PROPOSED BUILDING PLAN FOR GROUP HOUSING COLONY AREA MEASURING 16.43125 ACRE

AT
SECTOR-37
BAHADURGARH (HARYANA)

SERVICE PLAN ESTIMATE
FOR
PUBLIC HEALTH ENGINEERING SERVICES

Client

HLT RESIDENCY PVT. LTD. AND OTHERS IN COLLABORATION WITH HL PROMOTERS PVT. LTD.

ARCHITECT

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PLOT- 96, BASEMENT, POCKET- 1, NEAR LIVING STYLE MALL,
JASOLA VIHAR, NEW DELHI - 110 025

PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF RESIDENTIAL PROJECT GROUP HOUSING, SECTOR-37, BAHADURGARH (HARYANA)

Bahadurgarh is located at 28.68°N 76.92°E [2] It has an average elevation of 206 metres (675 feet). Bahadurgarh was founded by Mughal Emperor Alamgir II (The Sultan of Delhi 1754-1759) gave the town in jagir to Bahadur Khan and Taj Khan, Baloch rulers of Farrukhnagar in 1754, who changed its name from Sharafabad to Bahadurgarh.A fort named Bahadurgarh Fort was constructed there by them. Bahadurgarh came into the hands of Sindhia in 1793. After his defeat in 1803 at the hands of the British, Lord Lake handed the town to the brother of the Nawab of Jhajjar. It was confiscated after the First War of Independence (1857) and became a division of the Rohtak district in 1860.In 1997, the town got attached with Jhajjar after Jhajjar become new district bifurcated from Rohtak. But Bahadurgarh is still larger to Jhajjar in every term, be it education, economy, population or administration.Bahadurgarh is the upcoming NCR of New Delhi, capital of India.Bahadurgarh is upcoming like Gurgaon and Faridabad It is well connected through rail and road network to the capital of nation.

GROUP HOUSING is a residential proposed between sector -37, at Bahadurgarh, Haryana for development by **HLT RESIDENCY PVT. LTD. AND OTHERS IN COLLABORATION WITH HL PROMOTERS 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 HUDA water supply and then pumped to the overhead water tanks of each tower.

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 20000 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 UGT-1 has been worked out to 03 Nos and For UGT-2 has been worked out to 02 Nos the tubewells and will be bored in lune with growth of demand to avoid absolence of the tubewells.

ii) Design

The scheme has been designed for population of 7134 persons in 16.43125 Acre. The rate of water supply per head per day has been taken assumed as 155.25 litres per head per day as per HUDA norms. In addition to above necessary provision of water for Nursery School, Primary School, Community building, Commercial building, parks etc. have been taken into account for calculating the maximum 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 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.

v.) Boosting Station

The boosting station is being planned with under ground storage reservoir catering to the above requirement.

vi.) **Distribution System**

The distribution systems for this development are has been designed to supply @ 155.25 Litres per head per day @ 3 times the average rate of flow on 'Hazen Willima' formula with C-100. Necessary provision for laying G.I. pipes only conforming to relevant IS standards along with valves and specials has been made in this estimate. The minimum terminal head at any point in this system will be as / water supply pumping head calculation.

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.

6 **Horticulture**

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

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. ~~1687.30~~ 2058.80 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. ~~96.61~~ 125.30 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.

HLT RESIDENCY PVT. LTD. AND OTHERS IN
COLLABORATION WITH HL PROMOTERS PVT. LTD.

Authorised Signatory

Paradise Consultants
New Delhi

PROPOSED GROUP HOUSING, SECTOR-37, BAHADURGARH (HARYANA)

DESIGN CALCULATION

1 **Daily Domestic Water Requirement**

		UGT-1 & STP-1	UGT-2 & STP-2
Apartment		**718**	**446 Units**
Tower-1, (G+14) Block-1		90	- Units
Tower-2, (G+14) Block-1		90	- Units
Tower-3, (G+14) Block-1		90	- Units
Tower-4, (G+14) Block-1		90	- Units
Tower-5, (G+14) Block-2		72	- Units
Tower-6, (G+14) Block-2		72	- Units
Tower-7, (G+14) Block-2		72	- Units
Tower-8, (G+14) Block-3		70	- Units
Tower-9, (G+14) Block-3		72	- Units
Tower-10, (G+14) Block-6		-	59 Units
Tower-11, (G+14) Block-6		-	58 Units
Tower-12, (G+14) Block-6		-	59 Units
Tower-13, (G+14) Block-5		-	90 Units
Tower-14, (G+14)		-	90 Units
Tower-15, (G+14)		-	90 Units
EWS (G+11)		**216**	**0 Units**
Service Personnel / Service Unit		**0**	**117 Units**
Tower-10, (G+14) Block-6		-	59 Units
Tower-11, (G+14) Block-6		-	58 Units
Population @ 5 person per unit - Apartment		**5**	**5 Persons**
Population @ 5 person per unit - EWS		**5**	**5 Persons**
Population @ 2 person per unit - Service Personnel		**2**	**2 Persons**
Therefore population (Apartment)		3590	2230 Persons
Therefore population (EWS)		1080	0 Persons
Therefore population (Maintenance Personnel)		0	234 Persons
Total Population		**4670**	**2464 Persons**
Water requirement for apartment	@	155.25	155.25 lpd.
		725018	382536 lpd.
	or	**725.02**	**382.54 KLD (1)**

2	**Other Requirement**				
a.)	Nursery School	1	@	10000	- lit/day
	Therefore daily water requirement			10000	- lit/day
				10.00	0 KLD
b.)	Primary School	1	@	25000	- lit/day
	Therefore daily water requirement			25000	- lit/day
				25.00	0 KLD
c.)	No. of Community Building	1	@	25000	- lit/day
	Daily water requirement lumpsum			25000	- lit/day
	Therefore daily water requirement			25.00	0 KLD
d.)	No. of Convenient Shopping	1	@	5000	- lit/day
	Daily water requirement lumpsum			5000	- lit/day
	Therefore daily water requirement			5.00	0 KLD
	Total (2a+2b+2c+2d)			60.00	0.00 KLD (2)
3	**Total Daily Water Requirement (1+2)**			790.02 ~~786.02~~	382.54 KLD
	Note : 100 % Domestic water For Nursery & Primary school				
i)	Domestic Water Requirement @	65%		529.76	248.65 KLD
			Say	529.00	250.00 KLD
ii)	Flushing Water Requirement @	35%		183.75 ~~171.77~~	87.03 KLD
			Say	185.00	90.00 KLD
4	**Water usage from STP**				
a)	Area under Parks (Area : 12750.869 Sqm.)	3.15	@	25000	25000 lit/acre/day
	Daily water requirement For STP-1	2.42	@	60426.60	- lit/day
	Daily water requirement For STP-2	0.73	@	-	18343.54 lit/day
	Daily water requirement			60426.60	18343.54 lit/day
				60.43	18.34 KLD
b)	Area under Roads				
	Daily water requirement		Lumpsum	20000	10000 lit/day
				20000	10000 lit/day
				20	10 KLD
c)	Under Road+ Parks (a+b)		Total	80.43	28.34 KLD
			Say	90.00	30.00 KLD
	Total treated water requirement (3 (ii) + 4c)			276.00	120.00 KLD

	Total Daily Requirement [3 (i) + d]		800 ~~790.00~~	370.00 KLD
		SAY	~~790.00~~ 800	370.00 KLD
5	**Tubewell**			
	Assuming working hours of tubewells		10	10 hours
	Assuming discharge/hour of each tubewell		20	20 KL/hours
	Total fresh water demand		520.76	248.65 KLD
	No. of tubewells required	520-76 ~~510.26~~ & 248.65 /10/20	2.60	1.24
	Add 10% standby		0.26	0.12
		Total	2.86	1.37
		Say	3.00	2.00
	Provide 3 Nos. of tubewell with 20 KL/hour discharge for UGT-1.			
	Provide 2 Nos. of tubewell with 20 KL/hour discharge for UGT-2.			
6	**Pumping machinery for tubewell**			
	Gross working load	=	65.00	65.00 m
	Average fall in SL	=	3.05	3.05 m
	Depression head	=	6.10	6.10 m
	Friction loss in main	=	2.50	2.50 m
		=	76.65	76.65 m
		Say =	77.00	77.00 m
	BHP = 18000x77x1/60x60x75x0.6	=	8.56	8.56 BHP
	With 60% efficiency	Say	10.0	10.0 BHP
7	**Underground Tank**			
	Daily fresh water requirement for domestic use		520.00	250.00 KLD
	Capacity of under ground tank			
	24 hours storage	520.00 x 24 / 24	520.00	250.00 KLD
	Fire Tank Capacity As/NBC Code 100 kld But Proposed		450.00	- KL
		Total	970.00	250.00 KL

It is proposed to provide under ground tank (UGT-1) of capacity 975 KL which also includes 450 KL capacity for fire fighting.

In UGT-1 will have Six compartments, two for fire, two for raw and the other two for domestic use. The water first enters the raw water compartment and after filtration water will go to the fire compartment and then over flows to the domestic compartment so that the water in the fire compartment shall remain fresh.

It is proposed to provide under ground tank (UGT-2) of capacity 250 KL.

In UGT-2 will have Four compartments, two for raw and the other two for domestic use. The water first enters the raw water compartment and after filtration water will go to the domestic compartment.

