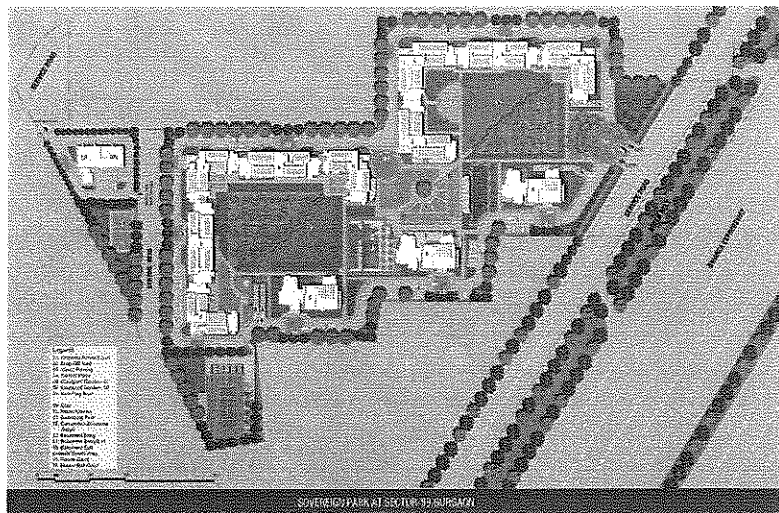


GROUP HOUSING SCHEME MEASURING 10.43125

AT SEC.99, GURGAON (HR.)

SERVICE ESTIMATE, DESIGN REPORT AND CALCULATION OF INTERNAL DEVELOPMENT WORKS



DEVELOPED BY



M/S VATIKA LIMITED

Report

Gurgaon town of Haryana State is situated on Delhi - Jaipur National Highway No.8 at a distance of 30 kms from 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, Haryana Urban Development Authority has already developed residential sector which are fully inhabited to an extent. Further to the increasing demand HUDA has planned to develop new sectors at outskirts of Gurgaon town.

This report and estimate is for approval of for Group housing scheme measuring 10.43125 Acres at Sector 99, Gurgaon

WATER SUPPLY

At present the source of water supply in this area is HUDA and optional bore well. As the underground water is potable, provision for 1 number of bore well have been made in this estimate. It has been proposed to construct underground tanks of capacity as per attached details and at location for domestic purpose and for fire protection. The underground tanks will be fed from the bore wells and HUDA supply, from there water will be supplied by set of variable frequency pump to all towers. The water supply system has been designed as per the Hazen William formula.

DESIGN

The scheme has been designed for population considering 5 person for each apartment and 2 person for EWS. The rate of water supply per head/day has been taken as (150+15%) i.e. 172.5 liters per head per day.

PUMPING EQUIPMENTS

It has been proposed to install pumping set as described with standby of equal capacity. Standby electric power requirement is added to the main DG Sets in case of electricity failure.

SEWERAGE SCHEME

Sewer lines have been designed for three times average D.W.F in relation to water supply demand. It has been assumed that about 80% of the domestic water supply shall find its way into the proposed sewer. Sewer lines shall be laid to a gradient maintaining minimum 2.46 ft./sec self-cleaning velocity. Sewer line up to 400mm dia has been designed to run half full and above 400mm dia has been designed to run three fourth full at peak flow. Necessary provision for laying S.W/RCC pipe sewer line, construction of required number of manholes etc., has been made in the estimate.

Necessary design statement for entire sewerage system has been prepared and attached with estimate. Manning's formula has been used on the design of sewerage system.

STORM WATER DRAINAGE

We proposed to lay underground R.C.C. pipe drains with required number of catch basins, manholes and rainwater recharge pits with over flow to the Proposed HUDA storm drain on sector Road. The intensity of rain fall has been taken as ¼" per hour. R.C.C storm water line will be designed as per Manning's formula.

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

Roads have been provided to above zones and estimate is prepared as per revised specifications adopted by HUDA

STREET LIGHTING

Provision for streets also has been made

HORTICULTURE

Estimates of plantation, landscaping, signage, etc., have been included

RATES

The estimate has been prepared based on the present market rates

COST

The total cost of the scheme, including cost of all services works out to be

Per Acres Including 3% Contingencies @

Rs. 85,045,137.49
49% Departmental

101950000/- OR 9774000/-

For Vatika Sovereign Park Private Limited

Authorised Signatory

Project: Group housing colony for Vatika Group at sector 99, Gurgaon
DAILY WATER DEMAND & PUMPING SYSTEM (Annexure - 1)

