
SERVICE PLAN/ESTIMATE FOR Affordable Group Housing Colony MEASURING 5.0 ACRE (LICENCE NO-11 OF 2014 DATED 10.06.2014) (LICENCE NO-82 OF 2014 DATED 06.12.2018 MEASURING OF 4.1125 ACRE) Village Dhankot, Sector-102 Gurugram

BEING DEVELOPED BY
M/S NANI RESORT AND FLORICULTURE PVT. LTD.

REPORT

Gurugram town of Haryana State is situated on Delhi – Jaipur National highway No.8 at a distance of 30 km's. 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, Haryana Urban Development Authority has already developed residential sector which are fully inhabited to an extend. Further to the increasing demand HUDA has planned to develop new sectors at outskirts of Gurugram town. This report and estimate is for approval of 9.1125 acres Group Housing scheme of SEC-102, Gurugram.

WATER SUPPLY

At present the source of water supply in this area is bore well. As the underground water is potable, provision for two numbers of bore wells 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 mains passing along sector dividing master road, from there water will be pumped to O.H. tanks on the roof of the buildings. The water supply system has been designed as per the Hazen William formula.

Number of units and towers are as follows:

OCCUPANCY / POPULATION ESTIMATION OF RESIDENTIAL & COMMERCIAL AREA

S.No.	Description of Tower or Area	No. of Floors in Each Tower	No. of Building	No. of Units or Area (sq.m.)	Person per Unit or Area	Total Population	Visitors & Floating Population	10% of Fixed Population of Toatal Population
OCCUPANCY / POPULATION ESTIMATION OF RESIDENTIAL								
1	Tower - A	S + 14	1	224	5	1120	56	
2	Tower - B	S + 14	1	224	5	1120	56	
3	Tower - C	S + 14	1	224	5	1120	56	
4	Tower - D	S + 14	1	116	5	580	29	
5	Tower - E	S + 11	1	44	5	220	11	
6	Tower - F	S + 14	1	116	5	580	29	
7	Tower - H	S + 14	1	116	5	580	29	
8	Tower - I	S + 14	1	116	5	580	29	
9	Tower - G	S + 14	1	112	5	560	28	
10	Tower - J	S + 14	1	112	5	560	28	
11	Tower - K	S + 1	1	8	5	40	2	
⇒	Total Occupancy / Population of Towers			1412		7060	353	
OCCUPANCY / POPULATION ESTIMATION OF COMMERCIAL AREA								
12	Commercial Area at Ground Floor			1322.56	3	441	396	45
13	Community Area			184.32	1.4	132	118	14
14	Guard Room + Secuirity + maintenance Staff							25
⇒	Total Occupancy / Population of Other Area					573	514	59

DESIGN

The scheme has been designed for population considering five persons for each main dwelling. The rate of water supply per head/day has been taken as 172.5 liters per head per day.

PUMPING EQUIPMENTS

It has been proposed to install pumping set as described above 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 from proposed development will be connected to proposed master sewer on sector dividing road. The sewerage system has been marked on the respective plans. This scheme is designed for sewer connection the centralized sewage treatment plant to treat the sewage and to use for horticulture and flashing purpose and excess sewage line will be connected to proposed HUDA sewer passing along sector dividing master road.

Sewer lines have been designed for three times average D.W.F in relation to water supply demand. It has been assumed that about 75% of the domestic water supply shall find its way

into the proposed sewer. Sewer lines shall be laid to a gradient maintaining minimum 0.75 ft/sec self cleaning velocity. Sewer line upto 400 mm dia has been designed to run half full. However, in the present case, the maximum dia works out to 250 dia laid at 1 in 195 Creating Velocity of 0.75 ft./Sec for 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 for the design of sewerage system.

STORM WATER DRAINAGE

We propose to lay under ground R.C.C. pipe drains with required number of catch basins, manholes and rainwater harvesting pits / wells. Over flow of storm water will be connected to the proposed HUDA storm drain on sector road. The intensity of rain fall has been taken as 1/4" per hour. R.C.C. storm water line will be designed as per Manning's formula. We propose to construct underground pipe drain which will be connecting rain water harvesting system for recharge aquifer and surplus storm water will be allowed to flow to the HUDA drain along sector dividing master road.

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 lighting on surrounding 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 schemes, including cost of all services works out to be Rs. **576.99** Lacs including 3% contingencies and 49% departmental charges which include Price Escalation & Deptt. Charges.

For _____

Authorized signatory

PROJECT : AFFORDABLE GROUP HOUSING COLONY VILLAGE DHANKOT SEC-102, GURUGRAM (HR)

ESTIMATE FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF RESIDENTIAL PROJECT GROUP HOUSING HAVING LICENCE NO.11 OF 2014 DATE 10-06-2014 MEASURING 5.0 ACRE AND LICENCE NO.82 OF 2018 DATE 06-12-2018 MEASURING 4.1125 ACRE, TOTAL AREA 9.1125 ACRE IN SECTOR 102.

FINAL ABSTRACT OF COST			
			Amount (Lacs.)
Sub Work - I Water Supply Distribution System & Pumping Machinery			193.93
Sub Work - II (A) Sewerage			134.98
Sub Work - III Storm Water Drainage			49.34
Sub Work - IV Roads & Footpath			81.06
Sub Work - V Street Lighting			20.98
Sub Work - VI - Horticulture			5.06
Sub Work - VII - Maintenance of Services for 10 years including resurfacing of roads after 1st 5 years & II phase i.e. 10 years of maintenance (as per HUDA norms)			109.33
		Total	594.672654

Per Acre 65.26

(RUPEES FIVE CRORE SEVENTY SIX LAC NINTY NINE THOUSAND FIVE HUNDRED FOURTY ONLY)

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Sub Work - I (ABSTRACT OF COST)		
Water Supply Distribution System & Pumping Machinery	Amount (Lacs.)	
Sub head I. Water Supply & Fire Fighting	38.34	
Sub head II. Water Supply Pumping machinery	24.19	
Sub head III. Water Supply Distribution	32.77	
Sub head IV. Water Supply Irrigation	3.92	
Sub head V. Fire Scheme	27.14	
Total	126.36	
Adding 3% for Contingencies	3.79	
Total	130.15	
Adding 49% departmental charges & price escalation etc	63.77	
Say	193.93	Lacs

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Sub Work I		Water Supply & Fire fighting				
Sub Head No. I						
S. No.	Description	Unit	Qty	Rate	Amount	
					(in Lakhs)	
1	Boring & installing tubewell with rotary ring complete with 100mm dia pipe and strainer to a depth of about 120mts in all respect	Nos.	2	200000	4.00	
2	Provision og rising main, connecting tube well with water main and by pass arrangements					
a	100mm dia UPVC Pipe	Mtr.	240	500	1.20	
3	Providing Tubewell submersible pumps caapcity : 14000 LPH at 80 mtr head (7.5HP)	Nos.	2	65000	1.30	
4	Provision for carriage for materials and other unforeseen items	LS	-	-	0.50	
5	Provision for chlorination plant	LS	-	-	1.00	
6	Construction of UG tanks	KLD	1030	2800	28.84	
7	Provision of construction of tubewell chambers of size 1.5x1.5x1.5 mtrs for housing tubewell	Nos.	2	75000	1.50	
	(C.O. to abstract of cost of Sub-work No.I)				38.34	

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	Sub Work I					
	Sub Head No. II			Pumping Machinery		
S. No.	Description	Unit	Qty	Rate	Amount	
					(in Lakhs)	
1	Providing & installing electricity driven pumping set capable of delivering 284 LPM of water against a total head of 60m complete with motor and other accessories (For Domestic - 25.0 HP).	Nos.	2	165000	3.30	
2	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities.					
	1 No. - 82.5 KVA	Nos.	1	540000	5.40	
3	Providing & installing pumping set of following capacities for fire protection:					
i)	180 LPM @ 88 M Head (10 HP)	Nos.	2	114000	2.28	
ii)	2280 LPM @ 88 M Head (75 HP) Hydrant	Nos.	2	178000	3.56	
iii)	2280 LPM @ 88 M Head (DG Pump) (97 HP)	Nos.	2	345000	6.90	
4	Provision for making foundations & erection of pumping machinery.	LS	-	-	1.00	
5	Provision for pipes, valves & specials inside the pump chamber.	LS	-	-	1.00	
6	Provision for carriage for materials and other unforeseen items.	LS	-	-	0.75	
	(C.O. to abstract of cost of Sub-work No.I)				24.19	

