GMDA

GURUGRAM METROPOLITAN DEVELOPMENT AUTHORITY

From

Chief Engineer,
Infra-II, GMDA, Gurugram

To

Director General,
Town and Country Planning Department,
Haryana, Chandigarh,

Subject: **Approval of service plan estimate of affordable residential plotted colony under DDJAY on land measuring 19.70 acres bearing license No. 13 of 2022 dated 24.02.2022 for 12.20 acres and license No. 152 of 2022 dated 29.09.2022 for 7.50 acres falling in the revenue estate of village Harsaru, Sector-88B, Gurugram being developed by M/s Vatika Limited.**

Ref: Please refer to your good office drawing no.29597 dated 29.09.2022 vide which the layout plans of Affordable Residential Plotted Colony (DDJAY-2016) had been approved. Accordingly, the firm M/s Vatika Limited submitted the service plan estimate to the Executive Engineer (Proj.), Infra-II, GMDA, Gurugram pertaining to Affordable Plotted Colony (DDJAY-2016) measuring 19.70 acres (Licence No. 13 of 2022 and 152 of 2022) in village Harsaru, Sector-88B, Gurugram. The service plan estimate has been scrutinized in this office and comments are as under:

1. **EXTERNAL DEVELOPMENT CHARGES:**

The colonizer will have to pay the proportionate cost of external development charges for setting up of Affordable Residential Plotted Colony (DDJAY-2016) for the services like water supply, sewerage, storm water drainage, roads, bridges, community building, street lighting and horticulture and Mtc. thereof etc. on gross acreage basis as and when determined by TCP/ GMDA/ Govt. for Gurugram. These charges will be modifiable as and when approved by the authority/ State Govt. and will be binding upon the colonizer.

2. **MAINTENANCE OF SERVICES:**

The Mtc. charges for various services like water supply, sewerage, storm water drainage, roads, street lighting and Hort., etc has been included by the firm in the Sub Work No. VII and the total cost works out to be Rs.388.27 Lakh. It may be made clear to the colonizer that they are liable to maintain the estate developed by

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them for 10 years or as per TCP/ GMDA norms till such time, the colony is taken over by the local authority/State Govt.

3. **DENSITY/ AREA/ POPULATION:**

The overall density of the Affordable Residential Plotted Colony (DDJAY-2016) works out to 5472 persons considering PPA – 18 persons per plot. The category wise area as shown on the plans and proposed density of population thereof has been treated to be correct for the purposes of services only. This may be checked and confirmed by your office that overall density of sector should be maintained accordingly to the final development plan.

4. The titled and name of the license may be examined by your office.

5. All technical notes and comments incorporated in this estimate in two sheets will also apply. A copy of these are also appended as Annexure - 'A'.

6. The colonizer will have to ensure that sewer/ storm water laid by them 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 the responsibility of the colonizer to make the pumping arrangement and maintenance thereof for all the times to come.

7. It is made clear to the colonizer that release of water for external source will take about five years for the new licensed area subject to the following:

   i) Availability of litigation free land in the alignment of services.

   ii) Permission from forest and environment department area accorded, where ever required.

   iii) GMDA shall supply the drinking water only to the license granted in the master plan area.

   iv) GMDA shall provide water supply along master road at the initial stage and various colonizer will have to take connection from this water supply main up to their site at their own expenses, till the land of master road encircling the licensed area is acquired and the area in between licensed area & master road is further acquired by GMDA or licensee.

   v) Till the water supply and other services area made available by GMDA, the licenses will have to make their own arrangement from GMDA WTPs or ground water source with the permission from Central Ground Board and other concerned authority designated by Govt., for the purpose.

8. It may be clarified to the colonizer that recycled water is proposed to be utilized for flushing purposes. The firm has to make provision of separate flushing line, storage tank, metering system, pumping system, plumbing etc. It may be clarified

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to developer 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 separates distribution systems, independent of each other, will be adopted, one for potable water supply and second for recycled water, Home/ Office/ business establishment will have access to two water pipe lines.

ii) Portable 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 feet, if no possible then readily identifiable sleeve should be used. The recycled pipeline shall be painted with red paint.

To avoid any accidental use of recycled water for potable purpose:

a) All recycle water pipes, fitting, Appurtenances, valves, taps, meters hydrants will be of Red color or painted red.

b) Sign and symbol signifying and clearly indicating "Recycle Water" "Not fit for Drinking" must invariably be stamped /fixed on outlet, hydrants Valves both surface and subsurface, Covers and at all conspicuous places of recycle distribution system.

c) Detectable marker taps of red color bearing words "Recycle Water" should be fixed at suitable interval on pipes.

d) Octagonal covers, red in color or pointed Red and words "Recycle Water Not for Drinking "embossed on them should be used for recycled water.

9. It shall be mandatory for the firm to provide dual/ two button or level flushing system in toilets.

10. It may be made clear to the colonizer that he will not make the connection with the master services without prior approval of the competent authority, in writing.

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11. The layout plan for setting up of Affordable Residential Plotted Colony (DDJAY-2016) having an area 19.70 acres supplied by your office vide drawing no 29597 dated 29.09.2022, have been considered to be correct for the purposes of estimation/ services only.

12. For disposal of sewage of the colony, the colonizer has proposed initial Sewage Treatment Plant in their colony. It may be made clear to the colonizer that he will be sole responsible for disposal of their colony as per requirements of HSPCB/ Environment Deptt. till such time GMDA services are made available as per proposal of the Town. All the link connection with the GMDA services shall be made by the colonizer at his own cost.

13. That colonizer shall ensure the installation of Solar Power Plants as per provision of Haryana Solar Power Policy 2016 issued by Haryana Govt. Renewable Energy Department vide notification No. 19/4/2016-5 power 14.03.2016, if applicable.

14. The estimate does not include the provision of electrification of the colony. However, it may be made clear to the colonizer that the supervision charges O&M charges shall be paid by them directly to the HVPNL/ DHBVNL Deptt.

15. It may be made clear to the colonizer that there will be no pollution due to disposal of sewerage of their colony. The disposal of effluent should be in accordance to the standard norms, fixed by the Haryana State Pollution Control Board/ Environment Deptt. time to time.

16. The colonizer will be responsible for the construction of various structures such as RCC, UGT and OHSR; water/ sewage treatment plant etc. according to CPHEEO Manual, standard specifications, good quality workmanship and water tightness of all the structures will be responsible of the colonizer.

17. The colonizer shall install Online Analyzer/ Monitoring System to monitor the operational effluent Parameters at Sewerage Treatment Plant and integrated with GMDA Integrated Command & Control Centre (ICCC) for sharing/ sinking the Real time data.

18. The portion of the sector/ development plan roads/ greens belt as provided in the development plan which is part of the licensed area shall be transferred free of cost to the Govt./ GMDA.

19. In case of 24 Mtrs. Wide road if it is decided by the Govt. that master services be extended on 24 Mtr wide internal circulation road, additional amount at rates as decided by the authority will be recoverable over and above the EDC.

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20. The correctness of the levels of the colony will be the sole responsibility of the colonizer for integrating the internal sewer/ storm water drainage of the colony by gravity with the master services to be provided by the GMDA as per the proposal.

21. In case some additional structures area required to be constructed, as decided by TCP/ GMDA at a later stage, the same will be binding upon the colonizer. Flow control valves will be installed, preferably of automatic type on water supply connection with GMDA water supply line and the Electro Magnetic flow meter with the provision of synchronization with GMDA Integrated Command & Control Centre (ICCC) for sharing/ sinking the Real time data.

22. The Treated water shall be used for non-potable purposes such as flushing, green areas, parks etc as per the plan in line with Govt. of Haryana Policy for Reuse of Treated Waste Water Policy-2019.

23. That the colonizer/ owner shall use only compact fluorescent lamps fitting for internal lighting as well campus lighting.

24. Level/ extent of the external services to be provided by GMDA will be in accordance with the EDC deposited.

25. **COMMON SERVICES:**

The estimate does not include the common services like water supply, storage tank on top of the building block like the plumbing works etc. and will be part of building works.