FIRE WATER TANK	**450.00**	**- KL**
TOTAL UG STORAGE (DOMESTIC + FLUSHING + HORTICULTURE)	**790.00**	**379.00 KL**
RAW WATER TANK	**260.00**	**125.00 KL**
DOMESTIC WATER TANK	**260.00**	**125.00 KL**
FLUSHING, HORTICULTURE & ROAD WASHING (PART OF STP)	**270.00**	**120.00 KL**

8 DOMESTIC WATER PUMPS - LOCATED IN PUMP ROOM

i) UGT-1 Domestic Water Transfer Pumps For Tower - 1 To 10, Community Building & Shopping

Daily requirement for domestic use		=	381.78 KL
Assuming 6 hours running 3 pumps (with one standby)			
Discharge/hour	381.78 / 6 / 3	=	21.21 KL/HR
Head of pump			
i) Suction lifts		=	0.0 m
ii) Friction loss in M<main & specials		=	10.0 m
iii) Residual head		=	5.0 m
iv) Clear head		=	50.0 m
		=	65.0 m
BHP of motor	21.21 x1000x65/4500x60x0.6		8.5 HP
	SAY 360 LPM		~~9.0~~ HP 10.0

ii) UGT-1 Domestic Water Transfer Pumps For EWS, Nursery School & Primary School

Daily requirement for domestic use		=	138.99 KL
Assuming 6 hours running 1 pumps (with one standby)			
Discharge/hour	138.99 / 6 / 1	=	23.16 KL/HR
Head of pump			
i) Suction lifts		=	0.0 m
ii) Friction loss in M<main & specials		=	3.0 m
iii) Residual head		=	5.0 m
iv) Clear head		=	45.0 m
		=	53.0 m
BHP of motor	23.16 x1000x53/4500x60x0.6		7.6 HP
	SAY 390 LPM =		~~8.0~~ HP nearest 10.0

iii) UGT-2 Domestic Water Transfer Pumps For Towers - 10 To 15

Daily requirement for domestic use		=	248.65 KL
Assuming 6 hours running 2 pumps (with one standby)			
Discharge/hour	248.65 / 6 / 2	=	20.72 KL/HR
Head of pump			
i) Suction lifts		=	0.0 m
ii) Friction loss in M<main & specials		=	10.0 m
iii) Residual head		=	5.0 m
iv) Clear head		=	50.0 m
		=	65.0 m
BHP of motor	20.72 x1000x65/4500x60x0.6		8.3 HP
	SAY 3568m	=	~~9.0~~ HP 10.0

9 Sewage Treatment Plant Capacity (STP.)

Gross Domestic+Flushing water requirment / day	790.02 ~~785.02~~	382.54 Kld.
Sewage flow 80% of total load	632.02 ~~628.01~~	306.03 Kld.
Proposed STP. Capacity	**628.00**	**306.00 Kld.**
Say	675 ~~760.00~~	**310.00 Kld.**

	Pump Description	Location	Nos.	Discharge	Head	HP
i)	Diesel Driven Pump	Pump Room	2	4500	105.00	-
ii)	Hydrant Pump	Pump Room	2	2850	105.00	115
iii)	Sprinkler Pump	Pump Room	2	2850	105.00	115
iv)	Jockey Pump	Pump Room	4	180	105.00	10
v)	Water Curtain Pump	Pump Room	1	2850	45.00	50

10 Capacity of Gen Set

		Nos.	HP		
i)	UGT-1 Domestic Water Transfer Pumps For Tower - 1 To 10, Community Building & Shopping	3	9.0	=	30 ~~27~~ HP
ii)	UGT-1 Domestic Water Transfer Pumps For EWS, Nursery School & Primary School	1	6.0	=	~~8~~ HP
iii)	UGT-2 Domestic Water Transfer Pumps For Towers - 10 To 15	2	9.0	=	30 ~~18~~ HP
iv)	Fire Pump (Jockey)	4	10.0	=	40 HP
v)	Tube Well	5	10.0	=	50 HP
vi)	Lighting			=	25 HP
					175 ~~168~~ HP

or 175 ~~168~~ x0.746x1.50 = 195.82 ~~187.99~~ KVA

Say ~~190.00~~ 200 KVA

Requirement of ~~190~~ 200 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
HLT RESIDENCY PVT. LTD. AND OTHERS IN COLLABORATION WITH HL PROMOTERS PVT. LTD.

Description	Amount (Lacs.)
	554.83
Sub Work - I Water Supply	~~478.64~~
	247.19
Sub Work - II Sewerage	~~224.08~~
	183.92
Sub Work - III Storm Water Drainage	~~112.02~~
	387.24
Sub Work - IV Roads & Footpath	~~442.91~~
	63.04
Sub Work - V Street Lighting	~~24.52~~
	15.22
Sub Work - VI - Horticulture	~~9.44~~
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)	607.35 ~~295.07~~
Total	2058.79 ~~1587.30~~

Say Rs 2058.80 lacs

~~(RUPEES FIFTEEN CRORE EIGHTY SEVEN LACS THIRTY THOUSAND ONLY)~~

COST PER ACRE = ~~1587.30~~ LACS /16.43125 ACRE = ~~96.61~~ LACS / ACRE
2058.80 125.30

HLT RESIDENCY PVT. LTD. AND OTHERS IN COLLABORATION WITH
HL PROMOTERS PVT. LTD.

Authorized Signatory

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

Paradise Consultants New Delhi

Superintending Engineer (HQ)
for Chief Engineer 1 HSVP
Panchkula
18/12/19

HL PROMOTERS PVT. LTD.

Submitted for approval

Recommended for appl

Executive Engineer,
HSVP, Division,
Bahadurgarh.

Superintending Engineer
HSVP Circle, Rohtak

Director Town & Country Planning Haryana Chandigarh

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2058.80 125.30

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Authorized Signatory

Paradise Consultants Pvt. Ltd. New Delhi

FINAL ABSTRACT OF REVISED COST

Description	Amount (Lacs.)
Sub Head - (I) Head Works	119.70 ~~94.70~~
Sub Head - (II) Pumping Machinery	128.10 ~~121.50~~
Sub Head - (III) Distribution System (Dom. & flushing	44.41 ~~49.12~~
Sub Head - (IV) Irrigation Scheme	18.50 ~~19.09~~
Sub Head - (V) Fire Scheme	50.92 ~~27.56~~
Total	361.53 ~~311.88~~
Add 3% Contingencies & PE charges	10.84 ~~9.36~~
Total	372.37 ~~321.24~~
Add 49% Departmental Charges, proj escalation, Unforseen, Admin	182.46 ~~157.41~~
Grand Total	554.83 ~~478.64~~ Lacs
(CO to final abstract of cost) Say	~~478.64~~

	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	5	500000.00	~~25.00~~ 50.00	
2	Constructing pump chambers as per standard design of PWD PH/HUDA of size ~~2.50 x 2.50~~ Housing TW m.	Nos	5	100000.00	5.00	
3	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 station for *UGT-1 & UGT-2*	Nos	2	750000.00	15.00	
ii)	*UGT-1* for fire fighting, raw and domestic water in two compartments. incl. 450 kl. for fire	KL	970	3500.00	33.95	
iii)	*UGT-2* for raw and domestic water in two compartments.	KL	250	3500.00	8.75	
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)				119.70 ~~94.70~~ Lacs	
				Say	~~94.70~~ Lacs	

	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 20.0 KL water per hour against a total head of 77.0 M complete with motor and other accessories. (For Tubewell -10.0 HP)	Nos.	5	200000.00	10.00
2	Providing & installing electricity driven pumping set capable of delivering 360 LPM of water against a total head of 65 m complete with motor and other accessories (9.0 HP).	Nos.	(3+1) 4	100000.00	4.00 5.20
3	Providing & installing electricity driven pumping set capable of delivering 390 LPM of water against a total head of 53 m complete with motor and other accessories (8.0 HP).	Nos.	(1+1) 2	100000.00	2.00
4	Providing & installing electricity driven pumping set capable of delivering 350 LPM of water against a total head of 65 m complete with motor and other accessories (9.0 HP).	Nos.	(2+1) 3	100000.00	3.00
5	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear head arrangements of following capacities.				
	1 No. - ~~100~~ 200 KVA	Nos.	1	(L.S) ~~1000000.00~~	20.00 ~~18.00~~
6	Providing & installing pumping set of following capacities for fire protection:				
i)	180 LPM @ 100 M Head (15 HP)	Nos.	4	150000.00	6.00
ii)	2850 LPM @ 105 M Head (115 HP) Hydrant	Nos.	2	900000.00	18.00
iii)	2850 LPM @ 105 M Head (115 HP) Sprinkler	Nos.	2	900000.00	18.00
iv)	4500 LPM @ 105 M Head (DG Pump)	Nos.	2	1200000.00	24.00
v)	2850 LPM @ 45 M Head (Water Curtain Pump)	Nos.	1	350000.00	3.50
7	Provision for diesel engine genset stand bye arrangements for Tubewells.	Nos.	5	150000.00	Sum 7.50 ~~7.50~~
8	Provision for cheap pressure type chlorination plant complete.	Nos.	5	1.00 ~~60000.00~~	5.00 ~~3.00~~
9	Provision for making foundations & erection of pumping machinery.	LS	-	-	2.50
10	Provision for pipes, valves & specials inside the pump chamber.	LS	-	-	5.00 ~~1.00~~

11	Provision for electric services connection including electric fittings for tubewells chambers complete including cost of transformer.	LS	-	-	2.50	
12	Provision for carriage for materials and other unforeseen items.	LS	-	-	1.00	
	(C.O. to abstract of cost of Sub-work No I)				128.0 ~~121.50~~	Lacs
				Say	~~121.50~~	Lacs

128.0

	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 heavy class G.I. pipes including cost of clamping on basement complete as per ISI marked. (Note : Water supply pipes running at basement ceiling level)				
i)	65 mm i/d	M	125	900.00	112500.00
ii)	80 mm i/d	M	258	1050.00	270900.00
iii)	100 mm i/d	M	1054	1450.00	1528300.00
iv)	150 mm i/d	M	358	1950.00	698100.00
2	Providing, fixing & Testing Butterfly valves including cost of complete in all respects.				
i)	65 mm i/d	Nos.	1	9500.00	9500.00
ii)	80 mm i/d	Nos.	1	10500.00	10500.00
iii)	100 mm i/d	Nos.	9	12000.00	108000.00
iv)	150 mm i/d	Nos.	3	15000.00	45000.00
3	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.				
i)	100 mm i/d	Nos.	5	12000.00	60000.00
ii)	150 mm i/d	Nos.	1	15000.00	15000.00
5	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	10	10000.00	100000.00
6	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	30	1000.00	30000.00
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 on main road	LS	-	-	250000.00
10	Providing, laying, jointing & testing D.I. pipes including cost of excavation complete as per ISI marked for rising main from HUDA & Tube Well water supply line to UG Tank.				
i)	100 mm i/d	M	337	1450.00	488650.00
ii)	150 mm i/d	M	353	1950.00	688350.00
iii)	200 mm i/d	M	80	2450.00	196000.00
	(C.O. to abstract of cost of Sub-work No.I)				4911800.00 Rs.
				Say	49.12 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)	80 mm dia	M	2058	800.00	1646400.00	
2	Providing and fixing 20mm dia Irrigation hydrant valve complete in all respect.	Nos.	31	3500 ~~1200.00~~	1.08 ~~37200.00~~	
3	Providing & fixing valve 25mm dia	Nos	31	550.00	17050.00	
4	Providing, fixing & Testing Butterfly valves including cost of complete in all respects.					
i)	80 mm i/d	Nos	2	5500.00	11000.00	
5	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos	3	4500.00	13500.00	
6	Providing and fixing indicating plates for butterfly valve, air valve etc.	Nos	5	1000.00	5000.00	
7	Provision for carriage of materials etc. and other unforseen charges	LS	-	-	0.25 ~~50000.00~~	
8	Provision for cutting of roads & making good to its in original condition	LS	-	-	0.25 ~~50000.00~~	
					18.50	
				Total	~~1830450.00~~ Rs.	
				Say	~~19.00~~ Lacs	
					18.50	

