PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JANAWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR- 63A, GURUGRAM (HARYANA)

SERVICE PLAN ESTIMATE FOR PUBLIC HEALTH ENGINEERING SERVICES WORK

Client

MS. SIGNATURE GLOBAL INDIA PVT. LTD.

MEP Services Consultant

PARADISE CONSULTANTS

Plot No. 96, Pocket – 1, Jasola Vihar, New Delhi - 110025

PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JANAWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

Gurgaon is located at 28°28'N 77°02'E28.47°N 77.03°E/28.47; 77.03. It has an average elevation of 220 metres (721 ft) Gurgaon district, comprising four blocks Pataudi, Sohna, Gurgaon and Farrukhnagar, was created on 15 August, 1979.On its north, it is bounded by the district of Rohtak and the Union Territory of Delhi. Faridabad district lies to its east. On its south, the district shares boundaries with the district of Mewat. To its west lies the district of Rewari and the State of Rajasthan.Gurgaon is situated between the Himalayas and Aravalis mountain ranges. It is surrounded on three sides by Haryana and to the east, across the river Yamuna by Uttar Pradesh. Its greatest length is around 13 miles and the greatest breadth is 17 miles. Delhi's altitude ranges between 213 to 305 meters above sea level.

PROPOSED RESIDENTIAL PLOTTED COLONY MEASURING 5.0125 ACRES is a residential proposed between **SECTOR - 63A AT GURUGRAM, HARYANA** for development by **MS. SIGNATURE GLOBAL INDIA PVT. LTD.**

1 Water Supply

The source of water supply shall be HUDA water supply connection. It has been proposed to construct undergorund tanks of capacity as per attached detaileds for domestic and other purpose. The underground tanks will be filled up from the riser and then pumped to the overhead water tanks of each plot.

i.) Source

The source of water supply in this area is tubewells as the underground water is sweet and fit for human consumption, moreover, the water is available at reasonable depth.The average yield of tubewell with 60'–80' strainer will be about 26000 lph per hour. The recharging of under ground water table in this belt is stated to be good. However still we shall resort to rain water harvesting system to keep up the recharging system. The number of tubewells required for the above area has been worked out to 02 Nos and the tubewells will be bored in tune with growth of demand to avoid absolence of the tubewells.

ii.) Design

The scheme has been designed for population of 1296 persons in 5.0125 Acre. The rate of water supply per head per day has been taken assumed as 172.5 litres per head per day as per HUDA norms. In addition to above necessary provision of water for Community building, Commercial building, parks etc. have been taken into account for calculating the maximum number of tubewell water required.

iii.) Pumping Equipments

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

iv.) Under Ground Storage

Underground storage tank provision has been made, which caters for the present and a lot of future requirement as well as fire fighting requirement. The water for domestic water compartment shall over flow from the fire compartment so that the water in the fire compartment also remains fresh.

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v.) **Boosting Station**

The boosting station is being planned near UGSR catering to the above requirement.

vi.) **Distribution System**

The distribution systems for this development are has been designed to supply @ 172.5 Litres per head per day @ 3 times the average rate of flow on 'Hazen Willima' formula with C-100. Necessary provision for laying D.I. pipes only conforming to relevant IS standards along with valves and specials has been made in this estimate. Minimum pipe diameters for distribution are kept as 100 dia.

vii.) **Rising Mains**

Rising mains from HUDA water main on sector road to water works have also been designed and provision for D.I. pipe line (dia as/design) has been made in this estimate.

2 **Sewerage**

This scheme is designed for sewer connecting to the proposed sewage treatment plant. The sewerage system has been marked on the respective plans.

The sewer lines have been designed for 3 times average DWR in relation to the water supply demand assuming that 80% fo the domestic water supply shall find its way into the proposed sewer SW pipe sewers have been proposed designed to run half full. The sewers have been designed on 0.75 mtr. per second velocity ie. Self cleansing velocity. Necessary provisions for laying SW pipes manholes etc. has been made in this estimate.

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

3 **Storm Water Drainage**

The storm water drain is being designed to carry 6.25 mm rain fall per hour. Also suitable provisions are contemplated in our scheme to ensure better recharging of under ground water table in the area.RCC NP_3 pipe drain with minimum 400 mm dia is proposed in this area.

4 **Roads**

Cost of road has been taken in the estimate.

5 **Street Lighting**

Provision for street lighting on surrounding area has been made.

5 **Horticulture**

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

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7 **Specifications :**

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

8 **Rates**

Estimates for providing services in this site has been prepared on the recent HUDA rates.

9 **Cost**

The total cost of development in this Project including various PH & B & R services works out to **Rs. 433.35 lacs** which includes 3% contingency and PE charges and 49% departmental charges also.

The cost per gross acre for this phase works out to **Rs. 86.45 Lacs/acre** which covers the provision of services like water supply, sewerage, storm water drainage, roads, street lighting and plantations including plantations maintenance thereof as well as future expansion whatsoever indicated.

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PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JAN AWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

DESIGN CALCULATION

1	**Plots**				
	Total No. of Plots		72 Nos.		
	Population per plot		18.0 persons		
	Therefore population		1296 persons		
		SAY	**1296 persons**		
	Water requirement for plots (General)	@	172.50 Lpd.		
			Domestic @ 65 %	**Flushing @ 35 %**	
	Water requirement for plots (General)	@	113.00	59.50 Lpd.	
			146448	77112 Lpd.	
		or	**146.45**	**77.11 Kld.**	
2	**Visitors @ 10%**		130.00 persons		
	Water requirement	@	15.00 Lpd.		
			Domestic	**Flushing**	
	Water requirement	@	5.00	10.00 Lpd.	
			650	1300 Lpd.	
		or	**0.65**	**1.30 Kld.**	
3	**Commercial (0.201 Acres)**	811.40	sq.m		
		@		3	sq.m/per
	Total Population	270			
	Staff @ 10%	27	-	-	Person
	Visitors @ 90%	243	-	-	Person
	Per Person Water Requirement		**Domestic**	**Flushing**	
	Staff	45.00	25.00	20.00 Lpd.	
	Visitors	15.00	5.00	10.00 Lpd.	
	Daily Water Requirement				
	Staff	1217.10	676.17	540.93 Lpd.	
	Visitors	3651.30	1217.10	2434.20 Lpd.	
			1.89	**2.98 Kld.**	
4	**Common facility (0.501 Acres)**	2028.49	sq.m		
		@		1.8	sq.m/per
	Population	1127			
	Staff @ 10%	113	-	-	Person
	Visitors @ 90%	1014	-	-	Person
	Per Person Water Requirement		**Domestic**	**Flushing**	
	Staff	45.00	25.00	20.00 Lpd.	
	Visitors	15.00	5.00	10.00 Lpd.	
	Daily Water Requirement				
	Staff	5071.22	2817.34	2253.87 Lpd.	
	Visitors	15213.65	5071.22	10142.43 Lpd.	
			7.89	**12.40 Kld.**	

