SERVICES ESTIMATE

Proposed Commercial Complex at Sector – 82A, Gurgaon

Developed by

M/s. Vatika Limited.

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

REPORT

Gurgaon town of Haryana State is situated on Delhi - Jaipur National Highway No.8 at a distance of 30 kms for Delhi. Being in the national capital Region, the town has fast developing tendency and potential. Further, it has also started sharing the growing Industrial load of Delhi. In order to relieve the growing pressure of population in National Capital of Delhi, it has been decided by the Haryana Government to establish various residential Sectors alongwith infrastructure facilities in Gurgaon. This report is for Proposed Commercial Complex on land measuring 2.961 Acres at Sector- 82A, Gurgaon – Manesar Urban Complex, Gurgaon Licence No. 110 of 2010 dated 29.12.2010 . for M/s. Vatika Limited, Vatika Traingle 4th Floor, Sushant Lok-I, Mehrauli Gurgaon Road, Gurgaon-122002, Haryana.

WATER SUPPLY

At present the source of water supply in this area is bore well. It may be noted that HUDA is laying main water trunk lines As the underground water is potable, provision for ONE numbers of Borewells have been made in this estimate. It has been proposed to construct underground tanks of capacity as per attached details, for domestic purpose. The underground tanks will be filled up from the proposed bore wells or HUDA riser and the water will be pumped to the tank proposed on the roof of the building. The water supply has been designed as per Hazen Willam's formula for pressure pipes.

DESIGN :

The scheme has been designed for population as given in attached sheets.

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 electricity failure. Generator will be provided separately or added to the capacity of main generator.

SEWERAGE SCHEME

This scheme is designed for captive Sewage Treatment and Recycling Plant within the Complex and only emergency overflow to be connected to HUDA sewer to be laid along main 30 m wide HUDA sector road. The sewerage system has been marked on the respective plans.

The sewer lines have been designed for three times average D.W.F in relation to water supply demand. It has been assumed that about 90% of the domestic water (as per MoEF guidelines for EIA approval) supply shall find its way into the underground sewer. Sewer lines shall be laid to a gradient maintaining minimum 2.46 ft/sec self cleaning velocity. Necessary provisions for laying S.W pipe sewer line, construction of

For M/S VATIKA LIMITED

Authorised Signatory

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required number of manholes etc., have been made in the estimate. Manning's formula has been used for the design of sewerage system (Non-pressure under gravity flow).

Necessary design statement for entire sewerage system has been prepared and attached with estimate.

STORM WATER DRAINAGE

Complete rainwater harvesting system has been adopted in accordance with CGWA and MoEF EIA guidelines. Three rainwater harvesting pits have been provided as per EIA norms. The rainwater harvesting pit design details have been attached with the estimates (Annexure-II) and details incorporated in the drawings also.

Manning's formula has been used for the design of underground stormwater drainage system (Non-pressure under gravity flow).

SPECIFICATIONS

The work will be carried out in accordance with the standard specifications of P.H as laid down by the Haryana Govt./HUDA.

Roads:
Cost of road has been taken in the estimate.

Street Lighting
Provision for external lighting of proposed area has been made.

Horticulture
Estimates and details of plantation, landscaping, signage, etc., has been included.

Rates
The estimate has been based on the present market rates.

Cost:
The total cost of the scheme, including cost of all services works out to be Rs. ~~190.60~~ ~~2.77.76~~ 360.00 lacs ~~Lakhs (Rupees One Crore Ninety Lakhs Sixty thousand only)~~ including 3% contingencies and 49% departmental charges, price escalation, unforeseen administrative charges. Cost per acre comes out to Rs ~~78.71~~ ~~93.60~~ 121.50 lacs per acre

For Vatika Limited.

Authorized signatory

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

ABSTRACT OF COST

Sub Work No.	Description	Amount in Rs. Lakhs.
SUB WORK NO. I	WATER SUPPLY SCHEME	~~62.00~~ ~~66.45~~ 135.41
SUB WORK NO.II	SEWERAGE SCHEME	~~4.75~~ ~~29.06~~ 30.61
SUB WORK NO.III	STORM WATER DRAINAGE	~~10.00~~ ~~9.43~~ 19.43
SUB WORK NO.IV	ROAD	~~39.69~~ ~~86.45~~ 82.53
SUB WORK NO.V	STREET LIGHTING	~~2.98~~ ~~4.25~~ ~~4.55~~ 5..
SUB WORK NO. VI	HORTICULTURE	~~0.53~~ ~~0.89~~ 84.22
SUB WORK NO. VII	MAINTENANCE CHARGES FOR 10 YEARS INCLUDING RESURFACING OF ROADS AFTER 1ST 5 YEARS AND 2ND 5 YEARS OF MAINTENANCE	81.23 ~~30.17~~ ~~39.76~~ ~~81.23~~ ~~359.~~
	TOTAL	~~277.76~~ ~~190.60~~ ~~275.94~~ 359.7

Cost per Acre = ~~275.94~~ ~~190.60~~/~~2.462~~ = Rs. ~~111~~ ~~55.05~~ per Acre
~~277.76~~/~~2.961~~ = ~~Rs. 93.80 Lacs~~.

Rs. 360.00 / 2.961 Acres = Rs. 121.50 Lacs / Acres

For M/S VATIKA LIMITED

Authorised Signatory

Executive Engineer
HUDA Division No. III
Gurgaon

Superintending Engineer
HUDA Circle No. 1,
Gurgaon

Director General
Town and Country Planning,
Haryana, Chandigarh

Checked subject to comments in forwarding letter No. 13684 Dt. 7.10.13 ...and notes attached with the estimate

7/10/13

Executive Engineer (W) —
for Chief Engineer
HUDA Panchkula

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982,723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

I. DESIGN CALCULATIONS

1. Site Area = 2.961 Acre or 11982.723 Sqm
2. ~~Proposed~~ Personal FAR area = ~~11,982.723~~ sqm 20969.76
3. Population 1612 Person 20723.96 Sqm

4. **Water Calculations (Refer Annexure I : Attached)**

a) Domestic and flushing water demand = ~~100725~~ litres/day 129058

Potable ~~Flushing~~ water demand 65% = 72540 litres/day 83888

Flushing ~~Potable~~ water demand 35% = ~~28185~~ 45170 litres/day

b) Garden irrigation (horticulture) demand = ~~12,950~~ 18500 litres/day

c) HVAC make-up water demand = 00 21000 litres/day

d) DG set cooling tower make-up demand = ~~25,762~~ litres/day

e) Water body make-up demand = 1, 000 litres/day

TOTAL WATER DEMAND = ~~140437~~ 169558 litres/day (A)

f) Sewage influent to STP = ~~82,187~~ litres/day

Treated effluent available from STP@90% = **73,968 litres/day (B)**

→ STP — Proposed STP = 100 KLD

g) NET DAILY REQUIREMENT OF FRESH WATER (A-B) = 56,085 litres/day

SAY 56 KLD

II. Fire demand

As per NBC of India 2005, static underground fire storage = 200 kL

Provided = ~~200 kL~~

III. Underground water tanks provided:

Fire	200 kL	
Raw water	50 kL	
Treated water	~~100~~ kL	50 Addl.
Recycled STP	50	
Treated water	50 kL	
Soft water	25 kL	
Total	**~~425~~ kL**	375

IV. BOREWELLS

Approx discharge of borewells @ ~~12~~ 18 KL/hr. and working ~~12~~ 16 hrs/day

a)	Total fresh Water demand	~~56~~ kLD	8.29
b)	Number of borewells 56 / (12x12)	~~0.39~~ no.	8.02
c)	Add 10% as standby	0.039	0.31
	Total 18x16	**~~0.429~~ nos. , Say 1 nos.**	

It may be noted that HUDA is laying main water trunk lines in the vicinity of the development to supply potable water to the proposed Sector-82A Development and

adjoining areas. Therefore, it is proposed to provide One (1) Nos of Borewells as supplementary source to the HUDA water supply network.

