PROPOSED BUILDING PLAN
GROUP HOUSING COLONY
AREA MEASURING (11.875+8.294) 20.169 ACRE
AT
SECTOR-109, GURGAON, HARYANA

Revised · **SERVICE PLAN ESTIMATE**
FOR
PUBLIC HEALTH ENGINEERING SERVICES

(i) Amount as per already approved estimate vide DGTCP No. 3716 dt. 28.2.2017 (Block-A) = Rs. 923.94 Lacs

(ii) Revised cost for (Block-B) = Rs 1126.45 Lacs

Revised cost for (A & B) Rs 2050.39 Lacs

Rs 2050.40 Lacs

Client

M/S RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH CHINTELS INDIA LTD.

Plumbing & Fire Suppression Consultant

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

Revised

PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF RESIDENTIAL PROJECT PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE, SECTOR-109, GURGAON (HARYANA)

Gurgaon is located at 28°28'N 77°02'E28.47°N 77.03°E/28.47; 77.03. It has an average elevation of 220 metres (721 ft) Gurgaon district, comprising four blocks Pataudi, Sohna, Gurgaon and Farrukhnagar, was created on 15 August, 1979.On its north, it is bounded by the district of Rohtak and the Union Territory of Delhi. Faridabad district lies to its east. On its south, the district shares boundaries with the district of Mewat. To its west lies the district of Rewari and the State of Rajasthan.Gurgaon is situated between the Himalayas and Aravalis mountain ranges. It is surrounded on three sides by Haryana and to the east, across the river Yamuna by Uttar Pradesh. Its greatest length is around 13 miles and the greatest breadth is 17 miles. Delhi's altitude ranges between 210 to 305 meters above sea level.

PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE is a residential proposed between sector - 109, at Gurgaon for development by **M/s RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH M/s CHINTELS INDIA 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.

1 **Water Supply Source**

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.

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 DWF 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

Revised (A+B Block)

The total cost of development in this Project including various PH & B & R services works out to **Rs. ~~944.24~~ 2050.40 lacs** which includes 3% contingency and PE charges and 49% departmental charges also.

Revised

The cost per gross acre for this phase works out to **Rs. ~~96.85~~ 101.66 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.

M/s RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH
M/s CHINTELS INDIA LTD.

Authorised Signatory

Paradise Consultants New Delhi

PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE, SECTOR-109, GURGAON (HARYANA)

(Block- B)

DESIGN CALCULATION

1 Daily Domestic Water Requirement

Apartment			444	Nos.
EWS			79	Nos
Service Personnel			48	Nos.
Population @ 5 person per unit - Apartment			5	Persons
Population @ 5 person per unit - EWS			5	Persons
Population @ 2 person per unit - Service Personnel			2	Persons.
Therefore population (Apartment)			2220	persons
Therefore population (EWS)			395	persons
Therefore population (Maintenance Personnel)			96	persons
Total Population			**2711**	**persons**
		SAY	**2711**	**persons**
Water requirement for apartmant		@	172.5	lpd.
			467647.50	lpd.
		or	**467.65**	**KLD (1)**

2 Other Requirement

a.)	Nursery School	1	@	10000.00	lit/day
	Therefore daily water requirement			10000.00	lit/day
				10.00	KLD
b.)	No. of Community Building	1	@	25000.000	lit/day
	Daily water requirement lumpsum			25000.000	lit/day
	Therefore daily water requirement			25.00	KLD
c.)	No. of Convenient Shopping	1	Lumpsum	5000.00	lit/day
	Daily water requirement lumpsum			5000.00	lit/day
	Therefore daily water requirement			5.00	KLD
			Total	**40.00**	**KLD (2)**

3	Total Daily Water Requirement (1+2)				**507.65 KLD**
i)	Domestic Water Requirement @	65%		329.77	~~333.47~~ KLD
			Say		**350.00 KLD**
ii)	Flushing Water Requirement @	35%		177.67	~~174.18~~ KLD
			Say		**180.00 KLD**
4	**Water usage from STP**				
a)	Area under Parks	1.56 acre			
	Daily water requirement			@	25000.00 lit/acre/day
					39000.00 lit/day
					39.00 KLD
b)	Area under Roads				
	Daily water requirement		Lumpsum		25000.00 lit/acre/day
					25000.00 lit/day
					25.00 KLD
c)	Under Road+ Parks **(a+b)**		**Total**		64.00 KLD
			Say		**70.00 KLD**
d)	**Total treated water requirement [3 (ii) + 4 (c)]**				**250.00** KLD
	Total Daily Requirement [3 (i) + 4 (d)]				**600.00 KLD**
			SAY		**600.00 KLD**

5 Sewage Treatment Plant Capacity (STP.)

Gross water requirment / day		507.65 Kld.
Sewage flow 80% of total load		406.12 Kld.
Proposed STP. Capacity		**410.00 Kld.**
		STP

6 Underground Tank

Daily fresh water requirement for domestic use		350.00 KL
Capacity of under ground tank		
24 hours storage	350.00 x 24 / 24	350.00 KL
Fire Tank Capacity As/NBC Code 100 kl. But Proposed		500.00 KL
	Total	**850 KL**

It is proposed to provide under ground tank of capacity **850 KL** which also includes **500 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	**500.00 KL**
TOTAL UG STORAGE (DOMESTIC + FLUSHING + HORTICULTURE)	**600.00 KL**
RAW WATER TANK	**150.00 KL**
DOMESTIC WATER TANK	**200.00 KL**
FLUSHING, HORTICULTURE & ROAD WASHING (PART OF STP)	**250.00 KL**

7 DOMESTIC WATER PUMPS - LOCATED IN PUMP ROOM

a.) Domestic Water Transfer Pumps

i) For Towers, EWS, Community, Commercial & N. School

Daily requirement for domestic use		=	329.97 ~~333.47~~ KL
Assuming 6 hours running 2 pumps working with 1 standby			
Discharge/hour	~~333.47~~ / 6 / 2 329.97	=	27.49 KL/HR 458.29 LPM
Head of pump			Say 460 LPM
i) Suction lifts		=	0.0 m
ii) Friction loss in M<main & specials		=	4.0 m
iii) Residual head		=	5.0 m
iv) Clear head		=	80.0 m
		=	89.0 m Say = 90 m
BHP of motor	27.79 x1000x88/4500/60/0.6		15.3 HP
	SAY	=	~~16.0~~ **HP** nearest 17.50

$\frac{460 \times 90}{4500 \times 0.6}$ =

Flushing water requirement

Flushing water requirement = 250 KL

6 Hrs. Pumping 2 Nos Pump with one standby. 250/6x2 = 20.83 KLH or 347.16 LPM

Say 350 LPM

Head = 90 m

BHP of motor = $\frac{350 \times 90}{4500 \times 0.60}$ = 11.67 HP

Say = 12.50 HP

8 PUMPS FOR FIRE PROECTION

	Pump Description	Location	Nos.	Discharge	Head	HP
i)	Diesel Driven Pump	Pump Room	2	4500	140.00	-
ii)	Hydrant Pump	Pump Room	1	2850	140.00	240
iii)	Sprinkler Pump	Pump Room	1	2850	140.00	240
iv)	Jockey Pump	Pump Room	2	180	140.00	15
v)	Water Curtain Pump	Pump Room	1	2850	45.00	50

Capacity of Gen Set	Nos.	HP		
Domestic Water Transfer Pumps For Towers	2	~~16.0~~ 17.50	=	~~35~~.00 HP
flushing water Transfer Pump	2	12.50		25.00HP
Fire Pump (Jockey)	2	15.0	=	30.00 HP
Lighting			=	~~25.00~~ 10.00 HP
				100.0 ~~87.00~~ HP
		100.0		111.90
or		87 x0.745x1.50		~~87.35~~ KVA
		Say		120.00 KVA

Requirement of 120 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

M/s RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH M/s CHINTELS INDIA LTD.

Description	Block- A 10.41875 Acres	Revised Amount Block- B 9.75025 Acre Amount (Lacs.)
Sub Work - I Water Supply	₹ 280.36 lacs	307.21 ~~318.35~~
Sub Work - II Sewerage	₹ 103.52 lacs	110.82 ~~104.26~~
Sub Work - III Storm Water Drainage	₹ 70.52 lacs	94.15 ~~71.91~~
Sub Work - IV Roads & Footpath	₹ 180.88 lacs	249.63 ~~118.14~~
Sub Work - V Street Lighting	₹ 23.99 lacs	37.40 ~~18.70~~
Sub Work - VI - Horticulture	₹ 8.63 lacs	6.80 ~~82.76~~
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)	₹ 256.04 lacs	320.44 lacs ~~230.12~~
	923.94 Total	1126.45 ~~944.24~~

(i) Amount as per already approved estimate
~~(RUPEES NINE CRORE FOURY FOUR LACS TWENTY FOUR THOUSAND ONLY)~~
vide OGTCP No. 3716 dt. 28.2.2017 (Block- A) = ₹ 923.94 lacs

(ii) Revised cost for (Block- B) ₹ 1126.45 lacs
M/s RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH
M/s CHINTELS INDIA LTD. Revised cost for Block(A+B) ₹ 2050.39 lacs

~~Cost per Acre = 923.94 / 9.75025~~ = ~~₹ 96.85 lacs per Acre~~ Say ₹ 2050.40 lacs

Dev. cost Per acre = 2050.40 lacs / 20.169 Acre = ₹ 101.66 Lacs Per gross acre

Authorized Signatory

C/S

Director
Town & Country Planning
Haryana, Chandigarh

Executive Engineer
HUDA Division No. V
Gurgaon

Checked subject to comments in forwarding letter No. 2265 Dt. 27.02.18 .... and notes attached with the estimate

Addl. Chief Engineer
HUDA Gurugram

Superintending Engineer
HUDA Circle No. I,
Gurgaon

Superintending Engineer(HQ)
for Chief Engineer HUDA
Panchkula

Director General
Town & Country Planning,
Haryana, Chandigarh

PROPOSED GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE, SECTOR-109, GURGAON (HARYANA)

FINAL ABSTRACT OF REVISED COST (BLOCK - B)

	Amount (Lacs.)		Amount (Lacs.)
Sub Head - (I) Head Works	₹	73.25	~~74.00~~
Sub Head - (II) Pumping Machinery	₹	63.50	~~53.95~~
Sub Head - (III) Distribution System (Dom. & Flushing)	₹	28.93	~~31.40~~
Sub Head - (IV) Irrigation Scheme	₹	1.57	~~8.63~~
Sub Head - (V) Fire Scheme	₹	32.93	~~39.65~~
	Total ₹	200.18	~~207.43~~
Add 3% Contingencies & PE Charges	₹	6.00	~~6.22~~
	Total ₹	206.18	~~213.65~~
Add 49% Departmental Charges, price escalation Misc. Admn. Charges	₹	101.03	~~104.69~~
	Grand Total ₹	307.21	~~318.35~~ Lacs
(CO to final abstract of cost)	Say		~~318.35~~

40
(Block-B)

	Sub Work I				Water Supply
	Sub Head No. I				Head Works
S. No.	Description	Unit	Qty	Rate	Amount
					Rs. (lacs)
1	Construction of boosting chambers of suitable size along with under ground tank & pumping machinery and generating set etc. complete in all respects.				
	Details of boosting station				
i)	construction of boosting chamber	LS	-	-	7.50
ii)	construction of UG tank. 850 KL including 500 KL capacity for Fire Fighting	KL	850 KL	~~7000~~ 3500/- Ltr 29.75	~~59.50~~
4	Provision for carriage of material and other unforeseen items.	LS	-	-	2.00
5	Provision for facilites staff for Maintenance	LS	-	-	5.00
					~~74.00 Lacs~~
	~~(C.O. to abstract of cost of Sub-work No.I)~~			~~Say~~	~~74.00 Lacs~~

6) Pow. for T.W. for (drinking Purposes) with Permissim of GGWA Complete in all respect 2 Nos (L.S) ₹ 20.00 lacs

7) Pow for Pump chamber for T.W. Housing & T.W. line upto UGT. Complete in all respect (L.S) ₹ 5.00 lacs

8) Pow. for installing submersible Pumping sets of delivering 22 KL water P.Hrs. Complete in all respect @ No (L.S) ₹ 4.00 lacs

₹ 73.25 lacs

C.O.T. abstract of cost of sub work No. I

(BLOCK - B)

	Sub Work I				Water Supply
	Sub Head No. II				Pumping Machinery
S. No.	Description	Unit	Qty	Rate	Amount (in Lakhs)
1	Providing & installing electricity driven pumping set capable of delivering ~~480~~ LPM of water against a total head of ~~90~~.0 m complete with motor and other accessories (Domestic Pumps For Towers - ~~16.0~~ HP). 17.50 HP	Nos.	(2+1) 3	@ 2.00 las ~~175000.00~~	6.00 las ~~5.25~~
1(a)	-do- 350 LPM, 90 m Head (12.50 HP) Plumbing water Transfer Pump	2+1 3 Nos		@ 1.50 las	~~4.50~~ las
2	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities.				
	1 No. - ~~1~~90 KVA	Nos.	1	~~1200000.00~~	12.00
3	Providing & installing pumping set of following capacities for fire protection:				
i)	180 LPM @ 140 M Head (15 HP)	Nos.	2	150000.00	3.00
ii)	2850 LPM @ 140 M Head (240 HP) Hydrant	Nos.	1	750000.00	7.50
iii)	2850 LPM @ 140 M Head (240 HP) Sprinkler	Nos.	1	750000.00	7.50
iv)	4500 LPM @ 140 M Head (DG Pump)	Nos.	1	1~~2~~00000.00	1~~2~~.00
v)	2850 LPM @ 45 M Head (50 HP) Water Curtain Pump.	Nos.	1	400000.00	4.00
4	Provision for making foundations & erection of pumping machinery.	LS	-	-	1.00 las ~~0.70~~
5	Provision for pipes, valves & specials inside the pump chamber.	LS	-	-	2.50 las ~~1.25~~
6	Provision for carriage for materials and other unforeseen items.	LS	-	-	1.00 las ~~0.75~~
7)	Pssr for Electric Service Connection complete including cost of Transformer			~~Total~~	~~63.95~~ 2.50 las
	~~(C.O. to abstract of cost of Sub-work No.I)~~			~~Say~~	~~53.95~~

8) Pssr. for cheap ~~type~~ pressure type Cholorination plant complete (L.S) — @ 2.00 las

@ 63.50 las

(Block-B)

	Sub Work I				Water Supply
	Sub Head No. III				Distribution System/Rising Main
					(Dom. & Flushing)
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)
1	Providing, laying, jointing & testing G.I. pipes including cost of excavation complete as per ISI marked.				16.13 lacs
i)	100 mm dia	M	1290	~~1550.00~~	~~1999500.00~~
ii)	150 mm dia	M	35	~~1950.00~~ 1575/-	~~68250.00~~ 0.55 lacs
2	Providing, fixing & Testing Sluice valves including cost of complete in all respects.				0.60 lacs
i)	100 mm i/d	Nos.	~~2~~ 5	12000.00	~~24000.00~~
ii)	150 mm i/d	Nos.	1	15000.00	15000.00
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.	3	10000.00	30000.00
6	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	~~7~~ 10	1000.00	10000.00
7	Provision for carriage of material ~~etc~~ other wise Seen Items of	LS	-	-	~~150000.00~~ 5.00 Lacs
8	Provision for cutting the roads and making to its original conditions.	LS	-	-	150000.00
9	Making water supply connection. on master Card	LS	-	-	1.00 Lacs ~~250000.00~~
10	Provision for rising main from HUDA D.I./C.I. LA water supply line to UG Tank & Tube Well to UG Tank.				3.50 lacs
i)	100 mm i/d (Connection From HUDA Line)	M	280 mtr	1250.00	~~434000.00~~
	(C.O. to abstract of cost of Sub-work No.I)			Total	~~3139750.00~~
					28.93 Lacs
				Say	~~31.40~~ Lacs

(Block - B)

	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 25mm irrigation connect to flushing line / irrigation hydrant line	M	~~963~~	~~800.00~~	~~762400.00~~ 0.50 lac
2	Providing and fixing 20mm dia Irrigation hydrant valve complete in all respect.	Nos.	22	3500 ~~1200.00~~	0.77 lac ~~26400.00~~
3	Providing & fixing valve 25mm dia.	Nos.	22	400.00	8800.00
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.	1	4500.00	4500.00
6	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	2	800.00	2000 - ~~1600.00~~
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~~
					1.57 lacs
				Total	~~853450.00~~
				Say	~~8.53 Lacs~~

	Sub Work I				(Block-B) Fighting
	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.			1575	22.32 lacs
a)	150 mm dia	M	1417	~~2000.00~~	~~2834000.00~~
b)	80 mm dia	M	320	1000.00	320000.00
2	Providing and fixing External Fire Hydrants complete with masonary chambers.	Nos.	21	15000.00	2.10 lacs ~~315000.00~~
3	Providing & fixing valve 150mm dia.			~~[illegible]~~	0.45 lacs
a)	150 mm dia	Nos.	3	~~20000.00~~	~~60000.00~~
b)	80 mm dia	Nos.	21	10000.00	210000.00
4	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.				
i)	80 mm i/d	Nos.	21	5000.00	105000.00
5	Provision for cutting of roads ~~and carriage of materials etc~~ and other unforsean charges	LS	-	-	1.00 lacs ~~40000.00~~
6	Provision for indication plates	Nos.	21	1000.00	21000.00
7	Provision for carriage of material	LS	-	-	50000.00
					₹ 32.93 Lacs
				Total	~~3955000.00~~
				~~Say~~	~~39.55 Lacs~~

(Block-B)

	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.				
ii)	**250 mm i/d**			1800/-	15.07 lacs
a)	Average depth 1.5 m to 4.5 m	M	837	~~1660.00~~	~~1381060.00~~
iii)	**400 mm i/d**			2700/-	0.14 lacs
a)	Average depth 1.5 m to 4.5 m	M	5	~~2450.00~~	~~12250.00~~
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 on master Road	LS	-	-	1.00 lacs ~~200000.00~~
5	Cost of **410 Kld** Sewerage Treatment Plant. (Upto tertiary Level)	LS	-	-	52.00 lacs ~~4500000.00~~
6	Provision for CI / DI pipe 150 mm dia pipe from STP. To Huda Main Line.	LS	-	-	200000.00
					Rs 72.21 lacs
				Total	~~6793300.00~~
	Add 3% contingencies & PE charges				2.17 lacs ~~203799.00~~
				Total	~~6997099.00~~
	Add 49% Deptt. Charges, price escalation, unforseen Admin. charges				74.37 lacs 36.44 lacs ~~3428578.51~~
				Total	~~10425677.51~~
	(C.O. to abstract of cost of Sub-work No. 1) final			Say	110.82 lacs ~~104.26 Lacs~~

(Block- B)