5	**Filter backwash (Assumed Lumsum)**		@	10.00	0.00 **Kld.**
6	**Total water Requirement (1+2+3+4+5)**		**Total**	166.88	93.78 **Kld.**
7	**Green area**		1899.64 Sq.m		
	Daily water requirement		@	-	1899.640 Sqm.
				-	6.00 Ltr./Sqm.
				-	11397.84 Lpd.
				-	11397.84 Lpd.
				0.00	**11.40 Kld.**
8	**Area under undetermined use**		0.00		
	Daily water requirement		@	-	0 Lpd.
				0.00	0 Lpd.
			Total	**0.00**	**0.00 Kld.**
		(7+8)	**Total**	**0.00**	**11.40 Kld.**
I	**Total Daily Requirement**				
	a) For Domestic+Flushing use (1+2+3+4+5)			166.88	93.78 Kld.
	b) Under Road+ Parks (7+8)			0.00	11.40 Kld.
	Total Daily Requirement			166.88	105.18 Kld.
			SAY	**170.00**	**110.00 Kld.**
II	**Tubewell**				
	Assuming working hours of tubewells				8 Hours
	Assuming discharge/hour of each tubewell				26 KL/Hours
	Total domestic demand				**166.88 Kld.**
	No. of tubewells required		166.88 /26/8		0.80
			Say		**1.00 Nos.**
III	**Pumping machinery for tubewell**				
	Gross working load			=	45.00 Mtr.
	Average fall in SL			=	3.05 Mtr.
	Depression head			=	6.10 Mtr.
	Friction loss in main			=	2.50 Mtr.
				=	56.65 Mtr.
			Say	=	60.00 Mtr.
	BHP = 26000x60x1/60/60/75/0.6			=	9.63 HP
	With 60% efficiency		**Say**		**10.00 HP**
IV	**Underground Tank**				
	Daily requirement for domestic use			=	166.88 Kld.
	Capacity of under ground tank				
	12 hours storage		166.88 x 12 / 24		83.44 Kld.
			Say	=	**90.00 Kld.**
	Fire Tank Capacity As/NBC Code 100 sqrt (P)= 100 sqrt (4.784)			=	113.84 KLD
			Say	=	**120.00 KLD**

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	TOTAL				**210.00 KLD**

It is proposed to provide under ground tank of capacity **210 KL** which also includes **120 KL** capacity for fire fighting.

Both tanks will have four compartments, two for fire, one for raw and the other one for domestic use. The water first enters the fire compartment, then over flows to the raw use compartment so that the water in the fire compartment shall remain fresh.

It is proposed to provide the under ground tank of following capacity :

Capacity of Fire Water Tank-01	**60.00 Kld.**
Capacity of Fire Water Tank-02	**60.00 Kld.**
Capacity of Raw Water Tank-01	**45.00 Kld.**
Capacity of Raw Water Tank-02	**- Kld.**
Capacity of Domestic Water Tank-01	**45.00 Kld.**
Capacity of Domestic Water Tank-02	**- Kld.**
	UGT

V BOOSTING MACHINERY

UG. Tank

Daily requirement for domestic use			=	166.88 Kld.
Assuming 6 hours pumping	2 pumps (with one standby)			
Discharge/hour	166.88	/ 6 / 2	=	13.91 KL/Hours
Head of pump				
i) Suction lifts			=	0.0 Mtr.
ii) Friction loss in M<main & specials			=	5.0 Mtr.
iii) Clear head			=	17.0 Mtr.
iv) Residual head			=	5.0 Mtr.
			=	27.0 Mtr.
BHP of motor				2.3 HP
			=	3.0 **HP**

Gen Set	Nos.	HP		
Pumps for UG. Tank	2	3.0		6 HP
Tubewell	1	10.0		10 HP
Lighting			=	25 HP
				41 HP
or		41 x0.746x1.5		45.88 KVA
			Say	**50.00 KVA**

VI Sewage Treatment Plant Capacity (STP.)

Gross Domestic+Flushing water requirment / day	260.66 Kld.
Sewage flow 80% of total load	208.53 Kld.
Proposed STP. Capacity	**210.00 Kld.**
	STP

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Estimate for Providing in Internal Development works for

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Description	Amount (Lacs.)
Sub Work - I Water Supply System	**103.51**
Sub Work - II Sewerage System	**45.90**
Sub Work - III Storm Water Drainage System	**28.95**
Sub Work - IV Roads & Footpath	**135.92**
Sub Work - V Street Lighting	**7.69**
Sub Work - VI - Horticulture	**9.99**
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)	**101.39**
Total	**433.35**

(RUPEES FOUR CRORES THIRTY THREE LACS THIRTY FIVE THOUSAND ONLY)

COST PER ACRE **86.45 Lacs**

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FINAL ABSTRACT OF REVISED COST

Description		Amount (Lacs.)
Sub Head - (I) Head Works		16.40
Sub Head - (II) Pumping Machinery		17.21
Sub Head - (III) Distribution System		30.80
Sub Head - (IV) Irrigation Scheme		3.04
	Total	**67.45**
Add 3% Contingencies		2.02
	Total	**69.47**
Add 49% Departmental Charges		34.04
	Grand Total	103.51
(CO to final abstract of cost)	**Say**	**103.51**

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Sub Work I — **Water Supply**