V. PUMPING MACHINERY FOR BOREWELLS

Gross working head	52.00 mts.
Average fall in S.L.	5.00 mts.
Depression Head	5.00 mts.
Friction loss in main	10.0 mts
Total	72.00 mts.

HP= $\frac{12000 \times 72 \times 1}{60 \times 60 \times 75 \times 0.6}$ = ~~5.33~~ 7.99 SAY ~~7.5~~ HP 10HP

VI. BOOSTING MACHINERY (Water distribution pumps).

Demand Potable

a. Potable water supply

- Daily demand/shift — ~~55,085~~ litres/day 84 KLD
- Pumping per hour @ 6 hr. pumping day — ~~9,18~~ litres/hr or ~~153~~ lpm 233 — Say ~~155~~ lpm 240

$\frac{84000}{6 \times 60}$

-Proposed two pumps of ~~155~~ 240 lpm each (1 working+1 standby]

Gross working head [Each pump configuration]

-	Suction lift	0.0 metre
-	Delivery head (residual)	5.0 metres
-	Frictional loss in mains & specials	10.0 mts.
		15.0 metres
-	Clear Head required	55.82 (G+14 roof)+5 metres
		60.82 metres
	Total	75.82metres
	SAY	**80 metres**

Pump HP – $\frac{240 \times 80}{60 \times 75 \times 0.65}$ = ~~4.24~~ 6.57 HP

SAY ~~7.5~~ 240 **HP** 7.5 HP

It is proposed to provide 2 nos of domestic water transfer pumping sets of ~~155~~ lpm discharge each at 80 m. head of 7.5 HP each (**one pump in working** and one as standby).

b. Flushing water supply

- Daily demand/shift — ~~35,256~~ litres/day 45 KLD
- Pumping per hour @ 6 hr. pumping day — 5,876 litres/hr or ~~97.9~~ lpm 125 — Say ~~100~~ lpm 125 LPM

$\frac{45000}{6 \times 60} = 125$

-Proposed two pumps of ~~100~~ 125 lpm each (1 working+1 standby]

Gross working head [Each pump configuration]

-	Suction lift	0.0 metre
-	Delivery head (residual)	5.0 metres
-	Frictional loss in mains & specials	10.0 mts.
		15.0 metres
-	Clear Head required	55.82(G+14 roof)+5 metres
		60.82 metres
	Total	75.82 metres
	SAY	**80 metres**

Pump HP – ~~100~~ 125 x 80 = ~~2.73~~ 3.41 HP
60x75x0.65

SAY ~~7.5 HP~~ 5.00

It is proposed to provide 2 nos of flushing water transfer pumping sets of ~~100~~ 125 lpm discharge each at 80 m. head of 7.5 HP each (**one pump in working** and one as standby).

c. Soft water transfer pumps

- Daily demand/shift ~~25,762=~~ 21000 ~~25,762~~litres/day
- Pumping per hour @ 6 hr. pumping day ~~4.29 litres/hr~~ or ~~71.50~~ lpm Say ~~75~~ lpm

21000 / 6x60 = 60

-Proposed two pumps of ~~75~~ 60 lpm each (1 working+1 standby]

Gross working head [Each pump configuration]

-	Suction lift	0.0 metre
-	Delivery head (residual)	5.0 metres
-	Frictional loss in mains & specials	10.0 mts.
		15.0 metres
-	Clear Head required	55.82 (G+14 roof)+5 metres
		60.82 metres
	Total	75.82 metres
	SAY	**80 metres**

Pump HP ~~75~~ 60 x 80 = 2.05 HP
60x75x0.65

SAY ~~7.5 HP~~ 5.00

It is proposed to provide 2 nos of soft water transfer pumping sets of 75 lpm discharge each at 80 m. head of 7.5 HP each (**one pump in working** and one as standby).

VII. PUMPS FOR FIRE PROTECTION

S.NO.	PARAMETERS	LOCATION	PUMP SETS		
			JOCKEY	MAIN	DIESEL
a.	Discharge in lpm	Pump room	**180**	**2850**	**2850**
b.	Head in meters		**120**	**120**	**120**
c.	HP		~~7.5~~ 10	**120**	**120**
d.	Quantity in nos		2	**2**	**1**

VIII. CAPACITY OF GENERATING SETS

S.NO.	EQUIPMENT	QTY	HP	TOTAL HP
1	TUBEWELL	1	~~7.5~~ 10	~~7.5~~ 10
2	DOMESTIC+FLUSHING PUMP+SOFT WATER (1 working pump only considered)	1 each from each set	~~10+10+5=25~~ 20	~~25~~ 20
3	JOCKEY PUMP	1	~~7.5~~ 10	~~7.5~~ 10
	TOTAL			~~40 HP~~
				~~30 kW~~
			SAY	~~50 kVA~~

10 + 20 + 10 = 40 HP

Since diesel engine pump is provided no electrical back up is required for main fire pump.

40x0.746x1.50 = 44.76

Say : 50 kVA

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

SUB WORK No. I — **Water Supply**

1.	Sub Head No. 01	Water Supply Head Works	13,01,600
2.	Sub Head No. 02	Pumping Machinery	19,60,000
3.	Sub Head No. 03	Rising Main from HUDA	62,500
4.	Sub Head No. 04	Distribution System	86,000
5.	Sub-Head No. 05	Fire fighting	3,13,100
6.	Sub-Head No. 06	Irrigation	3,08,220
		TOTAL	40,31,420.00
		Add 3% contingencies & PH Charges	1,20,942.60
		TOTAL	41,52,362.60
		Add 49% Departmental charges, Price escalation, unforeseen, Admn. charges	20,34,657.67
		TOTAL	61,87,020.27

Say 62 Lakhs

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982,723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. I — Water Supply
Sub Head No. 01 — Head Works

Amount in Rs.

1. Boring and installing 510 mm I/d bore well with reverse Rotary rig Complete with pipe and strainer to a depth of About 120-metre.1 Nos @ Rs. ~~2,50,000~~/- each. — Rs. ~~2,50,000.00~~ (7.00 Lac)
2. Provision for rising mains, connecting bore wells with Water main and Bye-pass arrangements. — Rs ~~21,600.00~~ (0.54 Lac)
   a) ~~65~~ MM X 30 M @ Rs.~~720~~/- (150 @ 1800)
3. Providing Boosting arrangement by pumps: Capacity 12000 lph@52 m, ~~7.5~~ 10 HP-1 nos @ Rs. ~~75,000.00~~ each, (2.00 + 50 Lac each) — Rs. ~~75,000.00~~ (2.00 Lac)
4. Provision for carriage for materials — L.S. — Rs. ~~10,000.00~~ (1.00 Lac)
5. Construction of U.G. tanks 425 KL Rs. ~~2200~~/ KL (3000/-) — Rs. ~~9,35,000~~.00 (13.12 Lac)
6. Provision for Construction of chamber Size 1.50 x 1.10 x 2.00 M for housing Tube well – 1 nos @ Rs. ~~10,000~~- each (1.00 Lac each) — Rs. ~~10,000.00~~ (1.50 Lac)

TOTAL (150) — **Rs. ~~13,01,600.00~~** (25.16)

Add cost recycle line for HUDA main (L.S.) UGT and inter connection with STP — ~~23,44,600/-~~ (0.20)

(C.O. cost to final abstract of cost Sub Work No.1). — (25.46) ~~23.47~~ Lac

Bill of Materials [Reference drawing: PL-603]

S.No	Name of Line	Length in metre	Discharge KL/Hr	Velocity ft/sec	Friction loss in metres	Line loss M/100m	Commulative line loss
	SYMBOL	~~65MM~~ (150)					
1	BW1 - BW1A	3	18	3.28	3.875	3.1	3.875
2	BW1A - BW1B	15	18	3.28	.440	3.1	4.315
3	BW1B – UG TANK	12	18	3.28	.440	3.1	4.150
	TOTAL	30					

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. I
Sub Head No. 02

Water Supply
Pumping Machinery
Amount in Rs.