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Sub Work I		Water Supply Distribution System /Rising Main			
Sub Head No. III					
S. No.	Description	Unit	Qty	Rate	Amount
i)	Providing, laying, jointing and testing pipe lines including cost of complete in all respects 100 mm dia ASTM pipe	Mt.	244	1050	256,200
ii)	Providing, laying, jointing and testing pipe lines including cost of complete in all respects 80 mm dia ASTM pipe	Mt.	1903	700	1,332,100
iii)	Providing, laying, jointing and testing pipe lines including cost of complete in all respects 65 mm dia ASTM pipe	Mt.	880	620	545,600
iv)	Providing, laying, jointing and testing pipe lines including cost of complete in all respects 50 mm dia ASTM pipe	Mt.	550	315	173,250
v)	Providing, laying, jointing and testing pipe lines including cost of complete in all respects 40 mm dia ASTM pipe	Mt.	550	250	137,500
vi)	Providing, laying, jointing and testing pipe lines including cost of complete in all respects				
	(From HUDA supply)				
	100 mm dia pipe DI kg pipe	Mt.	100	1200	120,000
	1.Providing and fixing indicating plates for sluice valve and air valves	Nos.	25	5000	125,000
	2. Providing and fixing air release valve and scour valve	Nos.	5	7500	37,500
	3. Provision for carriage for materials and other unforeseen items(L/S)	L/s			50,000
	4.Providing for making water supply connection in HUDA (line)	L/s			500,000
	Total Rs.				3,277,150
	Say				32.77
	HUDA -A				Lacs
	Material Statement	HUDA -A			
	Line	A – U.G. Tank			
	Daily domestic demand – This include half days storage capacity of O.H.T. (in KL)	657			
	Length (Mtr.)	100			
	Dia (MM)	(100 MM)			
	Friction loss in line (M) L.S.	5			
	Velocity (M/S)	1.5m			

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	Sub Work I					
	Sub Head No. IV	Water Supply irrigation				
S. No.	Description	Unit	Qty	Rate	Amount	
1.	Providing, laying, jointing and testing UPVC pipe lien confirming to IS4985 including cost of excavation etc. complete in all respect.					
a)	25 mm dia (CPVC)	Mt.	200	150	30,000	
a)	65 mm dia	Mt.	1020	240	244,800	
2.	Providing and fixing 20 mm dia. Irrigation hydrant valve complete in all respect. 34 Nos. @Rs.500/each	Nos.	34	500	17,000	
3.	Provision for carriage of Material and other as foreseen Item				100,000	
	TOTAL				391,800	
	Say					
	(C.O. to Abstract of Cost of Sub Work No. I)				3.92	Lacs

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Sub Work I		Fire Scheme				
Sub Head No. V						
S. No.	Description	Unit	Qty	Rate	Amount	
1.	Providing, laying, jointing and testing M.S. pipes lines for fire rising main including cost of fittings, valves, connection etc. complete in all respect.					
	(i) 150 mm M.S. pipe line	Mt.	1020	1250	1,275,000	
	(ii) 80 mm i/d	Mt.	50	900	45,000	
2.	Providing and fixing sluice valve 150 mm dia	Nos.	2	12000	24,000	
3.	Providing and fixing fire hydrant	Nos.	126	10000	1,260,000	
4.	Providing for carriage of material as other Unforeseen items (L.S)				100,000	
5	Providing for indication plates	Nos.	17	600	10,200	
	Total cost of abstract of cost for Subwork No.1					
	Total				2,714,200	
	Say				27.14	Lacs
	(C.O. to Abstract of cost in sub work no -I)					
	Fire Fighting External - Material Statement					
Sl. No.	Name of Pipe Line	Dia (MM)	Length			
1	Fire Main Ring (03 Hydrants)	150	740			
2	Fire Hydrant 80 Dia	80	25.5			

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Sub Work II		Sewerage Scheme				
S. No.	Description	Unit	Qty	Rate	Amount	
1	Providing, laying and jointing glazed stone were pipes as per specifications i/c excavation, bed conc, encasement /cradle section with C.C., also i/c testing etc and construction of man holes etc complete.					
a)	250 dia pipe for depth 0 to 3.0 m	Mt.	1359	1,100	1,494,900	
b)	Provision for carriage of pipes, road cuts & making good of roads.	L.S.			100,000	
c)	Provision for vent shafts	L.S.			50,000	
d)	Provision for centring & shuttering, shoring & barricading.	L.S.			200,000	
e)	Provision for watch & ward & lighting etc.	L.S.			50,000	
f)	Provision for temporary disposal arrangements	L.S.			400,000	
g)	Providing for Making connection with HUDA Master Sewer line	LS			500,000	
h)	Constuction of STP Capacity 1000KLD				6,000,000	
	Total				8,794,900	
	Adding 3% for Contingencies				263,847	
	Total				9,058,747	
	Adding 49% departmental charges & price escalation etc				4,438,786	
					13,497,533	
	Say				134.98	Lacs

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Sub Work - III		Storm Water Drain				
S. No.	Description	Unit	Qty	Rate	Amount	
1	Providing, laying and jointing S & S RCC pipes with rubber ring joints as per specifications i/c excavation bed & cradle section cove, also manholes & testing etc complete.					
a)	300 dia RCC pipes Class NP 3	Mt.	1395	1,050	1,464,750	
b)	Provision for carriage of pipes, road cutting & road restonation etc.	L.S.			250,000	
c)	Provision of centring, shuttering shoring & barricading	L.S.			250,000	
d)	Provision for watch & ward & lightings etc	L.S.			100,000	
e)	For rain harvesting wells	Nos.	5	150000	750,000	
f)	Provision of temporary arrangement for services till HUDA Services are made available	L.S.			400,000	
	Total				3,214,750	
	Adding 3% for Contingencies				96,443	
	Total				3,311,193	
	Adding 49% departmental charges & price escalation etc				1,622,484	
					4,933,677	
	Say				49.34	Lacs

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Sub Work IV					Road Work	
S. No.	Description	Unit	Qty	Rate	AMOUNT	
1	Provision for leveling, earth filling compaction as per specification as per site conditions	Acre	9.1125	75000	6.83	Lacs
2	The necessary provision for construction of roads, parks etc Has been made in the estimate according to HUDA norms					
	The following specifications has been proposed :					
i)	Construction of roads by providing granular sub base 300 mm as per MORT & H cs conforming to clause 401 grading –II 400.I					
ii)	Providing and laying, spreading & 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 25mm (125+125mm) by taking material 1:32 times of the (thickness of the layer) including premixing of material with water in mechanical mixer.					
iii)	50 mm thick B.M.					
iv)	20 mm thick mix seal surfacing	Sqmt.	7869.5	550	43.28	Lacs
3	Provision of kerbs and channels	Mt.	50	400	0.20	Lacs
4	Provision for making approach and pavement to each block of building	L.S.			1.5	Lacs
5	Provision for parking arrangement (L.S.)	L.S.			0.5	Lacs
6	Provision for carriage of materials	L.S.			0.5	Lacs
	Total				52.82	Lacs
	Add 3% contingencies and P L charges				1.584	Lacs
	Total				54.401	Lacs
	Add 49% departmental charges, price escalation. Unforeseen admn				26.657	Lacs
	Total				81.058	Lacs
	Say (Carry over to final abstract of cost)				81.058	Lacs

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	Sub Work V	Street Lighting				
S. No.	Description	Unit	Qty	Rate	Amount	
	1. Providing street lighting on roads as per standard specifications of HVPN approx.	Acre	9.1125	150000	1,366,875	Lacs
	Add 3% contingencies and PC Charges			Rs.	41,006	
	Total				1,407,881	
	Add 49% Departmental charges, Price Escalation, Unforeseen Adm.			Rs.	689,862	
	Total				2,097,743	
	Carry Over to Final Abstract of Cost				20.98	Lakhs