	Sub Work I					
	Sub Head No. V				Fire Scheme	
S. No.	Description	Unit	Qty	Rate (Rs.)	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.				24.98	
a)	200 mm dia	M	1162	2650.00	~~3079300.00~~	
b)	150 mm dia	M	732	1575 ~~1850.00~~	1354200.00	11.53
c)	80 mm dia	M	~~221~~ 216	1000.00	~~221000.00~~ 2.16	
2	Providing and fixing External Fire Hydrants complete with masonary chambers.	Nos	35	10000.00	350000.00	
3	Providing & fixing butterfly valve.				0.40	
a)	200 mm dia	Nos	2	~~28500.00~~	~~57000.00~~	
b)	150 mm dia	Nos	2	15000 ~~20000.00~~	30000.00	
c)	80 mm dia	Nos	35	10000.00	350000.00	
4	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.			10000	0.20	
i)	150 mm i/d	Nos.	2	~~24500.00~~	~~49000.00~~	
5	Provision for cutting of roads and carriage of materials etc. and other unforsean charges	LS	-	-	200000.00	
6	Provision for indication plates	Nos	35	1000.00	35000.00	
7	Provision for carriage of material	LS	-	-	200000.00	
				Total	50.92 ~~2750200.00 Rs.~~	
				Say	~~27.50~~ Lacs	

	Sub Work II				Sewerage Scheme
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, lowering, jointing, cutting salt glazed stone ware / DWC SN-8 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	207	1250.00	5.09 lacs ~~258750.00~~
ii)	250 mm i/d				
a)	Average depth 1.5 m to 4.5 m	M	467	1800.00	8.41 ~~840600.00~~
iii)	300 mm i/d				
a)	Average depth 1.5 m to 4.5 m	M	5	2200.00	11000.00
iv)	400 mm i/d				
a)	Average depth 1.5 m to 4.5 m	M	273	2500.00	682500.00
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 sector road.	LS	-	-	200000.00
5	Cost of Sewerage Treatment Plant.				85 lacs
5.1	675 Kld Sewerage Treatment Plant.	LS	-	-	~~7000000.00~~
5.2	310 Kld Sewerage Treatment Plant.	LS	-	-	4000000.00
6	Provision for CI / DI pipe 150 mm dia pipe from STP. To Huda Main Line.	M	421	~~2250.00~~ 1575	6.63 lacs ~~947250.00~~
7	Provision for vent pipe as per P.H. requirement at suitable places.	LS	-	-	500000.00
					161.07 ~~14640100.00~~
	Add 3% contingencies as per CPWD charts				4.83 ~~439203~~
					~~15079303.00~~
	Add 49% Deptt. Charges, price escalation, unforseen, Admin			Total	165.90 81.29 ~~7388858~~ ~~22468161 Rs.~~
	(C.O. to abstract of cost of Sub work No. 1)			Say	247.19 lacs ~~224.68 Lacs~~

	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			2500	31.75
a)	Average depth 0.0 m to 1.5 m	M	1270	~~2250.00~~	~~2857500.00~~
b)	Average depth 1.5 m to 4.5 m	M	250	~~2450.00~~ 2600	~~612500.00~~ 6.50
ii)	500 mm i/d			3400	0.85
a)	Average depth 0.0 m to 1.5 m	M	25	~~2550.00~~	~~63750.00~~
b)	Average depth 1.5 m to 4.5 m	M	7	~~2750.00~~ 3450	~~19250.00~~ 0.24
2	Provision for Road Gully & Drain with 300 mm dia RCC pipe.	LS	-	-	450000.00
3	Provision for cutting of roads and carriage of materials etc. and other unforseen items.	LS	-	-	150000.00
4	Provision for temporary disposal arrangements Recharge Pit if applicable	Nos	17	150000.00	42.50 ~~2550000.00~~
5	Provision for lighting, watching and temporary diversion of traffic.	LS	-	-	500000.00
6	Provision for connection with HUDA sector road.			(L.S)	2.00 lacs
i)	~~500 mm i/d~~	~~M~~	~~35~~	~~2750.00~~	~~96250.00~~
7.	Pow for temporary disposal arrangement till HSVP services are provide		(L.S)		25.00 lacs
					~~7299250.00~~ 119.84
	Add 3% contingencies on PE charges				~~218977.50~~ 3.60
					~~7518227.50~~ 123.44 lacs
	Add 49% Deptt. Charges, unforseen, price escalation & dewn charges				~~3683931.48~~ 60.48 lacs
				Total	~~11202158.98~~ Rs. 183.92
				Say	~~112.02~~ Lacs
	(C.O. to abstract of cost of Sub-work No. 1				

	Sub Work IV				Road Work	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)	
1	Provision for leveling & earth filling as per site condition 15.97965 acre @ 100000/acre (Note : Excavated Earth reused for filling within site for grading works)	Acres	~~15.97965~~ 21.70425 − 5.278 = 16.43125	100000.00	~~1597965.00~~ 24.65 las	
2	Construction of road by -					
	i) Providing GSB 250 mm thick.					
	ii) 250 mm thick W.M.M. stone aggregate					
	iii) 50 mm thick Sand Filling 3m					
	iv) 80 mm thick Pre-Cast Concrete Pavers complete in all respect. 80 mm thick mss	Sq. mtr.	11237.0	1200/ ~~1600.00~~	134.84 ~~17979200.00~~	
3	Provision for making approach and pavement to building block by providing concrete pavement or tiles Etc. 1690.0 sqm @ 600 / sqm.	Sq. mtr.	1690.0	600.00	1014000.00	
4	Provision for parking arrangement 8950 sqm. @ 600/sqm	Sq. mtr.	8950.0	600.00	5370000.00	
5	Provision for kerb stone with complete specification. channels	mtr.	3498.0	600.00	20.99 ~~2098800.00~~	
6	Provision for Carriage of material & other unforseen	LS.		~~500000.00~~ (Lump)	500000.00	
7	Provision for traffic lighting and guide map/ indicators	LS		~~300000.00~~	300000.00	
				Total	~~28059905.00 Rs.~~ 258.32 las	
	Add 3% contingencies & PE charges				~~866798.95 Rs.~~ 7.57 las	
					~~29725763.95 Rs.~~ 259.89 las	
				Total	~~297.26 Lacs~~ 187.35 las	
	Add 49 % department charges, price escalation unforseen, Admn.				~~145.66 Lacs~~ 387.24 las	
				Say	~~442.91 Lacs~~	

	Sub Work V				Street Lighting	
S. No.	Description	Unit	Qty	Rate (Rs.)	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 on roads as per Standard specification of HVPNL with GI PE charges	per acre	~~16.97965~~ 21.07925 Acre 5.278 Acre (-) 16.43125	~~100000.00~~ 2.50 lac	~~1697965.00~~ 41.08	
	Add 3% contingencies				~~47938.05~~ 1.23	
	Total				~~1645903.95~~ 42.31	lacs
	Add 49% Deptt. Charges, price escalation Misc Item, Admn				~~806492.94~~ 20.73	lac
				Total	~~2452397.00~~ Rs. 63.04	lacs
				Say	~~24.52~~	Lacs

	Sub Work VI				Horticulture
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Development of lawn area				
	a) Tranching 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)				4.72 lacs
	~~3.15 acres @ Rs. 100000~~	per acre	3.15	100000.00	~~315,000~~
	400 trees @ Rs. ~~750/-~~ 1300/- each				~~300,000~~ 5.20
					~~615000.00 Rs~~
	Add 3% contingency charges & PE charges				9.92 lacs
					~~18450.00 Rs~~ 0.30 lacs
				Total	~~633450.00 Rs.~~ 10.22 lacs
	Add 49% Deptt. Charges, Unforseen, Admn & price escalation				5.in la ~~310390.50 Rs.~~
				Total	15.22 lacs ~~943840.50 Rs.~~
				Say	~~9.44 Lacs~~

	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			7.50 lacs	183.23 lacs
	~~15.97965 acres @ 5 lacs per acre~~	per acre	~~16.97965~~ 16.43125	~~500000.00~~ Acre	~~7989825~~
2	Provision for resurfacing & strengthening of road after five years of Ist phase 11213 sqm @ 400/- per sqm	Sq. mtr.	11237.0 + 8950 = 20187	600 ~~400~~	121.12 lacs ~~4494800.00~~
3	Provision for resurfacing & strengthening of road after ten years of 2nd phase 11213 sqm @ 600/- per sqm	Sq. mtr.	11237.0 + 8950 = 20187	750/ ~~600~~	151.40 lacs ~~6742200.00~~
				Total	395.75 lacs ~~19226825 Rs.~~
	Add 3% contingency & PE charges				11.87 lacs ~~576804.75 Rs.~~
				Total	407.62 lacs ~~19803629.75 Rs.~~
	Add 49% Departmetal charges, price escalation unforeseen, admin charges				199.73 lacs ~~9703778.578 Rs.~~
				Total	607.35 lacs ~~29507408.33 Rs.~~
				Say	~~293.07 Lacs~~

DOMESTIC WATER SUPPLY QUANTITY SHEET

S.No.	Line No	Length of Pipe mtr.	Dia of Pipe mtr.
1	*Pump Room1- D1*	50.0	150
2.	*D1 - D1a*	58.0	100
3.	*D1 - D2*	46.0	150
4.	*D2 - D3*	100.0	150
5.	*D3 - D4*	117.0	100
6.	*D2 - D4*	140.0	100
7.	*Pump Room1- D5*	170.0	100
8.	*Pump Room 2- DD1*	10.0	100
9.	*DD1 - DD1a*	70.0	100
10.	*DD1 - DD2*	178.0	100

FLUSHING WATER SUPPLY QUANTITY SHEET

1	*STP 1 - F1*	83.0	150
2.	*F1 - F1a*	24.0	100
3.	*F1 - F2*	79.0	150
4.	*F2 - F3*	100.0	100
5.	*F3 - F4*	117.0	100
6.	*F2 - F4*	140.0	100
7.	*STP 1- FF1*	55.0	65
8.	STP 2- FF1	10.0	65
9.	FF1 - FF1a	70.0	65
10.	FF1 - FF2	178.0	80

