990cum	@1800.16/cum	48586.32
4.004	5.22.6			
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more			

Sl No	Specification	Quantity	Rate	Amount	
	Net Total	3238.800kilo gram	@ 102.61/kilogra m	332333.27	
4.005	OD71095/2022-2023				
	Extra for providing epoxy coating for reinforcement bar				
	Net Total	3238.080kg	@2.00/kg	6476.16	
4.006	4.12				
	Extra for providing and mixing water proofing material in cement concrete doses by weight of cement as per manufacturer's specification.				
	Net Total	9176.600kg	@1.40/kg	12847.24	
4.007	5.9.2				
	Centering and shuttering including thickness) including attached pilast				
	Net Total	141.340sqm	@748.62/sqm	105809.95	
4.008	5.9.3	M			
	Centering and shuttering including floors, roofs, landings, balconies an			or:Suspended	
	Net Total	2.970sqm	@851.49/sqm	2528.93	
4.009	22.23.1				
4.010	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., prep integral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was ame from negative (internal) side with shall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as engineerincharge. The product performance shall be all surface two controls. Net Total	Structures like servior, sewage ared by mixing vater) for verticater) for horizon with the help of ified in ACI-212 ann 90% compandrostatic pressuring of cracks upper specification all carry guarants @0.70 kg pe	retaining walls of the & amp; water treatment in the ratio of 5 : 2 (stall surfaces and 3 : 1 (stall surfaces and appropriate to 10 i.e. by reduced with control concare on negative side. The amount of 0.50mm and the direction of the for 10 years against the amount of the stall surfaces and the direction of the stall surfaces.	e basement, ent plant, 5 parts (3 parts lying the The material ucing erete as per The n. The work	
4.010	22.23.2				
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., prep integral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was same from negative (internal) side was	Structures like servior, sewage ared by mixing vater) for vertica ater) for horizor	retaining walls of the & water treatment in the ratio of 5 : 2 (all surfaces and 3 : 1 (at all surfaces and applications).	e basement, ent plant, 5 parts (3 parts lying the	

Sl No	Specification	Quantity	Rate	Amount	
	shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline				
	slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any				
	leakage. For horizontal surface one coat @1.10 kg per sqm.				
	Net Total	20.250sqm	@458.80/sqm	9290.70	
4.011	13.7.1				
	12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1	
	Net Total	201.429sqm	@418.80/sqm	84358.47	
4.012	19.18.1				
	Supplying and fixing C.I with out f cover (light duty) the weight of the			ectangular C.I	
	Net Total	2.000each	@1629.51/each	3259.02	
4.013	OD54500/2022-2023		ID N		
	Supply of uPVC Pipe, IS 4985:2000,10Kg/cm2,110mmDiaand fixing				
	Net Total	0.4 <mark>50</mark> metre	@572.91/metre	257.81	
4.014	Providing orange colour safety foot as per IS: 10910 on 12 mm dia steed cross section as 23 mm x 25 mm an 165 mm with minimum 112 mm spatop surface by ribbing or chequering projections on tail length on 138 mm stand the bend test and chemical resumanufactures permanent identificate fixing in manholes with 30x20x15 coarse sand: 6 graded stone aggregations.	el bar conforming dover all minimace between progressides necessed as per standars istance test as progression mark to be communication.	ng to IS:1786, having mum length 263 mm otruded legs having 2 sary and adequate and drawing and suital per specifications and visible even after fixerete block 1:3:6 (1cm line) and size) Complete a	g minimum and width as 2 mm tread on achoring ble to with d having ing including ement: 3	
4.015	100.36.1				
	Filling water with 5000 litre tankers distance of 5 km (average) to the rereservoir of height not less than 3 m tanker lorry, tools and other applied	servoir site and using 5 HP die	pumping the water i	nto the , hire for	
	Net Total	49.604Kilo litre	@190.05/Kilo litre	9427.24	
4.016	13.52.2				
	Finishing with Epoxy paint (two or as per manufacturer's specific preparation of surface, etc. complete	ations including	g appropriate priming	d and applied g coat,	
				<u> </u>	

Sl No	Specification	Quantity	Rate	Amount
	Net Total	201.450sqm	@232.70/sqm	46877.42
			Heading Total(Rs)	989579.23
5	EQUALISATION TANK			
5.001	2.6.1			
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil			
5.002	Net Total	686.940cum	@223.41/cum	153469.27
3.002	OD54720/2022-2023 Earth work in excavation by mechanover areas (exceeding 30cm in depth plan)including disposal of excavated, disposed earth to be levelled and no 3m	h,1.5m in width d earth ,lead up	aswell as 10 sqm or to 50m and lift up to	n o 1.5 m
	Net Total	686.940cum	@334.44/cum	229740.21
5.003	OD54726/2022-2023		COAL	
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil - additional depth 3.0 to 4.5 m.			
	Net Total	686.940cum	@445.49/cum	306024.90
5.004	OD54733/2022-2023 Earth work in excavation by mechanover areas (exceeding 30 cm in deptincluding disposal of excavated earth to be levelled and neatly dress Net Total	h, 1.5 m in wid h, lead up to 50 ed. All kinds of	th as well as 10 sqm or m and lift up to 1.5	on plan) m, disposed
5.005	4.1.6			
	Providing and laying in position cer cost of centering and shuttering - Al coarse sand : 6 graded stone aggregation	l work up to plate 40 mm nom	inth level:1:3:6 (1 coinal size)	ement : 3
	Net Total	68.694cum	@7527.05/cum	517063.17
5.006	5.37.1			
	Providing and laying in position real cement concrete work, using cement manufactured in fully automatic bat transit mixer for all leads, having condesign of specified grade for reinfor R.M.C. from transit mixer to site of finishing and reinforcement including proportions as per IS: 9103 to accele workability without impairing strength.	t content as per ching plant and ontinuous agitat ced cement cor laying, excluding cost of admi erate/ retard set	approved design mill transported to site of ed mixer, manufacture the cost of center attures in recommendating of concrete, important important in the cost of center attures in recommendating of concrete, important in the cost of center attures in recommendating of concrete, important in the cost of center attures at the cost of center at the cost	x, f work in red as per mix g pumping of ing, shuttering led prove

Sl No	Specification	Quantity	Rate	Amount
	- in -charge. Note:- Cement content /less cement used as per design mix plinth level			
	Net Total	233.028cum	@10319.09/cum	2404636.90
5.007	OD54757/2022-2023			
	Extra for providing sulphate resista	nt cement for th	e structures	
	Net Total	463.720cum	@1800.16/cum	834770.20
5.008	5.34.1			
	Extra for providing richer mixes at specified cement content used is par grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	yable/ recoveral	ble separately.Provid	ing M-30
	Net Total	463.720cum	@85.68/cum	39731.53
5.009	5.37.2	27800711 wh		
	cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All work above plinth level upto floor V level			
	Net Total	230.696cum	@12043.58/cum	2778405.73
5.010	5.22.6			
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more			
	Net Total	55646.880kil ogram	@102.61/kilogra m	5709926.36
5.011	OD56162/2022-2023			
	Extra for providing epoxy coating f	or reinforcemer	nt bar	
	Net Total	55646.880kg	@2.00/kg	111293.76
5.012	4.12			
	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer \$\& #39\$; specification .			
	Net Total	157664.800kg	@1.40/kg	220730.72
5.013	5.9.1			
	Centering and shuttering including for:Foundations, footings, bases of			

Sl No	Specification	Quantity	Rate	Amount	
	Net Total	259.920sqm	@350.00/sqm	90972.00	
5.014	5.9.2				
	Centering and shuttering including sthickness) including attached pilaste				
	Net Total 1106.730sqm @748.62/sqm 828520.21				
5.015	5.9.3				
	Centering and shuttering including shors, roofs, landings, balconies and			or:Suspended	
	Net Total	420.210sqm	@851.49/sqm	357804.61	
5.016	22.23.1				
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and Structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and Structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and Structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and Structures like retaining in the ratio of Structures and Discourse and				
	Net Total	324.000sqm	@595.25/sqm	192861.00	
5.017	Providing and applying integral cryswaterproofing treatment to the RCC water tanks, roof slabs, podiums, retunnels / subway and bridge deck etc., preprintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part wasame from negative (internal) side wishall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as pengineerincharge. The product performance shalleakage. For horizontal surface one of Net Total	structures like servior, sewage ared by mixing vater) for vertical area for horizor with the help of an 90% compardrostatic pressure of cracks up per specification all carry guarance (al. 10 kg) per specification (al. 10 kg)	retaining walls of the & amp; water treatment in the ratio of 5:2 (all surfaces and 3:1) at all surfaces and appropriate fiber brush 2-3R-2010 i.e by reduced with control concare on negative side. To a width of 0.50mm and the direction of the for 10 years again.	e basement, nent plant, 5 parts (3 parts lying the n. The material lucing crete as per The m. The work f the	

Sl No	Specification	Quantity	Rate	Amount
5.018	13.7.1			
	12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1
	Net Total	2046.330sqm	@418.80/sqm	857003.00
5.019	2.25			
	Filling available excavated earth (exfoundation etc. in layers not exceed layer by ramming and watering, lea	ing 20 cm in de	pth, consolidating ea	des of ach deposited
	Net Total	1011.804cum	@269.88/cum	273065.66
5.020	19.16			
	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS: 10910 on 12 mm dia steeel bar conforming to IS:1786, having minimum cross section as 23 mm x 25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufactures permanent identification mark to be visible even after fixing including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size) Complete as per design			
	Net Total	1 <mark>4.00</mark> 0each	@568.91/each	7964.74
5.021	100.36.1	ATEORM FOR TH	E MANAGEMENT	
	Filling water with 5000 litre tankers fited in lorry and conveying water from a distance of 5 km (average) to the reservoir site and pumping the water into the reservoir of height not less than 3 m using 5 HP diesel engine pump set, hire for tanker lorry, tools and other appliences and cost of water etc. complete.			
	Net Total	1409.805Kilo litre	@190.05/Kilo litre	267933.44
5.022	10.26.3			
	Providing and fixing hand rail of apbalcony railing, staircase railing and of approves steel primer.G.I. pipes			
	Net Total	1907.022kg	@194.15/kg	370248.32
5.023	13.48.3			
	Finishing with Deluxe Multi surface primer as per manufacturers specifically Surface Paint to give an even shade over an under coat of primer applied manufacture	cations:Painting . Two or more of	g Steel work with De coat applied @ 0.90 l	luxe Multi ltr/10 sqm
	Net Total	59.277sqm	@154.59/sqm	9163.63
5.024	13.52.2			
	Finishing with Epoxy paint (two or as per manufacturer's specific preparation of surface, etc. complet	ations including	g appropriate priming	
	t			

Sl No	Specification	Quantity	Rate	Amount
	Net Total	1912.770sqm	@232.70/sqm	445101.58
			Heading Total(Rs)	17422698.8 5
6	DILUTION TANK FOR CO TRI	EATMENT-red	ctangular	
6.001	2.6.1			
	Earth work in excavation by mecha over areas (exceeding 30 cm in dep including disposal of excavated earth earth to be levelled and neatly dress	th, 1.5 m in wid th, lead up to 50	th as well as 10 sqm) m and lift up to 1.5	on plan)
	Net Total	103.680cum	@223.41/cum	23163.15
6.002	OD55372/2022-2023			
	Earth work in excavation by mecha over areas (exceeding 30cm in dept plan)including disposal of excavate, disposed earth to be levelled and no 3m	h,1.5m in width d earth ,lead up	aswell as 10 sqm or to 50m and lift up to	n o 1.5 m
	Net Total	114.048cum	@334.44/cum	38142.21
6.003	4.1.6	- STERROW	MRA	
	Providing and laying in position cer cost of centering and shuttering - A coarse sand : 6 graded stone aggreg	ll wo <mark>rk up</mark> to pl	inth level:1:3:6 (1 ce	
	Net Total	10.368cum	@7527.05/cum	78040.45
6.004	5.37.1			
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All wiork upto plinth level			
6.005	Net Total 5.37.2	65.043cum	@10319.09/cum	671184.57
	Providing and laying in position reactement concrete work, using cement manufactured in fully automatic bat transit mixer for all leads, having condesign of specified grade for reinfor R.M.C. from transit mixer to site of finishing and reinforcement including proportions as per IS: 9103 to accel	at content as per sching plant and continuous agitated ced cement con laying, excluding cost of admi	approved design mile transported to site of ed mixer, manufacture work includinging the cost of center attures in recommend	x, If work in red as per mix g pumping of ing, shuttering led

Sl No	Specification	Quantity	Rate	Amount	
	workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All work above plinth level upto floor V level				
	Net Total	9.951cum	@12043.58/cum	119845.66	
6.006	5.34.1				
	Extra for providing richer mixes at a specified cement content used is pay grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	yable/ recoveral	ole separately.Provid	ing M-30	
	Net Total	74.994cum	@85.68/cum	6425.49	
6.007	OD55377/2022-2023				
	Extra for providing sulphate resistar	nt cement for th	e structures		
	Net Total	74.994cum	@1800.16/cum	135001.20	
6.008	5.22.6	M			
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more				
	Net Total	899 <mark>9.280</mark> kilo gram	<mark>@102.61/kil</mark> ogra m	923416.12	
6.009	OD55381/2022-2023	ATEODIA EOD TH	ENANDGEMENT		
	Extra for providing epoxy coating for	or reinforcemen	nt bar		
	Net Total	8999.280kg	@2.00/kg	17998.56	
6.010	4.12				
	Extra for providing and mixing water doses by weight of cement as per m			rete work in	
	Net Total	25398.450kg	@1.40/kg	35557.83	
6.011	5.9.1				
	Centering and shuttering including strutting, etc. and removal of form for:Foundations, footings, bases of columns, etc for mass concrete				
	Net Total	54.560sqm	@350.00/sqm	19096.00	
6.012	5.9.2				
	Centering and shuttering including thickness) including attached pilaste				
	Net Total	228.000sqm	@748.62/sqm	170685.36	
6.013	5.9.3				
	Centering and shuttering including strutting, etc. and removal of form for:Susp floors, roofs, landings, balconies and access platform				
	Net Total	83.820sqm	@851.49/sqm	71371.89	
6.014	22.23.1				
	Providing and applying integral cry	stalline slurry o	f hydrophilic in natu	re for	

Sl No	Specification	Quantity	Rate	Amount			
	waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm						
	Net Total	108.000sqm	@595.25/sqm	64287.00			
6.015	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and 3 to 1 (3 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3: 1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For horizontal surface one coat @1.10 kg per sqm. Net Total 40.000sqm @458.80/sqm 18352.00						
6.016	13.7.1 12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1			
	Net Total	406.240sqm	@418.80/sqm	170133.31			
6.017	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m. Net Total 62.865cum @269.88/cum 16966.01						
6.018	19.18.1	23.00000111		10,00.01			
0.310		rame for manho	oles:455 x 610 mm r	Supplying and fixing C.I with out frame for manholes:455 x 610 mm rectangular C.I			

Sl No	Specification	Quantity	Rate	Amount
	cover (light duty) the weight of the	e cover to be no	less than 23 kg	
	Net Total	4.000each	@1629.51/each	6518.04
6.019	OD55499/2022-2023			
	Supply of uPVC Pipe, IS 4985:2000),10Kg/cm2,11	0mmDiaand fixing	
	Net Total	0.900metre	@572.91/metre	515.62
6.020	19.16			
	Providing orange colour safety foot as per IS: 10910 on 12 mm dia steed cross section as 23 mm x 25 mm an 165 mm with minimum 112 mm spatop surface by ribbing or chequering projections on tail length on 138 mr stand the bend test and chemical resmanufactures permanent identificate fixing in manholes with 30x20x15 coarse sand: 6 graded stone aggregations.	el bar conforming dover all minimace between progressives necessing as per standardistance test as per mark to be conformed to be conformed to mark to mark to be conformed to mark to mark to be conformed to the conf	ng to IS:1786, having mum length 263 mm otruded legs having 2 sary and adequate and drawing and suitable er specifications and visible even after fixing the size) Complete a	g minimum and width as 2 mm tread on choring ble to with d having ing including ement: 3 as per design
	Net Total	18.000each	@568.91/each	10240.38
6.021	Filling water with 5000 litre tankers fited in lorry and conveying water from a distance of 5 km (average) to the reservoir site and pumping the water into the reservoir of height not less than 3 m using 5 HP diesel engine pump set, hire for tanker lorry, tools and other appliences and cost of water etc. complete.			
	Net Total	120.000Kilo litre	@190.05/Kilo litre	22806.00
6.022	10.26.3			
	Providing and fixing hand rail of ap balcony railing, staircase railing and of approves steel primer.G.I. pipes	proved size by l similar works	welding etc. to steel, including applying	ladder railing, priming coat
	Net Total	665.571kg	@194.15/kg	129220.61
6.023	13.48.3			
	Finishing with Deluxe Multi surface primer as per manufacturers specific Surface Paint to give an even shade over an under coat of primer applied manufacture	cations:Painting . Two or more o	g Steel work with De coat applied @ 0.90	luxe Multi ltr/10 sqm
	Net Total	20.768sqm	@154.59/sqm	3210.53
6.024	13.52.2			
	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work			
	Net Total	304.240sqm		70796.65
			Heading Total(Rs)	2822974.64
7	MOVING BED BIOFILM REAC	TOR TANK-I	BOD REMOVAL	

Sl No	Specification	Quantity	Rate	Amount	
7.001	2.6.1				
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil				
	Net Total	119.917cum	@223.41/cum	26790.66	
7.002	4.1.6				
	Providing and laying in position cercost of centering and shuttering - A coarse sand : 6 graded stone aggreg	ll work up to pli	inth level:1:3:6 (1 co		
	Net Total	51.138cum	@7527.05/cum	384918.28	
7.003	5.37.1				
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All wiork upto plinth level				
	Net Total	177.040cum	@10319.09/cum	1826891.69	
7.004	5.37.2				
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All work above plinth level upto floor V level				
	Net Total	970.331cum	@12043.58/cum	11686259.0 2	
7.005	5.34.1				
	Extra for providing richer mixes at a specified cement content used is par grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	yable/ recoveral	ble separately.Provid	ling M-30	
	Net Total	1147.208cum	@85.68/cum	98292.78	

