

Directorate of Town & Country Planning, Haryana

Plot No. 3, Nagar Yojna Bhawan, A-wing, Madhya Marg, Sector-18 Chandigarh,
Website: tcpharyana.gov.in; Phone: 0172-2548475, 2707175; email:
tcpharyana7@gmail.com

Regd.

To

Vallabham Buildcon Pvt. Ltd.,
Vibhor Home Developers Pvt. Ltd.,
In collaboration with Lion Infradevelopers LLP.,
Plot No. 10, 3rd Floor, Local Shopping Complex,
B-1, Vasant Kunj,
New Delhi 110079.

Memo No. LC-3804-JE(MK)-2021/ | 6373 Dated: 09/07/2024

Subject: Approval of Service Plan/Estimates for affordable residential plotted colony under DDJAY over an area measuring 12.41875 acres falling under Licence No. 23 of 2019 dated 20.02.2019 in Sector 35, Sohna, District Gurugram - Lion Infra Developer LLP.

Please refer your application on the matter as subject cited above.

The service plan/ estimates of Affordable Plotted Colony (under DDJAY) being developed over an area measuring 12.41875 acres falling under Licence No. 23 of 2019 dated 20.02.2019 in Sector 35, Sohna, District Gurugram has been checked and corrected wherever necessary and are hereby approved subject to the following terms and conditions:-

1. That you will have to pay External Development Charges as a full and no deduction on account of any services proposed from other Department/from own sources by the colonizer for the time being, as EDC works for a town as a whole will have to be got executed in view of overall planning, proposed area also covered/to be covered in EDC, Gurugram Town.
2. The category wise area shown on the plans and proposed density of population thereof has been treated to be correct for the purpose of services only.
3. That you are liable to maintain the licensed area for ten years or as per HSVN norms till such time, the colony is taken over by the local authority/State Govt.
4. The wiring system of street lighting will be under ground and the specifications of the street lighting fixture etc. will be as per relevant standard of HVPNL. LED lamps shall be provided to meet the requirement of HVPNL and as well environment.
5. It is made clear that appropriate provision for fire-fighting arrangement as required in the NBC/ISI should also be provided by you and fire safety certificate should also be obtained from the competent authority before undertaking any construction. You shall be sole responsible for fire safety arrangement.
6. All technical notes and comments incorporated in the estimates in two sheets will also apply. A copy of these is also appended as Annexure-A.

7. The correctness of the levels of the colony will be sole responsibility of the owner for integrating the internal sewer/ storm water drainage of the colony by gravity with the master services.
8. That level/extents of external services to be provided by HSVP will be in accordance with EDC deposited. The colonizer will be fully responsible to meet the demand, to dispose of effluent and rain water till these services are provided by HSVP.
9. You shall be sole responsible for disposal of sewage of your colony as per requirement of HSPCB/Environment Deptt. till such time the external services are made available as per the proposal of the town. All the link connections with the external services shall be made by you at your own cost after seeking approval from competent authority. There should be no pollution due to disposal of sewerage of the colony. The disposal of the effluent should be accordance to the standard norms fixed by Haryana State Pollution Board/Environment Department.
10. The estimate does not include the provision of electrification of the colony. However, it is clear that the supervision charges and O&M charges shall be paid by you directly to the HVPNL.
11. That you shall be solely responsible to lay the services upto the external services laid/to be laid by HSVP or any developing agency on Sector dividing road at respective locations/points.
12. You have proposed to utilize recycled water for flushing purposes and provision of separate flushing line, storage tank, metering system, pumping system and plumbing has been made. Therefore, it is clarified that no tap or outlet of any kind will be provided from the flushing lines/plumbing lines for recycled water except for connection to the cistern of flushing tanks and any scouring arrangement. Even ablution taps should be avoided.
 - (i) Two separate distribution systems, independent to each other, will be adopted, one for potable water supply and second for recycled water. Every Home/Office/business establishment will have access to two water pipe lines.
 - (ii) Potable water and recycled water supply lines will be laid on opposite berms of road. Recycled water lines will be above sewer lines. Wherever unavoidable and if all pipes are required to be laid on same side of road, these will be located from the ground surface in order of descending quality. Potable water shall be above recycled water which should be above sewer. Minimum clear vertical separation between a potable water line and a recycled water line shall be one ft, if it not possible then readily identifiable sleeve should be used.
To avoid any accidental use of recycled water for potable purposes all:-

- (a) Recycle water pipes, fitting, appurtenances, valves, taps, meters, hydrants will be of Red Colour or painted red.

- (b) Sign and symbols signifying and clearly indicating "Recycle Water" "Not fit for Drinking" must invariably be stamped/fixed on outlets, Hydrants Valves both surface and subsurface, Covers and at all conspicuous places of recycle distribution system.
- (c) Detectable marker tapes of red colour bearing words "Recycle Water" should be fixed at suitable interval on pipes.
- (d) Octagonal covers, red in colour or painted red and words "Recycle Water- Not fit for Drinking" embossed on them should be used for recycled water.
13. That it shall be mandatory to provide dual/two button or lever flushing system in toilets.
14. You shall be sole responsible for the construction of various structures such as RCC underground tank etc. according to the standard specification good quality and its workmanship. The structural stability responsibility will entirely rest upon you.
15. In case some additional structures are required to be constructed and decided by HSVP/development agency at a later stage, the same will be binding upon you. Flow of control valves will be installed preferably of automatic type on water supply connection with main water supply line, laid by developing agency or HSVP.
16. The formation level of internal road should match with sector roads. Similar other services like water supply, sewerage and SWD level etc. should be fixed in integration of levels of EDC services of water supply, sewerage and SWD etc. which shall be ensured by you.
17. In case it is decided by Govt. that HSVP/Govt. will construct 24 m wide road and will extend master services on 24 m wide internal circulation road, then additional amounts at rates as decided by the authority/Govt. will be recoverable over and above EDC.
18. Since, the construction of master plan is yet to take place, you will get the road level/formation level of your service fixed from the concerned Superintending Engineer, before execution.
19. This estimate does not include the common services like water supply, storage tank on the top of the building block, the plumbing works etc. will part of the building works.
20. You will have to ensure that the sewer/storm water drainage to be laid by you will be connected with the proposed existing master services by gravity. If it is not possible to connect the services by gravity, it will be your sole responsibility to make the pumping arrangement and maintenance thereof for all the time to come.
21. That you shall not make any connection with the master services i.e. water supply, sewerage, storm water drainage, without prior approval of the competent authority in writing.
22. That the detailed technical proposal/scheme shall be got approved from this office before execution of work at site.

23. The firm will provide solar water heating system as per the guidelines issued by Haryana Govt./Ministry of Environment/Govt. of India.
24. It is made clear that roof top rain harvesting system shall be provided by you as per Central Ground Water Authority norms/Haryana Govt. Notification and the same shall be kept operational/maintained all the time. The arrangement for segregation of first rain water not to be entered into the system shall also be made by you.
25. That you shall transfer the land under master plan road as well as service road to Govt./HSVP for construction of road/service road free of cost and proportionate cost for construction of service road shall also be paid by you.
26. That you shall ascertain the compliance of all conditions of Chief Engineer-I, Haryana Shehri Vikas Pradhikaran, Panchkula imposed in his office letter memo no. EIC / SE(HQ) / SDE(W) / HDM(G) / 2021 / 45182 dated 12.03.2021 (enclosed as Annexure-A).