Note (1):

In order to implement the directions given by National Green Tribunal in O.A. No.21 of 2014 and No. 95 of 2014 (In the matter of Vardhaman Kaushik V/s Union of Indian and Ors), instructions have been issued vide HSVP's office letter No.2121-37 dated 23.02.2015, 2609-19 dated 05.03.2015, 4412-21 dated 22.04.2015, 4971-89 dated 30.04.30.04.2017, 5442-5457 dated 11.05.2015, 15622-43 dated 10.12.2015, 1-16 dated 01.01.2016 and No. 114152-154/114160-114196 dated 21.01.2016. The same may be incorporated in the estimate and the developer must ensure implementation of these instrumentations at site.

The estimated cost of various services to be provided by the firm for the development of internal services has been checked and corrected for purpose of bank guarantee and execution of works out as under:

Sr. No.	Description	Amount (Rs. in Lakh)

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1.	Water Supply	180.13
2.	Sewerage	328.25
3.	Storm Water Drainage	139.83
4.	Roads	186.06
5.	Street Lighting	49.25
6.	Horticulture	9.66
7	Maintenance Of Services For Ten Years Including Resurfacing Of Road After 1st Five Years And 2nd Five Years Of Maintenance (As Per GMDA norms)	252.99
	Sub Total	1146.18
	Add 3% contingency charges	34.38
	Sub Total	1180.56
	Add 49% charges on account Maintenance, supervision charges, departmental charges, Admin charges, unforeseen	578.47
	Total	**1759.03 Lakh**

Development Cost per acre = Rs. 1759.03 Lakh/ 19.70 acres = Rs. 89.29 Lakh per gross acre.

Two copies of the estimate along with Fours Plans and proposal as received are sent herewith duly corrected and signed for taking further necessary action.

It is requested to get three copies of the service plan estimate from the colonizer for distribution amongst the field stations.

DA/- Estimate in duplicate
alongwith four plans
& Annexure-A.

Signed by Rajesh Bansal
Date: 09-11-2022 18:42:29
Reason: Approved

Chief Engineer (Infra-II),
GMDA, Gurugram

CC to

1. Chief Executive Officer, GMDA
2. Executive Engineer- W/s (Proj.)/ Sewerage/ Drainage/Road, GMDA
3. Nodal Officer for the purpose.

This communication is computer generated and does not contain any signature in pen. This is signed with the digital signature obtained from a certifying authority under the Information Technology Act, 2000. For any queries, please quote the letter Number and e-mail at the mail address provided above.

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Annexure 'A'

Subject: **Approval of service plan estimate of affordable residential plotted colony under DDJAY on land measuring 19.70 acres bearing license No. 13 of 2022 dated 24.02.2022 for 12.20 acres and license No. 152 of 2022 dated 29.09.2022 for 7.50 acres falling in the revenue estate of village Harsaru, Sector-88B, Gurugram being developed by M/s Vatika Limited.**

1. All detailed working drawings would have to be prepared by the colonizer for integrating the internal service proposals with the master proposals of town.
2. The correctness of the levels will be the sole, responsibility of the colonizer for the integration of internal proposals, with the master proposals, of town and will be got confirmed before execution.
3. The material to be used shall be of the same specifications as are being adopted by GMDA and further, it shall also conform to such directions, as issued by Chief Engineer, Infra-II, GMDA from time to time.
4. The work shall be carried out according to Haryana PWD specifications or such specifications as are being followed by GMDA. Further, it shall also conform to such other directions as issued by Chief Engineer, Infra-II, GMDA from time to time.
5. The colonizer will be fully responsible to meet the demand of water supply and allied services till such time these are made available by State Government/ GMDA. All link connections with the State Government/ GMDA system and services will be done by the colonizer. If necessary extra tube-wells shall so be installed to meet extra demand of water beyond the provision accordingly to EDC deposited after due approval from the competent authority designated by Govt. from installation of tube-well.
6. Structural design & drawing of all the structures, such as pump chamber, boosting chamber, RCC OHSR, underground tanks, quarters, manholes, chamber, sections of RCC pipes sewer and SW pipes, sewer, ventilating shafts for sewerage and Masonry Ventilation Chamber for Chamber for storm water drainage, temporary disposal/ arrangement etc. will be as per relevant I.S. codes and PWD specifications, colonizer himself will be fully responsible for structural audit of all structures from a reputed organization.
7. Potability of water will be checked and confirmed by the builder and the tube-wells will be put into operation after getting chemical analysis of water tested from reputed laboratory whether it is fit for human consumption.
8. Only DI pipes will be used in water supply & flushing system and UPVC/HDPE pipe for irrigation purposes.
9. A minimum 100 mm i/d DI, 200mm i/d UPVC/SW pipe and 400mm id RCC NP-3 pipe will be used for water supply, sewerage and storm water drainage respectively.

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10. Standard X-section for laying of sewerlines will be followed as are being adopted in Haryana Public Health Engineering Deptt. or GMDA.
11. The X-section, width of roads, will be followed as approved by the Chief Town Planner, Haryana, Chandigarh. The kerbs and channels will also be provided as per approved X-section and specifications.
12. The specifications for various roads will be followed as per IRC/MORTH specifications.
13. The wiring system of street light and specifications of street lighting fixture will be as per relevant standards/ codes.
14. This shall conform to such other conditions as re-incorporated in the approved estimate and the letter of approval.

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Service Estimate

For Development by Vatika Limited

by

Vatika Ltd

19.700 Acres

in Sector 88B Gurgaon

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Overview

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REPORT

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Report for approval of Service Estimate for Development by Vatika Limited
In 19.700 Acres in Sector 88B Gurgaon

1 INTRODUCTION

Gurgaon has been an important urban centre in the neighborhood of Delhi. The town is known for automobile companies, modern commercial malls, cyber parks & software development centre. The town is located only at 10 Km distance from the Indira Gandhi Airport, Delhi.

1.2. Location

Located on the south western border of Delhi, the district lies between 27 degree 39' and 28 degree 32' 25" latitude, and 76 degree 39' 30"and 77 degree 20' 45" longitude.

1.3. Development Proposal by Vatika

Vatika Ltd has been authorized to develop a residential colony in Gurgaon Urban Complex, Sector- 88B, Gurgaon (19.700 Acres)

2 ROADS

2.1. Soil Investigation Results (CBR Value)

- CBR Value : 6%

2.2. Design of road crust

Based on data of C.B.R. values 6% in the area the roads specifications proposed are approximately as under:-

9 m Collector Streets

a. Sub grade: Existing soil to be pulverized & mechanically compacted
b. 150 mm GSB as per MORTH Specification
c. 150 mm W.M.M. as per MORTH Specification
d. 50 mm BM as per MORTH Specification No.5
e. 20 mm MSS as per MORTH Specification No.510

Detail of Road Lengths

Table-1

Description	Wide Road	
	9 M WIDTH	12 M WIDTH
Road Length 19.700 Acre	1168 M	424 M

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3 WATER SUPPLY

S.N.	Plot	No. of Plots	Population density	Expected population	Water requirement per person in lpd (As/HUDA norms)	Total Water consumption in lpd	Domestic Water consumption in lpd (65%)	Flushing Water consumption in lpd (35%)
1	DDJAY Plot	304	@18 persons/Plot	5472	172.5	943,920	613548	330,372
	Garden irrigation @ 5 lits/sqm/day (Assumed subject to confirmation from Landscape Architect)-1.639 Acres / 6632.797Sqm green area assumed			6632.797	5	33,164	..	33,164
A	SUBTOTAL		Domestic Water & Flushing Water Demand			977,084	613,548	363,536
			Domestic water Demand (Litres / day)				614 KLD	
			Flushing & Irrigation water Demand (Litres / day)					364 KLD

3.1. Daily Water Demand of 19.700 Acre Area

- Total Water Demand = 977 KLD
- Fresh Water Demand = 614 KLD
- Recycled Treated waste water Demand= 364 KLD

3.2. Fire Demand

- Fire Demand in Liters. $= (P)^{1/2}$ 100 X 1000
- (P is Population in thousands) $= (5.472)^{1/2}$ X 100 =234 K Ltr

3.3. Boosting Stations

- The area falls in Sector 88A & 88B
- It is proposed to construct 2 no. Boosting station each in Sector 88A& 88B.
- Break up of Fresh Water Demand Zone wise is as under

  Sector -88 B
  - Fresh Water Demand = 614 KLD SAY 620 KLD
  - Fire Demand = 250 KLD

3.4. Hydro pneumatic water supply

- Proposal of providing Hydro pneumatic device in transfer pump set to control uniform pressure head.