Sl No	Specification	Quantity	Rate	Amount
7.006	OD55694/2022-2023			
	Extra for providing sulphate resista	nt cement for th	e structures	
	Net Total	1147.208cum	@1800.16/cum	2065157.95
7.007	5.22.6			
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more			
	Net Total	288621.960ki logram	@102.61/kilogra m	29615499.3 2
7.008	OD55693/2022-2023			
	Extra for providing epoxy coating f	or reinforcemen	it bar	
	Net Total	288621.960kg	@2.00/kg	577243.92
7.009	4.12			
	Extra for providing and mixing wat doses by weight of cement as per m			rete work in
	Net Total	390050.720kg	@1.40/kg	546071.01
7.010	5.9.1	- HETER	DK	
	Centering and shuttering including for:Foundations, footings, bases of			
	Net Total	418.7 <mark>70</mark> sqm	@350.00/sqm	146569.50
7.011	5.9.2	OBUC WURKS		
	Centering and shuttering including thickness) including attached pilaste			
	Net Total	5440.353sqm	@748.62/sqm	4072757.06
7.012	22.23.1			
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and 3 in the ratio of 5 in 2 (5 parts integral crystalline slurry in 2 parts water) for vertical surfaces and 3 in 1 (3 parts integral crystalline slurry in 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm Net Total 604.100sqm @595.25/sqm 359590.53			

Sl No	Specification	Quantity	Rate	Amount	
7.013	22.23.2				
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and 3 to 1 (3 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3: 1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any				
	leakage.For horizontal surface one o	L-1 (0) V-2		200710 (2	
7.014	Net Total	655.446sqm	@458.80/sqm	300718.62	
	Brick work with common burnt clay machine moulded perforated modular bricks of class designation 12.5 conforming to IS: 2222 in exposed brick work including making horizontal and vertical grooves 10 mm wide 12 mm deep complete in cement mortar 1:6 (1 cement: 6 coarse sand) Above plinth level and upto floor V level				
	Net Total	6.890cum	@9281.31/cum	63948.23	
7.015	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters.80x1.25 mm M.S. laths with 1.25 mm thick top cover				
	Net Total	11.520sqm	@3617.31/sqm	41671.41	
7.016	Extra for providing grilled rolling shutters manufactured out of 8 mm dia M.S. bar instead of laths as per design approved by Engineer -in-Charges, (area of grill to be measured).				
	Net Total	11.520sqm	@821.94/sqm	9468.75	
7.017	Extra for providing and fixing expanded metal mesh of size 20x60 mm and strands 3.25 mm wide 1.6 mm thick weighing 3.64 kg per sqm for encasing or rolled steel sections in beams, columns and grillages excluding cost of hangers.				
	Net Total	27.880sqm	@545.46/sqm	15207.42	
7.018	13.7.1				

Sl No	Specification	Quantity	Rate	Amount	
	12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1	
	Net Total	6174.020sqm	@418.80/sqm	2585679.58	
7.019	19.16				
	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS: 10910 on 12 mm dia steeel bar conforming to IS:1786, having minimum cross section as 23 mm x 25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufactures permanent identification mark to be visible even after fixing including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size) Complete as per design				
	Net Total	44.000each	@568.91/each	25032.04	
7.020	100.36.1	/4/			
	Filling water with 5000 litre tankers distance of 5 km (average) to the re reservoir of height not less than 3 m tanker lorry, tools and other applien	servoir site and using 5 HP die	pumping the water i	nto the	
	Net Total	238 <mark>2.520</mark> Kilo litre	@190.05/Kilo litre	452797.93	
7.021	10.26.3	ATFORM FOR TH	E MANAGEMENT		
	Providing and fixing hand rail of apbalcony railing, staircase railing and of approves steel primer.G.I. pipes				
	Net Total	4069.800kg	@194.15/kg	790151.67	
7.022	13.48.3				
	Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications:Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture				
	Net Total	167.080sqm	@154.59/sqm	25828.90	
7.023	13.52.2				
	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work				
	Net Total	6173.910sqm	@232.70/sqm	1436668.86	
7.024	20.5.3				
	Providing, driving and installing driving specified diameter and length below safe working load not less than specifications. So black pipe of dia, 40 mm for genement: 2 coarse sand) under sufficient	the pile cap in the pile cap in the cified. With a community with ce	M-25 cement concretentral through preforment sand grouting of	ete to carry rmed hole with of mix 1:2 (1	

Sl No	Specification	Quantity	Rate	Amount	
	including centering, shuttering, driving and removing the steel casing pipe and lifting casing etc. complete but excluding the cost of steel reinforcement. (Length of pile for payment shall be measured from top of the shoe to the bottom of pile cap).500 mm dia piles				
	Net Total	360.000metre	@4947.90/metre	1781244.00	
7.025	20.2A.1				
	Boring, providing and installation bored cast-in-situ reinforced cement concrete piles of garde M-25 of specified diameter and length below pile cap, to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of boring with bentonite solution and temporary casing of appropriate length for setting out and removal of same and the length of the pile to be embedded in the pile cap etc. by Crawler mounted, telescopic boom hydraulic pilling Rig all complete, including removal of excavated earth with all its lifts and leads (length of pile for payment shall be measured up to bottom of pile cap). Note: Truck Mounted rotary/TMR/Tube well boring machine shall not be used.600				
	mm dia piles	162 <mark>0.000</mark> metr			
	Net Total	e e	@5191.83/metre	8410764.60	
7.026	20.5.5	ATFORM FOR TH	E MANAGEMENT		
	Providing, driving and installing driven Pre-cast reinforced cement concrete piles of specified diameter and length below the pile cap in M-25 cement concrete to carry safe working load not less than specified. With a central through preformed hole with M.S. black pipe of dia, 40 mm for grouting with cement sand grouting of mix 1:2 (1 cement: 2 coarse sand) under sufficient positive pressure to ensure complete filling including centering, shuttering, driving and removing the steel casing pipe and lifting casing etc. complete but excluding the cost of steel reinforcement. (Length of pile for payment shall be measured from top of the shoe to the bottom of pile cap).750 mm dia piles				
	Net Total	1080.000metr e	@10810.53/metr e	11675372.4 0	
7.027	20.6.3.1				
	Vertical load testing of piles in accordance with IS 2911(Part IV) including installation of loading platform and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of engineer -in-Charge. Group of two or more piles upto 50 tonne capacityInitial test				
	Net Total	8.000per test	@82193.55/per test	657548.40	
7.028	20.6.3.2				
	Vertical load testing of piles in account installation of loading platform and cap and dismantling of test cap afte	preparation of	pile head or construc	tion of test	

Sl No	Specification	Quantity	Rate	Amount
	direction of engineer -in-Charge. Group of two or more piles upto 50	tonne capacity	Routine test	
	Net Total	14.000per test	@48494.19/per test	678918.66
			Heading Total(Rs)	80357063.1 9
8	SECONDARY CLARIFIER WIT	TH PLATE SE	TTLER	
8.001	2.6.1			
	Earth work in excavation by mecha over areas (exceeding 30 cm in dep including disposal of excavated earth earth to be levelled and neatly dress	th, 1.5 m in wid th, lead up to 50	th as well as 10 sqm) m and lift up to 1.5	on plan)
	Net Total	86.436cum	@223.41/cum	19310.67
8.002	4.1.6			
	Providing and laying in position cer cost of centering and shuttering - A coarse sand : 6 graded stone aggreg	ll work up to pl	inth level:1:3:6 (1 ce	
	Net Total	14.406cum	@7527.05/cum	108434.68
8.003	5.37.1			
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All wiork upto plinth level			
	Net Total	39.967cum	@10319.09/cum	412423.07
8.004	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately.All work above plinth level upto floor V level			
	Net Total	70.250cum	@12043.58/cum	846061.50

Sl No	Specification	Quantity	Rate	Amount
8.005	5.34.1	-		
	Extra for providing richer mixes at a specified cement content used is pay grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	yable/ recoveral	ble separately.Provid	ing M-30
	Net Total	110.210cum	@85.68/cum	9442.79
8.006	OD57007/2022-2023			
	Extra for providing sulphate resistar	nt cement for th	e structures	
	Net Total	110.210cum	@1800.16/cum	198395.63
8.007	5.22.6			
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more			
	Net Total	13225.200kil ogram	@102.61/kilogra m	1357037.77
8.008	OD57006/2022-2023		The second second	
	Extra for providing epoxy coating f	or reinforcemen	nt bar	
	Net Total	13225.200kg	@2.00/kg	26450.40
8.009	4.12			
	Extra for providing and mixing water doses by weight of cement as per m	er proo <mark>fin</mark> g mat anufacturer	erial in cement conci 39;s specification .	ete work in
	Net Total	37471.400kg	@1.40/kg	52459.96
8.010	5.9.1			
	Centering and shuttering including for:Foundations, footings, bases of			
	Net Total	43.420sqm	@350.00/sqm	15197.00
8.011	5.9.2			
	Centering and shuttering including sthickness) including attached pilaste			
	Net Total	510.754sqm	@748.62/sqm	382360.66
8.012	22.23.1			
	Providing and applying integral crywaterproofing treatment to the RCC water tanks, roof slabs, podiums, retunnels / subway and bridge deck etc., prepaintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was same from negative (internal) side wishall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hycrystalline	structures like servior, sewage ared by mixing vater) for vertica ater) for horizor with the help of fied in ACI-212 an 90% compar	retaining walls of the & property water treatment in the ratio of 5 : 2 (state all surfaces and 3 : 1 (and surfaces and apply synthetic fiber brush 2-3R-2010 i.e by red red with control concerns.	e basement, ent plant, 5 parts (3 parts lying the The material ucing erete as per

Sl No	Specification	Quantity	Rate	Amount
	slurry shall be capable of self-healing shall be carried out all complete as pengineerincharge. The product performance shall leakage. For vertical surface two coal	per specification all carry guaran	n and the direction of the for 10 years aga	f the
	Net Total	181.800sqm	@595.25/sqm	108216.45
8.013	22.23.2	-		
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., preprintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was same from negative (internal) side with shall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as a engineerincharge. The product performance shall became one of the state of the self-healing shall became of the self-healing shall became out all complete as a leakage. For horizontal surface one of the self-healing shall surface one of the self-healing shall became of the self-healing shall became of the self-healing shall be carried out all complete as a leakage. For horizontal surface one of the self-healing shall be safely surface on the self-healing shall be safely shall be safely shall be safely shall be safely shall shall be safely shall be safely shall shall be safely shall shall be safely shall shall be safely shall s	structures like servior, sewage ared by mixing vater) for vertica ater) for horizor with the help of fied in ACI-212 an 90% compandrostatic pressur- age of cracks up per specification	retaining walls of the & amp; water treatment in the ratio of 5:2 (all surfaces and 3:1 and surfaces and appropriate fiber brush 2-3R-2010 i.e by reduced with control concurred on negative side. To a width of 0.50mm and the direction of the for 10 years again.	te basement, ment plant, 5 parts (3 parts lying the h. The material lucing crete as per The m. The work f the
		20.250sqm	@458.80/sqm	9290.70
8.014	13.7.1 12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1
	Net Total	409.210sqm	@418.80/sqm	171377.15
8.015	19.16			
	Providing orange colour safety foot as per IS: 10910 on 12 mm dia steed cross section as 23 mm x 25 mm an 165 mm with minimum 112 mm spotop surface by ribbing or chequering projections on tail length on 138 mm stand the bend test and chemical resumanufactures permanent identificate fixing in manholes with 30x20x15 coarse sand: 6 graded stone aggregations.	el bar conforming dover all minima de between progressides necessen as per standar istance test as progression mark to be comment concernity.	ng to IS:1786, having mum length 263 mm otruded legs having 2 sary and adequate and drawing and suital per specifications and visible even after fix crete block 1:3:6 (1c	g minimum and width as 2 mm tread on choring ble to with d having ing including ement: 3
0.015		19.000each	@ 308.91/eacn	10809.29
8.016	Filling water with 5000 litre tankers distance of 5 km (average) to the re reservoir of height not less than 3 m tanker lorry, tools and other applien Net Total	servoir site and using 5 HP die	pumping the water i	nto the , hire for
	INCLIUIAL	2 1 0.5/3IXII0	© 170.03/ KIIO	+1203.07

Sl No	Specification	Quantity	Rate	Amount
		litre	litre	
8.017	10.26.3			
	Providing and fixing hand rail of ap balcony railing, staircase railing and of approves steel primer.G.I. pipes			
	Net Total	493.436kg	@194.15/kg	95800.60
8.018	13.48.3			
	Finishing with Deluxe Multi surface primer as per manufacturers specific Surface Paint to give an even shade over an under coat of primer applied manufacture	cations:Painting . Two or more o	g Steel work with De coat applied @ 0.90 l	luxe Multi tr/10 sqm
	Net Total	15.480sqm	@154.59/sqm	2393.05
8.019	13.52.2			
	Finishing with Epoxy paint (two or as per manufacturer's specific preparation of surface, etc. complete	ations including	g appropriate priming	
	Net Total	409.210sqm	@232.70/sqm	95223.17
		131	Heading Total(Rs)	3967888.21
9	SLUDGE SUMP			
9.001	2.6.1	ATFORM FOR TH	E MANAGEMENT	
	Earth work in excavation by mecha over areas (exceeding 30 cm in depincluding disposal of excavated earth earth to be levelled and neatly dress	th, 1.5 m in wid th, lead up to 50	th as well as 10 sqm O m and lift up to 1.5	on plan)
	Net Total	16.810cum	@223.41/cum	3755.52
9.002	4.1.6			
	Providing and laying in position cercost of centering and shuttering - A coarse sand : 6 graded stone aggreg	ll work up to pl	inth level:1:3:6 (1 ce	
	Net Total	2.522cum	@7527.05/cum	18983.22
9.003	5.37.1			
	Providing and laying in position reacement concrete work, using cement manufactured in fully automatic bat transit mixer for all leads, having condesign of specified grade for reinfor R.M.C. from transit mixer to site of finishing and reinforcement including proportions as per IS: 9103 to accel workability without impairing strenting - in -charge. Note: - Cement content release cement used as per design mix plinth level	t content as per ching plant and ontinuous agitat reed cement con laying, excluding cost of admi erate/ retard set gth and durabil considered in t	approved design mill transported to site of ed mixer, manufacture merete work including the cost of center actures in recommending of concrete, implicitly as per direction of his item is @330 kg	f work in red as per mix g pumping of ing, shuttering led prove f the Engineer /cum. Excess

Sl No	Specification	Quantity	Rate	Amount		
	Net Total	15.007cum	@10319.09/cum	154858.58		
9.004	5.34.1					
	Extra for providing richer mixes at all floor levels. Note:- Excess/less cement over the specified cement content used is payable/ recoverable separately. Providing M-30 grade concrete instead of M-25 grade BMC/RMC. (Note:- Cement content considered in M-30 is @ 340 kg/cum).					
	Net Total	15.007cum	@85.68/cum	1285.80		
9.005	OD57071/2022-2023					
	Extra for providing sulphate resistar	nt cement for th	e structures			
	Net Total	15.007cum	@1800.16/cum	27015.00		
9.006	5.22.6					
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more	including straig upto plinth lev	ghtening, cutting, ber elThermo - Mechani	nding, placing cally Treated		
	Net Total	1800.000kilo gram	@102.61/kilogra m	184698.00		
9.007	4.12		GRAF			
	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer 's specification.					
	Net Total	5100.000kg	@1.40/kg	7140.00		
9.008	OD57082/2022-2023					
	Extra for providing epoxy coating f	or reinforcemen	it bar			
	Net Total	1800.000kg	@2.32/kg	4176.00		
9.009	5.9.1					
	Centering and shuttering including for:Foundations, footings, bases of					
	Net Total	18.840sqm	@350.00/sqm	6594.00		
9.010	5.9.2					
	Centering and shuttering including thickness) including attached pilaste	strutting, etc. an ers, butteresses,	d removal of form for plinth and string cou	or:Walls (any orses etc.		
	Net Total	64.947sqm	@748.62/sqm	48620.62		
9.011	22.23.1					
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., prepaintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was same from negative (internal) side with shall meet the requirements as specipermeability of concrete by more the	Structures like servior, sewage ared by mixing vater) for vertical ater) for horizon with the help of ified in ACI-212	retaining walls of the & amp; water treatm in the ratio of 5 : 2 (stall surfaces and 3 : 1 (stall surfaces and appropriate the synthetic fiber brush 2-3R-2010 i.e by red	e basement, ent plant, 5 parts (3 parts lying the The material ucing		

Sl No	Specification	Quantity	Rate	Amount
	DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as engineerin-	ng of cracks up	to a width of 0.50mr	n. The work
	charge. The product performance sheakage. For vertical surface two coaleakage.			inst any
	Net Total	25.434sqm	@595.25/sqm	15139.59
9.012	22.23.2			
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., prepintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part wis same from negative (internal) side wishall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as engineerincharge. The product performance shall eakage. For horizontal surface one of the self-healing shall be carried out all complete as a self-healing shall be carried out al	Structures like servior, sewage ared by mixing vater) for verticater) for horizon with the help of lified in ACI-21 an 90% compardrostatic pressure of cracks upper specification all carry guaran	retaining walls of the & amp; water treatment water treatment in the ratio of 5:2 (all surfaces and 3:1 and surfaces and appropriate synthetic fiber brush 2-3R-2010 i.e by reduced with control concurred on negative side. To a width of 0.50mm and the direction of the for 10 years again.	e basement, nent plant, 5 parts (3 parts lying the n. The material ucing crete as per The m. The work f the
	Net Total			3243.72
9.013	13.7.1	7,10,7004111		02.0172
	12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1
	Net Total	73.394sqm	@418.80/sqm	30737.41
9.014	19.16			
	Providing orange colour safety foot as per IS: 10910 on 12 mm dia steed cross section as 23 mm x 25 mm an 165 mm with minimum 112 mm sp top surface by ribbing or chequering projections on tail length on 138 mm stand the bend test and chemical resumanufactures permanent identificate fixing in manholes with 30x20x15 coarse sand: 6 graded stone aggregations.	el bar conforming dover all minimace between progressides necessed as per standardistance test as priced in mark to be some cement concept.	ng to IS:1786, having mum length 263 mm otruded legs having 2 sary and adequate and drawing and suital per specifications and visible even after fixterete block 1:3:6 (1c inal size) Complete a	g minimum and width as 2 mm tread on choring ble to with d having ing including ement: 3
0.015		o.uueacn		4331.28
9.015	Filling water with 5000 litre tankers distance of 5 km (average) to the re reservoir of height not less than 3 m	servoir site and	pumping the water i	nto the