Note (1):-

That you shall execute the development works as per Environmental Clearance and comply with the provisions of Environment Protection Act, 1986, Air (Prevention and Control of Pollution of Act 1981) and Water (Prevention and Control of Pollution of 1974). In case of any violation of the provisions of said statutes, you shall be liable for penal action by Haryana State Pollution Controlled Board or any other Authority Administering the said Acts.

A copy of the approved service plan/estimates is enclosed herewith. You are requested to supply three additional copies of the approved service plan/estimates to the Chief Administrator, HSVP, Panchkula under intimation to this office.

DAAs above


(Babita Gupta)
District Town Planner (HQ)
For Director, Town & Country Planning
Haryana, Chandigarh

Endst. No LC-3804-JE (MK)-2021/

Dated :

A copy is forwarded to the Chief Engineer-1, HSVP, Panchkula with reference to his memo No. EIC / SE(HQ) / SDE(W) / HDM(G) / 2021 / 45182 dated 12.03.2021 for information and necessary action please.


(Babita Gupta)
District Town Planner (HQ)
For Director, Town & Country Planning
Haryana, Chandigarh

LC-3804

**SERVICE ESTIMATE, DESIGN REPORT AND
CALCULATION OF
INTERNAL DEVELOPMENT WORKS**

FOR

**REVISED LAYOUT OF "AFFORDABLE PLOTTED COLONY (UNDER DEEN DAYAL
JAN AWAS YOJNA - 2016)" FOR LAND AREA MEASURING 12.41875 ACRES
(LICENSE NO. 23 OF 2019 DATED 20.02.2019) IN REVENUE ESTATE OF SECTOR
- 35, SOHNA, DISTT. – GURUGRAM BELONGING TO LION INFRADEVELOPERS
LLP, VALLABHAM BUILDCON PVT. LTD. AND VIBHOR HOME DEVELOPERS PVT.
LTD. IN COLLABORATION WITH M/S LION INFRADEVELOPERS LLP.**

ARCHITECT: VMA ARCHITECTS,
1023, JMD MEGAPOLIS, SECTOR 48, GURUGRAM-122001
MEP CONSULTANT: PRIFACTOR ENGINEERS,
109, ANSAL LAXMIDEEP TOWER, LAXMI NAGAR, DELHI-110092

**SERVICE ESTIMATE, DESIGN REPORT AND CALCULATIONS OF INTERNAL DEVELOPMENT
WORKS FOR PROPOSED "AFFORDABLE PLOTTED COLONY (UNDER DEEN DAYAL JAN AWAS
YOJNA - 2016) LAND AREA MEASURING 12.41875 ACRES (LICENSE NO. 23 OF 2019 DATED
20.02.2019) IN SECTOR 35, SOHNA, DISTT. GURUGRAM BELONGING TO LION
INFRADEVEOPERS LLP, VALLABHAM BUILDCON PVT.LTD. AND VIBHOR HOME DEVELOPERS
PVT. LTD. IN COLLABORATION WITH M/S LION INFRADEVELOPERS LLP**

Sohna town of Haryana State situated on NH 248-a road at a distance of 54 Km from Delhi. Being in the national capital region, the town has developing tendency and potential. Further, it has also started sharing the growing residential, commercial and Industrial load of Delhi. In order to review the growing pressure of population in National Capital of Delhi, it has been decided by the Haryana Government to develop various infrastructure facilities in Sohna, Distt. - Gurugram Urban Complex. This report is for a part of service estimate for proposed "Affordable Plotted Colony" (under Deen Dayal Jan Awas Yojna - 2016) measuring 12.41875 acres (License No. 23 of 2019 dated 20.02.2019) in Sector 35, Sohna Distt. Gurugram being belonging to Lion Infradevelopers LLP, Vallabham Buildcon Pvt. Ltd. and Vibhor Home Developers Pvt. Ltd. in collaboration with M/s Lion Infradevelopers Llp has been prepared with the following provisions which are as under:-

1. WATER SUPPLY

The source of water supply in this area is by HSVP Mains. It has been proposed to construct underground tanks of capacity as per attached details (Annexure-I: Water requirement chart and water storage capacity) and to location for domestic purpose and for fire protection. The underground tanks will be fed from the HSVP based supply, which will feed O.H. tanks on the roof of the Building and has been designed as per the Hazen Williams formula. Presently there is proposed HSVP W/S in this area. However the provision of tube well have been taken due to non availability of water but after getting the approval from the competent authority through tube wells /tankers / any other approved source till HSVP W/S will made available. The proposed tube wells shall be 510mm bore drilled with reverse rotary rig and installed with 100mm i/d housing pipe and 80mm i/d slotted tube as strainer, hence the provision of Two Nos Tube Wells have been taken in this estimate.

DESIGN

The scheme has been designed for population of 4160 persons considering @ 5-³⁹⁶² 13.5 persons/apartment for Affordable Plotted Colony and other provision etc. The combined quantum of water supply (domestic + flushing) per head / day has been taken as 135 Liters per head per day as per design calculation and in relevance to the national building codes of 2016.

PUMPING EQUIPMENTS

It has been proposed to install pumping set as described with standby of equal capacity. The provision for standby generating set has also been provided in case of any time electricity failure. Generator will be provided separately or added to the capacity of main generator.

2. SEWERAGE

The scheme is designed for sewer connecting to the STP and bypass connection to HSVP sewer scheme. The sewer lines have designed for three times average D.W.F. in relation to water supply demand. It has assumed that about 80% of the domestic and flushing water supply shall find its way into the proposed sewer. Sewer lines shall be running by gravity and discharge to STP proposed. Treated water will be used for Irrigation & Flushing purpose (through recycling) under the pipeline system. R.C.C Np2 class pipes have been used for the sewage system. *S.W. pipes*

3. STORM WATER DRAINAGE

It has been proposed to lay RCC NP3 and NP2 pipes with required number of manholes for disposal of storm water, which will be connected to the HSVP drain. The intensity of rain fall has been taken as 25mm per hour. A minimum size of 250mm i/d R.C.C. Np3 pipes for storm water drain will be provided and designed as per manning's formula. Necessary provision of rainwater harvesting arrangement has also been taken in this estimate.

4. ROADS

Road Parking and Pavement have been provided to above areas and estimates prepared as revised specifications adopted by HSVP.

5. STREET LIGHTING AND ELECTRIFICATION

Provision for external lighting and electrification of proposed area has been made.

6. HORTICULTURE

Estimate and details of plantation, landscaping, signage etc. have been included.

7. FIRE FIGHTING

Provision of Fire Fighting system has been made.

8. Provision for Electric Panel or ESS provision has also been made in this estimate

9. SPECIFICATIONS

The work will be carried out in accordance with the standard specifications of PH as laid down by the Haryana Government / HSVP.

10. RATES

The estimate has been used the present market rates

11. COST

The Total cost of scheme including cost of all services works out to Rs. 1034.37 Lacs (Rupees Ten Crores Thirty Four Lacs and Thirty Seven Thousand Only) including 3% contingencies and 49% departmental charges + Price escalation and cost per acre comes out to Rs. 83.29 Lacs.