	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.				
ii)	400 mm i/d				10000.-
a)	Average depth upto 1.5 m	M	4	2500.00	~~8400.00~~
b)	Average depth 1.5 m to 4.5 m	M	790 mtr	~~2250.00~~ 2500	~~1777500.00~~ 19.75 lacs
2	Provision for Road Gully & Drain pipe 300 mm	LS	-	-	400000.00
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 complete in all respect	Nos	9	150000.00	22.50 lacs ~~1350000.00~~
5	Provision for lighting, watching and temporary diversion of traffic, timbering & shoring	LS	-	-	500000.00
6	Provision for connection with HUDA. on master Road	LS	-	-	500000.00
7)	Pay for temporary disposal arrangement till HUDA services are provided				10.0 lacs
				Total	~~4685800.00~~
	Add 3% contingencies & PE charges				~~140577.00~~ 61.35 lacs
				Total	~~4826477.00~~ 1.84 lacs
	Add 49% Deptt. Charges, price escalation under secy, Admin charges, final				~~2364973.73~~ 63.19 lacs
				Total	~~7191450.73~~ 30.96 lacs
	(C.O. to abstract of cost of ~~Sub-work No. 1~~			Say	~~71.91~~ Lacs 94.15 lacs

(Block - B2)

	Sub Work IV				Road Work
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)
1	Provision for levelling & earth filling as per site conditions.As per cut & fill plan @ Rs.100,000/- per Acre	Acres	9.75025	100000.00	14.62 lacs ~~975025.00~~
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).	300 mm GSB 250 mm stone aggregate 50 mm thick BM - 20 mm thick MSS			
	ii) Wearing coat (Top coat) 100mm thick(53-22.4)mm gauge compacted to 75mm thick conforming to MOT specifications (Table 400-6, Grading No. 3)				
	iii) 25 mm thick pre-mix carpet with seal coat.	Sq. mtr.	~~6027.00~~ 10050	~~850.00~~ 1200/-	~~5122950.00~~ 120.6
3	Provision for kerbs & channels of CC 1:2 , 5:5, 1:1 1/2: 3. 787X2 = 1574 Rmt	~~Sq. mtr.~~ Rmt	~~900~~ 1574	500.00	~~450000.00~~ 9.44 lacs
4	Provision for making approach and pavement to building	LS	-	-	~~500000.00~~ 10.00
5	Provision for parking arrangement. traffic lights	LS	-	-	500000.00
6	Provision for carriage of material.	LS	-	-	100000.00
7	Provision for Guide Maps etc indicators	LS.	-	-	1.00 Lac 25000.00
8	Provision for Un foreseen. items	LS.	-	-	1.00 lac ~~25000.00~~
				Total	~~7697975.00~~ 162.66 lacs
	Add 3% contingencies etc PE charges				~~230939.25~~ 4.87 lacs
					~~7928914.25~~
				Total	167.53 ~~79.29~~ Lacs
	Add 49 % department charges , price escalation unforseen, Admin- charges				~~38.85~~ Lacs
					82.09
				Say	~~118.14~~ Lacs

Rs 249.63 Lacs

c.o. to final abstract of cost

(Block - B)

Sub Work V — **Street Lighting**

S. No.	Description	Unit	Qty	Rate	Amount (Rs.)
1	Providing lighting at surrounding Area as per standard specifications Total light poles @ Rs.125000/- per acre (street on Roads of HVPN within CPL)	per acre	9.75025	2.50 lacs 125000.00	24.37 lacs ~~1218781.25~~
	Add 3% contingencies (& PE charges)				0.73 lacs ~~36563.44~~
	Total				~~1255344.69~~
	Add 49% Deptt. Charges, price escalation unforseen, Belwin				25.10 lacs ~~615118.90~~
				Total	12.30 lacs ~~1870464.00~~
				Say	37.40 lacs ~~18.70~~ Lacs

c.o. to final abstract of cost

(Block-B)

	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.	~~Cum~~	~~3998.748~~	~~30.90~~	~~123,561.31~~
	b) Rough dressing of trenched area.	acre	1.646	~~2425.00~~	~~3,992.49~~
				1.50 lacs P. Acre	2.48 lacs
	c) Grassing with "DOOB GRASS" i/c watering and maintenance of lawns for 30 days till the grass forms a thick lawn , free from weeds and fit for mowing in row 7.5 cm part in either direction.(organized Green area@Rs.75,000/-per acre).	~~acre~~	~~1.646~~	~~75000.00~~	~~123450.00~~
2	Providing and planting trees along boundary @ 12.0 ~~2.5~~ m interval.				
	Total Road length	mtr	787 + 10% = 866 mtr ~~688~~	866/12 = 72.16 Nos x 2 = 144.33 150 Nos	1300
	~~Total No. of Trees~~	Nos	150 ~~688~~	~~750.00~~	1.95 lacs 616000.00
	~~Total No. of Shrub~~	~~Nos~~	~~14415~~	~~250.00~~	~~3603703.70~~
	~~Total No. of Ground Cover~~	~~Sqmt~~	~~2919~~	~~350.00~~	~~1021650.00~~
					4.43 lacs
				Total	~~5392357.51~~
	Add 3% contingency/charges ~~&~~ PE				0.13 lacs ~~161770.73~~
				Total	~~5554128.23~~ 4.56 lacs
	Add 49% Deptt. Charges, price escalation, unforseen Admin. charges.				~~2721522.83~~ 2.24 lacs
				Total	~~8275651.07~~ 6.80 lacs
				~~Say~~	~~82.76 Lacs~~

cost details

(i) Excavation = ₹ 60.-
(ii) manure = ₹ 90.-
(iii) Tree Plant - ₹ 150.-
(iv) Tree guard - ₹ 1000.-

₹ 1300.-

(Block - B)

	Sub Work VII				Maintenance Charges & Resurfacing of Roads
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)
1	Provision of MTC charges for W/s, SWD, Sewarage, Roads, Street Lighting, Horticulture etc.				
	Complete in all aspect, including operational and establishment charges as per HUDA norms for 10 years completion @ Rs. ~~3.75~~ 7.50 lacs per acre.	per acre	9.75025	~~375000.00~~ 7.50 lacs Acre	~~3656343.75~~ 73.12 lacs
2	Provision for resurfacing of road after lst 5 year of M.T.C. i.e. 100 mm thick BUSG compected to 75 mm thick with 25 mm thick premix carpet with seal coat with mechanical paved @Rs ~~350/SQM~~.	sqm.	~~14173.0~~ 10050	~~500.00~~ 600/-	~~7086500.00~~ 60.30 lacs
3	Provision for resurfacing of road after 10 year of M.T.C. i.e. 25 mm thck P.C. with seal coat with mechanical ~~paved @Rs 250/SQM~~	sqm.	~~14173.0~~ 10050	~~300.00~~ 750/-	~~4251900.00~~ 75.38 lacs
				Total	~~14994743.75~~ 208.80 lacs
	Add 3% contingency & PE charges				~~449842.31~~ 6.26 lacs
				Total	~~15444586.06~~ 215.06 lacs
	Add 49% Departmetal charges, price escalation, supervision, Admin. charges				~~7567847.17~~ 105.38 lacs
				Total	~~23012433.23~~ 320.44 lacs
				Say	~~230.12~~ Lacs

DOMESTIC WATER SUPPLY QUANTITY SHEET (Block - B)

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
1	*UGT.*	D1	35.0	150
2.	D1	D2	120.0	100
3.	D2	D3	134.0	100
4.	D1	D5	72.0	100
5.	D5	D4	119.0	100
6.	D4	D3	158.0	100

FLUSHING WATER SUPPLY QUANTITY SHEET

1	*STP.*	F1	48.0	100
2.	F1	F2	131.0	100
3.	F2	F3	171.0	100
4.	F3	F4	67.0	100
5.	F1	F5	150.0	100
6.	F5	F4	120.0	100

MUNICIPAL WATER SUPPLY QUANTITY SHEET

1	HUDA Water Supply Line	280.0	100

	Length in (MTR)	Pipe Dia (MM)
Domestic & Flushing Water Supply line	1290.0	100
Domestic & Flushing Water Supply line	35.0	150

	Length in (M)	Pipe Dia
HUDA Water Supply Line	280.0	100

Description	Qty.	Unit
100 Dia Valve	2	Nos.
150 Dia Valve	1	Nos.
100 Dia Non Return Valve	1	Nos.
Air Valve	3	Nos.

IRRIGATION WATER SUPPLY QUANTITY SHEET (Block-B)

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
1	*STP.*	G1	20.0	80
2.	G1	G2	166.0	80
3.	G2	G3	223.0	80
4.	G3	G4	141.0	80
5.	G4	G5	228.0	80
6.	G5	G1	175.0	80
Irrigation Water Supply line			**953.0**	**80**
Garden Hydrant			**22**	**Nos.**
80 Dia Valve			**1**	**Nos.**
Air Valve			**1**	**Nos.**

FIRE QUANTITY SHEET (Block - B)

S.No.	Line No		Length of Pipe	Dia of Pipe
-	From	To	mtr.	mm.
1	UGT.	B1	56.0	150
2.	B1	B2	227.0	150
3.	B2	B3	119.0	150
4.	B3	B4	145.0	150
5.	B4	B5	139.0	150
6.	B5	B6	98.0	150
7.	B6	B1	83.0	150
8.	Fire Brigade Inlet Connection		275.0	150
9.	Fire Brigade Withdrawl Connection		275.0	150

80 mm Dia Pipe	320.0	mtr.
150 mm Dia Pipe	1417.0	mtr.
External Fire Hydrant	21	Nos.
80 Dia Valve	21	Nos.
150 Dia Valve	3	Nos.
80 Dia Non Return Valve	21	Nos.

TITLE - SEWERAGE QUANTITY SHEET (Block - B)

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	171.0	250	0.250	1.20	2.18	1.69	221.19	0.0	171.0	0.0	0.0
2	S2	S3	134.0	250	0.250	2.18	2.68	2.43	237.58	0.0	134.0	0.0	0.0
3	S3	S4	105.0	250	0.250	2.68	3.19	2.93	220.56	0.0	105.0	0.0	0.0
4	S5	S6	141.0	250	0.250	1.20	1.86	1.53	167.82	0.0	141.0	0.0	0.0
5	S6	S7	106.0	250	0.250	1.86	2.37	2.12	166.47	0.0	106.0	0.0	0.0
6	S7	S8	82.0	250	0.250	2.37	2.76	2.57	152.75	0.0	82.0	0.0	0.0
7	S8	S4	98.0	250	0.250	2.76	3.28	3.02	211.45	0.0	0.0	98.0	0.0
8	S4	S.T.P	5.0	400	0.400	3.28	3.29	3.28	14.34	0.0	0.0	5.0	0.0
Total			**842.0**						**1393.0**	**0.0**	**739.0**	**103.0**	**0.0**

Excavation Depth				
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
250 mm Dia pipe	0.0	739.0	98.0	0.0
400 mm Dia pipe	0.0	0.0	5.0	0.0

TITLE : STORM WATER QUANTITY SHEET (Block - B)

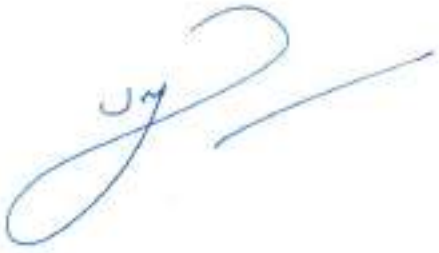
S.No.	Line No.		Length	Size of Pipe		Depth			Excavation Depth	EXCAVATION		
						Start	End	Avg.		0.0 -1.5	1.5 - 3.0	3.0 - 4.5
	From	To	(mtr.)	(mm)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(cum.)	(mtr.)	(mtr.)	(mtr.)
1	A1	A2	47.0	400	0.400	1.50	1.53	1.52	85.36	0.0	47.0	0.0
2.	A2	D.C.01	3.0	400	0.400	1.53	1.54	1.54	5.51	0.0	3.0	0.0
3.	D.C.01	D.T.01	3.0	400	0.400	1.54	1.54	1.54	5.52	0.0	3.0	0.0
4.	D.T.01	A3	5.0	400	0.400	1.50	1.51	1.50	9.02	0.0	5.0	0.0
5.	A3	A4	50.0	400	0.400	1.51	1.60	1.55	92.63	0.0	50.0	0.0
6.	A4	D.C.02	6.0	400	0.400	1.60	1.61	1.60	11.41	0.0	6.0	0.0
7.	D.C.02	D.T.02	2.0	400	0.400	1.61	1.61	1.61	3.82	0.0	2.0	0.0
8.	D.T.02	A5	4.0	400	0.400	1.50	1.51	1.50	7.21	0.0	4.0	0.0
9.	A5	A6	80.0	400	0.400	1.51	1.62	1.56	148.98	0.0	80.0	0.0
10.	A6	D.C.03	5.0	400	0.400	1.62	1.63	1.62	9.61	0.0	5.0	0.0
11.	D.C.03	D.T.03	5.0	400	0.400	1.63	1.63	1.63	9.65	0.0	5.0	0.0
12.	D.T.03	A7	2.0	400	0.400	1.50	1.47	1.49	3.57	2.0	0.0	0.0
13.	A7	A8	77.0	400	0.400	1.47	1.56	1.52	139.84	0.0	77.0	0.0
14.	A8	D.C.04	5.0	400	0.400	1.56	1.57	1.56	9.31	0.0	5.0	0.0
15.	D.C.04	D.T.04	2.0	400	0.400	1.57	1.57	1.57	3.74	0.0	2.0	0.0
16.	D.T.04	A9	3.0	400	0.400	1.50	1.51	1.50	5.41	0.0	3.0	0.0
17.	A9	A10	88.0	400	0.400	1.51	1.61	1.56	163.46	0.0	88.0	0.0
18.	A10	D.C.05	2.0	400	0.400	1.61	1.61	1.61	3.82	0.0	2.0	0.0
19.	D.C.05	D.T.05	2.0	400	0.400	1.61	1.62	1.61	3.83	0.0	2.0	0.0
20.	D.T.05	A11	2.0	400	0.400	1.50	1.50	1.50	3.60	0.0	2.0	0.0
21.	A11	A12	95.0	400	0.400	1.50	1.63	1.57	177.35	0.0	95.0	0.0
22.	A12	D.C.06	4.0	400	0.400	1.63	1.64	1.63	7.73	0.0	4.0	0.0
23.	D.C.06	D.T.06	4.0	400	0.400	1.64	1.64	1.64	7.76	0.0	4.0	0.0
24.	D.T.06	A13	6.0	400	0.400	1.50	1.51	1.51	10.83	0.0	6.0	0.0
25.	A13	A14	68.0	400	0.400	1.51	1.63	1.57	127.17	0.0	68.0	0.0
26.	A14	D.C.09	2.0	400	0.400	1.63	1.63	1.63	3.86	0.0	2.0	0.0
27.	A15	A16	18.0	400	0.400	1.50	1.53	1.52	32.68	0.0	18.0	0.0
28.	A16	D.C.07	10.0	400	0.400	1.53	1.55	1.54	18.40	0.0	10.0	0.0
29.	D.C.07	D.T.07	4.0	400	0.400	1.55	1.56	1.55	7.41	0.0	4.0	0.0
30.	D.T.07	A17	6.0	400	0.400	1.50	1.51	1.51	10.83	0.0	6.0	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.	A17	A18	33.0	400	0.400	1.51	1.53	1.52	60.04	0.0	33.0	0.0
32.	A18	**D.C.08**	12.0	400	0.400	1.53	1.55	1.54	22.07	0.0	12.0	0.0
33.	**D.C.08**	**D.T.08**	2.0	400	0.400	1.55	1.55	1.55	3.70	0.0	2.0	0.0
34.	**D.T.08**	A19	5.0	400	0.400	1.50	1.51	1.50	9.02	0.0	5.0	0.0
35.	A19	A20	68.0	400	0.400	1.51	1.63	1.57	127.05	0.0	68.0	0.0
36.	A20	A21	58.0	400	0.400	1.63	1.69	1.66	113.62	0.0	58.0	0.0
37.	A21	**D.C.09**	2.0	400	0.400	1.69	1.69	1.69	3.98	0.0	2.0	0.0
38.	**D.C.09**	**D.T.09**	2.0	400	0.400	1.69	1.70	1.70	3.99	0.0	2.0	0.0
39.	**D.T.09**	***To HUDA***	2.0	400	0.400	1.50	1.30	1.40	3.40	2.0	0.0	0.0
Total			**794.0**						**1477.0**	**4.0**	**790.0**	**0.0**

mh

Excavation Depth			
Description	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)
400 mm Dia pipe	4.0	790.0	0.0

mh



TITLE : ROAD QUANTITY SHEET

AREA OF METALLED ROAD (A) (Block - B)

S.NO.	ROAD NO.	LENGTH (In Mt.)	WIDTH (In Mt.)	TOTAL AREA (In Sq. Mt.)
1.	R1-R2	20.14	6.00	120.84
2.	R2-R3	26.52	6.00	159.12
3.	R3-R4	13.78	6.00	82.68
4.	R4-R5	33.03	6.00	198.18
5.	R5-R6	9.79	6.00	58.74
6.	R6-R7	29.71	6.00	178.26
7.	R7-R8	14.13	6.00	84.78
8.	R8-R9	49.74	6.00	298.44
9.	R9-R10	14.13	6.00	84.78
10.	R10-R11	7.87	6.00	47.22
11.	R11-R12	14.13	6.00	84.78
12.	R12-R13	48.65	6.00	291.96
13.	R13-R14	14.13	6.00	84.78
14.	R14-R15	34.80	6.00	208.80
15.	R15-R16	10.04	6.00	60.24
16.	R16-R17	147.01	6.00	882.06
17.	R17-R18	5.66	6.00	~~60.24~~ 33.96
18.	R18-R19	32.34	6.00	~~882.06~~ 194.04
19.	R19-R20	12.57	6.00	~~33.96~~ 75.42
20.	R20-R21	88.34	6.00	~~194.04~~ 530.04
21.	R21-R22	14.13	6.00	~~75.40~~ 84.78
22.	R22-R23	29.94	6.00	~~530.04~~ 179.64
23.	R23-R24	12.81	6.00	~~84.78~~ 76.86
24.	R24-R25	29.88	6.00	~~179.64~~ 179.28
25.	R25-R26	29.68	6.00	~~76.86~~ 178.08
26.	R26-R27	13.17	6.00	~~179.28~~ 79.02
27.	R27-R28	20.14	6.00	~~178.08~~ 120.84
28.	R27-R2	11.00	6.00	~~79.02~~ 66.00
			TOTAL	4723.62 ~~5479.07~~
			ADD 10% FOR CURVES	472.36 ~~547.907~~
			TOTAL METALLED ROAD AREA (A)	5195.98 ~~6026.975~~
			SAY	~~6027.000~~

AREA OF HARD PAVED (For Fire Tender Movement) (B) (Block-B)				
S.NO.	ROAD NO.	LENGTH (In Mt.)	WIDTH (In Mt.)	TOTAL AREA (In Sq. Mt.)
1	F1-F2	8.30	6.00	49.80
2.	F2-F3	13.99	6.00	83.94
3.	F3-F4	130.04	6.00	780.24
4.	F4-F5	10.04	6.00	60.24
5.	F5-F6	24.57	6.00	147.42
6.	F2-F7	88.38	6.00	530.28
7.	F7-F8	20.39	6.00	122.34
8.	F9-F10	49.15	6.00	294.90
9.	F10-F11	16.95	6.00	101.70
10.	F12-F13	12.51	6.00	75.06
11.	F13-F14	40.30	6.00	241.80
12.	F14-F15	14.95	6.00	89.70
13.	F16-F17	19.20	6.00	115.20
14.	F17-F18	50.90	6.00	305.40
		499.67	6.00	2998.02 (say)
			TOTAL	~~5996.04~~
			ADD 10% FOR CURVES	299.80 ~~599.60~~
			TOTAL HARD PAVED AREA (B)	3297.82 ~~6,596.64~~
			SAY	~~6596.000~~

