PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

AT
SECTOR-99A, GURGAON MANESAR URBAN COMPLEX, HARYANA

SERVICE PLAN ESTIMATE
ON
PUBLIC HEALTH ENGINEERING SERVICES

Client

LEO ARGO PVT. LTD. IN COLLABORATION WITH SATYA TOWNSHIP PVT. LTD.

PLOT NO. 8, SECTOR – 44, GURGON, HARYANA - 122002

Architect

ARCOP ASSOCIATES (P.) LTD

Plot No. - 36, Sector - 32, Gurgaon

Plumbing & Fire Suppression Consultant

PARADISE CONSULTANTS

Plot No.-103, Pocket-1, Jasola, New Delhi -110025

ECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, ERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF RESIDENTIAL PROJECT GROUP HOUSING, TOR-99A, SECTOR-99A, GURGAON MANESAR URBAN COMPLEX (HARYANA)

aon 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) gaon district, comprising four blocks Pataudi, Sohna, Gurgaon and Farrukhnagar, was created on 15 August, 1979.On orth, it is bounded by the district of Rohtak and the Union Territory of Delhi. Faridabad district lies to its east. On its th, the district shares boundaries with the district of Mewat. To its west lies the district of Rewari and the State of asthan.Gurgaon is situated between the Himalayas and Aravalis mountain ranges. It is surrounded on three sides by ryana and to the east, across the river Yamuna by Uttar Pradesh. Its greatest length is around 13 miles and the eatest breadth is 17 miles. Delhi's altitude ranges between 213 to 305 meters above sea level.

GROUP HOUSING is a residential proposed between sector - 99A, at Gurgaon Manesar Urban Complex for development by **LEO ARGO PVT. LTD. IN COLLABORATION WITH SATYA TOWNSHIP PVT. LTD.**

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 tower.

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 18000 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 3 Nos and the tubewells will be bored in tune with growth of demand to avoid absolence of the tubewells.But provide 2 Nos. tubewell 50% of total requirement.

2 **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.

3 **Sewerage**

This scheme is designed for sewer connecting to the proposed sewage treatment. 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.

4	**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.
5	**Roads**
	Cost of road has been taken in the estimate
6	**Street Lighting**
	Provision for street lighting on surrounding area has been made.
7	**Horticulture**
	Estimates and details of plantation, landscaping, signage etc. has been included
8	**Specifications :**
	The work will be carried out in accordance with the standard specifications of PH as laid down by the HUDA/Haryana Government.
9	**Rates**
	Estimates for providing services in this site has been prepared on the recent HUDA rates.
10	**Cost**
	The total cost of development in this Project including various PH & B & R services works out to **Rs. 613.69 lacs** which includes 3% contingency and PE charges and 14% departmental charges also.
	The cost per gross acre for this phase works out to **Rs. 61.07 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.
	TOWNSHIP PVT. LTD.
	Authorised Signatory

Paradise Consultants New Delhi

Manish Kr. Bagga, Architect
Council of Architecture
Registration No. CA/95/18626

GROUP HOUSING, SECTOR-99A, GURGAON (HARYANA)

	DESIGN CALCULATION					
1	**Daily Domestic Water Requirement**					
	Apartment			493		
	EWS			87		
	Service Personnel			50		
	Population @ 5 person per unit - Apartment			5		
	Population @ 5 person per unit - EWS			5		
	Population @ 2 person per unit - Service Personnel			2		
	Therefore population (Apartment)			2465	persons	
	Therefore population (EWS)			435	persons	
	Therefore population (Maintenance Personnel)			100	persons	
	Total Population			**3000**	**persons**	
			SAY	**3000**	**persons**	
	Water requirement for apartmant		@	172.5	lpd.	
				517500.00	lpd.	
			or	**517.50**	**KLD (1)**	
2	**Other Requirement**					
a.)	Nursery School	1	@	10000	lit/day	
	Therefore daily water requirement			10000	lit/day	
				10.00	KLD	
b.)	No. of Community Building	1	@	25000	lit/day	
	Daily water requirement lumpsum			25000	lit/day	
	Therefore daily water requirement			25.00	KLD	
c.)	No. of Convenient □Shopping	1	Lumpsum	5000	lit/day	
	Daily water requirement lumpsum			5000	lit/day	
	Therefore daily water requirement			5.00	KLD	
			Total	**40.00**	**KLD (2)**	

3	Total Daily Water Requirement (1+2)			**557.50**	**KLD**	
i)	Domestic Water Requirement @	65%		365.88	KLD	
			Say	**370.00**	**KLD**	
ii)	Flushing Water Requirement @	35%		191.63	KLD	
			Say	**200.00**	**KLD**	
4	**Water usage from STP**					
a)	Area under Parks	1.94	acre			
	Daily water requirement		@	25000	lit/acre/day	
				48500.00	lit/day	
				48.50	KLD	
b)	Area under Roads					
	Daily water requirement		Lumpsum	25000	lit/acre/day	
				25000	lit/day	
				25	KLD	
c)	Under Road+ Parks **(a+b)**		**Total**	73.50	KLD	
			Say	**80.00**	**KLD**	
d)	**Total treated water requirement [3 (ii) + c]**			**280.00**	KLD	
	Total Daily Requirement [3 (i) + d]			**650.00**	**KLD**	
			SAY	**650.00**	**KLD**	

I	**Tubewell**					
	Assuming working hours of tubewells			10	hours	
	Assuming discharge/hour of each tubewell			18	KL/hours	
	Total fresh water demand			**370.00**	**KLD**	
	No. of tubewells required	370.00	/16/18	2.06		
	Add 10% standby			0.21		
			Total	2.26		
			Say	3.00		
	Provide no. of tubewell = 50% of total requirement.					
	Provide 2 Nos. of tubewell with 18 KL/hour discharge.					
	However as it is expected that the water supply would be made avaible by HUDA.It is proposed to install only 2 No. tubewell as standby / makeup source of water.					
II	**Pumping machinery for tubewell**					
	Gross working load		=	65.00	m	
	Average fall in SL		=	3.05	m	
	Depression head		=	6.10	m	
	Friction loss in main		=	2.50	m	
			=	76.65	m	
		Say	=	**77.00**	m	
	BHP = 18000x77x1/60x60x75x0.6		=	8.56	BHP	
	With 60% efficiency	Say		10.0	BHP	
III	**Underground Tank**					
	Daily fresh water requirement for domestic use			370.00	KL	
	Capacity of under ground tank					
	24 hours storage	370.00	x 24 / 24	370.00	KL	
	Fire Tank Capacity As/NBC Code 100 kl. But Proposed			400.00	KL	
			Total	**770**	**KL**	
	It is proposed to provide under ground tank of capacity **770KL** which also includes **400 KL** capacity for fire fighting.					
	Both tanks will have Six compartments, two for fire, two for raw and the other two 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.					
	FIRE WATER TANK			**400.00**	**KL**	
	TOTAL UG STORAGE (DOMESTIC + FLUSHING + HORTICULTURE)			**650.00**	**KL**	
	RAW WATER TANK			**170.00**	**KL**	
	DOMESTIC WATER TANK			**200.00**	**KL**	
	FLUSHING, HORTICULTURE & ROAD WASHING (PART OF STP)			**280.00**	**KL**	