1084.10

87.30 Lacs

FOR LION INFRADEVELOPERS LLP


AUTHORISED SIGNATORY

Fire water will be replenished from the domestic and raw water tanks.

III.

Garden Irrigation Requirement (For Total Area)	25.00 =15.67 KLD
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IV. Total Water Requirement for UGT

Raw Water Tanks	=2 x 100 KLD
Domestic Water Tanks	=2 x 75 KLD - 2x100 KLD
Flushing Water Tanks	= 1 x 125 KLD - 1x100 KLD

V. Tube Well

Tube Well	For UGT
a) Yield	= 15 K.L. / Hr.
b) Working Hour per day	= 16 Hr. / per day
c) Total water demand	340 = 484.6 M3 / day
d) Number of tube well required (water Demand / Discharge / Hr. working Per day)	2.01 Nos 1.42
Say	= 2 Nos

(Water to the proposed development is to be supplied by HSVP. However, consider 2.00 Nos TW's to install for proposed requirement of water for augmentation / standby purposes and provision has also been taken in the estimates due to non-availability of water but after getting the approval from the competent authority.

I. Pumping Machinery for Tube wells

a) Gross Working Head	= 80 Mtr
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b) Average fall in S.L	= 2 Mtr
c) Depression Head	= 6 Mtr
d) Friction loss in main	= 10 mtr
Total	= 98 Mtr
e) Discharge	= 15000 LPH (Or 4.17 LPS Say 4.50 LPS)
f) Horse Power	= 9.80 HP
HP = $(4.50 \times 98) / (75 \times 0.60)$	Say = 10.00 H.P.

It is proposed to provide ~~2~~ No pumping set of 4.50 LPS discharge at 98 Mtr head (2W)

II. Boosting Machinery for domestic water for UGT

338	
Total Water Requirement	= 314.7 KLD
Pumping per hour @ 8 hr. pumping / day	= 314.7/8 KL / hr.
	= 39.33 KL / hr.
	= 42.25 KL / hr.
	= 704.16 11.74 lpm
	= 655.25 lpm = 10.93 lps
	Say 2 No. 6.00 lps each
Gross working head	For UGT
Suction lift	= 5.00 mts.
Frictional loss in mains & Specials	= 10.00 mts.
Clear Head required	= 30.00 mts.
Total	= 45.00 mts
Say	= 45.00 mts
Pump HP	= $(6.00 \times 45) / (75 \times 0.60)$
	= 6.00 H.P.
	Say = 6.00 H.P.

It is proposed to provide 3 No of pumping set of 6.00 lps discharge at 45 mts Head each (2W + 1S) for UGT.

III. Boosting Machinery for flushing water at STP

Total Water Requirement	$\frac{167}{167}$ = 169.9 KLD
Pumping per hour @ 8 hr. pumping / day	$\frac{167}{8}$ = 169.9/8 KL / hr.
	20.88 = 21.23 KL / hr.
	5.80 = 5.9 lps
	Say 2 No. 6.00 lps each
Gross working head	
Suction lift	= 5.00 mts.
Frictional loss in mains & Specials	= 10.00 mts.
Clear Head required	= 30.00 mts.
Total	= 45.00 mts
Say	= 45.00 mts
Pump HP	$(6.00 \times 45) / (75 \times 0.60)$
	= 6.00 H.P.
	Say = 6.00 H.P.

It is proposed to provide 2 Nos of pumping set of 6.00 lps discharge at 45 mts Head each (1W + 1S).

IV. Boosting Machinery for Irrigation water

Total Water Requirement	25.00	= 15.00 KLD
Pumping per hour @ 5 hr. pumping / day	25/5	= 15/2 KLD / hr.
	5.00	= 7.50 KLD / hr.
	83.33	158 = 125.00 lpm = 2.08 lps
	2.00	Say = 2.20 lps each
Gross working head		
Suction lift		= 5.00 mts.
Frictional loss in mains & Specials		= 3.00 mts.
Clear Head required		= 15.00 mts.
Total		= 21.00 mts
Say ~		= 21.00 mts
Pump HP	2.00	= $(2.20 \times 21) / (75 \times 0.60)$
	0.73	= 1.03 H.P.
	2.00	Say = 1.05 H.P.

It is proposed to provide 2 No. of pumping set of 2.2 lps discharge at 21 mts Head each (1W+1S).

FLOW TO SEWAGE TREATMENT PLANT

~~505~~
Total Water Requirement = 314.7 KLD for domestic & 169.9 KLD for flushing

I. — 85% of total Domestic Water Demand = 85% of 314.7 KLD = 267.495 KLD

II. — 100% of total Flushing Water Demand = 100% of 169.9 KLD = 169.90 KLD

Total = 437.395 KLD Take up 80% + 8 STP = 404 KLD

Say 440 KLD Add 5% marginal factor = 20 KLD

Proposed STP Capacity = 440 KLD Or 0.44 MLD

464 KLD

FOR LION INFRADEVELOPERS LLP

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Proposed = 440 KLD
STP

FINAL ABSTRACT OF COST

SR. NO.	SUB WORK	DESCRIPTION	Amount (Rs. in Lacs)
1.	SUB WORK NO. I	WATER SUPPLY SCHEME	165.51
2.	SUB WORK NO. II	SEWERAGE SCHEME	148.97
3.	SUB WORK NO.III	STORM WATER DRAINAGE	99.86
4.	SUB WORK NO.IV	ROADS & FOOT PATHS	240.24
5.	SUB WORK NO.V	STREET LIGHTING	47.64
6.	SUB WORK NO. VI	HORTICULTURE (PLANTATION & ROAD SIDE TREES)	7.16
7.	SUB WORK NO. VII	MTC CHARGES INCL RESURFACING OF ROADS AFTER 1st 5 YEARS AND 2nd YEAR OF MTC AS/HUDA	324.99
		TOTAL	1034.37
TOTAL : (Rupees Ten Crores Thirty Four Lacs and Thirty Seven Thousand Only)/-			

1034-10 57-30
 Cost Per Acre = Rs. 1034.37 Lacs / 12.41875 = 83.29 Lacs Per Acre.