S No.	Line No	Length of Pipe mtr.	Dia of Pipe mtr.
HUDA WATER SUPPLY QUANTITY SHEET			
1	*HUDA* - M1	150.0	150
2.	M1 - *UGT 1*	35.0	100
3.	M1 - *UGT 2*	165.0	100
TUBE WELL WATER SUPPLY QUANTITY SHEET			
1	Tube Well 01 - T1	68.0	100
2.	Tube Well 02 - T1	6.0	100
3.	T1 - T2	117.0	150
4.	Tube Well 03 - T2	4.0	100
5.	T2 - *UGT 1*	80.0	200
6.	Tube Well 04 - T3	54.0	100
7.	Tube Well 05 - T3	5.0	100
8.	T3 - *UGT 2*	86.0	150

Description	Length in (MTR)	Pipe Dia (MM)
Domestic & Flushing Water Supply line	125.0	150
Domestic & Flushing Water Supply line	258.0 (1437.0m)	150
Domestic & Flushing Water Supply line	1054.0	100
Domestic & Flushing Water Supply line	358.0	150

S No.	Line No	Length of Pipe	Dia of Pipe
		mtr.	mtr.
Description		Length in (MTR)	Pipe Dia (MM)
Tube Well Water Supply line		137.0	100
Tube Well Water Supply line		203.0	150
Tube Well Water Supply line		80.0	200
HUDA Water Supply line		200.0	100
HUDA Water Supply line		150.0	150

Description	Qty.	Unit
Ø Dia Valve	1	Nos.
Ø Dia Valve	1	Nos.
100 Dia Valve	9	Nos.
150 Dia Valve	3	Nos.
100 Dia Non Return Valve	5	Nos.
150 Dia Non Return Valve	1	Nos.
Air Valve	10	Nos.

IRRIGATION WATER SUPPLY QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
1.	STP-1	G1	15.0	80
2.	G1	G2	15.0	80
3.	G2	G3	16.0	80
4.	G3	G4	100.0	80
5.	G4	G4a	43.0	80
6.	G4a	G4b	45.0	80
7.	G4	G5	208.0	80
8.	G5	G4b	107.0	80
9.	G4b	G6	173.0	80
10.	G5	G6	221.0	80
11.	G6	G7	173.0	80
12.	G7	G4a	39.0	80
13.	G7	G8	142.0	80
14.	G8	G2	86.0	80
15.	G8	G1	248.0	80
16.	STP-2	GG1	15.0	80
17.	GG1	GG2	99.0	80
18.	GG2	GG3	77.0	80
19.	GG1	GG3	236.0	80
Irrigation Water Supply line			2058.0	80
Garden Hydrant			31	Nos.
80 Dia Valve			2	Nos.
Air Valve			3	Nos.

FIRE QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
-	From	To	mtr.	mtr.
1	*UGT-1*	B1	15.0	200
2.	B1	B2	45.0	200
3.	B2	B3	27.0	200
4.	B3	B4	10.0	200
5.	B4	B5	58.0	200
6.	B5	B5a	13.0	80
7.	B5	B6	45.0	200
8.	B6	B6a	13.0	80
9.	B6	B7	49.0	200
10.	B7	B7a	32.0	80
11.	B7	B8	220.0	200
12.	B8	B9	75.0	200
13.	B9	B9a	32.0	80
14.	B9	B10	40.0	200
15.	B10	B10a	23.0	80
16.	B10	B11	18.0	200
17.	B11	B11a	32.0	80
18.	B11	B4	30.0	200
19.	B1	B12	125.0	200
20.	B3	B12	98.0	200
21.	B12	B13	52.0	150
22.	B13	B14	53.0	150
23	B14	B15	35.0	150
24.	B13	B15	126.0	150
25	*UGT-1*	BB1	65.0	200
26.	BB1	BB1a	40.0	80

S No.	Line No		Length of Pipe	Dia of Pipe
-	From	To	mtr.	mtr.
27.	BB1	BB2	43.0	200
28.	BB2	BB2a	75.0	200
29.	BB2a	BB2b	36.0	80
30.	BB2	BB3	127.0	200
31.	BB3	BB4	17.0	150
32.	BB4	BB5	47.0	150
33.	BB5	BB6	67.0	150
34.	Fire Brigade Inlet Connection		250.0	150
35.	Fire Brigade Withdrawl Connection		85.0	150

200 mm Dia Pipe	1162.0	mtr.
150 mm Dia Pipe	732.0	mtr.
80 mm Dia Pipe	~~231.0~~ 316	mtr.

Extemal Fire Hydrant	35	Nos.
200 Dia Valve	2	Nos.
150 Dia Valve	2	Nos.
80 Dia Valve	35	Nos.
150 Dia Non Return Valve	2	Nos.

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	112.0	250	0.250	1.50	2.01	1.75	0.0	112.0	0.0	0.0
2	S2	S3	95.0	250	0.250	2.01	2.51	2.26	0.0	95.0	0.0	0.0
3	S3	S4	114.0	400	0.400	2.66	3.03	2.84	0.0	114.0	0.0	0.0
4	S4	S5	144.0	400	0.400	3.03	3.49	3.26	0.0	0.0	144.0	0.0
5	S5a	S5	80.0	200	0.200	1.50	2.07	1.79	0.0	80.0	0.0	0.0
6	S5	*STP-1*	15.0	400	0.400	3.49	3.53	3.51	0.0	0.0	15.0	0.0
7	S6	S7	260.0	250	0.250	1.50	2.91	2.20	0.0	260.0	0.0	0.0
8	S7a	S7	24.0	200	0.200	1.50	1.68	1.59	0.0	24.0	0.0	0.0
9	S8	S7	103.0	200	0.200	1.45	2.17	1.81	0.0	103.0	0.0	0.0
10	S7	*STP-2*	5.0	300	0.300	2.96	2.98	2.97	0.0	5.0	0.0	0.0
Total			952.0						0.0	793.0	159.0	0.0

200 mm ø S.W for EWS (apply) 200 / 793 mtr

Excavation Depth

Description	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
200 mm Dia pipe	0.0	207.0 200	0.0	0.0
250 mm Dia pipe	0.0	467.0	0.0	0.0
300 mm Dia pipe	0.0	5.0	0.0	0.0
400 mm Dia pipe	0.0	114.0	159.0	0.0

SEWER OVER FLOW PUMPING LINE TO MUNICIPAL SEWER LINE

S.No.	Line No.		Length	Pipe Dia
-	From	To	(mtr.)	(mm.)
1	*STP-01*	SS1	106.0	150
2	*STP-02*	SS1	115.0	150
3	SS1	Mun. Sewer	200.0	150
Total			421.0	150.0

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	135.0	400	0.400	1.40	1.64	1.52	0.0	135.0	0.0
2.	A2a	A2	18.0	400	0.400	1.40	1.41	1.41	18.0	0.0	0.0
3.	A2	D.C.01	2.0	400	0.400	1.64	1.64	1.64	0.0	2.0	0.0
4.	D.C.01	*D.T.01*	2.0	400	0.400	1.64	1.64	1.64	0.0	2.0	0.0
5.	*D.T.01*	A3	10.0	400	0.400	1.40	1.42	1.41	10.0	0.0	0.0
6.	A3	A4	36.0	400	0.400	1.42	1.46	1.44	36.0	0.0	0.0
7.	A18	A19	54.0	400	0.400	1.40	1.50	1.45	54.0	0.0	0.0
8.	A19	D.C.02	7.0	400	0.400	1.50	1.52	1.51	0.0	7.0	0.0
9.	D.C.02	*D.T.02*	2.0	400	0.400	1.52	1.52	1.52	0.0	2.0	0.0
10.	*D.T.02*	A20	5.0	400	0.400	1.40	1.41	1.40	5.0	0.0	0.0
11.	A20	A4	66.0	400	0.400	1.41	1.49	1.45	66.0	0.0	0.0
12.	A21	A22	42.0	400	0.400	1.40	1.45	1.43	42.0	0.0	0.0
13.	A22	D.C.03	5.0	400	0.400	1.45	1.46	1.46	5.0	0.0	0.0
14.	D.C.03	*D.T.03*	2.0	400	0.400	1.46	1.47	1.46	2.0	0.0	0.0
15.	*D.T.03*	A4	11.0	400	0.400	1.40	1.41	1.40	11.0	0.0	0.0
16.	A4	A5	18.0	400	0.400	1.49	1.52	1.51	0.0	18.0	0.0
17.	A23	A24	122.0	400	0.400	1.40	1.59	1.50	122.0	0.0	0.0
18.	A24	D.C.04	8.0	400	0.400	1.59	1.60	1.60	0.0	8.0	0.0
19.	D.C.04	*D.T.04*	2.0	400	0.400	1.60	1.61	1.61	0.0	2.0	0.0
20.	*D.T.04*	A25	5.0	400	0.400	1.40	1.41	1.40	5.0	0.0	0.0
21.	A25	A5	27.0	400	0.400	1.41	1.46	1.43	27.0	0.0	0.0
22.	A5	A6	47.0	400	0.400	1.52	1.58	1.55	0.0	47.0	0.0
23.	A6	D.C.05	5.0	400	0.400	1.58	1.59	1.58	0.0	5.0	0.0
24	D.C.05	*D.T.05*	2.0	400	0.400	1.59	1.59	1.59	0.0	2.0	0.0
25.	*D.T.05*	A7	9.0	400	0.400	1.40	1.43	1.41	9.0	0.0	0.0
26.	A7	A8	15.0	400	0.400	1.43	1.45	1.44	15.0	0.0	0.0
27	A26	A27	80.0	400	0.400	1.40	1.52	1.46	80.0	0.0	0.0