IV	**DOMESTIC WATER PUMPS - LOCATED IN PUMP ROOM**					
a.)	**Domestic Water Transfer Pumps**					
i)	**For Towers, EWS, Community Building, Shopping & Schools**					
	Daily requirement for domestic use			=	365.88	KL
	Assuming 6 hours running 3 pumps working with 1 standby					
	Discharge/hour	365.88	/ 6 / 3	=	20.33	KL/HR
	Head of pump					
	i) Suction lifts			=	0.0	m
	ii) Friction loss in M<main & specials			=	5.0	m
	iii) Residual head			=	5.0	m
	iv) Clear head			=	90.0	m
				=	100.0	m
	BHP of motor	20.33	x1000x116/4500x60x0.6		12.5	HP
			SAY	=	**12.5**	**HP**

5	**PUMPS FOR FIRE PROECTION**					
	Pump Description	**Location**	**Nos.**	**Discharge**	**Head**	**HP**
i)	**Diesel Driven Pump**	Pump Room	**1**	**2280**	**135.00**	
ii)	**Hydrant Pump**	Pump Room	**1**	**2280**	**135.00**	**120**
iii)	**Sprinkler Pump**	Pump Room	**1**	**2280**	**135.00**	**120**
iv)	**Jockey Pump**	Pump Room	**1**	**180**	**135.00**	**25**
	Capacity of Gen Set	Nos.	HP			
	Domestic Water Transfer Pumps	3	12.5	=	37.5	HP
	Fire Pump (Jockey)	1	25.0	=	25	HP
	Tube Well	2	10.0	=	20	HP
	Lighting			=	25	HP
					107.5	HP
	or	107.5	x0.746x1.50		120.29	KVA
			Say		130.00	KVA
	Requirement of 130 KVA capacity will be added in to the main D.G. set to provide standby supply.					

Estimate for Providing in Internal Development works for Housing for

LEO ARGO PVT. LTD. IN COLLABORATION WITH SATYA TOWNSHIP PVT. LTD.

	Amount (Lacs.)
Sub Work - I Water Supply	**242.72**
Sub Work - II Sewerage	**80.25**
Sub Work - III Storm Water Drainage	**60.08**
Sub Work - IV Roads & Footpath	**107.75**
Sub Work - V Street Lighting	**20.65**
Sub Work - VI - Horticulture	**6.44**
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)	**95.80**
Total	**613.69**

(RUPEES SIX CRORE THIRTEEN LACS SIXTY NINE THOUSAND ONLY)

LEO ARGO PVT. LTD. IN COLLABORATION WITH SATYA TOWNSHIP PVT. LTD.

Paradise Consultants New Delhi

Authorized Signatory

Manish Kr. Bagga, Architect
Council of Architecture
Registration No. CA/95/18626

FINAL ABSTRACT OF REVISED COST

Amount (Lacs.)		**Amount (Lacs.)**
Sub Head - (I) Head Works		53.45
Sub Head - (II) Pumping Machinery		58.70
Sub Head - (III) Distribution System		40.81
Sub Head - (IV) Irrigation Scheme		11.48
Sub Head - (V) Fire Scheme		42.27
	Total	**206.71**
Add 3% Contingencies		6.20
	Total	**212.91**
Add 14% Departmental Charges		29.81
	Grand Total	242.72
(CO to final abstract of cost)	**Say**	**242.72**

	Sub Work I				**Water Supply**	
	Sub Head No. I				**Head Works**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**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.	2	500000.00	10.00	
2	Constructing pump chambers as per standard design of PWD PH/HUDA of size 1.50x1.50 m.	Nos.	2	100000.00	2.00	
3	Construction of boosting chambers of suitable size along with under ground tank of capacity **770 KL** pumping machinery and generating set etc. complete in all respects.					
	Details of boosting station					
i)	construction of boosting chamber	LS	-	-	7.50	
ii)	UG tank **770 KL** capacity incl. 400 KL for fire fighting in two compartments @ 3000 / KL.	KL	770	3500	26.95	
4	Provision for carriage of material and other unforeseen items.	LS	-	-	2.00	
5	Provision for facilites staff for Maintenance	LS	-	-	5.00	
	(C.O. to abstract of cost of Sub-work No.I)				**53.45**	**Lacs**
				Say	**53.45**	**Lacs**

	Sub Work I				**Water Supply**	
	Sub Head No. II				**Pumping Machinery**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**Amount (in Lakhs)**	
1 (i)	Providing and installing electricity driven electro or submersible pumping set capable of delivering about 18.0 KL water per hour against a total head of 77.0 M complete with motor and other accessories. (For Tubewell -10.0 HP)	Nos.	2	100000.00	2.00	
(ii)	Providing & installing electricity driven pumping set capable of delivering 340 LPM of water against a total head of 100 m complete with motor and other accessories (For Domestic - 12.5 HP).	Nos.	4	135000.00	5.40	
2	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities.					
	1 No. - 130 KVA	Nos.	1	1600000.00	16.00	
3	Providing & installing pumping set of following capacities for fire protection:					
i)	180 LPM @ 135 M Head (25 HP)	Nos.	1	150000.00	1.50	
ii)	2280 LPM @ 135 M Head (120 HP) Hydrant	Nos.	1	750000.00	7.50	
iii)	2280 LPM @ 135 M Head (120 HP) Sprinkler	Nos.	1	750000.00	7.50	
iv)	2280 LPM @ 135 M Head (DG Pump)	Nos.	1	1000000.00	10.00	
4	Provision for diesel engine genset stand bye arrangements for Tubewells.	Nos.	2	150000.00	3.00	
5	Provision for cheap pressure type chlorination plant complete.	Nos.	2	15000.00	0.30	
6	Provision for making foundations & erection of pumping machinery.	LS	-	-	1.00	
7	Provision for pipes, valves & specials inside the pump chamber.	LS	-	-	1.25	
8	Provision for electric services connection including electric fittings for tubewells chambers complete.	LS	-	-	2.50	
9	Provision for carriage for materials and other unforeseen items.	LS	-	-	0.75	
	(C.O. to abstract of cost of Sub-work No.I)				**58.70**	
				Say	**58.70**	

	Sub Work I				**Water Supply**	
	Sub Head No. III				**Distribution System/Rising Main**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**Amount (Rs.)**	
1	Providing, laying, jointing & testing D.I. pipes including cost of excavation complete as per ISI marked.					
I)	80 mm dia	M	1003	1250.00	1253750.00	
ii)	100 mm dia	M	793	1500.00	1189500.00	
iii)	150 mm dia	M	276	1950.00	538200.00	
2	Providing, fixing & Testing Sluice valves including cost of complete in all respects.					
i)	100 mm i/d	Nos.	3	12000.00	36000.00	
ii)	150 mm i/d	Nos.	2	15000.00	30000.00	
3	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.					
i)	100 mm i/d	Nos.	1	12000.00	12000.00	
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.	11	1000.00	11000.00	
7	Provision for carriage of material	LS	-	-	150000.00	
8	Provision for cutting the roads and making to its original conditions.	LS	-	-	150000.00	
9	Making water supply connection.	LS	-	-	250000.00	
10	Provision for rising main from HUDA water supply line to UG Tank & Tube Well to UG Tank.					
i)	100 mm i/d (Tube Line)	M	133	1550.00	206150.00	
ii)	150 mm i/d (Tube Line)	M	35	1950.00	68250.00	
iii)	150 mm i/d (Connection From HUDA Line)	M	70	1950.00	136500.00	
	(C.O. to abstract of cost of Sub-work No.I)				**4081350.00**	
				Say	**40.81**	**Lacs**