FOR LION INFRADEVELOPERS LLP

AUTHORISED SIGNATORY



Executive Engineer
HSVP Division No. VI
Gurugram



Superintending Engineer,
HSVP Circle-II, Gurugram

Director Town & Country
Planning Haryana
Chandigarh
Leela

Checked subject to comments
in forwarding letter No. 15182
Dt. 12/03/2021, and notes
attached with the estimate

Superintending Engineer (HQ)
For Chief Engineer 1 HSVP
Panchnkula

**SUB WORK No. 1
(Abstract of Cost)**

WATER SUPPLY SCHEME

SR. NO.	SUB WORK	DESCRIPTION	AMOUNT (Rs. In Lacs)
1	Sub Head No. 01	Head Works	41.12
2	Sub Head No. 02	Plumbing Machinery	11.00
3	Sub Head No. 03	Water Supply Distribution (Domestic, Flushing & Rising Main pipe)	52.61
4	Sub Head No. 04	Irrigation	3.12
		TOTAL	107.85
		Add 3% contingencies & PH Charges	3.2355
		TOTAL	111.08
		Add 49% Departmental charges + Price escalation	54.43
		G. TOTAL	165.51
		Say in Lacs	165.51

(C.O. to Final Abstract of Cost)

Say Rs- 195.55 Lacs

Sub Work No. 1**Sub Head No. 01**

Water Supply
Head Works

Sr. No.	Description	Amount in Rs.
1	Construction of U.G. Tanks including pipes, valve & Specials. 350-KLD @ Rs. 3000/- per KLD <i>500 4500</i>	10,50,000/- <i>2250,000/-</i>
2	Provision of Construction of Boosting Station 1 Nos @ Rs. 200000/- each <i>300000/-</i>	2,00,000/- <i>300000/-</i>
3	Boring and installing tube well with reverse rotary rig complete with pipe and strainer to a depth of about 120 Mtr complete in all respect . 1 Nos @ Rs. 1000000/- each	10,00,000/-
4	Provision of Construction of Tube well Chambers of Size 1.50m x 1.50m complete in all respect. 1 Nos @ Rs. 100000/- each. (Housing T.W)	1,00,000/-
5	Provision for Carriage of material & other unforeseen items L.S	50,000/-
6	Provision of rising main for tube well upto UGT L.S to by pass arrangement 100mm dia 170m @Rs.1250/-	2,12,500/- <i>212,500/-</i>
7	Provision for footpath, lawn, hedges at T.W boundary wall, boosting station (L.S)	5,00,000/-
8	Provision for staff office for maintenance Staff (L.S)	10,00,000/-
	Total	41,12,000/- <i>5412500</i>
	Say in Lacs	41.12 Lacs <i>54.13</i>

(C.O. to Abstract of cost of Sub Work No. I)

Sub Work No. 1

Sub Head No. 02

Water Supply
Pumping
Machinery

Sr. No.	Description	Amount in Rs.
1	Providing and installing transfer pumping set of following capacities for domestic water Supply with specials.	4,50,000/-
	6.00 lps at 45 mts head 3 No. (2W+1SB) - @ Rs. 150,000/- each Set (6 HP)	1,50,000/-
2	Providing and installing pumping set of following capacities for Flushing water supply. 150000	3,00,000/-
	6.00 lps at 45 mts head – 2 No. (1W + 1SB) @ Rs 1,00,000/- 1 Set (6 HP each)	1,00,000/-
3	Providing and installing Submersible pump for tube wells with specials. Complete in all respects ① 125000/-	125000/-
	4.50 lps at 98 mts head -2 No. (2W) @ Rs 2,00,000/- 1 Set (10 HP each)	2,00,000/-
4	Provision for making foundations & erection of pumping machinery.	1,50,000/- 1,00,000/-
5	Provision for pipes, valves & specials inside boosting chamber.	1,00,000/-
6	Provision for electric services connection including electric fittings for boosting chambers and pump chamber etc.	2,50,000/-
7	Provision for carriage of materials and other unforeseen items L.S.	1,50,000/- 1,00,000/-
	<u>Total</u>	11,00,000/-
	<u>Say in Lacs</u>	11.00 Lacs

(C.O. to Abstract of cost of Sub-Work No. 1)

⑧ Prov. & Installation of Pumping set for Irrigation 1,00,000/-
 220S at 21.0 m Head, 2 HP
 2 Nos (1W + 1S) @ Rs 50,000/- 1525000/-

Say Rs 15.25 Lakh. →

Sub-Work No. 1
Sub Head No. 03

Water Supply
Water Supply Distribution & Rising Main Pipe

Sr. No.	Description	Amount in Rs.
1	Providing, laying, jointing & testing pipe lines including cost of excavation etc complete in all respects.	1612000/-
i)	80mm dia D.I. Pipe 767-Mtr @ Rs. 1750/- per Mtr	13,42,250/-
ii)	100mm i/d D.I. Pipes - 787 Mtr @ Rs. 2250/- per Mtr	17,70,750/-
iii)	150mm i/d D.I. Pipes 520 Mtr @ Rs. 2750/- per Mtr	14,30,000/-
2	Providing and fixing sluice valve including cost of surface box and masonry chamber etc. complete in all respect.	130,000/-
a)	80mm i/d 18 No. @ Rs. 7500/- each	1,35,000/-
b)	100mm i/d 9 No. @ Rs. 10000/- each	90,000/-
c)	150mm i/d 1 No. @ Rs. 15000/- each	15,000/-
3	Providing and fixing indicating plates for sluice valve 28 No @ Rs. 1000/-	28,000/-
4	Provision for carriage of materials and other unforeseen items.	1,00,000/-
5	Provision for making connection with HUDA Pipe on master road	2,00,000/-
6	Provision for cutting the road and making good the same.	1,50,000/-
	Total	52,61,000/-
	Say in Lacs	52.61 Lac

(C.O. to Abstract of cost of Sub Work No. 1)

- ⑦ Prov. & fixing of fire hydriants with accessories 555000/-
 37 Nos @ Re 15000/-
- ⑧ D.G. Pump 2850 LPM, 45 M 9,00,000/-
 head, 48 HP, 60 KVA 5517000/-
 Say Re 55.17 Lakh.

Sub-Work No. 1**Sub Head No. 04**

Water Supply
Irrigation

Sr. No.	Description	Amount in Rs.
1	Providing, Laying, Jointing and testing UPVC Pipe lines suitable for 6 kg pressure including cost of fittings, valves, connection etc. complete in all respect. <i>3(m)</i>	<i>60,000/-</i>
a)	25mm dia - 200 M @ Rs. 500/- Per Mtr.	1,00,000/-
2	Providing and fixing 25mm dia irrigation hydrant valve complete in all respect. 25 Nos @ Rs. 3500/- each.	87,500/-
3	Provision for carriage of materials and other unforeseen items L.S.	1,00,000/-
4	Provision for indicating plate with safety box etc. complete in all respect. 25 Nos @ Rs. 1000/- each.	25,000/-
	Total	<i>272500/-</i>
	Say in Lacs	<i>3.12 Lac 2.73</i> <i>Lakhs</i>

(C/O To Abstract of Cost for Sub work No.1)

Sub-Work No. II

SEWERAGE SCHEME

Sr. No.	Description	Amount in Rs.
1	Sewer Pipes - Providing and laying non-pressure NP2-class (medium-duty) R.C.C. pipes conforming to IS-458 with collars jointed with stiff mixture cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc. complete. (all round and upto haunching shall be paid separately)	<i>Testing of S.W. pipe grade 'A'</i> 1250
a)	200 mm Diameter i/d 1700 M @ Rs. 1400/- per Mtr	2380000.00/- <i>1500</i>
b)	250 mm Diameter i/d 163 M @ Rs. 2000/- per Mtr	326000.00/- <i>244500</i>
c)	300 mm Diameter i/d 10 M @ Rs. 2600/- per Mtr	26000.00/- <i>22500</i>
2	Provision of lighting and watching etc (LS)	1,00,000/-
③	<i>Provision for carriage of Material & unforseen items</i>	2,00,000/-
④	Provision for construction of Sewerage Treatment Plant (STP) including the cost of tertiary treatment level with recycling storage tank and machinery with all arrangement etc. complete in all respect 440KLD or (0.44MLD) Capacity @ 16000/- Per KLD	68,75,000.00/- <i>70,40,000</i>
⑤	<i>Provision for making connection with existing/builtup Total sewer line.</i>	1,00,000/- <i>9707000.00/- 9332000</i>
	Add 3% contingency & P.H. Services	291210/- <i>274960</i>
	Total	9998210/- <i>10126960</i>
	Add 49% Department charges + Price Escalation	4899122.9/- <i>4962210</i>
	G. Total	14897332.9/- <i>15089170</i>
	Say in Lacs	148.97 Lacs
		<i>150.90</i>