S No.	Building		Unit		Population @5 Person/Unit & @2 Person/Unit for service personnel and EWS	Water Req. @ 172.5 lpcd		Water Req. Flushing 33% Domestic 67%	
			Main	Ser.		In LPD	In KLD	In KLD	In KLD
I		Height							
1	Tower A (G+35)	130.5 Mtr.	68		340	58650	58.65	19	39
2	Tower B (G+36)	124.15 Mtr.	69		345	59513	59.51	20	40
3	Tower C (G+36)	124.15 Mtr.	70		350	60375	60.38	20	40
4	Tower D,H (G+10)	37.45 Mtr.	40		200	34500	34.50	11	23
5	Tower E,G,L (G+12)	44.65 Mtr.	69		345	59513	59.51	20	40
6	Tower F,J,K,M (G+10)	44.65 Mtr.	84		420	72450	72.45	24	49
7	EWS Unit	20.25 Mtr.	71		142	24495	24.50	8	16
8	Club Building	3.5 Mtr.			0	25000	25.00	8	17
10	Filter back wash					10000	10.00	N/A	10
11	Swimming pool					10000	10.00	N/A	10
12	DG Cooling					20000	20.00	20	N/A
13	10% of total population as visitors @ 15lpcd		47.1			707	0.71	0	0
Total			471	0	2189.1	435201.50	435.20	150.42	284.79
	i	Horticulture total area of 3.459 acres @ 25000 / Acre from STP			59,450		59	60	KL
	ii	Fire demand 100 * (P in thousand) ^{1/2} only for Underground static Reservior			147,956		148	450	KL
	iii	STP capacity 80% of daily domestic and flushing water			348,161.20			350	KLD
2	Under ground water tank				Req.	Provided			
	i	Daily fresh water demand			285	200	KL		
	ii	Daily flushing water demand			150	100	KL		
	ii	For Fire Fighting Static demand			148	450	KL		
	iii	Total under ground Tank Capacity			583	750	KL		
					Say	750	KL		
Therefore it is proposed to construct under ground water tank of									
	Fire Reserve			200 X 3	600	KL			
	Raw Water Tank			75 X 1	75	KL			
	Domestic Tank			150 X 1	150	KL			
	Flushing Tank			100 X 1	100	KL			
	Total				925	KL			
3A	Fresh Water Transfer Pumpset for A,B,C								
	a)	Pump Capacity							
	i	Total Domestic Demand for Main (i)				120		KLD	
	ii	Daily Working Hrs for pumping				8.0		Hrs	
	iii	Required Pumping Capacity				249		LPM	
	iv	Proposed pump set (1 W + 1S)			Say	280		LPM	
	b)	Pump Head							
	i	Suction lift				0		Mtr	
	ii	Elevation Height				140		Mtr	
	iii	Residual Head				15		Mtr	
	iv	Friction Head Loss				4.72			
	v	Total pump head required				160		Mtr	
					Say	160		Mtr	
	c)	Pump HP							
	i	Power Required each pump (Lpm*head (m)/4500*.65(effi)				15.3		HP	
				Say		15.5		HP	
3B	Fresh Water Transfer Pumpset for D,H,F,E,G,L,J,K,M,EWS,Retail & Club								
	a)	Pump Capacity							
	i	Total Domestic Demand for Main (i)				165		KLD	
	ii	Daily Working Hrs for pumping				8.0		Hrs	
	iii	Required Pumping Capacity				344		LPM	
	iv	Proposed pump set (1 W + 1S)			Say	350		LPM	
	b)	Pump Head							
	i	Suction lift				0		Mtr	
	ii	Elevation Height				55		Mtr	
	iii	Residual Head				15		Mtr	
	iv	Friction Head Loss				4.82			
	v	Total pump head required				75		Mtr	
					Say	75		Mtr	
	c)	Pump HP							
	i	Power Required each pump (Lpm*head (m)/4500*.65(effi)				9.0		HP	
				Say		6.5		HP	

4A Flushing Water Transfer Pumpset for A,B & C			
a) Pump Capacity			
i Total Flushing Demand for Main (i)		59	KLD
ii Daily Working Hrs for pumping		8	Hrs
iii Required Pumping Capacity		123	LPM
iv Proposed pump set (1 W + 1S)	Say	100	LPM
b) Pump Head			
i Suction lift		0	Mtr
ii Elevation Height		140	Mtr
iii Residual Head		15	Mtr
iv Friction Head Loss		1	
v Total pump head required	Say	156	Mtr
		160	Mtr
c) Pump HP			
i Power Required each pump (Lpm*head (m)/4500*.65(effi)		5.5	HP
	Say	5.5	HP
4B Flushing Water Transfer Pumpset for D,H,F,E,G,L,J,K,M,EWS,Retail & Club			
a) Pump Capacity			
i Total Flushing Demand for Main (i)		71	KLD
ii Daily Working Hrs for pumping		8	Hrs
iii Required Pumping Capacity		149	LPM
iv Proposed pump set (1 W + 1S)	Say	200	LPM
b) Pump Head			
i Suction lift		0	Mtr
ii Elevation Height		55	Mtr
iii Residual Head		15	Mtr
iv Friction Head Loss		3.00	
v Total pump head required	Say	73	Mtr
		70	Mtr
c) Pump HP			
i Power Required each pump (Lpm*head (m)/4500*.65(effi)		4.8	HP
	Say	4.0	HP
5 Irrigation Water Transfer Pumpset			
a) Irr. water Pump Capacity			
i Total Irr. Demand (i)		59	KLD
ii Daily Working Hrs for pumping		3	Hrs
iii Required Pumping Capacity		330	LPM
iv Proposed pump set (1 W + 1S)	Say	400	LPM
b) Pump Head			
i Suction lift		0	Mtr
ii Elevation Height		35	Mtr
iii Residual head		25	Mtr
iv Friction Head Loss		10	
v Total pump head required	Say	70	Mtr
		70	Mtr
c) Pump HP			
i Power Required each pump (Lpm*head (m)/4500*.65(effi)		9.6	HP
	Say	6	HP
6 Fire Pumpset			
i Wet Riser Pump (Electric operated)		2,850	LPM
ii Sprinkler pump (Electric operated)		2,850	LPM
iii Diesel pump (Diesel operated)		4,500	LPM
iv Jockey pump (Electric operated)		180	LPM
v Jockey pump (Electric operated)		180	LPM
vi Curtain pump (Electric operated)		2,280	LPM
a1) Pump Head (for main electrical pumps)			
i Suction lift		0	Mtr
ii Elevation Height		140	Mtr
iii Residual head		35	Mtr
iv Friction Head Loss		15	
v Total pump head required	Say	190	Mtr
		190	Mtr
a2) Pump HP (for main electrical pumps)			
i Power Required each pump (Lpm*head (m)/4500*.65(effi)		185.1	HP
	Say	185	HP
b1) Pump Head (for jockey electrical pumps)			
i Suction lift		0	Mtr