	Sub Work I				**Water Supply**	
	Sub Head No. IV				**Irrigation**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**Amount (Rs.)**	
1	Providing, laying, jointing & testing uPVC pipe line confirming to IS 4985 including cost of Excavation etc. complete in all respect.					
i)	80 mm dia	M	1313	800.00	1050400.00	
2	Providing and fixing 20mm dia Irrigation hydrant valve complete in all respect.	Nos.	30	800.00	24000.00	
3	Providing & fixing valve 25mm dia	Nos.	30	400.00	12000.00	
4	Providing, fixing & Testing Sluice 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.	2	4500.00	9000.00	
6	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	3	800.00	2400.00	
7	Provision for carriage of materials etc. and other unforsean charges	LS	-	-	15000.00	
8	Provision for cutting of roads & making good to its in original condition	LS	-	-	30000.00	
			Total		**1147550.00**	
			Say		**11.48**	**Lacs**

	Sub Work I					
	Sub Head No. V				**Fire Scheme**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**Amount (Rs.)**	
1	Providing, laying, jointing & testing M.S. pipes for fire ring main including cost of Fittings & excavation complete (as per ISI marked) in all respect.					
a)	150 mm dia	M	1429	2000.00	2858000.00	
b)	80 mm dia	M	370	1000.00	370000.00	
2	Providing and fixing External Fire Hydrants complete with masonary chambers.	Nos.	26	15000.00	390000.00	
3	Providing & fixing valve 150mm dia.					
a)	150 mm dia	Nos.	3	20000.00	60000.00	
b)	80 mm dia	Nos.	26	10000.00	260000.00	
4	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.					
i)	80 mm i/d	Nos.	26	5000.00	130000.00	
5	Providing and fixing Fire Brigade connection.					
i)	4 way inlet connection.	Nos.	2	15000.00	30000.00	
ii)	2 way withdrawl connection.	Nos.	1	10000.00	10000.00	
5	Provision for cutting of roads and carriage of materials etc. and other unforsean charges	LS	-	-	40000.00	
6	Provision for indication plates	Nos.	29	1000.00	29000.00	
7	Provision for carriage of material	LS	-	-	50000.00	
			Total		**4227000.00**	
			Say		**42.27**	**Lacs**

	Sub Work II			**Sewerage Scheme**		
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**Amount (Rs.)**	
1	Providing, lowering, jointing, cutting salt glazed stone ware pipes and specials into trenches including cost of excavation, bed concrete lot of manholes complete.					
i)	**200 mm i/d**					
a)	Average depth 1.5 m to 4.5 m	M	250	1500.00	375000.00	
ii)	**250 mm i/d**					
a)	Average depth 1.5 m to 4.5 m	M	449	1800.00	808200.00	
iii)	**300 mm i/d**					
a)	Average depth 1.5 m to 4.5 m	M	115	2000.00	230000.00	
iv)	**400 mm i/d**					
a)	Average depth 1.5 m to 4.5 m	M	46	2250.00	103500.00	
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	-	-	200000.00	
5	Cost of **450 Kld** Sewerage Treatment Plant.	LS	-	-	5000000.00	
6	Provision for CI / DI pipe 150 mm dia pipe from STP. To Huda Main Line.	M	150	1950.00	292500.00	
					6834200.00	
	Add 3% contingencies				205026	
					7039226.00	
	Add 14% Deptt. Charges				985491.64	
				Total	**8024717.64**	
	(C.O. to abstract of cost of Sub-work No. 1)			**Say**	**80.25**	**Lacs**

	Sub Work - III			**Storm Water Drain**		
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**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)	**250 mm i/d**					
a)	Average depth upto 1.5 m	M	350	1300.00	455000.00	
ii)	**400 mm i/d**					
a)	Average depth upto 1.5 m	M	0	1800.00	0.00	
b)	Average depth 1.5 m to 4.5 m	M	1029	2000.00	2058000.00	
iii)	**500 mm i/d**					
a)	Average depth upto 1.5 m	M	0	2050.00	0.00	
b)	Average depth 1.5 m to 4.5 m	M	25	2150.00	53750.00	
2	Provision for Road Gully & Drain	LS	-	-	250000.00	
3	Provision for cutting of roads and carriage of materials etc. and other unforseen items	LS	-	-	150000.00	
4	Provision for disposal arrangements Recharge Pit.	Nos	11	150000.00	1650000.00	
5	Provision for lighting, watching and temporary diversion of traffic	LS	-	-	500000.00	
6	Provision for connection with HUDA					
i)	500 mm i/d	M	25	2150.00	53750.00	
					5116750.00	
	Add 3% contingencies				153502.50	
					5270252.50	
	Add 14% Deptt. Charges				737835.35	
			Total		**6008087.85**	
		SAY			**60.08**	**Lacs**
	(C.O. to abstract of cost of Sub-work No. 1					

	Sub Work IV				**Road Work**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**Amount (Rs.)**	
1	Provision for leveling & earth filling as per site condition 10.05 acre @ 125000/acre	Acres	10.050	125000	1256250.00	
2	Construction of road by:- i) soling coat 100 mm thick (63-45) mm gauge compacted to 75 mm thick WBM conforming to MOT specification (table 400-6,grading no 2) 8356.046 sqm.X0.10 m - @ 950/ cum	Cu. mtr.	835.6	950	793820.00	
	ii) Wearing coat (top coat) 100 mm thick (53-22.4)mm gauge compacted to 75mm thick conforming to MOT specifications (table 400-6, grading no 3) 8356.046sqm.X0.10 m – 824.1 cum@ 950/ cum	Cu. mtr.	835.6	950	793820.00	
	iii) 25mm thick pre-mix carpet with seal coat 8356.046 sqm. @ 265/ sqm	Sq. mtr.	8356.046	265	2214352.19	
3	Provision for making pavement for parking beside building block by providing concrete pavement or tiles. 3418sqm.150@ 500 / sqm.	Sq. mtr.	3418	500	1709075.00	
4	Provision for parking arrangement 3418.150 sqm.@ 500/sqm	Sq. mtr.	3418.15	500	1709075.00	
5	Provision for Carriage of material	LS.		500000.00	500000.00	
6	Provision for traffic lighting and guide map/ indicators	LS.		200000.00	200000.00	
			Total		**9176392.19**	
	Add 3% contingencies				275291.77	
					9451683.96	
			Total		94.52	Lacs
	Add 14 % department charges				13.23	Lacs
		SAY			**107.75**	**Lacs**