(C/O to Final Abstract of Cost)

Sub-Work No. III

STORM WATER DRAINAGE SCHEME

Sr. No.	Description	Amount in Rs.
1	Storm Water Pipes - Providing and laying non pressure NPZ class (medium duty) R.C.C. pipes conforming to IS 458 with collars jointed with stiff mixture cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc. complete. (all round and upto haunching shall be paid separately)	<i>NPZ</i>
a)	150 mm Diameter i/d = 150 M @ Rs. 650/- per Mtr	97,500.00/-
b)	200 mm Diameter i/d = 1500 M @ Rs. 850/- per Mtr	12,75,000.00/-
c)	250 mm Diameter i/d = 298 M @ Rs. 1020/- per Mtr	3,03,960.00/-
d)	300 mm Diameter i/d = 424 M @ Rs. 1250/- per Mtr	5,30,000.00/- <i>180500/-</i>
e)	450 mm Diameter i/d = 286 M @ Rs. 1850/- per Mtr	5,29,100.00/- <i>757905/-</i>
f)	600 mm Diameter i/d = 189 M @ Rs. 3500/- per Mtr	6,61,500.00/- <i>850505/-</i>
2	Provision for Rain Water Harvesting arrangement including the cost of screening chamber and pit with all type of pipes and other material etc. complete in all respect as per standard drawing and bore upto requirement of site etc. 9 Nos RWH @ Rs. 1,50,000/- each.	<i>10 250,000/-</i> 13,50,000.00/-
3	Provision for road gulley & pipe with connection 300mm dia (L.S)	3,00,000.00/-
4	Provision for lighting and watching (L.S)	80,000.00/-
5	Provision for timbering and shoring (L.S)	80,000.00/-
6	Provision for cartage of material and other unforeseen item	1,00,000.00/-
7	Provision for making connection with HSV storm water drain (L.S)	1,00,000.00/-
8	Provision for temporary disposal arrangement	10,00,000.00/-
9	Provision for cutting of road and making road to its original condition	1,00,000.00/-
	Total	65,07,060.00/- <i>7673400</i>
	Add 3% contingency & P.H. Services	1,95,211.80/- <i>230202</i>
	Total	67,02,271.80/- <i>7903602</i>
	Add 49% Department charges + Price Escalation, unforeseen, addendum	32,84,113.18/- <i>3872765</i>
	G. Total	99,86,384.98/- <i>1176367</i>
	Say in Lacs	99.86 Lacs

(C/O to Final Abstract of Cost)

Sub Work No. IV

ROAD AND FOOTPATH

S. No.	Description	Unit	Qty.	Rate (In Rs.)	Amount (In Rs.)
1	Provision for leveling & earth filling as per site conditions	Per Acre	12.4187	150000	18,62,805.00
2	i) Providing and laying 100 mm thick PCC under pavement, cement concrete of specified grade 1:4:8 and 150 mm thick RMC grade M-40 ii) Providing and laying Bituminous road (200mm GSB, 250mm WMM, 50mm BM, DBM 25mm M45S) 25 mm BC .	Sqm	8787	1200	1,05,44,400.00
3	Provision for kerbs and channels of C.C. 1:2:4	Meter	1440.93	600	8,64,558.00
4	Provision for arrangement of guide map and indicating board etc.	LS			2,00,000.00
5	Provision for Traffic light control	LS			1,00,000.00
6	Provision for footpath with 100mm thick PCC under pavement cement concrete of specified grade 1:4:8 and 150mm thick RMC Grade M-40 or Bituminous road with 250 mm GSB, 300mm WMM, 50mm thick DBM & 40mm thick BC etc as per requirement of site for surface car parking & approach to Tower / Block etc.	Sqm	2161.39	600	12,96,834.00
7	Provision for carriage of material & other unforeseen commercial	LS			2,00,000.00
8	Provision for pavement in common area i.e. 50% of the area 1853.47 i.e. 1853.47/2 = 926.235 Sqm 1893.96 1893.96/2	Sqm	947 926	600	586200/- 5,85,600.00
	Sub Total			15654797	1,56,54,197.00
	Add 3% contingencies & PH services			469644	4,69,675.91
	Sub Total			16124441	1,61,23,822.91
	Add 49% Departmental Charges + Price Escalation			7900976	79,00,673.22
	Total			24025417/-	2,40,24,496.14
	Say Rs. in Lacs			2.40 26 Lacs	240.24

(C.O. to Final Abstract of cost)

Sub Work No. V

STREET LIGHTING

S. No.	Description	Unit	Qty.	Rate (In Rs.)	Amount (In Rs.)
1	Provision for Street Lighting at surrounding area as per standard specifications of HVPN etc. complete with CFL	Acre	12.4187	250000	31,04,675.00
	Add 3% contingencies & PH services				93,140.25
	Total				31,97,815.25
	Add 49% Departmental Charges + Price Escalation and unforeseen, addendum				15,66,929.47
	Total				47,64,744.72
	Say Rs. in Lacs				47.64

(C.O. to Final Abstract of cost)

47.65

Sub Work No. VI

HORTICULTURE

S. No.	Description	Unit	Qty.	Rate (In Rs.)	Amount (In Rs.)
1	Development of Lawn Areas				
a	Trenching of ordinary soil upto depth of 60cm i/c removal & stacking of serviceable material & disposing by spreading and levelling with in a lead of 50M and making up the trench area for proper levels by filling with earth or earth mixed with manure before and after flooding trench with water i/c cost of imported earth and manure with all fitting and valve etc. complete				
b	Rough dressing of turfed area				
c	Grassing with "Cynodon dactylon" i/c watering and maintenance of lawns for 30 days till the grass forms a thick lawn, free from weeds and fit for moving in row 7.5cm part in either direction				
d	Organized green 3830.63 Sqm or 0.94 acres (As per detail given in green park area calculation)	Acre	0.9466	150000	1,41,990.00
2	Providing and planting trees along boundary @12m interval (Length appx. x 1440M) = 1440/12 = 120 , 120 x 2 = 240 Say No. of trees = 250 NOS Cost details : Excavation = Rs. 60 Manure = Rs. 90 Tree Plant + Tree guarded = Rs. 1150 Total Rs. = Rs. 1300				
		Each	250	1300	3,25,000.00
		Total			4,66,990.00
	Add 3% contingencies & PH services				14,009.70
		Total			4,80,999.70
	Add 4% Departmental Charges + Price Escalation, unforeseen, addendum				2,35,689.85
		Total			7,16,689.55
	Say Rs. In Lacs				7.17