3.5. Under Ground Tank

- UGT of 200 KL +200 KL + 220 KL = 620 KL capacity is proposed to meet Water Demand of Sector - 88B.
- UGT of 250 KL capacity is required to meet Fire Demand
- UGT of 370 KL capacity is required as Recycled Water Demand

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- Also Recycled UGTs provided with sanitary separation as dual plumbing system in this township for Sector – 88 B
- STP proposed in Sector – 88B with tertiary level treatment as filtration & disinfection.

3.6. Water Supply Net Work

Description	Quantities 19.700 Acre
(For Rising Main)	
200mm	30mt.
150mm	150mt.
100mm	1379 mt.
(For Distribution Net Work)	
100 mm	1100 mt.

4 Sewer Waste Water

4.1. Estimation of Sewer Waste Demand

- Estimated Generation of Waste Water 1586 KLD

S.No.	Location	STP Treated Water UGT at STP – KL
1	Sector - 88B	1000 KL In two phase, first phase of 200 KLD and second proposed 800 KLD

- Sewer Waste to be treated up to tertiary Level: 1000KLitres (Two units 200 KLD + 800 KLD). Emergency bypass shall go in to the Master Sewer System.
- This STP is proposed to be constructed at Sector -88B located in area in possession of Vatika Ltd.
- Sewer Waste Water flow is towards Railway Track as per planning of Master Sewerage Scheme.

4.2. Design of Sewer Pipe Line System

Sewer Pipe Length

Description	Quantities 19.7 Acre
200 mm dia Sewer Pipe, Average Depth up to 2 M	1086 mtr.
250 mm dia Sewer Pipe, Average Depth 2 M to 4 M	362 mtr.
300 mm dia Sewer Pipe, Average Depth 4 M to 4.5 M	6 mtr.

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4.2.1. **Pipe Line Length for Recycling System**

Description	Quantities 19.700 Acre
Providing Stringing, cutting and jointing HDPE Pipe of 6 kg cm^{-1} pressure including cost of excavation complete in all respect	
90 mm o/d	1471 mtr.

5 Storm Water Drainage & Recharge Wells

5.1. Adopted Design Criteria

- External Storm water Drainage along Master Roads is provided to cater for rain fall up to Intensity@ 3.12 mm /Hr.
- Internal Storm water Drainage is provided to cater for rain fall up to Rain Fall Intensity @ 6.25 mm /Hr.

5.2. Storm Pipe/Drain of Internal Storm Water System

As per Original Proposal	
250 mm dia, RCC Pipe NP3	960 mtr.
300 mm width, Covered RCC Drain	60 mtr.
400 mm width, Covered RCC Drain	12 mtr.

5.3. Recharge Wells

- Total No. of Recharge wells approved for 19.7 Acre area : 7 Locations

6 HORTICULTURE / ARBORICULTURE

- Green area acts in the similar manner as lungs perform in human body. Hence its development is important for eco friendly development.
- Fine grassing is proposed in all the parks.
- Shrubs and creepers will be provided at suitable places.
- Road side plantation will be carried out as per norms i.e. at 10 m c/c on foot paths.
- Green area already approved in 19.7 Acre area =1.639 Acres
- No. of Road side plantation approved in 19.7 Acres = 400 Nos,

7 STREET LIGHTING

- 20 Watt LED street lights have been proposed on 9 m road on one side at 25m distance.
- It is proposed to provide LED Lights 9 mt. wide roads on one side @25 m c/c with height of pole above road level is 4.5 m.

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8 SPECIFICATIONS:

- The work will be carried out in accordance with the MORTH, HARYANA PWD & HUDA specification/ Guide lines.
- Specification s in detail has been submitted at time of calling tenders

9 RATES

- The Costing for providing services in this project has been prepared on the basis of recent market rates and H.S.R.

10 COSTING

- The total cost of the project for 19.700 Acres: ~~1758.73~~ 1759.04 ~~875.786~~ Lacs.
- The cost of development in this project comes out to be ~~44.456~~ 89.29 Lacs. per acre

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FINAL ABSTRACT OF COST

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2nd Copy

Final Abstract of Cost of Vatika Township, in Sector 88 B,

Total Area – 19.700 Acres, being developed by Vatika Group

Sr. No.	Description		Total Cost in Rs.	Total Cost in (Lacs)
	Sub Work No	Sub Work Name		
1	Sub Work No. 1	Roads	18606700/ [illegible]	186.06 [illegible]
2	Sub Work No. 2	Water Supply	18012525/ [illegible]	180.13 [illegible]
3	Sub Work No. 3	Sewerage Waste & Recycling water	32825728/ 25031958	328.25 250.32
4	Sub Work No. 4	Storm Water Drainage	13982300 [illegible]	139.83 84.35
5	Sub Work No. 5	Horticulture & Plantation	965880 543990	9.66 5.44
6	Sub Work No. 6	Lighting & Fittings	4925880 [illegible]	49.25 4.86
7	Sub Work No. 7	MEP Services & Façade	25279600	252.80
	Total / Sub Total		57065308	[illegible] 952.[illegible]
	Add 3 % Contingency charges		114[illegible]8133 [illegible]	1146.[illegible]8 17.12
	Sub Total		3438943 [illegible]	34.38 587.78
	Add 49 % Charges on account Maintenance, Supervision charges, departmental charges, Admin charges, unforeseen		118[illegible]6678 57897178 [illegible]	1180.36 578.47 288.01
	Total Cost		87578128 175[illegible]3	875.78 [illegible] 1755.03
	Area : 19.700 Acres	Cost per acre	Lakhs Per Acre 125904448	44.456 89.09 Per Acre.

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Checked for service estimate only

Executive Engineer-III
Drainage Division, GMDA,
Gurugram

Executive Engineer-I (EDC)
Gurugram Metropolitan Development Authority
Gurugram

Checked subject to comments in forwarding letter No. 1/5[illegible]/2022
Dt. 09/11/2022 ......and notes attached with the estimate

Executive Engineer-V
Sew. Division No. II
GMDA, Gurugram

Executive Engineer-I
W/S Division, GMDA
Gurugram

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Chief Engineer,
(Infra-II), GMDA
Gurugram

DESIGN CALCULATION

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I. DESIGN CALCULATIONS

1. Total Site Area = 19.700 Acres

Total Area of Site	19.700 Acres
Area under Sector Dividing Road	1.044 Acres
Area under 30 m wide Green Belt (Including 12m wide service road	1.639 Acres
Balance Area of the Scheme	17.017 Acres

2. **Population Calculations**

Plot Category	No. of Plots	Population per Plot	Population
DDJAY Plot	304	18	5472 Persons

Achieved Population Density 298.006 Persons Per Acre (PPA)

Greens		
Description		Provided
Green Belt		1.639 Acres

3. **Water Calculations :**

TOTAL WATER DEMAND

S.No.	Plot Type	Population	Water requirement per person in lpd (As/HUDA norms)	Total Water Demand in lpd
1	DDJAY Plot	5472	172.6	943920
				944 KLD

Domestic Water Demand (Litres / Day) 65 % of Total Demand = 614 KLD

Flushing Water Demand (Litres / Day) 35 % of Total Demand = 330 KLD

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Horticultural water requirement , Area under green belt

Water Demand for Green Belt = 6632.797 SQM x 5 Lt. = 33164 Lt.