	Sub Work V				**Street Lighting**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**Amount (Rs.)**	
1	Supply, installation, testing and commissioning of Street Lighting GI Poles, Light Fixtures, Feeder Pillars, Cables & Wires including cable end terminations and Earthing Station etc. for Street Lighting	per acre	10.050	175000.00	**1758750.00**	
	Add 3% contingencies				52762.50	
	Total				1811512.50	
	Add 14% Deptt. Charges				253611.75	
			Total		**2065124.00**	
		SAY			**20.65**	**Lacs**

	Sub Work VI				**Horticulture**	
S. No.	**Description**	**Unit**	**Qty**	**Rate**	**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)					
	1.93 acres @ Rs. 0.90 lacs/acre.	per acre	1.930	90000.00	173,700	
	500 trees @ Rs. 750/- each				375,000	
					548700.00	
	Add 3% contingency charges				**16461.00**	
				Total	**565161.00**	
	Add 14% Deptt. Charges				**79122.54**	
				Total	**644283.54**	
			say		**6.44**	**Lacs**

	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 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.					
	10.05 acres @ 5 lacs per acre	per acre	10.050	500000.00	5025000	
2	Provision for resurfacing & strengthening of road after five years of Ist phase 8356.05 sqm @ 250/- per sqm	Sq. mtr.	8356.046	250	2089011.50	
3	Provision for resurfacing & strengthening of road after ten years of 2nd phase 8356.05 sqm @ 125/- per sqm	Sq. mtr.	8356.046	125	1044505.75	
				Total	**8158517.25**	
	Add 3% contingency & PE charges				244755.5175	
				Total	**8403272.768**	
	Add 14% Departmetal charges				1176458.187	
				Total	**9579730.955**	
			say		**95.80**	**Lacs**

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE DOMESTIC WATER SUPPLY QUANTITY SHEET			
S.No.	Line No	Length of Pipe mtr.	Dia of Pipe mm.
1	***Pump Room*** *- D1*	25.0	150
2.	D1 - D2	30.0	150
3.	D2 - D3	143.0	100
4.	D1 - D3	155.0	100
5.	D3 - D3a	44.0	100
6.	D2 - D4	12.0	150
7.	D4 - D5a	55.0	100
8.	D5a - D5	106.0	100
9.	D4 - D5	95.0	150
10.	D5- D6	114.0	150
11.	D6- D7	36.0	100
12.	D7- D8	91.0	100
13.	D6 - D8	127.0	100
FLUSHING WATER SUPPLY QUANTITY SHEET			
1	***STP*** *- F1*	30.0	100
2.	F1 - F2	6.0	100
3.	F2 - F3	95.0	80
4.	F2 - F3a	106.0	80
5.	F3a - F3	55.0	80
6.	F3 - F4	12.0	80
7.	F4 - F5	30.0	80
8.	F5 - F6	155.0	80

S.No.	Line No	Length of Pipe mtr.	Dia of Pipe mm.
9.	F4 - F6	143.0	80
10.	F6 - F6a	44.0	80
11.	F1 - F7	109.0	80
12.	F7 - F8	36.0	80
13.	F8 - F9	91.0	80
14.	F7 - F9	127.0	80

TUBE WELL & MUNICIPAL WATER SUPPLY QUANTITY SHEET			
1.	Tube Well 01 - T1	130.0	100
2.	Tube Well 02 - T1	3.0	100
3.	T1 - **UGT.**	35.0	150
1	**Municipal Supply**	70.0	150

	Length in (MTR)	Pipe Dia (MM)
Domestic & Flushing Water Supply line	1003.0	80
Domestic & Flushing Water Supply line	793.0	100
Domestic & Flushing Water Supply line	276.0	150

	Length in (M)	Pipe Dia
Tube Well Water Supply line	133.0	150
Tube Well Water Supply line	35.0	150
Municipal Water Supply line	70.0	150
100 Dia Valve	3	Nos.
150 Dia Valve	2	Nos.
100 Dia Non Return Valve	1	Nos.
Air Valve	5	Nos.

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE
IRRIGATION WATER SUPPLY QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
1	***STP.***	G1	15.0	80
2.	G1	G2	32.0	80
3.	G2	G3	116.0	80
4.	G3	G4	193.0	80
5.	G2	G9	146.0	80
6.	G9	G8	119.0	80
7.	G1	G6	35.0	80
8.	G6	G5	83.0	80
9.	G5	G4	360.0	80
10.	G6	G7	71.0	80
11.	G7	G8	143.0	80
Irrigation Water Supply line			**1313.0**	**80**
Garden Hydrant			**30**	**Nos.**
80 Dia Valve			**1**	**Nos.**
Air Valve			**2**	**Nos.**

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

FIRE QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
1	***U.G.Tank***	B1	30.0	150
2.	B1	B2	133.0	150
3.	B2	B3	126.0	150
4.	B3	B4	116.0	150
5.	B4	B5	120.0	150
6.	B1	B7	179.0	150
7.	B7	B6	92.0	150
8.	B7	B5	25.0	150
9.	B5	B6	79.0	150
10.	B3	B8	94.0	150
11.	B8	B9	53.0	150
12.	B9	B10	120.0	150
13.	B8	B10	172.0	150
14.	Fire Brigade Inlet Connection		45.0	150
15.	Fire Brigade Withdrawl Connection		45.0	150

80 mm Dia Pipe	**370.0**	**mtr.**
150 mm Dia Pipe	**1429.0**	**mtr.**

External Fire Hydrant	**26**	**Nos.**
80 Dia Valve	**26**	**Nos.**
150 Dia Valve	**3**	**Nos.**
80 Dia Non Return Valve	**26**	**Nos.**

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

TITLE - SEWERAGE QUANTITY SHEET

S.No.	Line No.		Length	Pipe Dia		Depth			Excavation 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.)	(cum.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1	S1	S2	133.0	250	0.250	2.00	2.61	2.30	225.20	0.0	133.0	0.0	0.0
2.	S2	S3	115.0	300	0.300	2.61	3.08	2.85	253.17	0.0	115.0	0.0	0.0
3.	S3a	S3b	97.0	250	0.250	2.00	2.46	2.23	159.53	0.0	97.0	0.0	0.0
4.	S3b	S3	135.0	250	0.250	2.46	3.09	2.78	269.90	0.0	135.0	0.0	0.0
5.	S3	S4	40.0	400	0.400	3.09	3.18	3.14	109.92	0.0	0.0	40.0	0.0
6.	S4a	S4	84.0	250	0.250	2.00	2.47	2.24	138.47	0.0	84.0	0.0	0.0
7.	S4	***S.T.P***	6.0	400	0.400	3.18	3.20	3.19	16.74	0.0	0.0	6.0	0.0
8.	***Branch Line***		250.0	200	0.200	0.60	1.00	0.80	165.00	250.0	0.0	0.0	0.0
Total			**860.0**						**1338.0**	**250.0**	**564.0**	**46.0**	**0.0**

Excavation Depth				
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
200 mm Dia pipe	250.0	0.0	0.0	0.0
250 mm Dia pipe	0.0	449.0	0.0	0.0
300 mm Dia pipe	0.0	115.0	0.0	0.0
400 mm Dia pipe	0.0	0.0	46.0	0.0