~~AREA UNDER CAR PARKING~~ (C)	
NO. OF CARS ON SURFACE = ~~55~~ 124 NO.	
AREA UNDER CAR PARKING = 5 X 2.5 X 124 = 1550 SQM	
TOTAL AREA UNDER CAR PARKING (C)	1550 SQM
5795.98 + 3297.82 + 1550 = 10643.80	
TOTAL AREA OF ROADS = A + B + C = ~~6027~~ ~~+6596~~ +1550 = ~~14173~~ SQM	~~14173.0~~

Say 10050 Sqm

PROJECT : PROPOSED GROUP HOUSING PART B, SE[illegible]OR - 109, GURGAON (HARYANA)

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	Prog-ressive Discharge	Prog-ressive Discharge (Average)	Prog-ressive Discharge (Peak)	Infiltration @ 25% Av. Discharge	Total Dis-charge	Length	Pipe Size	Slope (1 in)	Fall	Velocity	Capacity of Pipe	FRL at Start	Invert Levels at Start	FRL at End	Invert Levels at End	Manhole Start Depth	Manhole Start End	Average Depth
	From	To	lpd	80%	1000	Kld.	Kld.	lps.	lps.	lps.	lps.	(mtr.)	(mm)	(mm)	(mtr.)	(m/s) (v)	lps.	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1.	S1	S2	1035.00	828.00	82.80	0.00	82.80	0.96	2.88	0.24	3.11	171.0	250	190	0.90	0.76	18.70	211.67	210.47	211.75	209.57	1.20	2.18	1.69
2.	S2	S3	948.00	758.00	75.80	82.80	158.00	1.83	5.49	0.46	5.94	134.0	250	190	0.71	0.76	18.70	211.75	209.57	211.54	208.86	2.18	2.68	2.43
3.	S3	S4	974.63	779.70	77.97	158.00	235.97	2.73	8.19	0.68	8.88	105.0	250	190	0.55	0.76	18.70	211.54	208.86	211.50	208.31	2.68	3.19	2.93
4.	S5	S6	621.00	496.80	49.68	0.00	49.68	0.58	1.73	0.14	1.87	143.0	250	190	0.74	0.76	18.70	211.67	210.47	211.59	209.73	1.20	1.86	1.53
5.	S6	S7	310.50	248.40	24.84	49.68	74.52	0.86	2.59	0.22	2.80	108.0	250	190	0.56	0.76	18.70	211.59	209.73	211.54	209.17	1.86	2.37	2.12
6.	S7	S8	393.25	314.60	31.46	74.52	105.98	1.23	3.68	0.31	3.99	82.0	250	190	0.43	0.76	18.70	211.54	209.17	211.50	208.74	2.37	2.76	2.57
7.	S8	S4	802.10	641.68	64.17	105.98	170.15	1.97	5.91	0.49	6.40	98.0	250	190	0.52	0.76	18.70	211.50	208.74	211.50	208.22	2.76	3.28	3.02
8.	S4	*S.T.P*	0	0	0.00	406.12	406.12	4.70	14.10	1.18	15.28	5.0	400	350	0.01	0.77	48.26	211.50	208.22	211.50	208.21	3.28	3.29	3.28

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 GROUP HOUSING PART B, SECTOR - 109, GURGAON (HARYANA)

LOAD ON SEWAGE LINES

S. No.	Name of Sewer Line		Apartment (General & EWS)			Unit (Service Personnel)			Water Requirement for Non Residential Plots					
	From	To	Number of Apartment	Population @ 5 persons / Plot.	Water Requirement @ 172.5 Ltr/ head / day	Number of Apartment	Population @ 2 persons/ Plot	Water Requirement @ 172.5 Ltr/ head / day	Type of Building	Basis of Water Requirement	Total Water Requirement.	Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line)	Sewage Flow (Self Load on Line)
				Nos.	lpd.		Nos.	lpd.		lpd.	lpd.	lpd.	lpd.	Ltd.
				5	172.5		2	172.5		Lumpsum			80%	1000
1.	S1	S2	120	600	103500	0	0	0	-	-	0	103500	82800	82.80
2.	S2	S3	80	400	69000	0	0	0	Community Building	25000	25000	94000	75200	75.20
3.	S3	S4	113	565	97462.5	0	0	0	-	-	0	97463	77970	77.97
4.	S5	S6	72	360	62100	0	0	0	-	-	0	62100	49680	49.68
5.	S6	S7	36	180	31050	0	0	0	-	-	0	31050	24840	24.84
6.	S7	S8	34	170	29325	0	0	0	Nursery School	10000	10000	39325	31460	31.46
7.	S8	S4	68	340	58650	48	96	16560	Commercial	5000	5000	80210	64168	64.17
8.	S4	S.T.P	0	0	0	0	0	0	-	-	0	0	0	0.00
			523	2615	451087.5	48	96	16560			40000	507648	406118	406.12

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PROJECT : PROPOSED GROUP HOUSING PAR[illegible]I, SECTOR - 109, GURGAON (HARYANA)

TITLE : HYDRAULIC STORM WATER DESIGN CHART

S.No.	Line No.		Length	Catchment Area (Sqm.)			Discharge @ 6.25mm/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 (mts.)		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	47.0	2650.0	0.0	2650.0	2.76	400	570	0.60	75.63	0.08	211.75	210.65	210.25	211.70	210.57	210.17	1.50	1.53	1.52
2.	A2	*D.C.01*	3.0	500.0	2650.0	3150.0	3.28	400	570	0.60	75.63	0.01	211.70	210.57	210.17	211.70	210.56	210.16	1.53	1.54	1.54
3.	*D.C.01*	*D.T.01*	3.0	0.0	3150.0	3150.0	3.28	400	570	0.60	75.63	0.01	211.70	210.56	210.16	211.70	210.56	210.16	1.54	1.54	1.54
4.	*D.T.01*	A3	5.0	0.0	3150.0	3150.0	3.28	400	570	0.60	75.63	0.01	211.70	210.60	210.20	211.70	210.59	210.19	1.50	1.51	1.50
5.	A3	A4	50.0	2450.0	3150.0	5600.0	5.83	400	570	0.60	75.63	0.09	211.70	210.59	210.19	211.70	210.50	210.10	1.51	1.60	1.55
6.	A4	*D.C.02*	6.0	0.0	5600.0	5600.0	5.83	400	570	0.60	75.63	0.01	211.70	210.50	210.10	211.70	210.49	210.09	1.60	1.61	1.60
7.	*D.C.02*	*D.T.02*	2.0	0.0	5600.0	5600.0	5.83	400	570	0.60	75.63	0.00	211.70	210.49	210.09	211.70	210.49	210.09	1.61	1.61	1.61
8.	*D.T.02*	A5	4.0	0.0	5600.0	5600.0	5.83	400	570	0.60	75.63	0.01	211.70	210.60	210.20	211.70	210.59	210.19	1.50	1.51	1.50
9.	A5	A6	80.0	3200.0	5600.0	8800.0	9.17	400	570	0.60	75.63	0.14	211.70	210.59	210.19	211.67	210.45	210.05	1.51	1.62	1.56
10.	A6	*D.C.03*	5.0	400.0	8800.0	9400.0	9.79	400	570	0.60	75.63	0.01	211.67	210.45	210.05	211.67	210.44	210.04	1.62	1.63	1.62
11.	*D.C.03*	*D.T.03*	5.0	0.0	9400.0	9400.0	9.79	400	570	0.60	75.63	0.01	211.67	210.44	210.04	211.67	210.44	210.04	1.63	1.63	1.63
12.	*D.T.03*	A7	2.0	0.0	9400.0	9400.0	9.79	400	570	0.60	75.63	0.00	211.67	210.57	210.17	211.64	210.57	210.17	1.50	1.47	1.49
13.	A7	A8	77.0	3465.0	9400.0	12865.0	13.40	400	570	0.60	75.63	0.14	211.64	210.57	210.17	211.59	210.43	210.03	1.47	1.56	1.52
14.	A8	*D.C.04*	5.0	0.0	12865.0	12865.0	13.40	400	570	0.60	75.63	0.01	211.59	210.43	210.03	211.59	210.42	210.02	1.56	1.57	1.56
15.	*D.C.04*	*D.T.04*	2.0	0.0	12865.0	12865.0	13.40	400	570	0.60	75.63	0.00	211.59	210.42	210.02	211.59	210.42	210.02	1.57	1.57	1.57
16.	*D.T.04*	A9	3.0	0.0	12865.0	12865.0	13.40	400	570	0.60	75.63	0.01	211.59	210.49	210.09	211.59	210.48	210.08	1.50	1.51	1.50
17.	A9	A10	88.0	3000.0	12865.0	15865.0	16.53	400	570	0.60	75.63	0.15	211.59	210.48	210.08	211.54	210.33	209.93	1.51	1.61	1.56
18.	A10	*D.C.05*	2.0	2000.0	15865.0	17865.0	18.61	400	570	0.60	75.63	0.00	211.54	210.33	209.93	211.54	210.33	209.93	1.61	1.61	1.61
19.	*D.C.05*	*D.T.05*	2.0	0.0	17865.0	17865.0	18.61	400	570	0.60	75.63	0.00	211.54	210.33	209.93	211.54	210.32	209.92	1.61	1.62	1.61
20.	*D.T.05*	A11	2.0	0.0	17865.0	17865.0	18.61	400	570	0.60	75.63	0.00	211.54	210.44	210.04	211.54	210.44	210.04	1.50	1.50	1.50
21.	A11	A12	95.0	3700.0	17865.0	21565.0	22.46	400	570	0.60	75.63	0.17	211.54	210.44	210.04	211.50	210.27	209.87	1.50	1.63	1.57
22.	A12	*D.C.06*	4.0	0.0	21565.0	21565.0	22.46	400	570	0.60	75.63	0.01	211.50	210.27	209.87	211.50	210.26	209.86	1.63	1.64	1.63
23.	*D.C.06*	*D.T.06*	4.0	0.0	21565.0	21565.0	22.46	400	570	0.60	75.63	0.01	211.50	210.26	209.86	211.50	210.26	209.86	1.64	1.64	1.64
24.	*D.T.06*	A13	6.0	0.0	21565.0	21565.0	22.46	400	570	0.60	75.63	0.01	211.50	210.40	210.00	211.50	210.39	209.99	1.50	1.51	1.51
25.	A13	A14	68.0	5000.0	21565.0	26565.0	27.67	400	570	0.60	75.63	0.12	211.50	210.39	209.99	211.50	210.27	209.87	1.51	1.63	1.57
26.	A14	*D.C.09*	2.0	0.0	26565.0	26565.0	27.67	400	570	0.60	75.63	0.00	211.50	210.27	209.87	211.50	210.27	209.87	1.63	1.63	1.63
27.	A15	A16	18.0	800.0	0.0	800.0	0.83	400	570	0.60	75.63	0.03	211.58	210.48	210.08	211.58	210.45	210.05	1.50	1.53	1.52
28.	A16	*D.C.07*	10.0	700.0	800.0	1500.0	1.56	400	570	0.60	75.63	0.02	211.58	210.45	210.05	211.58	210.43	210.03	1.53	1.55	1.54
29.	*D.C.07*	*D.T.07*	4.0	0.0	1500.0	1500.0	1.56	400	570	0.60	75.63	0.01	211.58	210.43	210.03	211.58	210.42	210.02	1.55	1.56	1.55

S.No.	Line No.		Length	Catchment area (Sqm.)			Discharge @ 6.25mm/hr rainfall	Pipe dia	Slope 1 in	Velocity m/sec.	Capacity of pipe	Fall in line	Levels at start (mtr.)			Levels at End (mtr.)			Depth (mtr.)		Avg.
30.	*D.T.07*	A17	6.0	0.0	1500.0	1500.0	1.56	400	570	0.60	75.63	0.01	211.58	210.48	210.08	211.58	210.47	210.07	1.50	1.51	1.51
31.	A17	A18	33.0	2500.0	1500.0	4000.0	4.17	400	570	0.60	75.63	0.06	211.58	210.47	210.07	211.54	210.41	210.01	1.51	1.53	1.52
32.	A18	*D.C.08*	12.0	0.0	4000.0	4000.0	4.17	400	570	0.60	75.63	0.02	211.54	210.41	210.01	211.54	210.39	209.99	1.53	1.55	1.54
33.	*D.C.08*	*D.T.08*	2.0	0.0	4000.0	4000.0	4.17	400	570	0.60	75.63	0.00	211.54	210.39	209.99	211.54	210.39	209.99	1.55	1.55	1.55
34.	*D.T.08*	A19	5.0	0.0	4000.0	4000.0	4.17	400	570	0.60	75.63	0.01	211.54	210.44	210.04	211.54	210.43	210.03	1.50	1.51	1.50
35.	A19	A20	68.0	3500.0	4000.0	7500.0	7.81	400	570	0.60	75.63	0.12	211.54	210.43	210.03	211.54	210.31	209.91	1.51	1.63	1.57
36.	A20	A21	58.0	2000.0	7500.0	9500.0	9.90	400	570	0.60	75.63	0.10	211.54	210.31	209.91	211.50	210.21	209.81	1.63	1.69	1.66
37.	A21	*D.C.09*	2.0	0.0	9500.0	9500.0	9.90	400	570	0.60	75.63	0.00	211.50	210.21	209.81	211.50	210.21	209.81	1.69	1.69	1.69
38.	*D.C.09*	*D.T.09*	2.0	0.0	36065.0	36065.0	37.57	400	570	0.60	75.63	0.00	211.50	210.21	209.81	211.50	210.20	209.80	1.69	1.70	1.70
39.	*D.T.09*	*To HUDA*	2.0	0.0	36065.0	36065.0	37.57	400	570	0.60	75.63	0.00	211.50	210.40	210.00	211.30	210.40	210.00	1.50	1.30	1.40

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

PROJECT : PROPOSED GROUP HOUSING PART B, SECTOR - 109, GURGAON (HARYANA)

(Pump Riser Calculation Sheet)

Domestic Water Supply Design Calculation For Towers, EWS, Community Building, Shopping & N. School

Line No.		Probable demand (lps)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fits (%)	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	17
UGT.	D1	15.438	150	0.010	35.0	5	1.75	36.75	0.353	0.353	0.873	89.00	88.65	-	-	-
D1	D2	7.994	100	0.020	120.0	5	6.00	126.00	2.577	2.930	1.017	88.65	86.07	6.07	80.00	TOWER - 5, 6 & 7
D2	D3	4.879	100	0.008	134.0	5	6.70	140.70	1.153	4.083	0.621	86.07	84.92	4.92	80.00	TOWER - 3, 4, EWS & COMMUNITY BUILDING
													Used PRV For EWS & Community Bld.			
D1	D5	7.445	100	0.018	72.0	5	3.60	75.60	1.355	1.708	0.947	88.65	87.29	13.29	74.00	TOWER - 8
D5	D4	5.576	100	0.010	119.0	5	5.95	124.95	1.312	3.020	0.710	87.29	85.98	11.98	74.00	TOWER - 9
D4	D3	4.642	100	0.007	158.0	5	7.90	165.90	1.240	4.260	0.591	85.98	84.74	14.74	70.00	TOWER - 1, 2, NURSERY SCHOOL & COMMERCIAL
													Used PRV For N. School & Commercial			

	Flow Rate	**15.438**	lps	
		926.3	**LPM**	
	(2 W + 1 S)	**463.2**	**LPM**	
	Maximum Building Height	80	m	
	Pump Head	**89.00**	m	
	Pump HP	15.3	HP	
	Say	**15.0**	**HP**	

Flushing Water Supply Design Calculation For Towers, EWS, Community Building, Shopping & N. 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 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	17
STP.	F1	8.064	100	0.021	48.0	5	2.40	50.40	1.046	1.046	1.026	89.00	87.95	55.95	32.00	EWS
													Used PRV For EWS			
F1	F2	4.206	100	0.006	131.0	5	6.55	137.55	0.857	1.904	0.535	87.95	87.10	7.10	80.00	TOWER - 3, 4 & COMMUNITY BUILDING
													Used PRV For Community Bld.			
F2	F3	2.683	100	0.003	171.0	5	8.55	179.55	0.486	2.391	0.341	87.10	86.61	6.61	80.00	TOWER - 5, 6 & 7
F3	F4	1.006	100	0.000	67.0	5	3.35	70.35	0.031	2.422	0.128	86.61	86.58	12.58	74.00	TOWER - 8
F1	F5	2.753	100	0.003	150.0	5	7.50	157.50	0.447	1.495	0.350	87.95	87.51	17.51	70.00	TOWER - 1, 2, COMMERCIAL & NURSERY
													Used PRV For N. School & Commercial			
F5	F4	0.503	100	0.000	120.0	5	6.00	126.00	0.015	1.510	0.064	87.51	87.49	13.49	74.00	TOWER - 9

Flow Rate	**8.064**	lps	
	483.8	**LPM**	
(2 W + 1 S)	**241.9**	**LPM**	
Maximum Building Height	80	m	
Pump Head	**89.00**	m	
Pump HP	8.0	HP	
Say	**8.0**	**HP**	

हरियाणा शहरी विकास प्राधिकरण
Haryana Urban
Development Authority

Tel : 0172-2570982
Toll Free No. : 1800-180-3030
Website : www.huda.org.in
Email : cencrhuda@ gmail.com
Address : C-3, HUDA HQ Sector-6
Panchkula
C.E.I-No. 2265
Dated: 02/02/18
Annexure-

SUB:- Approval of Revised Service Plan/ estimate for Pocket-B (9.75025) acres falling in Group Housing Colony measuring 20.169 acres (License No. 250 of 2007 dated 2.11.2007 and No. 50 of 2012 dated 17.5.2012) in Sector-109, Gurugram being developed by Raj Kiran Pvt. Ltd. & others in collaboration with Chintels India Ltd.

Technical note and comments:-

1. All detailed working drawings would have to be prepared by the colonizer for Integrating the internal services proposals with the master proposals of town.
2. The correctness of the levels will be the sole, responsibility of the colonizer for the integration of internal proposals, with the master proposals, of town and will be got confirmed before execution.
3. The material to be used shall the same specifications as are being adopted by HUDA and further shall also confirm to such directions, as issued by Chief Engineer, HUDA from time to time.
4. The work shall be carried out according to Haryana PWD specification or such specifications as are being followed by HUDA. Further it shall also confirm to such other directions, as are issued by Chief Engineer, HUDA from time to time.
5. The colonizer will be fully responsible to meet the demand of water supply and allied services till such time these are made available by State Government/ HUDA. All link connections with the State Government/ HUDA system and services will be done by the colonizer. If necessary extra tube-wells shall also be installed to meet extra demand of water beyond the provision according to EDC deposited.
6. Structural design & drawings of all the structures, such as pump chamber, boosting chamber, RCC OHSR underground tanks quarters, manholes chamber, sections of RCC pipes sewer and SW pipes, sewer, ventilating shafts for sewerage and Masonry Ventilation Chamber for Chamber for storm water drainage, temporary disposal/ arrangement etc. will be as per relevant I.S codes and PWD specifications; colonizer himself will be responsible for structural stability of all structures.