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Sub Work VI					Horticulture	
S. No.	Description	Unit	Qty	Rate	Amount	
1	Development of lawn area					
	a) Trenching the ordinary soil upto depth of 60 cm.Including removal & packing of serviceable material & disposing at a lead of 50 M and making up the trenched area to proper level by filling with earth mixed with manure before & after flooding trench with water including cost of imported earth & manure.					
	b) Rough dressing of trenched area.					
	c) Grassing including watering & maintenance of lawns free from weeds & fit for mowing in rows including hedges, shrubs & green belts (as per HUDA Norms)					
	1.4 acres @ Rs. 1.50 lacs/acre.	per acre	1.4	150000	210,000	
2	Provision of trees, guards and planting trees along road at 12M intervals.	Tress	160	750	120,000	
					330,000	
	Add 3% contingency charges				9,900	
				Total	339,900	
	Add 49% Deptt. Charges				166,551	
				Total	506,451	
			say		5.06	Lacs

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Sub Work VII					Maintenance Charges & Resurfacing of Roads	
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)	
1	Provision for maintenance charges for water supply, sewerage, storm water drainenage, roads, street light, horticulture etc. complete including operation & establishments charges as per HUDA norms after completion & resurfacing of roads after 10 years or 1st phase.					
	9.1125 acres @ 3.5 lacs per acre	per acre	9.113	350000	3,189,375	
2	Provision for resurfacing & strengthening of road after five years of 1st phase	Sq. mtr.	7869.5	200	1,573,900	
3	Provision for resurfacing & strengthening of road after ten years of 2 nd phase	Sq. mtr.	7869.5	300	2,360,850	
				Total	7,124,125	
	Add 3% contingency & PE charges				213,724	
				Total	7,337,849	
	Add 49% Departmetal charges				3,595,546	
				Total	10,933,395	
			say		109.33	Lacs

**PROVIDING INTERNAL DEVELOPMENT WORKS IN CONSTRUCTION OF PROPOSED AFFORDABLE GROUP HOUSING
COLONY VILLAGE DHANKOT, (SECTOR -102) GURUGRAM, HARYANA, MEASURING 9.1125 ACRES IN PROJECT:
DEVELOPED BY M/s. NANI RESORT AND FLORICULTURE PVT. LTD.**

WATER DEMAND CALCULATION

	DESIGN CALCULATIONS				
No. of Units	No. of floors	No. of BLK	Units/ BLK	Total Units	Density
Tower A	Stilt +14	1BHK	68	68	340
		2BHK	156	156	780
Tower B	Stilt +14	1BHK	68	68	340
		2BHK	156	156	780
Tower C	Stilt +14	1BHK	68	68	340
		2BHK	156	156	780
Tower D	Stilt +14	1BHK	36	36	180
		2BHK	80	80	400
Tower E	Stilt +11	2 BHK	4	4	20
		3 BHK	40	40	200
Tower I	Stilt +14	3 BHK	116	116	580
Tower J	Stilt +14	3 BHK	114	114	570
Tower K	Stilt +14	3 BHK	116	116	580
Tower L	Stilt +14	3 BHK	116	116	580
Tower M	Stilt +14	3 BHK	114	114	570
Tower N	Stilt +2	3 BHK	19	19	95
	TOTAL DENSITY			1427	7135

DETAILS OF DAILY WATER CONSUMPTION					
DOMESTIC WATER DEMAND					
S.NO.	Description	Total water demand	Domestic Water	Flushing/ Recycled Water	Input to STP @80% of total water
1	Water requirement @ 172.5 Lit/person for residence(as per HUDA). Number of person per flat is 5. Total number flat is 1427.Total number of occupant is 7135. (112.5 litre Domestic because 60 litre flushing as per HUDA)	1230787.5	802687.5	428100	984630
2	Water requirement @ 15 Lit/person for 243 visitors of shop.Total area 1460.64 sq.mtr. occupant load @ 6 sq.mtr.10%/visitor (Dom. Water: 35%, Flushing: 65%)	3645	1275.75	2369.25	2916
3	Water requirement @ 45 Lit/person for 50 person (of Creche) .Total area 203.03 sq.mtr. occupant load @ 4 sq.mtr./person (Dom. Water: 35%, Flushing: 65%)	2250	788	1463	1800
4	Water requirement @ 45 Lit/person for 62 person (Community Hall) .Total area 186.02 sq.mtr. occupant load @ 3 sq.mtr./person (Dom. Water: 35%, Flushing: 65%)	2790	977	1814	2232
5	Water requirement @ 45 Lit/person for 90 person (Commercial) .Total area 905 sq.mtr. occupant load @ 10 sq.mtr./person (Dom. Water: 35%, Flushing: 65%)	4050	1418	2633	3240
6	Horticulture / Irrigation @ 4 lit/sqmt/day. (for 5563 sqmt).	22252	-	22252	-
7	Domestic softener and filter backwash @10minute & double flow	10548		10548	8438
	Sub Total	1276322.5	807145	469178	1003256
	Total Domestic Water Requirement excluding	807145			
	Recycled water				
	Gross Water Requirement including Recycled water	1276323			
	Total STP Input	1003256			
	STP Output @80% Utilization Factor	802605			
	say	1000KLD			

PROJECT : AFFORDABLE GROUP HOUSING COLONY (VILLAGE DHANKOT)SEC-102, GURUGRAM (HR)

STORM WATER DESIGN																			
Formula used - Rational																			
Q = 10 C I A																			
C																			
I																			
A																			
Area in Hectares																			
					17-Sep-18														
Sr.No	NODE NO.	Line Length (M)	Total Area (m2)	Total Area (Hectare)	Total Self Flow Q=10CIA (m3/Hr)	Contribution from other Area/ Line (M3/Hr)	Total Flow in Line (M3/ Hr)	Absorption in R.W.H.Pit (M3/ Hr) 20%	Balance Flow in Line (M3/ Hr) Flow after Absorption into R.W.H	Balance Flow in Line (M3/Sec)	Size of Pipe Dia in mm	Velocity (m/sec)	Gradient	Fall in MM	Ground Level in (+)MM	Invert at Start in (-) MM	Invert at End in (-)MM	Depth of M.H. in MM	Size of M.H.
1	2	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
2	MH - 1 to 2	21.200	578	0.058	18.207		18.207		18.207	0.005	300	0.77	1 in 350	61	450	-750	-811	1200	900 DIA
3	MH - 2 to 3	24.000	350	0.035	11.025	18.207	29.232		29.232	0.008	300	0.77	1 in 350	69	450	-811	-879	1261	900 DIA
4	MH - 3 to 4	17.800	301	0.030	9.482	29.232	38.714		38.714	0.011	300	0.77	1 in 350	51	450	-879	-930	1329	900 DIA
5	MH - 4 to 5	17.600	261	0.026	8.222	38.7135	46.935		46.935	0.013	300	0.77	1 in 350	50	450	-930	-980	1380	900 DIA
6	MH - 5 to 6	10.000	162	0.016	5.103	46.935	52.038		52.038	0.014	300	0.77	1 in 350	29	450	-980	-1009	1430	900 DIA
7	MH - 6 to 7	19.400	409	0.041	12.884	52.038	64.922		64.922	0.018	300	0.77	1 in 350	55	450	-1009	-1064	1459	900 DIA
8	MH - 7 to 8	23.800	250	0.025	7.875	64.9215	72.797		72.797	0.020	300	0.77	1 in 350	68	450	-1064	-1132	1514	900 DIA
9	MH - 8 to 9	17.900	215	0.022	6.773	72.7965	79.569		79.569	0.022	300	0.77	1 in 350	51	450	-1132	-1183	1582	900 DIA
10	MH - 9 to 10 I/C RWHP-01	18.700	325	0.033	10.238	79.569	89.807	17.961	71.845	0.020	300	0.77	1 in 350	53	450	-1183	-1237	1633	900 DIA
11	MH - 10 to 11	21.500	480	0.048	15.120	71.8452	86.965		86.965	0.024	300	0.77	1 in 350	61	450	-1237	-1298	1687	1200 DIA
12	MH - 11 to 12	19.600	438	0.044	13.797	86.9652	100.762		100.762	0.028	300	0.77	1 in 350	56	450	-1298	-1354	1748	1200 DIA
13	MH - 12 to 13	19.300	524	0.052	16.506	100.7622	117.268		117.268	0.033	300	0.77	1 in 350	55	450	-1354	-1409	1804	1200 DIA
14	MH - 13 to 14	20.700	499	0.050	15.719	117.2682	132.987		132.987	0.037	300	0.77	1 in 350	59	450	-1409	-1469	1859	1200 DIA
15	MH - 14 to 15	21.500	591	0.059	18.617	132.9867	151.603		151.603	0.042	300	0.77	1 in 350	61	450	-1469	-1530	1919	1200 DIA
16	MH - 15 to 16	19.000	210	0.021	6.615	151.6032	158.218		158.218	0.044	300	0.77	1 in 350	54	450	-1530	-1584	1980	1200 DIA
17	MH - 16 to 17	16.500	325	0.033	10.238	158.2182	168.456		168.456	0.047	300	0.77	1 in 350	47	450	-1584	-1631	2034	1200 DIA
18	MH - 17 to 23	17.000	210	0.021	6.615	168.4557	175.071		175.071	0.049	300	0.77	1 in 350	49	450	-1631	-1680	2081	1200 DIA
19	MH - 18 to 19	21.500	340	0.034	10.710		10.710		10.710	0.003	300	0.77	1 in 350	61	450	-750	-811	1200	900 DIA
20	MH - 19 to 20	25.500	193	0.019	6.080	10.71	16.790		16.790	0.005	300	0.77	1 in 350	73	450	-811	-884	1261	900 DIA