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

TITLE : STORM WATER QUANTITY SHEET

S.No.	Line No.		Length	Size of Pipe		Depth			Excavation 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.)	(cum.)	(mtr.)	(mtr.)	(mtr.)
1	A1	A2	67.0	400	0.400	1.80	1.87	1.83	142.96	0.0	67.0	0.0
2.	A2	D.C.01	2.0	400	0.400	1.87	1.87	1.87	4.34	0.0	2.0	0.0
3.	D.C.01	***R.P.01***	2.0	400	0.400	1.87	1.87	1.87	4.35	0.0	2.0	0.0
4.	***R.P.01***	A3	3.0	400	0.400	1.80	1.81	1.80	6.31	0.0	3.0	0.0
5.	A3	A4	83.0	400	0.400	1.81	1.95	1.88	180.78	0.0	83.0	0.0
6.	A4	D.C.02	5.0	400	0.400	1.95	1.96	1.96	11.28	0.0	5.0	0.0
7.	D.C.02	***R.P.02***	2.0	400	0.400	1.96	1.96	1.96	4.52	0.0	2.0	0.0
8.	***R.P.02***	A5	3.0	400	0.400	1.80	1.81	1.80	6.31	0.0	3.0	0.0
9.	A5	A6	61.0	400	0.400	1.81	1.88	1.84	130.77	0.0	61.0	0.0
10.	A6	D.C.03	2.0	400	0.400	1.88	1.89	1.88	4.37	0.0	2.0	0.0
11.	D.C.03	***R.P.03***	2.0	400	0.400	1.89	1.89	1.89	4.38	0.0	2.0	0.0
12.	A7	A8	84.0	400	0.400	1.80	1.90	1.85	180.49	0.0	84.0	0.0
13.	A8	D.C.04	3.0	400	0.400	1.90	1.90	1.90	6.60	0.0	3.0	0.0
14.	D.C.04	***R.P.04***	2.0	400	0.400	1.90	1.91	1.90	4.41	0.0	2.0	0.0
15.	***R.P.04***	A9	5.0	400	0.400	1.50	1.51	1.50	9.02	0.0	5.0	0.0
16.	A9	A10	70.0	400	0.400	1.51	1.58	1.55	129.16	0.0	70.0	0.0
17.	A10	D.C.03a	2.0	400	0.400	1.58	1.59	1.58	3.77	0.0	2.0	0.0
18.	D.C.03a	***R.P.03***	2.0	400	0.400	1.59	1.59	1.59	3.77	0.0	2.0	0.0
19.	***R.P.03***	A11	9.0	400	0.400	1.80	1.82	1.81	18.97	0.0	9.0	0.0
20.	A11	A12	47.0	400	0.400	1.82	1.88	1.85	100.91	0.0	47.0	0.0
21.	A18	A19	72.0	400	0.400	1.80	1.96	1.88	156.83	0.0	72.0	0.0
22.	A19	D.C.05	10.0	400	0.400	1.96	1.97	1.97	22.65	0.0	10.0	0.0
23.	D.C.05	***R.P.05***	2.0	400	0.400	1.97	1.98	1.98	4.55	0.0	2.0	0.0
24.	***R.P.05***	A20	4.0	400	0.400	1.50	1.51	1.50	7.21	0.0	4.0	0.0
25.	A20	A21	81.0	400	0.400	1.51	1.57	1.54	148.88	0.0	81.0	0.0
26.	A21	D.C.06	2.0	400	0.400	1.57	1.57	1.57	3.74	0.0	2.0	0.0
27.	D.C.06	***R.P.06***	2.0	400	0.400	1.57	1.58	1.57	3.75	0.0	2.0	0.0
28.	***R.P.06***	A22	10.0	400	0.400	1.50	1.52	1.51	18.09	0.0	10.0	0.0
29.	A22	A12	57.0	400	0.400	1.52	1.55	1.53	104.46	0.0	57.0	0.0
30.	A12	A13	11.0	400	0.400	1.88	1.90	1.89	24.07	0.0	11.0	0.0

S.No.	Line No.		Length	Size of Pipe		Depth			Excavation 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.)	(cum.)	(mtr.)	(mtr.)	(mtr.)
31.	A13	D.C.07	2.0	400	0.400	1.90	1.90	1.90	4.40	0.0	2.0	0.0
32.	D.C.07	***R.P.07***	2.0	400	0.400	1.90	1.90	1.90	4.41	0.0	2.0	0.0
33.	***R.P.07***	A14	4.0	400	0.400	1.80	1.81	1.80	8.41	0.0	4.0	0.0
34.	A14	A15	37.0	400	0.400	1.81	1.84	1.82	78.61	0.0	37.0	0.0
35.	A15	D.C.08	4.0	400	0.400	1.84	1.85	1.85	8.58	0.0	4.0	0.0
36.	D.C.08	***R.P.08***	2.0	400	0.400	1.85	1.85	1.85	4.30	0.0	2.0	0.0
37.	***R.P.08***	A16	3.0	400	0.400	1.50	1.51	1.50	5.41	0.0	3.0	0.0
38.	A16	A17	52.0	400	0.400	1.51	1.58	1.54	95.73	0.0	52.0	0.0
39.	A23	A24	53.0	400	0.400	1.50	1.55	1.53	96.80	0.0	53.0	0.0
40.	A24	D.C.09	4.0	400	0.400	1.55	1.56	1.56	7.43	0.0	4.0	0.0
41.	D.C.09	***R.P.09***	2.0	400	0.400	1.56	1.56	1.56	3.72	0.0	2.0	0.0
42.	***R.P.09***	A25	3.0	400	0.400	1.50	1.51	1.50	5.41	0.0	3.0	0.0
43.	A25	A26	58.0	400	0.400	1.51	1.57	1.54	106.50	0.0	58.0	0.0
44.	A26	D.C.10	2.0	400	0.400	1.57	1.57	1.57	3.74	0.0	2.0	0.0
45.	D.C.10	***R.P.10***	2.0	400	0.400	1.57	1.57	1.57	3.74	0.0	2.0	0.0
46.	***R.P.10***	A27	6.0	400	0.400	1.50	1.51	1.51	10.83	0.0	6.0	0.0
47.	A27	A17	81.0	400	0.400	1.51	1.61	1.56	150.79	0.0	81.0	0.0
48.	A17	D.C.11	3.0	400	0.400	1.61	1.62	1.62	5.75	0.0	3.0	0.0
49.	D.C.11	***R.P.11***	2.0	400	0.400	1.62	1.62	1.62	3.84	0.0	2.0	0.0
50.	***R.P.11***	***To Huda***	25.0	500	0.500	1.80	1.38	1.59	52.01	0.0	25.0	0.0
51.	**Catch Basin Line**		350.0	250	0.250	0.60	0.80	0.70	297.50	350.0	0.0	0.0
	Total		**1404.0**						**2410.0**	**350.0**	**1054.0**	**0.0**

Excavation Depth			
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)
250 mm Dia pipe	350.0	-	-
400 mm Dia pipe	0.0	1029.0	0.0
500 mm Dia pipe	0.0	25.0	0.0