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.)
28.	A27	D.C.06	2.0	400	0.400	1.52	1.52	1.52	0.0	2.0	0.0
29.	D.C.06	*D.T.06*	5.0	400	0.400	1.52	1.53	1.53	0.0	5.0	0.0
30.	*D.T.06*	A28	5.0	400	0.400	1.40	1.41	1.40	5.0	0.0	0.0
31.	A28	A8	20.0	400	0.400	1.41	1.44	1.43	20.0	0.0	0.0
32.	A8	A9	11.0	400	0.400	1.45	1.47	1.46	11.0	0.0	0.0
33.	A29	A30	55.0	400	0.400	1.40	1.50	1.45	55.0	0.0	0.0
34.	A30	D.C.07	2.0	400	0.400	1.50	1.50	1.50	2.0	0.0	0.0
35.	D.C.07	*D.T.07*	5.0	400	0.400	1.50	1.51	1.50	0.0	5.0	0.0
36.	*D.T.07*	A31	5.0	400	0.400	1.40	1.41	1.40	5.0	0.0	0.0
37.	A31	A9	75.0	400	0.400	1.41	1.51	1.46	75.0	0.0	0.0
38.	A9	D.C.08	2.0	400	0.400	1.51	1.51	1.51	0.0	2.0	0.0
39.	D.C.08	*D.T.08*	2.0	400	0.400	1.51	1.52	1.52	0.0	2.0	0.0
40.	*D.T.08*	A10	4.0	400	0.400	1.40	1.41	1.40	4.0	0.0	0.0
41.	A10	A11	41.0	400	0.400	1.41	1.47	1.44	41.0	0.0	0.0
42.	A11	D.C.09	2.0	400	0.400	1.47	1.47	1.47	2.0	0.0	0.0
43.	D.C.09	*D.T.09*	2.0	400	0.400	1.47	1.48	1.47	2.0	0.0	0.0
44.	*D.T.09*	A12	5.0	400	0.400	1.40	1.41	1.40	5.0	0.0	0.0
45.	A12	A13	40.0	400	0.400	1.41	1.43	1.42	40.0	0.0	0.0
46.	A13	D.C.10	5.0	400	0.400	1.43	1.44	1.43	5.0	0.0	0.0
47.	D.C.10	*D.T.10*	2.0	400	0.400	1.44	1.44	1.44	2.0	0.0	0.0
48.	*D.T.10*	A14	2.0	400	0.400	1.40	1.40	1.40	2.0	0.0	0.0
49.	A14	A15	58.0	400	0.400	1.40	1.45	1.42	58.0	0.0	0.0
50.	A15	D.C.11	2.0	400	0.400	1.45	1.45	1.45	2.0	0.0	0.0
51.	D.C.11	*D.T.11*	2.0	400	0.400	1.45	1.45	1.45	2.0	0.0	0.0
52.	*D.T.11*	A16	2.0	400	0.400	1.40	1.40	1.40	2.0	0.0	0.0
53.	A16	A17	30.0	400	0.400	1.40	1.46	1.43	30.0	0.0	0.0
54.	A32	A33	75.0	400	0.400	1.40	1.50	1.45	75.0	0.0	0.0
55.	A33	D.C.12	2.0	400	0.400	1.50	1.51	1.50	0.0	2.0	0.0

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.)
56.	D.C.12	*D.T.12*	2.0	400	0.400	1.51	1.51	1.51	0.0	2.0	0.0
57.	*D.T.12*	A34	8.0	400	0.400	1.40	1.41	1.41	8.0	0.0	0.0
58.	A34	A35	53.0	400	0.400	1.41	1.47	1.44	53.0	0.0	0.0
59.	A35	D.C.13	2.0	400	0.400	1.47	1.47	1.47	2.0	0.0	0.0
60.	D.C.13	*D.T.13*	2.0	400	0.400	1.47	1.47	1.47	2.0	0.0	0.0
61.	*D.T.13*	A36	10.0	400	0.400	1.40	1.42	1.41	10.0	0.0	0.0
62.	A36	A37	54.0	400	0.400	1.42	1.48	1.45	54.0	0.0	0.0
63.	A37	D.C.14	2.0	400	0.400	1.48	1.49	1.48	2.0	0.0	0.0
64.	D.C.14	*D.T.14*	2.0	400	0.400	1.40	1.40	1.40	2.0	0.0	0.0
65.	*D.T.14*	A38	2.0	400	0.400	1.40	1.40	1.40	2.0	0.0	0.0
66.	A38	A39	55.0	400	0.400	1.40	1.47	1.44	55.0	0.0	0.0
67.	A39	D.C.15	5.0	400	0.400	1.47	1.48	1.47	5.0	0.0	0.0
68.	D.C.15	*D.T.15*	2.0	400	0.400	1.48	1.48	1.48	2.0	0.0	0.0
69.	*D.T.15*	A40	5.0	400	0.400	1.40	1.41	1.40	5.0	0.0	0.0
70.	A40	A41	50.0	400	0.400	1.41	1.48	1.44	50.0	0.0	0.0
71.	A41	D.C.16	15.0	400	0.400	1.48	1.50	1.49	15.0	0.0	0.0
72.	D.C.16	*D.T.16*	2.0	400	0.400	1.50	1.51	1.50	0.0	2.0	0.0
73.	*D.T.16*	A42	5.0	400	0.400	1.40	1.41	1.40	5.0	0.0	0.0
74.	A42	A17	46.0	400	0.400	1.41	1.49	1.45	46.0	0.0	0.0
75.	A17	D.C.17	5.0	500	0.500	1.59	1.60	1.59	0.0	5.0	0.0
76.	D.C.17	*D.T.17*	2.0	500	0.500	1.60	1.60	1.60	0.0	2.0	0.0
77.	*D.T.17*	*HUDA*	25.0	500	0.500	1.60	1.33	1.46	25.0	0.0	0.0
Total			1552.0						1295.0	257.0	0.0

Excavation Depth			
Description	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)
400 mm Dia pipe	1270.0	250.0	0.0
500 mm Dia pipe	25.0	7.0	0.0

TITLE : ROAD QUANTITY SHEET

AREA OF METALLED ROAD (A)

S.NO.	ROAD NO.	LENGTH (In Mt.)	WIDTH (In Mt.)		TOTAL AREA (In Sq. Mt.)
1	R1	19.63	6.00	1.00	117.75
2.	R2	15.10	6.00	1.00	90.60
3.	R3	5.23	6.00	1.00	31.36
4.	R4	174.85	6.00	1.00	1049.10
5.	R5	13.70	3.00	1.00	41.11
6.	R6	108.82	6.00	1.00	652.92
7.	R7	15.14	1.84	2.00	55.72
8.	R8	30.14	4.80	1.00	144.67
9.	R9	41.75	6.00	1.00	250.50
10.	R10	11.14	2.00	2.00	22.28
11.	R11	22.97	6.00	1.00	137.79
12.	R12	12.89	2.00	2.00	25.78
13.	R13	5.48	2.00	1.00	10.96
14.	R14	10.94	2.00	1.00	21.88
15.	R15	8.96	2.00	1.00	17.91
16.	R16	17.84	6.00	1.00	107.05
17.	R17	4.39	6.00	1.00	26.34
18.	R18	45.71	6.00	1.00	274.26
19.	R19	29.88	6.00	1.00	179.28
20.	R20	60.14	6.00	1.00	360.84
21.	R21	31.33	6.00	1.00	187.97
22.	R22	15.83	6.00	1.00	94.95
23.	R23	10.75	4.90	1.00	52.67
24.	R24	27.52	6.00	1.00	165.09
25.	R25	89.31	6.00	1.00	535.86
26.	R26	8.83	6.00	1.00	52.96
27.	R27	50.54	6.00	1.00	303.24
28.	R28	21.00	6.00	1.00	126.00
29.	R29	18.31	6.00	1.00	109.86
30.	R30	53.12	6.00	1.00	318.70
31	R31	51.30	6.00	1.00	307.80

32.	R32	111.79	6.00	1.00	670.74
33.	R33	56.90	6.00	1.00	341.38
34.	R34	23.43	8.49	1.00	198.94
35.	R35	47.80	6.00	1.00	286.77
36.	R36	14.70	6.00	1.00	88.18
37.	R37	15.24	6.00	1.00	91.43
38.	R38	96.71	6.00	1.00	580.23
39.	R39	15.83	6.00	1.00	94.96
40.	R40	9.95	6.00	1.00	59.70
41.	R41	16.15	6.00	1.00	96.92
42.	R42	4.72	4.00	1.00	18.86
43.	R43	82.33	6.00	1.00	493.98
44.	R44	117.92	6.00	1.00	707.52
45.	R45	21.24	6.00	1.00	127.45
46.	R46	19.93	6.00	1.00	119.58
47.	R47	37.69	6.00	1.00	226.16
48.	R48	10.62	6.00	1.00	63.74
49.	R49	10.58	6.00	1.00	63.47
50.	R50	3.02	4.00	1.00	12.08
				TOTAL	10215.29
				ADD 10% FOR CURVES	1021.529
				TOTAL METALLED ROAD AREA (A)	11236.818
				SAY	11237.000

AREA OF HARD PAVED (For Fire Tender Movement) (B)					
S.NO.	ROAD NO.	LENGTH (In Mt.)	WIDTH (In Mt.)		TOTAL AREA (In Sq. Mt.)
1	A	41.99	6.00	1.00	251.93
2.	B	66.51	6.00	1.00	399.06
3.	C	18.46	6.00	1.00	110.76
4.	D	16.64	6.00	1.00	99.86
5.	E	8.05	6.00	1.00	48.31
6.	F	78.17	6.00	1.00	469.04
7.	G	24.57	6.00	1.00	147.42
8.	H	63.24	6.00	1.00	379.42
9.	J	36.51	6.00	1.00	219.03
10.	K	37.50	6.00	1.00	225.00
11.	L	29.14	6.00	1.00	174.85
12.	M	22.24	6.00	1.00	133.44
13.	N	28.06	6.00	1.00	168.36
14.	P	65.79	6.00	1.00	394.74
15.	Q	5.71	6.00	1.00	34.24
16.	R	14.00	6.00	1.00	84.00
17.	S	10.69	6.00	1.00	64.11
18.					
				TOTAL	3403.60
				ADD 10% FOR CURVES	340.36
				TOTAL HARD PAVED AREA (B)	3,743.96
				SAY	3744.000

AREA UNDER CAR PARKING (C)
NO. OF CARS ON SURFACE = 629 + 87 = 716 NO.
AREA UNDER CAR PARKING = 5 X 2.5 X 716 = 8950 SQM
TOTAL AREA UNDER CAR PARKING (C) 8950 SQM
TOTAL AREA OF ROADS + FIRE TENDER + PARKING = A + B + C = 11237 + 3744 + 8950 = 23931 SQM.