(C.O. to Final Abstract of cost)

Sub Work No. VII**Mtc. of services and Resurfacing of Roads**

S. No.	Description	Unit	Qty.	Rate (In Rs.)	Amount (In Rs.)
1	Mtc of water supply, sewer, storm water drain, roads, street light, hort, etc. for period of 10 years including operation charges full establishment etc. complete in all respects @ Rs. 7.5 lacs per acre	Acre	12.4187	7,50,000.00	93,14,025.00
2	Provision for resurfacing of roads after 5 years of 1st phase with provision of 50mm thick BM including leveling coarse and 25mm BC as per crust design whichever is safer	Sqm	8787	600	52,72,200.00
3	2nd phase after next five years of 1st phase (50mm DBM & 25mm BC or as per crust design whichever is safer)	Sqm	8787	750	65,90,250.00
	Sub Total				2,11,76,475.00
	Add 3% contingencies & PH services				6,35,294.25
	Sub Total				2,18,11,769.25
	Add 49% Departmental Charges + Price Escalation and unforeseen, addendum				1,06,87,766.93
	Total				3,24,99,536.18
	Say Rs. in Lacs				324.99

(C.O. to Final Abstract of cost)

325.00 Lakh

SUMMARY OF DESIGN REQUIREMENT

Sr. No.	Description	Qty	Unit
1	Total Population	3961 4160-	Persons
2	Total Water Requirement (Domestic)	338 314.7-	KLD
3	Total Water Requirement (Flushing)	167 154.23-	KLD
4	Total Water Requirement (Horticulture)	25.0 15.67-	KLD
5	U. G. Tank (Domestic)	2	No.
6	U. G. Tank (Raw)	2	No.
7	No. of Domestic WS pumps UGT	2+1	Set
8	No. Flushing pumps	1+1	No.
9	No. of submersible pumps	2	No.
10	STP (440 KLD)	1	No.

Material Summary : Water Supply (Domestic & Flushing) and Rising Main

Sr. No.	Pipe Size (in mm)	Qty (in Mtr)		
		Water Supply (Domestic)	Water Supply (Flushing)	Rising Main
1	20		1200	
2	25	1200		
3	50		423	
4	65	423	43	
5	80	43	680	
6	100	680		
7	150			520

Grand Total

	Domestic	Flushing	Total
80mm	466	1146	= 1612 Mtr
100 mm	680	—	= 680 Mtr
150mm	520	—	= 520 Mtr

Material Summary (Water Supply : Domestic)

S. No.	Node		Pipe Size / Length		
	From	To	65 mm	80 mm	100 mm
1	1	2	115	115	
2	3	4		43	
3	4	5		—	115
4	4	6		—	101
5	7	8		—	115
6	9	10	157	157	
7	11	12	33	33	
8	13	14		—	20
9	15	16		—	174
10	17	18		—	155
11	19	20	30	30	
12	21	22	88	88	
Total Quantity		423	43	680	

466

Branch Pipe for Domestic (25mm) = 1200 Mtr

80mm = 466 Mtr

100mm = 680 Mtr

Material Summary (Water Supply : Flushing)

S. No.	Node		Pipe Size / Length		
	From	To	50 mm	65 mm	80 mm
1	1	2	115-		115
2	3	4		43-	43
3	4	5			115
4	4	6			101
5	7	8			115
6	9	10	157-		157
7	11	12	33-		33
8	13	14			20
9	15	16			174
10	17	18			355
11	19	20	30-		30
12	21	22	88-		88
Total Quantity			423-	43-	680-

Branch Pipe for Flushing (20mm) = 1200 Mtr

1146 MTR

Rising Main

S. No.	Name of Line		Size mm	Length (in Mtr)	
	From	To		100	150
1	TW	UGT	150		170
2	Government Line	UGT	150		350
Total				0	520

MATERIAL STATEMENT OF SEWERAGE SCHEME

Node no (Sewer)	Length in mtr.	Design
		Pipe size (R.C.C NP2 PIPE) SW Pipe
1	0	200
1-2	97	200
3	0	200
3-2	24	200
2-8	84	200
7	0	200
7-8	101	200
9	0	200
9-8	60	200
8-6	88	250
4	0	200
4-5	78	200
5-6	38	200
6-12	24	250
16	0	200
16-17	58	200
15	0	200
15-17	29	200
17-14	62	200
13	0	200
13-14	129	200
14-11	53	200
10	0	200
10-11	103	200
11-12	51	250
12-STP	10	300
	1029 Mtr	

200 mm i/d Pipe Length	= 916 Mtr + 784 = 1700 Mtr
250 mm i/d Pipe Length	= 163 Mtr
300 mm i/d Pipe Length	= 10 Mtr

MATERIAL STATEMENT OF STORM WATER DRAINAGE SCHEME

Node no (Storm Water)	Length in mtr.	Design
		Pipe size (R.C.C. NP2)
1-2	88	250- 400
3-2	16	250- 400
2-4	84	300- 400
5-5A	31	300- 400
6-5A	21	300- 400
5A-4	43	300- 400
4-7	82	450
8-7	29	250- 400
7-9	89	450
10-12	130	300- 400
11-12	93	250- 400
12-09	74	450
09-13	41	450
14-13	115	300- 400
13-16	21	600
15-16	36	250- 400
16-18	40	600
17-18	36	250- 400
18-19	128	600
		1192

250 mm i/d Pipe Length

300 mm i/d Pipe Length

450 mm i/d Pipe Length

600 mm i/d Pipe Length

= 298 Mtr

= 424 Mtr 722 mtrs

= 286 Mtr

= 189 Mtr

Material statement of Road work

SR. NO.	ROAD NO.	ROAD WIDTH	LENGTH	WIDTH	AREA	
1	1	9	82.377	6	494.262	Sqm.
2	2	9	94.94	6	569.64	Sqm.
3	3	9	174.122	6	1044.732	Sqm.
4	4	9	34.233	6	205.398	Sqm.
5	5	9	154.934	6	929.604	Sqm.
6	6	9	114.968	6	689.808	Sqm.
7	7	9	148.968	6	893.808	Sqm.
8	8	9	86.696	6	520.176	Sqm.
9	9	9	61.736	6	370.416	Sqm.
10	10	9	33.944	6	203.664	Sqm.
11	11	9	86.699	6	520.194	Sqm.
12	12	9	120.7	6	724.2	Sqm.
13	13	12	44	6	264	Sqm.
14	14	24	67	2x7	938	Sqm.
G. TOTAL					8367.902	Sqm.
Add 5% extra for curves					418.3951	Sqm.
Total					8786.2971	Sqm.
				say	8787	Sqm.