1.	Providing and installing electricity driven submersible pumping set capable of delivering about ~~12KL~~ / ~~12Hr~~. of water against a total Head of ~~52~~ M complete with motor and other accessories. ~~2~~ Nos. @ Rs. ~~75,000/-~~	Rs. ~~75,000.00~~
2.	Provision for diesel engine genset each for standby arrangements For T.W. & Booster Pump complete with gear head arrangements of following capacities. - 1 No. ~~60~~ KVA @ Rs. ~~6,00,000/-~~	Rs. ~~6,00,000.00~~
3.	Providing & installing pumping set of following capacity For fire protection	
	- 180 lpm at 120m Head 2 No. @ Rs. ~~75000~~/- [elect.]	Rs. ~~1,50,000.00~~
	- 2850 lpm at 120m Head 1 No. @ Rs. ~~400000~~/-[diesel]	Rs. ~~4,00,000.00~~
	- 2850 lpm at 120m Head 2 No. @ Rs. ~~250000~~/- each [elect.]	Rs. ~~5,00,000.00~~
4.	Provision for chlorination plant complete 1 nos @ Rs. ~~60,000~~/- Each	Rs. ~~60,000.00~~
5.	Provision for making foundations and erection of Pumping Machinery (lump sum)	Rs. ~~50,000.00~~
6.	Provision for pipes, valves and specials inside the pump Chamber and boosting chamber. (Lump sum)	Rs. ~~50,000.00~~
7.	Provision for electric service connection including electrical Fittings for tube-well and boosting chamber etc. (lump sum)	Rs. ~~50,000.00~~
8.	Provision for carriage of material and other unforeseen Items etc. L/S	Rs. ~~25,000.00~~
	TOTAL	**Rs. ~~19,60,000.00~~**

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

(b) 2 nos Sub Pump - 125 LPM - 80m head 1.00 HP
(for recycle) (1 wt 1 SB)
2 nos @ 0.80 lacs each 1.60 lacs

(c) 2 nos Pump 60 LPM - 80m head 5 HP
(1 wt 1 SB) 2 nos @ 1.55 lacs 1.10 lacs

(d) 2 nos Pump, 170 LPM - 20m - 2.5 HP 1.50 lacs
(for Hot-Wardens) (1 wt 1 SB)
2 nos @ 0.75 lacs each 50-2a lacs

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982,723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub-Work No. I
Sub Head No. 03

Water Supply
Rising Main from HUDA
Amount in Rs.

1. Providing, laying, jointing and testing ~~GI/GI~~ pipe lines Including cost of excavation etc. complete in all respects. - ~~80~~ mm dia. 35 m @ Rs. ~~800/-M~~	Rs.	~~28,000~~.00
2. Providing and fixing sluice valve including cost of surface boxes And masonry chambers etc. complete in all respects. - ~~80~~mm i/d 2 No. @ Rs. ~~4500~~/- each	Rs.	~~9,000~~.00
3. Providing and fixing indicating plates for sluice valve and air valves 2 No.@ Rs. ~~500~~/- each	Rs.	~~500~~.00
4. Providing and fixing air release and scour valve - ~~2~~ no. @ Rs. ~~5000~~/- each	Rs.	~~5,000~~.00
4. Provision for carriage for materials and other Unforeseen items (L/S)	Rs.	~~5,000~~.00
5. Provision for cutting of roads and making good to its original Conditions. (L/S)	Rs.	~~15,000~~.00
TOTAL	Rs.	~~62,500~~.00

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

Friction loss calculation for HUDA rising main:

S.NO.	Line	Daily Demand KL	Peak flow (2.5xav. Flow)	Length Mtr.	Dia mm	Friction loss in line	Velocity ft/sec.
1.	Rising main HUDA-UG tank	~~56~~ KLD	~~140~~ KLD	35	~~80~~ 100	0.125 m	2.62 (0.8 m/s)

Bill of Materials [Reference drawing: PL-603]

MUNICIPAL WATER SUPPLY LINE MATERIAL STATEMENT		
S.NO.	NAME OF LINE	LENGTH OF WATER SUPPLY LINE IN MTR. 100 ~~80Ø~~
1	1 TO 2	3
2	2 TO 3	15
3	3 TO 4	15
4	4 TO PUMP ROOM	2
	TOTAL	35

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. I
Sub-Head No. 04

Water Supply
Distribution System

	Amount in Rs.
1. Providing, Laying, jointing and testing G.I pipe line including Fittings cost of excavation etc. complete in all respect.	
- G.I. Pipe (Domestic Line) 80 mm , 22 M @ Rs. 800.00	Rs. 17,600.00
- G.I. Pipe (Flushing Line) 65 mm , 20 M @ Rs. 720.00	Rs. 14,400.00
- G.I. Pipe (Soft Water Line) 50 mm ,15 M @ Rs. 600.00	Rs. 9,000.00
2. Provision for carriage for materials and others unforeseen items	Rs. 20,000.00
3. Providing and fixing sluice valve:	
- 80 mm dia 2 Nos. @ Rs. 4500/- each	Rs. 9,000.00
- 65 mm dia 2 Nos. @ Rs. 3500/- each	Rs. 7,000.00
- 50 mm dia 2 Nos. @ Rs. 3000/- each	Rs. 6,000.00
4. Providing and fixing indicating plates for sluice valves -6 Nos.@ Rs. 500/- each	Rs. 3,000.00
S. Row for Road Cuts Carriage material	
TOTAL	**Rs. 86,000.00**

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

Say Rs. Lakhs.

Sub Work No. I
Sub-Head No. 04

Water Supply
Distribution System

Bill of Materials [Reference drawing: PL-603]

S.No	Line	Daily Demand 4 times avg.demand	Length Mtr.	Dia mm	Friction loss in metres	Velocity ft.sec	Head available	Head of pump meter
1	UGT - Overhead tanks	80 ~~50~~	22	100 ~~80~~	5.94	3.95	69.06	75
2	UGT - Overhead tanks	80 ~~50~~	20	100 ~~65~~	4.5	2.95	69.06	75
3	UGT - Overhead tanks	80 ~~50~~	15	100 ~~50~~	2.5	1.5	69.06	75

NOTE

L.S. 57M length for block ABC from D

Block ABC will be fed from, Block D at basement level (B.1) The blocks are inter connected for supply of water through basement (L.S) Row of 57M is taken in estimate.

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. I
Sub-Head No. 05

Water Supply
Fire fighting
Amount in Rs.