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

TITLE :- TUBE WELL WATER DESIGN CHART

S.NO	Line No.		Average Demand	Peak Demand @ 1.5 Times	Flow Rate	Length of Pipe	Head Loss mtr./ mtr.	Total Head Loss	Velocity	Dia of Pipe
	From	To	lph.	lph.	lpm.	mtr.	mtr.	mtr.	m/sec	mm
1	Tube Well 01	T1	18.00	27.00	450.00	130.0	0.018	2.36	0.954	100
2.	Tube Well 02	T1	18.00	27.00	450.00	3.0	0.018	0.05	0.954	100
3.	T1	***UGT.***	36.00	54.00	900.00	35.0	0.009	0.32	0.848	150
Total Length of branch lines						**168.0**	**mtr.**			

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

(Pump Riser Calculation Sheet)

Domestic Water Supply Design Calculation For Towers, EWS, Community Building, Shopping & Schools

Line No.	Probable demand (lps)	cum/hr	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fitts (%)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available in basement	Residual Head Available at terrace	Residual Head Available at inlet of tank	Tower Height From Pump Room To OHT	Building Name
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pump Room *- D1*	16.939	60.98	**150**	0.011	25.0	5	1.25	26.25	0.299	0.299	0.958	100.00	99.70	-	-	-
D1 - D2	16.939	60.98	**150**	0.011	30.0	5	1.50	31.50	0.359	0.659	0.958	99.70	99.04	-	-	-
D2 - D3	8.031	28.91	**100**	0.021	143.0	5	7.15	150.15	3.097	3.756	1.022	99.04	95.29	-	-	-
D1 - D3	8.031	28.91	**100**	0.021	155.0	5	7.75	162.75	3.357	3.657	1.022	99.70	96.04	40.04 Used PRV	56.00	Block - (C1, C2 & C3)
D3 - D3a	2.964	10.67	**100**	0.003	44.0	5	2.20	46.20	0.150	3.807	0.377	96.04	92.24	60.24 Used PRV	32.00	EWS, Nursery School & Convient Shopping
D2 - D4	9.660	34.78	**150**	0.004	12.0	5	0.60	12.60	0.051	0.709	0.546	99.04	98.33	-	-	-
D4 - D5a	5.694	20.50	**100**	0.011	55.0	5	2.75	57.75	0.630	1.339	0.725	98.33	96.99	79.99 Used PRV	17.00	Community Building
D5a - D5	4.942	17.79	**100**	0.008	106.0	5	5.30	111.30	0.934	1.644	0.629	96.99	95.35	20.35	75.00	Block - (B1)
D4 - D5	6.925	24.93	**150**	0.002	95.0	5	4.75	99.75	0.217	0.926	0.392	98.33	97.41	22.41	75.00	Block - (B2)
D5- D6	4.942	17.79	**150**	0.001	114.0	5	5.70	119.70	0.139	1.066	0.279	97.41	96.34	-	-	-
D6- D7	4.942	17.79	**100**	0.008	36.0	5	1.80	37.80	0.317	1.383	0.629	96.34	94.96	4.96	90.00	Block - (A1)
D7- D8	2.471	8.90	**100**	0.002	91.0	5	4.55	95.55	0.222	1.605	0.314	94.96	93.35	-	-	-
D6 - D8	2.471	8.90	**100**	0.002	127.0	5	6.35	133.35	0.310	1.376	0.314	96.34	94.96	4.96	90.00	Block - (A2)
	Flow Rate				**16.939**	lps										
		or			**1016.3**	**LPM**										
	(3 W + 1 S)				**338.8**	**LPM**										
	Maximum Building Height				90	m										
	Pump Head				**100.00**	m										
	Pump HP				12.5	HP										
	Say				**12.5**	**HP**										

Flushing Water Supply Design Calculation For Towers, EWS, Community Building, Shopping & Schools

Line No.	Probable demand (lps)	cum/hr	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fitts (%)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available in basement	Residual Head Available at terrace	Residual Head Available at inlet of tank	Tower Height From Pump Room To OHT	Building Name
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16
STP - F1	8.872	31.94	**100**	0.025	30.0	5	1.50	31.50	0.781	0.781	1.129	100.00	99.22	-	-	-
F1 - F2	8.872	31.94	**100**	0.025	6.0	5	0.30	6.30	0.156	0.938	1.129	99.22	98.28	-	-	-
F2 - F3	2.903	10.45	**80**	0.009	95.0	5	4.75	99.75	0.927	1.864	0.577	98.28	96.42	21.42	75.00	Block - (B2)
F2 - F3a	3.308	11.91	**80**	0.012	106.0	5	5.30	111.30	1.317	2.255	0.658	98.28	96.03	21.03	75.00	Block - (B1)
F3a - F3	2.240	8.06	**80**	0.006	55.0	5	2.75	57.75	0.332	2.587	0.445	96.03	93.44	76.44	17.00	Community Building
														Used PRV		
F3 - F4	3.670	13.21	**80**	0.014	12.0	5	0.60	12.60	0.181	2.045	0.730	96.42	94.37	-	-	-
F4 - F5	3.670	13.21	**80**	0.014	30.0	5	1.50	31.50	0.452	2.497	0.730	94.37	91.88	-	-	-
F5 - F6	3.670	13.21	**80**	0.014	155.0	5	7.75	162.75	2.334	4.831	0.730	91.88	87.04	31.04	56.00	Block - (C1, C2 & C3)
														Used PRV		
F4 - F6	3.670	13.21	**80**	0.014	143.0	5	7.15	150.15	2.154	4.198	0.730	94.37	90.17	-	-	-
F6 - F6a	1.297	4.67	**80**	0.002	44.0	5	2.20	46.20	0.097	4.927	0.258	87.04	82.12	50.12	32.00	EWS, Nursery School
														Used PRV		& Convient Shopping
F1 - F7	2.661	9.58	**80**	0.008	109.0	5	5.45	114.45	0.905	1.686	0.529	99.22	97.53	-	-	-
F7 - F8	1.330	4.79	**80**	0.002	36.0	5	1.80	37.80	0.083	1.769	0.265	97.53	95.76	5.76	90.00	Block - (A1)
F8 - F9	1.330	4.79	**80**	0.002	91.0	5	4.55	95.55	0.209	1.979	0.265	95.76	93.78	-	-	-
F7 - F9	1.330	4.79	**80**	0.002	127.0	5	6.35	133.35	0.292	1.979	0.265	97.53	95.55	5.55	90.00	Block - (A2)
	Flow Rate				**8.872**	lps										
		or			**532.3**	**LPM**										
	(2 W + 1 S)				**266.1**	**LPM**										
	Maximum Building Height				90	m										
	Pump Head				**100.00**	m										
	Pump HP				9.9	HP										
	Say				**10.0**	**HP**										