Sl No	Specification	Quantity	Rate	Amount	
	tanker lorry, tools and other applien	ces and cost of	water etc. complete.		
	Net Total	19.089Kilo litre	@190.05/Kilo litre	3627.86	
9.016	10.26.3				
	Providing and fixing hand rail of apbalcony railing, staircase railing and of approves steel primer.G.I. pipes				
	Net Total	147.168kg	@194.15/kg	28572.67	
9.017	13.48.3				
	Finishing with Deluxe Multi surface primer as per manufacturers specific Surface Paint to give an even shade, over an under coat of primer applied manufacture	cations:Painting Two or more of	g Steel work with De coat applied @ 0.90 l	luxe Multi ltr/10 sqm	
	Net Total	4.617sqm	@154.59/sqm	713.74	
9.018	13.52.2				
	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.On concrete work				
	Net Total	7 <mark>3.38</mark> 0sqm	@232.70/sqm	17075.53	
		TEODIN SOD TH	Heading Total(Rs)	560788.54	
10	SLUDGE THICKENER-Circular	UBLIC WORKS	74.50.000.000.0000.000		
10.001	2.6.1				
	Earth work in excavation by mechan over areas (exceeding 30 cm in dept including disposal of excavated earth to be levelled and neatly dress	h, 1.5 m in wid h, lead up to 50	th as well as 10 sqm om and lift up to 1.5	on plan)	
	Net Total	80.688cum	@223.41/cum	18026.51	
10.002	4.1.6				
	Providing and laying in position cercost of centering and shuttering - Al coarse sand : 6 graded stone aggregation	l work up to pl	inth level:1:3:6 (1 ce		
	Net Total	10.086cum	@7527.05/cum	75917.83	
10.003	5.37.1				
	Providing and laying in position reacement concrete work, using cemen manufactured in fully automatic bat transit mixer for all leads, having codesign of specified grade for reinfor R.M.C. from transit mixer to site of finishing and reinforcement including proportions as per IS: 9103 to accele workability without impairing strengting to the content of the content	t content as per ching plant and ontinuous agitat ced cement cor laying, excludi ng cost of admi- erate/ retard set gth and durabil	approved design mile transported to site of ed mixer, manufacture more the work including the cost of center extures in recommendating of concrete, impirity as per direction of	x, of work in ored as per mix g pumping of ing, shuttering led prove f the Engineer	

Sl No	Specification	Quantity	Rate	Amount
	/less cement used as per design mix plinth level	is payable/reco	verable separately.A	ll wiork upto
	Net Total	48.766cum	@10319.09/cum	503220.74
10.004	5.34.1			
	Extra for providing richer mixes at a specified cement content used is pay grade concrete instead of M-25 gradin M-30 is @ 340 kg/cum).	yable/ recoverat	ole separately.Provid	ing M-30
	Net Total	48.760cum	@85.68/cum	4177.76
10.005	OD57321/2022-2023	-		
	Extra for providing sulphate resistar	nt cement for th	e structures	
	Net Total	48.760cum	@1800.16/cum	87775.80
10.006	5.22.6	-		
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more			
	Net Total	5851.200kilo gram	@102.61/kilogra m	600391.63
10.007	OD57320/2022-2023			
	Extra for providing epoxy coating for	or reinforcemen	nt bar	
	Net Total	5851.200kg	@2.00/kg	11702.40
10.008	4.12			
	Extra for providing and mixing water doses by weight of cement as per m			rete work in
	Net Total	16578.400kg	@1.40/kg	23209.76
10.009	5.9.1			
	Centering and shuttering including for:Foundations, footings, bases of	strutting, etc. an columns, etc for	nd removal of form r mass concrete	
	Net Total	46.040sqm	@350.00/sqm	16114.00
10.010	5.9.2			
	Centering and shuttering including sthickness) including attached pilaste			
	Net Total	143.950sqm	@748.62/sqm	107763.85
10.011	22.23.1			
	Providing and applying integral cryswaterproofing treatment to the RCC water tanks, roof slabs, podiums, retunnels / subway and bridge deck etc., prepaintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was	structures like servior, sewage ared by mixing vater) for verticater) for horizon	retaining walls of the & the wamp; water treatment in the ratio of 5 : 2 (5 all surfaces and 3 : 1 (5 at all surfaces and applications).	e basement, ent plant, 5 parts 3 parts lying the
	same from negative (internal) side v	vith the help of	synthetic fiber brush	. The material

Sl No	Specification	Quantity	Rate	Amount
	shall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline	an 90% compa drostatic pressu	red with control conductor on negative side.	crete as per The
	slurry shall be capable of self-healing shall be carried out all complete as pengineerincharge. The product performance sharps and the product performance sharps.	per specification	n and the direction o	f the
	leakage.For vertical surface two coa			I
	Net Total	54.175sqm	@595.25/sqm	32247.67
10.012	22.23.2			
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels	Structures like servior, sewage	retaining walls of the & water treatm	e basement, nent plant,
	/ subway and bridge deck etc., preprintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was same from negative (internal) side vishall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline	vater) for vertical vater) for horizon with the help of ified in ACI-21 ann 90% compardrostatic pressu	al surfaces and 3:1 ntal surfaces and app synthetic fiber brush 2-3R-2010 i.e by red red with control concre on negative side.	(3 parts lying the a. The material lucing crete as per The
	slurry shall be capable of self-healing shall be carried out all complete as pengineerincharge. The product performance shall eakage. For horizontal surface one of	per specification nall carry guaran	n and the direction on the for 10 years aga	f the
	Net Total	37.390sqm	@458.80/sqm	17154.53
10.013	13.7.1			
	12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1
	Net Total	219.305sqm	@418.80/sqm	91844.93
10.014	19.16			
	Providing orange colour safety foot as per IS: 10910 on 12 mm dia steed cross section as 23 mm x 25 mm an 165 mm with minimum 112 mm sp. top surface by ribbing or chequering projections on tail length on 138 mr stand the bend test and chemical resmanufactures permanent identificate fixing in manholes with 30x20x15 coarse sand: 6 graded stone aggregation of the provided	el bar conforming dover all minimace between progressides necessed as per standardistance test as per standardista	ng to IS:1786, having num length 263 mm otruded legs having 2 sary and adequate and drawing and suital per specifications and visible even after fix crete block 1:3:6 (1c) and size) Complete a	g minimum and width as 2 mm tread on choring ble to with d having ing including ement: 3
10.015	100.36.1	7.000cacii	@ 300.71/Cacii	3702.31
10.013	Filling water with 5000 litre tankers	s fited in lorry a	nd conveying water	from a
	1 ming water with 5000 little tallkers	, inca in forty a	ing conveying water	110111 a

Sl No	Specification	Quantity	Rate	Amount
	distance of 5 km (average) to the reservoir of height not less than 3 m tanker lorry, tools and other applien	using 5 HP die	esel engine pump set	
	Net Total	93.425Kilo litre	@190.05/Kilo litre	17755.42
10.016	10.26.3			
	Providing and fixing hand rail of apbalcony railing, staircase railing and of approves steel primer.G.I. pipes			
	Net Total	364.487kg	@194.15/kg	70765.15
10.017	13.48.3			
	Finishing with Deluxe Multi surface primer as per manufacturers specific Surface Paint to give an even shade over an under coat of primer applied manufacture	cations:Painting Two or more of	Steel work with Del coat applied @ 0.90 l	luxe Multi tr/10 sqm
	Net Total	11.435sqm	@154.59/sqm	1767.74
10.018	13.52.2		GRAF	ره
	Finishing with Epoxy paint (two or as per manufacturer's specifical preparation of surface, etc. complete	ation <mark>s inclu</mark> ding	g a <mark>ppropriate priming</mark>	
	Net Total	219.300sqm	@232.70/sqm	51031.11
		obot woms	Heading Total(Rs)	1734849.20
11	FILTER FEED TANK-Rectangul	ar		
11.001	2.6.1			
	Earth work in excavation by mechan over areas (exceeding 30 cm in dept including disposal of excavated earth earth to be levelled and neatly dress	h, 1.5 m in wid h, lead up to 50	th as well as 10 sqm m and lift up to 1.5	on plan)
	Net Total	25.205cum	@223.41/cum	5631.05
11.002	4.1.6			
	Providing and laying in position cer cost of centering and shuttering - Al coarse sand : 6 graded stone aggregation	l work up to pl	inth level:1:3:6 (1 ce	
	Net Total	7.562cum	@7527.05/cum	56919.55
11.003	5.37.1			
	Providing and laying in position reacement concrete work, using cemen manufactured in fully automatic bat transit mixer for all leads, having codesign of specified grade for reinfor R.M.C. from transit mixer to site of finishing and reinforcement including proportions as per IS: 9103 to acceler	t content as per ching plant and entinuous agitat ced cement cor laying, excluding cost of admi	approved design mix transported to site of ed mixer, manufactural acrete work including ang the cost of centering axtures in recommend	f work in red as per mix g pumping of ing, shuttering ed

Sl No	Specification	Quantity	Rate	Amount
	workability without impairing stren - in -charge. Note:- Cement content /less cement used as per design mix plinth level	considered in the	his item is @330 kg	/cum. Excess
	Net Total	37.564cum	@10319.09/cum	387626.30
11.004	OD57371/2022-2023			
	Extra for providing sulphate resistar	nt cement for th	e structures	
	Net Total	37.564cum	@1800.16/cum	67621.21
11.005	5.34.1			
	Extra for providing richer mixes at a specified cement content used is pay grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	yable/ recoveral	ble separately.Provid	ing M-30
	Net Total	37.564cum	@85.68/cum	3218.48
11.006	5.22.6	AN		
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more			
	Net Total	450 <mark>7.680</mark> kilo	<mark>@102.61/kilogra</mark> m	462533.04
11.007	OD57425/2022-2023	ATEODIA SOD TH	E MANAGEMENT	
	Extra for providing epoxy coating for	or reinforcemen	nt bar	
	Net Total	37.564kg	@2.00/kg	75.13
11.008	4.12			
	Extra for providing and mixing wated doses by weight of cement as per m	er proofing mat anufacturer	erial in cement conci 39;s specification .	rete work in
	Net Total	12771.760kg	@1.40/kg	17880.46
11.009	5.9.1			
	Centering and shuttering including for:Foundations, footings, bases of			
	Net Total	42.600sqm	@350.00/sqm	14910.00
11.010	5.9.2			
	Centering and shuttering including sthickness) including attached pilaste			
	Net Total	142.040sqm	@748.62/sqm	106333.98
11.011	22.23.1			
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., preprintegral crystalline slurry: 2 parts w	structures like servior, sewage ared by mixing	retaining walls of the & amp; water treatm in the ratio of $5:2$ (\$	e basement, ent plant, 5 parts

Sl No	Specification	Quantity	Rate	Amount
	integral crystalline slurry: 1 part was same from negative (internal) side with shall meet the requirements as special permeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as pengineerincharge. The product performance shall beakage. For vertical surface two coal	with the help of ified in ACI-212 an 90% compand of cracks upper specification all carry guaran	synthetic fiber brush 2-3R-2010 i.e by red red with control concure on negative side. to a width of 0.50mm and the direction of the for 10 years again.	a. The material ucing crete as per The m. The work f the
	Net Total	60.000sqm	@595.25/sqm	35715.00
11.012	22.23.2			
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., preprintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part was same from negative (internal) side with shall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as a engineerincharge. The product performance shall be a product performance shall surface one of the state of	structures like servior, sewage ared by mixing vater) for verticater) for horizon with the help of ified in ACI-212 an 90% compard of cracks upper specification all carry guaran coat @1.10 kg preserviors and the service of the serv	retaining walls of the & amp; water treatment in the ratio of 5:2 (and surfaces and 3:1) and surfaces and appropriately surfaces and the direction of the for 10 years against a surface for 10 years against a su	e basement, sent plant, 5 parts (3 parts lying the 1. The material ucing crete as per The m. The work f the inst any
	Net Total	36.000sqm	@458.80/sqm	16516.80
11.013	13.7.1 12 mm cement plaster finished with cement : 3 fine sand)	a floating coat	of neat cement of m	ix:1:3 (1
	Net Total	161.000sqm	@418.80/sqm	67426.80
11.014	Providing orange colour safety foot as per IS: 10910 on 12 mm dia steed cross section as 23 mm x 25 mm an 165 mm with minimum 112 mm sp. top surface by ribbing or chequering projections on tail length on 138 mm stand the bend test and chemical resumanufactures permanent identificate fixing in manholes with 30x20x15 coarse sand: 6 graded stone aggregation Net Total	el bar conformind over all minir ace between progressides necessed as per standar sistance test as progression mark to be communicate 20 mm nominate 20 mm n	ng to IS:1786, having mum length 263 mm otruded legs having 2 sary and adequate and drawing and suitable specifications and visible even after fixing the specifications and the specifications are the specif	g minimum and width as 2 mm tread on choring ble to with d having ing including ement: 3
11.015	100.36.1	7.000eacii	@ JUO. 71/Cacii	3704.37
11.015	100.30.1			

Sl No	Specification	Quantity	Rate	Amount
	Filling water with 5000 litre tankers distance of 5 km (average) to the re reservoir of height not less than 3 m tanker lorry, tools and other applien	servoir site and using 5 HP die	pumping the water it sel engine pump set	nto the
	Net Total	90.000Kilo litre	@190.05/Kilo litre	17104.50
11.016	10.26.3			
	Providing and fixing hand rail of ap balcony railing, staircase railing and of approves steel primer.G.I. pipes			
	Net Total	413.111kg	@194.15/kg	80205.50
11.017	13.48.3			
	Finishing with Deluxe Multi surface primer as per manufacturers specific Surface Paint to give an even shade over an under coat of primer applied manufacture	cations:Painting . Two or more o	Steel work with De coat applied @ 0.90 l	luxe Multi ltr/10 sqm
	Net Total	3.935sqm	@154.59/sqm	608.31
11.018	13.52.2	Age aga	TO MAN	
	Finishing with Epoxy paint (two or as per manufacturer's specific preparation of surface, etc. complete	ation <mark>s includin</mark> g	g appropriate priming	
	Net Total	161.000sqm	@232.70/sqm	37464.70
			Heading Total(Rs)	1381773.18
12	TREATED WATER TANK-CHI	ORINE CON	ΓΑCT TANK Recta	angular
12.001	2.6.1			
12.001	2.6.1 Earth work in excavation by mecha over areas (exceeding 30 cm in depincluding disposal of excavated earth to be levelled and neatly dress	th, 1.5 m in wid th, lead up to 50	th as well as 10 sqm m and lift up to 1.5	on plan)
12.001	Earth work in excavation by mecha over areas (exceeding 30 cm in depincluding disposal of excavated eart	th, 1.5 m in wid th, lead up to 50	th as well as 10 sqm m and lift up to 1.5	on plan)
12.001	Earth work in excavation by mecha over areas (exceeding 30 cm in dep including disposal of excavated earth earth to be levelled and neatly dress	th, 1.5 m in wid th, lead up to 50 ed.All kinds of	th as well as 10 sqm m and lift up to 1.5 soil	on plan) m, disposed
	Earth work in excavation by mecha over areas (exceeding 30 cm in depi including disposal of excavated eart earth to be levelled and neatly dress Net Total	th, 1.5 m in wid th, lead up to 50 ed.All kinds of 193.489cum nical means (Hy h,1.5m in width d earth ,lead up	th as well as 10 sqm m and lift up to 1.5 soil @223.41/cum ydraulic excavator)/n aswell as 10 sqm or to 50m and lift up to	on plan) m, disposed 43227.38 manual means o 1.5 m
	Earth work in excavation by mecha over areas (exceeding 30 cm in deprincluding disposal of excavated earth to be levelled and neatly dress Net Total OD57489/2022-2023 Earth work in excavation by mecha over areas (exceeding 30cm in depting plan) including disposal of excavate disposed earth to be levelled and near the content of the	th, 1.5 m in wid th, lead up to 50 ed.All kinds of 193.489cum nical means (Hy h,1.5m in width d earth ,lead up	th as well as 10 sqm m and lift up to 1.5 soil @223.41/cum ydraulic excavator)/n aswell as 10 sqm or to 50m and lift up to	on plan) m, disposed 43227.38 manual means o 1.5 m
	Earth work in excavation by mecha over areas (exceeding 30 cm in deprincluding disposal of excavated earth to be levelled and neatly dress Net Total OD57489/2022-2023 Earth work in excavation by mecha over areas (exceeding 30cm in deptiplan) including disposal of excavate, disposed earth to be levelled and not 3m	th, 1.5 m in width, lead up to 50 ed.All kinds of 193.489cum nical means (Hyh,1.5m in width d earth ,lead up eatly dressed .A	th as well as 10 sqm m and lift up to 1.5 soil @223.41/cum ydraulic excavator)/r aswell as 10 sqm or to 50m and lift up to 11 kind of soil-addition	on plan) m, disposed 43227.38 manual means 1 0 1.5 m onal lift 1.5to
12.002	Earth work in excavation by mecha over areas (exceeding 30 cm in depincluding disposal of excavated earth to be levelled and neatly dress Net Total OD57489/2022-2023 Earth work in excavation by mecha over areas (exceeding 30cm in depting plan) including disposal of excavate disposed earth to be levelled and not 3m Net Total	th, 1.5 m in width, lead up to 50 ed. All kinds of 193.489cum nical means (Hyh,1.5m in width dearth ,lead up eatly dressed .A 193.489cum nical means (Hyth, 1.5 m in width, 1.5 m in width, lead up to 50	th as well as 10 sqm m and lift up to 1.5 soil @223.41/cum //draulic excavator)/r aswell as 10 sqm or to 50m and lift up to 11 kind of soil-addition //draulic excavator)/r th as well as 10 sqm or m and lift up to 1.5	on plan) m, disposed 43227.38 manual means of 1.5 m onal lift 1.5to 64710.46 manual means on plan) m, disposed