Sub Head No. I — **Head Works**

S. No.	Description	Unit	Qty	Rate (Rs.)	Amount Rs. (lacs)
1	Boring and installing 510 mm i/d tubewells with reverse/direct rotary rig complete with pipe strainer to a depth of about 80 m. complete.	Nos.	1	400000.00	4.00
2	Constructing pump chambers as per standard design of PWD PH/HUD.\ of size 1.50x1.50 m.	Nos.	1	100000.00	1.00
1	Construction of boosting chambers of suitable size along with under ground tank & pumping machinery and generating set etc. complete in all respects.				
	Details of boosting station				
i)	construction of boosting chambers	Nos.	1	300000.00	3.00
ii)	construction of UG tank	KL	90	6000.00	5.40
4	Provision for carriage of material and other unforeseen items.	LS	-	-	1.50
5	Provision for facilites staff for Maintenance	LS	-	-	1.50
	(C.O. to abstract of cost of Sub-work No.I)				**16.40 Lacs**
				Say	**16.40 Lacs**

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	Sub Work I				**Water Supply**
	Sub Head No. II				**Pumping Machinery**
S. No.	**Description**	**Unit**	**Qty**	**Rate (Rs.)**	**Amount (in Lakhs)**
1	Providing and installing electricity driven electro or submersible pumping set capable of delivering about 26 KL water per hour against a total head of 60 M complete with motor and other accessories.	Nos.	1	130000.00	1.30
2	Providing & installing electricity driven pumping set capable of delivering 240 LPM of water against a total head of 27 m complete with motor and other accessories (For Domestic - 3.0 HP).	Nos.	3	100000.00	3.00
3	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities.				
i)	50 KVA	Nos.	1	500000.00	5.00
4	Provision for diesel engine genset stand bye arrangements for Tubewells.	Nos.	1	125000.00	1.25
5	Provision for cheap pressure type chlorination plant complete.	Nos.	1	15500.00	0.16
6	Provision for making foundations & erection of pumping machinery.	LS	-	-	2.00
7	Provision for pipes, valves & specials inside the pump chamber.	LS	-	-	1.50
8	Provision for electric services connection including electric fittings for tubewells chambers complete including cost of transformer.	LS	-	-	1.50
9	Provision for carriage for materials and other unforeseen items.	LS	-	-	1.50
	(C.O. to abstract of cost of Sub-work No.I)			**Total**	**17.21**
				Say	**17.21**

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Sub Work I — **Water Supply**

Sub Head No. III — **Distribution System/Rising Main**

S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, laying, jointing & testing D.I. K-7 pipes including cost of excavation complete as per ISI marked. (For Domestic & Tube Well water supply line)				
i)	100 mm dia	M	1704	1150.00	1959600.00
ii)	150 mm dia	M	0	1575.00	0.00
2	Providing, laying and Jointing GI pipes and fittings conforming to IS:1239 (heavy class) complete with GI fittings (union and clamps including cutting holes in wall and making good the same in cement mortar 1 : 2 including pipe supports with walls and ceilings including pipe supports with galvanised MS slotted angle iron angles, clamps, nuts, bolts complete including cutting and making good the floors and walls where required complete of outer diameter.				
i)	40mm dia nominal bore	M	112	650.00	29900.00
ii)	50mm dia nominal bore	M	112	750.00	60750.00
iii)	65mm dia nominal bore	M	0	900.00	58500.00
iv)	80mm dia nominal bore	M	0	1150.00	94300.00
3	Providing, fixing & Testing butterfly valves including cost of complete in all respects.				
i)	100 mm i/d	Nos.	10	10000.00	100000.00
ii)	150 mm i/d	Nos.	0	15000.00	0.00
4	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.				
i)	100 mm i/d	Nos.	3	14000.00	42000.00
5	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	5	10000.00	50000.00
6	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	18	1000.00	18000.00
7	Provision for carriage of material	LS	-	-	150000.00
8	Provision for cutting the roads and making to its original conditions.	LS	-	-	200000.00
9	Making water supply connection.	LS	-	-	200000.00
10	Provision for rising main from HUDA water supply line to UG Tank.				
i)	65 mm i/d	M	180	650.00	117000.00
	(C.O. to abstract of cost of Sub-work No.I)			**Total**	**3080050.00**
				Say	**30.80 Lacs**

	Sub Work I				Water Supply
	Sub Head No. IV				Irrigation
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, laying, jointing & testing uPVC pipe line confirming to IS 4985 including cost of Excavation etc. complete in all respect.				
i)	90 OD	M	94	650.00	61100.00
ii)	75 OD	M	198	400.00	79200.00
iii)	40 OD	M	0	310.00	0.00
iv)	32 OD	M	98	260.00	25480.00
v)	25 OD	M	54	210.00	11340.00
2	Providing and fixing 20 mm PVC RQRC hydrant valve with PVC lid complete in all respect.	Nos.	10	1200.00	12000.00
3	Providing & fixing 20 mm PVC Keys for hydrant valve complete in all respects.	Nos.	10	400.00	4000.00
4	Providing, fixing & Testing Butter fly valves including cost of complete in all respects.				
i)	80 mm i/d	Nos.	1	4750.00	4750.00
5	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	1	4500.00	4500.00
6	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	2	1000.00	2000.00
7	Provision for carriage of materials etc. and other unforscan charges.	LS	-	-	50000.00
8	Provision for cutting of roads & making good to its in original condition.	LS	-	-	50000.00
				Total	**304370.00**
				Say	**3.04 Lacs**