1 Kerbs and channels

(i)	9 mtr. wide road	(1 x 1194.317)	1194.317 mtr
(ii)	12 mtr. wide road	(1 x 44)	44 mtr
(iii)	24 mtr. wide road	(2 x 67)	134 mtr
		Total	1372.317 mtr
		Add 5% extra for curves	68.62 mtr
		G. TOTAL	1440.93 mtr

2 Foothpath

(i)	9M & 12M wide road	1238.317 x 1.5	1857.4755 mtr
(ii)	24 mtr. wide road	67 x 2 x 1.5	201 mtr
		Total	2058.4755 mtr
		Add 5% extra for curves	102.923775 mtr
		G. TOTAL	2161.399275 mtr



PRIFACTOR

ENGINEERS

Innovate Implement

RAINFALL HARVESTING AND REUSE POTENTIAL

RAINFALL HARVESTING CALCULATION

S.NO.	DESCRIPTION	AREA (SQ. MTR.)	RUNOFF COEFFICIENT	AVERAGE ANNUAL RAINFALL (MM)	TOTAL VOLUME AVAILABLE FROM RAINFALL (CUM/YEAR)	DESIGN HOURLY INTENSITY OF RAINFALL (MM/HR.)	RAINFALL HARVESTING POTENTIAL (CUM/HR.)
1	ROOF TOP WATER	28704	0.85	389	9498.30	25.0	610.71
2	PAVED SURFACES, ROADS AND OTHER BUILT UP AREAS	10746	0.6	389	2510.06	25.0	161.39
3	LAWNS, GARDEN AND OTHER GREEN SPACES	2343	0.35	389	319.24	25.0	20.53
	TOTAL	41793			12327.60		792.63
	DETENTION TIME PLANNED (MIN)					20.00	
	TOTAL VOLUME OF HARVESTING PIT REQUIRED (CUM)					264.21	
	SURFACE AREA REQUIRED (CONSIDERING WATER DEPTH OF 3 MTR.) IN SQ. MTR.					88.07	
	NO. OF PIT PLANNED					9.00	
	SURFACE AREA FOR EACH PIT					9.79	
	DIAETER OF CIRCULAR CONVENTIONAL PIT					3.53	
	MODULAR HARVESTING PIT			LENGTH (M)		2.55	
				WIDTH (M)		3.83	



WATER REQUIREMENT CHART

WATER REQUIREMENT CHART											
Sr. No.	DESCRIPTION	AREAL/NETWORK		WATER REQUIREMENT		WATER REQUIREMENT		FLOW TO SEWER		GROSS FLOW TO SEWER	
		NO.	SQ. MTR.	DOMESTIC	FRESH WATER	RE-CYCLED TREATED	DOMESTIC	FRESH WATER	RE-CYCLED TREATED		
1	APARTMENTS	812	PARALLEL'S OF 5 PERSON EACH	4160	45	15	187200	251200	180%	50%	
2	Maintenance STAFF	10	ASSUMED	20	20	0	200	200	100%	100%	
3	FLITERATION BACKWASH	5% OF THE TOTAL DEMAND		JANUARY TO APRIL - 5 LIT/SEC. MTR.		MAY - JUNE - 6 LIT/SEC. MTR.		AUG - SEPTEMBER - 2 LIT/SEC. MTR.		MUNICIPAL CONNECTION	
4	EXTERNAL IRRIGATION - 40000	MAY - JUNE - 6 LIT/SEC. MTR.		JULY - SEPTEMBER - 2 LIT/SEC. MTR.		OCTOBER - DECEMBER - 3 LIT/SEC.		APRIL - MAY - 15667		BOREWELL FLOW RATE ETC.	
	LANDSCAPE CONSULTANT)	MTR		TOTAL		212437		305570		282240	
	TOTAL CONSUMPTIONS REDUCTION IN DEMAND @ 20% BY USING LOW FLOW FIXTURES	168649		244776		157416		49920		11468	
	TOTAL RECYCLED TREATED WATER DEMAND	101.3		UNDERGROUND STORAGE CAPACITY		17514		35936		520418	
	TOTAL FRESH WATER DEMAND	114.7		RAW WATER TANK (40% OF 1 DAY REQ.)		189		9174		443355	
	FLOW TO SEWER/SEWAGE TREATMENT PLANT	442.4		TREATED FRESH WATER TANK (45% OF 1 DAY REQ.)		126		109.01		MUNICIPAL CONNECTION	
		LIT/HOUR		LIT/HOUR		LIT/HOUR		LIT/HOUR		28.34	
		CBM/HOUR		CBM/HOUR		CBM/HOUR		CBM/HOUR		CBM/HOUR	



DOMESTIC WATER TREATMENT STATION

GROSS DOMESTIC WATER REQUIREMENT		315	30.0
Sr. No.	Description	Value	Unit
A	Filter Feed Pump		
1	Capacity Calculation		
1.1	Operational Hours	34	Hrs.
1.2	Flow Rate	22.5	m ³ /hr
		374.2	Lit./min.
1.3	Safety Factor @ 10%	6.2	Lit./sec.
1.4	Calculated Flow Rate	0.6	Lit./sec.
1.5	Selected Flow Rate (1W+1S)	6.9	Lit./sec.
2	Head Loss Calculation		
2.1	Length of Horizontal Pipes	10.0	mtr.
2.2	Static Head	1.5	mtr.
2.3	Total Length of pipes	11.5	mtr.
2.4	Residual head required	15	mtr.
2.5	Discharge through pipe	0.0070	cum/sec
2.6	Diameter of pipe	77.1	mm
2.7	No. of Bends and fittings in pipe	5	No.
2.8	Coefficient of roughness	1.0	
2.9	Resistance Coefficient of valves and fitting	6.0	
2.10	Gravitational acceleration	9.8	m/sec ²
2.11	Velocity of flow	1.5	m/sec
2.12	Major Head Loss (Modified Hazen williams)	0.3	mtr.
2.13	Minor Head Loss	0.7	mtr.
2.14	Total Head Loss	1.0	mtr.
2.15	Head of Pump Required	17.5	mtr.
2.16	Adding 10% Safety Factor	1.8	mtr.
2.17	Head of Pump	19.3	mtr.
2.18	Head of Pump Selected	25.0	mtr.
B	Domestic Water Transfer Pump		
1	Capacity Calculation		
1.1	Operational Hours	6	Hrs.
1.2	Flow Rate	52.5	m ³ /hr
		874.2	Lit./min.
1.3	Safety Factor @ 10%	1.5	Lit./sec.
1.4	Calculated Flow Rate	16.0	Lit./sec.
1.5	Selected Flow Rate (2W+1S)	8.0	Lit./sec.
2	Head Loss Calculation		
2.1	Length of Horizontal Pipes	1000.0	mtr.
2.2	Static Head	25.0	mtr.
2.3	Total Length of pipes	1025.0	mtr.
2.4	Residual head required	10	mtr.
2.5	Discharge through pipe	0.0080	cum/sec
2.6	Diameter of pipe	82.4	mm
2.7	No. of Bends and fittings in pipe	15	No.
2.8	Coefficient of roughness	1.0	
2.9	Resistance Coefficient of valves and fitting	6.0	
2.10	Gravitational acceleration	9.8	m/sec ²
2.11	Velocity of flow	1.5	m/sec
2.12	Major Head Loss (Modified Hazen williams)	27.0	mtr.
2.13	Minor Head Loss	0.7	mtr.
2.14	Total Head Loss	27.7	mtr.
2.15	Head of Pump Required	62.7	mtr.
2.16	Adding 10% Safety Factor	6.3	mtr.
2.17	Head of Pump	69.0	mtr.
2.18	Head of Pump Selected	70.0	mtr.
E	Multigrade Filter		
1.1	Flow of Filtration system	25.2	m ³ /hr
1.2	Total no. of filters	2	No.
1.3	Design flow of each filter	12.6	m ³ /hr.
1.4	Filtration Rate	14	m ³ /m ² /hr.
1.5	Therefore surface area required	0.90	m ²