	ii	Elevation Height				140		Mtr	
	iii	Residual head				35		Mtr	
	iv	Friction Head Loss				10			
	v	Total pump head required				185		Mtr	
					Say	190		Mtr	
	b2)	Pump HP (for jockey electrical pumps)							
	i	Power Required each pump (Lpm*head (m)/4500*.65(effi)				11.7		HP	
					Say	12		HP	
	c1)	Pump Head (for Curtain electrical pumps)							
	i	Suction lift				0		Mtr	
	ii	Elevation Height				20		Mtr	
	iii	Residual head				15		Mtr	
	iv	Friction Head Loss				15			
	v	Total pump head required				50		Mtr	
					Say	50		Mtr	
	c2)	Pump HP (for Curtain electrical pumps)							
	i	Power Required each pump (Lpm*head (m)/4500*.65(effi)				39.0		HP	
					Say	31		HP	
7	Borewell Number & Pumping machinery (borewells will be installed of authorities Permits)								
	a)	Number of borewell							
	i	Yield / Borewell				12.0		KL/Hr	
	ii	Operation Borewell per day				8.0		Hrs	
	iii	Half Day Requirement				75.2		KL	
	iv	Required number of Borewell				0.8		Nos	
	v	Add 10% as standby				0.1		Nos	
	vi	Total Number of bore well				0.9		Nos	
				Bore well Required	Say	1.0		Nos	
				Bore well Provided		1.0		Nos	
	b)	Pumping Machinery for Borewell							
	i	Gross working head				60		Mtr	
	ii	Average Fall in S.L.				5		Mtr	
	iii	Depression Head loss				5		Mtr	
	iv	Friction Loss in main				10		Mtr	
	v	Total Head Required				80		Mtr	
	vi	Power Required each pump (Lipm*head (m)/4500*.65(effi)				5.47		HP	
					Say	6.0		HP	
Note:-Entire Water to the proposed development is to be supplied by HUDA from the canal filtration scheme and therefore it is proposed to install one borewell as standby.									
8	CAPACITY OF DG SET								
		Equipment Description	No of Pump	Each power cons (HP)		Total Power Cons		Unit	
	i	Dom. Water Transfer Pumps A,B,C (Working)	1	15.5		16		HP	
	ii	Dom Water Transfer Pumps D,E,F,G,H,J,K,L,EWS (Working)	1	6.5		7		HP	
	iii	Bore wells	1	6.0		6		HP	
	iv	Flu. Water Transfer Pumps A,B & C (Working)	1	5.5		6		HP	
	v	Flu. Water Transfer Pumps D,E,F,G,H,J,K,L,EWS (W	1	4.0		4		HP	
	vi	Irr. Water Transfer Pumps (Working)	1	5.5		6		HP	
	vii	Total HP Required				43.0		HP	
	viii	DG KVA Required (HP*.8)				34		KVA	
		DG Capacity				40		KVA	
9	HUDA Water Suply Line (for domestic water use)								
		Total Water Demand	Line	Flow	Propose d Dia	Length of Line	Fractional Head Loss	Velocity	Total Head Loss
		LPD		LPM	mm	Mtr.	Mtr./ Mtr.	Mtr./Sec.	Mtr.
	i	284785.01	A - Tank	237.32	100	80	0.00556	0.6040	0.445

Description	Total of sub work	3% Contingencies and	TOTAL	49% departmental charges	Grand Total
Sub Work-1 Water Supply	16268560 13,832,535	488056 414,976	16756616 14,247,511	8210742 6,981,280	24967359 21,228,791
Sub Work-2 Sewerage	4213900 4,025,900	126417 120,777	4340317 4,146,677	2126755 2,031,872	6467072 6,178,549
Sub Work-3 Drainage	5921000 5,071,000	177630 152,130	6098630 5,223,130	2988329 2,559,334	9086959 7,782,464
Sub Work-4 Road Works	16140000 13,493,000	484200 404,790	16624200 13,897,790	8145858 6,809,917	24770058 20,707,707
Sub Work-5 Street Lighting	2116000 1,773,000	63480 53,190	2179480 1,826,190	1067945 894,833	3247425 2,721,023
Sub Work-6 Plantation	1715600 1,168,000	51450 35,040	1766450 1,203,040	865560 589,490	2632010 1,792,530
Sub Work-7 Services & Resurfacing of road	20050000 16,054,000	601580 481,620	20651580 16,535,620	10119235 8,102,454	30770735 24,638,074
TOTALS	Rs. 55,417,435.00	Rs. 1,662,523.05	Rs. 57,079,958.05	Rs. 27,969,179.44	Rs. 85,049,137.49
Total Cost —	Rs. 85,049,137.49				101941618

101941618

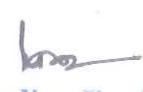
say Rs 101950000/-

For: **For Vatika Sovereign Park Private Limited**

 Authorised Signatory

Cost Per Acres Rs $\frac{101950000}{10.43125} = 97.74$ (Lacs)


 Executive Engineer
 HUDA Division No. III
 Gurugram


 Superintending Engineer
 HUDA Circle No. I,
 Gurgaon

SUB WORK No. 1
WATER SUPPLY

S No.	Heads	Description	Amount
1	Sub Head 01	WATER SUPPLY	Rs. 3,943,500.00 4443500/-
2	Sub Head 02	HUDA Rising Mains	Rs. 279,500.00 636000/-
3	Sub Head 03	Pumping and Machinery	Rs. 5,785,000.00
4	Sub Head 04	Water Supply and distribution	Rs. 2,374,050.00 3620250/-
5	Sub Head 05	Flushing/Irr. System	Rs. 1,450,485.00 1783810/-
TOTAL			Rs. 13,832,535.00 16268560/-

SUB WORK No. 1		WATER SUPPLY
Sub Head 01		Bore well & rising Main
S No.	Description	Amount
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 meter	
	1 Nos. @ Rs. 500,000 each.	Rs. 500,000.00
2	Prvision for rising mains, connecting Bore wells with water main and bye-pass arrangements: for tank feeding.(CILA Pipe)	
a)	80 mm dia 35 Mtr. @ Rs. 1,600	Rs. 56,000.00
b)	100 mm dia 0 Mtr. @ Rs. 2,100	Rs. 0.00
3	Construction of UG Tank (In total) 925 KL @ Rs. 3,500 /-KL	Rs. 3,237,500.00
4	Provision of unseen items/carriage of materials	Rs. 50,000.00
5	Provision for construction of pump chamber of Size 1.5 x 5 x 1.5 m for Housing	
	Bore wells 1 Nos. @ Rs. 100,000 ^{150,000/-}	Rs. 100,000.00 ^{150,000/-}
Total of Sub Head 01 Carried over to summary of Sub work - 1		Rs. 3,943,500.00 ^{4443500/-}

Material statement for Bore well refers to Water demand chart & Design chart Dom.