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	Sub Work II				Sewerage Scheme
S. No.	**Description**	**Unit**	**Qty**	**Rate (Rs.)**	**Amount (Rs.)**
1	Providing, lowering, jointing, cutting SW/ RCC NP_3 pipes and specials into trenches including cost of excavation, bed concrete lot of manholes complete.				
i)	**200 mm i/d**				
a)	Average depth 0.0 m to 1.5 m	M	212	1050.00	222600.00
b)	Average depth 1.5 m to 4.5 m	M	162	1200.00	194400.00
ii)	**250 mm i/d**				
a)	Average depth 0.0 m to 1.5 m	M	0	1200.00	0.00
b)	Average depth 1.5 m to 4.5 m	M	124	1400.00	173600.00
ii)	**300 mm i/d**				
a)	Average depth 1.5 m to 4.5 m	M	0	1690.00	0.00
ii)	**400 mm i/d**				
a)	Average depth 1.5 m to 4.5 m	M	0	2100.00	0.00
2	Provision for lighting, watching and temporary diversion of traffic	LS	-	-	100000.00
3	Provision for cutting of roads and carriage of materials etc. and other unforsean charges.	LS	-	-	100000.00
4	Provision for connection with HUDA.	LS	-	-	100000.00
5	Cost of 210 Kld Sewerage Treatment Plant.	LS	-	-	2100000.00
6	Provision for CI / DI pipe from STP. To Huda Main Line.				
i)	150 mm dia pipe.	M	0	1575.00	0.00
					2990600.00
	Add 3% contingencies				89718
					3080318.00
	Add 49% Deptt. Charges				1509355.82
				Total	**4589673.82**
	(C.O. to abstract of cost of Sub-work No. 1)			Say	**45.90 Lacs**

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	Sub Work - III				Storm Water Drain
S. No.	**Description**	**Unit**	**Qty**	**Rate (Rs.)**	**Amount (Rs.)**
1	Providing, lowering, jointing, cutting RCC NP_3 pipes and specials into trenches including cost of excavation cost of manholes, ventilating chambers etc. complete in all respects.				
i)	**400 mm i/d**				
a)	Average depth upto 1.5 m	M	309	1900.00	587100.00
b)	Average depth 1.5 m to 4.5 m	M	170	2100.00	357000.00
2	Provision for Road Gully & Drain.	LS	-	-	200000.00
3	Provision for cutting of roads and carriage of materials etc. and other unforseen items	LS	-	-	200000.00
4	Provision for disposal arrangements Recharge Pit.	Nos	2	200000.00	400000.00
5	Provision for lighting, watching and temporary diversion of traffic	LS	-	-	100000.00
6	Provision for connection with HUDA.				
i)	400 mm i/d (Average depth 1.5 m to 4.5 m)	M	20	2100.00	42000.00
					1886100.00
	Add 3% contingencies				56583.00
					1942683.00
	Add 49% Deptt. Charges				951914.67
				Total	**2894597.67**
				SAY	**28.95 Lacs**
	(C.O. to abstract of cost of Sub-work No. 1				

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	Sub Work IV				**Road Work**
S. No.	**Description**	**Unit**	**Qty**	**Rate (Rs.)**	**Amount (Rs.)**
1	Provision for leveling & earth filling as per site condition 5.0125 acre @ 100000/acre	Acres	5.0125	100000	501250.00
2	Construction of road by:- i) Providing GSB 300 mm thick. ii) 250 mm thick W.M.M. stone aggregate. iii) 50 mm thick B.M. iv) 20 mm thick M.S.S. complete in all respect.	Sq. mtr.	4183.0	800	3346400.00
3	Provision for making approach and pavement to building block by providing concrete pavement or tiles. Etc.	Sq. mtr.	836.60	650	543790.00
4	Provision for parking arrangement @ 500 / sqm	Sq. mtr.		500	0.00
5	Provision for kerb stone with complete specification.	mtr.	8366.0	450	3764700.00
6	Provision for Carriage of material	LS.		500000.00	500000.00
7	Provision for traffic lighting and guide map/ indicators	LS.		200000.00	200000.00
				Total	**8856140.00**
	Add 3% contingencies				265684.20
					9121824.20
				Total	91.22 Lacs
	Add 49 % department charges				44.70 Lacs
				SAY	**135.92 Lacs**

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	Sub Work V				Street Lighting
S. No.	**Description**	**Unit**	**Qty**	**Rate (Rs.)**	**Amount (Rs.)**
1	Providing street lighting on internal roads as per standard specifications of HVPNL with CFL	per acre	5.0125	100000.00	**501250.00**
	Add 3% contingencies				15037.50
				Total	**516287.50**
	Add 49% Deptt. Charges				252980.88
				Total	**769268.00**
				SAY	**7.69 Lacs**

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Sub Work VI				Horticulture
S. No. Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
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 prope level by filling with earth mixed with manure befor & after flodding 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)				
5.0125 acres @ Rs. 1.0 lacs.	per acre	5.0125	100000.00	5,01,250
200 trees @ Rs. 750/- each				1,50,000
				651250.00
Add 3% contingency charges				**19537.50**
			Total	**670787.50**
Add 49% Deptt. Charges				**328685.88**
			Total	**999473.38**
			Say	**9.99 Lacs**

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Sub Work VII — **Maintenance Charges & Resurfacing of Roads**

S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Provision for maintenance charges for water supply, sewerage,storm water drainage, 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.				
	5.0125 acres @ 4 lacs per acre	per acre	5.0125	400000.00	2005000
2	Provision for resurfacing & strengthening of road after five years of Ist phase @ 500/- per sqm	Sq. mtr.	4183.0	500	2091500.00
3	Provision for resurfacing & strengthening of road after ten years of 2nd phase @ 600/- per sqm	Sq. mtr.	4183.0	600	2509800.00
				Total	**6606300.00**
	Add 3% contingency & PE charges				198189.00
				Total	**6804489.00**
	Add 49% Departmetal charges				3334199.61
				Total	**10138688.61**
			say		**101.39 Lacs**

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WATER SUPPLY QUANTITY SHEET

DOMESTIC WATER SUPPLY QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
1	***U.G.T***	D1	6.0	100
2.	D1	D2	19.0	100
3.	D2	D3	38.0	100
4.	D3	D4	77.0	100
5.	D4	D5	55.0	100
6.	D5	D5a	112.0	50
7.	D2	D6	24.0	100
8.	D6	D6a	115.0	100
9.	D6a	D7a	9.0	100
10.	D7a	D7	115.0	100
11.	D6	D7	9.0	100
12.	D7	D8	86.0	100
13.	D8	D9	9.0	100
14.	D9	D3a	155.0	100
15.	D3a	D3	9.0	100
16.	D3a	D5	98.0	100