Sr.No	NODE NO.	Line Length (M)	Total Area (m2)	Total Area (Hectare)	Total Self Flow Q=10CIA (m3/Hr)	Contribution from other Area/ Line (M3/Hr)	Total Flow in Line (M3/ Hr)	Absorption in R.W.H.Pit (M3/ Hr) 20%	Balance Flow in Line (M3/ Hr)	Balance Flow in Line (M3/Sec)	Size of Pipe Dia in mm	Velocity (m/sec)	Gradient	Fall in MM	Ground Level in (+)MM	Invert at Start in (-) MM	Invert at End in (-)MM	Depth of M.H. in MM	Size of M.H.
									Flow after Absorption into R W H										
21	MH - 20 to 21	19.300	134	0.013	4.221	16.7895	21.011		21.011	0.006	300	0.77	1 in 350	55	450	-884	-939	1334	900 DIA
22	MH - 21 to 22	12.800	501	0.050	15.782	21.0105	36.792		36.792	0.010	300	0.77	1 in 350	37	450	-939	-976	1389	900 DIA
23	MH - 22 to 23	16.500	438	0.044	13.797	36.792	50.589		50.589	0.014	300	0.77	1 in 350	47	450	-976	-1023	1426	900 DIA
24	MH - 23 to 24	14.500	276	0.028	8.694	225.6597	234.354		234.354	0.065	300	0.77	1 in 350	41	450	-1023	-1065	1473	900 DIA
25	MH - 24 to 25 I/C RWHP-02	12.000	390	0.039	12.285	306.1989	318.484	63.697	254.787	0.071	300	0.77	1 in 350	34	450	-1680	-1714	2130	1200 DIA
26	MH - 25 to 26	16.600	247	0.025	7.781	341.75232	349.533		349.533	0.097	300	0.77	1 in 350	47	450	-1714	-1762	2164	1200 DIA
27	MH - 26 to 27	12.900	325	0.033	10.238	450.29502	460.533		460.533	0.128	300	0.77	1 in 350	37	450	-1762	-1799	2212	1200 DIA
28	MH - 27 to 28	15.000	452	0.045	14.238	577.80072	592.039		592.039	0.164	300	0.77	1 in 350	43	450	-1799	-1841	2249	1200 DIA
29	MH - 28 to 32	12.600	504	0.050	15.876	725.02542	740.901		740.901	0.206	300	0.77	1 in 350	36	450	-1841	-1877	2291	1200 DIA
30	MH - 29 to 30	22.000	273	0.027	8.600	892.50462	901.104		901.104	0.250	300	0.77	1 in 350	63	450	-750	-813	1200	900 DIA
31	MH - 30 to 31	25.000	258	0.026	8.127	1059.32232	1067.449		1067.449	0.297	300	0.77	1 in 350	71	450	-813	-884	1263	900 DIA
32	MH - 31 to 32	11.100	118	0.012	3.717	1235.90502	1239.622		1239.622	0.344	300	0.77	1 in 350	32	450	-884	-916	1334	900 DIA
33	MH - 32 to 33	17.300	215	0.022	6.773	1414.69272	1421.465		1421.465	0.395	300	0.77	1 in 350	49	450	-1877	-1927	2327	1500 DIA
34	MH - 33 to 34	15.000	443	0.044	13.955	1432.17522	1446.130		1446.130	0.402	300	0.77	1 in 350	43	450	-1927	-1970	2377	1500 DIA
35	MH - 34 to 35	15.000	415	0.042	13.073	1462.91922	1475.992		1475.992	0.410	300	0.77	1 in 350	43	450	-1970	-2013	2420	1500 DIA
36	MH - 35 to 36 I/C RWHP-03	14.000	180	0.018	5.670	1497.00222	1502.672	300.534	1202.138	0.334	300	0.77	1 in 350	40	450	-2013	-2053	2463	1500 DIA
37	MH - 36 to 37	19.200	576	0.058	18.144	1238.92978	1257.074		1257.074	0.349	300	0.77	1 in 350	55	600	-2053	-2107	2653	1500 DIA
38	MH - 37 to 38	14.600	323	0.032	10.175	1307.66278	1317.837		1317.837	0.366	300	0.77	1 in 350	42	600	-2107	-2149	2707	1500 DIA
39	MH - 38 to 39	20.700	318	0.032	10.017	1552.19098	1562.208		1562.208	0.434	300	0.77	1 in 350	59	600	-2149	-2208	2749	1500 DIA
40	MH - 39 to 40	20.200	210	0.021	6.615	1816.9951	1823.610		1823.610	0.507	300	0.77	1 in 350	58	600	-2208	-2266	2808	1500 DIA
41	MH - 40 to 41	17.600	205	0.021	6.458	2173.14292	2179.600		2179.600	0.605	300	0.77	1 in 350	50	600	-2266	-2316	2866	1500 DIA
42	MH - 41 to 42	10.800	524	0.052	16.506	2640.13294	2656.639		2656.639	0.738	300	0.77	1 in 350	31	600	-2316	-2347	2916	1500 DIA
43	MH - 42 to 43	16.000	244	0.024	7.686	3248.67766	3256.364		3256.364	0.905	300	0.77	1 in 350	46	600	-2347	-2393	2947	1500 DIA
44	MH - 43 to 44 I/C RWHP-04	15.000	591	0.059	18.617	4157.46778	4176.084	835.217	3340.867	0.928	300	0.77	1 in 350	43	600	-2393	-2436	2993	1500 DIA
45	MH - 44 to 45	16.500	210	0.021	6.615	4408.31674	4414.932		4414.932	1.226	300	0.77	1 in 350	47	700	-2436	-2483	3136	1500 DIA
46	MH - 45 to 46	17.000	325	0.033	10.238	5654.55376	5664.791		5664.791	1.574	300	0.77	1 in 350	49	700	-2483	-2531	3183	1500 DIA