SUB WORK No. 1				WATER SUPPLY	
Sub Head 02				HUDA Rising Mains	
S No.	Description			Amount	
1	1. Providing, laying, jointing and testing CILA pipe lines from HUDA mains to water tank				
a)	100 mm dia pipe	80 Mtr.	@ Rs. 2,100	Rs. 168,000.00	
2	Providing and fixing sluice valve including cost of surface boxes and masonry chambers etc. complete in all respects				
a)	100 mm dia	1 Nos.	@ Rs. 11,000	Rs. 11,000.00	
3	Providing and fixing indicating plates for sluice valve and air valves				
a)	1 Nos.	@ Rs. 500	each	Rs. 500.00	
4	Provision for carriage for materials and other unforeseen items (L/S)			Rs. 25,000.00	
5	Provision for cutting of roads and making good to its original conditions (L/S)			Rs. 25,000.00	
6	Provision for making connection with HUDA (L/S)			Rs. 50,000.00	
Total of Sub Head 02 Carried over to summary of Sub work - 1				Rs. 279,500.00	
Material statement for HUDA Rising mains refers to Water demand chart					
Sub Head 03				Pumping and machinery	
S No.	Description			Amount	
1	Providing and installing electricity driven submersible pumping set capable of delivering about 14 KL/Hr of water against a total head of 80m complete with motor and other accessories				
	1 Nos.	Rs. 100,000.00		Rs. 100,000.00	
2	Providing & installing following capacity for Water supply Booster Pumps				
a)	Capacity 280 LPM @ 140 mtr. Head (A,B,C)	2 Nos. @	Rs. 180,000.00 each.	Rs. 360,000.00	
b)	Capacity 200 LPM @ 55 mtr. Head (D,H,F,E,G,L,J,K,M,EWS,RETAIL Etc.)	2 Nos. @	Rs. 225,000.00 each.	Rs. 450,000.00	
3	Providing & installing pumping set of following capacity for Flushing Pumps				
a)	Capacity 150 LPM @ 140 mtr. Head (A,B,C)	2 Nos. @	Rs. 125,000.00 each.	Rs. 250,000.00	
b)	Capacity 200 LPM @ 55 mtr. Head (D,H,F,E,G,L,J,K,M,EWS,RETAIL Etc.)	2 Nos. @	Rs. 150,000.00 each.	Rs. 300,000.00	
4	Providing & installing pumping set of following capacity for Multistage Fire Pumps				
a)	Capacity 2850 LPM @ 55/140 mtr. Head (Main)	2 Nos. @	Rs. 480,000.00 each.	Rs. 960,000.00	
b)	Capacity 180 LPM @ 140 mtr. Head (Jockey)	1 Nos. @	Rs. 110,000.00 each.	Rs. 110,000.00	
c)	Capacity 180 LPM @ 90 mtr. Low Head (Jockey)	1 Nos. @	Rs. 110,000.00 each.	Rs. 110,000.00	
d)	Capacity 2280 LPM @ 20 mtr. Head (Curtain)	1 Nos. @	Rs. 275,000.00 each.	Rs. 275,000.00	
e)	Capacity 4500 LPM @ 140 mtr. Head (diesel)	1 Nos. @	Rs. 850,000.00 each.	Rs. 850,000.00	
5	Providing & installing pumping set of following capacity for Irrigation Pumps				
a)	Capacity 400 LPM @ 35 mtr. Head	2 Nos. @	Rs. 80,000.00 each.	Rs. 160,000.00	
6	Provisions for chlorination plant complete			1 Nos @	Rs. 60,000.00 each
7	Provision for making foundations and erection of pumping machinery				
	1 set @	Rs. 25,000.00		Rs. 25,000.00	
8	Provision for pipes, valves and specials inside the boosting chamber				
	1 Set @	Rs. 25,000.00		Rs. 25,000.00	
9	Provision for electric service connection including electrical fittings for boosting pumps. 10 Set @			Rs. 75,000.00	
10	Provision for carriage of material and other unforeseen items etc. L/S			Rs. 100,000.00	
11	Provision for diesel engine Gen set each for standby arrangements for booster pump complete with gear head arrangements of 40 KVA capacities – 1 No.			Rs. 1,000,000.00	
Total of Sub Head 03 Carried over to summary of Sub work - 1				Rs. 5,785,000.00	

SUB WORK No. 1	WATER SUPPLY
Sub Head 04	Water supply and distribution (Domestic)

S No.	Description	Amount
1	Providing, laying, jointing and testing GI pipe lines including fittings etc. complete in all respects.	
a)	50 mm Pipe 300 Mtr @ Rs. 550 1000/-	Rs. 165,000 Rs. 300,000/-
b)	65 mm Pipe 439 Mtr @ Rs. 750 1250	Rs. 329,063 Rs. 548,750/-
c)	80 mm Pipe 171 Mtr @ Rs. 550 1400	Rs. 94,188 Rs. 239,400/-
d)	100 mm Pipe 130 Mtr @ Rs. 750 2200	Rs. 97,500 Rs. 286,000/-
2	Providing, laying, jointing and testing MS pipe lines including fittings etc complete in all respects.	
a)	80 mm Pipe 294 Mtr @ Rs. 1,600	Rs. 470,400
b)	150 mm Pipe 276 Mtr @ Rs. 2,800	Rs. 772,800
3	Providing and fixing sluice valve including cost of surface boxes and masonry chambers etc. complete in all respects.	
a)	50 mm 3 Each @ Rs. 3,200 9500/-	Rs. 9,600 28800
b)	65 mm 5 Each @ Rs. 4,000 12500/-	Rs. 20,000 62500
c)	80 mm 3 Each @ Rs. 6,500 16000/-	Rs. 19,500 48000
d)	100 mm 1 Each @ Rs. 9,000 21000/-	Rs. 9,000 21000
4	Providing and fixing External Fire Hydrants	
	27 Nos @ Rs. 11,000 18000/-	Rs. 297,000 486000/-
5	Providing and fixing air release valve	
	8 Nos @ Rs. 5,000 12000/-	Rs. 40,000 96000
7	Provision for carriage of materials and other unforeseen items	Rs. 50,000
Total of Sub Head 04 Carried over to summary of Sub work - 1		Rs. 2,374,050.00 3620250/-

Project - SOVEREIGN PARK SECTOR- 99, GURGAON

Material statement for EFH

S No.	Line		EFH	dia	S No.	Line		EFH	dia
1	A-B	18	1	80	36	O1-O2	52	1	150
2	B1-B	14	1	150	37	O2'-O2	26		150
3	B-C	16	1	80	38	O2'-O	10	1	80
4	C-D	22		150					
5	D1-D	18	1	80					
6	D-E	12		150					
7	E1-E	18	1	80					
8	E1'-E	15	1	150					
9	E2-E3	10	1	80					
10	E3-E	22		150					
11	E-F	40	1	80					
12	F-G	30		150					
13	G1-G2	14	1	80					
14	G2-G3	35	1	150					
15	G3'-G3	46	1	150					
16	G3-G	20		80					
17	H4-H	17	1	150					
18	H1-H2	40		150					
19	H1'-H2'	24	1	150					
21	H2'-H3'	38	1	80					
22	H3'-H5'	30	1	150					
23	H5-1	19		150					
24	I-J	17		150					
25	K-L	28	1	80					
26	L-M	17	1	150					
27	M1-M2	12	1	80					
28	M2'-M2	14	1	150					
29	M2-M3	40		150					
30	M3'-M3	19	1	80					
31	M3-M	22		150					
32	M-N	43		80					
33	N1-N	34	1	150					
34	N2-N	23		150					
35	N-O	37	1	150					
	Total EFH	27	Pipe						
			80mm	294					
			150mm	276					