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

TITLE : HYDRAULIC SEWAGE 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	Slope (1 in)	Fall	Velocity	Capacity of Pipe	Formation Road Levels at Start	Invert Levels at Start	Formation Road Levels at End	Invert Levels at End	Manhole Depth at Start	Manhole Depth at End	Average Depth
	From	To	(lps.)	80%	1000	(kld.)	(kld.)	(lps.)	(lps.)	(lps.)	(lps.)	(mtr.)	(mm)	(mm)	(mtr.)	(m/s) (v)	(lps.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1.	S1	S2	236490	189192	189.19	0.00	189.19	2.19	6.57	0.55	7.12	133.0	250	190	0.70	0.76	18.70	215.60	213.60	215.51	212.90	2.00	2.61	2.30
2.	S2	S3	90895	72716	72.72	189.19	261.91	3.03	9.09	0.76	9.85	115.0	300	250	0.46	0.75	26.51	215.51	212.90	215.52	212.44	2.61	3.08	2.85
3.	S3a	S3b	164220	131376	131.38	0.00	131.38	1.52	4.56	0.38	4.94	97.0	250	190	0.51	0.76	18.70	215.65	213.65	215.60	213.14	2.00	2.46	2.23
4.	S3b	S3	0	0	0.00	131.38	131.38	1.52	4.56	0.38	4.94	135.0	250	190	0.71	0.76	18.70	215.60	213.14	215.52	212.43	2.46	3.09	2.78
5.	S3	S4	0	0	0.00	393.28	393.28	4.55	13.66	1.14	14.79	40.0	400	370	0.11	0.75	46.93	215.52	212.43	215.50	212.32	3.09	3.18	3.14
6.	S4a	S4	65895	52716	52.72	0.00	52.72	0.61	1.83	0.15	1.98	84.0	250	190	0.44	0.76	18.70	215.47	213.47	215.50	213.03	2.00	2.47	2.24
7.	S4	***S.T.P***	0	0	0.00	446.00	446.00	5.16	15.49	1.29	16.78	6.0	400	370	0.02	0.75	46.93	215.50	212.32	215.50	212.30	3.18	3.20	3.19

Formula Used:

Peak factor is considered as 3 times for population upto 20,000 persons & above 20,000 person peak factor is considered 2.5 times.

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(Sewers are designed to run half full)

Abbreviation Used:

IL=Invert level of pipe

FSL=Full supply level

FRL=Formation Road Level

CL=Connection Level

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

LOAD ON SEWAGE LINES

S.No.	Name of Sewer Line		Residential Sewage Load						Non Residential Sewage Load		Residential + Non Residential Load		
			Main Apart-ment & EWS	Population @ 5 persons / Unit	Water Reuirement @ 172.5 Ltr/day/Person	Service Person	Population @ 2 persons / Unit	Water Reuirement @ 172.5 Ltr/day/Person	Amenity	Water Reuirement @ Lumsum / day	Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line)	Sewage Flow (Self Load on Line)
			Unit	**Nos.**	**lpd.**	**Unit**	**Nos.**	**lpd.**	**sqm.**	**lpd.**	**lpd.**	**lpd.**	**kld.**
	From	To		5	172.5	-	2	172.5	-	-	-	80%	1000
1.	S1	S2	252	1260	217350	12	24	4140	Shopping & Nursary School	15000	236490	189192	189.19
2.	S2	S3	72	360	62100	11	22	3795	Cumminity Centre	25000	90895	72716	72.72
3.	S3a	S3b	184	920	158700	16	32	5520	-	0	164220	131376	131.38
4.	S3b	S3	0	0	0	0	0	0	-	0	0	0	0.00
5.	S3	S4	0	0	0	0	0	0	-	0	0	0	0.00
6.	S4a	S4	72	360	62100	11	22	3795	-	0	65895	52716	52.72
7.	S4	***S.T.P***	0	0	0	0	0	0	-	0	0	0	0.00
			580	**2900**	**500250**	**50**	**100**	**17250**		**40000.00**	**557500.00**	**446000.00**	**446.00**

PROJECT : PROPOSED BUILDIND PLAN FOR GROUP HOUSING COLONY AREA MEASURING 10.05 ACRE

TITLE :- HYDRAULIC SEWAGE 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.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Start	End	Depth
1.	A1	A2	67.0	2660.0	0.0	2660.0	2.77	400	570	0.60	75.63	0.12	215.60	214.20	213.80	215.55	214.08	213.68	1.80	1.87	1.83
2.	A2	D.C.01	2.0	0.0	2660.0	2660.0	2.77	400	570	0.60	75.63	0.00	215.55	214.08	213.68	215.55	214.08	213.68	1.87	1.87	1.87
3.	D.C.01	***R.P.01***	2.0	0.0	2660.0	2660.0	2.77	400	570	0.60	75.63	0.00	215.55	214.08	213.68	215.55	214.08	213.68	1.87	1.87	1.87
4.	***R.P.01***	A3	3.0	0.0	2660.0	2660.0	2.77	400	570	0.60	75.63	0.01	215.55	214.15	213.75	215.55	214.14	213.74	1.80	1.81	1.80
5.	A3	A4	83.0	3080.0	2660.0	5740.0	5.98	400	570	0.60	75.63	0.15	215.55	214.14	213.74	215.55	214.00	213.60	1.81	1.95	1.88
6.	A4	D.C.02	5.0	0.0	5740.0	5740.0	5.98	400	570	0.60	75.63	0.01	215.55	214.00	213.60	215.55	213.99	213.59	1.95	1.96	1.96
7.	D.C.02	***R.P.02***	2.0	0.0	5740.0	5740.0	5.98	400	570	0.60	75.63	0.00	215.55	213.99	213.59	215.55	213.99	213.59	1.96	1.96	1.96
8.	***R.P.02***	A5	3.0	0.0	5740.0	5740.0	5.98	400	570	0.60	75.63	0.01	215.55	214.15	213.75	215.55	214.14	213.74	1.80	1.81	1.80
9.	A5	A6	61.0	2530.0	5740.0	8270.0	8.61	400	570	0.60	75.63	0.11	215.55	214.14	213.74	215.52	214.04	213.64	1.81	1.88	1.84
10.	A6	D.C.03	2.0	0.0	8270.0	8270.0	8.61	400	570	0.60	75.63	0.00	215.52	214.04	213.64	215.52	214.03	213.63	1.88	1.89	1.88
11.	D.C.03	***R.P.03***	2.0	0.0	8270.0	8270.0	8.61	400	570	0.60	75.63	0.00	215.52	214.03	213.63	215.52	214.03	213.63	1.89	1.89	1.89
12.	A7	A8	84.0	3270.0	0.0	3270.0	3.41	400	570	0.60	75.63	0.15	215.62	214.22	213.82	215.57	214.07	213.67	1.80	1.90	1.85
13.	A8	D.C.04	3.0	0.0	3270.0	3270.0	3.41	400	570	0.60	75.63	0.01	215.57	214.07	213.67	215.57	214.07	213.67	1.90	1.90	1.90
14.	D.C.04	***R.P.04***	2.0	0.0	3270.0	3270.0	3.41	400	570	0.60	75.63	0.00	215.57	214.07	213.67	215.57	214.06	213.66	1.90	1.91	1.90
15.	***R.P.04***	A9	5.0	0.0	3270.0	3270.0	3.41	400	570	0.60	75.63	0.01	215.57	214.47	214.07	215.57	214.46	214.06	1.50	1.51	1.50
16.	A9	A10	70.0	2780.0	3270.0	6050.0	6.30	400	570	0.60	75.63	0.12	215.57	214.46	214.06	215.52	214.34	213.94	1.51	1.58	1.55
17.	A10	D.C.03a	2.0	0.0	6050.0	6050.0	6.30	400	570	0.60	75.63	0.00	215.52	214.34	213.94	215.52	214.33	213.93	1.58	1.59	1.58
18.	D.C.03a	***R.P.03***	2.0	0.0	6050.0	6050.0	6.30	400	570	0.60	75.63	0.00	215.52	214.33	213.93	215.52	214.33	213.93	1.59	1.59	1.59
19.	***R.P.03***	A11	9.0	0.0	14320.0	14320.0	14.92	400	570	0.60	75.63	0.02	215.52	214.12	213.72	215.52	214.10	213.70	1.80	1.82	1.81
20.	A11	A12	47.0	2280.0	14320.0	16600.0	17.29	400	570	0.60	75.63	0.08	215.52	214.10	213.70	215.50	214.02	213.62	1.82	1.88	1.85
21.	A18	A19	72.0	3090.0	0.0	3090.0	3.22	400	570	0.60	75.63	0.13	215.62	214.22	213.82	215.65	214.09	213.69	1.80	1.96	1.88