Sr.No	NODE NO.	Line Length (M)	Total Area (m2)	Total Area (Hectare)	Total Self Flow Q=10CIA (m3/Hr)	Contribution from other Area/ Line (M3/Hr)	Total Flow in Line (M3/ Hr)	Absorption in R.W.H.Pit (M3/ Hr) 20%	Balance Flow in Line (M3/ Hr)	Balance Flow in Line (M3/Sec)	Size of Pipe Dia in mm	Velocity (m/sec)	Gradient	Fall in MM	Ground Level in (+)MM	Invert at Start in (-) MM	Invert at End in (-)MM	Depth of M.H. in MM	Size of M.H.
									Flow after Absorption into R W H										
47	MH - 46 to 47	21.500	210	0.021	6.615	7086.25648	7092.871		7092.871	1.970	300	0.77	1 in 350	61	700	-2531	-2593	3231	1500 DIA
48	MH - 47 to 53	20.000	340	0.034	10.710	8539.0012	8549.711		8549.711	2.375	300	0.77	1 in 350	57	700	-500	-557	1200	900 DIA
49	MH - 48 to 49	19.300	193	0.019	6.080	10025.7029	10031.782		10031.782	2.787	300	0.77	1 in 350	55	700	-557	-612	1257	900 DIA
50	MH - 49 to 50	12.800	134	0.013	4.221	11233.9202	11238.141		11238.141	3.122	300	0.77	1 in 350	37	700	-612	-649	1312	900 DIA
51	MH - 50 to 51	16.500	501	0.050	15.782	12495.215	12510.996		12510.996	3.475	300	0.77	1 in 350	47	700	-649	-696	1349	900 DIA
52	MH - 51 to 52	17.000	303	0.030	9.545	13828.8337	13838.378		13838.378	3.844	300	0.77	1 in 350	49	700	-696	-745	1396	900 DIA
53	MH - 52 to 53	15.000	303	0.030	9.545	15400.5862	15410.131		15410.131	4.281	300	0.77	1 in 350	43	700	-745	-787	1445	900 DIA
54	MH - 53 to END I/C RWHP-05	5.000	255	0.026	8.033	15400.5862	15408.619	3081.724	12326.895	3.424	300	0.77	1 in 350	14	700	-2593	-2607	3293	1500 DIA
55	MH - 54 to 55	15.000	210	0.021	6.615	4408.31674	4414.932		4414.932	1.226	300	0.77	1 in 350	50	400	-800	-850	1200	900 DIA
56	MH - 55 to 56	15.000	325	0.033	10.238	5654.55376	5664.791		5664.791	1.574	300	0.77	1 in 350	31	400	-850	-900	1250	900 DIA
57	MH - 56 to 57	15.000	210	0.021	6.615	7086.25648	7092.871		7092.871	1.970	300	0.77	1 in 350	46	400	-900	-950	1300	900 DIA
58	MH - 57 to 58	15.000	340	0.034	10.710	8539.0012	8549.711		8549.711	2.375	300	0.77	1 in 350	43	400	-950	-1000	1350	900 DIA
59	MH - 58 to 59	15.000	193	0.019	6.080	10025.7029	10031.782		10031.782	2.787	300	0.77	1 in 350	47	400	-1000	1050	1400	900 DIA
60	MH - 59 to 60	20.000	134	0.013	4.221	11233.9202	11238.141		11238.141	3.122	300	0.77	1 in 350	49	400	1050	1100	1500	900 DIA
61	MH - 60 to 61	15.000	501	0.050	15.782	12495.215	12510.996		12510.996	3.475	300	0.77	1 in 350	61	400	1100	-800	1200	900 DIA
62	MH - 61 to 62	15.000	303	0.030	9.545	13828.8337	13838.378		13838.378	3.844	300	0.77	1 in 350	57	400	-800	-900	1200	900 DIA
63	MH - 62 to 63	15.000	303	0.030	9.545	15400.5862	15410.131		15410.131	4.281	300	0.77	1 in 350	55	400	-900	-950	1300	900 DIA
64	MH - 63 to 64	15.000	210	0.021	6.615	4408.31674	4414.932		4414.932	1.226	300	0.77	1 in 350	37	400	-950	-1000	1350	900 DIA
65	MH - 64to 65	15.000	325	0.033	10.238	5654.55376	5664.791		5664.791	1.574	300	0.77	1 in 350	47	400	-1000	1050	1400	900 DIA
66	MH - 65 to 66	15.000	210	0.021	6.615	7086.25648	7092.871		7092.871	1.970	300	0.77	1 in 350	49	400	1050	1100	1500	900 DIA
67	MH - 66 to 67	15.000	340	0.034	10.710	8539.0012	8549.711		8549.711	2.375	300	0.77	1 in 350	43	400	1100	1150	1550	900 DIA

[illegible]

PROJECT : AFFORDABLE GROUP HOUSING COLONY (VILLAGE DHANKOT)SEC-102, GURUGRAM (HR)

Total Water Supply (Av) as per Statement Annexure- I
 Formula used for Velocity adopted - Mannings Equation
 $V = \frac{1}{n} (D/4)^{2/3} (S)^{1/2}$
 n
 Value of n adopted for SW Pipes = 0.013

SEWERAGE CALCULATION SHEET

Sr. No.	Node No.	Length (Meter)	Water Requirement (KLD)	Total Sewage Generated Per day (80% for Sewage in KLD)			Peak = Av x 3 in KLD	Flow per second for area (LPS)	Pipe Dia of RCC HUME Pipes	Gradient (S)	Fall in MM	Velocity created in (V) m/s	Capacity of Pipe with 1/2 full pipe (LPS)	Ground Level (+mm)	Invert at Start in mm	Invert at End in mm	Depth of M.H.	Zize of M.H.
				Self	Previous	Total												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	SMH - 1 to 2	20	0.5	0.400	-	0.400	1.2	0.014	250	1 in 200	100	0.86	21.07	600	-600	-700	1200	900 DIA
3	SMH - 2 to 3	21	1	0.800	0.400	1.200	3.6	0.042	250	1 in 200	105	0.85	21.07	600	-700	-805	1300	900 DIA
4	SMH - 3 to 4	20	0.5	0.400	1.200	1.600	4.8	0.056	250	1 in 200	100	0.85	21.07	600	-805	-905	1405	900 DIA
5	SMH - 4 to 5	19.5	0.5	0.400	1.600	2.000	6	0.069	250	1 in 200	98	0.85	21.07	600	-905	-1003	1505	900 DIA
6	SMH - 5 to 6	22	0.5	0.400	2.000	2.400	7.2	0.083	250	1 in 200	110	0.85	21.07	600	-1003	-1113	1603	900 DIA
7	SMH - 6 to 7	22.5	0.5	0.400	2.400	2.800	8.4	0.097	250	1 in 200	113	0.85	21.07	600	-1113	-1225	1713	1200 DIA
8	SMH - 7 to 8	20	0	0.000	2.800	2.800	8.4	0.097	250	1 in 200	100	0.85	21.07	400	-1225	-1325	1625	1200 DIA
9	SMH - 8 to 9	15	0	0.000	2.800	2.800	8.4	0.097	250	1 in 200	75	0.85	21.07	400	-1325	-1400	1725	1200 DIA
10	SMH - 9 to 10	15	0	0.000	2.800	2.800	8.4	0.097	250	1 in 200	75	0.85	21.07	400	-1400	-1475	1800	1200 DIA
11	SMH - 10 to 11	14	0	0.000	2.800	2.800	8.4	0.097	250	1 in 200	70	0.85	21.07	400	-1475	-1545	1875	1200 DIA
12	SMH - 12 to 13	16	48.3	38.640	2.800	41.440	124.32	1.439	250	1 in 200	80	0.85	21.07	450	-750	-830	1200	900 DIA
13	SMH - 13 to 14	14	48.3	38.640	41.440	80.080	240.24	2.781	250	1 in 200	70	0.86	21.07	450	-830	-900	1280	900 DIA
14	SMH - 14 to 15	14.5	48.3	38.640	80.080	118.720	356.16	4.122	250	1 in 200	73	0.86	21.07	450	-900	-973	1350	900 DIA
15	SMH - 15 to 16	9.5	48.3	38.640	118.720	157.360	472.08	5.464	250	1 in 200	48	0.86	21.07	450	-973	-1020	1423	900 DIA
16	SMH - 16 to 17	13.5	48.3	38.640	157.360	196.000	588	6.806	250	1 in 200	68	0.86	21.07	450	-1020	-1088	1470	900 DIA
17	SMH - 17 to 18	15.5	50.5	40.400	196.000	236.400	709.2	8.208	250	1 in 200	78	0.86	21.07	450	-1088	-1165	1538	900 DIA
18	SMH - 18 to 19	13.5	48.3	38.640	236.400	275.040	825.12	9.550	250	1 in 200	68	0.86	21.07	450	-1165	-1233	1615	900 DIA
19	SMH - 19 to 20	15.5	48.3	38.640	275.040	313.680	941.04	10.892	250	1 in 200	78	0.86	21.07	450	-1233	-1310	1683	1200 DIA
20	SMH - 20 to 21	14.5	0	0.000	313.680	313.680	941.04	10.892	250	1 in 200	73	0.86	21.07	450	-1310	-1383	1760	1200 DIA
21	SMH - 21 to 11	7	0	0.000	313.680	313.680	941.04	10.892	250	1 in 200	35	0.86	21.07	450	-1383	-1545	1833	1200 DIA
22	SMH - 11 to 22	16	0	0.000	313.680	313.680	941.04	10.892	250	1 in 200	80	0.86	21.07	400	-1545	-1625	1945	1200 DIA
23	SMH - 22 to 23	14	0	0.000	313.680	313.680	941.04	10.892	250	1 in 200	70	0.86	21.07	400	-1625	-1695	2025	1200 DIA
24	SMH - 23 to 24	14.5	0	0.000	313.680	313.680	941.04	10.892	250	1 in 200	73	0.86	21.07	400	-1695	-1768	2095	1200 DIA
25	SMH - 24 to 25	16	0	0.000	313.680	313.680	941.04	10.892	250	1 in 200	80	0.86	21.07	400	-1768	-1848	2168	1200 DIA
26	SMH - 25 to 26	5.2	0	0.000	313.680	313.680	941.04	10.892	250	1 in 200	26	0.86	21.07	400	-1848	-1874	2248	1200 DIA
27	SMH - 26 to 35	4.4	48.3	38.640	313.680	352.320	1056.96	12.233	250	1 in 200	22	0.86	21.07	400	-1874	-1896	2274	1200 DIA
28	SMH - 27 to 28	13.5	48.3	38.640	352.320	390.960	1172.88	13.575	250	1 in 200	68	0.86	21.07	450	-750	-818	1200	900 DIA
29	SMH - 28 to 29	13.5	48.3	38.640	390.960	429.600	1288.8	14.917	250	1 in 200	68	0.86	21.07	450	-818	-885	1268	900 DIA