Sl No	Specification	Quantity	Rate	Amount		
12.004	4.1.6					
	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level:1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 40 mm nominal size)					
	Net Total	19.349cum	@7527.05/cum	145640.89		
12.005	5.37.1					
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:- Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately. All wiork upto plinth level					
	Net Total	138.882cum	@10319.09/cum	1433135.86		
12.006	5.34.1					
	Extra for providing richer mixes at a specified cement content used is pay grade concrete instead of M-25 grad in M-30 is @ 340 kg/cum).	yable/ recoveral	ole separately.Provid	ling M-30		
	Net Total	138.880cum	@85.68/cum	11899.24		
12.007	OD57637/2022-2023					
	Extra for providing sulphate resistar	nt cement for th	e structures			
	Net Total	138.880cum	@3152.04/cum	437755.32		
12.008	5.22.6					
	Steel reinforcement for R.C.C work in position and binding all complete bars of grade Fe-500D or more					
	Net Total	55059.600kil ogram	@102.61/kilogra m	5649665.56		
12.009	OD57636/2022-2023					
	Extra for providing epoxy coating for reinforcement bar					
	Net Total	55059.600kg	@2.00/kg	110119.20		
12.010	4.12					
	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer's specification.					
	Net Total	47219.200kg	@1.40/kg	66106.88		
12.011	5.9.1					

Sl No	Specification	Quantity	Rate	Amount
	Centering and shuttering including s for:Foundations, footings, bases of	strutting, etc. ar columns, etc for	nd removal of form r mass concrete	
	Net Total	123.720sqm	@350.00/sqm	43302.00
12.012	5.9.2			
	Centering and shuttering including sthickness) including attached pilaste			
	Net Total	566.908sqm	@748.62/sqm	424398.67
12.013	22.23.1			
	Providing and applying integral crywaterproofing treatment to the RCC water tanks, roof slabs, podiums, retunnels / subway and bridge deck etc., prepaintegral crystalline slurry: 2 parts wintegral crystalline slurry: 1 part wasame from negative (internal) side wishall meet the requirements as specipermeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as pengineerincharge. The product performance shalleakage. For vertical surface two coasticles and the surface two coasticles.	structures like servior, sewage ared by mixing vater) for vertica ater) for horizor with the help of fied in ACI-212 an 90% compan drostatic pressur- ag of cracks up per specification	retaining walls of the & amp; water treatment in the ratio of 5:2 (all surfaces and 3:1 and surfaces and appropriate fiber brush 2-3R-2010 i.e by reduced with control concurs on negative side. To a width of 0.50mm and the direction of the for 10 years against the amount of the for 10 years against the amount of the direction of the for 10 years against the amount of the direction of the for 10 years against the formal years against the forma	te basement, ment plant, 5 parts (3 parts lying the h. The material lucing crete as per The m. The work f the
	Net Total	204.750sqm	@595.25/sqm	121877.44
12.014	22.23.2			
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and Structures are treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5:2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For horizontal surface one coat @1.10 kg per sqm. Net Total 104.376sqm @458.80/sqm 47887.71			
12.015	13.7.1	10 r.5 / 054III	© 120.00/3 q III	7/00/./1
12.013	12 mm cement plaster finished with	a floating coat	of neat cement of m	ix:1:3 (1

Sl No **Specification** Quantity Rate Amount cement : 3 fine sand) Net Total 594.170sqm @418.80/sqm 248838.40 12.016 19.16 Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS: 10910 on 12 mm dia steel bar conforming to IS:1786, having minimum cross section as 23 mm x 25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufactures permanent identification mark to be visible even after fixing including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size) Complete as per design Net Total 26.000each @568.91/each 14791.66 12.017 100.36.1 Filling water with 5000 litre tankers fited in lorry and conveying water from a distance of 5 km (average) to the reservoir site and pumping the water into the reservoir of height not less than 3 m using 5 HP diesel engine pump set, hire for tanker lorry, tools and other appliences and cost of water etc. complete. 365.313Kilo @190.05/Kilo Net Total 69427.74 litre litre 12.018 10.26.3 Providing and fixing hand rail of approved size by welding etc. to steel ladder railing, balcony railing, staircase railing and similar works, including applying priming coat of approves steel primer.G.I. pipes 625.409kg @194.15/kg Net Total 121423.16 12.019 | 13.48.3 Finishing with Deluxe Multi surface paint system for interiors and exteriors using primer as per manufacturers specifications: Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture Net Total 19.620sqm @154.59/sqm 3033.06 12.020 | 13.52.2 Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer & #39;s specifications including appropriate priming coat, preparation of surface, etc. complete. On concrete work 594.170sqm Net Total @232.70/sqm 138263.36 12.021 | 20.5.3 Providing, driving and installing driven Pre-cast reinforced cement concrete piles of specified diameter and length below the pile cap in M-25 cement concrete to carry safe working load not less than specified. With a central through preformed hole with M.S. black pipe of dia, 40 mm for grouting with cement sand grouting of mix 1:2 (1) cement : 2 coarse sand) under sufficient positive pressure to ensure complete filling including centering, shuttering, driving and removing the steel casing pipe and lifting

Sl No	Specification	Quantity	Rate	Amount	
	casing etc. complete but excluding the cost of steel reinforcement. (Length of pile for payment shall be measured from top of the shoe to the bottom of pile cap).500 mm dia piles				
	Net Total	900.000metre	@4947.90/metre	4453110.00	
12.022	20.5.5				
	Providing, driving and installing driven Pre-cast reinforced cement concrete piles of specified diameter and length below the pile cap in M-25 cement concrete to carry safe working load not less than specified. With a central through preformed hole with M.S. black pipe of dia, 40 mm for grouting with cement sand grouting of mix 1:2 (1 cement: 2 coarse sand) under sufficient positive pressure to ensure complete filling including centering, shuttering, driving and removing the steel casing pipe and lifting casing etc. complete but excluding the cost of steel reinforcement. (Length of pile for payment shall be measured from top of the shoe to the bottom of pile cap).750 mm dia piles				
	Net Total	180.000metre	@10810.53/metr e	1945895.40	
12.023	20.6.3.1			7	
	Vertical load testing of piles in account installation of loading platform and cap and dismantling of test cap after direction of engineer -in-Charge. Group of two or more piles upto 50	preparation of r test etc. comp	pile head or constructlete as per specification	tion of test	
	Net Total	6.000per test	@82193.55/per test	493161.30	
12.024	20.6.3.2				
	Vertical load testing of piles in account installation of loading platform and cap and dismantling of test cap afte direction of engineer -in-Charge. Group of two or more piles upto 50	preparation of r test etc. comp	pile head or constructlete as per specification	tion of test	
	Net Total	6.000per test	@48494.19/per test	290965.14	
			Heading Total(Rs)	16404495.1 9	
13	ECO-FRIENDLY AND ADMINI	STRATIVE U	NITS		
13.001	OD68432/2022-2023				
	Construction of administrative cum	laboratary buil	ding		
	Net Total	300.000sqm	@16700.05/sqm	5010015.00	
13.002	OD68444/2022-2023				
	Construction of blower room on roo	of top of MBBR	with Truss roof	10,000001.5	
	Net Total	196.000sqm	@100000.11/sqm	19600021.5 6	
13.003	OD68445/2022-2023				
	Equipment, laboratory items, furnit	ture and compu	ter system for CIPS	of IoT	
	Net Total	1.000each	@500000.00/eac h	500000.00	

Sl No	Specification	Quantity	Rate	Amount	
13.004	OD68446/2022-2023				
	Facility for Recycling purpose				
	Net Total	1.000each	@150000.00/eac h	150000.00	
13.005	OD68521/2022-2023				
	Green Belt, Special Exterior Wall C in the outer periphery with provision				
	Net Total	1.000each	@2090700.00/ea ch	2090700.00	
13.006	OD82214/2022-2023				
	Providing and installing acoustics so	ervices for nece	ssary sound insulation	on standards.	
	Net Total	1.000each	@1000000.39/ea ch	1000000.39	
			Heading Total(Rs)	28350736.9 5	
14	MECHANICAL ITEMS-STP		SAF		
14.001	OD67391/2022-2023	- Allection	ID NA		
	Supply, erection, testing, and commissioning of new generation non clog motor pump set having suitable discharge and head, including all accessories such as cost of the panel board with an ammeter, voltmeter, phase indicating lamps, change over switch, main switch, cost of soft starter, cable from panel board to starter, starter to motor, capacitors suction pipe, foot valve, Non return valve, suction and delivery pipes of required length, pressure gauge, earthing and wiring materials, cables etc. complete As per KWA/HO/SP-333/2014 Dtd.18-03-2016 of The Managing Director - for Centrifugal Pump sets				
	Net Total	124.000HP (Horse power)	@16858.01/HP (Horse power)	2090393.24	
14.002	OD67442/2022-2023	•			
	MBBR media- Supplying and fixing of non-clogging freely moving biomass media of polypropylene construction Sp.Gravity 0.93 for MBBR reactor with required specific surface area, length 10-20 mm, dia 20-25 mm complete as per technical specification or as directed by Engineer in Charge				
	Net Total	800.640each	@24553.57/each	19658570.2 8	
14.003	OD67510/2022-2023				
	Air Blower Supply, erection, testing and commissioning of twin lobe air blower for indoor application complete with acoustic canopy, air filter, motor of 1500 rpm, pulleys, pressure gauges, pressure relief valve, acoustic hood, suction silencer with suitable flanges, common motor and compressor base frame with motor belt tightening arrangement interconnecting line with flanges including all accessories complete as per technical specification or as Directed by Engineer in Charge 50-99HP, head 20-50m				
ı					

Sl No	Specification	Quantity	Rate	Amount	
	Net Total	980.000HP (Horse power)	@16858.01/HP (Horse power)	16520849.8 0	
14.004	OD67546/2022-2023				
	Bubble Diffuser for MBBR- Fine Bubble Diffuser Supplying and fixing of retrievable type fine bubble diffusers of 90mm dia,1500mm length, Ethylene Propylene Diene Monomer (EPDM) make with SStee1"x1",SS lifting hook 8 mm, SS foundation bolt 6 mm, SS C clamp suitable for 1"O.D, hose, PP Rope, PP swivel nut, PP sleeve, Silicone Washer, SS hos clamp, RCC block complete as per technical specification compatible for specified air flow				
	Net Total	4.000each	@66964.28/each	267857.12	
14.005	OD67563/2022-2023				
	Air Grid Pipe Supply and installation other accessories as required for the				
	Net Total	4.000each	@53570.99/each	214283.96	
14.006	OD67571/2022-2023	- City		7	
	Tube settler media- Media to be of shaped, 750mm height and about 1. fitting. The plan settling area should minimum at 600 slope. The media i	0mm thick and I be between 10	with tongue and grown and with tongue and grown and ash; 12 m2/m3	o <mark>ve tu</mark> be /day	
	Net Total	1.000each	@133928.00/eac h	133928.00	
14.007	OD67584/2022-2023	UBLIC WORKS			
	"Supply, erection, testing, and motor pump set having suitable discost of the panel board with an amm over switch, main switch, cost of so to motor, capacitors suction pipe, for pipes of required length, pressure gardeness complete As per KWA/HO/SP-33 Director - for Centrifugal Pump sets	charge and head neter, voltmeter oft starter, cable not valve, Non rauge, earthing a 33/2014 Dtd.18-	, including all access, phase indicating lar from panel board to eturn valve, suction and wiring materials,	sories such as mps, change starter, starter and delivery cables etc.	
	Net Total	130.000HP (Horse power)	@16858.01/HP (Horse power)	2191541.30	
14.008	OD67604/2022-2023				
	Pressure Sand Filter- Supply, instal of Pressure Sand Filter - MS vessel multiport valve for operations. Suita the filter. Filtration rate should not barea. Dirt loading capacity to be sufforce / shift. Filter to have inlet and vent. Sand filter to be fitted with preheader is to be fitted with flow meter range up to minimum of 125% of the consist of graded pebble, coarse and recommendations provided in CPHI	construction. Fable stand / suppose greater than fricient to initiate outlet piping, in essure guage at er – turbite rated flow that I fine sand. Dep	ilter to be of MS conport should be provided in 12 m3/hour/m2 of the backwash once in allet and outlet for backing and outlet. Sand in type / rotameter through the pipe line. Noth of media to be as	struction with ded along with e filtration 8 hours i.e. ckwash and air d filter main ype with Media to per	

Sl No	Specification	Quantity	Rate	Amount	
	Cost includes supporting foundation	1.			
	Net Total	2.000each	@2271377.36/ea ch	4542754.72	
14.009	OD67645/2022-2023				
	Carbon Filter- Supply, Installation and erection, testing and commissioning of Activated Carbon Filter - MS composite vessel construction. Filter to be of MS construction with multiport valve for operations. Suitable stand / support should be provided along with the filter. Filtration rate should not be greater than 10 m3/hour/m2 of the filtration area. Filter to have inlet and outlet piping, inlet and outlet for backwash and air vent. Carbon filter to be fitted with pressure guage at outlet. Media to consist of graded pebble, coarse, fine sand and activated carbon. Depth of media to be as per recommendations provided in CPHEEO manual. Activated carbon should be of high quality for removal of impurities and to be used for waste water purification. Cost includes for foundation also.				
	Net Total	2.000each	@2555300.00/ea ch	5110600.00	
14.010	OD67666/2022-2023				
	Alum and Lime Dosing System- Su Alum dosing tank having capacity 5 dosing electronic metering type pun pressure.	0 litre in LLDF	PE/FRP/PP material	and alum	
	Net Total	2.000each	@25000.01/each	50000.02	
14.011	OD67702/2022-2023	ATFORM FOR TH	E MANAGEMENT		
	Hypo Dosing System - Supply, instadosing tank having capacity 50lit in electronic metering type pump of 1-	LLDPE/ FRP/	PP material and hypo	dosing	
	Net Total	2.000each	@399999.99/eac h	799999.98	
14.012	OD67713/2022-2023				
	Odour control unit for co-treatment	unit and STP.			
	Net Total	1.000each	@52267.50/each	52267.50	
14.013	OD67725/2022-2023				
	Supply, erection, testing, and commissioning of new generation non clog motor pump set having suitable discharge and head, including all accessories such as cost of the panel board with an ammeter, voltmeter, phase indicating lamps, change over switch, main switch, cost of soft starter, cable from panel board to starter, starter to motor, capacitors suction pipe, foot valve, Non return valve, suction and delivery pipes of required length, pressure gauge, earthing and wiring materials, cables etc. completecentrifuge pump of screw type As per KWA/HO/SP-333/2014 Dtd.18-03-2016 of The Managing Director - centrifuge pump of screw type				
	Net Total	2.000HP (Horse power)	@23832.00/HP (Horse power)	47664.00	
14.014	OD67748/2022-2023				
	Supply, erection, testing, and comm	issioning of ne	w generation non clo	g motor pump	

Sl No	Specification	Quantity	Rate	Amount	
	set having suitable discharge and head, including all accessories such as cost of the panel board with an ammeter, voltmeter, phase indicating lamps, change over switch, main switch, cost of soft starter, cable from panel board to starter, starter to motor, capacitors suction pipe, foot valve, Non return valve, suction and delivery pipes of required length, pressure gauge, earthing and wiring materials, cables etc. complete As per KWA/HO/SP-333/2014 Dtd.18-03-2016 of The Managing Director - for Centrifugal Pump sets.				
	Net Total	41.400HP (Horse power)	@27680.87/HP (Horse power)	1145988.02	
14.015	OD67824/2022-2023				
	Mechanical arrangement for Oil and	d Grease trap			
	Net Total	1.000each	@25000.01/each	25000.01	
14.016	OD67825/2022-2023				
	Mechanical arrangements for screen	ns and grit remo	vals		
	Net Total	4.000each	@300000.03/eac h	1200000.12	
14.017	OD67826/2022-2023		GRAF	٩	
	Mechanical arrangement for anoxic	tank			
	Net Total	1.000each	@200000.00/eac h	200000.00	
14.018	OD67827/2022-2023	ATFORM FOR TH UBLIC WORKS	E MANAGEMENT		
	Mechanical arrangement for sludge	thickner			
	Net Total	1.000each	@500000.00/eac h	500000.00	
14.019	OD67967/2022-2023				
	Supply and installation of centrifug	e.			
	Net Total	2.000each	@172191.00/eac h	344382.00	
14.020	OD67969/2022-2023				
	Piping, initial channel arrangements, bypass arrangements, steel ladder, framework and fire fighting arrangements				
	Net Total	1.000each	@500000.00/eac h	500000.00	
14.021	OD67970/2022-2023				
	Interconnecting piping system: • All process piping is to be in uPVC of approved ISI make, Class 2 minimum • All process valves to be in PP/PVC of Ball / Globe type• For valves in piping of ID > 150 mm, Butterfly valves are preferred • NRV should be provided at the common discharge header of all process pumps • Dosing lines to be in flexible Teflon / rigid PVC / HDPE. Detailed hydraulic analysis must be done for the system before supply and installation.				
	Net Total	1.000each	@311116.07/eac	311116.07	

Sl No	Specification	Quantity	Rate	Amount	
			h		
14.022	OD67968/2022-2023				
	Providing Mechanical arrangement for cleaning and flushing manholes, Collection septic waste				
	Net Total	1.000each	@4000000.00/ea ch	4000000.00	
14.023	OD85408/2022-2023				
	Bar Screen-fine- Supply and installation frame to be fitted in bar screen chand mm c/c gap between bars. The fram with MS rake arm with racks for reprovided for transfer of the collected specified. Angle of Inclination: 45 I	nber of specifie e to be mounted noval of collect d solids. Flow I	d width, with MS fla d on the chamber and ted solids and trough Rate and height shoul	t bars and 20 l provided to be	
	Net Total	2.000each	@29037.50/each	58075.00	
14.024	OD85412/2022-2023	141			
	Electromagnetic Flow meter, pressure and quality sensors- Supply and erection of electromagnetic flow meter, pressure and quality sensors compatible to IoT and central control system with flow recorder, digital flow/quality/pressure indicator, flow/quality/pressure integrator with sensors, totaliser, transmittal and display arrangements and all accessories including housing arrangements, etc. complete to fix in the incoming pipeline to STP or at the Screen channel as directed by the Engineer in Charge.				
	Net Total	2.000each	@51852.68/each	103705.36	
14.025	OD85414/2022-2023				
	Bar Screen- Supply and installation to be fitted in bar screen chamber of gap between bars. The frame to be rake arm with racks for removal of transfer of the collected solids. Flow Inclination: 45 Degree, Spacing: 20	specified widt mounted on the collected solids and heigh	h, with MS flat bars chamber and provide and trough to be pro ht should be as speci	and 20 mm c/c ed with MS ovided for	
	Net Total	2.000each	@29037.50/each	58075.00	
			Heading Total(Rs)	60127051.5 0	
15	ELECTRICAL WORKS-STP				
15.001	OD68682/2022-2023				
	Supply Installation and commission	ing of Diesel G		LD	
	Net Total	1.000each	@4561348.72/ea ch	4561348.72	
15.002	OD68680/2022-2023				
	ELECTRICAL & DESTRUMN PRESSURE guages, level switches, electronscription of pressure gauges, IoT based sensors, Panel shall be Non compartmentalize proof, with reinforcement of suitable	etro magnetic fl electrical pane and free standin	low meter, normal flo ls – Powder c g floor mounted, dus	ow meter, oated MCC t and vermin	