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S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
FLUSHING WATER SUPPLY QUANTITY SHEET				
1	***S.T.P***	F1	3.0	100
2.	F1	F2	82.0	100
3.	F2	F3	63.0	100
4.	F3	F4	77.0	100
5.	F4	F5	55.0	100
6.	F5	F5a	112.0	40
7.	F1	F6a	35.0	100
8.	F6a	F7a	9.0	100
9.	F7a	F7	115.0	100
10.	F2	F7	9.0	100
11.	F7	F8	86.0	100
12.	F8	F9	9.0	100
13.	F9	F3a	155.0	100
14.	F3a	F3	9.0	100
15.	F3a	F5	98.0	100
TUBE WELL WATER SUPPLY QUANTITY SHEET				
1	**Tube Well**	***UGT.***	75.0	100
HUDA WATER SUPPLY QUANTITY SHEET				
1	HUDA Water Supply	***UGT***	180.0	65

Description	Length in (MTR)	Pipe Dia (MM)
Domestic, Flushing & Tube Well Water Supply line	1704.0	100
Domestic, Flushing & Tube Well Water Supply line	112.0	50
Domestic, Flushing & Tube Well Water Supply line	112.0	40

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S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
Description			**Length in (MTR)**	**Pipe Dia (MM)**
HUDA Water Supply line			180.0	65
100 Dia Valve			10	Nos.
150 Dia Valve			0	Nos.
100 Dia Non Return Valve			3	Nos.
Air Valve			5	Nos.

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IRRIGATION WATER SUPPLY QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	OD
1	***S.T.P***	G1	10.0	90
2.	G1	G1a	53.0	32
3.	G1	G2	84.0	90
4.	G2	G3	18.0	75
5.	G3	G4	60.0	75
6.	G4	G5	30.0	75
7.	G3	G5	90.0	75
8.	G2	G6	45.0	32
9.	G6	G7	54.0	25

Irrigation Water Supply line	**94.0**	**90**
Irrigation Water Supply line	**198.0**	**75**
Irrigation Water Supply line	**0.0**	**40**
Irrigation Water Supply line	**98.0**	**32**
Irrigation Water Supply line	**54.0**	**25**
Garden Hydrant	**10**	Nos.
80 Dia Valve	**1**	Nos.
Air Valve	**1**	Nos.

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TITLE - SEWERAGE QUANTITY SHEET

S.No.	Line No.		Length	Pipe Dia		Depth			EXCAVATION			
						Start	End	Avg.	0.0 - 1.5	1.5 - 3.0	3.0 - 4.5	4.5 - 6.0
	From	To	(mtr.)	(mm)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1	S1	S2	40.0	200	0.200	1.10	1.60	1.35	40.0	0.0	0.0	0.0
2.	S2	S3	65.0	200	0.200	1.60	2.52	2.06	0.0	65.0	0.0	0.0
3.	S3a	S3	44.0	200	0.200	1.10	1.42	1.26	44.0	0.0	0.0	0.0
4.	S3	S4	19.0	200	0.200	2.52	2.66	2.59	0.0	19.0	0.0	0.0
5.	S4a	S4	38.0	200	0.200	1.10	1.38	1.24	38.0	0.0	0.0	0.0
6.	S4	S5	17.0	200	0.200	2.66	2.79	2.73	0.0	17.0	0.0	0.0
7.	S5	S6	61.0	200	0.200	2.79	3.23	3.01	0.0	0.0	61.0	0.0
8.	S6a	S6	90.0	200	0.200	1.10	1.75	1.43	90.0	0.0	0.0	0.0
9.	S6	S7	122.0	250	0.250	3.28	3.93	3.61	0.0	0.0	122.0	0.0
10.	S7	***S.T.P***	2.0	250	0.250	3.93	3.95	3.94	0.0	0.0	2.0	0.0
Total			**498.0**						**212.0**	**101.0**	**185.0**	**0.0**

Excavation Depth

Description	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
200 mm Dia pipe	212.0	101.0	61.0	0.0
250 mm Dia pipe	0.0	0.0	124.0	0.0
300 mm Dia pipe	0.0	0.0	0.0	0.0
400 mm Dia pipe	0.0	0.0	0.0	0.0

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TITLE : STORM WATER QUANTITY SHEET

S.No.	Line No.		Length	Size of Pipe		Depth			EXCAVATION		
						Start	End	Avg.	0.0 -1.5	1.5 - 3.0	3.0 - 4.5
-	From	To	(mtr.)	(mm)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1	A1	A2	83.0	400	0.400	1.30	1.45	1.38	83.0	0.0	0.0
2.	A2a	A2	114.0	400	0.400	1.30	1.50	1.40	114.0	0.0	0.0
3.	A2	A3	24.0	400	0.400	1.50	1.55	1.53	0.0	24.0	0.0
4.	A3	***D.C.-01***	3.0	400	0.400	1.55	1.56	1.56	0.0	3.0	0.0
5.	***D.C.-01***	***R.P.-01***	2.0	400	0.400	1.56	1.57	1.57	0.0	2.0	0.0
6.	***R.P.-01***	A4	4.0	400	0.400	1.57	1.58	1.58	0.0	4.0	0.0
7.	A4	A5	36.0	400	0.400	1.58	1.65	1.62	0.0	36.0	0.0
8.	A5a	***A5***	31.0	400	0.400	1.30	1.36	1.33	31.0	0.0	0.0
9.	***A5***	***A6***	19.0	400	0.400	1.65	1.69	1.67	0.0	19.0	0.0
10.	***A6a***	A6	53.0	400	0.400	1.30	1.40	1.35	53.0	0.0	0.0
11.	A6	A7	74.0	400	0.400	1.69	1.82	1.76	0.0	74.0	0.0
12.	A7	***D.C.-02***	2.0	400	0.400	1.82	1.83	1.83	0.0	2.0	0.0
13.	***D.C.-02***	***R.P.-02***	2.0	400	0.400	1.83	1.84	1.84	0.0	2.0	0.0
14.	***R.P.-02***	***TO HUDA DRAIN***	4.0	400	0.400	1.84	1.40	1.62	0.0	4.0	0.0
15.	***A8***	***A9***	24.0	400	0.400	1.30	1.35	1.33	24.0	0.0	0.0
16.	***A9***	***TO EXT.***	4.0	400	0.400	1.35	1.36	1.36	4.0	0.0	0.0
Total			**479.0**						**309.0**	**170.0**	**0.0**