Project - SOVEREIGN PARK SECTOR-99, GURGAON

Design Statement for Domestic Water supply

Domestic Water supply calculation

S No	Line No	Length h	Self Load	Total person	Daily water @172.5 ltr/Pers on	Others Facilities water consump tion	Total Domestic Demand (LPD) (67% of Total)	Eff. Length (1.25%)	Dia propos ed	Velocity m/Sec	Frictional head loss	Elevation height	Loss in Riser	Total Frictional head losses in Mtr.	Remarks						
	From	To	Mtr	FLATS	EWS	Others	Main Visitors	LPD	LPD	Self	Cumm.	LPM	Mtr.	mm	m/Sec	Mtr./Mtr.	Mtr.	Mtr.	Self	Cumm.	
1	A	B	35	21			105	10.5	18270	12241	12241	25.5	43.75	50	0.260	0.003	44.650	0.117	0.231	0.23	
2	B1	B3	37	21			105	10.5	18270	12241	12241	25.5	46.25	50	0.260	0.003	44.650	0.117	0.237	0.24	
3	B2	B3	26	23			115	11.5	20010	13407	13407	27.9	32.5	65	0.168	0.001			0.028	0.27	
4	B3	B	27				0	0	0	0	25648	53.4	33.75	65	0.322	0.003			0.097	0.36	
5	B	C	33				0	0	0	0	37889	78.9	41.25	65	0.475	0.006	130.500	0.770	1.013	1.01	
6	C1	C	35	21			105	10.5	18270	12241	12241	25.5	43.75	50	0.260	0.003			0.114	0.38	
6	C	D	32				0	0	0	0	50129	104.4	40	80	0.415	0.004	124.150	0.447	0.591	0.59	
7	E	F	52	20			100	10	17400	11658	11658	24.3	65	80	0.097	0.000	124.150	0.030	0.046	0.05	
8	F1	F3	42	23			115	11.5	20010	13407	13407	27.9	52.5	100	0.071	0.000			0.006	0.05	
9	F2	F3	30	71			355	35.5	61770	41386	41386	86.2	37.5	80	0.343	0.003	37.450	0.095	0.189	0.19	
10	F3	F	26				0	0	0	0	54793	114.2	32.5	50	1.162	0.042			1.362	1.41	
11	F	G	23				0	0	0	0	66451	138.4	28.75	80	0.551	0.006			0.175	0.36	
12	G1	G	41	21			105	10.5	18270	12241	12241	25.5	51.25	50	0.260	0.003	3.500	0.009	0.143	0.14	
13	G	H	47				0	0	0	0	78692	163.9	58.75	65	0.988	0.023	0.000	0.000	1.341	1.34	
14	H1	H	30	23			115	11.5	20010	13407	13407	27.9	37.5	50	0.284	0.003			0.116	1.46	
17	H	I	8				0	0	0	0	92098	191.9	10	50	1.953	0.110			1.097	2.55	
18	I	I	28	20			100	10	17400	11658	11658	24.3	35	50	0.247	0.002			0.084	2.64	
19	I	D	30				0	0	0	0	103756	216.2	37.5	65	1.302	0.038			1.429	4.07	
20	D	Pump	62				0	0	0	0	153886	320.6	77.5	100	0.816	0.010			0.752	4.82	
TOWER-A,B,C																					
1	A	B	75	68			340	34	59160	39637	39637	83	93.75	65	0.497	0.006	130.500	0.837	1.438	1.44	
2	B	C	37				0	0	0	0	39637	83	46.25	65	0.497	0.006	124.150	0.796	1.093	1.09	
3	C1	C	18	69			345	34.5	60030	40220	40220	84	22.5	65	0.505	0.007			0.148	1.24	
4	C	D	8				0	0	0	0	79857	166	10	65	1.002	0.023	124.150	2.913	3.147	3.15	
5	D1	D	50	70			350	35	60900	40803	40803	85	62.5	65	0.512	0.007			0.423	1.66	
5	D	Pump	25				0	0	0	0	120660	251	31.25	65	1.514	0.050			1.575	4.72	

Material Sheet for Domestic

1	50 mm	300 Mtr.
2	65 mm	439 Mtr.
3	80 mm	171 Mtr.
4	100 mm	130 Mtr.

Valves

3	1
5	1
3	1
1	1

SUB WORK No. 1					WATER SUPPLY	
Sub Head 05					Water supply and distribution (Flushing/Irr. System)	
S No.	Description					Amount
1	Providing, laying, jointing and testing GI pressure pipe lines conforming to IS:4985 including cost.complete in all respects.					
a)	50	mm OD	331 Mtr @	Rs. 450 - 600/	Flu.	Rs. 148,725
b)	63	mm OD	170 Mtr @	Rs. 550 - 690/	Flu.	Rs. 93,500
c)	75	mm OD	138 Mtr @	Rs. 650 - 850	Flu.	Rs. 89,700
d)	90	mm OD	47 Mtr @	Rs. 850 - 1000	Flu.	Rs. 39,950
2	Providing, laying, jointing and testing HDPE pressure pipe lines conforming including cost.complete in all respects.					
a)	32	mm OD	210 Mtr @	Rs. 450	Irr.	Rs. 94,500
b)	40	mm OD	116 Mtr @	Rs. 560	Irr.	Rs. 64,960
c)	50	mm OD	85 Mtr @	Rs. 650	Irr.	Rs. 55,250
d)	63	mm OD	75 Mtr @	Rs. 800	Irr.	Rs. 60,000
e)	90	mm OD	110 Mtr @	Rs. 1,080	Irr.	Rs. 118,800
f)	110	mm OD	300 Mtr @	Rs. 1,200	Irr.	Rs. 360,000
3	Providing and fixing sluice valve including cost of surface boxes and masonry chambers etc. complete in all respects.					
a)	40	mm	10 Each @	Rs. 2,500		Rs. 25,000
b)	50	mm	3 Each @	Rs. 3,200		Rs. 9,600
c)	65	mm	1 Each @	Rs. 4,000		Rs. 4,000
c)	80	mm	1 Each @	Rs. 4,000		Rs. 4,000
4	Providing and fixing Garden Hydrant Chamber including valve					
	55 Nos.	@	Rs. 4,500 each			Rs. 247,500.00
5	Providing and fixing air release valve					
	2 Nos.	@	Rs. 5,000 each			Rs. 10,000.00
6	Provision for carriage of materials and other unforeseen items					Rs. 25,000.00
TOTAL CO to SUB WORK - 1						Rs. 1,450,485.00