Sl No	Specification	Quantity	Rate	Amount	
	required. Panel shall be suitable for 415V, 3-Phase,50 Hz incomer. Switchgear components to include, but not limited to, MCCB for incomer and for each switchgear, suitable OLR and contactor provisions to be given as per guidelines of the Electrical authority. Panel to be fabricated based on the Motor Load List as given in the technical specifications AC: MS powder coated panel with switchgear components as per motor load list, fixed, floor mounted and non compartmentalized pane.INTERCONNECTING CABLING – Outgoing feeders from AC panel to each prime mover will be based on CEIG guidelines. Cables to be suitably protected either through (a) PVC conduit or (b) armored cables as appropriate Cabling includes glanding and termination for each prime mover. Cables should not be run on the ground or directly on the walls. Cables to be mounted on suitable runners / cable trays / PVC conduits as appropriate. All interconnecting cabling and glanding, termination accessories as per specifications.				
	Net Total	1.000each	@6250000.02/ea ch	6250000.02	
15.003	OD68681/2022-2023				
	Supply,installation and commission	ing of solar unit	ts for STP	The sec	
	Net Total	1.000each	@1000000.00/ea ch	1000000.00	
15.004	OD85126/2022-2023	- STEERSON	DKM		
	Transformer unit of 500 KVA indoinstallation	or ty <mark>pe inc</mark> ludii	ng <mark>building</mark> s, allied w	orks and	
	Net Total	2.000each	@1400000.00/ea ch	2800000.00	
			Heading Total(Rs)	14611348.7 4	
16	COMPOUND WALL FOR STP S	SITEA AND W	VELL SITE		
16.001	OD71862/2022-2023				
	For the construction of compound v	vall and road fo	r STP site		
	Net Total	2.000L.S	@2000000.03/L. S	4000000.06	
			Heading Total(Rs)	4000000.06	
17	SITE CLEARANCE				
17.001	OD85449/2022-2023				
	Site preparation including clearing vegetation, cutting trees, demolition of buildings etc				
	Net Total	1.000L.S	@2500000.00/L. S	2500000.00	
			Heading Total(Rs)	2500000.00	
18	SATUATORY CHARGES				
18.001	OD126185/2022-2023				
		1 6 077			
	Contingency including all statutory	charges for ST	P and network		

Sl No	Specification	Quantity	Rate	Amount	
	Net Total	1.000L.S	@1499999.99/L. S	1499999.99	
			Heading Total(Rs)	1499999.99	
	Total Estimation PAC 239361963.				
20	Extra Charges				
	Provision for GST				
19.001		239361963.67	18.00%	43085153.4 6	
			Grand Total	0.00	
			Round off	0.00	
		M	Rounded Total(Rs)	282447117.1 3	
	Rupees Twenty Eight Crore Twenty and Seventeen	y Four Lakh Fo	orty Seven Thousand	One Hundred	



GENERAL ABSTRACT

Others-DPR PREPARATION OF ALAPPUZHA MUNICIPALITY SEWERAGE SCHEME-

Sewerage Net work with pipes ,Manholes, Inspection Chambers and wells. Alappuzha Muncipality Subzone 1-Sewerage Work

Sl No	Head Description	Amount
1	Sewer Net work with Pipes, Manholes, Inspection chambers and Wells	302729434.6 1
2	Eco-friendly items	1502107.55
3	Mechanical Items	2304967.89
4	Electrical Items	492920.00
	Total Estimation PAC	307029430.0 5
C	Extra Charges	
C.001	Provision for GST	T
	307029430.05 18.00%	55265297.41
	Grand Total	0.00
	Round off	0.00
	CPLATFORM FOR THE MANAGEMENT OF PUBLIC WORKS Rounded Total(Rs)	362294727.4 6
	Rupees Thirty Six Crore Twenty Two Lakh Ninety Four Thousand Sand Twenty Seven	Seven Hundred

DETAILED ESTIMATE

Others-DPR PREPARATION OF ALAPPUZHA MUNICIPALITY SEWERAGE SCHEME-

Sewerage Net work with pipes ,Manholes, Inspection Chambers and wells. Alappuzha Muncipality Subzone 1-Sewerage Work

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity					
1	Sewer Net work with Pipes, Manholes, Inspection chambers and Wells											
1.001	2.6.1											
	Earth work in exca over areas (exceed including disposal earth to be levelled	ing 30 cm of excava	n in depth, 1. ated earth, lea	5 m in width ad up to 50 n	as well as 10 and lift up t) sqm on	plan)					
	Sewer Net Work with Pipes, Manholes, Inspection Chambers and Wells.											
	For Manholes SZ1-Class 1(.9mdia)	ET	990.945									
	For Manholes SZ1-Class 2 (1.2mdia)	68	2.300	2.300	1.500		539.580					
	For Manholes SZ1-Class 3(1.5mdia)	133	2.700	2.700	1.500	т	1454.355					
	Additional depth for storage in lift Manholes	3	2.700	2.700	1.000	1.0000	21.870					
	For Collection Well-1	1	60.790		1.500	1.0000 00	91.185					
	For lift manhole panel board foundation	3	1.000	0.450	0.600	1.0000	0.810					
	For Sewer Chambers	768	1.300	1.300	1.000	1.0000 00	1297.920					
	Total						4396.665					
				To	otal Quantity	y in cum	4396.665					
1.002	OD76500/2022-20)23										
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30cm in depth,1.5m in width aswell as 10 sqm on plan)including disposal of excavated earth ,lead up to 50m and lift up to 1.5 m ,disposed earth to be levelled and neatly dressed .All kind of soil-additional lift 1.5to 3m											
	For Sewer Netwo	rk with Pi	pes,Manhole	s, Inspection	chambers a	nd Wells						

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	For Manholes SZ1-class1(0.9m dia)	183	1.900	1.900	0.630		416.197		
	For Manholes SZ1-class2(1.2m dia)	68	2.300	2.300	1.010		363.317		
	For Manholes SZ-1-class3(1.5m dia)	133	2.700	2.700	1.500		1454.355		
	Total		2233.869						
		y in cum	2233.869						
1.003	OD76499/2022-20								
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil - additional depth 3.0 to 4.5 m. For Sewer Network with Pipes, Manholes, Inspection chambers and Wells								
	For Manholes SZ1-class3(1.5m dia) 133 2.700 2.700 0.800								
	Total	100		\prec \square			775.656		
	Total Quantity in cum								
1.004	OD78182/2022-20)23			otal Quantity	y in cum	775.656		
1.004	OD78182/2022-20 Earthwork open w 9.0m in all kinds of 50m and lift from	ell excava	ation (in or us	nder water) f	or wells of d	ia. 6.0m a ithin initi	and up to		
1.004	Earthwork open w 9.0m in all kinds o	ell excava f soil and 1.50m to	ntion (in or us conveying a 3.0 m includ	nder water) f	or wells of d	ia. 6.0m a ithin initi	and up to		
1.004	Earthwork open w 9.0m in all kinds o 50m and lift from	ell excava f soil and 1.50m to	ntion (in or us conveying a 3.0 m includ	nder water) f	or wells of d	ia. 6.0m a ithin initi	and up to		
1.004	Earthwork open w 9.0m in all kinds o 50m and lift from	ell excava f soil and 1.50m to	ation (in or un conveying a 3.0 m includi 5-9m)	nder water) f	or wells of d	ia. 6.0m a ithin initi	and up to al lead of		
1.004	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection	ell excava f soil and 1.50m to	ation (in or un conveying a 3.0 m includi 5-9m)	nder water) f nd depositin ing neat bank	or wells of d	ia. 6.0m a ithin initi g well	and up to al lead of		
1.004	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection	ell excava of soil and 1.50m to on well (6	ation (in or un conveying a 3.0 m includi 5-9m)	nder water) f nd depositin ing neat bank	or wells of d g the spoil w king - sinking	ia. 6.0m a ithin initi g well	1.500		
	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection	ell excava of soil and 1.50m to on well (6 1 223 well excapa om in all k	ation (in or unconveying a 3.0 m include 5-9m) 1.500 avation (in or inds of soil a	nder water) find depositing ing neat bank	for wells of d g the spoil wells of the spoil wells al Quantity f) for wells of g and deposit	ia. 6.0m a ithin initing well in metre f diameter ting the s	1.500 1.500 1.500		
	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection Total OD78321/2022-20 Earthwork in open 6.0m and up to 9.0	ell excava of soil and 1.50m to on well (6 1 023 well exca om in all k and lift fo	ation (in or unconveying a 3.0 m include 5-9m) 1.500 avation (in or inds of soil a rom 3.0m to rom 3.0m to rom 2.0m to rom 3.0m to rom 3	nder water) find depositing ing neat bank	for wells of d g the spoil wells of the spoil wells al Quantity f) for wells of g and deposit	ia. 6.0m a ithin initing well in metre f diameter ting the s	1.500 1.500 1.500		
	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection Total OD78321/2022-20 Earthwork in open 6.0m and up to 9.0 initial lead of 50m	ell excava of soil and 1.50m to on well (6 1 023 well exca om in all k and lift fo	ation (in or unconveying a 3.0 m include 5-9m) 1.500 avation (in or inds of soil a rom 3.0m to rom 3.0m to rom 2.0m to rom 3.0m to rom 3	nder water) find depositing ing neat bank	for wells of d g the spoil wells of the spoil wells al Quantity f) for wells of g and deposit	ia. 6.0m a ithin initing well in metre f diameter ting the s	1.500 1.500 1.500		
	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection Total OD78321/2022-20 Earthwork in open 6.0m and up to 9.0 initial lead of 50m	ell excava of soil and 1.50m to on well (6 1 223 well exca om in all k and lift from well (6	ation (in or unconveying a 3.0 m include 5-9m) 1.500 avation (in or index of soil a rom 3.0m to 5-9m)	nder water) find depositing ing neat bank	for wells of d g the spoil wells of the spoil wells al Quantity f) for wells of g and deposit	ia. 6.0m a ithin initing well in metre f diameter ting the s	1.500 1.500 1.500 r above poil within		
	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection Total OD78321/2022-20 Earthwork in open 6.0m and up to 9.0 initial lead of 50m FOR SZ1,collection	ell excava of soil and 1.50m to on well (6 1 223 well exca om in all k and lift from well (6	ation (in or unconveying a 3.0 m include 5-9m) 1.500 avation (in or index of soil a rom 3.0m to 5-9m)	nder water) find depositing ing neat bank and the transfer water and conveying 4.5m includi	for wells of d g the spoil wells of the spoil wells al Quantity f) for wells of g and deposit	ia. 6.0m a ithin initing well in metre f diameter ting the sing.	1.500 1.500 1.500 1.500 1.500 1.500		
	Earthwork open w 9.0m in all kinds of 50m and lift from FOR SZ1,collection Total OD78321/2022-20 Earthwork in open 6.0m and up to 9.0 initial lead of 50m FOR SZ1,collection	ell excava of soil and 1.50m to on well (6 1 023 well exca om in all k and lift fr on well (6 1	ation (in or unconveying a 3.0 m include 5-9m) 1.500 avation (in or inds of soil arom 3.0m to 5-9m) 1.500	Total	for wells of dg the spoil weight with a conting and conting and deposing neat bank	ia. 6.0m a ithin initing well in metre f diameter ting the sing.	1.500 1.500 1.500 1.500 1.500 1.500 1.500		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	FOR SZ1,collection	on well (6	5-9m)				
		1	1.500				1.500
	Total						1.500
				Tota	al Quantity	in metre	1.500
1.007	OD78320/2022-20)23					
	Earthwork in open 6.0m and up to 9.0 initial lead of 50m	iting the s					
	FOR SZ1,collecti	ion well ((6-9m)				
		1	1.623				1.623
	Total						1.623
				Tota	al Quantity	in metre	1.623
1.008	4.1.6						
	Providing and layi of centering and sh sand: 6 graded sto	nuttering -	All work up	to plinth lev			
	Providing and la	ying ceme	ent concrete	September 1	DIE	4.	
	For Manholes- Class1(.9mdia)	183	1.900	1.900	0.150		99.095
	For Manholes - Class1 (1.2mdia)	68	2.300	2.300	0.150	rr	53.958
	For Manholes - Class3(1.5mdia)1 33	133	2.700	2.700	0.150		145.436
	For Collection Well-1	1	8.800	8.800	0.150		11.616
	For lift Manhole Panel board foundationFor Collection Well-1	3	1.000	0.450	0.600		0.810
	For Sewer Chamber	768	1.300	1.300	0.150		194.688
	Total						505.603
				To	otal Quantit	v in cum	505.603
)	00000

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity					
	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in -charge. Note:-Cement content considered in this item is @330 kg/cum. Excess /less cement used as per design mix is payable/recoverable separately.All wiork upto plinth level Providing and laying inM30 grade concrete											
	Base Slab - Manhole-1	183	1.900	1.900	0.350		231.221					
	Base Slab- Manhole class-2	68	2.300	2.300	0.400		143.888					
	Base slab- Manhole Class-3	133	2.700	2.700	0.450		436.307					
	Base Slab Collection Well-1	1	0.785*8.8 *8.8	1000	0.450	IFT	27.356					
	Walls-Manhole class-1	183	0.900	3-11	1.130		186.111					
	Walls Manhole Class-3	68	1.410	DRM FOR THE	1.960	rT .	187.925					
	Walls -Manhole Class-3	133	2.030		3.200		863.968					
	Walls Manhole Class-4	0	2.760		0.000		0.000					
	Top Slab - Manhole Cass-5	0	3.020		0.000		0.000					
	Wall-Well1 Well-1	1	10.530		7.620		80.239					
	Wall-Well1 Top slab	1	10.000	10.000	0.200		20.000					
	Top Slab- Manhole Class- 1ss-2	183	1.540		0.200		56.364					
	Top slab- Manhole Class- 2Chamber Slab	68	2.540		0.200		34.544					
	Top Slab- Manhole class-3	133	3.800		0.200		101.080					
	Top Slab- Manhole Class-4	0	5.310		0.200		0.000					
	Top Slab- Manhole Class-5	0	6.160		0.200		0.000					

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Chamber slab	768	1.000	1.000	0.200		153.600			
	Chamber Walls	768	2.400	0.200	0.500		184.320			
	ChamberCover Slab	768	1.000	1.000	0.150		115.200			
	Deduct Manhole Cover (600mmdia)	-384	0.280		0.200		-21.504			
	Total						2800.619			
	Total Quantity in cum									
1.010	OD72452/2022-20									
	Extra for providing sulphate resistant cement for the structures									
	Providing S RC	•								
	QTY as per item code5.37.1	1	2797.581	*****			2797.581			
	Total		-63	TWO ST			2797.581			
			MIS	To	tal Quantity	in cum	2797.581			
1.011	5.34.1		1981	Silling.	DRA	All				
	grade concrete inst in M-30 is @ 340 Providing richer M	kg/cum).	e-PLATFOR	C/RMC. (No	ote:- Cemen	t content (considered			
	QTY as per item code5.37.1	1	2797.581				2797.581			
	Total						2797.581			
	Total			То	tal Quantity	in oum	2797.581			
1.012	OD72499/2022 20	22		10	tai Quantity	in cum	2191.301			
1.012	OD72488/2022-20 Extra for providing		acting for rain	forcement b	0.4					
	Epoxy coated for		Dating for Ten	Horcement b	aı					
	QTY as per item code5.37.1	1	2797.581			110.00 0000	307733.9			
	Total					0000	307733.9 10			
	Total Quantity in kg									
1.013	5.22.6									
	Steel reinforcement for R.C.C work including straightening, cutting, bending in position and binding all complete upto plinth levelThermo - Mechanically bars of grade Fe-500D or more									
	pars of grade Fe-500D or more RCC Work									

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity				
	QTY as per item code5.37.1	1	2797.581			110.00 0000	307733.9 10				
	Total		307733.9 10								
				Total (Quantity in l	kilogram	307733.9 10				
1.014	4.12										
	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer's specification.										
	Water proofing m	aterial				Г					
	QTY as per item code5.37.1	1	2797.581			340.00 0000	951177.5 40				
	Total						951177.5 40				
			0		Total Quant	ity in kg	951177.5 40				
1.015	5.9.1		셻	MAND W	-01	FI					
	Centering and shur footings, bases of				removal of f	orm for:F	oundations,				
	Centering and shu	ttering B	ase Slab								
	For manholes- Class 1	183	7.600	ORM FOR THE C WORKS	0.350	ıτ	486.780				
	For Manholes- Class2	68	9.200		0.400		250.240				
	For Manholes- Class-3	133	10.800		0.450		646.380				
	For Collection well-1	1	35.200		0.450		15.840				
	For Sewer Chambers	768	4.000		0.200		614.400				
	Total						2013.640				
				To	otal Quantit	y in sqm	2013.640				
1.016											
		Centering and shuttering including strutting, etc. and removal of form for:Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.									
	For Walls Inside. SUB ZONE1										
	For Manholes Class-1	183	2.830		1.130		585.216				
	For Manholes Class-2	68	3.770		1.960		502.466				
	For Manholes Class-3	133	4.710		3.200		2004.576				