1.	Providing, Laying, jointing and testing M.S pipe line Including fittings, cost of excavation etc. complete In all respects. -M.S. pipe 150mm dia 165M @ Rs. ~~1200~~/- M M S pipe 200mm dia 30m @ 1500/-	Rs.	~~1,98,000.00~~ ~~247500/-~~ 247500/-
2.	Providing and fixing Sluice valve -150mm dia 3 no @ Rs. ~~5200~~/- each 7000/- 1 Rs 12000/-	Rs.	~~15,600.00~~ ~~21000/-~~ 36000 30000/- 0.30
3.	Providing and fixing fire hydrants with accessories 9 nos @ Rs. ~~5000~~/- each 10000/-	Rs.	~~45,000.00~~ ~~90000/-~~ 90,000/-
4.	Provision for carriage of materials & other unseen items etc. L.S	Rs.	50,000.00
5.	Provision for indicating plates 9 nos@ Rs. ~~500~~ 1000/- each	Rs.	~~4,500.00~~ 9000/-
	Prov for Road cut and restoration	Rs.	0-50
	TOTAL	Rs.	~~3,13,100.00~~ ~~417500/-~~ 5.13

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

Say ~~4.18 lacs~~. 5.13 lacs

Bill of Materials [Reference drawing: PL-603

FIRE FIGHTING LINE MATERIAL STATEMENT

S.NO.	NAME OF LINE	LENGTH OF FIRE PIPE LINE IN MTR. 150Ø
1	EFH-1	8
2	EFH-2	5
3	EFH-3	40
4	EFH-4	7
5	EFH-5	5
6	EFH-6	6
7	EFH-7	4
8	EFH-8	50
9	EFH-9	40
	TOTAL	165

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. I — Water Supply

Sub Head – 6 — Garden Irrigation

S.NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	Providing, laying, jointing and testing HDPE pipes lines conforming to IS-4984 including cost of excavation etc. complete in all respects.				
A	Pipe 32mm O.D.	Mtr	13	140	1,820.00
B	Pipe 90 mm O.D. (80 dia)	Mtr	441	400	1,76,400.00
2	Providing and fixing CI butterfly valve with valve chamber 80 mm size	Each	3	4500	13,500.00
3	Providing and fixing irrigation pumps complete with foundation, motor control panel, cabling etc. Set of two pumps	Set	1	1,00,000	1,00,000.00
4	Providing and fixing irrigation hydrant valves in all respect.			1000	13000
A	25mm dia	Each	13	~~500~~	~~6,500.00~~
5	Provision for carriage of materials and other unforeseen items	L/S		10000	10,000.00
	TOTAL				~~3,08,220.00~~

0.02
1.76
0.14
0.13
0.10
2.15
~~314720~~
~~315~~ 214720
2.15

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

Sub Work No. I — Water Supply
Sub Head – 6 — Garden Irrigation

Bill of Materials [Reference drawing: PL-603]

IRRIGATION LINE MATERIAL STATEMENT			
S.NO.	NAME OF LINE	LENGTH OF IRRIGATION LINE IN MTR.	
		90MM OD	32MM OD
1	A TO B	67	1
2	B TO C	22	1
3	C TO D	39	1
4	D TO E	83	1
5	E TO F	60	1
6	F TO G	45	1
7	G TO H	9	1
8	H TO I	2	1

9	I TO J	12	1
10	J TO K	2	1
11	K TO L	54	1
12	STP TO L	11	1
13	L TO A	35	1
	GRAND TOTAL	441	13

TOTAL STORMWATER PIPE LENGTH- 441Mtr @ 90mm OD
-13Mtr @ 32mm OD

32MM DIA FOR GARDEN
HYDRANT connection 13 mtr

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub-Work No. II | Sewerage Scheme
Amount in Rs.

1.	Providing, jointing, cutting and testing SW pipe class "A" and lowering into trenches including cost of Excavation, bed concrete, cost of manholes etc. Complete.	
	a) SW pipe 200 mm i/d avg. depth 0-2 M 235 M @ Rs. ~~890~~/M 1250	Rs. ~~2,09,150.00~~ 293750 2.94
	b) Provision for lighting and watching	Rs. ~~25,000.00~~ 1.00 Lac
	c) Provision for timbering and shoring	Rs. ~~25,000.00~~ 1.00 Lac
	d) Provision for making connection with HUDA	Rs. ~~25,000.00~~ 1.00 Lac
	e) Provision for carriage of material (L.S)	Rs. ~~25,000.00~~ 1.00 Lac
	d) Cost of STP 100 KLD @ 12000/- per KLD	Rs. 1200000/-
	Prov for carriage of material ... TOTAL	Rs. ~~3,09,150.00~~ ~~1893750~~ 19.9
	Add 3% contingencies & PH charges	Rs ~~9,274.50~~ ~~56812~~ 597.20 0.6
	TOTAL	Rs. ~~3,18,424.50~~ ~~1950562~~ 20,53,880 20
	Add 49% Departmental charges, price escalation, Unforeseen admn. charges	Rs. ~~1,56,028.00~~ ~~955775~~ 1006,377/- 10
	TOTAL	Rs. ~~4,74,452.50~~ ~~2906338~~

(C.O. to final abstract of cost). Say ~~4.75~~ Lakhs ~~29.06 Lakhs~~ 30.60 L.

Design statement

1.	Total domestic demand	~~90,341~~ 129 LPD
2.	Flow to sewer (129 x 80%)	~~82,187~~ 130 LPD
3.	Av. Hourly sewage discharge 129	~~10.69~~ 12.87 kL/hr
4.	Peak sewage discharge (3.5 timesxAv. Discharge)	~~37.40~~ 45.06 kL/hr = ~~0.294~~ cusec.
5.	Carrying capacity of 200mm dia sewer at Half flow and 2.46 ft/sec. (0.75m/s) Velocity	~~0.416~~ 0.3 cusec.

Therefore the proposed dia of 200 mm @1:150 slope is more than adequate.

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub-Work No. II — Sewerage Scheme

Bill of Materials [Reference drawing: PL-601]

S.No.	Line Nos	Length	Slope	Pipe Dia
1	MH-1 - MH-2	14	1:150	200 MM
2	MH-2 - MH-3	13	1:150	200 MM
3	MH-3 - MH-4	10	1:150	200 MM
4	MH-4 - MH-5	19	1:150	200 MM
5	MH-5 - MH-6	29	1:150	200 MM
6	MH-6 - MH-7	7	1:150	200 MM
7	MH-7 - MH-8	15	1:150	200 MM
8	MH-8 - MH-9	10	1:150	200 MM
9	MH-9 - MH-10	12	1:150	200 MM
10	MH-10 - MH-11	12	1:150	200 MM
11	MH-11 - MH-12	10	1:150	200 MM
12	MH-12 - MH-13	24	1:150	200 MM
13	MH-13 - MH-14	5	1:150	200 MM
14	MH-14 - MH-15	21	1:150	200 MM
15	MH-15 - MH-16	24	1:150	200 MM
16	MH-16 - STP	10	1:150	200 MM

TOTAL SEWERAGE PIPE LENGTH- 235Mtr @ 200mm DIA

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982,723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub-Work No. III

Storm Water Scheme
Amount in Rs.