30	SMH - 29 to 30	12.8	48.3	38.640	429.600	468.240	1404.72	16.258	250	1 in 200	64	0.86	21.07	450	-885	-949	1335	900 DIA
31	SMH - 30 to 31	14	48.3	38.640	468.240	506.880	1520.64	17.600	250	1 in 200	70	0.86	21.07	450	-949	-1019	1399	900 DIA
32	SMH - 31 to 32	13.5	48.3	38.640	506.880	545.520	1636.56	18.942	250	1 in 200	68	0.86	21.07	450	-1019	-1087	1469	900 DIA
33	SMH - 32 to 33	13.5	48.3	38.640	545.520	584.160	1752.48	20.283	250	1 in 200	68	0.86	21.07	450	-1087	-1154	1537	900 DIA
34	SMH - 33 to 34	14.5	0	0.000	584.160	584.160	1752.48	20.283	250	1 in 200	73	0.86	21.07	450	-1154	-1227	1604	900 DIA
35	SMH - 34 to 35	15	2.8	2.240	584.160	586.400	1759.2	20.361	250	1 in 200	75	0.86	21.07	450	-1227	-1896	1677	1200 DIA
36	SMH - 35 to 36	11.7	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	59	0.86	21.07	400	-1896	-1954	2296	1200 DIA
37	SMH - 36 to 37	16.2	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	81	0.86	21.07	400	-1954	-2035	2354	1500 DIA
38	SMH - 37 to STP	18.7	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	94	0.86	21.07	400	-2035	-2129	2435	1500 DIA
39	SMH - 38 to 39	5	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	25	0.86	21.07	400	-800	-825	1200	900 DIA
40	SMH - 39 to 40	14.7	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	74	0.86	21.07	400	-825	-899	1225	900 DIA
41	SMH - 40 to 41	15.1	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	76	0.86	21.07	400	-899	-974	1299	900 DIA
42	SMH - 41 to 42	15	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	75	0.86	21.07	400	-974	-1049	1374	900 DIA
43	SMH - 42 to 43	13.5	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	68	0.86	21.07	400	-1049	-1117	1449	900 DIA
44	SMH - 43 to 44	21	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	105	0.86	21.07	400	-1117	-1222	1517	900 DIA
45	SMH - 44 to 45	24.7	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	124	0.86	21.07	400	-1222	-1345	1622	900 DIA
46	SMH - 45 to 46	20	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	100	0.86	21.07	400	-1345	-1445	1745	1200 DIA
47	SMH - 47 to 37	20	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	100	0.86	21.07	400	-1445	-1545	1845	1200 DIA
48	SMH - 37 to STP	5	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	25	0.86	21.07	400	-1545	-2129	1945	1200 DIA
49	SMH -STP to 48	5	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	25	0.86	21.07	400	-2129	-2154	2529	1500 DIA
50	SMH - 48 to 49	18.5	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	93	0.86	21.07	400	-2154	-2246	2554	1500 DIA
51	SMH - 49 to 50	20	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	100	0.86	21.07	400	-2246	-2346	2646	1500 DIA
52	SMH - 50 to 51	20	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	100	0.86	21.07	400	-2346	-2446	2746	1500 DIA
53	SMH - 51 to 52	17.5	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	88	0.86	21.07	400	-2446	-2534	2846	1500 DIA
54	SMH - 52 to 53	20	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	100	0.86	21.07	400	-2534	-2634	2934	1500 DIA
55	SMH - 53 to 54	21	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	105	0.86	21.07	400	-2634	-2739	3034	1500 DIA
56	SMH - 54 to 55	25	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	125	0.86	21.07	400	-2739	-2864	3139	1500 DIA
57	SMH - 55 to 56	9	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	45	0.86	21.07	400	-2864	-2909	3264	1500 DIA
58	SMH - 56 to 57	27.5	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	138	0.86	21.07	400	-2909	-3046	3309	1500 DIA
59	SMH - 57 to 58	30	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	150	0.86	21.07	700	-3046	-3196	3746	1500 DIA
60	SMH - 58 to 59	15	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	35	0.86	21.07	400	-800	-850	1200	900 DIA
61	SMH - 59 to 60	15	0	0	586.4	586.4	1759.2	20.36111111	250	1 in 200	35	0.85663338	21.07	400	-850	-900	1250	900 DIA
62	SMH - 60 to 61	15	0	0.000	584.160	584.160	1752.48	20.283	250	1 in 200	74	0.86	21.07	400	-900	-950	1300	900 DIA
63	SMH - 61 to 62	15	2.8	2.240	584.160	586.400	1759.2	20.361	250	1 in 200	76	0.86	21.07	400	-950	-1000	1350	900 DIA
64	SMH - 62 to 63	15	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	75	0.86	21.07	400	-1000	1050	1400	900 DIA
65	SMH - 63 to 64	15	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	68	0.86	21.07	400	1050	1100	1500	900 DIA
66	SMH - 64 to 65	12	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	105	0.86	21.07	400	1100	-800	1200	900 DIA
67	SMH - 65 to 66	15	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	124	0.86	21.07	400	-800	-900	1200	900 DIA
68	SMH - 66 to 67	15	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	100	0.86	21.07	400	-900	-950	1300	900 DIA
69	SMH - 67 to 68	15	0	0.000	586.400	586.400	1759.2	20.361	250	1 in 200	100	0.86	21.07	400	-950	-1000	1350	900 DIA
70	SMH - 68 to 69	15	0	0.000	584.160	584.160	1752.48	20.283	250	1 in 200	25	0.86	21.07	400	-1000	1050	1400	900 DIA