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity		
	For Collection Well-1	1			6.020		6.020		
	For Sewer Chambers	768	2.400		0.500		921.600		
	Top Slab	768	5.000		0.500		1920.000		
	For Manholes Class-1	183	1.000				183.000		
	For Manholes Class-2	68	1.000				68.000		
	For Man holes Class-3	133	1.000				133.000		
	Total						6323.878		
	For Walls Out si	de Sub Zo	ne 1						
	For Manhole - Class 1	183	4.400	(20,000)	1.130		909.876		
	For Manholes- Class -2	68	5.650	i n	1.960	FT	753.032		
	For Manholes- Class3	133	6.910	2000	3.200		2940.896		
	For Collection Well-1	1	24.810	₹Ⅱ	6.020		149.356		
	For Sewer Chamber	768	4.000	RM FOR THE C WORKS	0.500	r	1536.000		
	Total						6289.160		
				T	otal Quantit	y in sqm	12613.03 8		
1.017	22.23.1								
	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & Discourse and the same plant, tunnels walls and bridge deck etc., prepared by mixing in the ratio of 5:2 (5 parts integral crystalline slurry: 2 parts water) for vertical surfaces and 3:1 (3 parts integral crystalline slurry: 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerincharge. The product performance shall carry guarantee for 10 years against any leakage. For vertical surface two coats @0.70 kg per sqm								
	Inside of Walls SUB ZONE1								
	For Manholes - Class 1	183	2.830		1.130		585.216		

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	For Manholes - Class 2	68	3.770		1.960		502.466			
	For Manholes- Class-3For Manholes -Class 2	133	4.710		3.200		2004.576			
	For Collection Well-1	1	21.980		21.980		483.120			
	For Sewer Chambers	768	2.400		0.500		921.600			
	Total 4496.97									
				Te	otal Quantity	y in sqm	4496.978			
1.018	22.23.2					-				
	water tanks, roof s tunnels / subway and bridg integral crystalline integral crystalline same from negative shall meet the requested permeability of co DIN 1048 and resistalline cap shall be carried out engineerin- charge. The production	ge deck etc slurry: 2 slurry: 1 e (interna- nirements ncrete by stant to 16 able of sel t all comp	c., prepared by parts water) part water) for the part water part w	y mixing in for vertical or horizonta e help of syn ACI-212-3% compared tic pressure eracks up to ecification a	the ratio of 5 surfaces and al surfaces and on the tic fiber 3R-2010 i.e. but with controls on negative a width of 0, and the directes for 10 years	5:2 (5 pa 3:1 (3 pa d applyin brush. The by reducin 1 concrete side. The 50mm. T ion of the	rts arts g the ne material ng e as per crystalline he work			
	leakage.For horizo	ntal surfa	ce one coat @	1.10 kg per	r sqm.					
	Bottom Slab For Manholes- Class 1	183	0.640				117.120			
	For Manholes- Class2For Manholes-Class1	68	1.130			_	76.840			
	For Manholes- Class3	133	1.770				235.410			
	For Collection Well-1	1	38.480				38.480			
	For Sewer Chambers	768	0.360				276.480			
	Total									
				To	otal Quantity	y in sqm	744.330			
1.019	2.25									

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Filling available exfoundation etc. in layer by ramming	layers not	exceeding 2	0 cm in deptl	h, consolidat	ing each o	of leposited			
	Quantity as san	ne as 4.1.6	5							
	PCC	-1				505.60 3000	-505.603			
	Walls -Collection well	-1	48.990		7.570		-370.854			
	Total						-876.457			
	Deductions									
	For Manholes- class1	-183	1.540		1.480		-417.094			
	For Manholes- class2	-68	2.540		2.360		-407.619			
	For Manholes - class3	-133	3.800	18/	3.650		- 1844.710			
	Total			017	501		2669.423			
	Quantity as per ite	em 1,2,3				est.				
	Quantity as per item 1,2,3	1	P	マル		7431.1 80000	7431.180			
	Collection well1	1	60.790	RM FOR THE	7.573	IT	460.363			
	Total						7891.543			
	Top slab-Manhole	es+Chamb	pers							
	Top slab- Manhole class-1	-183	1.540		0.200		-56.364			
	Top slab - Manhole class-2	-68	2.540		0.200		-34.544			
	Top slab - Manhole class3	-133	3.800		0.200		-101.080			
	Top slab- Manhole class-4	0	5.310		0.200		0.000			
	Top slab - Manhole class5	0	6.160		0.200		0.000			
	Total						-191.988			
				To	tal Quantity	y in cum	4153.675			
1.020	100.41.40									
	Supply, stacking, spreading and consolidating of Red earth in the trench of pipe line for cushion including carriage, loading, unloading & Damp; stacking up to any lead.									
	Supply ,stacking 1				<u> </u>					
	Pipe PN8160	0.5	9968.640	0.600	0.300		897.178			
	Pipe PN8 200	1	9202.000	1.200	0.300		3312.720			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity					
	Pipe PN8280	1	133.000	1.200	0.300		47.880					
	Pipe PN315	1	255.000	1.200	0.300		91.800					
	Pipe PN 355	1	200.000	1.200	0.300		72.000					
	Total		·	·			4421.578					
				To	tal Quantity	in cum	4421.578					
1.021	50.2.25.1											
	Filling with contractor's own earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m as per direction of site Engineer-in-charge											
	Filling with Contr	actors ow	n earth									
		0.1	19805.30 0				1980.530					
		0.1	8051.780				805.178					
		0.1	2253.470			-	225.347					
	Total		ALD		- 10	ET	3011.055					
			1000	To	tal Quantity	in cum	3011.055					
1.022	100.98.138			3-11								
	Supply of HDPE F	Pipe PE 10	0 (IS 4984/19	9 <mark>95),</mark> 8kg, 16	60mm Outer	Dia.						
	For connection from	om chamb	er to manhole	SAFOR THE P	MANAGEMEN	т						
		768	5.000	1.000			3840.000					
	Total						3840.000					
				Tota	l Quantity i	in metre	3840.000					
1.023	100.98.140											
	Supply of HDPE F	Pipe PE 10	0 (IS 4984/19	995), 8kg, 20	00mm Outer	Dia.						
	Dedutions for Mar	holes										
	Class1	-183	0.900				-164.700					
	Class2	-60	1.200				-72.000					
	Class3	-117	1.500				-175.500					
	Total						-412.200					
	For sewer network											
		1	9202.000				9202.000					
	Total						9202.000					
				Tota	l Quantity i	in metre	8789.800					
1.024	100.98.143											
	Supply of HDPE F	Pipe PE 10	0 (IS 4984/19	995), 8kg, 28	30mm Outer	Dia.						

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	For sewer network	1	133.000				133.000			
	Class2	-8	1.200				-9.600			
	Total	<u> </u>	1.200				123.400			
				Tot	al Quantity	in metre	123.400			
1.025	100.98.144									
	Supply of HDPE I	Pipe PE 10	00 (IS 4984/1	995), 8kg, 3	15mm Outer	Dia.				
	For sewer network									
	For sewer network	1	255.000				255.000			
	Class3	-9	1.500				-13.500			
	Total						241.500			
				Tot	al Quantity	in metre	241.500			
1.026	100.98.145			18/						
	Supply of HDPE I	Pipe PE 10	00 (IS 4984/1	995), 8kg, 3	55mm Outer	Dia.	\			
	For sewer networ	·k	454	35000	GRI	AF.)			
	For sewer network	1	200.000	3-1			200.000			
	Class3	-7	1.500				-10.500			
	Clear water pump	1	650.000	RM FOR THE C WORKS	MANAGEMEN	IT.	650.000			
	Total						839.500			
				Tot	al Quantity	in metre	839.500			
1.027	100.98.158									
	Supply of HDPE I	Pipe PE 10	00 (IS 4984/1	995), 10kg,	160mm Out	er Dia.				
	For sewer network									
	Lifting Station1	1	80.000				80.000			
	Lifting station2	1	105.000				105.000			
	Lifting station3	1	180.000				180.000			
	Total			TD . 4	10	•	365.000			
1.000	100.00.164			100	al Quantity	in metre	365.000			
1.028	100.98.164	Dina DE 10	M (IC 1001/1	005) 101,~	215mm Out	n Dia				
	Supply of HDPE I Well to STP	ripe PE 10	<u>10 (13 4984/1</u>	993), 10kg,	313IIIIII Out	er Dia.				
	Well to STP	1	150.000				150.000			
	Total	1	150.000		I	1	150.000			
	_ 			Tot	al Quantity	in metre	150.000			
1.029	100.1.1			100	Y-MILLI		220,000			

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity			
	Excavating trenches sockets, and dressing etting out the exceeding 20cm in watering, etc., and 50m, in all kinds of	ing of side avated so a depth, in disposing	es, ramming oil, and then recluding cons	of bottoms, deturning the solidating each	lepth up to 1. soil as requir ch deposited	.5m, inclu ed, in lay layer by r	iding ers not amming,			
	Pipes,cables etc.	exceeding	g 80mm dia b	out not excee	ding 300mm	dia for de	epth 0-			
		1	3351.000	1.200	1.160		4664.592			
		1	3740.000	1.200	1.500		6732.000			
		1	2699.000	1.200	1.500		4858.200			
	For lifting stations	1	80.000	0.700	1.200		67.200			
		1	105.000	0.700	1.200		88.200			
		1	180.000	0.700	1.200		151.200			
	Chamber to MH	1	3840.000	0.700	0.750	-	2016.000			
	From well 1to STP	1	150.000	1.000	1.300	FI	195.000			
	Clear water pumping	1	650.000	1.200	1.400		1092.000			
	Total		e-PLATFO	ORM FOR THE	MANAGEMEN	VT.	19864.39 2			
			UP POSC	To	otal Quantit	y in cum	19864.39 2			
1.030	100.1.2									
	Excavating trenches sockets, and dressi exceeding 3m, increquired, in layers deposited layer by directed, within a	ing of side luding get not excee ramming	es, ramming of ting out the of ding 20cm in watering, et	of bottoms, dexcavated so depth, inclute, and disposite.	lepth exceedil, and then ruding consoli	ing 1.5m leturning to idating ea	but not he soil as ch			
	For depth 1.5m to	3.0m								
		1	3740.000	1.200	0.710		3186.480			
		1	2699.000	1.200	1.500		4858.200			
	Total						8044.680			
	Total Quantity in cum 8044.680									
1.031	Excavating trenches of required width for pipes, cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth exceeding 3m but not exceeding 4.5 m, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc., and disposing of surplus excavated soil as directed, within a lead of 50m, in all kinds of soil.									

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	For depth 3.0m to	4.5m		-		-		
		1	2699.000	1.200	0.700		2267.160	
	Total						2267.160	
				To	tal Quantit	y in cum	2267.160	
1.032	100.10.5							
	Laying HDPE pipes (IS: 4984) on land portion including conveying within initial lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 160mm Nominal Outside Diameter Pipes.							
	FOR SZ1							
	Connection from chamber to manhole	768	5.000	Ö	1.000	1.0000	3840.000	
	For sewer network-160mm OD HDPE pipes	1	365.000		DR		365.000	
	Total			\prec			4205.000	
			e-PLATFO	orm for Tota	al Quantity	in metre	4205.000	
1.033	100.10.7		OF PUBL	C WORKS				
	Laying HDPE pipe and aligning the pi electrofusion mach working pressure a into the trenches al before back filling appliances etc., co Outside Diameter	pes, elect nines, test and after t lready ma and level mplete bu	ro-fusion we ing the pipeli testing, aligni ide, testing the lling the trend	Iding using a ine thus fabri ing the pipeli ie line to suit ches includin	utomatic or cated to suit ne, lowering able pressure g all labour	semi-auto the hydra the pipe with pot charge, hi	matic ulic in position able water re for	
	For sewer networl	k-200mm	ODHDPE pi	pes				
	Sewer network	1	8789.800				8789.800	
	Total						8789.800	
				Tota	al Quantity	in metre	8789.800	
1.034	Laying HDPE pipe and aligning the pi electrofusion mach working pressure a into the trenches al before back filling appliances etc., co Outside Diameter	pes, elect nines, test and after t lready ma and level mplete bu	ro-fusion we ing the pipeli testing, aligni ide, testing the lling the trend	Iding using a ine thus fabri ing the pipeli ie line to suit ches includin	utomatic or cated to suit ne, lowering able pressure g all labour	semi-auto the hydra the pipe : with pot charge, hi	matic ulic in position able water re for	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	FOR SZ1							
	For sewernetwork- 280mm OD HDPE pipes	1	123.400				123.400	
	Total		<u> </u>		•		123.400	
				Tot	al Quantity	in metre	123.400	
1.035	100.10.11					-		
	Laying HDPE pipes (IS: 4984) on land portion including conveying within initial lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 315mm Nominal Outside Diameter Pipes.							
	FOR SZ1		6			A STATE OF THE PARTY OF THE PAR		
	For sewer network -315mm OD HDPE pipes	1	241.500		DRA	A FA	241.500	
	well to stp	1	150.000	7			150.000	
	Total						391.500	
			OF PUBLI	C WORKS Tot	al Quantity	in metre	391.500	
1.036	100.10.12							
	Laying HDPE pipes (IS: 4984) on land portion including conveying within initial lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 355mm Nominal							
	working pressure a into the trenches a before back filling	and after t lready ma and level mplete bu	esting, aligni de, testing th ling the trenc	ng the pipel e line to suit thes includir	ine, lowering table pressur ng all labour	the pipe in the with potential that the with potential that the with potential the with the w	ulic in position able water re for	
	working pressure a into the trenches a before back filling appliances etc., co	and after t lready ma and level mplete bu	esting, aligni de, testing th ling the trenc	ng the pipel e line to suit thes includir	ine, lowering table pressur ng all labour	the pipe in the with potential that the with potential that the with potential the with the w	ulic in position able water re for	
	working pressure a into the trenches a before back filling appliances etc., co Outside Diameter	and after t lready ma and level mplete bu	esting, aligni de, testing th ling the trenc	ng the pipel e line to suit thes includir	ine, lowering table pressur ng all labour	the pipe in the with potential that the with potential that the with potential the with the w	ulic in position able water re for	
	working pressure a into the trenches a before back filling appliances etc., co Outside Diameter FOR SZ1 For sewer network- 355mmOD	and after t lready ma and level mplete bu Pipes.	esting, aligni de, testing th ling the trend t excluding o	ng the pipel e line to suit thes includir	ine, lowering table pressur ng all labour	the pipe in the with potential that the with potential that the with potential the with the w	ulic in position able water re for ominal	
	working pressure a into the trenches a before back filling appliances etc., co Outside Diameter FOR SZ1 For sewer network- 355mmOD HDPEpipes Clear water	and after t lready ma and level mplete bu Pipes.	esting, aligni de, testing th ling the trenc t excluding c	ng the pipel e line to suit thes includir	ine, lowering table pressur ng all labour	the pipe in the with potential that the with potential that the with potential the with the w	ulic in position able water re for ominal 200.000	
	working pressure a into the trenches a before back filling appliances etc., co Outside Diameter FOR SZ1 For sewer network- 355mmOD HDPEpipes Clear water pumping	and after t lready ma and level mplete bu Pipes.	esting, aligni de, testing th ling the trenc t excluding c	ng the pipel e line to suit ches includir cost of pipe a	ine, lowering table pressur ng all labour	the pipe is with pot charge, hi	ulic in position able water re for ominal 200.000	
1.037	working pressure a into the trenches a before back filling appliances etc., co Outside Diameter FOR SZ1 For sewer network- 355mmOD HDPEpipes Clear water pumping	and after t lready ma and level mplete bu Pipes.	esting, aligni de, testing th ling the trenc t excluding c	ng the pipel e line to suit ches includir cost of pipe a	ine, lowering table pressure ag all labour and fittings: 3	the pipe is with pot charge, hi	ulic in position able water re for ominal 200.000 650.000	
1.037	working pressure a into the trenches a before back filling appliances etc., co Outside Diameter FOR SZ1 For sewer network-355mmOD HDPEpipes Clear water pumping Total	and after the lready mand and level mplete burth Pipes.	esting, aligni de, testing th ling the trenc t excluding c 200.000 650.000	ng the pipele line to suite thes including the sost of pipe a	ine, lowering table pressure ag all labour and fittings: 3	the pipe is with pot charge, hi	ulic in position able water re for ominal 200.000 650.000	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	For pumping lines	1	3.000				3.000
	Total		•				3.000
				Tot	tal Quantity	in 1 nos	3.000
1.038	OD83462/2022-20)23					
	Supply and fixing	150mm b	utterfly valve				
	150mm butterfly	valve					
		6					6.000
	Total						6.000
				,	Total Quant	ity in no	6.000
1.039	OD78384/2022-20)23					
	Supply and fixing 300 mm butterfly valves						
	300mm Butterfly	valve					
	Well to STP	2	1.000				2.000
	Total		la to			ET	2.000
			1000	To	tal Quantity	in 1 nos	2.000
1.040	OD83472/2022-20)23		3-11			
	Supply and fixing	350mm b	utterfly valve				
	350mm butterfly v	alve	e-PLATFO	RM FOR THE	MANAGEMEN	VT	
		3					3.000
	Total						3.000
				r	Total Quant	ity in no	3.000
1.041	OD77588/2022-20)23					
	Road Cutting - Re Dtd.30-07-2020 T				GO(Ms)No.:	59/2020/P	WD
	FOR SZ1						
	BM/BC roads	1	3000.000	3.000			9000.000
	Total						9000.000
				To	otal Quantit	y in sqm	9000.000
1.042	OD77595/2022-20)23					
	Road Cutting - Re Dtd.30-07-2020 T	storation o	charge - As po H)D, Excludi	er order No. ng GST.	GO(Ms)No.:	59/2020/P	WD
	FOR SZ1						
	For muncipal roads	1	4300.000	3.000			12900.00 0
	Total						12900.00 0