PROJECT : PROPOSED GROUP HOUSING COLONY AREA MEASURING 16.43125 ACRE AT SECTOR-37, BAHADURGARH (HARYANA)

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	20.00	30.00	500.00	68.0	0.022	1.50	1.060	100
2.	Tube Well - 02	T1	20.00	30.00	500.00	6.0	0.022	0.13	1.060	100
3.	T1	T2	40.00	60.00	1000.00	117.0	0.011	1.29	0.943	150
4.	Tube Well - 03	T2	20.00	30.00	500.00	4.0	0.022	0.09	1.060	100
5.	T2	UGT - 1	60.00	90.00	1500.00	80.0	0.006	0.46	0.795	200
6.	Tube Well - 04	T3	20.00	30.00	500.00	54.0	0.022	1.19	1.060	100
7.	Tube Well - 05	T3	20.00	30.00	500.00	5.0	0.022	0.11	1.060	100
8.	T3	UGT - 02	40.00	60.00	1000.00	86.0	0.011	0.95	0.943	150

PROJECT : PROPOSED GROUP HOUSING COLONY AREA MEASURING 16.43125 ACRE AT SECTOR-37, BAHADURGARH (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	Length of Pipe	Head Loss	Total Head Loss	Velocity	Dia of Pipe
-	From	To	kld.	kl/hr.	lph.	lpm.	mtr.	mtr./ mtr.	mtr.	m/sec	mm
1	*HUDA*	M1	693.52	31.5	47.3	788.1	150.0	0.007	1.07	0.743	150
2	M1	*UGT-2*	248.65	11.3	17.0	282.6	35.0	0.008	0.27	0.599	100
3	M1	*UGT-1*	444.87	20.2	30.3	505.5	165.0	0.023	3.72	1.072	100

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

PROJECT : PROPOSED GROUP HOUSING COLONY AREA MEASURING 16.43125 ACRE AT SECTOR-37, BAHADURGARH (HARYANA)

(Pump Riser Calculation Sheet)

Domestic Water Supply Design Calculation For Tower- 1 To 9, Community Building & Shopping

Line No.	Probable demand (lps)	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 Basement Level	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 1 - D1	17.675	150	0.012	50.0	5	2.50	52.50	0.648	0.648	1.000	65.00	64.35	-	-	-
D1 - D1a	3.317	100	0.004	58.0	5	2.90	60.90	0.244	0.892	0.422	64.35	63.46	8.46	55.00	Tower - 8 & 9
D1 - D2	14.358	150	0.008	46.0	5	2.30	48.30	0.406	1.053	0.812	64.35	63.30	8.30	55.00	Community Building
D2 - D3	11.353	150	0.005	100.0	5	5.00	105.00	0.571	1.624	0.642	63.30	61.67	6.67	55.00	Tower - 5, 6 & 7
D3 - D4	6.307	100	0.013	117.0	5	5.85	122.85	1.620	3.244	0.803	61.67	58.43	3.43	55.00	Tower - 2, 3 & 4
D2 - D4	2.102	100	0.002	140.0	5	7.00	147.00	0.253	0.901	0.268	64.35	63.45	8.45	55.00	Tower - 1

Flow Rate	17.675 lps
	1060.5 LPM
(3 W + 1 S)	353.5 LPM
Say	360.0 LPM
Maximum Building Height	45 m
Pump Head	55.00 m
Pump HP	8.5 HP
Say	9.0 HP

Domestic Water Supply Design Calculation For EWS, Nursery School & Primary School

Line No.	Probable demand (lps)	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 Basement Level	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 Room1 - D5	6.435	100	0.014	170.0	5	8.50	178.50	2.443	2.443	0.819	53.00	50.56	5.56	45.00	EWS
													31.56	19.00	Nursery School
													31.56	19.00	Primary School
	Flow Rate			6.435 lps									PRV Used For Nursery & Primary School		
				386.1 LPM											
	(1 W + 1 S)			386.1 LPM											
	Say			390.0 LPM											
	Maximum Building Height			35 m											
	Pump Head			53.00 m											
	Pump HP			7.6 HP											
	Say			8.0 HP											

Domestic Water Supply Design Calculation For Tower- 10 To 15

Line No.	Probable demand (lps)	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 Basement Level	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 2 - DD1	11.512	100	0.040	10.0	5	0.50	10.50	0.422	0.422	1.465	65.00	64.58	-	-	-
DD1 - DD1a	4.205	80	0.018	70.0	5	3.50	73.50	1.356	1.778	0.836	64.58	62.80	7.80	55.00	Tower - 13 & 15
DD1 - DD2	7.307	100	0.017	178.0	5	8.90	186.90	3.236	3.658	0.930	64.58	60.92	5.92	55.00	Tower - 10,11,12&14
	Flow Rate			11.512 lps											
				690.7 LPM											
	(2 W + 1 S)			345.3 LPM											
	Say			350.0 LPM											
	Maximum Building Height			45 m											
	Pump Head			65.00 m											
	Pump HP			8.3 HP											
	Say			9.0 HP											

Flushing Water Supply Design Calculation For Tower - 1 To 9, EWS, Community Building, Shopping & Schools

Line No.	Probable demand (lps)	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 Basement Level	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 1 - F1	9.934	150	0.004	83.0	5	4.15	87.15	0.370	0.370	0.562	65.00	64.63	-	-	-
F1 - F1a	0.906	100	0.000	24.0	5	1.20	25.20	0.008	0.379	0.115	64.63	64.25	9.25	55.00	Tower - 9
F1 - F2	9.028	150	0.004	79.0	5	3.95	82.95	0.295	0.665	0.511	64.63	63.97	8.97	55.00	Tower - 8 &
F2 - F3	5.113	100	0.012	100.0	5	5.00	105.00	1.307	1.972	0.778	63.97	61.99	6.99	55.00	Tower - 5, 6 & 7
F3 - F4	3.396	100	0.004	117.0	5	5.85	122.85	0.515	2.486	0.432	61.99	59.51	4.51	55.00	Tower - 2, 3 & 4
F2 - F4	1.132	100	0.001	140.0	5	7.00	147.00	0.081	0.745	0.144	63.97	63.22	8.22	55.00	Tower - 1

Flow Rate	9.934 lps
	596.0 LPM
(2 W + 1 S)	298.0 LPM
Say	300.0 LPM
Maximum Building Height	45 m
Pump Head	65.00 m
Pump HP	7.2 HP
Say	8.0 HP

Flushing Water Supply Design Calculation For EWS

Line No.	Probable demand (lps)	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 Basement Level	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 1 - FF1	2.717	65	0.023	55.0	5	2.75	57.75	1.305	1.305	0.818	53.00	51.70	6.70	45.00	EWS

Flow Rate	2.717 lps
	163.0 LPM
(1 W + 1 S)	163.0 LPM
Say	170.0 LPM
Maximum Building Height	35 m
Pump Head	53.00 m
Pump HP	3.2 HP
Say	4.0 HP

Flushing Water Supply Design Calculation For Tower - 10 To 15

Line No.	Probable demand (lps)	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 Basement Level	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 2 - FF1	6.199	80	0.038	10.0	5	0.50	10.50	0.398	0.398	1.232	65.00	64.60	-	-	-
FF1 - FF1a	2.264	65	0.018	70.0	5	3.50	73.50	1.185	1.582	0.682	64.60	63.02	8.02	55.00	Tower - 13 & 15
FF1 - FF2	3.934	80	0.016	178.0	5	8.90	186.90	3.049	3.447	0.782	64.60	61.15	6.15	55.00	Tower - 10, 11, 12 &
	Flow Rate			6.199 LPS											
				371.9 LPM											
	(1 W + 1 S)			371.9 LPM											
	Say			380.0 LPM											
	Maximum Building Height			45 m											
	Pump Head			65.00 m											
	Pump HP			9.0 HP											
	Say			9.0 HP											

PROJECT - PROPOSED GROUP HOUSING COLONY AREA MEASURING [illegible] ACRE AT SECTOR-37, BAHADURGARH (HARYANA)

TITLE - HYDRAULIC SEWAGE DESIGN CHART

S.No.	Line No.		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)	Infiltration @ 5% Av. Discharge	Total Discharge	Length	Pipe Size	Slope (1 in)	Fall	Velocity	Capacity of Pipe	Levels at start (mtr.)			Levels at End (mtr.)			Manhole Depth at Start	Manhole Depth at End	Average Depth
-	From	To	lpd	LPD	KLD	(kl)	(kl)	(lps)	(lps)	(lps)	(lps)	(mtr)	(mm)	(mm)	(mtr)	(m/s) (v)	(lps)	FRL	FSL	IL	FRL	FSL	IL	(mtr)	(mtr)	(mtr)
1	S1	S2	279450	223560	223.56	0.00	223.56	2.59	7.76	0.65	8.41	112.0	250	190	0.59	0.76	18.70	215.380	214.13	213.88	215.300	213.54	213.29	1.50	2.01	1.75
2	S2	S3	0	0	0.00	223.56	223.56	2.59	7.76	0.65	8.41	93.0	250	190	0.50	0.76	18.70	215.300	213.541	213.29	215.300	213.04	212.79	2.01	2.51	2.26
3	S3	S4	[illegible]	134136	134.14	223.56	357.70	4.14	12.42	1.04	13.46	114.0	400	370	0.31	0.75	46.93	215.300	213.041	212.64	215.360	212.73	212.33	2.66	3.03	2.84
4	S4	S5	[illegible]	112182	112.18	357.70	469.88	5.44	16.32	1.36	17.67	144.0	400	370	0.39	0.75	46.93	215.360	212.732	212.33	215.430	212.34	211.94	3.03	3.49	3.26
5	S5a	S5	[illegible]	77654	77.65	0.00	77.65	0.90	2.70	0.22	2.92	80.0	200	140	0.57	0.76	12.02	215.430	214.13	213.93	215.430	213.56	213.36	1.50	2.07	1.79
6	S5	STP-1	0	0	0.00	547.53	547.53	6.34	19.01	1.58	20.60	15.0	400	370	0.04	0.75	46.93	215.430	212.343	211.94	215.430	212.30	211.90	3.49	3.53	3.51
7	S6	S7	[illegible]	109296	109.30	0.00	109.30	1.27	3.80	0.32	4.11	260.0	250	190	1.37	0.76	18.70	215.420	214.17	213.92	215.460	212.80	212.55	1.50	2.91	2.20
8	S7a	S7	[illegible]	70546	70.55	0.00	70.55	0.82	2.45	0.20	2.65	24.0	200	140	0.17	0.76	12.02	215.450	214.15	213.95	215.460	213.98	213.78	1.50	1.68	1.59
9	S8	S7	157734	126187	126.19	0.00	126.19	1.46	4.38	0.37	4.75	103.0	200	140	0.74	0.76	12.02	215.480	214.23	214.03	215.460	213.49	213.29	1.45	2.17	1.81
10	S7	STP-2	0	0	0.00	306.03	306.03	3.54	10.63	0.89	11.51	5.0	300	250	0.02	0.75	26.51	215.460	212.802	212.50	215.460	212.78	212.48	2.96	2.98	2.97

Formula Used:

[illegible] for population upto 20,000 persons & above 20,000 person peak factor is considered 2.5 times.