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C.E. No:

Dated:

7. Potability of water will be checked and confirmed and the tube-wells will be put into operation after getting chemical analysis of water tested.

8. Only C.I/D.I pipes will be used in water supply and flushing system, UPVC/HDPE pipe for irrigation purposes.

9. A minimum 100 i/d C.I/D.I, 200mm i/d SW and 400mm id RCC NP-3 pipes will be used for water supply, sewerage and storm water drainage respectively.

10. Standard X-section for S.W. pipes sewer, RCC pipes sewer etc. will be followed as are being adopted in Haryana Public Health Engineering Deptt.or HUDA.

11. The X-section, width of roads, will be followed as approved by the Chief Town Planner, Haryana, Chandigarh. The kerbs and channels will also be provided as per approved X-section and specifications.

12. The specifications for various roads will be followed as per IRC/MORTH specifications.

13. The wiring system of street lighting and specifications of street lighting fixture will be as per relevant standards.

14. This shall confirm to such other conditions as are incorporated in the approved estimate and the letter of approval.

For Superintending Engineer (HQ),
Chief Engineer-I, HUDA,
Panchkula.

1/2/12

PROJECT : PROPOSED GROUP HOUSING PART B, SECTOR - 109, GURGAON (HARYANA)

TITLE : HUDA 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	KLPH	KLPH	lpm.	mtr.	mtr.	mtr.	m/sec	mm
1	HUDA Conn.	UGT.	27.79	41.68	694.73	280.0	0.041	11.37	1.473	100
HUDA Supply Considered 12 Hours										

PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF RESIDENTIAL PROJECT PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE, SECTOR-109, GURGAON (HARYANA)

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

PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE is a residential proposed between sector - 109, at Gurgaon for development by **M/s RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH M/s CHINTELS INDIA LTD.**

1 **Water Supply Source**

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.

1.1 **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.

2 **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.

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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**

9.1 **Cost for Pocket - A**

The total cost of development in this Project including various PH & B & R services works out to **Rs. 776.93 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. 74.57 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.

9.2 **Cost for Pocket - B**

The total cost of development in this Project including various PH & B & R services works out to **Rs. 611.53 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. 62.72 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.

For M/s Chintels India Ltd.

Authorised Signatory

Paradise Consultants New Delhi

PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE, SECTOR-109, GURGAON (HARYANA)

DESIGN CALCULATION

1 **Daily Domestic Water Requirement**

	POKET - A			POKET - B		
Nos. of Blocks						
Apartment			418 Nos			370 Nos
EWS			74 Nos			65 Nos
Service Personnel			42 Nos			46 Nos
Population @ 5 person / unit - Apartment			5			5
Population @ 2 person / unit - EWS			5			5
Population @ 2 person / unit - Service Personnel			2			2
Therefore population (Apartment)			2090 persons			1850 persons
Therefore population (EWS)			370 persons			325 persons
Therefore population (Maintenance Personnel)			84 persons			92 persons
Total Population			**2544 persons**			**2267 persons**
		SAY	**2544 persons**		**SAY**	**2267 persons**
Water requirement for apartmant		@	172.5 liter/ head/ day		@	172.5 liter/ head/ day
			438840.00 liter/ head/ day			391057.50 liter/ head/ day
		or	**438.85 KLD (1)**		or	**391.05 KLD (1)**

2 **Other Requirement**

a.)	Primary/Nursery School	1	@	10000 lit/day	1	@	10000 lit/day
	Therefore daily water requirement			10000 lit/day			10000 lit/day
				10 KLD			10 KLD

		POKET - A			POKET - B		
b.)	No. of Club Community Centre	1			1		
	Daily water requirement lumpsum		@	25000 lit/day		@	25000 lit/day
	Therefore daily water requirement			25000 lit/day			25000 lit/day
				25 KLD			25 KLD
c.)	No. of Convenient □Shopping	1			1		
	Daily water requirement lumpsum		Lumpsum	5000 lit/day		Lumpsum	5000 lit/day
	Therefore daily water requirement			5000 lit/day			5000 lit/day
				5.00 KLD			5.00 KLD
			Total	**40.00 KLD (3)**		**Total**	**40.00 KLD (3)**
3	**Total Daily Water Requirement (1+2)**			**478.85 KLD**			**431.05 KLD**
i)	Domestic Water Requirement @		65%	311.25 KLD		65%	280.18 KLD
			Say	**315.00 KLD**		Say	**280.00 KLD**
ii)	Flushing Water Requirement @		35%	167.60 KLD		35%	150.87 KLD
			Say	**170.00 KLD**		Say	**155.00 KLD**

		POKET - A		POKET - B	
4	**Water usage from STP**				
a)	Area under Parks	5.06 acre		1.56 acre	
	Daily water requirement	@	25000 lit/acre/day	@	25000 lit/acre/day
			126500.00 lit/day		39000.00 lit/day
			126.50 KLD ✓		39.00 KLD ✓
b)	Area under Roads				
	Daily water requirement	Lumpsum	25000.00 lit/acre/day	Lumpsum	25000.00 lit/acre/day
			25000.00 lit/day		25000.00 lit/day
			25.00 KLD ✓		25.00 KLD ✓
c)	Under Road+ Parks **(a+b)**	**Total**	**151.50 KLD** ✓	**Total**	**64.00 KLD**
		Say	**152.00 KLD**	**Say**	**64.00 KLD** ✓
d)	**Total treated water requirement [3 (ii) + c]**		**322.00 KLD** ✓		**219.00 KLD** ✓
	Total Daily Requirement [3 (i) + d]		**637.00 KLD** ✓		**499.00 KLD** ✓
		Say	**640.00 KLD** ✓	**Say**	**500.00 KLD** ✓

5	**Underground Tank**						
	Daily fresh water requirement for domestic use		=	315.00 KL ✓		=	280.00 KL ✓
	Capacity of under ground tank						
	24 hours storage	315.00 x 24 / 24	=	315.00 KL ✓	280.00 x 24 / 24	=	280.00 KL ✓
	Fire Tank Capacity As/NBC Code 100 kld. But Proposed		=	375.00 KL ✓		=	375.00 KL ✓
			Total	**690** KL		**Total**	**655 KL** ✓
	It is proposed to provide under ground tank for **Pocket - A** of capacity **690 KL** which also includes **375 KL** capacity for fire fighting.						
	It is proposed to provide under ground tank for **Pocket - B** of capacity **655 KL** which also includes **375 KL** capacity for fire fighting.						
	This tank 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.						

	POCKET - A	**POCKET - B**
FIRE WATER TANK	**375.00 KL** ✓	**375.00 KL** ✓
TOTAL UG STORAGE (DOMESTIC + FLUSHING + HORTICULTURE)	**640.00 KL** ✓	**500.00 KL** ✓
RAW WATER TANK	**150.00 KL**	**130.00 KL**
DOMESTIC WATER TANK	**165.00 KL**	**150.00 KL**
FLUSHING, HORTICULTURE & ROAD WASHING (PART OF STP)	**322.00 KL**	**219.00 KL**

Flushing water transfer Pump For tower

	Pocket - A	Pocket - B
Daily requirement	170 KL	155 KL
6 hrs running 2 pumps	14.17 KLH or 236 LPM	12.92 KLH or 215 LPM
BHP = $\frac{236 \times 101}{450 \times 0.60}$ =	8.82 BHP say = 10 HP	$\frac{215 \times 101}{450 \times 0.60}$ = 8.01 say 10

		POKET - A		POKET - B	
IV	**DOMESTIC WATER PUMPS - LOCATED IN PUMP ROOM**				
	Domestic Water Transfer Pumps				
i)	**For Towers**	**POCKET - A**		**POCKET - B**	
	Daily requirement for domestic use		239.27 KL		217.75 KL
	Assuming 6 hours running 2 pumps (with one standby)			Assuming 6 hours running 2 pumps (with one standby)	
	Discharge/hour	239.27 / 6 / 2	19.94 KL/HR or 332.33 LPM	144.04 / 6 / 2	18.15 KL/HR or 302.5
	Head of pump				
	i) Suction lifts		0.0 m	=	0.0 m
	ii) Friction loss in M<main & specials		2.0 m Say 350 LPM	=	4.0 m Say 3
	iii) Residual head		5.0 m	=	5.0 m
	iv) Clear head	350x101 / 4500x0.60	94.0 m	=	92.0 m
			101.0 m	310 X 101 / 4500 x0.60 =	101.0 m
	BHP of motor	19.94 x1000x101/ 4500x60x0.60	13.09 ~~12.4~~ HP	18.15 x1000x101 /4500x60x0.60	11.6 ~~11.3~~ HP
		SAY	~~12.5 HP~~ 15.00	**SAY**	**12.5 HP**
ii)	**For Community, Shopping, EWS & N. School**	**POCKET - A**		**POCKET - B**	
	Daily requirement for domestic use	=	71.97 KL		62.44 KL
	Assuming 6 hours running 1 pumps (with one standby)				
	Discharge/hour	71.97/6/1 =	12.00 KL/HR or 200 LPM	62.44 / 6 / 1	10.41 KL/HR
	Head of pump				
	i) Suction lifts	=	0.0 m	=	0.0 m or 180
	ii) Friction loss in M<main & specials	=	6.0 m	=	4.0 m
	iii) Residual head	=	5.0 m	=	5.0 m
	iv) Clear head	=	20.0 m	=	17.0 m
		=	31.0 m	=	26.0 m
	BHP of motor	12.00 x1000x31/ 4500x60x0.60	2.3 HP	10.41 x1000x26/ 4500x60x0.60	1.7 HP
		SAY	**3.0 HP**	**SAY**	**2.0 HP**

5	**PUMPS FOR FIRE PROECTION**								
		POCKET - A				POCKET - B			
	Pump Description	**Nos.**	**Discharge**	**Head**	**HP**	**Nos.**	**Discharge**	**Head**	**HP**
i)	**Diesel Driven Pump** (Location - Pump Room)	**1**	**2280**	**135.00**	**-**	**1**	**2280**	**135.00**	**-**
ii)	**Hydrant Pump** (Location - Pump Room)	**1**	**2280**	**135.00**	**120** ✓	**1**	**2280**	**135.00** ✓	**120** ✓
iii)	**Sprinkler Pump** (Location - Pump Room)	**1**	**2280**	**135.00**	**120** ✓	**1**	**2280**	**135.00** ✓	**120** ✓
iv)	**Jockey Pump** (Location - Pump Room)	**1**	**180**	**135.00**	~~25~~ 10 HP	**1**	**180**	**135.00**	10 HP ~~25~~
		POCKET - A				POCKET - B			
	Capacity of Gen Set	Nos.	HP			Nos.	HP		
	Domestic Water Transfer Pumps for **Towers**	2	~~12.5~~ 15.0		30 25 HP	1	12.5		12.5 HP ✓
	Domestic Water Transfer Pumps for **Club, Shopping, EWS & Nursary School**	1	3.0		3 HP ✓	1	2.0 ✓		2 HP ✓
	Fire Pump (Jockey)	1	25.0		25 HP ✓	1	25.0		25 HP ✓
	Lighting				25 HP ✓				25 HP ✓
					~~78~~ 83 HP				64.5 HP ✓
		~~78~~ 83 x0.746x1.50			~~87.28~~ 92.88 KVA	64.5 x0.746x1.50			72.18 KVA ✓
		Say			**~~90.00~~ 100** KVA	**Say**			**80.00** KVA ✓
	Requirement of ~~90~~ 100 KVA capacity will be added in to the main D.G. set to provide standby supply for **Pocket - A**								
	Requirement of 80 KVA capacity will be added in to the main D.G. set to provide standby supply for **Pocket - B**								

	POKET - A	POKET - B
Estimate for Providing in Internal Development works for Housing for		
M/s RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH M/s CHINTELS INDIA LTD.		
	Pocket - A	Pocket - B
	Amount (Lacs.)	Amount (Lacs.)
Sub Work - I Water Supply	Rs 280.36 Lacs ~~197.58~~	Rs 277.39 Lacs ~~192.20~~
Sub Work - II Sewerage	Rs 103.52 Lacs ~~77.65~~	Rs 101.53 Lacs ~~72.26~~
Sub Work - III Storm Water Drainage	Rs 70.52 Lacs ~~52.98~~	Rs 69.40 Lacs ~~48.45~~
Sub Work - IV Roads & Footpath	Rs 180.88 Lacs ~~147.59~~	Rs 241.71 Lacs ~~87.18~~
Sub Work - V Street Lighting	Rs 23.99 Lacs ~~15.29~~	Rs 22.45 Lacs ~~14.31~~
Sub Work - VI - Horticulture	Rs 8.63 Lacs ~~79.45~~	Rs 3.84 Lacs ~~75.30~~
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)	Rs 256.04 Lacs Rs 923.94 Lacs ~~206.33~~	Rs 325.92 Lacs Rs 1042.24 Lacs ~~121.82~~
	Total ~~976.93~~	Total ~~611.53~~

~~(RUPEES SEVEN CRORE SEVENTY SIX LACS NINTY THREE THOUSAND ONLY) POCKET - A~~

~~(RUPEES SIX CRORE ELEVEN LACS PIETY THREE THOUSAND ONLY) POCKET - B~~

923.94 + 1042.24 = 1966.18

Say Rs 1966.20 Lacs

say Rs per Lacs/Acre = ~~1888.46~~ 1966.20 / 20.169 = ~~68.84~~ 97.49 Lacs

M/s RAJ KIRAN PVT. LTD. AND OTHERS IN COLLABORATION WITH M/s CHINTELS INDIA LTD.

~~Say Rs = 70.00 Lacs/Acre~~

Authorized Signatory

Sub Divisional Engineer
HUDA Sub Divn. No.13
GURGAON

Executive Engineer,
HUDA Division No. V,
Gurgaon

Checked subject to con
in forwarding letter No.
Dt. ...
with the estimate

Executive Engi
for Chief Engine
HUDA Panchkul

Paradise Consultants
New Delhi

Superintending Engineer
HUDA Circle

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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.)
36.	D.C.-09	R.P.-09	2.0	400	0.400	2.48	2.48	2.48	5.56	0.0	2.0	0.0
37.	R.P.-09	A21	2.0	400	0.400	2.48	2.49	2.48	5.57	0.0	2.0	0.0
38.	A21	A12	67.0	400	0.400	2.49	2.60	2.54	190.54	0.0	67.0	0.0
39.	A12	D.C.-10	2.0	400	0.400	2.60	2.61	2.60	5.81	0.0	2.0	0.0
40.	D.C.-10	R.P.-10	5.0	400	0.400	2.61	2.61	2.61	14.55	0.0	5.0	0.0
41.	R.P.-10	***To HUDA***	5.0	500	0.500	2.71	2.72	2.72	16.60	0.0	5.0	0.0
Total			**847.0**						**2207.0**	**0.0**	**847.0**	**0.0**

Excavation Depth			
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)
400 mm Dia pipe	0.0	842.0	0.0
500 mm Dia pipe	0.0	5.0	0.0

WATER SUPPLY

		POKET - A	POKET - B
		FINAL ABSTRACT OF REVISED COST	
		Amount (Lacs.)	Amount (Lacs.)
	Sub Head - (I) Head Works	Rs 63.15 Lacs ~~43.33~~	Rs 59.43 Lacs ~~40.28~~
	Sub Head - (II) Pumping Machinery	Rs 63.90 Lacs ~~63.90~~	Rs 57.70 Lacs ~~59.78~~
	Sub Head - (III) Distribution System Domestic Flushing + Rising main	Rs 26.50 Lacs ~~20.86~~	Rs 34.31 Lacs ~~32.29~~
	Sub Head - (IV) Irrigation Scheme	Rs 1.97 Lacs ~~11.99~~	Rs 1.57 Lacs ~~3.13~~
	Sub Head - (V) Fire Scheme	Rs 27.16 Lacs ~~31.68~~	Rs 27.74 Lacs ~~32.39~~
	Total	Rs 182.68 Lacs ~~160.35~~	Rs 180.75 Lacs ~~163.68~~
	Add 3% Contingencies Cost P.E Charges	Rs 5.48 Lacs ~~6.05~~	Rs 5.42 Lacs ~~4.91~~
		Rs 188.16 Lacs ~~173.40~~	Rs 186.17 Lacs ~~168.60~~
	Add 14% Departmental Charges, Price escalation & unforseem charges 45 %.	Rs 92.20 Lacs ~~24.27~~ 24.26	Rs 91.22 Lacs ~~23.60~~ 23.60
		280.36 Lacs ~~197.67~~ Total ~~197.68~~	R 277.39 Lacs ~~192.20~~ Total ~~192.20~~
	(CO to final abstract of cost)	Say ~~197.69~~	Say ~~192.20~~

S. No.	Description	Unit	POKET - A Qty	Rate	Amount	POKET - B Qty	Rate	Water Supply Head Works Amount
	Sub Work I							
	Sub Head No. I							
					Rs. (lacs)			Rs. (lacs)
1	Construction of boosting chambers of suitable size along with under ground tank of **capacity 690 KL for Pocket - A & 655 KL for Pocket - B** pumping machinery and generating set etc. complete in all respects.							
	Details of boosting station							
i)	construction of boosting chamber	LS.	-	-	7.50	-	-	5.00
ii)	UG tank for **Pocket - A 690 KL** capacity incl. 375 KL for fire fighting in two compartments @ 3500 / KL.	KL	690 ~~695~~	3500	24.15 ~~24.33~~	-	-	-
iii)	UG tank for **Pocket - B 655 KL** capacity incl. 375 KL for fire fighting in two compartments @ 3500 / KL.	KL	-	-	-	655 ~~665~~	3500	22.93 ~~23.28~~
2	Provision for carriage of material and other unforeseen items.	LS.	-	-	2.00	-	-	2.00
3	Provision for facilites staff for Maintenance.	LS.	-	-	5.00	-	-	5.00
4	Provision for pipes, valves & specials inside the pump chamber.	LS	-	-	5.00	-	-	5.00
	(C O. to abstract of cost of Sub-work No.I)			Total	43.65 ~~43.83~~		Total	39.93 ~~40.28 Lacs~~
				~~Say~~	~~43.83~~		~~Say:~~	~~40.28 Lacs~~

5) Provision for T. wells Complete in all respect — 2 Nos @ Rs 7.00 Rs 14.00 — 2 Nos @ Rs 7.00 — 14.00 Lacs
6) Provision for Sluice valve (L.S) — & 0.50 — 0.50 Lacs
7) Provision for Pump Chamber for T.W. House & T.W. line upto (L.S) — & 5.00 Lacs — & 5.00 Lacs