1a) Providing, laying, RCC pipe class NP-3 including Manholes etc.complete in all respects.		4.20
i) 400mm dia RCC pipe 240 M @ ~~850~~ 1750/M		Rs. ~~2,04,000.00~~ 4200001-
b) Provision for road gullies& connecting pipe	L.S.	Rs. ~~50,000.00~~ 1.50 Lac
c) Provision for lighting and watching		Rs. ~~25,000.00~~ 1.00 Lac
d) Provision for timbering and shoring		Rs. ~~25,000.00~~ 1.00 Lac
e) Provision for making connection with HUDA		Rs. ~~25,000.00~~ 1.00 Lac
f) Provision for carriage of material (L.S)		Rs. ~~25,000.00~~ 1.00 lacs.
g) Provision for rainwater harvesting arrangements 2.961@ Rs. 1.00 lakhs per acre		Rs. 2,96,100.00 2.96
	Total	**Rs ~~6,56,100.00~~** 1966100/-
Add 3% contingencies & P.H. charges		Rs. ~~19,503.00~~ 31983/-
		Rs. ~~6,69,603.00~~ 1304083/-
Add 49% Departmental charges, price escalation, Unforeseen admn. charges		Rs. ~~3,28,105.47~~ 639000/-
	Total	**Rs. ~~9,97,708.47~~** 1943083/-
	Say	**~~Rs. 10 Lakhs~~** 19.43 Lac.

(C.O. cost to final abstract of cost).

Design Statement

1.	Area of site	- 2.961 acres
2.	Run off @ ¼" rainfall [For coefficient of runoff=0.7]	- 1.302 cusec.
3.	Average load per recharge pit (main 3 zones)	- 0.186 cusec
4.	Carrying capacity 400 dia pipe at 2.30-ft./sec velocities	- 0.650 cusec.

Therefore, proposed drain size is enough to carry discharge from site.

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub-Work No. III — Storm Water Scheme

Bill of Materials [Reference drawing: PL-602]

S.No.	Line Nos	Length	Slope	Pipe Dia
1	MH-1 TO MH-2	21	1:400	400 MM
2	MH-2 TO MH-3	7	1:400	400 MM
3	MH-3 TO MH-4	11	1:400	400 MM
4	MH-4 TO MH-5	19	1:400	400 MM
5	MH-5 TO RW PIT	9	1:400	400 MM
6	RW PIT TO MH-6	1	1:400	400 MM
7	MH-6 TO MH-7	9	1:400	400 MM
8	MH-7 TO MH-8	9	1:400	400 MM
9	MH-8 TO MH-9	12	1:400	400 MM
10	MH-9 TO MH-10	18	1:400	400 MM
11	MH-10 TO MH-11	5	1:400	400 MM
12	MH-11 TO MH-12	12	1:400	400 MM
13	MH-12 TO MH-13	11	1:400	400 MM
14	MH-13 TO MH-14	24	1:400	400 MM
15	MH-14 TO MH-15	11	1:400	400 MM
16	MH-15 TO RW PIT	2	1:400	400 MM
17	MH-16 TO MH-17	0	1:400	400 MM
18	MH-17 TO MH-18	23	1:400	400 MM
19	MH-18 TO MH-19	19	1:400	400 MM
20	MH-19 TO MH-20	8	1:400	400 MM
21	MH-20 TO MH-15	9	1:400	400 MM

TOTAL STORM WATER PIPE LENGTH - 240Mtr @ 400mm DIA

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. IV — Road work

SUBHEAD IV - ROADS

Road Width	Length in Metres	Metalled portion	Area in Sq.mt.
7.0mt.	54.00	7.00	3,78.00
9.0mt.	30.00	9.00	270.00
12.0mt.	31.00	12.00	372.00
9.0mt.	30.00	9.00	270.00
15.0mt.	30.00	15.00	450.00
15.0mt.	31.00	15.00	372.00
15.0mt.	30.00	15.00	450.00
6.0mt.	64.00	6.00	384.00
7.0mt.	36.00	7.00	252.00
6.0mt.	45.00	6.00	270.00
6.0mt.	30.00	6.00	180.00
TOTAL	411.00		3,648.00
Add 10% for Curves	Add 10% for Curves		361.00
GRAND TOTAL			4,013.00

S. No.	Description of Work	Area in Sq.mt.
1	Provison for Levelling & Earth filling as per site Conditions ~~2.77~~ 2.961 acres @Rs. ~~70000/-~~ per acres ~~10000/acre~~ 1.50 Per/ acres	~~2770000/-~~ ~~193900.00~~ 4.44
2	Soling coat 100 mm thick (63-45) mm gauge compacted to 75 mm thick WBM conforming to MOT specifications (Table 400-6, Grading No. 2)	
#	Wearing (Top coat) coat 100 mm thick (53-22.4) mm gauge compacted to 75 mm thick WBM conforming to MOT specifications (Table 400-6, Grading No. 3)	36.12 Lac
#	~~25~~ 50mm thick BM/20mm MSC ~~premix carpet with seal coat~~ 4013.0 sq.mt. @ Rs. ~~350/-~~ per sq.mt. ~~550/-~~ 900/-	~~2207150/-~~ ~~1,404,550.00~~

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982,723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

3	Provison for Kerbs & Channels of CC 1:2:5 --- 411 x 2 = 822 Rmt. @Rs. 350/- per Rmt.	287,700.00
4	Provison for making approach to each block and pavements. LS	500,000.00
5	Provison for guide map and other unforseen & indicating board etc.LS	50,000.00
6	Provison for Traffic Light arrangement LS	50,000.00
7	Provison for carriage of material & unforseen charges LS	100,000.00
	TOTAL	2,068,150.00
	Add 3% contingencies & PE charges	77,584.50
	TOTAL	2,663,734.50
	Add 49% Department Charges, Price Escalation, unforseen, Admn. Charges	1,305,230.00
	GRAND TOTAL	3,968,964.00
	SAY	39,68,960.00

Say Rs. 39.68 lakhs

(C.O. to final abstract of cost.)

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11.982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. V Street Lighting

SUBHEAD V - STREET LIGHTING

S. No.	Description of Work	Area in Sq.mt.
1	Providing street lighting on roads as per standard specifications ~~2.77~~ 2.961 acres @Rs. ~~70000~~ 100000/-per acres	~~1,93,900.00~~ ~~277000/-~~ 296100/-
	Add 3% contingencies & PE charges	~~5817.00~~ ~~8310/-~~ 8883/-
	TOTAL	~~1,99,717.00~~ ~~285310/-~~ 304983/-
	Add 49% Department Charges, Price Escalation, unforseen, Admn. Charges	~~9,7861.12~~ ~~139801/-~~ 149442/-
	GRAND TOTAL	~~2,97,578.33~~ ~~425111/-~~ 454425/-

Say Rs. ~~2.98~~ ~~4.25~~ 4.55 lakhs 4.55 lacs

(C.O. to final abstract of cost.)