[illegible] slope [illegible]

[illegible] pipe Manning's Coefficient

A= Area of c/s section of pipe in sqm

[illegible] Wetted Perimeter in m

Capacity of pipe [illegible] = area of c/s section of pipe in sqm x velocity in m/s x 1000 x 1/2(Sewers are designed to run half full)

Abbreviation Used:

IL= Invert level of pipe

FSL= Full supply level

FRL= Formation Road Level

[illegible]

PROJECT : PROPOSED GROUP HOUSING COLONY AREA MEASURING 16.43125 ACRE AT SECTOR-37, BAHADURGARH (HARYANA)
LOAD ON SEWAGE LINES

S.No.	Name of Sewer Line		Residential Sewage Load						Non Residential Sewage Load		Residential + Non Residential Load		
			Men Apartment	Population @ 5 persons / Unit	Water Requirement @ 155.25 Ltr/day/Person	EWS/ Service Person	Population @ 2 persons / Unit	Water Requirement @ 155.25 Ltr/day/Person	Amenity	Water Requirement @ 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	155.25	-	2	155.25	-	-	-	80%	1000
1.	S1	S2	360	1800	279450	0	0	0	-	0	279450	223560	223.56
2.	S2	S3	0	0	0	0	0	0	-	0	0	0	0.00
3.	S3	S4	216	1080	167670	0	0	0	-	0	167670	134136	134.14
4.	S4	S5	142	710	110227.5	0	0	0	Community Building & Convenient Shopping	30000	140228	112182	112.18
5.	S5a	S5	0	0	0	216	432	67068	N. School & P. School	30000	97068	77654	77.65
6.	S5	STP-1	0	0	0	0	0	0	-	0	0	0	0.00
-	-	-	**718**	**3590**	**557348**	**216**	**432**	**67068**	-	**60000**	**684416**	**547532**	547.53
7.	S6	S7	176	880	136620	0	0	0	-	0	136620	109296	109.30
8.	S7a	S7	90	450	69862.5	59	118	18319.5	-	0	88182	70546	70.55
9.	S8	S7	180	900	139725	58	116	18009	-	0	157734	126187	126.19
10.	S7	STP-2	0	0	0	0	0	0	-	0	0	0	0.00
-	-	-	**446**	**2230**	**346208**	**117**	**234**	**36329**	-	**0**	**382536**	**306029**	306.03

PROJECT : PROPOSED GROUP HOUSING COLONY AREA MEASURING 16.4375 ACRE AT SECTOR-37, BAHADURGARH (HARYANA)

TITLE : HYDRAULIC STORM WATER DESIGN CHART

S.No.	Line No.		Length	Catchment Area (Sqm.)			Discharge @ 6.25 mm/hr runoff	Pipe dia	Slope 1 in	Velocity m/sec.	Capacity of pipe	Fall in line	Levels at start (mac.)			Levels at End (mac.)			Manhole Depth		
	From	To	(mtr.)	Self	Progg.	Total	60% runoff (lps)	(mm)	(mm)	m/sec.	lps.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Depth (mtr.)		Avg
																			Start	End	Depth
1.	A1	A2	135.0	3500.0	0.0	3500.0	3.65	400	570	0.60	75.63	0.24	215.460	214.46	214.06	215.460	214.22	213.82	1.40	1.64	1.52
2.	A2a	A2	54.0	820.0	0.0	820.0	0.85	400	570	0.60	75.63	0.09	215.480	214.48	214.08	215.460	214.39	213.99	1.40	1.47	1.44
3.	A2	D.C.01	2.0	0.0	4320.0	4320.0	4.50	400	570	0.60	75.63	0.00	215.460	214.22	213.82	215.460	214.22	213.82	1.64	1.64	1.64
4.	D.C.01	*D.T.01*	2.0	0.0	4320.0	4320.0	4.50	400	570	0.60	75.63	0.00	215.460	214.22	213.82	215.460	214.22	213.82	1.64	1.64	1.64
5.	*D.T.01*	A3	10.0	0.0	4320.0	4320.0	4.50	400	570	0.60	75.63	0.02	215.460	214.46	214.06	215.460	214.44	214.04	1.40	1.42	1.41
6.	A3	A4	36.0	1050.0	4320.0	5370.0	5.59	400	570	0.60	75.63	0.06	215.460	214.44	214.04	215.440	214.38	213.98	1.42	1.46	1.44
7.	A18	A19	54.0	1950.0	0.0	1950.0	2.03	400	570	0.60	75.63	0.09	215.460	214.46	214.06	215.470	214.37	213.97	1.40	1.50	1.45
8.	A19	D.C.02	7.0	0.0	1950.0	1950.0	2.03	400	570	0.60	75.63	0.01	215.470	214.37	213.97	215.470	214.35	213.95	1.50	1.52	1.51
9.	D.C.02	*D.T.02*	2.0	0.0	1950.0	1950.0	2.03	400	570	0.60	75.63	0.00	215.470	214.35	213.95	215.470	214.35	213.95	1.52	1.52	1.52
10.	*D.T.02*	A20	5.0	0.0	1950.0	1950.0	2.03	400	570	0.60	75.63	0.01	215.470	214.47	214.07	215.470	214.46	214.06	1.40	1.41	1.40
11.	A20	A4	66.0	2150.0	1950.0	4100.0	4.27	400	570	0.60	75.63	0.12	215.470	214.46	214.06	215.440	214.35	213.95	1.41	1.49	1.45
12.	A21	A22	42.0	1580.0	0.0	1580.0	1.65	400	570	0.60	75.63	0.07	215.470	214.47	214.07	215.450	214.40	214.00	1.40	1.45	1.43
13.	A22	D.C.03	5.0	830.0	1580.0	2410.0	2.51	400	570	0.60	75.63	0.01	215.450	214.40	214.00	215.450	214.39	213.99	1.45	1.46	1.46
14.	D.C.03	*D.T.03*	2.0	0.0	2410.0	2410.0	2.51	400	570	0.60	75.63	0.00	215.450	214.39	213.99	215.450	214.38	213.98	1.46	1.47	1.46
15.	*D.T.03*	A4	11.0	0.0	2410.0	2410.0	2.51	400	570	0.60	75.63	0.02	215.450	214.45	214.05	215.440	214.43	214.03	1.40	1.41	1.40
16.	A4	A5	16.0	400.0	11880.0	12280.0	12.79	400	570	0.60	75.63	0.03	215.440	214.35	213.95	215.430	214.31	213.91	1.49	1.52	1.51
17.	A23	A24	122.0	8950.0	0.0	8950.0	9.32	400	570	0.60	75.63	0.21	215.450	214.45	214.05	215.430	214.24	213.84	1.40	1.59	1.50
18.	A24	D.C.04	6.0	0.0	8950.0	8950.0	9.32	400	570	0.60	75.63	0.01	215.430	214.24	213.84	215.430	214.23	213.83	1.59	1.60	1.60
19.	D.C.04	*D.T.04*	2.0	0.0	8950.0	8950.0	9.32	400	570	0.60	75.63	0.00	215.430	214.23	213.83	215.430	214.22	213.82	1.60	1.61	1.61
20.	*D.T.04*	A25	3.0	0.0	8950.0	8950.0	9.32	400	570	0.60	75.63	0.01	215.430	214.43	214.03	215.430	214.42	214.02	1.40	1.41	1.40
21.	A25	A5	27.0	450.0	8950.0	9400.0	9.79	400	570	0.60	75.63	0.05	215.430	214.42	214.02	215.430	214.37	213.97	1.41	1.46	1.43
22.	A5	A6	47.0	2600.0	21680.0	24280.0	25.29	400	570	0.60	75.63	0.08	215.430	214.31	213.91	215.410	214.23	213.83	1.52	1.58	1.55
23.	A6	D.C.05	5.0	0.0	24280.0	24280.0	25.29	400	570	0.60	75.63	0.01	215.410	214.23	213.83	215.410	214.22	213.82	1.58	1.59	1.58
24.	D.C.05	*D.T.05*	2.0	0.0	24280.0	24280.0	25.29	400	570	0.60	75.63	0.00	215.410	214.22	213.82	215.410	214.22	213.82	1.59	1.59	1.59
25.	*D.T.05*	A7	9.0	0.0	24280.0	24280.0	25.29	400	570	0.60	75.63	0.02	215.410	214.41	214.01	215.420	214.39	213.99	1.40	1.43	1.41