		POKET - A				POKET - B			
	Sub Work I							Water Supply	
	Sub Head No. II							Pumping Machinery	
S. No.	Description	Unit	Qty	Rate	Amount	Qty	Rate	Amount	
					(in Lakhs)			(in Lakhs)	
1 (i)	Providing & installing electricity driven pumping set capable of delivering 310 LPM of water against a total head of 101 m complete with motor and other accessories (For Domestic - ~~12.5~~ 15.0 HP)	Nos.	3	200000.00	6.00	-	-	-	
(ii)	Providing & installing electricity driven pumping set capable of delivering 310 LPM of water against a total head of 101 m complete with motor and other accessories (For Domestic - 12.5 HP)	Nos.	-	-	-	3	1.50 Lacs ~~200000.00~~	4.50 ~~6.00~~	
(iii)	Providing & installing electricity driven pumping set capable of delivering 200 LPM of water against a total head of 31 m complete with motor and other accessories (For Domestic - 3.0 HP)	Nos.	2	45000.00	0.90	-	-	-	
(iv)	Providing & installing electricity driven pumping set capable of delivering 180 LPM of water against a total head of 26 m complete with motor and other accessories (For Domestic - 2.0 HP)	Nos.	-	-	-	2	35000.00	0.70	
(V)	Flushing water pump (4W + 4 S.by) for Towers & Villas	(L.S)			Rs. 7.50 Lacs			Rs 7.50 Lacs	
2	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities.								
	1 No. ~~100~~ 80 KVA for **Pocket - A** 1 No. - 80 KVA for **Pocket - B**	Nos.	1	1500000.00	10.00 ~~15.00~~	1	7.50 ~~1200000.00~~	7.50 ~~12.00~~	
3	Providing & installing pumping set of following capacities for fire protection.								
	10								
i)	180 LPM @ 135 M Head (25 HP)	Nos.	1	150000.00	1.50	1	150000.00	1.50	

			POKET - A			POKET - B		
ii)	2280 LPM @ 135 M Head (110 HP) Hydrant	Nos.	1	750000.00	7.50	1	750000.00	7.50
iii)	2280 LPM @ 135M Head (110 HP) Sprinkler	Nos.	1	750000.00	7.50	1	750000.00	7.50
iv)	2280 LPM @ 135 M Head (DG Pump)	Nos.	1	1000000.00	10.00	1	1000000.00	10.00
4	Provision for making foundations & erection of pumping machinery	LS	-	-	1.00	-	-	1.00
5	Provision for pipes, valves & specials inside the pump chamber	LS	-	-	2.50 ~~1.25~~	-	-	2.50 ~~1.25~~
6	Provision for carriage for materials and other unforeseen items	LS	-	-	1.00 ~~0.75~~	-	-	1.00 ~~0.75~~
7	Provision for electric services connection ~~including electric bills~~ Complete in all respect including cost of transformer	LS	-	-	2.50	-	-	2.50
	(C.O. to abstract of cost of Sub-work No.I)			~~Total~~	~~53.99~~		~~Total~~	~~50.70~~
				~~Say~~	~~53.00~~		~~Say~~	~~50.70~~

8) Provision for Chemical pressure type Chlorination plant Complete (L.S) — Rs 1.00 Lacs — 1.00 Lacs

9) Providing and installing electrically driven electro or Submersible pumpsets Sets of delivering 22 KL water per hrs against a total Head of 80m (6 S) Complete with motor and other accessories for 7 wells. — Rs 5.00 Lacs — Rs 3.00 Lacs

Rs 63.90 Lacs — Rs 57.70 Lacs

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		POKET - A				POKET - B			
	Sub Work I							Water Supply (Dom.+F	
	Sub Head No. III							Distribution System/Rising Main	
S. No.	Description CI|OC	Unit	Qty	Rate	Amount (Rs.)	Qty	Rate	Amount (Rs.)	
1	Providing, laying, jointing & testing G.I. pipes including cost of hanging at basement ceiling complete as per ISI marked. (Domestic + Flushing)								
i)	50 mm dia (Running at Basement Ceiling)	M	193	650.00	125450.00	243	650.00	157950.00	
ii)	65 mm dia (Running at Basement Ceiling)	M	722	850.00	613700.00	460	850.00	136000.00	
iii)	80 mm dia (Running at Basement Ceiling)	M	489	950.00	179550.00	204	950.00	193800.00	
iv)	100 mm dia (Running at Basement Ceiling)	M	657+702=1359	1250.00	706250.00	1379	1250.00	1723750.00	24.83 Lac
v)	150 mm dia (Running at Basement Ceiling)	M	43	1550.00	66650.00	25	1550.00	38750.00	
				1575/-	0.68 Lac	1092+802=1986	1575/-	0.40 Lac	
						16.99 Lac			
2	Providing, fixing & Testing Sluice valves including cost of complete in all respects.								
i)	65 mm i/d	Nos.	2	3500.00	7000.00	1	3500.00	3500.00	
ii)	80 mm i/d	Nos.	0	40000.00	0.00	1	40000.00	40000.00	
					0.60 Lac				
iii)	100 mm i/d	Nos.	5	12000.00	60000.00	7	12000.00	84000.00	
iv)	150 mm i/d	Nos.	1	15000.00	15000.00	1	15000.00	15000.00	
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	1	12000.00	12000.00	
4	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	6	10000.00	60000.00	6	10000.00	60000.00	
5	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	13	1000.00	13000.00	12	1000.00	12000.00	
6	Provision for carriage of material	LS	-	-	150000.00	-	-	150000.00	
7	Provision for cutting the roads and making to its original conditions.	LS	-	-	150000.00	-	-	150000.00	

					POKET - A			POKET - B	
8	Making water supply connection on master road	LS	-	-	~~250000.00~~ 0.50 Lacs		-	~~250000.00~~ 0.50 Lacs	
9	Provision for rising main from HUDA to UG Tank				1250/-	3.75 Lacs		1250/-	3.75 Lacs
I)	100 mm i/d DI	M	300		~~1500.00~~	~~450000.00~~	300	~~1500.00~~	~~450000.00~~
						26.50 Lacs			34.31 Lacs
	(C.O. to abstract of cost of Sub-work No.I)				Total	~~2696159.00~~		Total	~~3226800.00~~
					Say	~~26.95~~		Say	~~32.20 Lacs~~

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		POKET - A				POKET - B		
	Sub Work I							Water Supply
	Sub Head No. IV							Irrigation
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)	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.			350/	0.54 Lacs		350/	0.42 Lacs
i)	25 mm dia connect to flushing line	M	155	~~175.00~~	~~27125.00~~	120	~~175.00~~	~~21000.00~~
~~ii)~~	~~80 mm dia~~	~~M~~	~~1382~~	~~800.00~~	~~1105600.00~~	~~816~~	~~800.00~~	~~Z28000.00~~
2	Providing and fixing 20mm dia Irrigation hydrant valve complete in all respect.	Nos.	31	3500/ ~~800.00~~	1.09 Lacs ~~24800.00~~	24	3500/ ~~800.00~~	0.84 Lacs ~~19200.00~~
3	Providing & fixing valve 25mm dia	Nos.	31	400.00	12400.00	24	400.00	9600.00
4	Providing, fixing & Testing Sluice valves including cost of complete in all respects.							
i)	80 mm i/d	~~Nos~~	~~1~~	~~4750.00~~	~~4750.00~~	1	~~4750.00~~	~~4750.00~~
5	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	1	4500.00	4500.00	1	4500.00	4500.00
6	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	2	1000/ ~~800.00~~	2000 ~~1600.00~~	2	1000/ ~~800.00~~	2000 ~~1600.00~~
7	Provision for carriage of materials etc. and other unforsean charges	LS	-	-	15000.00	-	-	15000.00
8	~~Provision for cutting of roads & making good to its in original condition~~	~~LS~~	-	-	~~30000.00~~	-	-	~~30000.00~~
					1.97 Lacs			1.57 Lacs
				Total	~~1102550.00~~		Total	~~812550.00~~
				~~Say~~	~~11.03~~		~~Say~~	~~8.13 Lacs~~

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FIRE FIGHTING

		POKET - A				POKET - B			
	Sub Work I								
	Sub Head No. V							Fire Scheme	
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)	Qty	Rate	Amount (Rs.)	
1	Providing, laying, jointing & testing M.S. pipes for fire ring main including cost of Fittings, Valves & excavation complete (as per ISI marked) in all respect.			1575/-	16.21 lacs		1575/-	16.33 lacs	
a)	150 mm dia	M	1029 ✓	~~2000.00~~	~~2058000.00~~	1037 ✓	~~2000.00~~	~~2074000.00~~	
b)	80 mm dia	M	290 ✓	1000.00	290000.00 ✓	150 ✓	1000.00	150000.00 ✓	
2	Providing and fixing External Fire Hydrants complete with masonary chambers.	Nos.	20	15000.00	300000.00	26 Nos	15000.00	2.60 lacs 390000.00	
3	Providing & fixing valve including cost of masonary chamber complete in all respects.			1500	0.45 lacs		1500	0.45 lacs	
a)	150 mm dia	Nos.	3	~~20000.00~~	~~60000.00~~	3	~~20000.00~~	~~60000.00~~	
b)	80 mm dia	Nos.	20	10000.00	200000.00	26	10000.00	260000.00	
4	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.			10000/-	2 lacs		10000/-	2.60 lacs	
i)	80 mm i/d	Nos.	20	~~5000.00~~	~~100000.00~~	26	~~5000.00~~	~~130000.00~~	
5	Provision for cutting of roads and carriage of materials etc. and other unforsean charges.	LS	-	-	40000.00	-	-	40000.00	
6	Provision for indication plates.	Nos.	20	1000.00	20000.00	26	1000.00	26000.00	
7	Provision for carriage of material.	LS	-	-	100000.00	-	-	100000.00	
				Total	~~3168000.00~~		Total	~~3230000.00~~	
				Say	27.76 Lacs ~~31.68~~		Say	27.74 Lacs ~~32.30~~	Lacs

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		POKET - A				POKET - B			
	Sub Work II							Sewerage Scheme	
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)	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)	**250 mm i/d**								
a)	Average depth 1.5 m to 4.5 m	M	403 m	1800.00	725400.00	378 m	1800.00	680400.00	
ii)	**300 mm dia i/d**				4.71 Lacs			8.86 Lacs	
a)	Average depth 1.5 m to 4.5 m	M	219 mts	~~2000.00~~ 2150/-	~~438000.00~~	412 m	~~2000.00~~ 2150/-	824000.00	
2	Provision for lighting, watching and temporary diversion of traffic.	LS	-	-	200000.00	-	-	200000.00	
3	Provision for cutting of roads and carriage of materials etc. and other unforsean charges	LS	-	-	100000.00	-	-	100000.00	
4	Provision for connection with HUDA. on master plan	LS	-	-	200000.00	-	-	200000.00	
5	Cost of 460 Kld Sewerage Treatment Plant for Pocket - (A).	LS	-	-	50.0 Lacs ~~5000000.00~~	-	-	-	
6	360 Cost of 400 Kld Sewerage Treatment Plant for Pocket - (B).	LS	-	-	-	-	-	45.0 Lacs ~~4500000.00~~	

		POKET - A				POKET - B			
7	Provision for CI / DI pipe 150 mm dia pipe from STP. To Huda Main Line.	LS	-	-	50000.00	-	-	50000.00	
				Total	6613400.00			Total	6164400.00
					67.46 Lacs				66.16 Lacs
	Add 3% contingencies & P.E. charges				2.02 Lacs 198402				1.98 Lacs 184632
					6811802.00				6339032.00
					69.48 Lacs				68.14 Lacs
	4% Add 14% Departmental Charges, Price escalation & unforseem charges, Addnl.				34.04 Lacs 953652.28				33.39 Lacs 887464.48
					103.52 Lacs				101.53
				Total	7765454.28			Total	7226496.48
	(C.C. to abstract of cost of Sub-work No. 1)			Say	77.65			Say	72.26 Lacs

	Sub Work - III	POKET - A				POKET - B			
						Storm Water Drain			
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)	Qty	Rate	Amount (Rs.)	
1	Providing, lowering, jointing, cutting RCC NP3 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	24.26 Lacs		2505/-	21.05 Lacs	
a)	Average depth 1.5 m to 4.5 m	M	971	~~1800.00~~	~~1747800.00~~	842	~~1800.00~~	~~1515600.00~~	
ii)	**500 mm i/d**			3400/-	0.17 Lacs		3405/-	0.17 Lacs	
a)	Average depth 1.5 m to 4.5 m	M	5	~~2050.00~~	~~10250.00~~	5	~~2050.00~~	~~10250.00~~	
2	Provision for Road Gully & Drain with 300 mm Pipe Connection	LS	-	-	200000.00	-	-	200000.00	
3	Provision for cutting of roads and carriage of materials etc. and other unforseen items.	LS	-	-	150000.00	-	-	150000.00	
4	Provision for disposal arrangements Recharge Pit . Site Total area = 20.169 (10.41875+9.75025) ACRE	Nos	11	150000.00	1650000.00	10	150000.00	1500000.00	
	Notes : Per acre 1 Recharge Pit.								
5	Provision for lighting, watching and temporary diversion of traffic, timbering & shoring	LS	-	-	500000.00	-	-	500000.00	

		POKET - A				POKET - B			
6	Provision for connection with HUDA main on Master road	LS	-	-	50000.00	-	-	50000.00	
					49.95 Lacs			45.22 Lacs	
				Total	4508050.00		Total	4125860.00	
	Add 3% contingencies & PE charges.				135241.50			123775.50	
					1.38 Lacs			1.36 Lacs	
	4% Add 14% Departmental Charges, Price escalation & unforseem charges			47.33	4643291.50			4249625.50	46.58
				23.19	950060.81			584947.57	22.82
				$ 70.52					
				Total	5293352.31		Total	4844573.07	69.4
				Say	52.93		Say	48.45 Lacs	
	(C.O. to abstract of cost of Sub-work No. 1				69.19			63.37	

S. No.	Sub Work IV Description	Unit	POKET - A Qty	Rate	Amount (Rs.)	POKET - B Qty	Rate	Road Work Amount (Rs.)
1	Provision for levelling & earth filling as per site conditions.As per cut & fill plan @ Rs.100,000/-per Acre	Acres	10.41875 ✓	100000	1041875.00	9.75025 ✓	100000	975025.00
2	Construction of road by:-							
	i) Providing GSB 300 mm thick.							
	ii) 250 mm thick stone aggregate.							
	ii) 50 mm thick B.M.							
	iii) 40 mm thick ~~M.S.S.~~ SDBC 1:1½:3	Sq. mtr.	8500 ~~9890.00~~	1000/-	85 Lacs ~~9890000.00~~	12180 ~~4400.00~~	1000/-	121.80 Lacs ~~4400000.00~~
3	Provision for kerbs & channels of CC ~~1:2~~, 5:5, 1:1 1/2: 3 (~~@ Rs.500/-per RM~~)	mtr.	865 ~~975~~	600.00	5.19 Lacs ~~487500.00~~	1550 ~~1800~~	600.00	9.30 Lacs ~~900000.00~~
4	Provision for making approach and pavement to building.	LS.	-	-	500000.00	-	-	500000.00
5	Provision for parking arrangement.	LS.	-	-	500000.00	-	-	500000.00
					5 Lacs			5 Lacs
6	Provision for carriage of material & other unforeseen items	LS.	-	-	100000.00	-	-	100000.00
7	Provision for Guide Maps.	LS.	-	-	0.25 ~~25000.00~~	-	-	0.25 ~~25000.00~~

c/o to ₹ 1178.6 Lacs

Rs 157.50 Lacs

			POKET - A				POKET - B				
8	Provision for Un-foreseen	LS.	-	-		70000.00	-	-		5000.00	
					Total	12569375.00			Total	7425025.00	157.50 Lacs
					Rs	117.86 Lacs					
	Add 3% contingencies & P.E. charges				Rs	377081.25 3.54 Lacs				222750.75	4.73 Lacs
											162.23
				Rs 121.40 Lacs		12946456.25				7647775.75	
				Rs 59.48 Lacs		129.46				76.48 Lacs	79.49
	46% Add 14% Departmental Charges, Price escalation & unforseem charges			Rs 180.88 Lacs	Total	18.13			Total	10.71 Lacs	241.7
					Say	147.59			Say	87.18 Lacs	

(Go to Grand Abstract sheet)

499

ROAD NO	Length IN MTR
1	10.00
2	10.00
3	37.50
4	36.00
5	115.00
6	62.50
7	115.00
8	35.00
9	85.00
10	45.00
11	55.00
12	60.00
13	40.00
14	45.00
15	35.00
	786.00
Add 10% for curves	78.60
	864.60
width	7.50 mtr
	6484.50 Sqm

ROAD NO	Length in MTR
1	23.00
2	23.00
3	60.00
4	60.00
5	55.00
6	40.00
7	89.00
8	15.00
9	37.00
10	105.00
11	27.00
12	49.50
13	155.00
14	130.00
15	25.00
16	85.00
17	95.00
18	55.00
19	60.00
20	57.00
21	42.50
22	45.00
	1309.00
Add 10% for curves	130.90
	1439.90
	6 m wide
	8639.40 Sqm

Total metalled width in (A+B) = 6484.50 + 8639.40 = 15123.90 Sqm

Pocket A

Surface car Packing = 161 Nos

Area = 161 × 3.50 × 5.00 = 2818.50 Sqm

Total in Pocket A = 6484.50 + 2818.50 = 9303 Sqm

Pocket - B

Surface car packing = 278 Nos

278 × 3.50 × 5.00 = 3475 Sqm

Total in Pocket - B

8639.40 + 3475.00 = 12114.40 Sqm

S. No.	Sub Work V	Unit	POKET - A Qty	Rate	Amount (Rs.)	POKET - B Qty	Rate	Street Lighting Amount (Rs.)
1	Providing, fixing street lighting on roads as per standard specifications Total Say @Rs. ~~125000~~ 1.50 per acre (with CFL)	per acre	10.41875	1.50 lacs ~~125000.00~~	15.63 las ~~1302343.75~~	9.75025	1.50 las ~~125000.00~~	14.63 las ~~1218781.25~~
	Add 3% contingencies & P.E. Charges				0.47 las ~~39070.31~~			0.44 las ~~36563.44~~
				Total	16.10 las ~~[illegible]~~		Total	15.07 las ~~1255344.69~~
	Add ~~14%~~ 49% Departmental Charges, Administration & Supervision charges, Adum.				7.89 las ~~[illegible]~~ ~~183779.87~~			7.38 las ~~615119~~ ~~175748.26~~
					23.99 las			22.45 las
				Total	~~1195710~~ ~~1528291.41~~		Total	~~1870464~~ 1431093.00
				Say	~~15.28~~		Say	~~14.31~~ Lacs
					~~15.99~~			~~18.71~~

(G to [illegible] Assistant [illegible])

~~500~~
501

			POKET - A			POKET - B		
	Sub Work VI							Horticulture
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)	Qty	Rate	Amount (Rs.)
	Development of lawn area							
1	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.	Cum	9995	28.5	2852858	8298	30	248940
	b) Rough dressing of trenched area.	acre	4.5	2425	10912.5	3.795	2425	9203
	c) Grassing with "DOOB GRASS" i/c watering and maintenance of lawns for 30 days till the grass forms a thick lawn , free from weeds and fit for mowing in row 7.5 cm part in either direction.(organized Green area@Rs.75,000/-per acre).	acre	0.9	75000	67500	0.65	75000.00	48750.00
2	Providing and planting trees along boundary @ 2.5 m interval.							
	Total Road length	mtr.	975			975		
	Total No. of Trees	Nos	600	750	450000	500	750.00	375000.00
	Total No. of Shrub	Nos	5250	250	1312500	5000	250.00	1250000.00
	Total No. of Ground Cover	Sqmt	13200	350	4620000	12700	350.00	4445000.00
				Total	6766668.00		Total	6412727.28
	Add 3% contingency charges				203000.04			192381.82
					6969668.04			6605109.09
	Add.14% Departmental Charges, Price escalation & unforseem charges				975753.53			924715.27
				Total	7945421.57		Total	7529824.37
				Say	79.45		Say	75.30 Lacs