Project - SOVEREIGN PARK SECTOR- 99, GURGAON

Design Statement for Flushing Water supply

TOWER- D,H,F,E,G,L,J,K,M,EWS,Retail & Club

Flushing Water supply calculation																						
S No	Line No	Length	Self Load	Total person			Daily water consumption @172.5 ltr/Pers on	Others water consumption	Total Flushing Demand (LPD) (33% of Total)	Eff. Length (1.25%)	Dia proposed	Velocity	Frictional head loss	Ele. height	Loss in Riser	Total Frictional head losses in Mtr.	Remarks					
	From	To	Mtr	Others	Main	10% Visitors	LPD	LPD	Self	Cumm.	LPM	Mtr.	mm	m/Sec	Mtr./Mtr.	Mtr.	Mtr.	Self	Cumm.			
1	A	B	35	21	105	10.5	18270		6029	6029.1	13	43.75	40	0.200	0.002	44.650	0.093	0.184	0.18			
2	B1	B2	38	21	105	10.5	18270		6029	6029.1	13	46.875	40	0.200	0.002	44.650	0.093	0.191	0.19			
3	B3	B2	26	23	115	11.5	20010		6603	6603.3	14	32.5	40	0.219	0.002	44.650	0.110	0.191	0.19			
3	B2	B	27		0	0	0		0	12632	26	33.75	50	0.268	0.003	44.650	0.124	0.217	0.41			
4	B	C	32		0	0	0		0	18662	39	40	50	0.396	0.006	44.650	0.255	0.483	0.48			
5	C1	C	35	21	105	10.5	18270		6029	6029	13	43.75	40	0.200	0.002	44.650	0.093	0.184	0.59			
6	C	E	34		0	0	0		0	24691	51	42.5	65	0.310	0.003	44.650	0.119	0.233	0.72			
7	E1	E	21	20	100	10	17400		5742	5742	12	26.25	40	0.190	0.002	20.250	0.039	0.089	0.09			
8	E	F	25		0	0	0		0	30433	63	31.25	65	0.382	0.004	3.500	0.014	0.137	0.14			
9	F1	F	40	23	115	11.5	20010		6603	6603.3	14	50	40	0.219	0.002	0.000	0.000	0.123	0.12			
10	F	G	41		0	0	0		0	37036	77	51.25	65	0.465	0.006	0.000	0.000	0.290	0.29			
11	G1	G	30	21	105	10.5	18270		6029	6029.1	13	37.5	40	0.200	0.002	0.000	0.000	0.078	0.08			
12	G	H	8		0	0	0		0	43065	90	10	65	0.540	0.007	0.000	0.000	0.075	0.07			
13	H1	H3	15	23	115	11.5	20010		6603	6603.3	14	18.75	65	0.083	0.000	0.000	0.000	0.004	0.00			
14	H2	H3	6	71	355	35.5	61770		20384	20384.1	42	7.5	50	0.432	0.007	0.000	0.000	0.050	0.05			
14	H3	H	15		0	0	0		0	26987.4	56	18.75	65	0.339	0.003	0.000	0.000	0.059	0.06			
15	H	I	19		0	0	0		0	70052	146	23.75	80	0.580	0.007	0.000	0.000	0.159	0.16			
16	I1	I	14	20	100	10	17400		5742	5742	12	17.5	40	0.190	0.002	0.000	0.000	0.033	0.03			
17	I	STP	28		0	0	0		0	75794.4	158	35	80	0.628	0.008	0.000	0.000	0.271	0.27			
TOWER- A,B,C																						
Flushing Water supply calculation																						
S No	Line No	Length	Self	Total person			Daily	Others	Total	Cumm.	LPM	Eff. Length	Dia	Velocity	Frictional	Ele.	Loss in	Total	Remarks			
		Mtr		EWS	Others	Main	LPD	LPD	Self			Mtr.	mm	m/Sec	Mtr./Mtr.	Mtr.	Mtr.	Self	Cumm.			
1	A	B	72	68		340	34	59160	19523	19522.8	54	90	40	0.863	0.031	0.000	0.000	2.818	2.82			
2	B1	B	20	69		345	34.5	60030	19810	19809.9	55	25	40	0.875	0.032	0.000	0.000	0.804	0.80			
3	B	C	27			0	0	0	0	39333	109	33.75	50	1.112	0.039	0.000	0.000	1.304	2.11			
4	C1	C	78	70		350	35	60900	20097	20097	56	97.5	50	0.568	0.011	0.000	0.000	1.087	1.09			
5	C2	C	78			0	0	0	0	0	0	97.5	51	0.000	0.000	0.000	0.000	0.000	0.00			
5	C	STP	35			0	0	0	0	59430	165	43.75	51	1.615	0.075	0.000	0.000	3.297	3.30			

Material Sheet for Domestic

1	40 mm	331 Mtr.
2	50 mm	170 Mtr.
3	65 mm	138 Mtr.
4	80 mm	47 Mtr.

Valves	10
	3
	1
	1

SUB WORK No. 2
SEWERAGE SCHEME

S No.	Description	Amount
1	Providing , jointing , cutting and testing SW pipe and lowering into trenches including	
a)	150 mm dia 0 Mtr. @ Rs. 2,900 CILA Class (Bye Pass Line)	Rs. 0
b)	200 mm dia 889 Mtr. @ Rs. 1,100 SW Pipe	Rs. 977,900
c)	250 mm dia 20 Mtr. @ Rs. 1,400 SW Pipe	Rs. 28,000
2	Provision for carriage of material (L.S)	Rs. 100,000
3	Provision for making connection with HUDA sewer	Rs. 100,000
4	Provision for cutting of roads & making good to its original condition (L.S.)	Rs. 10,000
5	Provision for lighting and watering (L.S.)	Rs. 10,000
6	Providing STP of 350 KLD Rs. 8,000 per KLD	Rs. 2,800,000
TOTAL CO to FINAL ABSTRACT OF COST		Rs. 4,025,900