[illegible]

	PROJECT : AFFORDABLE HOUSING AT MANESAR, GURGAON.				
	PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF RESIDENTIAL PROJECT GROUP HOUSING HAVING LICENCE NO.11 OF 2014 DATE 10-06-2014 MEASURING 5.0 ACRE AND LICENCE NO.82 OF 2018 DATE 06-12-2018 MEASURING 4.1125 ACRE, TOTAL AREA 9.1125 ACRE IN SECTOR 102 VILLAGE DHANKOT,				
1)					
a)	Fire demand (as per NBC)		250	KL	
b)	Total Water Demand		807.14	KL	
c)	Tubewells				
	Yeild		14	KL/hr	
	Working hours per day		16	hrs.	
	50% Total water demand		403.57	(Cum/Min)	
	No. of tube wells required		1.80		
	Add 10% as stand by		0.18		
	Total		1.98		
	Say		2	Nos.	
2					
a)	Pumping machinery for Tube Wells				
b)	Gross working head		70	Meter	
	Average fall in S.L.		5	Meter	
c)	Depression Head		5	Meter	
d)	Friction loss in main		10	Meter	
e)	Total		90	Meter	
	Discharge		14000	LPM	
	Horse Power		6.40	HP	
	(HP=(14000x1)/60x60.75x0.6				
	Say		7.5	HP	
3	Underground and overhead Tank				
	Total Domestic water demand daily			473	m3/day
i	Proposed underground tank for domestic use(2/3 day storage)			315	m3/day
ii	Proposed overhead tank for domestic use(1/3 day storage)			158	m3/day

iii	Minimum static storage for Fire as per NBC		250	m3
4	Total flushing water demand		285	m3/day
iv	Proposed underground tank for flushing use(half day storage)		143	m3/day
v	Proposed overhead tank for flushing use(1/3 day storage)		94	m3/day
5	HUDA Main Water supply calculation			
a)	Required fresh water per day		473	m3/day
b)	Supply Duration		20	Hrs.
c)	Line flow rate		0.39	Cum/min
	Proposed line dia		100	mm
	Flow velocity		0.8	m/sec
	friction head loss/1000m		13.31	Mtr.
	Length of line		100	Mtr.
	Total head loss		1.33	Mtr.
6	Pumps For Domestic water Supply			
	Domestic water requirement per day		473	m3/day
	Pumping Duration per day		14	hrs.
	Clear head required		45	Mtr.
	Friction head loss		15	Mtr.
	Total head loss		60	Mtr.
	Discharge of pump		563.10	Say 560 LPM
	Power Required		23.2	HP
	Say		25	HP
	It is proposed to provide domestic water transfer pumps (2w+1s) of capacity 280LPM at 60mt. Head.			
7	Pumps For Flushing water Supply			

	Flushing water requirement per day			285	m3/day
	Pumping Duration per day			14	hrs.
	Clear head required			45	Mtr.
	Friction head loass			15	Mtr.
	Total head loass			60	Mtr.
	Discharge of pump			339.286	Say 350 LPM
	Power Required			15.6	HP
	Say			15	HP
	It is proposed to provide domestic water transfer pumps (1w+1s) of capacity 350LPM at 60mt. Head.				

	PROJECT : AFFORDABLE GROUP HOUSING COLONY (VILLAGE DHANKOT)SEC-102, GURUGRAM (HR)		
	MATERIAL STATEMENT FOR IRRIGATION LINE		
S.NO.	DESCRIPTION	PIPE DIA(in mm)	LENGTH(in M)
1	GH1_2	65	30
2	GH2_3	65	30
3	GH3_4	65	30
4	GH4_5	65	30
5	GH5_6	65	30
6	GH6_7	65	30
7	GH7_8	65	30
8	GH8_9	65	30
9	GH9_10	65	30
10	GH10_11	65	30
11	GH11_12	65	30
12	GH12_13	65	30
13	GH13_14	65	30
14	GH14_15	65	30
15	GH15_16	65	30
16	GH16_17	65	30
17	GH17_18	65	30
18	GH18_19	65	30
19	GH19_20	65	30
20	GH20_21	65	30
21	GH21_22	65	30
22	GH22_23	65	30
23	GH23_24	65	30
24	GH24_25	65	30
25	GH25_26	65	30
26	GH26_27	65	30
27	GH27_28	65	30
28	GH28_29	65	30
29	GH29_30	65	30
30	GH30_31	65	30
31	GH31_32	65	30
32	GH32_33	65	30
33	GH33_34	65	30
34	GH34_17	65	30
	TOTAL		
	PIPE DIA(in mm)	LENGTH (in M)	
	65mm Dia	1020	

Sub Work IV**Road Work****Material statement for Road Work**

ROAD AREA CALCULATION				
S.NO.	LENGTH	WIDTH	NOS.	AREA (SQ.M)
ADDITIONS				
1	18.630	6.000	1	111.780
2	91.120	6.000	1	546.720
3	48.880	6.000	1	293.280
4	21.970	6.000	1	131.820
5	22.000	6.000	1	132.000
6	49.410	6.000	1	296.460
7	5.550	4.910	1	27.251
8	5.540	8.010	1	44.375
9	30.660	6.000	1	183.960
10	53.650	6.000	1	321.900
11	6.000	6.000	1	36.000
12	59.730	6.000	1	358.380
13	51.020	6.000	1	306.120
14	112.340	6.000	1	674.040
15	13.790	5.730	1	79.017
16	46.610	6.000	1	279.660
17	17.330	4.540	1	78.678
18	65.950	6.000	1	395.700
19	41.480	6.000	1	248.880
20	4.720	8.620	1	40.686
21	6.500	37.050	1	240.825
22	4.720	6.050	1	28.556
23	15.270	6.000	1	91.620
24	54.280	6.000	1	325.680
25	16.000	6.000	1	96.000
26	117.450	6.000	1	704.700
27	60.350	6.000	1	362.100
28	16.020	8.620	1	138.092
29	22.380	6.520	1	145.918
30	16.020	6.060	1	97.081
31	12.720	2.490	1	31.673
32	4.730	6.000	1	28.380
33	41.620	6.000	1	249.720
34	123.740	6.000	1	742.440
TOTAL NON F.A.R. AREA				7869.492

PROJECT : AFFORDABLE GROUP HOUSING COLONY (VILLAGE DHANKOT) SEC-102, GURUGRAM (HR)

MATERIAL STATEMENT (SEWERAGE)

S. No.	Name of Sewerage Line	Dia in MM	Length in Mtr.
1	SMH - 1 to 2	250	20
2	SMH - 2 to 3	250	21
3	SMH - 3 to 4	250	20
4	SMH - 4 to 5	250	19.5
5	SMH - 5 to 6	250	22
6	SMH - 6 to 7	250	22.5
7	SMH - 7 to 8	250	20
8	SMH - 8 to 9	250	15
9	SMH - 9 to 10	250	15
10	SMH - 10 to 11	250	14
11	SMH - 12 to 13	250	16
12	SMH - 13 to 14	250	14
13	SMH - 14 to 15	250	14.5
14	SMH - 15 to 16	250	9.5
15	SMH - 16 to 17	250	13.5
16	SMH - 17 to 18	250	15.5
17	SMH - 18 to 19	250	13.5
18	SMH - 19 to 20	250	15.5
19	SMH - 20 to 21	250	14.5
20	SMH - 21 to 11	250	7
21	SMH - 11 to 22	250	16
22	SMH - 22 to 23	250	14
23	SMH - 23 to 24	250	14.5
24	SMH - 24 to 25	250	16
25	SMH - 25 to 26	250	5.2
26	SMH - 26 to 35	250	4.4
27	SMH - 27 to 28	250	13.5
28	SMH - 28 to 29	250	13.5
29	SMH - 29 to 30	250	12.8
30	SMH - 30 to 31	250	14
31	SMH - 31 to 32	250	13.5
32	SMH - 32 to 33	250	13.5
33	SMH - 33 to 34	250	14.5
34	SMH - 34 to 35	250	15
35	SMH - 35 to 36	250	11.7
36	SMH - 36 to 37	250	16.2
37	SMH - 37 to STP	250	18.7