Excavation Depth

Description	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)
400 mm Dia pipe	309.0	170.0	0.0

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TITLE : ROAD QUANTITY SHEET

AREA OF METALLED ROAD (A)

S.NO.	ROAD NO.	LENGTH (In Rm. Mt.)	WIDTH (In Rm. Mt.)	-	TOTAL AREA (In Sq. Mt.)
1	R-1	114.00	5.40		615.60
2.	R-2	155.00	5.40		837.00
3.	R-3	112.00	5.40		604.80
4.	R-4	58.00	5.40		313.20
	Service Road	170.45	8.40		1431.78
TOTAL		**609.45**			**3802.38**
ADD 10% FOR CURVES		**60.945**			**380.24**
TOTAL		**670.40**			**4182.62**
SAY		**671.00**			**4183.00**

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PROJECT : PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JAN AWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

S.No.	Line No.		Average Demand	Peak Demand @ 1.5 Times	Flow Rate	Length	Head Loss	Total Head Loss	Velocity	Pipe Dia
-	From	To	lph.	lph.	lpm.	mtr.	mtr./ mtr.	mtr.	m/sec	mm
1	Tube Well 01	***UGT.***	20.86	31.29	521.50	75.0	0.024	1.79	1.106	100

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PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JAN AWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

TITLE : HYDRAULIC DESIGN CHART FOR MUNICIPAL WATER SUPPLY CONNECTION LINE FROM HUDA

S.No	Line No.		Average Demand		Peak Demand @ 1.5 Times	Flow Rate	Pipe Length	Head Loss	Total Head Loss	Velocity	Pipe Dia
-	From	To	kld.	kl/hr.	klph.	lpm.	mtr.	mtr./ mtr.	mtr.	m/sec	mm
1	***HUDA***	***UGT.***	166.88	7.6	11.4	189.6	180.0	0.030	5.38	0.952	65

Note : HUDA supply line calculation has been done as / 22 hours.

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PROJECT : PROPOSED AFFORDABLE GROUP HOUSING COLONY FOR AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

TITLE : DOMESTIC WATER SUPPLY HYDRAULIC CHART

-	Line No					Plots (EWS)			Water Req. for Non Resi. Plots.		Total water Requirement	Domestic Water Req. @ 65 %								
S.No.	From	To	Nos.	Population @ 18 persons / Plot.	Water Requirement /day/person @	Nos.	Pop. @ 9 persons / Plot	Water Req./day/ person @	Type of Building	Basis of Water Requirement	Residential & Non Residential Building	Residential & Non Residential Building	Average Demand	Peak Demand @ 3 Times	Flow Rate	Length of Pipe	Head Loss	Total Head Loss	Velocity	Dia of Pipe
-	-	-	-	18.0	172.5	-	9	172.5	-	Lumpsum	lpd.	lpd.	kld.	kld.	lpm.	mtr.	mtr./mtr.	mtr.	mtr./sec	mtr.
1.	***U.G.T***	D1	0	0	0	0	0	0	-	0	0	0	0.00	0	0	6.0	0.000	0.00	0.000	100
2.	D1	D2	0	0	0	0	0	0	-	0	0	0	0.00	0	0	19.0	0.000	0.00	0.000	100
3.	D2	D3	2	36	6210	0	0	0	-	0	6210	4037	4.04	12	8	38.0	0.000	0.00	0.018	100
4.	D3	D4	8	144	24840	0	0	0	-	0	24840	16146	16.15	48	34	77.0	0.000	0.01	0.071	100
5.	D4	D5	5	90	15525	0	0	0	-	0	15525	10091	10.09	30	21	55.0	0.000	0.00	0.045	100
6.	D5	D5a	3	54	9315	0	0	0	Commecrial (0.201 Acre)	4870	14185	9220	9.22	28	19	112.0	0.001	0.12	0.163	50
7.	D2	D6	0	0	0	0	0	0	-	0	0	0	0.00	0	0	24.0	0.000	0.00	0.000	100
8.	D6	D6a	8	144	24840	0	0	0	-	0	24840	16146	16.15	48	34	115.0	0.000	0.01	0.071	100
9.	D6a	D7a	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
10.	D7a	D7	13	234	40365	0	0	0	-	0	40365	26237	26.24	79	55	115.0	0.000	0.03	0.116	100
11.	D6	D7	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
12.	D7	D8	10	180	31050	0	0	0	-	0	31050	20183	20.18	61	42	86.0	0.000	0.01	0.089	100
13.	D8	D9	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
14.	D9	D3a	17	306	52785	0	0	0	-	0	52785	34310	34.31	103	71	155.0	0.000	0.07	0.152	100
15.	D3a	D3	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
16.	D3a	D5	6	108	18630	0	0	0	Community Facility (0.501 Acre)	20280	38910	25292	25.29	76	53	98.0	0.000	0.02	0.112	100

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PROJECT : PROPOSED AFFORDABLE GROUP HOUSING COLONY FOR AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