DOMESTIC WATER TREATMENT STATION

GROSS DOMESTIC WATER REQUIREMENT		315	KLD
Sr. No.	Description	Value	Unit
1.6	Diameter of filter	1070	mm
1.7	Diameter of filter selected	1000	mm
F	Activated Carbon Filter		
1.1	Flow of Filtration system	25.2	m ³ /hr
1.2	Total no. of filters	2	No.
1.3	Design flow of each filter	12.6	m ³ /hr.
1.4	Filtration Rate	14	m ³ /m ² /hr.
1.5	Therefore surface area required	0.90	m ²
1.6	Diameter of filter	1070	mm
1.7	Diameter of filter selected	1000	mm

MANNING'S CALCULATION - SEWER

Node no	Length in mtr.	Sewt(LPM)	Self infiltration @ 10%	Peak Discharge(LPS)		Manning's constant	Slope 1 in	Pipe size	Velocity in m/s	Discharge in lps/full flow	Fall in metre		Design		Level at end
				Total	Add.						G.L.	T.L.	G.L.	T.L.	
1	0	31.3	0.19	0.02	0.00	0.21	0.01	150	150	0.91	16.17	8.03	0.00	0.90	0.90
1-2	97	135.6	2.26	0.23	0.21	2.69	0.01	150	150	0.91	16.17	8.03	0.65	0.90	0.90
3	0	5.65	0.09	0.01	0.00	0.20	0.01	150	150	0.91	16.17	8.03	0.00	0.90	1.55
3-2	24	5.65	0.09	0.01	0.10	0.21	0.01	150	150	0.91	16.17	8.03	0.00	0.90	0.90
1-8	84	50.85	0.08	2.90	3.83	0.01	150	150	0.91	16.17	8.03	0.16	0.90	0.90	1.06
7	0	11.3	0.19	0.02	0.00	0.21	0.01	150	150	0.91	16.17	8.03	0.56	0.90	1.11
7-8	101	79.1	1.32	0.13	0.21	1.66	0.01	150	150	0.91	16.17	8.03	0.00	0.90	0.90
9	0	11.3	0.19	0.02	0.00	0.21	0.01	150	150	0.91	16.17	8.03	0.67	0.90	0.90
9-8	60	79.1	1.32	0.13	0.21	1.66	0.01	150	150	0.91	16.17	8.03	0.00	0.90	1.57
8-6	83	107.35	1.79	0.18	7.15	9.12	0.01	225	250	1.05	51.56	25.78	0.39	0.90	0.90
4	0	22.6	0.38	0.04	0.00	0.41	0.01	150	150	0.91	16.17	8.03	0.00	0.90	2.50
4-5	78	113	1.88	0.19	0.41	2.49	0.01	150	150	0.91	16.17	8.03	0.00	0.90	0.90
5-6	38	28.25	0.47	0.05	2.49	3.00	0.01	150	150	0.91	16.17	8.03	0.52	0.90	0.90
5-12	24	28.25	0.47	0.05	12.12	12.64	0.01	225	250	1.05	51.56	25.78	0.25	0.90	1.42
16	0	5.65	0.09	0.01	0.00	0.30	0.01	150	150	0.91	16.17	8.03	0.00	0.90	1.67
16-17	50	45.2	0.75	0.08	0.10	0.93	0.01	150	150	0.91	16.17	8.03	0.00	0.90	0.90
15	0	11.3	0.19	0.03	0.00	0.21	0.01	150	150	0.91	16.17	8.03	0.39	0.90	1.29
15-17	29	33.3	0.57	0.06	0.21	0.83	0.01	150	150	0.91	16.17	8.03	0.00	0.90	0.90
17-14	62	62.15	1.04	0.10	1.76	2.99	0.01	150	150	0.91	16.17	8.03	0.15	0.90	1.09
13	0	22.6	0.38	0.04	0.00	0.41	0.01	150	150	0.91	16.17	8.03	0.41	0.90	1.70
13-14	129	158.2	2.64	0.25	0.41	3.31	0.01	150	150	0.91	16.17	8.03	0.00	0.90	0.90
14-11	53	33.9	0.57	0.06	6.22	6.84	0.01	150	150	0.91	16.17	8.03	0.86	0.90	0.90
10	0	11.3	0.19	0.02	0.00	0.21	0.01	150	150	0.91	16.17	8.03	0.35	0.90	1.76
10-11	103	73.45	1.22	0.12	0.21	1.59	0.01	150	150	0.91	16.17	8.03	0.00	0.90	2.11
11-12	51	28.25	0.47	0.05	8.39	8.91	0.01	225	250	1.05	51.56	25.78	0.23	0.90	1.59
12-STP	30	0	0.00	0.00	21.03	21.03	0.01	275	300	1.07	75.83	37.92	0.24	0.90	2.34
														2.60	2.60



MANNING'S CALIBRATION - STUDY WATER INDEX

MANNING'S CALCULATION - STORM WATER PIPES										
Node no.	Length in mtr.	Catchment Area (Nectare)		Discharge in LPS	Manning's constant	Design		Fall in metre	Level at end	
		Area (sq.mtr.)	Self Add.			Total	Slope 1 in		G.L.	I.L.
1-2	88	4115	0.41	0.00	0.41	51.44	0.03	225	1.05	51.56
3-2	16	650	0.07	0.00	0.07	8.13	0.03	225	1.05	51.56
2-4	84	1924	0.19	0.24	0.43	53.83	0.03	250	300	1.12
5-5A	31	1546	0.15	0.00	0.15	19.33	0.01	250	300	1.12
6-5A	21	723	0.07	0.00	0.07	9.04	0.01	250	300	1.12
5A-4	43	797	0.08	0.23	0.31	38.33	0.01	250	300	1.12
4-7	82	3022	0.30	0.44	0.74	93.07	0.01	400	450	1.17
8-7	29	773	0.08	0.00	0.08	9.66	0.01	225	250	1.05
7-9	85	2379	0.24	0.52	0.76	95.24	0.01	400	450	1.17
10-12	130	4895	0.49	0.00	0.49	61.19	0.01	275	300	1.07
11-12	93	2987	0.30	0.00	0.30	37.34	0.01	225	250	1.05
12-09	74	1892	0.19	0.59	0.78	97.70	0.01	400	450	1.17
09-13	41	535	0.09	1.08	1.18	146.99	0.01	400	450	1.17
14-13	115	4665	0.47	0.00	0.47	58.51	0.01	275	300	1.07
13-16	21	684	0.07	1.55	1.62	202.19	0.01	500	600	1.25
15-16	36	638	0.03	0.00	0.08	10.48	0.01	225	250	1.05
16-18	40	1045	0.10	1.70	1.81	225.73	0.01	500	600	1.25
17-18	36	1553	0.16	0.00	0.16	19.41	0.01	225	250	1.05
18-19	128	2188	0.22	1.96	2.18	272.49	0.01	500	600	1.25
								357.10	357.10	0.26