S. No.	Name of Sewerage Line	Dia in MM	Length in Mtr.
38	SMH - 38 to 39	250	5
39	SMH - 39 to 40	250	14.7
40	SMH - 40 to 41	250	15.1
41	SMH - 41 to 42	250	15
42	SMH -42 to 43	250	13.5
43	SMH - 43 to 44	250	21
44	SMH - 44 to 45	250	24.7
45	SMH - 45 to 46	250	20
46	SMH - 47 to 37	250	20
47	SMH - 37 to STP	250	5
48	SMH -STP to 48	250	5
49	SMH - 48 to 49	250	18.5
50	SMH - 49 to 50	250	20
51	SMH - 50 to 51	250	20
52	SMH - 51 to 52	250	17.5
53	SMH - 52 to 53	250	20
54	SMH - 53 to 54	250	21
55	SMH - 54 to 55	250	25
56	SMH - 55 to 56	250	9
57	SMH - 56 to 57	250	27.5
58	SMH - 57 to 58	250	30
59	SMH - 58 to 59	250	15
60	SMH - 59 to 60	250	15
61	SMH - 60 to 61	250	15
62	SMH - 61 to 62	250	15
63	SMH - 62 to 63	250	15
64	SMH - 63 to 64	250	15
65	SMH - 64 to 65	250	12
66	SMH - 65 to 66	250	15
67	SMH - 66 to 67	250	15
68	SMH - 67 to 68	250	15
69	SMH - 68 to 69	250	15
70	SMH - 69 to 70	250	12
71	SMH - 70 to 71	250	15
72	SMH - 71 to 72	250	12
73	SMH - 72 to 73	250	16
74	SMH - 73 to 74	250	15
75	SMH - 74 to 75	250	15
76	SMH - 75 to 76	250	15
77	SMH - 76 to 77	250	15
78	SMH - 77 to 78	250	15

S. No.	Name of Sewerage Line	Dia in MM	Length in Mtr.
79	SMH - 78 to 79	250	15
80	SMH - 79 to 80	250	15
81	SMH - 80 to 81	250	15
82	SMH - 81 to 82	250	15
83	SMH - 82 to 83	250	15
84	SMH - 83 to 84	250	15
85	SMH - 84 to 85	250	15
86	SMH - 85 to 86	250	15
87	SMH - 86 to 87	250	15
88	SMH - 80 to 88	250	15
	Total		1359

MATERIAL STATEMENT (STORM)

S. No.	Name of Storm Line	Dia in MM	Length in Mtr.
1	MH - 1 to 2	300	21.20
2	MH - 2 to 3	300	24.00
3	MH - 3 to 4	300	17.80
4	MH - 4 to 5	300	17.60
5	MH - 5 to 6	300	10.00
6	MH - 6 to 7	300	19.40
7	MH - 7 to 8	300	23.80
8	MH - 8 to 9	300	17.90
9	MH - 9 to 10 I/C RWHP-01	300	18.70
10	MH - 10 to 11	300	21.50
11	MH - 11 to 12	300	19.60
12	MH - 12 to 13	300	19.30
13	MH - 13 to 14	300	20.70
14	MH - 14 to 15	300	21.50
15	MH - 15 to 16	300	19.00
16	MH - 16 to 17	300	16.50
17	MH - 17 to 23	300	17.00
18	MH - 18 to 19	300	21.50
19	MH - 19 to 20	300	25.50
20	MH - 20 to 21	300	19.30
21	MH - 21 to 22	300	12.80
22	MH - 22 to 23	300	16.50
23	MH - 23 to 24	300	14.50
24	MH - 24 to 25 I/C RWHP-02	300	12.00
25	MH - 25 to 26	300	16.60
26	MH - 26 to 27	300	12.90
27	MH - 27 to 28	300	15.00
28	MH - 28 to 32	300	12.60
29	MH - 29 to 30	300	22.00
30	MH - 30 to 31	300	25.00
31	MH - 31 to 32	300	11.10
32	MH - 32 to 33	300	17.30
33	MH - 33 to 34	300	15.00
34	MH - 34 to 35	300	15.00
35	MH - 35 to 36 I/C RWHP-03	300	14.00
36	MH - 36 to 37	300	19.20

MATERIAL STATEMENT (STORM)

S. No.	Name of Storm Line	Dia in MM	Length in Mtr.
37	MH - 37 to 38	300	14.60
38	MH - 38 to 39	300	20.70
39	MH - 39 to 40	300	20.20
40	MH - 40 to 41	300	17.60
41	MH - 41 to 42	300	10.80
42	MH - 42 to 43	300	16.00
43	MH - 43 to 44 I/C RWHP-04	300	15.00
44	MH - 44 to 45	300	16.50
45	MH - 45 to 46	300	17.00
46	MH - 46 to 47	300	21.50
47	MH - 47 to 53	300	20.00
48	MH - 48 to 49	300	19.30
49	MH - 49 to 50	300	12.80
50	MH - 50 to 51	300	16.50
51	MH - 51 to 52	300	17.00
52	MH - 52 to 53	300	15.00
53	MH - 53 to END I/C RWHP-05	300	5.00
54	MH - 54 to 55	300	15.00
55	MH - 55 to 56	300	15.00
56	MH - 56 to 57	300	15.00
57	MH - 57 to 58	300	15.00
58	MH - 58 to 59	300	15.00
59	MH - 59 to 60	300	20.00
60	MH - 60 to 61	300	15.00
61	MH - 61 to 62	300	15.00
62	MH - 62 to 63	300	15.00
63	MH - 63 to 64	300	15.00
64	MH - 64to 65	300	15.00
65	MH - 65 to 66	300	15.00
66	MH - 66 to 67	300	15.00
67	MH - 67 to 68	300	20.00
68	MH - 68 to 69	300	15.00
69	MH - 69to 70	300	15.00
70	MH - 70 to 71	300	15.00
71	MH - 72 to 72	300	15.00
72	MH - 72 to 73	300	15.00
73	MH - 73 to 74	300	15.00

MATERIAL STATEMENT (STORM)

S. No.	Name of Storm Line	Dia in MM	Length in Mtr.
74	MH - 74 to 75	300	15.00
75	MH - 75 to 76	300	15.00
76	MH - 76 to 77	300	15.00
77	MH - 77 to 78	300	15.00
78	MH - 78 to 79	300	15.00
79	MH - 79 to 80	300	15.00
80	MH - 80 to 81	300	20.00
81	MH - 81 to 82	300	15.00
82	MH - 82 to 83	300	15.00
83	MH - 83 to 84	300	15.00
84	MH - 84 to 85	300	12.00
	TOTAL		1395.8

PROJECT : AFFORDABLE GROUP HOUSING COLONY (VILLAGE DHANKOT)SEC-102, GURUGRAM (HR)								
MATERIAL STATEMENT FOR WATER SUPPLY DISTRIBUTION SYSTEM / RISING MAIN LINE								
S.N.	Discription	No. of Floor	Pipe Dia (mm)					Remarks
			50 (mm)	40 (mm)	100 (mm)	80 (mm)	65 (mm)	
1	T- A	Stilt + 14	54	54	24	173	80	
2	T- B	Stilt + 14	54	54	24	173	80	
3	T- C	Stilt + 14	54	54	24	173	80	
4	T- D	Stilt + 14	54	54	24	173	80	
5	T- E	Stilt + 11	54	54	24	173	80	
6	T- I	Stilt + 14	54	54	24	173	80	
7	T- J	Stilt + 14	54	54	24	173	80	
8	T- K	Stilt + 14	54	54	24	173	80	
9	T- L	Stilt + 14	54	54	24	173	80	
10	T- M	Stilt + 14	44	44	18	173	80	
11	T- N	Stilt + 2	20	20	10	173	80	
	TOTAL QUANTITY		550	550	244	1903	880	4127