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. VI — Plantation & Road side Trees

SUBHEAD VI - HORTICULTURE

S. No.	Description of Work	Area in Sq.mt.
1	Development of Lawn Areas	
#	Trenching the ordinary soil upto depth of 60 cm i.e. removal and staging of serviceable material & disposing by spreading and levelling within a lead of 50 mt. and making up the trench area for proper levels by filling with earth or earth mixed with manure before or after flooding trench with water i.e cost of imported earth and manure	
#	Rough dressing of Turfed Area	
#	Grassing with " DOOB GRASS " i.e watering and maintainance of lawns for 30 days till the grass forma a thick lawn, free from weeds and fit mowing in rows 7.5cm part in either direction including provisioning for hedges and turbed wire around park. Approx. ~~0.125~~ acres organized green @ Rs. ~~70000~~/per acre.	2.96 lac ~~12500/-~~ ~~8,750.00~~
	2.961 Acs Rs. 1.00 lacs/Acs	
2	Providing and planting trees along 6.0mt. Wide and more width at 12mt. Interval Total Road Length = 411.0Rmt. No. of Trees @ 12mt. c/c = 34Nos. Cost Details Excavation Rs. 30.00 Manure Rs. 60.00 Tree Plant Rs. 60.00 Tree Guard Rs. ~~600.00~~ 750 Total Rs. ~~750.00~~ 900 34 Nos. @ Rs. ~~750.00~~ 900 each	0.30 ~~25,500.00~~
	TOTAL	38000 ~~34,250.00~~ J.
	Add 3% contingencies & PE charges	1140 ~~1,027.50~~
	TOTAL	39140 ~~36,277.50~~ J.
	Add 49% Department Charges, Price Escalation, unforseen, Admn. Charges	19178 ~~17,285.97~~ 1.6
	GRAND TOTAL	~~553789~~ ~~52,563.47~~
	SAY	~~52,563~~

Say Rs. ~~0.53~~ 0.58 lakhs (500 lacs)

(C.O. to final abstract of cost)

PROPOSED TOWN SQUARE (VATIKA RET-004) MEASURING 11,982.723 SQM (2.961 ACRES) AT SECTOR-82A, GURGAON

Sub Work No. VII MTC. Charges and resurfacing of roads

SUBHEAD VII - MTC CHARGES & RESURFACING OF ROADS

S. No.	Description of Work	Area in Sq.mt.
1	Provison for Maintainence charges for Water Supply, Sewerage, Storm Water, Drainage, Roads, Strre Lighting, Horticulture, etc. including Operation & establishment charges as HUDA norms after completion	
#	~~2.77~~ 2.961 acres @ Rs. ~~2.75~~ 50 Lacs per acre	~~7,61,750.00~~ ~~1480500~~ (14.80)
2	Provison of Resurfacing of Roads after first five years of maintainence i.e. 100mmthk. With 25mmthk. premix carpet with seal coat with mechanical paver	
#	4013.0 sq.mt @ Rs. ~~200~~ ~~350~~ 400/- per sq.mt.	~~802,600.00~~ ~~1404550~~ 1605200 (16.05)
3	Provison of Resurfacing of Roads after first ten years of maintainence i.e. 100mmthk. With 25mmthk. premix carpet with seal coat with mechanical paver	
#	4013.0 sq.mt @ Rs. ~~100~~ 600/- per sq.mt.	~~401,300.00~~ 2407800
	TOTAL	~~18,65,650.00~~ ~~5193350~~ 5293285
	Add 3% contingencies & PE charges	~~58,969.50~~ ~~155920~~ 158798 (54.9)
	TOTAL	~~20,24,619.50~~ ~~5350270~~ 5451063 (56.59)
	Add 49% Department Charges, Price Escalation, unforseen, Admn. Charges	~~9,92,063.55~~ 2671301 ~~2623102~~
	GRAND TOTAL	~~30,16,683.00~~
	SAY	~~30,16,683.00~~ ~~7976378~~ ~~8722936~~ 84.32

Say Rs. ~~30.17~~ ~~81.25~~ ~~79.76 Lakhs~~ 84.32 Lacs lakhs

ANNEXURE-III

STATEMENT OF WATER SUPPLY LINES

TOTAL FAR 21,028.77 sqm

TOTAL POPULATION 1612 persons Permanent
1879 persons Floating/visitors

S.No.	Name of Line	POPULATION TO BE SERVED (Nos.) Self		Branch	Water requirement in kL @45 lit/per/day for permanent and 15 lit/per/day for floating	Discharge/ hour @6 hours pumping	Size of pipe (mm)	Loss of head m/m	Total loss of head (m)	Length of pipe (metres)	Ground Level V/End	Ground Level L/End	Hydraulic level V/End	Hydraulic level L/End	Head available (metres)
		Permanent	Floating												
	MUNICIPAL LINE														
1	1 TO 2	1612	1879	0	100725	16787.5	80	0.002	0.005	3	237.34	238.04	11.999	11.998	11.760
2	2 TO 3	1612	1879	0	100725	16787.5	80	0.002	0.023	15	238.04	238.04	12.000	11.998	11.737
3	3 TO 4	1612	1879	0	100725	16787.5	80	0.002	0.023	15	238.04	238.07	12.000	11.998	11.715
4	4 TO UGT	1612	1879	0	100725	16787.5	80	0.002	0.003	2	238.07	238.07	12.000	11.998	11.712
	BOREWELL LINE														
7	BW1-BW1A	1612	1879	0	100725	16787.5	65	0.001	0.032	22.5	238.04	238.04	15.238	15.207	14.968
8	BW1A-BW1B	1612	1879	0	100725	16787.5	65	0.001	0.061	43.5	238.04	238.04	15.207	15.146	14.908
9	BW1B-UGT	1612	1879	0	100725	16787.5	65	0.001	0.014	10	238.04	238.07	15.146	15.132	14.894

ANNEXURE-I

S.No.	Line No.	Self Area (m2)	Self Area (Acre)	Branch Area (Acre)	Total Area (Acre)	Total Area (Hec)	Rain Fall mm/hr	Discharge @17.36 lps/Hec	Length in mtr.	Pipe dia in mm	Slope 1 in	Velocity m/sec.	Cap. of pipe in lps.	Fall in line mtr.
1	1 - 2	1425	0.35	0.05	0.40	0.16	6.25	2.78	21	400	400	0.72	90.28	0.05
2	2 - 3								7	400	400	0.72	90.28	0.02
3	3 - 4								11	400	400	0.72	90.28	0.03
4	4 - 5	745	0.18	0.05	0.63	0.25	6.25	4.34	19	400	400	0.72	90.28	0.07
5	5 - RW PIT								9	400	400	0.72	90.28	0.12
6	RW PIT - 6								1	400	400	0.72	90.28	1.30
7	6 - 7								9	400	400	0.72	90.28	0.02
8	7 - 8	1250	0.30	0.05	0.35	0.14	6.25	2.43	9	400	400	0.72	90.28	0.09
9	8 - 9								12	400	400	0.72	90.28	0.03
10	9 - 10	2852	0.70	0.05	1.10	0.44	6.25	7.64	18	400	400	0.72	90.28	0.04
11	10 - 11								5	400	400	0.72	90.28	0.01
12	11 - 12								12	400	400	0.72	90.28	0.03
13	12 - 13								11	400	400	0.72	90.28	0.05
14	13 - 14								24	400	400	0.72	90.28	-0.03
15	14 - 15	2620	0.65	0.05	1.80	0.73	6.25	12.67	11	400	400	0.72	90.28	0.05
16	15 - RW PIT								2	400	400	0.72	90.28	0.01
17	16 - 17	970	0.24	0.05	0.29	0.12	6.25	2.08	4	250	350	0.72	90.28	0.00
18	17 - 18								23	400	400	0.72	90.28	0.06
19	18 - 19								19	400	400	0.72	90.28	0.04
20	19 - 20								8	400	400	0.72	90.28	0.02
21	20 - 15	2120	0.52	0.05	0.86	0.35	6.25	6.08	9	400	400	0.72	90.28	0.06