42,139.00

SUB WORK No. 3
STORM WATER DRAINAGE

S No.	Description	Amount
1	Providing, laying, RCC pipe class NP-2 manholes etc. complete in all respects	
a)	400 mm dia 758 Mtr. @ Rs. 2,800	Rs. 2,121,000
b)	500 mm dia 0 Mtr. @ Rs. 3,000	Rs. 0
2	Provision for lighting and watching	Rs. 50,000
3	Provision for road gullies & connecting pipe L.S.	Rs. 500,000
4	Provision for rainwater harvesting arrangements	
	Rs. 200,000.00 per set Soak Pit with desilting chamber (Size 4 M Dia x 3 M DIA X 3.5 M Deep) 10 Nos.	Rs. 2,000,000
5	Provision for timbering & shoring (L.S.)	Rs. 150,000
6	Provision for watering and timbering drains & other unforeseen charges	Rs. 150,000
7	Provision for making connection with HUDA Mains.	Rs. 500,000
TOTAL CO to FINAL ABSTRACT OF COST		Rs. 5,071,000

54,21,000/-

M/2+A
B+CLB
C

Project - SOVEREIGN PARK SECTOR- 99, GURGAON						
Material Statement for Sewerage scheme						
S No.	From	To	Length	Dia		
1	1	2	95	200		
2	2	3	55	200		
3	3	4	145	200		
4	4A	4C	42	200		
5	4B	4C	45	200		
6	4C	4	23	200		
7	4	8	131	200		
8	5	6	132	200		
9	6	7	117	200		
10	7	8	104	200		
11	8	STP	20	250		
			200 Dia Pipe	889	Mtr.	
			250 Dia Pipe	20	Mtr.	
			STP	350	KL	
	STP BYEPASS 150 dia CILA Pipe				Mtr.	

Project - SOVEREIGN PARK SECTOR- 99, GURGAON

Design Statement for Drainage scheme

Drainage calculation

S No	Line Ref	Length	Area (Terrace)	Area (Green)	Area (Hard)	Total area to be drained	Drainage calculation																Remarks	
							Area in acre		Rain fall intensity in M3/sec	Discharge		Pipe Dia	Slope	Velocity	Discharge	Check for carrying cap.	Fall	Ground Start	Ground End	Invert Start	Invert End	Depth Start		Depth End
							Self	Total		LPS	Self													
1	1	2	26	400	87	1500	1987	0.491	0.491	0.002	2.22	2.22	400	370	0.75	93.87	OK	0.070	0.56	-1.20	-1.27	1.20	1.85	
2	2	RWH-1	8.5	175	890	650	1705	0.421	0.912	0.001	1.26	3.47	400	370	0.75	93.87	OK	0.023	0.58	-1.29	-1.29	1.85	1.87	
3	RWH-1	3	12	0	900	600	1500	0.371	1.283	0.001	0.94	4.41	400	370	0.75	93.87	OK	0.032	0.58	-1.29	-1.23	1.87	1.70	
4	3	RWH-2	30	390	900	1500	2790	0.689	1.972	0.002	2.48	3.97	400	370	0.75	93.87	OK	0.081	0.48	-1.23	-1.31	1.70	1.88	
5	RWH-2	4	95	260	330	400	990	0.245	2.217	0.001	0.94	4.30	400	370	0.75	93.87	OK	0.257	0.58	-1.31	-1.46	1.88	2.04	
6	4	RWH-3	31	230	170	525	925	0.229	2.446	0.001	0.97	1.83	400	370	0.75	93.87	OK	0.084	0.58	-1.46	-1.55	2.04	2.02	
7	RWH-3	5	25	30	200	620	850	0.210	2.656	0.001	0.76	2.59	400	370	0.75	93.87	OK	0.068	0.48	-1.55	-1.51	2.02	1.96	
8	5	6	23	120	120	160	400	0.099	2.755	0.000	0.40	0.91	400	370	0.75	93.87	OK	0.062	0.45	-1.51	-1.58	1.96	2.18	
9	6A	6	17	0	150	295	445	0.110	0.110	0.000	0.36	0.36	400	370	0.75	93.87	OK	0.046	0.45	-1.58	-1.60	1.20	1.40	
10	6	RWH-4	8	0	130	700	830	0.205	3.070	0.001	0.77	2.05	400	370	0.75	93.87	OK	0.022	0.60	-1.60	-1.60	2.18	2.20	
11																								
12	1	2	43	300	1400	1300	3000	0.741	0.741	0.002	2.31	2.31	400	370	0.75	93.87	OK	0.116	0.48	-1.73	-1.84	1.20	1.42	
13	2	RWH-5	24	100	970	1800	2870	0.709	1.451	0.002	2.37	4.68	400	370	0.75	93.87	OK	0.065	0.58	-1.84	-1.91	1.42	1.48	
14	RWH-5	3	28	260	800	3000	4080	1.003	2.454	0.004	3.81	8.49	400	370	0.75	93.87	OK	0.076	0.58	-1.91	-1.98	1.48	1.46	
15	3	RWH-6	55	0	720	550	1270	0.314	2.768	0.001	0.82	2.62	400	370	0.75	93.87	OK	0.149	0.58	-1.98	-1.03	1.46	1.61	
16	RWH-6	4	37	0	550	200	750	0.185	2.953	0.000	0.40	2.92	400	370	0.75	93.87	OK	0.100	0.58	-1.03	-1.03	1.61	1.61	
17	4	RWH-7	39	325	150	2500	2975	0.735	3.943	0.003	3.16	4.47	400	370	0.75	93.87	OK	0.105	0.58	-1.03	-1.14	1.61	1.71	
18	4A	RWH-7	36	0	500	1030	1030	0.255	0.255	0.001	0.73	0.73	400	370	0.75	93.87	OK	0.097	0.58	-1.03	-1.03	1.20	1.30	
19																								
20	1	2	47	420	670	1250	2340	0.578	0.578	0.002	2.19	2.19	400	370	0.75	93.87	OK	0.127	0.58	-1.63	-1.75	1.20	1.33	
21	2	RWH-8	26	0	126	574	700	0.173	0.751	0.001	0.64	2.83	400	370	0.75	93.87	OK	0.070	0.58	-1.75	-1.82	1.33	1.40	
22																								
23	1	2	64	250	790	1850	2890	0.714	0.714	0.003	2.59	2.59	400	370	0.75	93.87	OK	0.173	0.58	-1.63	-1.80	1.20	1.37	
24	2	RWH-9	46	380	340	2100	2820	0.697	1.990	0.003	2.90	7.61	400	370	0.75	93.87	OK	0.124	0.58	-1.80	-1.92	1.37	1.50	
25	2A	RWH-9	31	0	470	1874	2344	0.579	0.579	0.002	2.12	2.12	400	370	0.75	93.87	OK	0.084	0.58	-1.63	-1.71	1.20	1.28	
26																								
27	1	2	68	0	750	1798	2548	0.630	0.630	0.002	2.13	2.13	400	370	0.75	93.87	OK	0.184	0.45	-1.75	-1.93	1.20	1.38	
28	2	RWH-10	28	320	90	967	1377	0.340	0.970	0.002	1.54	3.67	400	370	0.75	93.87	OK	0.076	0.45	-1.93	-1.01	1.38	1.46	
Material statement for Drainage																								
							Total Soak Pit	10 Nos.				Pipe dia	400	500										
												Length	758	0										