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
				To	otal Quantity	y in sqm	12900.00 0	
1.043	OD77596/2022-20)23						
	Road Cutting - Re Dtd.30-07-2020 T				GO(Ms)No.5	9/2020/P	WD	
	FOR SZ1				T			
	Concrete roads	1	2180.000	3.000			6540.000	
	Total						6540.000	
				To	tal Quantity	y in sqm	6540.000	
1.044	OD77594/2022-20)23						
	Connection for ma	anholes an	d chambers					
	FOR SZ1	,						
	Sewer network	384			2.000		768.000	
	Chamber	768		18	2.000	-	1536.000	
	Total		W	MALL.		ET	2304.000	
			42.0	September 1	Fotal Quant	ity in no	2304.000	
1.045	19.18.3			311				
	Supplying and fixing C.I with out frame for manholes:560 mm diameter (heavy duty) the weight of the cover to be not less than 108 kg							
	FOR SZ1	20.4	1 000	C WORKS			204.000	
		384	1.000				384.000	
	Total						384.000	
				To	tal Quantity	in each	384.000	
1.046	Bailing out water with 5HP engine and pump set including conveyance to the site, erecting, dismantling and taking back of engine and pump, cost of fuel lubricating oil and other stores pay of staff etc., complete.							
	FOR SZ1	Т		Т				
		420	12.000	5.000	0.750		18900.00 0	
	Total						18900.00 0	
				To	tal Quantity	in Kwh	18900.00 0	
1.047	100.7.2							
	Bailing out water with engine and pump set above 5HP up to 10HP including conveyance to the site, erecting, dismantling and taking back of engine and pump, c of fuel lubricating oil and other stores pay of staff etc., complete.							
	conveyance to the	site, erect	ing, dismant	ling and takin	ng back of en	igine and	pump, cost	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
		220	10.000	8.000	0.750		13200.00 0	
	Total			1	,		13200.00	
				Tot	tal Quantity	in Kwh	13200.00	
1.048	100.7.3					•		
	Bailing out water with engine and pump set above 10HP up to 20HP includ conveyance to the site, erecting, dismantling and taking back of engine and of fuel lubricating oil and other stores pay of staff etc., complete.							
	FOR SZ1	220	10.000	20,000	0.770		33000.00	
		220	10.000	20.000	0.750		0	
	Total			0-0			33000.00 0	
			A	Tot	tal Quantity	in Kwh	33000.00	
1.049	2.16.1		100	SERVE .	nRA	AR		
	Close timbering in required) complete exceeding 1.5m							
	Deduction		OF PUBLIC	WORKS	MANAGEMEN			
	For manholes- class1	-183	2.400		1.132		-497.174	
	For manholes - class2	-68	2.400		1.500		-244.800	
	For manholes- class3	-133	2.400		1.500		-478.800	
	Total						- 1220.774	
	Wooden shoring							
	pipe line	2	3351.000		1.161		7781.022	
		2	3740.000		1.500		11220.00 0	
		2	2699.000		1.500		8097.000	
	For manholes- class1	183	7.600		1.132		1574.386	
	For manholes class-2	68	9.200		1.500		938.400	
	For manholes- class3	133	10.800		1.500		2154.600	
							31765.40	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
				To	otal Quantit	y in sqm	30544.63 4
1.050	100.6.1						
	Providing steel sheet shoring to the sides of the trenches to depths of above 4. not exceeding 6.00m using 6 mm M.S. sheet 0.50 M wide stiffen on edges wit x 50mm x 6 mm M.S. angles driving down vertically on either side one after a in lines and levels with suitable pile driving equipments and accessories to a n depth of 0.50 M below the bottom of the proposed excavation 0.5 M above gr level suitably braced by horizontal walling pieces at 75 x 150 mm x 8 mm angeither side at intervals not exceeding 1.50M and horizontal screw jack type str 1.50M intervals and maintaining the shoring till the pipes are laid and works a completed, dismantling, cleaning and restacking for reuse including all labour charges and conveyance for equipments, tools and plants and sundries etc. con						
	Deduction				Τ	I	
	Manholes-class2	-68	2.400		1.960		-319.872
	Manholes-class3	-133	2.400	120	3.200		1021.440
	Total		丛	047	BRI	FI	1341.312
	FOR SZ1						
	Pipe line(1.5-3m)	2	3740.000	$\overline{}$	0.712		5325.760
		2	2699.000	DRM FOR THE	1.500	er.	8097.000
	Manholes-class2	68	9.200	C WORKS	1.960	W	1226.176
	Manholes-class3	133	10.800		1.500		2154.600
	Pipe line(3-4.5m)	2	2699.000		0.696		3757.008
	Manholes-class3	133	10.800		3.195		4589.298
	Lift manholes	3	2.400		1.000		7.200
	Total						25157.04 2
				To	otal Quantit	y in sqm	23815.73 0
1.051	OD77635/2022-20)23				-	
	Provision for side damage to nearby				re is chances	for land	slide and
	Provision for side	protection	work				
	For SZ1	1					1.000
	Total						1.000
				T	otal Quanti	ty in L.S	1.000
1.052	OD77636/2022-20)23					
	Charges for utility						
	For utility shifting						

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity	
	For SZ1	1					1.000	
	Total						1.00	
				T	otal Quanti	ty in L.S	1.00	
1.053	OD77643/2022-20)23						
	New sewer connection to house							
	Household sewer	connectio	n					
		1	2048.000				2048.00	
	Total						2048.00	
				,	Total Quant	ity in no	2048.00	
2	Eco-friendly items	}						
2.001	OD83552/2022-20)23						
	Pump house buildi	ing above	wells.					
	Pump house build	ling		AND.		1.00	9	
		1	8.800	8.800		THE REAL PROPERTY.	77.44	
	Total				501	FI	77.44	
		V-			otal Quantit	v in sam	77.4 4	
					Juan Quantiti	y m sqm i	//.44	
3	Mechanical Items			3	otai Quantit	y m sqm ₁	/ / • • • •	
	Mechanical Items OD83788/2022-20		P	DAM FOR THE	MANAGEMEN	II III 77		
	OD83788/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll	y and inst screen cha The frame as for reme ected soli	umber of spece to be moun oval of collect ds. Flow Rate	nanual bar so cified width, ted on the ch cted solids ar e and height	ereen, MS &r with MS flat namber and p nd trough to should be as	ndash; epo bars and rovided w	xy frame 20 mm c/o vith MS ed for	
	OD83788/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack	y and inst screen cha The frames s for remected soli gree, Space	umber of spece to be moun oval of collect ds. Flow Rate	nanual bar so cified width, ted on the ch cted solids ar e and height	ereen, MS &r with MS flat namber and p nd trough to should be as	ndash; epo bars and rovided w	xy frame 20 mm c/o vith MS ed for	
	OD83788/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De	y and inst screen cha The frames s for remected soli gree, Space	umber of spece to be moun oval of collect ds. Flow Rate	nanual bar so cified width, ted on the ch cted solids ar e and height	ereen, MS &r with MS flat namber and p nd trough to should be as	ndash; epo bars and rovided w	xy frame 20 mm c/o vith MS ed for . Angle of	
	OD83788/2022-20 Bar Screen- Suppl to be fitted in bar s gap between bars. rake arm with rack transfer of the coll Inclination: 45 De	y and inst screen cha The frame as for rem- ected soli gree, Space se	umber of spece to be moun oval of collect ds. Flow Rate	nanual bar so cified width, ted on the ch cted solids ar e and height	ereen, MS &r with MS flat namber and p nd trough to should be as	ndash; epo bars and rovided w	xy frame 20 mm c/o ith MS ed for . Angle of	
	OD83788/2022-20 Bar Screen- Supply to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 Degram Bar screen - Cour	y and inst screen cha The frame as for rem- ected soli gree, Space se	umber of spece to be moun oval of collect ds. Flow Rate	nanual bar sc cified width, ted on the ch cted solids ar e and height Bar Size: 50	ereen, MS &r with MS flat namber and p nd trough to should be as	ndash; epo bars and provided w be provide specified	exy frame 20 mm c/o vith MS ed for . Angle of 1.00	
3.001	OD83788/2022-20 Bar Screen- Supply to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 Degram Bar screen - Cour	y and inst screen cha The frame as for rem- ected soli gree, Space se	umber of spece to be moun oval of collect ds. Flow Rate	nanual bar sc cified width, ted on the ch cted solids ar e and height Bar Size: 50	ereen, MS &r with MS flat namber and p nd trough to should be as x10 mm	ndash; epo bars and provided w be provide specified	exy frame 20 mm c/o vith MS ed for . Angle of 1.00	
3.001	OD83788/2022-20 Bar Screen- Suppl to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 Deg Bar screen - Cour	y and instacted the frame of th	amber of spece to be moun oval of collecteds. Flow Rateing: 20mm,	nanual bar so cified width, ted on the ch cted solids ar e and height Bar Size: 50	ereen, MS &r with MS flat namber and p nd trough to should be as x10 mm	ndash; epo bars and be provided specified y in each	exy frame 20 mm c/orith MS ed for . Angle of 1.00 1.00 led at the	
3.001	OD83788/2022-20 Bar Screen- Suppl to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 De Bar screen - Cour. Total OD83789/2022-20 Electromagnetic floutlet of sewage tr	y and instacted the frame of th	capable of g	nanual bar so cified width, ted on the ch cted solids ar e and height Bar Size: 50	ereen, MS &r with MS flat namber and p nd trough to should be as x10 mm	ndash; epo bars and be provided specified y in each	exy frame 20 mm c/o 20 mm	
3.001	OD83788/2022-20 Bar Screen- Supply to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 Degram Bar screen - Court Total OD83789/2022-20 Electromagnetic floutlet of sewage tr 150-200m3/hr,150	y and instacted the frame of th	capable of g	nanual bar so cified width, ted on the ch cted solids ar e and height Bar Size: 50	ereen, MS &r with MS flat namber and p nd trough to should be as x10 mm	ndash; epo bars and be provided specified y in each	xy frame 20 mm c/o rith MS ed for . Angle of 1.00 1.00	
3.001	OD83788/2022-20 Bar Screen- Supply to be fitted in bar sigap between bars. rake arm with rack transfer of the coll Inclination: 45 Degram Bar screen - Court Total OD83789/2022-20 Electromagnetic floutlet of sewage tr 150-200m3/hr,150	y and instacted the frame of th	capable of g	nanual bar so cified width, ted on the ch cted solids ar e and height Bar Size: 50	ereen, MS &r with MS flat namber and p nd trough to should be as x10 mm	ndash; epo bars and be provided specified y in each	exy frame 20 mm c/o with MS ed for . Angle of 1.00 1.00 1.00 led at the	

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Supply, erection, t motor pump set ha cost of the panel b over switch, main to motor, capacitor pipes of required le complete.0-10HP	ving suita oard with switch, co	an ammeter, ost of soft sta pipe, foot va	e and head, i voltmeter, p rter, cable fr lve, Non ret	ncluding all bhase indicati om panel boa urn valve, su	accessorie ing lamps, ard to star ction and	es such as , change ter, starter delivery
	Non clog submer	sible moto	or pump 0-10)HP			
	Lifting station 1 & 3	4	0.500				2.000
	Lifting station 2	2	1.500				3.000
	Well to STP (5HP)	2	5.000				10.000
	Total						15.000
			Tota	l Quantity i	n HP (Hors	e power)	15.000
3.004	OD123423/2022-2	2023	-	18			
	required length, pr As per KWA/HO// Centrifugal Pump 20-30 HP Treated water pump set	sets 20-30) HP	an <mark>d wiring 1</mark> 3-2016 of Tl	materials, cal he Managing	bles etc. co	
	(57.87lps,16m head)	2	25.000				50.000
	well to stp (peak)	2	25.000				50.000
	Total						100.000
			Tota	l Quantity i	n HP (Horse	e power)	
							100.000
4	Electrical Items						100.000
4.001	OD83791/2022-20						100.000
	OD83791/2022-20 Supply ,installation		nmissioning o	of solar units	for lifting st	ation	100.000
	OD83791/2022-20 Supply ,installation Solar units	n and com	nmissioning o	of solar units	for lifting st	ation	
	OD83791/2022-20 Supply ,installation Solar units Lifting station	n and com	nmissioning o	of solar units	for lifting st	ation	3.000
	OD83791/2022-20 Supply ,installation Solar units Lifting station Collection well	n and com	nmissioning o	of solar units	for lifting st	ation	3.000 1.000
	OD83791/2022-20 Supply ,installation Solar units Lifting station	n and com	nmissioning o				3.000 1.000 4.000
4.001	OD83791/2022-20 Supply ,installation Solar units Lifting station Collection well Total	and com	nmissioning o		for lifting st		3.000 1.000
	OD83791/2022-20 Supply ,installation Solar units Lifting station Collection well	3 1		То	tal Quantity	in 1 nos	3.000 1.000 4.000 4.000

Sl No	Specification	No	Length	Width	Depth	Cf	Quantity
	Electrical connection and control units						
	Lifting station	3					3.000
	Collection well	1					1.000
	Total						
				To	tal Quantity	in 1 nos	4.000



ABSTRACT ESTIMATE

Others-DPR PREPARATION OF ALAPPUZHA MUNICIPALITY SEWERAGE SCHEME-

Sewerage Net work with pipes ,Manholes, Inspection Chambers and wells. Alappuzha Muncipality Subzone 1-Sewerage Work

Sl No	Specification	Quantity	Rate	Amount				
1	Sewer Net work with Pipes, Manh	oles,Inspection	chambers and We	lls				
1.001	2.6.1							
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be levelled and neatly dressed. All kinds of soil							
	Net Total	4396.665cum	@223.41/cum	982258.93				
1.002	OD76500/2022-2023	MA						
	over areas (exceeding 30cm in dept plan)including disposal of excavate	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30cm in depth,1.5m in width aswell as 10 sqm on plan)including disposal of excavated earth ,lead up to 50m and lift up to 1.5 m ,disposed earth to be levelled and neatly dressed .All kind of soil-additional lift 1.5to						
	Net Total	2233.869cum	@334.44/cum	747095.15				
1.003	OD76499/2022-2023	UBLIC WORKS	E MAGNAGEMENT					
	Earth work in excavation by mecha over areas (exceeding 30 cm in depincluding disposal of excavated earth to be levelled and neatly dress m.	th, 1.5 m in wid th, lead up to 50	th as well as 10 sqm m and lift up to 1.5	on plan) m, disposed				
	Net Total	775.656cum	@445.49/cum	345546.99				
1.004	OD78182/2022-2023							
	Earthwork open well excavation (in 9.0m in all kinds of soil and convey 50m and lift from 1.50m to 3.0 m in	ing and deposit	ing the spoil within	initial lead of				
	Net Total	1.500metre	@41434.78/metr e	62152.17				
1.005	OD78321/2022-2023							
	Earthwork in open well excavation 6.0m and up to 9.0m in all kinds of initial lead of 50m and lift from 3.0	soil and convey	ing and depositing t					
	Net Total	1.500metre	@44348.09/metr e	66522.14				
1.006	OD78342/2022-2023							
	Earthwork in open well excavation 6.0m and up to 9.0m in all kinds of							

Sl No	Specification	Quantity	Rate	Amount				
	initial lead of 50m and lift from 4.5	m to 6.0m inclu	ding neat banking.					
	Net Total	1.500metre	@47262.25/metr e	70893.38				
1.007	OD78320/2022-2023							
	Earthwork in open well excavation (in or under water) for wells of diameter above 6.0m and up to 9.0m in all kinds of soil and conveying and depositing the spoil within initial lead of 50m and lift from 6.0m to 7.5m including neat banking.							
	Net Total		@50176.41/metr e	81436.31				
1.008	4.1.6							
	Providing and laying in position cercost of centering and shuttering - A coarse sand : 6 graded stone aggreg	ll work up to pl	inth level:1:3:6 (1 ce					
	Net Total	505.603cum	@7527.05/cum	3805699.06				
1.009	5.37.1	MIN						
	cement concrete work, using cement manufactured in fully automatic bat transit mixer for all leads, having condesign of specified grade for reinfor R.M.C. from transit mixer to site of finishing and reinforcement including proportions as per IS: 9103 to accel workability without impairing strenting - in -charge. Note: - Cement content /less cement used as per design mix plinth level	ching plant and ontinuous agitat reed cement cor laying, excluding cost of admierate/ retard set gth and durabil considered in t	I transported to site of ed mixer, manufacturerete work including the cost of center extures in recommendating of concrete, implify as per direction of his item is @330 kg	f work in red as per mix g pumping of ing, shuttering led brove f the Engineer /cum. Excess Il wiork upto				
	Net Total	2800.619cum	@10319.09/cum	28899839.5 2				
1.010	OD72452/2022-2023							
	Extra for providing sulphate resistar							
	Net Total	2797.581cum	@1800.16/cum	5036093.41				
1.011	5.34.1 Extra for providing richer mixes at a specified cement content used is pay grade concrete instead of M-25 gradin M-30 is @ 340 kg/cum).	yable/ recoveral	ble separately.Provid	ing M-30				
1.012	OD72488/2022-2023	4171.Joiculli	@ 0J.UO/CUIII	437070.74				
1.012	Extra for providing epoxy coating f	or reinforcemer	nt har					
		307733.910kg	@2.32/kg	713942.67				
1.013	5.22.6	50//55.710Kg	G 2.32/Rg	113774.01				
1.013	Steel reinforcement for R.C.C work	including strai	ghtening, cutting, be	nding, placing				

Sl No	Specification	Quantity	Rate	Amount
	in position and binding all complete bars of grade Fe-500D or more	e upto plinth lev	elThermo - Mechani	cally Treated
	Net Total	307733.910ki logram	@102.61/kilogra m	31576576.5 1
1.014	4.12			
	Extra for providing and mixing wat doses by weight of cement as per m			rete work in
	Net Total	951177.540kg	@1.40/kg	1331648.56
1.015	5.9.1			
	Centering and shuttering including for:Foundations, footings, bases of			
	Net Total	2013.640sqm	@350.00/sqm	704774.00
1.016	5.9.2			
	Centering and shuttering including thickness) including attached pilaste			
	Net Total	12613.038sq m	@748.62/sqm	9442372.51
1.017	22.23.1			
	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., prep integral crystalline slurry: 2 parts v integral crystalline slurry: 1 part w same from negative (internal) side v shall meet the requirements as spec permeability of concrete by more the DIN 1048 and resistant to 16 bar hy crystalline slurry shall be capable of self-healing shall be carried out all complete as engineerincharge. The product performance shall be a self-healing slurry shall self-healing shall be carried out all complete as engineerincharge. The product performance shall be carried surface two coal self-healing shall self-healing shall self-healing shall self-healing shall self-healing shall be carried out all complete as engineerincharge. The product performance shall surface two coal self-healing shall self-hea	Structures like servior, sewage ared by mixing vater) for vertica ater) for horizor with the help of ified in ACI-212 ann 90% compand of cracks upper specification all carry guaran	retaining walls of the & amp; water treatment in the ratio of 5 : 2 (and surfaces and 3 : 1 (and surfaces and appropriate fiber brush 2-3R-2010 i.e by reduced with control concurred on negative side. The awidth of 0.50mment and the direction of the for 10 years again.	e basement, ent plant, 5 parts (3 parts lying the a. The material ucing erete as per The a. The work f the
1.010		4496.978sqiii	@595.25/sqm	20/0820.13
1.018	Providing and applying integral cry waterproofing treatment to the RCC water tanks, roof slabs, podiums, re tunnels / subway and bridge deck etc., prep integral crystalline slurry: 2 parts v integral crystalline slurry: 1 part was same from negative (internal) side v shall meet the requirements as spec	Structures like servior, sewage ared by mixing vater) for vertical ater) for horizor with the help of	retaining walls of th & amp; water treatments in the ratio of 5 : 2 (and surfaces and 3 : 1 of tal surfaces and app synthetic fiber brush	e basement, ent plant, 5 parts (3 parts lying the a. The material