Ground Level		Invert Level		Depth		
Start (M)	End (M)	Start (M)	End (M)	Start (M)	End (M)	Average (M)
238.04	238.04	236.84	236.79	1.20	1.25	1.23
238.04	238.04	236.79	236.77	1.25	1.27	1.26
238.04	238.04	236.77	236.74	1.27	1.30	1.29
238.04	238.04	236.74	236.67	1.30	1.37	1.34
238.04	238.14	236.67	236.65	1.37	1.49	1.43
	238.14		236.84		1.30	0.65
238.14	238.14	236.84	236.82	1.30	1.32	1.31
238.14	238.14	236.82	236.73	1.32	1.41	1.37
238.14	238.14	236.73	236.70	1.41	1.44	1.43
238.14	238.14	236.70	236.66	1.44	1.48	1.46
238.14	238.14	236.66	236.65	1.48	1.49	1.49
238.14	238.14	236.65	236.62	1.49	1.52	1.51
238.14	238.14	236.62	236.57	1.52	1.57	1.55
238.14	238.04	236.57	236.50	1.57	1.54	1.56
238.04	238.04	236.50	236.45	1.54	1.59	1.57
238.04	238.04	236.45	236.44	1.59	1.60	1.60
238.06	238.04	236.84	236.82	1.22	1.22	1.22
238.04	238.04	236.82	236.76	1.22	1.28	1.25
238.04	238.04	236.76	236.72	1.28	1.32	1.30
238.04	238.04	236.72	236.70	1.32	1.34	1.33
238.04	238.04	236.70	236.64	1.34	1.40	1.37

ANNEXURE-II

S.NO.	SEWER LINE	Tower No.	Total Population	Total Water Requirement	Sewage Discharge (LPD)			Average Sewage Discharge	Peak Sewage Discharge		Size of Pipe	Velocity	Design Discharge	Length of Line
				LPD	Self	Branch	Total	LPS	LPS	Cusec	mm	feet/sec	cusec	Meters
1	2	3	4	5	8	9	10	11	12	13	14	15	16	17
1	1 - 2	BLOCK A	781	19259	17 333		17 333	0.2006	0.60	0.02	200	2.80	0.47	14
2	2 - 3					17 333	17 333	0.2006	0.60	0.02	200	2.80	0.47	13
3	3 - 4					17 333	17 333	0.2006	0.60	0.02	200	2.80	0.47	10
4	4 - 5					17 333	17 333	0.2006	0.60	0.02	200	2.80	0.47	19
5	5 - 6					17 333	17 333	0.2006	0.60	0.02	200	2.80	0.47	29
6	6 - 7					17 333	17 333	0.2006	0.60	0.02	200	2.80	0.47	7
7	7 - 8					17 333	17 333	0.2006	0.60	0.02	200	2.80	0.47	15
8	8 - 9					17 333	17 333	0.2006	0.60	0.02	200	2.80	0.47	10
9	9 - 10	BLOCK B	640	16724	15 051	17 333	32 384	0.3748	1.12	0.04	200	2.80	0.47	12
10	10 - 11					32 384	32 384	0.3748	1.12	0.04	200	2.80	0.47	12
11	11 - 12					32 384	32 384	0.3748	1.12	0.04	200	2.80	0.47	10
12	12 - 13					32 384	32 384	0.3748	1.12	0.04	200	2.80	0.47	24
13	13 - 19	BLOCK C	631	16558	14 902	32 384	47 286	0.5473	1.64	0.06	200	2.80	0.47	5
14	14 - 15					47 286	47 286	0.5473	1.64	0.06	200	2.80	0.47	21
15	15 - 16					47 286	47 286	0.5473	1.64	0.06	200	2.80	0.47	24
16	16 - STP	BLOCK D	1639	64690	58 221	47 286	1 05 507	1.2211	3.66	0.13	200	2.80	0.47	10

Slope	Fall in Metres		Ground level		Invert Level		Depth of Pipe at		Average depth of pipe
	As per gradient	As per pipe slope	Start	End	Start	End	Start	End	
18	19	20	21	22	23	24	25	26	27
			(M)	(M)	(M)	(M)	(M)	(M)	(M)
150	0.00	0.10	238.04	238.04	236.84	236.74	1.20	1.30	1.25
150	0.00	0.09	238.04	238.04	236.74	236.65	1.30	1.39	1.34
150	0.00	0.06	238.04	238.04	236.65	236.59	1.39	1.45	1.42
150	0.00	0.18	238.04	238.04	236.59	236.41	1.45	1.63	1.54
150	0.00	0.20	238.04	238.14	236.41	236.21	1.63	1.93	1.78
150	0.00	0.04	238.14	238.14	236.21	236.17	1.93	1.97	1.95
150	1.00	0.10	238.14	238.14	236.17	236.07	1.97	2.07	2.02
150	2.00	0.07	238.14	238.14	236.07	236.00	2.07	2.14	2.10
150	3.00	0.04	238.14	238.14	236.00	235.96	2.14	2.18	2.16
150	4.00	0.03	238.14	238.14	235.96	235.93	2.18	2.21	2.19
150	5.00	0.03	238.14	238.14	235.93	235.90	2.21	2.24	2.22
150	6.00	0.16	238.14	238.04	235.90	235.74	2.24	2.30	2.27
150	7.00	0.04	238.04	238.04	235.74	235.70	2.30	2.34	2.32
150	8.00	0.12	238.04	238.04	235.70	235.58	2.34	2.46	2.40
150	9.00	0.18	238.04	238.04	235.58	235.40	2.46	2.64	2.55
150	10.00	0.08	238.04	238.04	235.40	235.32	2.64	2.72	2.68

RET004- VATIKA INX TOWN SQUARE, GURGAON

Total plot area		2.961 Acres	11982.723 sqm	11982.723 Sq.m.
Green belt & service road area		0.190 Acres	768.93 sqm	
Net site area		2.771 Acres	11213.72 sqm	
Ground coverage	Permitted	@40%	4793.06 sqm	
	Achieved	38.17%	4574.17 sqm	
Proposed FAR			21,028.77 sqm	

WATER REQUIREMENT AND WASTEWATER TREATMENT PLANT CAPACITY CALCULATIONS

S.No.	Usage description	Usage-wise floor Area (Sqm)	Total floor area (Sqm)	Population per sqm	Total Population	Water usage per head/day	<-------Water & STP Calculations --------> Total water usage lit/day	Flow to sewer (%)	Sewer flow lpd
1	**General water requirement for potable and flushing usage**								
1.1	**Block A (G+2)**		**2742.28**						
	Retail use Ground floor		1,347.73	3	449				
				Shop works@10% population	45	45	2,025	90.00	1,823
				Shoppers@90% population	404	15	6,064	90.00	5,457
	1st and 2nd floors	1,394.55	1,394.55	6	232				
				Shop works@10% population	23	45	1,035	90.00	932
				Shoppers@90% population	209	15	3,135	90.00	2,822
1.2	Add for 100 seats in restaurant-1 no.				100	70	7,000	90.00	6,300
2	**Block B (G+2)**		**2139.36**						
2.1	Retail use Ground floor		1,104.76	3	368				
				Shop works@10% population	37	45	1,665	90.00	1,499
				Shoppers@90% population	331	15	4,969	90.00	4,472
	1st and 2nd floors	1,034.60	1,034.60	6	172				