TITLE : FLUSHING WATER SUPPLY HYDRAULIC CHART

-	Line No					Plots (EWS)			Water Req. for Non Resi. Plots.		Total water Requirement	Flushing Water Req. @ 35 %								
S.No.	From	To	Nos.	Population @ 18 persons / Plot.	Water Requirement /day/person @	Nos.	Pop. @ 9 persons / Plot	Water Req./day/ person @	Type of Building	Basis of Water Requirement	Residential & Non Residential Building	Residential & Non Residential Building	Average Demand	Peak Demand @ 3 Times	Flow Rate	Length of Pipe	Head Loss	Total Head Loss	Velocity	Dia of Pipe
-	-	-	-	18.0	172.5	-	9	172.5	-	Lumpsum	lpd.	lpd.	kld.	kld.	lpm.	mtr.	mtr./mtr.	mtr.	mtr./sec	mtr.
1	***S.T.P***	F1	0	0	0	0	0	0	-	0	0	0	0.00	0	0	3.0	0.000	0.00	0.000	100
2.	F1	F2	9	162	27945	0	0	0	-	0	27945	9781	9.78	29	20	82.0	0.000	0.00	0.043	100
3.	F2	F3	2	36	6210	0	0	0	-	0	6210	2174	2.17	7	5	63.0	0.000	0.00	0.010	100
4.	F3	F4	8	144	24840	0	0	0	-	0	24840	8694	8.69	26	18	77.0	0.000	0.00	0.038	100
5.	F4	F5	5	90	15525	0	0	0	-	0	15525	5434	5.43	16	11	55.0	0.000	0.00	0.024	100
6.	F5	F5a	3	54	9315	0	0	0	Commecrial (0.201 Acre)	4870	14185	4965	4.96	15	10	112.0	0.001	0.12	0.137	40
7.	F1	F6a	0	0	0	0	0	0	-	0	0	0	0.00	0	0	35.0	0.000	0.00	0.000	100
8.	F6a	F7a	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
9.	F7a	F7	13	234	40365	0	0	0	-	0	40365	14128	14.13	42	29	115.0	0.000	0.01	0.062	100
10.	F2	F7	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
11.	F7	F8	9	162	27945	0	0	0	-	0	27945	9781	9.78	29	20	86.0	0.000	0.00	0.043	100
12.	F8	F9	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
13.	F9	F3a	17	306	52785	0	0	0	-	0	52785	18475	18.47	55	38	155.0	0.000	0.02	0.082	100
14.	F3a	F3	0	0	0	0	0	0	-	0	0	0	0.00	0	0	9.0	0.000	0.00	0.000	100
15.	F3a	F5	6	108	18630	0	0	0	Community Facility (0.501 Acre)	0	18630	6521	6.52	20	14	98.0	0.000	0.00	0.029	100

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PROJECT : PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JAN AWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

TITLE : HYDRAULIC SEWAGE DESIGN CHART

S.No	Line No.		Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line) LPD	Sewage Flow (Self Load on Line) KLD	Previous Load	Progressive Discharge	Progressive Discharge (Average)	Progressive Discharge (Peak)	Infilteration @ 25% Av. Discharge	Total Discharge	Length	Pipe Size dia	Slope (1 in)	Fall	Velocity	Capacity of Pipe	Levels at start (mtr)			Levels at End (mtr)			Manhole Start Depth	Manhole Start End	Average Depth
-	From	To	lpd.	80%	1000	kld.	kld.	lps.	lps.	lps.	lps	(mtr.)	(mm)	(mm)	(mtr.)	(m/s) (v)	lps.	FRL	FSL	IL	FRL	FSL	IL	(mtr)	(mtr)	(mtr)
1.	S1	S2	4870	3896	3.90	0.00	3.90	0.05	0.14	0.01	0.15	40.0	200	140	290	0.76	12.02	99.55	98.23	98.03	99.55	97.94	97.74	1.52	1.81	1.67
2.	S2	S3	9315	7452	7.45	3.90	11.35	0.13	0.39	0.03	0.43	65.0	200	140	470	0.76	12.02	99.55	98.15	97.95	100.00	97.68	97.48	1.60	2.52	2.06
3.	S3a	S3	31050	24840	24.84	0.00	24.84	0.29	0.86	0.07	0.93	44.0	200	140	320	0.76	12.02	100.00	99.10	98.90	100.00	98.78	98.58	1.10	1.42	1.26
4.	S3	S4	15525	12420	12.42	36.19	48.61	0.56	1.69	0.14	1.83	19.0	200	140	140	0.76	12.02	100.00	97.68	97.48	100.00	97.54	97.34	2.52	2.66	2.59
5.	S4a	S4	35805	28644	28.64	0.00	28.64	0.33	0.99	0.08	1.08	38.0	200	140	280	0.76	12.02	100.00	99.10	98.90	100.00	98.82	98.62	1.10	1.38	1.24
6.	S4	S5	0	0	0.00	77.25	77.25	0.89	2.68	0.22	2.91	17.0	200	140	130	0.76	12.02	100.00	97.54	97.34	100.00	97.41	97.21	2.66	2.79	2.73
7.	S5	S6	27945	22356	22.36	77.25	99.61	1.15	3.46	0.29	3.75	61.0	200	140	440	0.76	12.02	100.00	97.41	97.21	100.00	96.97	96.77	2.79	3.23	3.01
8.	S6a	S6	55890	44712	44.71	0.00	44.71	0.52	1.55	0.13	1.68	90.0	200	140	650	0.76	12.02	100.00	99.10	98.90	100.00	98.45	98.25	1.10	1.75	1.43
9.	S6	S7	68310	54648	54.65	144.32	198.97	2.30	6.91	0.58	7.48	122.0	250	190	650	0.76	18.70	100.00	96.97	96.72	100.00	96.32	96.07	3.28	3.93	3.61
10.	S7	***S.T.P***	0	0	0.00	198.97	198.97	2.30	6.91	0.58	7.48	2.0	250	190	20	0.76	18.70	100.00	96.32	96.07	100.00	96.30	96.05	3.93	3.95	3.94

Formula Used:

Velocity (m/s)=(1/n)x(A/P)^(2/3)*(1/slope)^.5

n=.013 for RCC pipe (Manning's Coefficient)

A=Area of x-section of pipe in sqm.