= 33 KLD

Total water demand = 944 KLD + 33KLD = 977 KLD

Say 980 KLD

4. Fire Fighting demand

As per NBC of India, Required static underground fire storage = 100 KL

Fire Fighting Demand =	234	KL
Proposed Fire Fighting of Sector 88 B	250	KL

Total Capacity of Potable UGT provided = ~~400 KL~~

S.No.	Location	Provided Domestic UGT – KL
1	Sector - 88 B	Two Main UGT 88B, ~~200 KL + 200 KL = 400 KL~~ 615 KLD + 615 KLD = 1230 KLD

Sewerage Calculation

80 % of domestic water = 614 x 80/100 = 491 KLD

100 % of Flushing water = 330 KLD

0% of Horticulture water

Expected daily influent Sewer load = 821 KLD

Add for ~~20%~~ 5% extra emergency loading

Expected maximum daily influent Sewer load = 821 KLD x ~~1.2 = 985KLD~~ 1.05 = 862 KLD

Proposed STP Capacity = ~~200 KLD + 800 KLD = 1000 KLD~~ 865 KLD

PROPOSED STP CAPACITY

S.No.	Location	STP Treated Water UGT at STP – KL
1	Sector - 88B	1000 KL ~~in two phase, first phase of 200 KLD and second proposed 800 KLD~~

~~Initial arrangement for treatment of 30 % sewer water up to tertiary level.~~

~~Excess quantity of sewer is to be disposed off in master sewer.~~

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BOREWELLS

It may be noted that ~~HUDA~~ GMDA is laying main water trunk lines in the vicinity of the development to supply potable water to the proposed Sector Development and adjoining areas. Therefore, it is proposed to provide 1 Nos of Borewells, in Sector 88 B. one TW as supplementary source to the HUDA water supply network.

PUMPING MACHINERY FOR BOREWELLS

Gross working head		45.00 mts.
Average fall in S.L.		5.00 mts.
Depression Head		5.00 mts.
Friction loss in main		10.0 mts
	Total	65 mts

HP= $\frac{15000 \times 65 \times 2}{60 \times 60 \times 75 \times 0.6}$ = 12.03

SAY 12.5 HP

Potable water supply

For Sector 88 B

Two UGT proposed with two transfer pumping set

Domestic Daily demand of each pump (2W+1S) = 613548 /2		
At each working pump water transfer demand	306774	litres/day
Pumping per hour @ 8 hr. pumping day	38347	litres/hr
	640	lpm
	10.65	LPS

Proposed 12 lps pumps @ 56 mt. head at two places

Sector 88 B

Flushing / Recycled Daily demand

Flushing & Irrigation Daily demand of each pump = 363536 /2		
At each working pump water transfer demand	181768	litres/day
Pumping per hour @ 8 hr. pumping day	22721	litres/hr
	378.68	lpm
	6.31	LPS

Proposed 7 lps pumps (2W+1S) @ 56 mt. head

FLUSHING WATER (330 KLD)

VATIKA LIMITED

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Design Statement of Waste Water collection - sewer line System

Sr. No.	Line No.	Length of Sewer Line	Popn. served by segment	Cumulative Population.	Waste water Generation Factor (as per NCR Plan)	Average Flow	Peaking Factor	Peak Sewage Flow , PF-3	Infiltration @ 10% of Avg. Flow	Design Flow (q) in	Sewer Diameter (D)	Ground level in M	Invert level in M		Depth of IL from GL		Slope - 1 in "L"	Avg. Depth
	From - To	(M)	(Persons)	(Persons)	lpcd	MLD		MLD	MLD	LPS	(MM)	U/S. MH	U/S M.H	D/S M.H	U/S (M)	D/S (M)		(M)
PROPOSED SEWER NETWORK																		
1	SW-101 TO SW-102	82	360	360	55800	0.056	3.00	0.1677	0.01	2.10	200	220.000	219.100	218.690	0.900	1.310	200	1.1
2	SW-102 TO SW-104	100	486	846	131341.5	0.131	3.00	0.3940	0.01	4.70	200	220.000	218.640	218.140	1.360	1.860	200	1.6
3	SW-103 TO SW-104	82	486	486	75451.5	0.075	3.00	0.2264	0.01	2.70	200	220.000	219.100	218.690	0.900	1.310	200	1.1
4	SW-104 TO SW-107	57	0	1332	206793	0.207	3.00	0.6204	0.02	7.40	250	220.000	218.090	217.862	1.910	2.138	250	2.0
5	SW-105 TO SW-107	153	810	810	125792.5	0.126	3.00	0.3773	0.01	4.50	200	220.000	219.100	218.335	0.900	1.665	200	1.3
6	SW-106 TO SW-107	88	468	468	72657	0.073	3.00	0.2180	0.01	2.60	200	220.000	217.812	217.372	2.188	2.628	200	2.4
7	SW-107 TO SW-108	42	0	2610	405202.5	0.405	3.00	1.2156	0.04	14.50	250	220.000	217.322	217.154	2.678	2.846	250	2.8
8	SW-108 TO SW-109	126	702	702	108985.5	0.109	3.00	0.3270	0.01	3.90	200	220.000	219.100	218.470	0.900	1.530	200	1.2
9	SW-109 TO SW-111	32	108	3420	530955	0.531	3.00	1.5929	0.05	19.00	250	220.000	217.104	216.976	2.896	3.024	250	3.0
10	SW-110 TO SW-111	72	396	396	61479	0.061	3.00	0.1844	0.01	2.30	200	220.000	219.100	218.740	0.900	1.260	200	1.1
11	SW-111 TO SW-112	86	288	4104	637146	0.637	3.00	1.9114	0.06	22.80	250	220.000	216.926	216.582	3.074	3.418	250	3.2
12	SW-112 TO SW-113	130	162	4266	662296.5	0.662	3.00	1.9860	0.07	23.60	250	220.000	216.332	216.012	3.468	3.988	250	3.7
13	SW-113 TO STP																	
14	SW-114 TO SW-116	49	162	162	19883	0.020	3.00	0.0596	0	0.70	200	220.000	219.100	218.855	0.900	1.145	200	1.0
15	SW-115 TO SW-116	100	576	576	69984	0.070	3.00	0.2100	0.01	2.50	200	220.000	219.100	218.600	0.900	1.400	200	1.2
16	SW-116 TO SW-117	54	72	810	98415	0.098	3.00	0.2952	0.01	3.50	200	220.000	218.550	218.280	1.450	1.720	200	1.6
17	SW-117 TO SW-113	180	396	1206	146529	0.147	3.00	0.4396	0.01	5.20	200	220.000	218.230	217.930	1.770	2.070	200	2.2
18	SW-113 TO STP	15	810	5472	664848	0.665	3.00	1.9945	0.07	23.90	250	219.700	215.962	215.902	3.738	3.798	250	3.8
	STP TO HUDA SEWER BYPASS CONNECTION	60		5472	664848	0.665	3	1.9945	0.07	23.90	250	219.700	219.100	218.860	0.6	0.840	2.50	0.7

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Design Statement of Water Supply

C=120

Distribution main

Sr. No.	Junction	Length	sec_pop	Tot_pop	Total Water Demand	Peak demand	Pipe Dia	Hl/km	Total Head loss	HGL	GL	Terminal Head	Remark
		Mtrs.			LPM	LPM	mm	Mtrs.	Mtrs.	265.000	220.000	45.00	Pump
1	PUMP ROOM TO WS101	45	72	5076	569147	1707441	100	76.765	3.454	261.546	220.000	41.55	
2	WS-101 TO WS102	101	576	5004	561074	1683222	100	74.763	7.551	253.995	220.000	34.00	
3	WS-101 TO WS103	54	162	4428	496490	1489470	100	59.626	3.220	253.995	220.000	34.00	
4	WS-103 TO WS104	36	108	4266	478325	1434975	100	55.653	1.948	252.047	220.000	32.05	
5	WS-104 TO WS105	74	396	4158	466216	1398648	100	53.074	3.927	248.120	220.000	28.12	
6	WS-104 TO WS106	75	288	450	50456	151368	100	0.868	0.065	248.120	220.000	28.12	
7	WS-106 TO WS107	82	162	162	18164	54492	100	0.131	0.011	248.109	220.000	28.11	
8	WS-103 TO WS108	140	702	702	78712	236136	100	1.973	0.000	252.047	220.000	32.05	
9	WS-103 TO WS109	43	0	2610	292646	877938	100	22.425	0.964	252.047	220.000	32.05	
10	WS-109 TO WS110	157	810	810	90821	272463	100	2.574	0.430	251.617	220.000	31.62	
11	WS-109 TO WS111	88	468	468	52475	157425	100	0.933	0.082	251.617	220.000	31.62	
12	WS-109 TO WS112	99	0	1332	149351	448053	100	5.461	0.355	251.617	220.000	31.62	
13	WS-112 TO WS113	88	486	1332	149351	448053	100	5.461	0.569	251.048	220.000	31.05	
14	WS-112 TO WS114	100	486	846	94858	284574	100	2.790	0.279	251.048	220.000		
15	WS-114 TO WS115	62	360	360	40365	121095	100	0.574	0.047	251.001	220.000	31.00	
										261.546			
16	PUMP ROOM TO WS-116	150	396	396	44402	133206	100	0.685	0.100	261.546	220.000	41.55	Pump
	Total	1379	5472										