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Cost details

(i) Excavation = 30/-
(ii) Manure = 60/-
(iii) Tree plant = 60/-
(iv) Tree Guard = 600/-

₹ 750/-

		POKET - A				POKET - B			
	Sub Work VII							Maintenance Charges & Resurfacing of Roads	
S. No.	Description	Unit	Qty	Rate	Amount (Rs.)	Qty	Rate	Amount (Rs.)	
1	Provision of MTC charges for W/s, SWD, Sewarage, Roads, Street Lighting, Horticulture etc.								
	Complete in all aspect, including operational and establishment charges as per HUDA norms for 10 years completion @ Rs. 5.0 lacs per acre.	per acre	10.41875	500000	5209375	9.75025	500000	4875125	
2	Provision for resurfacing of road after Ist 5 year of M.T.C. i.e. 100 mm thick BUSG compected to 75 mm thick with 25 mm thick premix carpet with seal coat with mechanical paved @ Rs.850/SQM.	sqm.	8500 ~~9890.00~~	600/- ~~800~~	51.00 lac, ~~7912000~~	12120 ~~4400.00~~	600/- ~~800~~	72.72 lacs ~~3520000~~	
3	Provision for resurfacing of road after 10 year of M.T.C. i.e. 25 mm thck P.C. with seal coat with mechanical paved @ Rs.450/SQM	sqm.	8500 ~~9890.00~~	750/- ~~450~~	63.75 lacs ~~4450500~~	12120 ~~4400.00~~	750/- ~~450~~	90.90 lacs ~~1980000~~	
					166.64 lac,				
				Total	~~17571875~~		Total	~~10375125~~	212.37 lacs
					5.00 lacs				
	Add 3% contingency & PE charges				~~527156.25~~			~~311253.75~~	6.37 lacs
					171.64 lacs				
	49%				~~18099031.25~~	84.20 lacs		~~10686378.75~~	218.74
	Add 14% Departmental Charges, Price escalation & unforseem charges				~~2533864.38~~	256.04 lacs		~~1496093.08~~	167.1
				Total	20632895.63		Total	12182471.78	325.
				Say	206.33	Lacs	Say	121.82	Lacs

(Go to Final Abstract at Cost)

PROJECT: PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20,159 (11.675+8.284) ACRE

DOMESTIC WATER SUPPLY QUANTITY SHEET

505

S.No.	Line No	Pocket - (A)		Pocket - (B)	
	From - To	Length of Pipe (mtr.)	Dia of Pipe (mm)	Length of Pipe (mtr.)	Dia of Pipe (mm)
1.	*U.G.Tank - DW1*	26.0	150	-	-
2.	DW1 - DW2	24.0	100	-	-
3.	DW2 - DW3	98.0	100	-	-
4.	DW3 - DW4	46.0	100	-	-
5.	DW1 - DW5	17.0	150	-	-
6.	DW5 - DW4	97.0	100	-	-
7.	*U.G.Tank - W1*	24.0	100 ~~80~~	-	-
8.	W1 - W1a	175.0	100 ~~65~~	-	-
9.	W1 - W2	45.0	100 ~~80~~	-	-
10.	W2 - W2a	120.0	100 ~~80~~	-	-
11.	W2 - W3	38.0	100 ~~65~~	-	-
12.	*U.G.Tank - D1*	-	-	25.0	150
13.	D1 - D2	-	-	96.0	100
14.	D2 - D3	-	-	90.0	100
15.	D3 - D4	-	-	90.0	100
16.	D1 - D5	-	-	115.0	100
17.	D5 - D4	-	-	201.0	100
18.	*U.G.Tank - DD1*	-	-	25.0	100
19.	DD1 - DD2	-	-	116.0	100
20.	DD2 - DD3	-	-	84.0	100
21.	DD3 - DD4	-	-	120.0	100
22.	DD4 - DD4a	-	-	40.0	100
23.	DD4 - *DD5*	-	-	115.0	100

PART A — Part - B — Total

150mm dia 26+17 = 43 mt + 25 m = 68 mt

100mm dia 657 mt + 1092 m = 1759 mt

FLUSHING WATER SUPPLY QUANTITY SHEET

S.No.	Line No	Pocket - (A)		Pocket - (B)	
	From - To	Length of Pipe (mtr.)	Dia of Pipe (mm)	Length of Pipe (mtr.)	Dia of Pipe (mm)
1.	STP. - FL1	25.0	100	-	-
2.	FL1 - FL2	100.0	100	-	-
3.	FL2 - FL3	45.0	100	-	-
4.	FL1 - FL4	47.0	100	-	-
5.	FL4 - FL3	83.0	100	-	-
6.	STP. - L1	25.0	~~65~~ 100	-	-
7.	L1 - L1a	157.0	~~50~~ 100	-	-
8.	L1 - L2	64.0	~~65~~ 100	-	-
9.	L2 - L2a	120.0	~~65~~ 100	-	-
10.	L2 - L3	36.0	~~50~~ 100	-	-
11.	STP. - F1	-	-	45.0	100
12.	F1 - F2	-	-	126.0	100
13.	F2 - F3	-	-	165.0	100
14.	F1 - F4	-	-	82.0	100
15.	F4 - F5	-	-	87.0	100
16.	F5 - F3	-	-	141.0	100
17.	STP. - FF1	-	-	45.0	65
18.	FF1 - FF2	-	-	115.0	~~100~~ 100
19.	FF1 - FF3	-	-	88.0	~~50~~ 100
		702 mtr		894 mtr	

505

MUNICIPAL WATER SUPPLY QUANTITY SHEET

S.No.	Line No	Pocket - (A)		Pocket - (B)	
	From - To	Length of Pipe (mtr.)	Dia of Pipe (mm)	Length of Pipe (mtr.)	Dia of Pipe (mm)
1	Municipal Supply	300.0	100	300.0	100

	Length in (MTR)	Pipe Dia (MM)	Length in (MTR)	Pipe Dia (MM)
Domestic & Flushing Water Supply line	193.0	50	243.0	50
Domestic & Flushing Water Supply line	422.0	65	160.0	65
Domestic & Flushing Water Supply line	189.0	80	204.0	80
Domestic & Flushing Water Supply line	565.0	100	1379.0	100
Domestic & Flushing Water Supply line	43.0	150	25.0	150
Municipal Water Supply line	300.0	100	300.0	100
65 Dia Valve	2	Nos.	1	Nos.
80 Dia Valve	0	Nos.	1	Nos.
100 Dia Valve	2	Nos.	2	Nos.
150 Dia Valve	1	Nos.	1	Nos.
100 Dia Non Return Valve	1	Nos.	1	Nos.
Air Valve	6	Nos.	6	Nos.

PROJECT: PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE

IRRIGATION WATER SUPPLY QUANTITY SHEET

508

S.No.	Line No		Pocket - (A)		Pocket - (B)	
	From	To	Length of Pipe (mtr.)	Dia of Pipe (mm)	Length of Pipe (mtr.)	Dia of Pipe (mm)
1.	S.T.P.	GG1	5.0	80	-	-
2.	GG1	GG2	16.0	80	-	-
3.	GG2	GG3	41.0	80	-	-
4.	GG3	GG4	131.0	80	-	-
5.	GG4	GG5	135.0	80	-	-
6.	GG5	GG6	150.0	80	-	-
7.	GG6	GG7	135.0	80	-	-
8.	GG7	GG7a	50.0	80	-	-
9.	GG7a	GG7b	137.0	80	-	-
10.	GG7b	GG7c	67.0	80	-	-
11.	GG7c	GG1	32.0	80	-	-
12.	GG7	GG8	50.0	80	-	-
13.	GG8	GG9	105.0	80	-	-
14.	GG9	GG10	150.0	80	-	-
15.	GG8	GG10	130.0	80	-	-
16.	GG10	GG2	48.0	80	-	-
17.	S.T.P.	G1	-	-	7.0	80
18.	G1	G2	-	-	172.0	80
19.	G2	G3	-	-	223.0	80
20.	G3	G4	-	-	285.0	80
21.	G4	G5	-	-	138.0	80
22.	G5	G1	-	-	105.0	80

	Length in (mtr.)	Pipe Dia	Length in (mtr.)	Pipe Dia
Irrigation Water Supply line	155.0	25	120.0	25
Irrigation Water Supply line	1382.0	80	910.0	80

Garden Hydrant	31	Nos.	24	Nos.
80 Dia Valve	1	Nos.	1	Nos.
Air Valve	1	Nos.	1	Nos.

FIRE QUANTITY SHEET

S.No.	Line No		Pocket - (A)		Pocket - (B)	
	From	To	Length of Pipe (mtr.)	Dia of Pipe (mm)	Length of Pipe (mtr.)	Dia of Pipe (mm)
1.	*U.G.Tank-01*	BB1	26.0	150	-	-
2.	BB1	BB2	61.0	150	-	-
3.	BB2	BB3	105.0	150	-	-
4.	BB2	BB4	178.0	150	-	-
5.	BB3	BB4	170.0	150	-	-
6.	BB4	BB5	187.0	150	-	-
7.	BB5	BB6	130.0	150	-	-
8.	BB6	BB1	122.0	150	-	-
9.	*U.G.Tank-01*	*F.B. Inlet*	25.0	150	-	-
10.	*U.G.Tank-01*	*F.B. Withdrawl*	25.0	150	-	-
11.	*U.G.Tank-02*	B1	-	-	38.0	150
12.	B1	B2	-	-	45.0	150
13.	B2	B3	-	-	72.0	150
14.	B3	B4	-	-	210.0	150
15.	B4	B5	-	-	127.0	150
16.	B5	B6	-	-	133.0	150
17.	B6	B7	-	-	145.0	150
18.	B7	B8	-	-	132.0	150
19.	B8	B1	-	-	45.0	150
20.	*U.G.Tank-02*	*F.B. Inlet*	-	-	45.0	150
21.	*U.G.Tank-02*	*F.B. Withdrawl*	-	-	45.0	150

	Length	Length
80 mm Dia Pipe	290.0 mtr.	150.0 mtr.
150 mm Dia Pipe	1029.0 mtr.	1037.0 mtr.

External Fire Hydrant	20 Nos.	26 Nos.
80 Dia Valve	20 Nos.	26 Nos.
150 Dia Valve	3 Nos.	3 Nos.
80 Dia Non Return Valve	20 Nos.	26 Nos.

PROJECT: PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE

TITLE - SEWERAGE QUANTITY SHEET FOR POCKET - (A)

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	SS1	SS2	81.0	250	0.250	2.00	2.45	2.22	132.84	0.0	81.0	0.0	0.0
2.	SS2	SS3	90.0	300	0.300	2.45	2.85	2.65	185.62	0.0	90.0	0.0	0.0
3.	SS3	SS4	111.0	300	0.300	2.85	3.35	3.10	264.05	0.0	0.0	111.0	0.0
4.	SS5	SS6	185.0	250	0.250	2.00	3.12	2.56	344.14	0.0	185.0	0.0	0.0
5.	SS6a	SS6	137.0	250	0.250	1.50	2.28	1.89	195.07	0.0	137.0	0.0	0.0
6.	SS6	SS4	13.0	300	0.300	3.12	3.15	3.13	31.26	0.0	0.0	13.0	0.0
7.	SS4	S.T.P	5.0	300	0.300	3.35	3.37	3.36	12.81	0.0	0.0	5.0	0.0
	Total		**622.0**						**1166.0**	**0.0**	**493.0**	**129.0**	**0.0**

Excavation Depth				
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
200 mm Dia pipe	0.0	0.0	0.0	0.0
250 mm Dia pipe	0.0	403.0	0.0	0.0
300 mm Dia pipe	0.0	90.0	129.0	0.0

TITLE - SEWERAGE QUANTITY SHEET FOR POCKET - (B)

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	155.0	250.0	0.250	2.00	2.76	2.38	269.80	0.0	155.0	0.0	0.0
2.	S2	S3	138.0	300.0	0.300	2.76	3.24	3.00	318.47	0.0	138.0	0.0	0.0
3.	S3	S4	96.0	300.0	0.300	3.24	3.62	3.43	250.64	0.0	0.0	96.0	0.0
4.	S5	S6	103.0	250.0	0.250	2.00	2.46	2.23	169.45	0.0	103.0	0.0	0.0
5.	S6	S7	120.0	250.0	0.250	2.46	3.04	2.75	238.13	0.0	120.0	0.0	0.0
6.	S7	S8	101.0	300.0	0.300	3.04	3.41	3.23	249.27	0.0	0.0	101.0	0.0
7.	S8	S4	72.0	300.0	0.300	3.41	3.74	3.57	195.13	0.0	0.0	72.0	0.0
8.	S4	S.T.P	5.0	300.0	0.300	3.74	3.76	3.75	14.16	0.0	0.0	5.0	0.0
Total			790.0						1706.0	0.0	516.0	274.0	0.0

Excavation Depth				
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
200 mm Dia pipe	0.0	0.0	0.0	0.0
250 mm Dia pipe	0.0	378.0	0.0	0.0
300 mm Dia pipe	0.0	138.0	274.0	0.0

PROJECT: PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE

TITLE : STORM WATER QUANTITY SHEET FOR POCKET - (A)

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	AA1	AA2	85.0	400	0.400	2.00	2.12	2.06	200.56	0.0	85.0	0.0
2.	AA2	D.C.01	2.0	400	0.400	2.12	2.12	2.12	4.84	0.0	2.0	0.0
3.	D.C.01	R.P.01	2.0	400	0.400	2.12	2.13	2.12	4.85	0.0	2.0	0.0
4.	R.P.01	AA3	5.0	400	0.400	2.00	2.01	2.00	11.52	0.0	5.0	0.0
5.	AA3	AA4	69.0	400	0.400	2.01	2.13	2.07	163.48	0.0	69.0	0.0
6.	AA4	D.C.02	5.0	400	0.400	2.13	2.14	2.13	12.17	0.0	5.0	0.0
7.	D.C.02	R.P.02	2.0	400	0.400	2.14	2.14	2.14	4.88	0.0	2.0	0.0
8.	R.P.02	AA5	3.0	400	0.400	2.14	2.15	2.14	7.33	0.0	3.0	0.0
9.	AA5	AA6	110.0	400	0.400	2.15	2.28	2.21	276.52	0.0	110.0	0.0
10.	AA6	D.C.03	5.0	400	0.400	2.28	2.29	2.28	12.92	0.0	5.0	0.0
11.	D.C.03	R.P.03	2.0	400	0.400	2.29	2.29	2.29	5.18	0.0	2.0	0.0
12.	R.P.03	AA7	2.0	400	0.400	2.29	2.30	2.29	5.19	0.0	2.0	0.0
13.	AA7	AA8	38.0	400	0.400	2.30	2.32	2.31	99.16	0.0	38.0	0.0
14.	AA8	D.C.04	2.0	400	0.400	2.32	2.33	2.32	5.25	0.0	2.0	0.0
15.	D.C.04	R.P.04	2.0	400	0.400	2.33	2.33	2.33	5.26	0.0	2.0	0.0
16.	R.P.04	AA9	2.0	400	0.400	2.33	2.33	2.33	5.26	0.0	2.0	0.0
17.	AA9	AA10	30.0	400	0.400	2.33	2.39	2.36	79.79	0.0	30.0	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.)
18.	AA11	AA12	48.0	400	0.400	2.00	2.08	2.04	112.42	0.0	48.0	0.0
19.	AA12	D.C.05	6.0	400	0.400	2.00	2.01	2.01	13.83	0.0	6.0	0.0
20.	D.C.05	R.P.05	2.0	400	0.400	2.00	2.00	2.00	4.60	0.0	2.0	0.0

Contd.

Cont.

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.)
21.	R.P.05	AA13	2.0	400	0.400	2.00	2.00	2.00	4.60	0.0	2.0	0.0
22.	AA13	AA14	68.0	400	0.400	2.00	2.09	2.05	159.67	0.0	68.0	0.0
23.	AA14a	AA14	72.0	400	0.400	2.00	2.10	2.05	169.07	0.0	72.0	0.0
24.	AA14	D.C.06	8.0	400	0.400	2.10	2.11	2.10	19.23	0.0	8.0	0.0
25.	D.C.06	R.P.06	2.0	400	0.400	2.11	2.11	2.11	4.82	0.0	2.0	0.0
26.	R.P.06	AA15	4.0	400	0.400	2.11	2.12	2.12	9.67	0.0	4.0	0.0
27.	AA15	AA16	52.0	400	0.400	2.12	2.17	2.15	127.22	0.0	52.0	0.0
28.	AA16	D.C.07	2.0	400	0.400	2.17	2.18	2.17	4.95	0.0	2.0	0.0
29.	D.C.07	R.P.07	2.0	400	0.400	2.18	2.18	2.18	4.95	0.0	2.0	0.0
30.	R.P.07	AA17	8.0	400	0.400	2.18	2.19	2.19	19.89	0.0	8.0	0.0
31.	AA17a	AA17b	88.0	400	0.400	2.00	2.10	2.05	206.99	0.0	88.0	0.0
32.	AA17b	D.C.08	2.0	400	0.400	2.10	2.11	2.11	4.81	0.0	2.0	0.0
33.	D.C.08	R.P.08	2.0	400	0.400	2.11	2.11	2.11	4.82	0.0	2.0	0.0
34.	R.P.08	AA17c	5.0	400	0.400	2.11	2.12	2.12	12.08	0.0	5.0	0.0
35.	AA17c	AA17	45.0	400	0.400	2.12	2.15	2.13	109.56	0.0	45.0	0.0
36.	AA17	AA18	31.0	400	0.400	2.19	2.20	2.20	77.36	0.0	31.0	0.0
37.	AA18	D.C.09	2.0	400	0.400	2.20	2.20	2.20	5.00	0.0	2.0	0.0
38.	D.C.09	R.P.09	2.0	400	0.400	2.20	2.20	2.20	5.01	0.0	2.0	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.)
39.	R.P.09	AA19	2.0	400	0.400	2.20	2.21	2.21	5.01	0.0	2.0	0.0
40.	AA19	AA20	51.0	400	0.400	2.21	2.30	2.25	130.19	0.0	51.0	0.0
41.	AA20	D.C.10	2.0	400	0.400	2.30	2.30	2.30	5.20	0.0	2.0	0.0
42.	D.C.10	R.P.10	2.0	400	0.400	2.30	2.30	2.30	5.21	0.0	2.0	0.0
43.	R.P.10	AA21	2.0	400	0.400	2.30	2.31	2.31	5.21	0.0	2.0	0.0
44.	AA21	AA10	87.0	400	0.400	2.31	2.46	2.38	233.54	0.0	87.0	0.0
45.	AA10	D.C.11	3.0	400	0.400	2.46	2.47	2.46	8.29	0.0	3.0	0.0
46.	D.C.11	R.P.11	3.0	400	0.400	2.47	2.47	2.47	8.31	0.0	3.0	0.0
47.	R.P.11	*To HUDA*	5.0	500	0.500	2.57	2.58	2.57	15.81	0.0	5.0	0.0
Total			**976.0**						**2402.0**	**0.0**	**976.0**	**0.0**