P =Wetted Perimeter in m

Capacity of pipe(lps) =Area of x-section of pipe in sqm x velocity in m/s x1000x1/2(Sewer Line are designed to run half flow)

Abbreviation Used:

IL=Invert level of pipe

FSL=Full supply level

FRL=Formation Road Level

CL=Connection Level

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PROJECT : PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JAN AWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

LOAD ON SEWAGE LINES

			Residential Sewage Load						Non Residential Load		Residential + Non Residential Load		
S.No.	Name of Sewer Line		Plots	Population for General Plots @ 18 persons	Water Reuirement @ 172.50 LPD.	EWS	Population @ 9 persons / Unit	Water Reuirement @ 172.50 LPD.	Amenity	Water Reuirement @ Lumsum/day	Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line) lpd.	Sewage Flow (Self Load on Line) lpd.
-	From	To	Unit	18	172.5	Unit	9	155.25	-	Lumpsum	lpd.	80%	1000
1.	S1	S2	0	0	0	0	0	0	Commercial (0.201 Acres.)	4870.00	4870	3896	3.90
2.	S2	S3	3	54	9315	0	0	0	-	0.00	9315	7452	7.45
3.	S3a	S3	10	180	31050	0	0	0	-	0.00	31050	24840	24.84
4.	S3	S4	5	90	15525	0	0	0	-	0.00	15525	12420	12.42
5.	S4a	S4	5	90	15525	0	0	0	Common facility (0.501 Acres)	20280.00	35805	28644	28.64
6.	S4	S5	0	0	0	0	0	0	-	0.00	0	0	0.00
7.	S5	S6	9	162	27945	0	0	0	-	0.00	27945	22356	22.36
8.	S6a	S6	18	324	55890	0	0	0	-	0.00	55890	44712	44.71
9.	S6	S7	22	396	68310	0	0	0	-	0.00	68310	54648	54.65
10.	S7	*S.T.P*	0	0	0	0	0	0	-	0.00	0	0	0.00
			72	1296	223560	0	0	0	-	25150.00	248710.00	198968.00	198.97

PROJECT : PROPOSED RESIDENTIAL PLOTTED COLONY UNDER DEEN DAYAL JAN AWAS YOJNA ON AN AREA MEASURING 5.0125 ACRE AT SECTOR - 63A AT GURUGRAM, HARYANA

TITLE : HYDRAULIC STORM WATER DESIGN CHART

S.No.	Line No.		Length	Catchment Area (Sqm.)			Discharge @ 6.25 mm/hr rainfall	Pipe dia	Slope 1 in	Velocity m/sec.	Capacity of pipe	Fall in line	Levels at start (mtr)			Levels at End (mtr)			Manhole Depth		
																			Depth (mtr.)		Avg.
	From	To	(mtr.)	Self	Progg.	Total	60% runoff (lps)	(mm)	(mm)	m/sec.	lps.	mm	FRL.	FSL.	IL.	FRL.	FSL.	IL.	Start	End	Depth
1.	A1	A2	83.0	3750.0	0.0	3750.0	3.91	400	570	0.60	75.63	150.0	100.00	99.10	98.70	100.00	98.95	98.55	1.30	1.45	1.38
2.	A2a	A2	114.0	5140.0	0.0	5140.0	5.35	400	570	0.60	75.63	200.0	100.00	99.10	98.70	100.00	98.90	98.50	1.30	1.50	1.40
3.	A2	A3	24.0	1090.0	8890.0	9980.0	10.40	400	570	0.60	75.63	50.0	100.00	98.90	98.50	100.00	98.85	98.45	1.50	1.55	1.53
4.	A3	*D.C.-01*	3.0	140.0	9980.0	10120.0	10.54	400	570	0.60	75.63	10.0	100.00	98.85	98.45	100.00	98.84	98.44	1.55	1.56	1.56
5.	*D.C.-01*	*R.P.-01*	2.0	0.0	10120.0	10120.0	10.54	400	570	0.60	75.63	10.0	100.00	98.84	98.44	100.00	98.83	98.43	1.56	1.57	1.57
6.	*R.P.-01*	A4	4.0	0.0	5060.0	5060.0	5.27	400	570	0.60	75.63	10.0	100.00	98.83	98.43	100.00	98.82	98.42	1.57	1.58	1.58
7.	A4	A5	36.0	1630.0	5060.0	6690.0	6.97	400	570	0.60	75.63	70.0	100.00	98.82	98.42	100.00	98.75	98.35	1.58	1.65	1.62
8.	A5a	A5	31.0	1400.0	0.0	1400.0	1.46	400	570	0.60	75.63	60.0	100.00	99.10	98.70	100.00	99.04	98.64	1.30	1.36	1.33
9.	A5	A6	19.0	860.0	8090.0	8950.0	9.32	400	570	0.60	75.63	40.0	100.00	98.75	98.35	100.00	98.71	98.31	1.65	1.69	1.67
10.	A6a	A6	53.0	2390.0	0.0	2390.0	2.49	400	570	0.60	75.63	100.0	100.00	99.10	98.70	100.00	99.00	98.60	1.30	1.40	1.35
11.	A6	A7	74.0	3340.0	11340.0	14680.0	15.29	400	570	0.60	75.63	130.0	100.00	98.71	98.31	100.00	98.58	98.18	1.69	1.82	1.76
12.	A7	*D.C.-02*	2.0	100.0	14680.0	14780.0	15.40	400	570	0.60	75.63	10.0	100.00	98.58	98.18	100.00	98.57	98.17	1.82	1.83	1.83
13.	*D.C.-02*	*R.P.-02*	2.0	0.0	14780.0	14780.0	15.40	400	570	0.60	75.63	10.0	100.00	98.57	98.17	100.00	98.56	98.16	1.83	1.84	1.84
14.	*R.P.-02*	*TO HUDA DRAIN*	4.0	0.0	7390.0	7390.0	7.70	400	570	0.60	75.63	10.0	100.00	98.56	98.16	99.55	98.55	98.15	1.84	1.40	1.62
15.	A8	A9	24.0	540.0	0.0	540.0	0.56	400	570	0.60	75.63	50.0	99.55	98.65	98.25	99.55	98.60	98.20	1.30	1.35	1.33
16.	A9	*TO EXT.*	4.0	50.0	540.0	590.0	0.61	400	570	0.60	75.63	10.0	99.55	98.60	98.20	99.55	98.59	98.19	1.35	1.36	1.36
				20430.0																	

Formula Used:

Velocity(m/s)=(1/n)x(A/P)^(2/3)*(1/slope)^.5

n=.015 for RCC pipe (Manning's Coefficient)

A=Area of x-section of pipe in sqm.

P =Wetted Perimeter in m

Capacity of pipe(lps) =Area of x-section of pipe in sqm x velocity in m/s x1000x1/2(Storm water are designed to run full flow)

Abbreviation Used:

IL=Invert level of pipe

FSL=Full supply level

FRL=Formation Road Level

CL=Connection Level

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