HUDA water line to PUMP ROOM HUDA connection 800 5472 5472 613548 613548 100 11.557 9.246 248.120 220 30

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Design Statement of Recycled Water Supply

C=120

Distribution main

Sr. No.	Junction	Length	Total Water Demand	Peak demand	Pipe Dia	Hl/km	Total Head loss	HGL	GL	Terminal Head	Remark
		Mtrs.	LPM	LPM	mm	Mtrs.	Mtrs.	265.000	220.000	45.00	Pump
1	STP-01 TO FW-101	4	377568	1132704	90	60.018	0.240	264.760	220.000	44.76	
2	FW-101 TO FW-102	31	377568	1132704	90	60.018	1.861	262.899	220.000	42.90	
3	FW-102 TO FW-103	130	377568	1132704	90	60.018	7.802	255.097	220.000	35.10	
4	FW-103 TO FW-104	75	366390	1099170	90	56.772	4.258	250.839	220.000	30.84	
5	FW-104 TO FW-105	74	346518	1039554	90	51.207	3.789	247.050	220.000	27.05	
6	FW-104 TO FW-109	35	319194	957582	90	43.988	1.540	247.050	220.000	27.05	
7	FW-101 TO FW-106	147	377568	1132704	90	60.018	8.823	264.760	220.000	44.76	
8	FW-106 TO FW-107	55	311742	935226	90	42.107	6.190	258.570	220.000	38.57	
9	FW-107 TO FW-108	101	306774	920322	90	40.874	4.128	254.442	220.000	34.44	
10	FW-107 TO FW-109	65	267030	801090	90	31.621	1.739	252.703	220.000	32.70	
11	FW-109 TO FW-110	140	255852	767556	90	29.216	4.090	254.442	220.000	34.44	
12	FW-109 TO FW-111	43	255852	767556	90	29.216	1.256	254.442	220.000	34.44	
13	FW-111 TO FW-112	88	255852	767556	90	29.216	2.571	251.871	220.000	31.87	
14	FW-111 TO FW-113	167	223590	670860	90	22.762	3.801	251.871	220.000	31.87	
15	FW-111 TO FW-114	55	167670	503010	90	13.368	0.735	251.871	220.000	31.87	
16	FW-114 TO FW-115	98	33534	100602	90	0.681	0.060	251.811	220.000	31.81	
17	FW-114 TO FW-116	100	100602	301806	90	5.196	0.520	264.760	220.000	44.76	
18	FW-116 TO FW-117	83	27324	81972	90	0.466	0.047	264.760	220.000	44.76	
	Total	1471									

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Design Statement of Storm Water collection - RWH System

Sr. No.	Line No.	Length of Storm water Line	Rain Rall	Storm Water Design Flow (q) in	Sewer Diameter (D)	Ground level in M	Invert level in M		Depth of IL from GL		Slope - 1 in "L"	Actual Velocity	Avg. Depth
	From - To	(M)	mm/hr	LPS	(MM)	D/S .M.H	U/S.MH	D/S.M.H	U/S (M)	D/S (M)		M / sec	(M)
PROPOSED STORM NETWORK													
1	CB-101 TO CB-102	75	6.25	4.20	400	220.000	219.100	218.913	0.900	1.088	400.00	0.401	1.0
2	CB-102 TO RWH-01	7	6.25	4.20	400	220.000	218.863	218.845	1.138	1.155	400.00	0.401	1.1
3	CB-201 TO CB-202	73	6.25	11.10	400	220.000	219.100	218.918	0.900	1.083	400.00	0.534	1.0
4	CB-202 TO RWH-02	14	6.25	11.10	400	220.000	218.795	218.760	1.205	1.240	400.00	0.534	1.2
5	CB-203 TO CB-204	70	6.25	5.40	400	220.000	219.100	218.925	0.900	1.075	400.00	0.431	1.0
6	CB-204 TO RWH-02	14	6.25	5.40	400	220.000	218.710	218.675	1.290	1.325	400.00	0.431	1.3
7	CB-301 TO RWH-03	76	6.25	5.40	400	220.000	219.100	218.910	0.900	1.090	400.00	0.431	1.0
8	CB-302 TO RWH-03	23	6.25	8.00	400	220.000	218.625	218.568	1.375	1.433	400.00	0.485	1.4
9	CB-401 TO RWH-04	131	6.25	8.00	400	220.000	219.100	218.773	0.900	1.227	400.00	0.485	1.1
10	CB-402 TO RWH-04	10	6.25	9.20	400	220.000	218.518	218.493	1.483	1.508	400.00	0.506	1.5
11	CB-501 TO CB-502	140	6.25	9.20	400	220.000	219.100	218.750	0.900	1.250	400.00	0.506	1.1
12	CB-502 TO RWH-05	9	6.25	9.20	400	220.000	218.443	218.420	1.558	1.580	400.00	0.506	1.5
13	CB-601 TO CB-603	101	6.25	9.20	400	220.000	219.100	218.848	0.900	1.153	400.00	0.506	1.0
14	CB-602 TO CB-603	42	6.25	9.20	400	220.000	219.100	218.995	0.900	1.005	400.00	0.506	1.0
15	CB-603 TO CB-605	27	6.25	9.20	400	220.000	218.945	218.878	1.055	1.123	400.00	0.506	1.1
16	CB-604 TO CB-605	28	6.25	9.20	400	220.000	218.945	218.875	1.055	1.125	400.00	0.506	1.1
17	CB-605 TO RWH-06	15	6.25	9.20	400	220.000	218.825	218.788	1.175	1.213	400.00	0.506	1.2
18	CB-09 TO RWH-09	13	6.25	6.60	400	220.000	218.825	218.793	1.175	1.208	400.00	0.458	1.2
19	CB-801 TO RWH-08	60	6.25	4.60	400	220.000	219.100	218.950	0.900	1.050	400.00	0.413	1.0
20	CB-701 TO CB-702	94	6.25	4.60	400	220.000	219.100	218.865	0.900	1.135	400.00	0.413	1.0
21	CB-702 TO RWH-07	38	6.25	4.60	400	220.000	218.815	218.720	1.185	1.280	400.00	0.413	1.2
22	CB-10 TO RWH-10	14	6.25	6.40	400	220.000	218.815	218.780	1.185	1.220	400.00	0.455	1.2

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VATIKA LTD - DOJAY, SECTOR- 88B			
Measurement Sheet for STROM			
	Line reference	Length of Pipe (m)	Dia of pipe In mm
	For Distribution Line		
	CB-101 TO CB-102	75	400
	CB-102 TO RWH-01	7	400
	CB-201 TO CB-202	73	400
	CB-202 TO RWH-02	14	400
	CB-203 TO CB-204	70	400
	CB-204 TO RWH-02	14	400
	CB-301 TO RWH-03	76	400
	CB-302 TO RWH-03	23	400
	CB-401 TO RWH-04	131	400
	CB-402 TO RWH-04	10	400
	CB-501 TO CB-502	140	400
	CB-502 TO RWH-05	9	400
	CB-601 TO CB-603	101	400
	CB-602 TO CB-603	42	400
	CB-603 TO CB-605	27	400
	CB-604 TO CB-605	28	400
	CB-605 TO RWH-06	15	400
	CB-09 TO RWH-09	13	400
	CB-801 TO RWH-08	60	400
	CB-701 TO CB-702	94	400
	CB-702 TO RWH-07	38	400
	CB-10 TO RWH-10	14	400
		1074	400