Excavation Depth			
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)
400 mm Dia pipe	0.0	971.0	0.0
500 mm Dia pipe	0.0	5.0	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.)
TITLE : STORM WATER QUANTITY SHEET FOR POCKET - (B)												
1	A1	A2	66.0	400	0.400	2.00	2.14	2.07	156.26	0.0	66.0	0.0
2.	A2	D.C.-01	3.0	400	0.400	2.14	2.14	2.14	7.32	0.0	3.0	0.0
3.	D.C.-01	R.P.-01	3.0	400	0.400	2.14	2.15	2.14	7.33	0.0	3.0	0.0
4.	R.P.-01	A3	5.0	400	0.400	2.15	2.16	2.15	12.25	0.0	5.0	0.0
5.	A3	A4	46.0	400	0.400	2.16	2.21	2.18	114.10	0.0	46.0	0.0
6.	A4	D.C.-02	6.0	400	0.400	2.21	2.22	2.21	15.07	0.0	6.0	0.0
7.	D.C.-02	R.P.-02	2.0	400	0.400	2.22	2.22	2.22	5.04	0.0	2.0	0.0
8.	R.P.-02	A5	4.0	400	0.400	2.22	2.23	2.22	10.09	0.0	4.0	0.0
9.	A5	A6	40.0	400	0.400	2.23	2.30	2.26	102.48	0.0	40.0	0.0
10.	A6	D.C.-03	5.0	400	0.400	2.30	2.31	2.30	13.01	0.0	5.0	0.0
11.	D.C.-03	R.P.-03	5.0	400	0.400	2.31	2.31	2.31	13.05	0.0	5.0	0.0
12.	R.P.-03	A7	2.0	400	0.400	2.31	2.32	2.32	5.23	0.0	2.0	0.0
13.	A7	A8	50.0	400	0.400	2.32	2.36	2.34	131.85	0.0	50.0	0.0
14.	A8	D.C.-04	5.0	400	0.400	2.36	2.36	2.36	13.30	0.0	5.0	0.0
15.	D.C.-04	R.P.-04	2.0	400	0.400	2.36	2.37	2.37	5.33	0.0	2.0	0.0
16.	R.P.-04	A9	3.0	400	0.400	2.37	2.37	2.37	8.01	0.0	3.0	0.0
17.	A9	A10	88.0	400	0.400	2.37	2.48	2.43	239.65	0.0	88.0	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.)
18.	A10	D.C.-05	2.0	400	0.400	2.48	2.48	2.48	5.56	0.0	2.0	0.0
19.	D.C.-05	R.P.-05	2.0	400	0.400	2.48	2.48	2.48	5.57	0.0	2.0	0.0
20.	R.P.-05	A11	2.0	400	0.400	2.48	2.49	2.49	5.57	0.0	2.0	0.0
21.	A11	A12	65.0	400	0.400	2.49	2.56	2.53	183.64	0.0	65.0	0.0
22.	A13	A14	87.0	400	0.400	2.00	2.11	2.06	205.00	0.0	87.0	0.0
23.	A14	D.C.-06	4.0	400	0.400	2.11	2.12	2.12	9.66	0.0	4.0	0.0
24.	D.C.-06	R.P.-06	4.0	400	0.400	2.12	2.13	2.12	9.69	0.0	4.0	0.0
25.	R.P.-06	A15	6.0	400	0.400	2.13	2.14	2.13	14.59	0.0	6.0	0.0
26.	A15	A16	60.0	400	0.400	2.14	2.21	2.17	148.49	0.0	60.0	0.0
27.	A16	D.C.-07	10.0	400	0.400	2.21	2.23	2.22	25.21	0.0	10.0	0.0
28.	D.C.-07	R.P.-07	4.0	400	0.400	2.23	2.24	2.23	10.13	0.0	4.0	0.0
29.	R.P.-07	A17	6.0	400	0.400	2.24	2.25	2.24	15.25	0.0	6.0	0.0
30.	A17	A18	35.0	400	0.400	2.25	2.27	2.26	89.54	0.0	35.0	0.0
31.	A18	D.C.-08	12.0	400	0.400	2.27	2.29	2.28	30.95	0.0	12.0	0.0
32.	D.C.-08	R.P.-08	2.0	400	0.400	2.29	2.29	2.29	5.18	0.0	2.0	0.0
33.	R.P.-08	A19	5.0	400	0.400	2.29	2.30	2.30	12.99	0.0	5.0	0.0
34.	A19	A20	121.0	400	0.400	2.30	2.47	2.39	325.30	0.0	121.0	0.0
35.	A20	D.C.-09	2.0	400	0.400	2.47	2.48	2.48	5.55	0.0	2.0	0.0

PROJECT: PROPOSED BUILDING PLAN GROUP HOUSING COLONY AREA MEASURING 20.169 (11.875+8.294) ACRE

(Pump Riser Calculation Sheet)

Towers Domestic Water Supply Design Calculation For Pocket - (A)

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 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
U.G.Tank - DW1	11.078	150	0.005	26.0	5	1.30	27.30	0.142	0.142	0.627	101.00	100.86	-	-	-
DW1 - DW2	2.980	100	0.003	24.0	5	1.20	25.20	0.083	0.225	0.379	100.86	100.63	14.63	86.00	Tower - (2)
DW2 - DW3	1.246	100	0.001	98.0	5	4.90	102.90	0.067	0.292	0.159	100.63	100.34	-	-	-
DW3 - DW4	1.246	100	0.001	46.0	5	2.30	48.30	0.032	0.324	0.159	100.34	100.02	12.02	88.00	Tower - (1)
DW1 - DW5	8.098	150	0.003	17.0	5	0.85	17.85	0.052	0.194	0.458	100.86	100.66	-	-	-
DW5 - DW4	8.098	100	0.021	97.0	5	4.85	101.85	2.134	2.327	1.030	100.66	98.34	4.34	94.00	Tower - (3, 4 & 5)
	Flow Rate			11.078	lps										
				664.7	LPM										
	(2 W + 1 S)			332.33	LPM										
	Maximum Building Height			85	m										
	Pump Head			101.00	m										
	Pump HP			12.4	HP										
	Say			12.5	HP										

Towers Flushing Water Supply Design Calculation For Pocket - (A)

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 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. - FL1	5.965	100	0.012	25.0	5	1.25	26.25	0.312	0.312	0.759	101.00	100.69	-	-	-
FL1 - FL2	1.604	100	0.001	100.0	5	5.00	105.00	0.110	0.422	0.204	100.69	100.27	14.27	86.00	Tower - (2)
FL2 - FL3	0.934	100	0.000	45.0	5	2.25	47.25	0.018	0.440	0.119	100.27	99.83	-	-	-
FL1 - FL4	4.360	100	0.007	47.0	5	2.35	49.35	0.329	0.641	0.555	100.69	100.05	12.05	88.00	Tower - (1)
FL4 - FL3	4.360	100	0.007	83.0	5	4.15	87.15	0.580	1.221	0.555	100.69	99.47	5.47	94.00	Tower - (3, 4 & 5)
	Flow Rate			5.965	lps										
				357.9	LPM										
	(1 W + 1 S)			357.9	LPM										
	Maximum Building Height			85	m										
	Pump Head			101.00	m										
	Pump HP			13.4	HP										
	Say			15.0	HP										

EWS, Community, Shops & Schools Domestic Water Supply Design Calculation For Pocket - (A)

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 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
U.G.Tank - W1	3.332	80	0.012	24.0	5	1.20	25.20	0.302	0.302	0.663	31.00	30.70	-	-	-
W1 - W1a	0.208	65	0.001	175.0	5	8.75	183.75	0.107	0.410	0.114	30.70	30.29	20.29	10.00	Raw Houses
W1 - W2	3.124	80	0.032	45.0	5	2.25	47.25	1.522	1.824	1.130	30.70	28.87	-	-	-
W2 - W2a	2.222	80	0.017	120.0	5	6.00	126.00	2.158	3.982	0.803	28.87	24.89	4.89	20.00	EWS & N. School
W2 - W3	0.903	65	0.009	38.0	5	1.90	39.90	0.355	2.179	0.494	28.87	26.69	14.69	12.00	Community & Shopping
	Flow Rate			3.332	lps										
	(1 W + 1 S)			199.9	LPM										
	Maximum Building Height			20	m										
	Pump Head			31.00	m										
	Pump HP			2.3	HP										
	SAY			2.00	HP										

EWS, Community, Shops & Schools Flushing Water Supply Design Calculation For Pocket - (A)

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 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. - L1	1.794	65	0.010	26.0	5	1.25	26.25	0.275	0.275	0.540	31.00	30.72	-	-	-
L1 - L1a	0.112	50	0.001	157.0	5	7.85	164.85	0.110	0.385	0.103	30.72	30.34	20.34	10.00	Raw Houses
L1 - L2	1.682	65	0.028	64.0	5	3.20	67.20	1.891	2.166	0.921	30.72	28.66	-	-	-
L2 - L2a	1.196	65	0.015	120.0	5	6.00	126.00	1.886	4.052	0.655	28.66	24.61	4.61	20.00	EWS & N. School
L2 - L3	0.486	50	0.010	36.0	5	1.80	37.80	0.383	2.549	0.450	24.61	21.96	9.96	12.00	Community & Shopping
	Flow Rate			1.794	lps										
	(1 W + 1 S)			107.6	LPM										
	Maximum Building Height			20	m										
	Pump Head			31.00	m										
	Pump HP			1.2	HP										
	SAY			2.00	HP										

Towers Domestic Water Supply Design Calculation For Pocket - (B)

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 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
U.G.Tank - D1	10.082	150	0.004	25.0	5	1.25	26.25	0.115	0.115	0.570	101.00	100.89	-	-	-
D1 - D2	3.696	100	0.005	96.0	5	4.80	100.80	0.494	0.609	0.470	100.89	100.28	31.28	69.00	Tower - (8)
D2 - D3	2.659	100	0.003	90.0	5	4.50	94.50	0.252	0.860	0.336	100.28	99.42	27.42	72.00	Tower - (9)
D3 - D4	1.671	100	0.001	90.0	5	4.50	94.50	0.107	0.967	0.213	99.42	98.45	6.45	92.00	Tower - (1)
D1 - D5	6.386	100	0.013	115.0	5	5.75	120.75	1.629	1.744	0.813	100.89	99.14	27.14	72.00	Tower - (5, 6 & 7)
D5 - D4	3.272	100	0.004	201.0	5	10.05	211.05	0.825	2.569	0.416	99.14	96.57	4.57	92.00	Tower - (2, 3 & 4)
	Flow Rate			10.082	lps										
				604.9	LPM										
	(1 W + 1.5)			302.47	LPM										
	Maximum Building Height			92	m										
	Pump Head			101.00	m										
	Pump HP			11.3	HP										
	Say			12.5	HP										

Towers Flushing Water Supply Design Calculation For Pocket - (B)

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 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	5.428	100	0.010	45.0	5	2.25	47.25	0.472	0.472	0.691	99.00	98.53	-	-	-
F1 - F2	1.090	100	0.001	126.0	5	6.30	132.30	0.068	0.539	0.139	98.53	97.99	28.99	69.00	Tower - (8)
F2 - F3	0.631	100	0.000	165.0	5	8.25	173.25	0.023	0.563	0.065	97.99	97.43	25.43	72.00	Tower - (9)
F1 - F4	4.338	100	0.007	82.0	5	4.10	86.10	0.568	1.040	0.552	98.53	97.49	5.49	92.00	Tower - (1)
F4 - F5	3.438	100	0.004	87.0	5	4.35	91.35	0.392	1.431	0.439	97.49	96.06	24.06	72.00	Tower - (5, 6 & 7)
F5 - F3	1.761	100	0.001	141.0	5	7.05	148.05	0.184	1.615	0.224	96.06	94.44	22.44	72.00	Tower - (2, 3 & 4)
	Flow Rate			5.428	lps										
				325.7	LPM										
	(1 W + 1 S)			325.7	LPM										
	Maximum Building Height			92	m										
	Pump Head			99.00	m										
	Pump HP			11.9	HP										
	Say			12.5	HP										

EWS, Club, Shops & Schools Domestic Water Supply Design Calculation For Pocket - (B)

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 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
U.G.Tank - DD1	2.891	100	0.003	25.0	5	1.25	26.25	0.062	0.062	0.368	26.00	25.92	-	-	-
DD1 - DD2	2.891	100	0.003	116.0	5	5.80	121.80	0.379	0.460	0.368	25.92	25.46	-	-	-
DD2 - DD3	2.891	80	0.009	84.0	5	4.20	88.20	0.813	1.273	0.575	25.46	24.18	12.18	12.00	Community & Shopping
DD3 - DD4	1.988	80	0.006	120.0	5	6.00	126.00	0.581	1.854	0.395	24.18	22.33	-	-	-
DD4 - DD4a	1.687	50	0.034	40.0	5	2.00	42.00	1.409	1.491	0.859	25.92	24.43	9.43	15.00	EWS
DD4 - *DD5*	0.301	65	0.000	115.0	5	5.75	120.75	0.046	1.801	0.091	22.33	20.43	3.43	17.00	Nursery School
	Flow Rate			2.891	lps										
	(1 W + 1 S)			173.4	LPM										
	Maximum Building Height			17	m										
	Pump Head			26.00	m										
	Pump HP			1.7	HP										
	SAY			1.00	HP										

EWS, Club, Shops & Schools Flushing Water Supply Design Calculation For Pocket - (B)

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 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. - FF1	1.557	65	0.008	45.0	5	2.25	47.25	0.381	0.381	0.469	26.00	25.62	10.62	15.00	EWS
FF1 - FF2	0.162	50	0.000	115.0	5	5.75	120.75	0.053	0.433	0.062	25.62	25.19	8.19	17.00	Nursery School
FF1 - FF3	0.486	50	0.003	88.0	5	4.40	92.40	0.309	0.690	0.247	25.62	24.93	12.93	12.00	Club & Shops
	Flow Rate			1.557	lps										
	(1 W + 1 S)			93.4	LPM										
	Maximum Building Height			17	m										
	Pump Head			26.00	m										
	Pump HP			0.9	HP										
	SAY			1.00	HP										

PROJECT : PROPOSED GROUP HO[illegible]ING 10.42 ACRES (PART-A) AT SECTOR - 109, GURGAON, HARYANA

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)	Infiltration @ 25% Av. Discharge	Total Discharge	Length	Pipe Size	Slope (1 in)	Fall	Velocity	Capacity of Pipe	FSL at Start	Invert Levels at Start	FSL at End	Invert Levels at End	Manhole Start Depth	Manhole Start End
	From	To	(lps.)	80%	1000	(kld.)	(lps.)	(lps.)	(lps.)	(lps.)	(lps.)	(mtr.)	(mm)	(mm)	(mtr.)	(m/sl (v)	(lps.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1.	SS1	SS2	112465	89972	89.97	0.00	89.97	1.04	3.12	0.26	5.38	81.0	250	150	0.426	0.76	18.703	212.40	210.40	212.42	209.97	2.00	2.45
2.	SS2	SS3	102465	81.972	81.97	89.97	171.94	1.98	5.97	0.50	6.47	90.0	300	250	0.360	0.75	26.513	212.42	209.97	212.46	209.61	2.45	2.85
3.	SS3	SS4	89700	71760	71.76	171.94	243.70	2.82	8.46	0.71	9.17	111.0	300	250	0.444	0.75	26.513	212.46	209.61	212.52	209.17	2.85	3.35
4.	SS5	SS6	71400	57120	57.12	0.00	57.12	0.66	1.98	0.17	2.15	185.0	250	190	0.974	0.76	18.703	212.40	210.40	212.55	209.43	2.00	3.12
5.	SS6a	SS6	6900	5520	5.52	0.00	5.52	0.06	0.19	0.02	0.21	137.0	250	190	0.721	0.76	18.703	212.49	210.99	212.55	210.27	1.50	2.28
6.	SS6	SS4	57615	46092	46.09	62.64	108.73	1.26	3.78	0.31	4.09	13.0	300	250	0.052	0.75	26.513	212.55	209.43	212.52	209.37	3.12	3.15
7.	SS4	*S.T.P*	0	0	0.00	352.44	352.44	4.08	12.24	1.02	13.26	5.0	300	250	0.020	0.75	26.513	212.52	209.17	212.52	209.15	3.35	3.37

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 GROUP HOUSING 10.42 ACRES (PART-A) AT SECTOR - 109, GURGAON, HARYANA

LOAD ON SEWAGE LINES

S.No.	Name of Sewer Line		Residential Sewage Load						Non Residential Sewage Load		Residential + Non Residential Load		
			Main Apartment & EWS	Population @ 5 persons / Unit	Water Requirement @ 172.5 Ltr/ day /Person	Service Personnel	Population @ 2 persons / Unit	Water Requirement @ 172.5 Ltr/ day /Person	Amenity	Water Requirement @ Lumsum / day	Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line)	Sewage Flow Load on Lin
	From	To	Unit	Nos.	lpd.	Unit	Nos.	lpd.	sqm.	lpd.	lpd.	lpd.	kld.
1.	SS1	SS2	104	520	89700	37	74	12765	-	-	-	80%	1000
2.	SS2	SS3	104	520	89700	37	74	12765	Nursary School	10000	112465	89972	89.97
3.	SS3	SS4	104	520	89700	0	0	0	-	0	102465	81972	81.97
4.	SS5	SS6	48	240	41400	0	0	0	-	0	89700	71760	71.76
5.	SS6a	SS6	8	40	6900	0	0	0	Shopping+Club	30000	71400	57120	57.12
6.	SS6	SS4	50	250	43125	42	84	14490	-	0	6900	5520	5.52
7.	SS4	S.T.P	0	0	0	0	0	0	-	0	57615	46092	46.09
			418.0	2090.0	360525.0	116.0	232.0	40020.0		40000.0	0	0	0.00
											440545.0	352436.0	352.44

PROJECT : PROPOSED GROUP HOUSING 9.75 ACRE (PART-E), SECTOR-109, GURGAON, HARYANA.