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.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Start	End	Depth
22.	A19	D.C.05	10.0	0.0	3090.0	3090.0	3.22	400	570	0.60	75.63	0.02	215.65	214.09	213.69	215.65	214.08	213.68	1.96	1.97	1.97
23.	D.C.05	***R.P.05***	2.0	0.0	3090.0	3090.0	3.22	400	570	0.60	75.63	0.00	215.65	214.08	213.68	215.65	214.07	213.67	1.97	1.98	1.98
24.	***R.P.05***	A20	4.0	0.0	3090.0	3090.0	3.22	400	570	0.60	75.63	0.01	215.65	214.55	214.15	215.65	214.54	214.14	1.50	1.51	1.50
25.	A20	A21	81.0	3230.0	3090.0	6320.0	6.58	400	570	0.60	75.63	0.14	215.65	214.54	214.14	215.57	214.40	214.00	1.51	1.57	1.54
26.	A21	D.C.06	2.0	0.0	6320.0	6320.0	6.58	400	570	0.60	75.63	0.00	215.57	214.40	214.00	215.57	214.40	214.00	1.57	1.57	1.57
27.	D.C.06	***R.P.06***	2.0	0.0	6320.0	6320.0	6.58	400	570	0.60	75.63	0.00	215.57	214.40	214.00	215.57	214.39	213.99	1.57	1.58	1.57
28.	***R.P.06***	A22	10.0	0.0	6320.0	6320.0	6.58	400	570	0.60	75.63	0.02	215.57	214.47	214.07	215.57	214.45	214.05	1.50	1.52	1.51
29.	A22.	A12	57.0	2620.0	6320.0	8940.0	9.31	400	570	0.60	75.63	0.10	215.57	214.45	214.05	215.50	214.35	213.95	1.52	1.55	1.53
30.	A12	A13	11.0	880.0	25540.0	26420.0	27.52	400	570	0.60	75.63	0.02	215.50	214.02	213.62	215.50	214.00	213.60	1.88	1.90	1.89
31.	A13	D.C.07	2.0	0.0	26420.0	26420.0	27.52	400	570	0.60	75.63	0.00	215.50	214.00	213.60	215.50	214.00	213.60	1.90	1.90	1.90
32.	D.C.07	***R.P.07***	2.0	0.0	26420.0	26420.0	27.52	400	570	0.60	75.63	0.00	215.50	214.00	213.60	215.50	214.00	213.60	1.90	1.90	1.90
33.	***R.P.07***	A14	4.0	0.0	26420.0	26420.0	27.52	400	570	0.60	75.63	0.01	215.50	214.10	213.70	215.50	214.09	213.69	1.80	1 81	1.80
34.	A14	A15	37.0	1940.0	26420.0	28360.0	29.54	400	570	0.60	75.63	0.06	215.50	214.09	213.69	215.47	214.03	213.63	1.81	1 84	1.82
35.	A15	D.C.08	4.0	0.0	28360.0	28360.0	29.54	400	570	0.60	75.63	0.01	215.47	214.03	213.63	215.47	214.02	213.62	1.84	1 85	1.85
36.	D.C.08	***R.P.08***	2.0	0.0	28360.0	28360.0	29.54	400	570	0.60	75.63	0.00	215.47	214.02	213.62	215.47	214.02	213.62	1.85	1.85	1.85
37.	***R.P.08***	A16	3.0	0.0	28360.0	28360.0	29.54	400	570	0.60	75.63	0.01	215.47	214.37	213.97	215.47	214.36	213.96	1.50	1.51	1.50
38.	A16	A17	52.0	2230.0	28360.0	30590.0	31.86	400	570	0.60	75.63	0.09	215.47	214.36	213.96	215.45	214.27	213.87	1.51	1.58	1.54
39.	A23	A24	53.0	2470.0	0.0	2470.0	2.57	400	570	0.60	75.63	0.09	215.57	214.47	214.07	215.53	214.38	213.98	1.50	1.55	1.53
40.	A24	D.C.09	4.0	0.0	2470.0	2470.0	2.57	400	570	0.60	75.63	0.01	215.53	214.38	213.98	215.53	214.37	213.97	1.55	1.56	1.56
41.	D.C.09	***R.P.09***	2.0	0.0	2470.0	2470.0	2.57	400	570	0.60	75.63	0.00	215.53	214.37	213.97	215.53	214.37	213.97	1.56	1.56	1.56
42.	***R.P.09***	A25	3.0	0.0	2470.0	2470.0	2.57	400	570	0.60	75.63	0.01	215.53	214.43	214.03	215.53	214.42	214.02	1.50	1.51	1.50
43.	A25	A26	58.0	2510.0	2470.0	4980.0	5.19	400	570	0.60	75.63	0.10	215.53	214.42	214.02	215.49	214.32	213.92	1.51	1.57	1.54

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.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Start	End	Depth
44.	A26	D.C.10	2.0	0.0	4980.0	4980.0	5.19	400	570	0.60	75.63	0.00	215.49	214.32	213.92	215.49	214.32	213.92	1.57	1.57	1.57
45.	D.C.10	***R.P.10***	2.0	0.0	4980.0	4980.0	5.19	400	570	0.60	75.63	0.00	215.49	214.32	213.92	215.49	214.32	213.92	1.57	1.57	1.57
46.	***R.P.10***	A27	6.0	0.0	4980.0	4980.0	5.19	400	570	0.60	75.63	0.01	215.49	214.39	213.99	215.49	214.38	213.98	1.50	1.51	1.51
47.	A27	A17	81.0	3160.0	4980.0	8140.0	8.48	400	570	0.60	75.63	0.14	215.49	214.38	213.98	215.45	214.24	213.84	1.51	1.61	1.56
48.	A17	D.C.11	3.0	0.0	38730.0	38730.0	40.34	400	570	0.60	75.63	0.01	215.45	214.24	213.84	215.45	214.23	213.83	1.61	1.62	1.62
49.	D.C.11	***R.P.11***	2.0	0.0	38730.0	38730.0	40.34	400	570	0.60	75.63	0.00	215.45	214.23	213.83	215.45	214.23	213.83	1.62	1.62	1.62
50.	***R.P.11***	***To Huda***	25.0	0.0	38730.0	38730.0	40.34	500	770	0.60	117.98	0.03	215.45	214.15	213.65	215.00	214.12	213.62	1.80	1.38	1.59

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