				Shop works@10% population	17	45	765	90.00	689
				Shoppers@90% population	155	15	2,325	90.00	2,093
2.2	Add for 100 seats in restaurant-1 no.				100	70	7,000	90.00	6,300
3	**Block C (G+2)**		**2107.02**						
3.1	Retail use Ground floor		1,077.60	3	359				
				Shop works@10% population	36	45	1,620	90.00	1,458
				Shoppers@90% population	323	15	4,848	90.00	4,363
	1st and 2nd floors	1,029.42	1,029.42	6	172				
				Shop works@10% population	17	45	765	90.00	689
				Shoppers@90% population	155	15	2,325	90.00	2,093
3.2	Add for 100 seats in restaurant-1 no.				100	70	7,000	90.00	6,300
4	**Block D (G+14)**		**14040.11**						
4.1	Retail use Ground floor		1,004.08	3	335				
				Shop works@10% population	33	45	1,485	90.00	1,337
				Shoppers@90% population	300	15	4,525	90.00	4,073
4.2	Business use	13,036.03	13,036.03	10	1304	45	58,680	90.00	52,812
5	**Sub total I**						**117,231**		**105,508**
6	Equipment backwash etc.						**7,327**	100.00	7,327
7	Add for maintenance staff/security etc.				100	45	4,500	90.00	4,050
8	**TOTAL [1 to 11]**						**129,058**		**116,885**
II	Horticultural demand @25 kL/Acre		0.74 Acre (~25%)				18,500		
III	HVAC Make-up water for HVAC Cooling	Air cooled system					0		0
IV	DG cooling tower/air washer make-up demand	Assumed for 6 hours operation (Subject to confirmation by Elect/HVAC Engineers)					21,000	Bleeding from cooling tower considered	525
V	Water body make-up (Provision made)						1,000		0

VI	**GRAND TOTAL**	**169,558**	**117,410**

VII WATER BALANCE CALCULATIONS

DAILY WATER DEMAND FOR DOMESTIC PURPOSES	129,058
DAILY SEWAGE INFLUENT LOAD TO STP	117,410
LIKELY RECOVERY FROM STP @90%	105,669
USE OF RECYCLED WATER FOR FLUSING USE @50% OF DOMESTIC WATER USE EXCEPT EQUIPMENT BACKWASH & RESTAURANTS	50,365
USE OF RECYCLED WATER FOR HORTICULTURAL USE	18,500
NET BALANCE STP WATER AVAILABLE FOR INDUSTRIAL USE e.g. AC/DG COOLING TOWER MAKE-UP+AIR WASHERS	36,803
ACTUAL REQUIREMENT OF RECYLED STP WATER FOR INDUSTRIAL USE e.g. AC/DG COOLING TOWER MAKE-UP+AIR WASHERS	21,000
EXCESS STP WATER TO BE DISPOSED OFF IN PUBLIC SEWER EVERY DAY	15,803
NET FRESH WATER DEMAND AFTER REUSE OF STP RECYLED WATER FOR NON-POTABLE USE(in litres/day)	**79,692**

VIII MoEF EIA norms effect on plumbing design

Since the project is being approved by MoEF for EIA norms (total area exceeding 20,000 sqm), the per person water consumption requirement shall drop by 30% and hence the net water balance equation shall also change as listed below:

WATER BALANCE CALCULATIONS (All figures in litres): CONSIDERED FOR SERVICE ESTIMATES WAER CALCULATIONS

DAILY WATER DEMAND FOR DOMESTIC PURPOSES (after 30% reduction)	90,340
DAILY SEWAGE INFLUENT LOAD TO STP	82,187
LIKELY RECOVERY FROM STP @90%	73,968
RESTAURANTS	35,256
USE OF RECYCLED WATER FOR HORTICULTURAL USE (after 30% reduction)	12,950
NET BALANCE STP WATER AVAILABLE FOR INDUSTRIAL USE e.g. AC/DG COOLING TOWER MAKE-UP+AIR WASHERS	25,762
ACTUAL REQUIREMENT OF RECYLED STP WATER FOR INDUSTRIAL USE e.g. AC/DG COOLING TOWER MAKE-UP+AIR WASHERS	21,000
EXCESS STP WATER TO BE DISPOSED OFF IN PUBLIC SEWER EVERY DAY	4,762
NET FRESH WATER DEMAND AFTER REUSE OF STP RECYLED WATER FOR NON-POTABLE	**56,085**
TOTAL DAILY WATER DEMAND IN THE GREEN BUILDING (POTABLE+FLUSHING+AC/DG MAKEUP+IRRIGATION)	125,290
NET REDUCTION IN DAILY FRESH WATER DEMAND IN GREEN BUILDING	**23,608**
% REDUCTION IN FRESH WATER DEMAND IN GREEN BUILDING	**29.62%**

Domestic & flushing water demand = 90341 lit/day

IX PROVISION FOR WATER STORAGE TANKS [capacities in kL]

TANK NOMENCALTURE	Underground Water Tanks	< Terrace water tanks ----->			
		Blk A	Blk B	Blk C	Blk D
FIRE TANK	200	10	10	10	20
RAW WATER	50				
TREATED WATER WATER	100	0	0	0	25

All potable and flushing water supply to Blocks A,B & C (G+2) shall be supplied from the overhead tanks provided on top

FLUSHING WATER TANK	Nil	0	0	0	25	of Tower D (G+14) to provide adequate pressure in excess of 2 bar.		
RECYCLED STP WATER TANK+AC WTP FEED TANK	50	Nil	Nil	Nil	Nil			
SOFT WATER [HVAC ONLY]	25	Nil	Nil	Nil	5			
TOTAL WATER STORAGE PROVIDED MINUS FIRE TANK	**225**	**0**	**0**	**0**	**55**			**55**
	Total underground water storage provided for ~1.8 day's requirement (As per Green bldg. norm)						*Total overhead water storage provided for ~0.44 day's requirement I/c SW make-up*	
TOTAL WATER STORAGE INCLUDING FIRE TANK	**725**	**10**	**10**	**10**	**75**	**0**	**0**	

X **Details of rainwater harvesting system**

It is proposed to do total rainwater harvesting for the project as per EIA norms. The detailed calculations are given below:

RAINWATER HARVESTING STRUCTURE DESIGN CALCULATIONS

S.NO.	DESCRIPTION	AREA CONSDIERED (IN SQM)	RUNOFF COEFFICIENT (As/IGBC norms)	AVERAGE ANNUAL RAINFALL (mm)	TOTAL VOLUME OF WATER AVAILABLE FOR RWH (Cum/year)	DESIGN RAINFALL INTENSITY (max. precipitation in mm in 15 min)	VOLUME OF RWH PIT DETENTION TANK REQUIRED FOR 15 min MAXIMUM RAINFALL
1	ROOF TOP WATER	4,574.17	0.95	795.4	3,456.38	25	108.637
2	PAVED SURFACES, ROADS AND OTHER BUILT UP AREAS	4,412.82	0.75	795.4	2,632.47	25	82.740
3	LAWS, GARDEN AND OTHER GREEN SPACES	2,995.66	0.2	795.4	476.55	25	14.978
	TOTAL				**6,565.40**		**206.36**

Number of recharge pits planned	**3**
Capacity of each recharge pit detention tank required (cum)	69
Assumed depth of water in each recharge pit detention tank (m)	2.5
Surface area of each recharge pit detention tank (sqm)	28
Aspect ratio	1:2
Required width of recharge pit detention tank (m)	3.71
Required length of recharge pit detention tank (m)	7.42

PROPOSED SIZE OF EACH RECHARGE PIT DETENTION TANK — **7.5X3.75X2.5 m (Liquid depth)**

PROPOSED LIQUID HOLDING VOULME OF EACH RECHARGE PIT (cum) — **70.31**

Notes: (i) The oil and grease trap and final recharge pipe pit shall be in addition to above mentioned detention tank.