Sl No	Specification	Quantity	Rate	Amount	
	permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineerin-				
	charge. The product performance shall carry guarantee for 10 years against any leakage. For horizontal surface one coat @1.10 kg per sqm.				
	Net Total	744.330sqm	@458.80/sqm	341498.60	
1.019	2.25				
	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m.				
	Net Total	4153.675cum	@269.88/cum	1120993.81	
1.020	100.41.40				
	Supply, stacking, spreading and cor for cushion including carriage, load	nsolidating of R ing, unloading	ed earth in the trencl & stacking up to	of pipe line any lead.	
	Net Total	4421.578cum	@370.72/cum	1639167.40	
1.021	50.2.25.1	- Comment	ID N		
	Filling with contractor's own earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m as per direction of site Engineer-in-charge				
	Net Total	3011.055cum	@548.87/cum	1652677.76	
1.022	100.98.138				
	Supply of HDPE Pipe PE 100 (IS 4984/1995), 8kg, 160mm Outer Dia.				
	Net Total	3840.000metr e	@689.21/metre	2646566.40	
1.023	100.98.140				
	Supply of HDPE Pipe PE 100 (IS 4	984/1995), 8kg	, 200mm Outer Dia.		
	Net Total	8789.800metr e	@1068.73/metre	9393922.95	
1.024	100.98.143				
	Supply of HDPE Pipe PE 100 (IS 4	984/1995), 8kg	, 280mm Outer Dia.		
	Net Total	123.400metre	@2087.37/metre	257581.46	
1.025	100.98.144				
	Supply of HDPE Pipe PE 100 (IS 4	984/1995), 8kg	, 315mm Outer Dia.		
	Net Total	241.500metre	@2644.49/metre	638644.34	
1.026	100.98.145				
	Supply of HDPE Pipe PE 100 (IS 4	984/1995), 8kg	, 355mm Outer Dia.		
	Net Total	839.500metre	@3475.43/metre	2917623.49	

Sl No	Specification	Quantity	Rate	Amount	
1.027	100.98.158				
	Supply of HDPE Pipe PE 100 (IS 4984/1995), 10kg, 160mm Outer Dia.				
	Net Total	365.000metre	@841.02/metre	306972.30	
1.028	100.98.164				
	Supply of HDPE Pipe PE 100 (IS 4	984/1995), 10k	g, 315mm Outer Dia	•	
	Net Total	150.000metre	@3239.58/metre	485937.00	
1.029	100.1.1				
	Excavating trenches of required width for pipes, cables, etc., including excavation f sockets, and dressing of sides, ramming of bottoms, depth up to 1.5m, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20cm in depth, including consolidating each deposited layer by ramming watering, etc., and disposing of surplus excavated soil as directed, within a lead of 50m, in all kinds of soil.				
	Net Total	19864.392cu m	@579.88/cum	11518963.6 3	
1.030	100.1.2		The second secon	1	
	Excavating trenches of required wide sockets, and dressing of sides, rammexceeding 3m, including getting our required, in layers not exceeding 20 deposited layer by ramming, watering directed, within a lead of 50m, in al	ning of bottoms t the excavated cm in depth, in ng, etc., and dis	s, depth exceeding 1. soil, and then returni cluding consolidatin	5m but not ing the soil as g each	
1.031	100.1.3				
	Excavating trenches of required width for pipes, cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth exceeding 3m but not exceeding 4.5 m, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc., and disposing of surplus excavated soil as directed, within a lead of 50m, in all kinds of soil. Net Total 2267.160cum @801.97/cum 1818194.31				
1.032	100.10.5			•	
	Laying HDPE pipes (IS: 4984) on land portion including conveying within initial lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 160mm Nominal Outside Diameter Pipes.				
	Net Total	4205.000metr e	@224.62/metre	944527.10	
1.033	100.10.7				
	Laying HDPE pipes (IS: 4984) on I	land portion inc	luding conveying wi	ithin initial	

Sl No	Specification	Quantity	Rate	Amount	
	lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 200mm Nominal Outside Diameter Pipes.				
	Net Total	8789.800metr e	@333.88/metre	2934738.42	
1.034	100.10.10				
	Laying HDPE pipes (IS: 4984) on land portion including conveying within initial lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 280mm Nominal Outside Diameter Pipes.				
	Net Total	123.400metre	@542.53/metre	66948.20	
1.035	100.10.11	- Hiller Stiller	IDA		
	Laying HDPE pipes (IS: 4984) on land portion including conveying within initial lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 315mm Nominal Outside Diameter Pipes.				
	Net Total	391.500metre	@606.44/metre	237421.26	
1.036	100.10.12				
	Laying HDPE pipes (IS: 4984) on land portion including conveying within initial lead and aligning the pipes, electro-fusion welding using automatic or semi-automatic electrofusion machines, testing the pipeline thus fabricated to suit the hydraulic working pressure and after testing, aligning the pipeline, lowering the pipe in position into the trenches already made, testing the line to suitable pressure with potable water before back filling and levelling the trenches including all labour charge, hire for appliances etc., complete but excluding cost of pipe and fittings: 355mm Nominal Outside Diameter Pipes.				
	Net Total	850.000metre	@684.28/metre	581638.00	
1.037	OD77554/2022-2023				
	Supply and fixing 150 mm non retu	rn valves			
	Net Total	3.0001 nos	@15772.07/1 nos	47316.21	
1.038	OD83462/2022-2023				
	Supply and fixing 150mm butterfly	valve	I	T	
	Net Total	6.000no	@27250.00/no	163500.00	

Sl No	Specification	Quantity	Rate	Amount	
1.039	OD78384/2022-2023		-		
	Supply and fixing 300 mm butterfly	valves			
	Net Total	2.0001 nos	@27250.00/1 nos	54500.00	
1.040	OD83472/2022-2023				
	Supply and fixing 350mm butterfly	valve			
	Net Total	3.000no	@27250.00/no	81750.00	
1.041	OD77588/2022-2023				
	Road Cutting - Restoration charge - Dtd.30-07-2020 Tvpm PW(H)D, Ex	As per order N cluding GST	o.GO(Ms)No.59/202	20/PWD	
	Net Total	9000.000sqm	@3633.48/sqm	32701320.0 0	
1.042	OD77595/2022-2023				
	Road Cutting - Restoration charge - As per order No.GO(Ms)No.59/2020/PWD Dtd.30-07-2020 Typm PW(H)D, Excluding GST.				
	Net Total	12900.000sq m	@3086.88/sqm	39820752.0 0	
1.043	OD77596/2022-2023	- Marie	DKA		
	Road Cutting - Restoration charge - As per order No.GO(Ms)No.59/2020/PWD Dtd.30-07-2020 Tvpm PW(H)D, Excluding GST				
	Net Total	6540.000sqm	@4886.99/sqm	31960914.6 0	
1.044	OD77594/2022-2023				
	Connection for manholes and cham	bers			
	Net Total	2304.000no	@756.40/no	1742745.60	
1.045	19.18.3				
	Supplying and fixing C.I with out frame for manholes:560 mm diameter (heavy duty) the weight of the cover to be not less than 108 kg				
	Net Total	384.000each	@8382.43/each	3218853.12	
1.046	100.7.1				
	Bailing out water with 5HP engine and pump set including conveyance to the site, erecting, dismantling and taking back of engine and pump, cost of fuel lubricating oil and other stores pay of staff etc., complete.				
	Net Total	18900.000Kw h	@38.55/Kwh	728595.00	
1.047	100.7.2				
	Bailing out water with engine and pump set above 5HP up to 10HP including conveyance to the site, erecting, dismantling and taking back of engine and pump, cost of fuel lubricating oil and other stores pay of staff etc., complete.				
	Net Total	13200.000Kw h	@19.29/Kwh	254628.00	
1.048	100.7.3				
	Bailing out water with engine and pump set above 10HP up to 20HP including conveyance to the site, erecting, dismantling and taking back of engine and pump, cost of fuel lubricating oil and other stores pay of staff etc., complete.				

Sl No	Specification	Quantity	Rate	Amount	
	Net Total	33000.000Kw h	@9.64/Kwh	318120.00	
1.049	2.16.1				
	Close timbering in trenches including strutting, shoring and packing cavities (wherever required) complete (Measurements to be taken of the face area timbered). Depth not exceeding 1.5m				
	Net Total	30544.634sq m	@159.67/sqm	4877061.71	
1.050	100.6.1				
	Providing steel sheet shoring to the sides of the trenches to depths of above 4.00 m but not exceeding 6.00m using 6 mm M.S. sheet 0.50 M wide stiffen on edges with 50 mm x 50mm x 6 mm M.S. angles driving down vertically on either side one after another in lines and levels with suitable pile driving equipments and accessories to a maximum depth of 0.50 M below the bottom of the proposed excavation 0.5 M above ground level suitably braced by horizontal walling pieces at 75 x 150 mm x 8 mm angles on either side at intervals not exceeding 1.50M and horizontal screw jack type struts at 1.50M intervals and maintaining the shoring till the pipes are laid and works are completed, dismantling, cleaning and restacking for reuse including all labour, hire charges and conveyance for equipments, tools and plants and sundries etc. complete.				
	Net Total	23 <mark>815.73</mark> 0sq m	@781.91/sqm	18621757.4 4	
1.051	OD77635/2022-2023				
	Provision for side protection work i damage to nearby compound walls	n cases where the	here is chances for la	and slide and	
	Net Total	1.000L.S	@1499999.99/L. S	1499999.99	
1.052	OD77636/2022-2023				
	Charges for utility shifting				
	Net Total	1.000L.S	@1000000.00/L. S	1000000.00	
1.053	OD77643/2022-2023				
	New sewer connection to house				
	Net Total	2048.000no	@16500.00/no	33792000.0 0	
			Heading Total(Rs)	302729434. 61	
2	Eco-friendly items				
2.001	OD83552/2022-2023				
	Pump house building above wells.	, ,			
	Net Total	77.440sqm	@19397.05/sqm	1502107.55	
			Heading Total(Rs)	1502107.55	

Sl No	Specification	Quantity	Rate	Amount	
3	Mechanical Items				
3.001	OD83788/2022-2023				
	Bar Screen- Supply and installation, of manual bar screen, MS – epoxy frame to be fitted in bar screen chamber of specified width, with MS flat bars and 20 mm c/c gap between bars. The frame to be mounted on the chamber and provided with MS rake arm with racks for removal of collected solids and trough to be provided for transfer of the collected solids. Flow Rate and height should be as specified. Angle of Inclination: 45 Degree, Spacing: 20mm, Bar Size: 50x10 mm				
	Net Total	1.000each	@29037.50/each	29037.50	
3.002	OD83789/2022-2023				
	Electromagnetic flow meter capable outlet of sewage transfer pump fron range 150-200m3/hr,150mm				
	Net Total	1.000no	@99999.34/no	99999.34	
3.003	OD123421/2022-2023	OnD.			
	Supply, erection, testing, and commissioning of new generation non clog Submersible motor pump set having suitable discharge and head, including all accessories such as cost of the panel board with an ammeter, voltmeter, phase indicating lamps, change over switch, main switch, cost of soft starter, cable from panel board to starter, starter to motor, capacitors suction pipe, foot valve, Non return valve, suction and delivery pipes of required length, pressure gauge, earthing and wiring materials, cables etc. complete.0-10HP				
	Net Total	15.000HP (Horse power)	@27680.87/HP (Horse power)	415213.05	
3.004	OD123423/2022-2023				
	Supply, erection, testing, and commissioning of new generation non clog motor pump set having suitable discharge and head, including all accessories such as cost of the panel board with an ammeter, voltmeter, phase indicating lamps, change over switch, main switch, cost of soft starter, cable from panel board to starter, starter to motor, capacitors suction pipe, foot valve, Non return valve, suction and delivery pipes of required length, pressure gauge, earthing and wiring materials, cables etc. complete As per KWA/HO/SP-333/2014 Dtd.18-03-2016 of The Managing Director - for Centrifugal Pump sets 20-30 HP				
	Net Total	100.000HP (Horse power)	@17607.18/HP (Horse power)	1760718.00	
			Heading Total(Rs)	2304967.89	
4	Electrical Items				
4.001	OD83791/2022-2023				
	Supply ,installation and commissioning of solar units for lifting station				
	Net Total	4.0001 nos	@23230.00/1 nos	92920.00	
4.002	OD83792/2022-2023				
	Supply and installation of accessories for electrical connection and control units for				

Sl No	Specification	Quantity	Rate	Amount	
	lifting stations and collection wells in				
	Net Total	4.0001 nos	@100000.00/1 nos	400000.00	
	Heading Total(Rs)				
	Total Estimation PAC 3070294				
6	6 Extra Charges				
	Provision for GST				
5.001	307029430.05 18.00%			55265297.4 1	
	Grand Total			0.00	
	Round off			0.00	
	Rounded Total(Rs) 3622947			362294727.4 6	
	Rupees Thirty Six Crore Twenty Two Lakh Ninety Four Thousand Seven Hundred and Twenty Seven				

e-PLATFORM FOR THE MANAGEMENT OF PUBLIC WORKS

അജണ്ട:- 7

E10 - 18527/21

ആലപ്പുഴ നഗരസഭ– എഞ്ചിനീയറിംഗ് വിഭാഗം – ആലപ്പുഴ നഗരസഭപ്രദേശത്ത് സ്വീവറേജ് നടപ്പിലാക്കുന്നതിനോടനുബന്ധിച്ച് കേരള സംസ്ക്കരണ സംവിധാനം നഗരസഭ ഉദ്യോഗസ്ഥരും സംയുക്ത പരിശോധന നടത്തി കണ്ടെത്തിയ സ്ഥലങ്ങൾ ഏറ്റെടുത്ത് നൽകണമെന്നുള്ള നഗരസഭ കൗൺസിൽ തീരുമാനം ലഭ്യമാക്കിയിട്ടില്ല എന്ന് വാട്ടർ അതോറിറ്റി സ്വീവറേജ് സർക്കിൾ സൂപ്രണ്ടിംഗ് എഞ്ചീനയറുടെ 11/05/22 ലെ KWA/SCK/ALP/2020 നമ്പർ കത്ത് മുഖാന്തിരം അറിയിച്ചിട്ടുണ്ട്. അമൃത് പദ്ധതിയിൽ ആലപ്പുഴ നഗരസഭ ഉൾപ്പെട്ടിട്ടുളള തിനാൽ സ്വീവറേജ് സംവിധാനം നടപ്പിലാക്കുന്നതിന് വേണ്ടിയുളള വിശദമായ പദ്ധതി രൂപകൽപ്പന സർക്കാരിന് കെ.ഡബ്ല്യൂ.എ. സമർപ്പിക്കേണ്ടതിനാൽ ആലിശ്ശേരിയിൽ കെ.ഡബ്ല്യൂ.എ. ഉടമസ്ഥതയി ലുളള സ്റ്റോർ കെട്ടിടം ഒഴികെയുളള 75 സെന്റ് സ്ഥലം ഉപയോഗപ്പെടുത്തി വികേന്ദ്രീകൃത സംവിധാനത്തിൽ നഗരസഭ 32 to 36, വാർഡുകൾ പൂർണ്ണമായും 37, 38, 42, 44 വാർഡുകൾ ഭാഗിക മായും ഉൾപ്പെടുത്തി 5 ദശലക്ഷം ശേഷിയുള്ള ശുദ്ധീകരണശാലയും അനുബന്ധ ഘടകങ്ങളും തയ്യാറാക്കുന്നതിന് കെ.ഡബ്ല്യൂ.എ. തീരുമാനിച്ചിട്ടുളളതിനാൽ നഗരസഭയിൽ നിന്നും അനുമതി പത്രവും ആവശ്യമായ സ്ഥലങ്ങൾ ഏറ്റെടുത്ത് നൽകാമെന്നുളള കൗൺസിൽ തീരുമാനവും അടിയന്തിരമായി നൽകുന്നതിന് ആവശ്യപ്പെട്ടിട്ടുണ്ട്. വിഷയം ബഹു. കൗൺസിലിന്റെ പരിഗണന

ചർച്ച

കേരള ജല അതോറിറ്റി ഇ.ഇ. ശ്രീമതി സുജാത. എ. മലീനജല ശുദ്ധീകരണശാലയുമായി ബന്ധപ്പെട്ട റിവൈസ്ഡ് പ്രോജക്ട് റിപ്പോർട്ട് അവതരിപ്പിച്ചു. അസിസ്റ്റന്റ് എഞ്ചിനീയർ ശ്രീ. ഉണ്ണികൃഷ്ണൻ ഇളയത്. സി.എൻ. പദ്ധതി സംബന്ധിച്ച് വിശദീകരിച്ചു.

തീരുമാനം - 7

ആലിശ്ശേരിയിൽ കെ.ഡബ്ല്യൂ.എ. യുടെ ഉടമസ്ഥതയിലുളള 75 സെന്റ് സ്ഥലത്ത് 5 എം.എൽ.ഡി. എസ്.റ്റി.പി., Co - Treatment ഉൾപ്പെടെ നിർമ്മിക്കുന്നതിന് അംഗീകാരം നൽകുന്നതിന് തീരുമാനിച്ചു.

(ഒപ്പ്)

ചെയർപേഴ്സൺ

ആലപ്പുഴ നഗരസഭ

// ശരിപകർപ്പ് //

സെകടറി

ആലപ്പുഴ നഗരസഭ