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COST ESTIMATES

VATIKA LIMITED

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Sr. No.	Description	Total Cost of 19.700
	Final Abstract of Cost of Vatika Township, in Sector 88 B being developed by Vatika Group	
1	Sub Work No. 1 (Roads)	18606700/- ~~10447600~~
2	Sub Work No. 2 (Water Supply)	18012525/- 2110850
3	Sub Work No. 3 (Sewerage Waste & Recyeling Water)	32825128/- ~~3~~031958
4	Sub Work No. 4 (Storm Water)	13983300/- 8445000
5	Sub Work No. 5 (Horticulture & Plantation)	965880/- 543900
6	Sub Work No. 6 (Lightings & Fittings)	4925000/- 486000
7	~~Sub Total~~ Sub Work No 7 MTC & Services & resurfacing	25279650/- ~~57065308~~
	Total	114598133/-
7	Add 3 % Contigency charges	3437944/- 1711930
	Sub Total	118036077/- 58777267
8	Add 49 % Charges on account Maintenance, Supervision charges departmental charges, Admin charges, unforseen.	57837678/- 28800851
	Total Cost	175873755/- 87578128
	Cost in Lacs / Acre including Maintenance for net area planned =19.700 Acres 178573755/19.70	8927601/- ~~44.456~~

VATIKA LIMITED

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Cost Estimation of Sub Work No. I (Roads)					
	SUB HEAD NO. I	19.700 Acres			
S No	Description	Qty.	Unit	Rate	Amount
		Roads			
1	**Providing for leveling & earth filling :** includes providing good earth transportation from source to site, laying in layer, rolling & watering & compaction to the desired specification complete as per MORT & H specifications for road & bridge works Clause - 305 for all leads and lifts as per site conditions	19.700	Acres	175000 ~~1000000~~	3447500/- ~~19700000~~
2	Construction of Road By :- i) Providing GSB 300 mm thick as per MORT & H specifications conforming to Clause 401 grading -II 400.1				
3	ii) Providing Laying, spreading and compacting graded stone aggregates as per Table 400-11 to Wet Mix Macadam specifications - 406 MORT&H IV Revision, including premixing the mixed materials with water to OMC in Mechanical mixer (Plug Mill) carriage of mixed material by tipper to site, laying in uniform layers using paver in subbase / base course, on a well prepared sub base and compacting with power and vibratory roller to achieve & desired density, including cost of material complete ~~150 mm thick~~ 250 mm	7396	sq mtr	150 ~~450~~	1169400/- ~~9620000~~
4	Providing, laying & compaction of **B.M. (Bituminous Macadam) 50 mm thick** with grading 2 as per table No. 500.10 and minimum 4.5% bitumen of 60/70 grade as per MORT&H specifications for road & bridge works 2001 (Revision IV) clause. 507.1 to 507.8 for all leads & lifts etc. complete in all respects to the satisfaction of the Engineer in charge				
5	30 mm thick ~~wearing~~ BC				
6	Providing & Fixing kerbs & channels of C.C. M-20 grade as per standard size including back filling etc. complete in all respects.	1592	mtr	600 ~~500~~	955200/- ~~796000~~
7	Provision for Guide Maps & Plat Indicators, Road Marking Strips & Post Delinators .	L.S		50000	~~50000~~ 50000/-
8	Provision for Carriage of materials.	L.S		50000	~~50000~~ 100000/-
9/10,139 ISR	Provision for 80 mm thickPavement of parking in shopping center/commercial center for pavement/parking taking 50 % of the area	1910	sq mtr	~~940~~ 1000	~~955000~~ 1910000/-
	Total				~~18497000~~ 18606700/-

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Vatika Ltd - DDJAY Sec-88B Material Statement of Road					
		09 Mtr. ROAD		12 Mtr. ROAD	
Sr. No.	Street/Road Name	Length (m.)	Area of GSB/WMM/BM as average 4.5 mt. Pavement for 9 m. width Road (sqmt.)	Length (m.)	Area of GSB/WMM/BM as average 6 mt. Pavement for 12 m. width Road (sqmt.)
Sector 88B					
1	Street - A2	212.09	954.41		
2	Street - A3	111.50	501.75		
3	Street - A4	105.85	476.33		
4	Street - A6	92.40	415.80		
5	Street - A7	92.40	415.80		
6	Street - A8	93.15	419.18		
7	Street - A9	81.00	364.50		
8	Street - A10	169.20	761.40		
9	Street - A11	134.50	605.25		
10	Street - A12	76.00	342.00		
11	AVENUE 10			260.36	1562.16
12	6TH BOULEVARD LANE			162.91	977.46
	TOTAL	1168.09	5256.41	423.27	2539.62
GRAND TOTAL (09m. + 12m.wide)		LENGTH		AREA (Sqm.)	
		1591.36		7796.03	

For - 19.70 Acres - Road K&C Length (mt.)

	Road Length	Kerbs & channels Length (m.)	
Length of 9 m. width Road	1168.09	1168.09	Kerbs & Channels in single side
Length of 12 m. width Road	423.27	423.27	Kerbs & Channels in single side

Sector	Road Length	80mm Parking Pavements (sqmt.)
Sector 88 B	1591.36	1910

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	Abstract of Sub Work No. 2 (Water Supply)		
	No. of Sub Head	Name of Sub Head	Amount in Rs.
1	Sub Head No. 1	Source Generation	1900000-2,00,000/-
2	Sub Head No. 2	Water Works & Boosting Station	6960000/-6,80,000/-
3	Sub Head No. 3	Distribution System & Rising Main	2650850-50,32,525/-
	Total Cost in Rs.		12110850-1,80,12,525/-

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	Cost Estimation of Sub Head No. 1 : Source Generation				
	Cost Estimation of Sub Work No. 2	Water Supply			
Sr. No.	Description	Qty.	Unit	Rate in	Amount in
1	Boring of tube wells having minimum of 450 mm dia with depth of 70 mtr including providing & fixing 200 mm inside dia V - wire Screen of stainless steel of approved make, blind pipe of MS confirming is IS: 3589 of 4.8 mm thick threaded and socket as per approved design including cost of all fitting and clamps placed on the girder and coated with antic corrosive paint of approved quality, including supply and installation of 12.5 BHP pumping set, GI column pipes, panel board and all other electrical appurtenances to run the tube well, making provision for the earthing, cost of panel board etc complete in all respect up to delivery pipe lines including the cost of Sluice valves, scour valves and non return valves etc. including pump chamber etc	1	Nos.	1500000 ~~800000~~	1500000/- ~~800000~~
2	Providing & Installation of Generator Set of Standard make 20 KVA capacity to run the tubewell fixed with the conapy and plateform including cost of change over switch etc complete in all repect.	1	Nos.	400000	400000
3	Provision for releasing electric connection charges to the DHBVN for the above tube wells	1	L.S	300000	300000
4	Prov. for carriage of [illegible]	25		4000	100000/-
	Total				~~1500000~~ 2300000/-

Tail

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	Cost Estimation of Sub Work No. 2	Water Supply			
	SUB WORK NO. 2	Water Supply-Head works			
	SUB HEAD NO.2	(Water Works, Boosting Station)			
Sr. No.	Description	Qty.	Unit	Rate in `	Amount in Rs.
1	Construction of **Boosting chamber** of suitable size with cost of **Pumping Machinery** (3 No Horizontal centrifugal pumps, 9 LPS at 56 M Head, ,Three No Horizontal centrifugal pumps, 5 LPS at 56 M Head and **Generating set of 50KVA capacity** on each location etc. complete in all respect. As detailed below :	1	No	2000000	2000000
	At Sector 88B - 1 SET.				
2	Construction of **RCC Under Ground Clear Water Storage Tank**, capacity in two compartments including inlet, outlet & overflow				
	Main UGT 88 B UGT 350 350 280	980	KL	6050	5929000/-
	Fire Water Tank 250	250	KL	6050	1512500/-
2a	Construction of **RCC Under Ground Clear Water Recycled Storage Tank**, capacity in two compartments including inlet, outlet & overflow	580	KL	6050	3509000/-
3	Construction of Boosting Station suitable for the pumping machinery and DG set	1	Nos	300000	300000
4	Provision for carriage of materials and other unforeseen items.	1	L.S.	100000	100000
5	Construction of **Boundary** wall and gate around the water works	1	L.S.	200000	200000
6	**Development** of campus of water works including construction of approach roads, footpath, hedges and development of lawns and plantation etc. complete at water works site	LS	No	100000	100000
7	Provision for **Pump operator office space**	LS		300000	300000
	Total				10680000
	C.O to Abstract of Cost of sub work no 2				10,680,000/-