	Sub -Work No.IV			Roads and Footpaths	
Statement for Roads					
Sl.No.	Road No.	Road width (m)	Length (m)	Area (Sqm)	
1	1 ~ 2	6	9.120	54.720	
2	2~ 3	6	2.834	17.004	
3	3 ~ 4	6	82.110	492.660	
5	4 ~ 5	6	5.320	31.920	
6	5 ~ 6	6	161.125	966.750	
7	6 ~ 7	6	19.760	118.560	
8	7 ~ 8	6	270.500	1623.000	
9	8 ~ 9	6	234.350	1406.100	
10	9~ 10	6	15.250	91.500	
11	9~3	17.75	26.365	467.979	
12	3 ~ 12	6	36.420	218.520	
13	1 2~ 11	6	221.100	1326.600	
14	1 2~ 4	6	57.950	347.700	
15	1 1~ 8	6	17.520	105.120	
16	11 ~ 13	6	23.290	139.740	
17	13 ~ 14	6	21.850	131.100	
18	13 ~ 5	6	59.000	354.000	
19	14 ~ 6	6	98.115	588.690	
20	14 ~ 7	6	169.785	1018.710	
21	15 ~ 15	6	136.345	818.070	
	Total		1668.109	10318.443	
			1668	10318	
Total area under all Roads					10318
Add 5% for Curves					516
Total area required for Roads					10834
No. of Car parking on surface					46
Area required for Car parking ((5x2.5=12.5)					575
Total area required for Roads & Car Parking					11409
Length of Kerb = 1668x 2 + 10% for approach Roads					3670
SL.NO	Description	Unit	Qty	Rate	Amount
1	Provision for leveling and earth filling as Per site condition,				
a)	Block	Acre	10.43125	100000	1,043,125.00
2	The necessary provision for construction of roads parking etc has beeb made in the estimate according to the HUDA norms the follwing specification has been proposed.				

(I)	Constriction of roads by providing granular sub base 300 mm as per MORT & H specifications conforming to clause 401 grading -II 400.1			
(II)	Providing, laying, spreading and compacting hand broken/crushed stone aggregate to wet mix conforming to physical requirement laid in 400 of MORT & H specification n in two layers (Compacting to 250mm (125+125mm) by taking material 1:32 times of the (thickness of the layer) including premixing of material with water in mechanical mixer.			
(III)	50mm thick B.M			
(IV)	20mm thick mix seal surfacing			
(a)	Sqm	11409 ✓	1000 850 ✓	11409000 9,697,650.00 ✓
3	Provision for kerbs and channels			
(a)	Metre	3670 ✓	855 600 ✓	3127850 2,201,760.00 ✓
4	Provision for making approach and pavement to building.		LS	500,000.00 ✓
5	Provision for carriage of materials & other unforeseen Itmes.		LS	50,000.00 ✓
	TOTAL			13,492,535.00
	SAY IN LAKHS			16139975 134.93
				161.40 Lacs

	Sub -Work No.V		Street Lighting		
SL.NO	Description	Unit	Qty	Rate	Amount
1	Providing Street lighting on roads as per standard specification of HVPN.			125000/	2216063/
(a)	Acre		17.7285	100000	1,772,850.00
	TOTAL			1221	1,772,850.00
	SAY IN LAKHS				2216063 -17.73 21.98 Lacs

Sub -Work No.VI		Plantation and road side trees			
SL.NO	Description	Unit	Qty	Rate	Amount
1	Development of lawn areas				
(i)	Acres		10.43125	100000 150000/	1,043,125.00 1564688.00
(a)	Trenching the ordinary soil up to dept of 60cm including removal and stacking serviceable material and disposing of by spreading and leveling within a lead of 50m and making up the trenches area to proper leads by filling with earth mixed with manure before and after flooding trench with water including cost of imported earth and manure.				
(b)	Rough dressing of turfed area				
(c)	Grassing with "Doob Grass" including watering and maintenance of lawns for 30 days till the grass forms a thick lawn, free from weeds and fit for moving in rows 7.5 m Apart in either direction including provision for hedges and barbed wire fencing around park 3.00 Acres @ 70000 per acre.				
2	Providing tress, guards and planting tress along road at 6.0 m internals for 6.0m wide road Total road length = 1668M ✓ No of Tress = 1668/12 = 139 nos. Say = 139 ✓ <u>Cost Analysis of Planting Trees</u> Excavation = 30.00 - 40.00 Manure = 60.00 60.00 Tree plants = 60.00 120.00 Tree guards = 750.00 850.00 = Rs. 900 per tree 1070/				
	Total				
(a)	Each		139	900 1070/	125,100.00 148730.00
	TOTAL				1715118.00
	SAY IN LAKHS				17.15 Lakhs

	Sub -Work No. VII		MTC. Charges & Resurfacing of Roads		
SL.NO	Description	Unit	Qty	Rate	Amount
1	Provision for MTC charges for water supply, sewerage storm water drainage, roads, street light and horticulture complete in all respect.				
(a)	Acres		10.43125	500000.00	5,215,625.00
2	Resurfacing of roads after Ist 5 Yrs, 50mm thick B.M & 25 mm thick premier carpet.				
(a)	Sqm		11409	350.00 500.00	3,993,150.00 6274950.00
3	Provision for resurfacing of roads after 10 yrs. by providing 25mm thick premier carpet.				
(a)	Sqm		11409	600.00 750.00	6,845,400.00 8558750
					20067325
	TOTAL				16,054,175.00
	SAY IN LAKHS				160.54
					200.50 Lacs