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		
	From	To	(mtr.)	Self	Peagg.	Total	(60% runoff (lps)	(mm)	(mm)	m/sec.	lps.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Depth (mtr.)		Avg.
																			Start	End	Depth
26.	A7	A6	15.0	170.0	24280.0	24450.0	25.47	400	570	0.60	75.63	0.03	215.420	214.39	213.99	215.420	214.37	213.97	1.43	1.45	1.44
27.	A26	A27	69.0	4080.0	0.0	4080.0	4.25	400	570	0.60	75.63	0.14	215.440	214.44	214.04	215.420	214.30	213.90	1.40	1.52	1.46
28.	A27	D.C.06	2.0	0.0	4080.0	4080.0	4.25	400	570	0.60	75.63	0.00	215.420	214.30	213.90	215.420	214.30	213.90	1.52	1.52	1.52
29.	D.C.06	*D.T.06*	5.0	0.0	4080.0	4080.0	4.25	400	570	0.60	75.63	0.01	215.420	214.30	213.90	215.420	214.29	213.89	1.52	1.53	1.53
30.	*D.T.06*	A25	5.0	0.0	4080.0	4080.0	4.25	400	570	0.60	75.63	0.01	215.420	214.42	214.02	215.420	214.41	214.01	1.40	1.41	1.40
31.	A25	A5	3.0	250.0	4080.0	4330.0	4.51	400	570	0.60	75.63	0.04	215.420	214.41	214.01	215.420	214.38	213.98	1.41	1.41	1.41
32.	A6	A9	19.0	150.0	28780.0	28930.0	30.14	400	570	0.60	75.63	0.02	215.420	214.37	213.97	215.420	214.35	213.95	1.45	1.47	1.46
33.	A25	A26	55.0	1900.0	0.0	1900.0	1.98	400	570	0.60	75.63	0.10	215.450	214.45	214.05	215.450	214.35	213.95	1.40	1.50	1.45
34.	A26	D.C.07	2.0	0.0	1900.0	1900.0	1.98	400	570	0.60	75.63	0.00	215.450	214.35	213.95	215.450	214.35	213.95	1.50	1.50	1.50
35.	D.C.07	*D.T.07*	5.0	0.0	1900.0	1900.0	1.98	400	570	0.60	75.63	0.01	215.450	214.35	213.95	215.450	214.34	213.94	1.50	1.51	1.50
36.	*D.T.07*	A31	5.0	0.0	1900.0	1900.0	1.98	400	570	0.60	75.63	0.01	215.450	214.45	214.05	215.450	214.44	214.04	1.40	1.41	1.40
37.	A31	A9	75.0	1650.0	1900.0	3750.0	3.91	400	570	0.60	75.63	0.13	215.450	214.44	214.04	215.420	214.31	213.91	1.41	1.51	1.46
38.	A9	D.C.08	2.0	0.0	32680.0	32680.0	34.04	400	570	0.60	75.63	0.00	215.420	214.31	213.91	215.420	214.31	213.91	1.51	1.51	1.51
39.	D.C.08	*D.T.08*	2.0	0.0	32680.0	32680.0	34.04	400	570	0.60	75.63	0.00	215.420	214.31	213.91	215.420	214.30	213.90	1.51	1.52	1.52
40.	*D.T.08*	A10	4.0	0.0	32680.0	32680.0	34.04	400	570	0.60	75.63	0.01	215.420	214.42	214.02	215.420	214.41	214.01	1.40	1.41	1.40
41.	A10	A11	41.0	2610.0	32680.0	35290.0	36.76	400	570	0.60	75.63	0.07	215.420	214.41	214.01	215.410	214.34	213.94	1.41	1.47	1.44
42.	A11	D.C.09	2.0	0.0	35290.0	35290.0	36.76	400	570	0.60	75.63	0.00	215.410	214.34	213.94	215.410	214.34	213.94	1.47	1.47	1.47
43.	D.C.09	*D.T.09*	2.0	0.0	35290.0	35290.0	36.76	400	570	0.60	75.63	0.00	215.410	214.34	213.94	215.410	214.33	213.93	1.47	1.48	1.47
44.	*D.T.09*	A12	5.0	0.0	35290.0	35290.0	36.76	400	570	0.60	75.63	0.01	215.410	214.41	214.01	215.410	214.40	214.00	1.40	1.41	1.40
45.	A12	A13	40.0	2380.0	35290.0	37670.0	39.24	400	570	0.60	75.63	0.07	215.410	214.40	214.00	215.360	214.33	213.93	1.41	1.43	1.42
46.	A13	D.C.10	5.0	0.0	37670.0	37670.0	39.24	400	570	0.60	75.63	0.01	215.360	214.33	213.93	215.360	214.32	213.92	1.43	1.44	1.43
47.	D.C.10	*D.T.10*	2.0	0.0	37670.0	37670.0	39.24	400	570	0.60	75.63	0.00	215.360	214.32	213.92	215.360	214.32	213.92	1.44	1.44	1.44
48.	*D.T.10*	A14	2.0	0.0	37670.0	37670.0	39.24	400	570	0.60	75.63	0.00	215.360	214.36	213.96	215.360	214.36	213.96	1.40	1.40	1.40
49.	A14	A15	58.0	3360.0	37670.0	41030.0	42.74	400	570	0.60	75.63	0.10	215.360	214.36	213.96	215.300	214.25	213.85	1.40	1.45	1.42
50.	A15	D.C.11	2.0	0.0	41030.0	41030.0	42.74	400	570	0.60	75.63	0.00	215.300	214.25	213.85	215.300	214.25	213.85	1.45	1.45	1.45
51.	D.C.11	*D.T.11*	2.0	0.0	41030.0	41030.0	42.74	400	570	0.60	75.63	0.00	215.300	214.25	213.85	215.300	214.25	213.85	1.45	1.45	1.45
52.	*D.T.11*	A16	2.0	0.0	41030.0	41030.0	42.74	400	570	0.60	75.63	0.00	215.300	214.30	213.90	215.300	214.30	213.90	1.40	1.40	1.40

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		
	From	To	(mtr.)	Self	Progg.	Total	60% runoff (lps)	(mm)	(mm)	m/sec.	lps.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Depth (mtr.)		Avg.
																			Start	End	Depth
53.	A16	A17	30.0	1970.0	41030.0	43000.0	44.79	400	570	0.60	75.63	0.05	215.300	214.30	213.90	215.300	214.24	213.84	1.40	1.46	1.43
54.	A32	A33	35.0	4050.0	0.0	4050.0	4.22	400	570	0.60	75.63	0.13	215.450	214.45	214.05	215.420	214.32	213.92	1.40	1.50	1.45
55.	A33	D.C.12	2.0	0.0	4050.0	4050.0	4.22	400	570	0.60	75.63	0.00	215.420	214.32	213.92	215.420	214.31	213.91	1.50	1.51	1.50
56.	D.C.12	*D.T.12*	2.0	0.0	4050.0	4050.0	4.22	400	570	0.60	75.63	0.00	215.420	214.31	213.91	215.420	214.31	213.91	1.51	1.51	1.51
57.	*D.T.12*	A34	5.0	0.0	4050.0	4050.0	4.22	400	570	0.60	75.63	0.01	215.420	214.42	214.02	215.420	214.41	214.01	1.40	1.41	1.41
58.	A34	A35	53.0	5570.0	4050.0	9620.0	10.02	400	570	0.60	75.63	0.09	215.420	214.41	214.01	215.380	214.31	213.91	1.41	1.47	1.44
59.	A35	D.C.13	2.0	0.0	9620.0	9620.0	10.02	400	570	0.60	75.63	0.00	215.380	214.31	213.91	215.380	214.31	213.91	1.47	1.47	1.47
60.	D.C.13	*D.T.13*	2.0	0.0	9620.0	9620.0	10.02	400	570	0.60	75.63	0.00	215.380	214.31	213.91	215.380	214.31	213.91	1.47	1.47	1.47
61.	*D.T.13*	A36	10.0	0.0	9620.0	9620.0	10.02	400	570	0.60	75.63	0.02	215.380	214.38	213.98	215.380	214.36	213.96	1.40	1.42	1.41
62.	A36	A37	54.0	3130.0	9620.0	12750.0	13.28	400	570	0.60	75.63	0.09	215.380	214.36	213.96	215.350	214.27	213.87	1.42	1.48	1.45
63.	A37	D.C.14	2.0	0.0	12750.0	12750.0	13.28	400	570	0.60	75.63	0.00	215.350	214.27	213.87	215.350	214.26	213.86	1.48	1.49	1.48
64.	D.C.14	*D.T.14*	2.0	0.0	12750.0	12750.0	13.28	400	570	0.60	75.63	0.00	215.350	214.35	213.95	215.350	214.35	213.95	1.40	1.40	1.40
65.	*D.T.14*	A38	2.0	0.0	12750.0	12750.0	13.28	400	570	0.60	75.63	0.00	215.350	214.35	213.95	215.350	214.35	213.95	1.40	1.40	1.40
66.	A38	A39	55.0	3190.0	12750.0	15940.0	16.60	400	570	0.60	75.63	0.10	215.350	214.35	213.95	215.320	214.25	213.85	1.40	1.47	1.44
67.	A39	D.C.15	5.0	0.0	15940.0	15940.0	16.60	400	570	0.60	75.63	0.01	215.320	214.25	213.85	215.320	214.24	213.84	1.47	1.48	1.47
68.	D.C.15	*D.T.15*	2.0	0.0	15940.0	15940.0	16.60	400	570	0.60	75.63	0.00	215.320	214.24	213.84	215.320	214.24	213.84	1.48	1.48	1.48
69.	*D.T.15*	A40	5.0	0.0	15940.0	15940.0	16.60	400	570	0.60	75.63	0.01	215.320	214.32	213.92	215.320	214.31	213.91	1.40	1.41	1.40
70.	A40	A41	50.0	5750.0	15940.0	21690.0	22.59	400	570	0.60	75.63	0.09	215.320	214.31	213.91	215.300	214.22	213.82	1.41	1.48	1.44
71.	A41	D.C.16	15.0	0.0	21690.0	21690.0	22.59	400	570	0.60	75.63	0.03	215.300	214.22	213.82	215.300	214.20	213.80	1.48	1.50	1.49
72.	D.C.16	*D.T.16*	2.0	0.0	21690.0	21690.0	22.59	400	570	0.60	75.63	0.00	215.300	214.20	213.80	215.300	214.19	213.79	1.50	1.51	1.50
73.	*D.T.16*	A42	5.0	0.0	21690.0	21690.0	22.59	400	570	0.60	75.63	0.01	215.300	214.30	213.90	215.300	214.29	213.89	1.40	1.41	1.40
74.	A42	A17	46.0	2060.0	21690.0	23750.0	24.74	400	570	0.60	75.63	0.08	215.300	214.29	213.89	215.300	214.21	213.81	1.41	1.49	1.45
75.	A17	D.C.17	5.0	0.0	66750.0	66750.0	69.53	500	770	0.60	117.98	0.01	215.300	214.21	213.71	215.300	214.20	213.70	1.59	1.60	1.59

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		
	From	To	(mtr.)	Self	Progg.	Total	60% runoff (lps)	(mm)	(mm)	m/sec.	lps.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Depth (mtr.)		Avg.
																			Start	End	Depth
76	D.T.17	D.T.17	2.0	0.0	66750.0	66750.0	69.53	500	770	0.60	117.98	0.00	215.300	214.20	213.70	215.300	214.20	213.70	1.60	1.60	1.60
77	D.T.17	HLDA	25.0	0.0	66750.0	66750.0	69.53	500	770	0.60	117.98	0.03	215.300	214.20	213.70	215.000	214.17	213.67	1.60	1.33	1.46

Formula Used:

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

n = 0.013 for R.C.C pipe (Manning's Coefficient)

A = Area of cross section of pipe in sqm.

P = Wetted Perimeter in m

Capacity of pipe(lps) = Area of cross 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

L=Connection Level