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Sr.No.	SUB HEAD NO.3	Distribution System & Rising Main			
	Description	Qty.	Unit	Rate in Rs.	Amount in Rs.
1	DSR 7 Providing, stringing, cutting and jointing water supply pipe including cost of excavation complete in all respect				
	(For Distribution)				
	100 mm id	1379	Mtr	~~1050~~ 1475	~~1447950~~ 2034025/-
	For ~~HUDA~~ GMDA Water Connection pipe - 800 mt. TW Pipe - 300 mt.				
	100 mm	1100	Mtr	~~1050~~ 1475	~~1155000~~ 1622500/-
	For Tube well Rising Main				
	200 mm	30	Mtr	~~1850~~ 2475	~~55500~~ 74250/-
	150 mm	90	Mtr	~~1500~~ 1875	~~135000~~ 168750/-
2	Providing and fixing cast iron double flanged sluice valve/ Butter Fly Valve PN 1.6 marked with IS: 14846 including cost of all joint of material, carriage, loading, unloading, stacking, handling etc complete in all respect at the satisfaction to the Engineer - in charge.				
	100 mm id	8	Nos.	~~8000~~ 20000	~~64000~~ 160000/-
	150 mm id	2	Nos.	~~12000~~ 30000	~~24000~~ 60000/-
	200 mm id	2	Nos.	~~14000~~ 40000	~~28000~~ 80000/-
3	Providing and fixing Fire Hydrants complete with masonry chambers	8	Nos.	5000	40000
4	Construction of Brick masonry Sluice Valve Chambers & Fire hydrant including surface boxes complete as per Public Health Standard	~~8~~ 12	Nos.	5500.00	~~44000~~ 66000/-
5	Provision for indicating Arrow plates for Sluice valve & Fire hydrant	4	Nos.	500	2000
6	Providing and fixing C.I. double Air valves marked with relevent IS code including carriage, loading, unloading, stacking, handling, re-handling etc., drilling, tapping, screwing in valves connections complete in all respects to the satisfaction of Engineer-in-charge 100mm i/d.	5	Nos.	~~3300~~ 15000	~~16500~~ 75000/-
7	Provision for Carrige of material	1	LS	100000	100000
8	Provision for Cutting of Roads and making good to its orignal condition	1	LS	100000	100000
9	Fee & connection charges for ~~HUDA~~ GMDA Main Master water line.	1	LS	300000	300000
10	Provision for HUDA water supply connection including Pipes, fitting, Water meter etc for testing and commissioning of Pipe Line operation HUDA Main Master water line arranging other allied work i.e water meter testing, water shutdown etc. for HUDA water supply connection including Cutting of Roads and making good to its orignal condition. water pipe HUDA connection	1	LS	150000	150000
	Total				~~1680850~~ 5032525/-

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VATIKA LTD, SECTOR - 88B		
Measurement Sheet for Water Supply		
Line reference	Length of Pipe (m)	Dia of pipe In mm
For Riser Main		
Pump room connection piping		
UP TO PUMP ROOM		
* For Riser Main -100 mm dia	1100	200 m for TW & 300 mm for HUDA connection
For Riser Main -150 mm dia	90	
For Riser Main -200 mm dia	30	
For Distribution Line		
PUMP ROOM TO WS101	45	100
WS-101 TO WS102	101	100
WS-101 TO WS103	54	100
WS-103 TO WS104	35	100
WS-104 TO WS105	74	100
WS-104 TO WS106	75	100
WS-106 TO WS107	82	100
WS-103 TO WS108	140	100
WS-103 TO WS109	43	100
WS-109 TO WS110	167	100
WS-109 TO WS111	88	100
WS-109 TO WS112	55	100
WS-112 TO WS113	86	100
WS-112 TO WS114	100	100
WS-114 TO WS115	82	100
WS-116 TO PUMP ROOM	150	100
Summary	1379	
100 mm dia distribution pipe		1379 MTR

* - TW to Pump Room 200 m

- Huda water supply 300 m.
Pipe connection
@ inner dia

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	Abstract of Sub Work No. 3 (Waste Water Collection System &Recycling of Treated Water)					
1	No. of Sub Head	Name of Sub Head				Amount in ₹
2	Sub Head No. 1	Sewerage Waste Water collection system				₹ 4176888/- 3693718
3	Sub Head No. 2	Recycling of Treated Water				₹ 28688240/- 23338280
	Total Cost					~~25031958~~ ₹ 32825128/-

C.O to Final Abstract of Cost

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	Cost Estimation of Waste Water / Sewerage				
	SUB WORK NO. 3				
Sr. No.	Description	Qty.	Unit	Rate in ₹	Amount in ₹
1	Providing of SW sewer pipes in standard length of each pipe and their lowering, cutting, jointing and testing , including cost of excavation, bed concrete , Man holes jointing materials as well as carriage, loading, unloading stacking, handling, refunding etc, complete in all respects to the satisfaction of Engineer in Charge.				
1.01	200 mm id Sewer Pipe			2270	2465220/-
	i) Average Depth up to 2 M	1086	M	~~1134~~	~~2231521~~
1.04	250 mm id Sewer Pipe			2430	879660/-
1.05	ii) Average Depth 2 M to 4 M	362	M	~~1137~~	~~5201491~~
2	Construction of Brick masonry Sewer Manhole including SFRC cover complete as per Public Health Standard	19	Each	18000	342000
3	Provision for Carriage of material	1	LS	100000	100000
4	Provision for Cutting of Roads and making good to its original condition	1	LS	100000	100000
5	Fee & connection charges for ~~HUDA~~ GMDA Main Master Sewer line.	1	LS	300000	300000
6	Provision for HUDA sewer connection including Pipes, fitting , Manhole etc for commissioning of sewer over flow Bypass connection, arranging other allied work i.e HUDA sewer connection including Cutting of Roads and making good to its original condition. Sewer pipe 60 m - dia of pipe 250 mm	1	LS	~~100000~~ 150500	~~100000~~ 150500/-
	Total				~~2693718~~ 4136888/-

~~C.O to Abstract of Cost of sub work no 3~~

1. Provision for construction of STP including the cost of tertiary treatment level with recycling storage tank & machinery with all arrangement complete in all respect ~~865 KLD~~ @ ₹ 2500 per KLD ₹ 2162500/-

@ ₹ 2500 Per KLD ₹ 2596188/-

Covd. in Recycling Head.

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VATIKA LTD, SECTOR- 88B		
Measurement Sheet for SEWER		
Line reference	Length of Pipe (m)	Dia of pipe In mm
For Distribution Line		
SW-101 TO SW-102	82	200
SW-102 TO SW-104	100	200
SW-103 TO SW-104	82	200
SW-104 TO SW-107	57	250
SW-105 TO SW-107	153	200
SW-106 TO SW-107	88	200
SW-107 TO SW-109	42	250
SW-108 TO SW-109	126	200
SW-109 TO SW-111	32	250
SW-110 TO SW-111	72	200
SW-111 TO SW-112	86	250
SW-112 TO SW-113	130	250
SW-113 TO STP	15	250
SW-114 TO SW-116	49	200
SW-115 TO SW-116	100	200
SW-116 TO SW-117	54	200
SW-117 TO SW-113	180	200
	1448	
Summary		
200 mm dia distribution pipe	1086	MTR
250 mm dia distribution pipe	362	
	1448	

STP to HUDA Sewer Bypass connection, 250mm dia sewer pipe line 60 m. 250mm dia.