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)	Infiltration @ 25% Av. Discharge	Total Discharge	Length	Pipe Size	Slope (1 in)	Fall	Velocity	Capacity of Pipe	FRL at Start	Invert Levels at Start	FRL at Start	Invert Levels at End	Manhole Start Depth	Manhole Start End	Area Dep
	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.)	(sq.
1.	S1	S2	103500	82800	82.80	0.00	82.80	0.96	2.88	0.24	3.11	155.0	250	190	0.816	0.76	18.705	211.67	209.67	211.61	208.85	2.00	2.76	2.1
2.	S2	S3	99000	79200	79.20	82.80	162.00	1.88	5.63	0.47	6.09	158.0	300	250	0.552	0.73	26.513	211.61	208.85	211.54	208.30	2.76	3.24	3.1
3.	S3	S4	15870	12696	12.70	162.00	174.70	2.02	6.07	0.51	6.57	96.0	300	250	0.384	0.75	26.513	211.54	208.30	211.54	207.92	3.24	3.62	3.4
4.	S5	S6	34500	27600	27.60	0.00	27.60	0.32	0.96	0.08	1.04	103.0	250	190	0.542	0.76	18.705	211.67	209.67	211.59	209.13	2.00	2.46	2.2
5.	S6	S7	32775	26220	26.22	27.60	53.82	0.62	1.87	0.16	2.02	120.0	250	190	0.632	0.76	18.705	211.59	209.13	211.54	208.50	2.46	3.04	2.7
6.	S7	S8	49675	39740	39.74	53.82	93.56	1.08	3.25	0.27	3.52	101.0	300	250	0.404	0.75	26.513	211.54	208.50	211.50	208.09	3.04	3.41	3.2
7.	S8	S4	62100	49680	49.68	93.56	143.24	1.66	4.97	0.41	5.39	72.0	300	250	0.288	0.75	26.513	211.50	208.09	211.54	207.80	3.41	3.74	3.5
8.	S4	S.T.P	0	0	0.00	317.94	317.94	3.68	11.04	0.92	11.96	5.0	300	250	0.020	0.75	26.513	211.54	207.80	211.54	207.78	3.74	3.76	3.7

Formula Used:

Peak factor is considered as 3 times for population upto 20,000 persons & above 20,000 persons 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 GROUP HOUSING 9.75 ACRE (PART-B), SECTOR-109 , GURGAON, HARYANA.
LOAD ON SEWAGE LINES

S.No.	Name of Sewer Line		Residential Sewage Load						Non Residential Sewage Load		Residential + Non Residential Load		
			Main Apartment	Population @ 5 persons / Unit	Water Requirement @ 172.5 Ltr/ day /Person	EWS	Population @ 2 persons / Unit	Water Requirement @ 172.5 Ltr/ day /Person	Amenity	Water Requirement @ Lumsum / day	Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line)	Sewage Flow (Se Load on Line)
			Unit	Nos.	lpd.	Unit	Nos.	lpd.	sqm.	lpd.	lpd.	lpd.	lpd.
	From	To		5	172.5		2	172.5				80%	1000
1.	S1	S2	120	600	103500	0	0	0	-	0	103500	82800	82.80
2.	S2	S3	80	400	69000	0	0	0	Shopping+Club	30000	99000	79200	79.20
3.	S3	S4	0	0	0	46	92	15870	-	0	15870	12696	12.70
4.	S5	S6	40	200	34500	0	0	0	-	0	34500	27600	27.60
5.	S6	S7	38	190	32775	0	0	0	-	0	32775	26220	26.22
6.	S7	S8	46	230	39675	0	0	0	Nursery School	10000	49675	39740	39.74
7.	S8	S4	46	230	39675	65	130	22425	-	0	62100	49680	49.68
8.	S4	S.T.P	0	0	0	0	0	0	-	0	0	0	0.00
			370.00	**1850.00**	**319125.00**	**111.00**	**222.00**	**38295.00**		**40000.00**	**397420.00**	**317936.00**	318.00

PROJECT :- GROUP HOUSING 10.42 ACRES (PART-A) AT SECTOR - 109, GURGAON, HARYANA

TITLE : HYDRAULIC STORM WATER DESIGN CHART

S.No.	Line No.		Length	Catchment Area (Sqrs.)			Discharge @ 6.25 mm / hr rainfall	Pipe dia	Slope 1 in	Velocity m/sec.	Capacity of pipe	Full 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.	AA1	AA2	55.0	3700.0	0.0	3700.0	3.85	400	570	0.60	75.63	0.15	212.55	210.95	210.55	212.52	210.80	210.40	2.00	2.12	2.06
2.	AA2	D.C.01	2.0	90.0	3700.0	3790.0	3.95	400	570	0.60	75.63	0.00	212.52	210.80	210.40	212.52	210.80	210.40	2.12	2.12	2.12
3.	D.C.01	***R.P.01***	2.0	0.0	3790.0	3790.0	3.95	400	570	0.60	75.63	0.00	212.52	210.80	210.40	212.52	210.79	210.39	2.12	2.13	2.12
4.	***R.P.01***	AA3	5.0	0.0	3790.0	3790.0	3.95	400	570	0.60	75.63	0.01	212.52	210.92	210.52	212.52	210.91	210.51	2.00	2.01	2.00
5.	AA3	AA4	69.0	3000.0	3790.0	6790.0	7.07	400	570	0.60	75.63	0.12	212.52	210.91	210.51	212.52	210.79	210.39	2.01	2.13	2.07
6.	AA4	D.C.02	5.0	250.0	6790.0	7040.0	7.33	400	570	0.60	75.63	0.01	212.52	210.79	210.39	212.52	210.78	210.38	2.13	2.14	2.13
7.	D.C.02	***R.P.02***	2.0	0.0	7040.0	7040.0	7.33	400	570	0.60	75.63	0.00	212.52	210.78	210.38	212.52	210.78	210.38	2.14	2.14	2.14
8.	***R.P.02***	AA5	3.0	0.0	7040.0	7040.0	7.33	400	570	0.60	75.63	0.01	212.52	210.78	210.38	212.52	210.77	210.37	2.14	2.15	2.14
9.	AA5	AA6	110.0	4800.0	7040.0	11840.0	12.33	400	570	0.60	75.63	0.19	212.52	210.77	210.37	212.46	210.58	210.18	2.15	2.28	2.21
10.	AA6	D.C.03	5.0	235.0	11840.0	12075.0	12.58	400	570	0.60	75.63	0.01	212.46	210.58	210.18	212.46	210.57	210.17	2.28	2.29	2.28
11.	D.C.03	***R.P.03***	2.0	0.0	12075.0	12075.0	12.58	400	570	0.60	75.63	0.00	212.46	210.57	210.17	212.46	210.57	210.17	2.29	2.29	2.29
12.	***R.P.03***	AA7	2.0	0.0	12075.0	12075.0	12.58	400	570	0.60	75.63	0.00	212.46	210.57	210.17	212.46	210.56	210.16	2.29	2.30	2.29
13.	AA7	AA8	38.0	1750.0	12075.0	13825.0	14.40	400	570	0.60	75.63	0.07	212.46	210.56	210.16	212.42	210.50	210.10	2.30	2.32	2.31
14.	AA8	D.C.04	2.0	110.0	13825.0	13935.0	14.52	400	570	0.60	75.63	0.00	212.42	210.50	210.10	212.42	210.49	210.09	2.32	2.33	2.32
15.	D.C.04	***R.P.04***	2.0	0.0	13935.0	13935.0	14.52	400	570	0.60	75.63	0.00	212.42	210.49	210.09	212.42	210.49	210.09	2.33	2.33	2.33
16.	***R.P.04***	AA9	2.0	0.0	13935.0	13935.0	14.52	400	570	0.60	75.63	0.00	212.42	210.49	210.09	212.42	210.49	210.09	2.33	2.33	2.33
17.	AA9	AA10	30.0	1320.0	13935.0	15255.0	15.89	400	570	0.60	75.63	0.05	212.42	210.49	210.09	212.42	210.43	210.03	2.33	2.39	2.36
18.	AA11	AA12	48.0	2120.0	0.0	2120.0	2.21	400	570	0.60	75.63	0.08	212.52	210.92	210.52	212.52	210.84	210.44	2.00	2.08	2.04
19.	AA12	D.C.05	6.0	260.0	2120.0	2380.0	2.48	400	570	0.60	75.63	0.01	212.52	210.92	210.52	212.52	210.91	210.51	2.00	2.01	2.01
20.	D.C.05	***R.P.05***	2.0	0.0	2380.0	2380.0	2.48	400	570	0.60	75.63	0.00	212.52	210.92	210.52	212.52	210.92	210.52	2.00	2.00	2.00
21.	***R.P.05***	AA13	2.0	0.0	2380.0	2380.0	2.48	400	570	0.60	75.63	0.00	212.52	210.92	210.52	212.52	210.92	210.52	2.00	2.00	2.00
22.	AA13	AA14	68.0	2970.0	2380.0	5350.0	5.57	400	570	0.60	75.63	0.12	212.52	210.92	210.52	212.49	210.80	210.40	2.00	2.09	2.05
23.	AA14a	AA14	72.0	3160.0	0.0	3160.0	3.29	400	570	0.60	75.63	0.13	212.52	210.92	210.52	212.49	210.79	210.39	2.00	2.10	2.05
24.	AA14	D.C.06	8.0	380.0	8510.0	8890.0	9.26	400	570	0.60	75.63	0.01	212.49	210.79	210.39	212.49	210.78	210.38	2.10	2.11	2.10
25.	D.C.06	***R.P.06***	2.0	0.0	8890.0	8890.0	9.26	400	570	0.60	75.63	0.00	212.49	210.78	210.38	212.49	210.78	210.38	2.11	2.11	2.11
26.	***R.P.06***	AA15	4.0	0.0	8890.0	8890.0	9.26	400	570	0.60	75.63	0.01	212.49	210.78	210.38	212.49	210.77	210.37	2.11	2.12	2.12
27.	AA15	AA16	52.0	2270.0	8890.0	11160.0	11.63	400	570	0.60	75.63	0.09	212.49	210.77	210.37	212.45	210.68	210.28	2.12	2.17	2.15
28.	AA16	D.C.07	2.0	120.0	11160.0	11280.0	11.75	400	570	0.60	75.63	0.00	212.45	210.68	210.28	212.45	210.67	210.27	2.17	2.18	2.17

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.)			Depth (mtr.)		Avg.
29.	D.C.07	***R.P.07***	2.0	0.0	11280.0	11280.0	11.75	400	570	0.60	75.63	0.00	212.45	210.67	210.27	212.45	210.67	210.27	2.18	2.18	2.18
30.	***R.P.07***	AA17	8.0	0.0	11280.0	11280.0	11.75	400	570	0.60	75.63	0.01	212.45	210.67	210.27	212.45	210.66	210.26	2.18	2.19	2.19
31.	AA17a	AA17b	88.0	3880.0	0.0	3880.0	4.04	400	570	0.60	75.63	0.15	212.55	210.95	210.55	212.50	210.80	210.40	2.00	2.10	2.05
32.	AA17b	D.C.08	2.0	130.0	3880.0	4010.0	4.18	400	570	0.60	75.63	0.00	212.50	210.80	210.40	212.50	210.79	210.39	2.10	2.11	2.11
33.	D.C.08	***R.P.08***	2.0	0.0	4010.0	4010.0	4.18	400	570	0.60	75.63	0.00	212.50	210.79	210.39	212.50	210.79	210.39	2.11	2.11	2.11
34.	***R.P.08***	AA17c	5.0	0.0	4010.0	4010.0	4.18	400	570	0.60	75.63	0.01	212.50	210.79	210.39	212.50	210.78	210.38	2.11	2.12	2.12
35.	AA17c	AA17	45.0	1960.0	4010.0	5970.0	6.22	400	570	0.60	75.63	0.08	212.50	210.78	210.38	212.45	210.70	210.30	2.12	2.15	2.13
36.	AA17	AA18	31.0	1350.0	17250.0	18600.0	19.38	400	570	0.60	75.63	0.05	212.45	210.66	210.26	212.40	210.60	210.20	2.19	2.20	2.20
37.	AA18	D.C.09	2.0	100.0	18600.0	18700.0	19.48	400	570	0.60	75.63	0.00	212.40	210.60	210.20	212.40	210.60	210.20	2.20	2.20	2.20
38.	D.C.09	***R.P.09***	2.0	0.0	18700.0	18700.0	19.48	400	570	0.60	75.63	0.00	212.40	210.60	210.20	212.40	210.60	210.20	2.20	2.20	2.20
39.	***R.P.09***	AA19	2.0	0.0	18700.0	18700.0	19.48	400	570	0.60	75.63	0.00	212.40	210.60	210.20	212.40	210.59	210.19	2.20	2.21	2.21
40.	AA19	AA20	51.0	2220.0	18700.0	20920.0	21.79	400	570	0.60	75.63	0.09	212.40	210.59	210.19	212.40	210.50	210.10	2.21	2.30	2.25
41.	AA20	D.C.10	2.0	95.0	20920.0	21015.0	21.89	400	570	0.60	75.63	0.00	212.40	210.50	210.10	212.40	210.50	210.10	2.30	2.30	2.30
42.	D.C.10	***R.P.10***	2.0	0.0	21015.0	21015.0	21.89	400	570	0.60	75.63	0.00	212.40	210.50	210.10	212.40	210.50	210.10	2.30	2.30	2.30
43.	***R.P.10***	AA21	2.0	0.0	21015.0	21015.0	21.89	400	570	0.60	75.63	0.00	212.40	210.50	210.10	212.40	210.49	210.09	2.30	2.31	2.31
44.	AA21	AA10	87.0	3780.0	21015.0	24795.0	25.83	400	570	0.60	75.63	0.15	212.40	210.49	210.09	212.40	210.34	209.94	2.31	2.46	2.38
45.	AA10	D.C.11	3.0	150.0	40050.0	40200.0	41.88	400	570	0.60	75.63	0.01	212.40	210.34	209.94	212.40	210.33	209.93	2.46	2.47	2.46
46.	D.C.11	***R.P.11***	3.0	0.0	40200.0	40200.0	41.88	400	570	0.60	75.63	0.01	212.40	210.33	209.93	212.40	210.33	209.93	2.47	2.47	2.47
47.	***R.P.11***	***To HUDA***	5.0	0.0	40200.0	40200.0	41.88	500	770	0.60	117.98	0.01	212.40	210.33	209.83	212.40	210.32	209.82	2.57	2.58	2.57

Formula Used:

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

n=.035 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

PROJECT : PROPOSED GROUP HOUSING 9.38 ACRE (PART- B) AT SECTOR-109 , GURGAON, HARYANA.
TITLE : HYDRAULIC STORM WATER DESIGN CHART

S.No.	Line No.		Length	Catchment Area (Sqm.)			Discharge @ 6.25 mm / hr rainfall	Pipe dia	Slope 1 in	Velocity m/sec.	Capacity of pipe	Fall in line	Levels at start (mtr.)			Levels at End (mtr.)			Manhole Depth		
																			Depth (mtr.)		Avg
	From	To	(mtr.)	Self	Progg.	Total	60% runoff (lps)	(mm)	(mm)	m/sec.	lps.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Start	End	Dep
1.	A1	A2	66.0	4256.0	0.0	4256.0	4.43	400	570	0.60	75.63	0.12	211.65	210.05	209.65	211.67	209.93	209.53	2.00	2.14	2.0
2.	A2	D.C.-01	3.0	180.0	4256.0	4436.0	4.62	400	570	0.60	75.63	0.01	211.67	209.93	209.53	211.67	209.93	209.53	2.14	2.14	2.1
3.	D.C.-01	***R.P.-01***	3.0	0.0	4436.0	4436.0	4.62	400	570	0.60	75.63	0.01	211.67	209.93	209.53	211.67	209.92	209.52	2.14	2.15	2.1
4.	***R.P.-01***	A3	5.0	0.0	4436.0	4436.0	4.62	400	570	0.60	75.63	0.01	211.67	209.92	209.52	211.67	209.91	209.51	2.15	2.16	2.1
5.	A3	A4	46.0	2330.0	4436.0	6766.0	7.05	400	570	0.60	75.63	0.08	211.67	209.91	209.51	211.64	209.83	209.43	2.16	2.21	2.1
6.	A4	D.C.-02	6.0	285.0	6766.0	7051.0	7.34	400	570	0.60	75.63	0.01	211.64	209.83	209.43	211.64	209.82	209.42	2.21	2.22	2.2
7.	D.C.-02	***R.P.-02***	2.0	0.0	7051.0	7051.0	7.34	400	570	0.60	75.63	0.00	211.64	209.82	209.42	211.64	209.82	209.42	2.22	2.22	2.2
8.	***R.P.-02***	A5	4.0	0.0	7051.0	7051.0	7.34	400	570	0.60	75.63	0.01	211.64	209.82	209.42	211.64	209.81	209.41	2.22	2.23	2.2
9.	A5	A6	40.0	1930.0	7051.0	8981.0	9.36	400	570	0.60	75.63	0.07	211.64	209.81	209.41	211.64	209.74	209.34	2.23	2.30	2.2
10.	A6	D.C.-03	5.0	260.0	8981.0	9241.0	9.63	400	570	0.60	75.63	0.01	211.64	209.74	209.34	211.64	209.73	209.33	2.30	2.31	2.3
11.	D.C.-03	***R.P.-03***	5.0	0.0	9241.0	9241.0	9.63	400	570	0.60	75.63	0.01	211.64	209.73	209.33	211.64	209.73	209.33	2.31	2.31	2.3
12.	***R.P.-03***	A7	2.0	0.0	9241.0	9241.0	9.63	400	570	0.60	75.63	0.00	211.64	209.73	209.33	211.64	209.72	209.32	2.31	2.32	2.3
13.	A7	A8	50.0	2300.0	9241.0	11541.0	12.02	400	570	0.60	75.63	0.09	211.64	209.72	209.32	211.59	209.63	209.23	2.32	2.36	2.3
14.	A8	D.C.-04	5.0	245.0	11541.0	11786.0	12.28	400	570	0.60	75.63	0.01	211.59	209.63	209.23	211.59	209.63	209.25	2.36	2.36	2.3
15.	D.C.-04	***R.P.-04***	2.0	0.0	11786.0	11786.0	12.28	400	570	0.60	75.63	0.00	211.59	209.63	209.23	211.59	209.62	209.22	2.36	2.37	2.3
16.	***R.P.-04***	A9	3.0	0.0	11786.0	11786.0	12.28	400	570	0.60	75.63	0.01	211.59	209.62	209.22	211.59	209.62	209.22	2.37	2.37	2.3
17.	A9	A10	88.0	5414.0	11786.0	17200.0	17.92	400	570	0.60	75.63	0.15	211.59	209.62	209.22	211.54	209.46	209.06	2.37	2.48	2.4
18.	A10	D.C.-05	2.0	140.0	17200.0	17340.0	18.06	400	570	0.60	75.63	0.00	211.54	209.46	209.06	211.54	209.46	209.06	2.48	2.48	2.4
19.	D.C.-05	***R.P.-05***	2.0	0.0	17340.0	17340.0	18.06	400	570	0.60	75.63	0.00	211.54	209.46	209.06	211.54	209.46	209.06	2.48	2.48	2.4
20.	***R.P.-05***	A11	2.0	0.0	17340.0	17340.0	18.06	400	570	0.60	75.63	0.00	211.54	209.46	209.06	211.54	209.45	209.05	2.48	2.49	2.4
21.	A11	A12	65.0	3100.0	17340.0	20440.0	21.29	400	570	0.60	75.63	0.11	211.54	209.45	209.05	211.50	209.34	208.94	2.49	2.56	2.5
22.	A13	A14	87.0	4100.0	0.0	4100.0	4.27	400	570	0.60	75.63	0.15	211.65	210.05	209.65	211.61	209.90	209.50	2.00	2.11	2.0
23.	A14	D.C.-06	4.0	230.0	4100.0	4330.0	4.51	400	570	0.60	75.63	0.01	211.61	209.90	209.50	211.61	209.89	209.49	2.11	2.12	2.1
24.	D.C.-06	***R.P.-06***	4.0	0.0	4330.0	4330.0	4.51	400	570	0.60	75.63	0.01	211.61	209.89	209.49	211.61	209.88	209.48	2.12	2.13	2.1
25.	***R.P.-06***	A15	6.0	0.0	4330.0	4330.0	4.51	400	570	0.60	75.63	0.01	211.61	209.88	209.48	211.61	209.87	209.47	2.13	2.14	2.1
26.	A15	A16	60.0	2900.0	4330.0	7230.0	7.53	400	570	0.60	75.63	0.11	211.61	209.87	209.47	211.58	209.77	209.37	2.14	2.21	2.1
27.	A16	D.C.-07	10.0	480.0	7230.0	7710.0	8.03	400	570	0.60	75.63	0.02	211.58	209.77	209.37	211.58	209.75	209.35	2.21	2.23	2.2