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	Recycling of Treated Water	Distribution System			
	SUB HEAD NO 2 (Recycling of Treated Water)	Qty.	Unit	Rate in `	Amount in `
Sr.No.	Description				
1	Providing, stringing, cutting and jointing HDPE Pipe of 6 kg / cm² pressure including cost of Excavation complete in all respect				
1.01	90 mm/od	1471	Mtr	840	1235640
1.02	75 mm/od	120	Mtr	740	88800
1.03	63 mm/od	90	Mtr	680	61200
2	Providing and fixing Sluice valves /Ball Valve in C.I. body with integrally moulded liner of nitrile or EPDM, as per is :13095 in PN 1.0.				
2.01	90 mm i/d	6	Nos.	3600	21600
2.02	50 mm i/d	12	Nos.	1200	14400
3 28.13(A)	Providing and fixing Air Valves , Butter Fly valves marked with relevent IS code including carriage, loading, unloading, stacking, handling, re-handling etc., drilling, tapping, screwing in valves connections complete in all respects to the satisfaction of Engineer-in-charge 100mm i/d.	6	Nos.	3100	18600
4	Provision for indicating Arrow Plates for sluice valve and Air Valves	6	Nos.	1000	6000
5	Construction of Brick masonry Chamber for and Air valves including surface boxes complete Public Health Standard	6	Nos.	5000	30000
6	Provision for providing & fixing lawn hydrants/ Sprinklers with sprinkler system at a distance of 30 m centre to centre on the periphery (green land) complete in all respects	12	Nos.	1000	12000
7	Providing & installing Treatment Units , 1 modules of 200cum/day and 1modules of 800 cum/day CSTP	1000	KL	25000	25000000
8	Construction of Boosting Station suitable for the pumping machinery and D.G. set.	1	Nos.	150000	150000
9	Providing and installing of pumping set with electric driven slip ring motor complete in all respects	5	each	100000	500000
10	Provision for Carriage of material	1	LS	100000	100000
11	Provision for Cutting of Roads and making good to its orignal condition	1	LS	100000	100000
	Total				28688240

C.O to Abstract of Cost of sub work no 3 ₹ 28,68,8240/-

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VATIKA LTD, SECTOR-88B		
Measurement Sheet for Recycle Water		
Line reference	Length of Pipe (m)	Dia of pipe In mm
For Distribution Line		
STP-01 TO FW-101	4	90
FW-101 TO FW-102	31	90
FW-102 TO FW-103	130	90
FW-103 TO FW-104	75	90
FW-104 TO FW-105	74	90
FW-104 TO FW-109	35	90
FW-101 TO FW-106	147	90
FW-106 TO FW-107	55	90
FW-107 TO FW-108	101	90
FW-107 TO FW-109	55	90
FW-109 TO FW-110	140	90
FW-109 TO FW-111	43	90
FW-111 TO FW-112	88	90
FW-111 TO FW-113	167	90
FW-111 TO FW-114	55	90
FW-114 TO FW-115	88	90
FW-114 TO FW-116	100	90
FW-116 TO FW-117	83	90
SUB TOTAL	1471	
Summary		
90 mm dia pipe	1471	MTR

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	Cost Estimation of Sub Work No. 4 (Storm Water Drainage)				
	Sub Head No. 1	(Storm Water Drainage)			
Sr. No.	Description	Qty.	Unit	Rate in '	Amount in '
1	Construction of RCC Drain, 12.5 cement plaster inside with 1 mm thick cement rendering, RCC slab in RMC M20 or SFRC slab including cost of excavation & complete in all respect				
2	Providing & Fixing RCC ~~350mm~~ 400 dia Pipe NP 3	1074	mtr.	~~2950~~ 2950	~~3168300~~ 3168300/-
2.01	Construction of RCC Covered Drain 300 mm x 300 mm in M20 Cement concrete	60	M	3400	204000
2.02	400m dia avg.depth 0-2 M	30	M	~~3050~~ 3050	~~91500~~ 91500.00
3	Construction of Brick masonry Storm drainage catch basin Chambers including SFRC drain cover complete as per Public Health Standard	30	Each	9000	270000
4	Provision for connection of proposed drains with existing HUDA Drains	1	Each	~~300000~~ 300000	~~300000~~ 300000/-
5	Provision for Shoring & Timbering , Lighting & Watching	1	L.S	150000	150000
6	Provision for Carriage of Material	1	L.S	100000	100000
7	Provision for cutting of road & making good to its original conditions	1	L.S	134000	134000
8	Provision for Community Recharge Wells with civil work, piping , boring, filter media, desilting chamber complete in all respect. 10 Places x 2nos RWH	20	Nos.	~~450600~~ 450600/-	~~9012000~~ 9012000/-
9	Fee & connection charges for HUDA Main Master Storm line.	1	LS	225000	~~225000~~ 225000
10	Provision for HUDA storm connection including Pipes, fitting , Manhole etc for commissioning of sewer over flow Bypass connection, arranging other allied work I.e HUDA storm connection including Cutting of Roads and making good to its original condition. @ 1600m dia pipe , 90 m.	~~1~~ 90	~~LS~~ mtr	~~100000~~ 2950	100000 ~~265500~~ 265500/-
	Total Cost				~~4415000~~ 13983300/-

C.O to Final Abstract of Cost

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VATIKA LTD - DDJAY, SECTOR- 88B			
Measurement Sheet for STROM			
	Line reference	Length of Pipe (m)	Dia of pipe in mm
	For Distribution Line		
	CB-101 TO CB-102	75	250
	CB-102 TO RWH-01	7	250
	CB-201 TO CB-202	73	250
	CB-202 TO RWH-02	14	250
	CB-203 TO CB-204	70	250
	CB-204 TO RWH-02	14	250
	CB-301 TO RWH-03	76	250
	CB-302 TO RWH-03	23	250
	CB-401 TO RWH-04	131	250
	CB-402 TO RWH-04	10	250
	CB-501 TO CB-502	140	250
	CB-502 TO RWH-05	9	250
	CB-601 TO CB-603	101	250
	CB-602 TO CB-603	42	250
	CB-603 TO CB-605	27	250
	CB-604 TO CB-605	28	250
	CB-605 TO RWH-06	15	250
	CB-09 TO RWH-09	13	25
	CB-801 TO RWH-08	80	250
	CB-701 TO CB-702	84	250
	CB-702 TO RWH-07	38	250
	CB-10 TO RWH-10	14	250
		1074	250
	RWH To MCGA STORM CONNECTION	90	250

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	Sub Work No. 5	Horticulture and Road Side Plantation			
Sr. No.	Description	Qty.	Unit	Rate in '	Amount in '
1	DEVELOPMENT OF GREEN AREA (8.61 Acres) a) Trenching the ordinary soil up to depth of 60 cm i.e. removal and stacking of serviceable material & disposing by spreading and leveling within a lead of 50 M 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 excluding cost of imported earth and manure. Area of Road				
1.1	b) Supply and stacking sludge at site including royalty and carriage Green Area	1.639	Acres	150610 ~~400000~~	245850 ~~463900~~
1.2	C) Rough dressing of turfed area Grassing with "DOOB GRASS" i.e. watering & maintenance of lawns for 30 days till the grass forms a thick lawn, free from weeds and fit moving in rows 7.5 cm part in either direction including provision for hedges and barbed wire around park				
1.3	d) Maintenance of lawns or turfing of slopes for a period of 1 year				
2	Road Side Plantation and plantation along the roads and above after distance of each 12 m Detail of Cost				
i	Trees\ Shurbs = 60 Rs				
ii	Excavation = 30 Rs				
iii	Manure = 60 Rs				
iv	Tree Guard =800 Rs				
v	Total Cost of 1 Tree =~~950~~ / 1850	400	No	1850 ~~950~~	720000 ~~380000~~
	Total cost				~~543900~~ 965850

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	Sub Work No. 6	Lighting & Fittings Street Lighting			
Sr. No.	Description	Qty.	Unit	Rate in	Amount in
1	Provision for street lighting at surrounding area as per std. Cost of LED Lighting & Fittings	30	Nos.	1200	36000
2	specification & HV PNL etc Cost of Poles with complete work 19.70 Acre, per Acre @	30	Nos.	15000 250000	450000 4925000
	Total cost				486000

4925000/-

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Sub Head No. 7 **Mtc. of services and resurfacing of road.**

S. No.	Description	Unit	Qty	Rate (in Rs.)	Amount
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 19.70 acres @Rs.7.50 lacs per acres	Acre	19.7	750000	14775000
2	Provision for resurfacing of roads after 5 years of 1st phase with provision of 50mm thick DBM including leveling coarse and 30mm BC as per crust design whichever is safer.	Sqm	7796	600	4677600
3	2nd phase after next five years of 1st phase 50mm DBM & 20mm BC or as per crust desig whichever is safer.	Sqm	7796	750	5847000
	Sub Total				25299600

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