PROPOSED GROUP HOUSING SCHEME MEASURING 45.4767 ACRES

(License No. 228 of 2007 dated 27.03.2007, License No. 93 of 2008 dated 12.05.2008 and License No. 50 of 2010 dated 24.06.2010)

AT

SECTOR-66, GURGAON, HARYANA

SERVICE PLAN ESTIMATE
ON
PUBLIC HEALTH ENGINEERING SERVICES

Client

MS. B.C.C PROPERTIES PVT. LTD AND OTHERS IN COLLABORATION WITH M/S. EMAAR MGF LAND LTD.

Architect

CRISP DESIGN SOLUTIONS
727, SECTOR-15, GURGAON

Plumbing & Fire Suppression Consultant

ENER SAVE CONSUTANTS PVT.LTD.
705, NEHRU PLACE, NEW DELHI

For Crisp Design Solutions

Authorised Signatory

PART - I

For Crisp Design Solutions

Authorised Signatory

PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF RESIDENTIAL GROUP HOUSING PROJECT (PART-01), SECTOR-66, GURGOAN (HARYANA) and II

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

Proposed residential group housing project in sector - 66, at Gurgoan for development by M/s B.C.C. Properties Pvt. Ltd. and other in Collaboration with M/s Emaar Mgf. Land Ltd.

WATER SUPPLY:

The source of water supply shall be Tubewell/HUDA connection. It has been proposed to construct underground tanks of capacity as mentioned in report for domestic and other purposes. The underground tanks will be filled up from Tubewell/HUDA connection and then pumped through risers to overhead water tanks of each tower.

DESIGN:

The scheme has been designed for population of approx. 8044 persons (Fixed + Floating). The rate of water supply per head/day has been taken as per NBC part 7, table No.-1 water requirements clause (4:1:2)

PUMPING EQUIPMENTS:

It has been proposed to install pumping set as described with standby of equal capacity. The provision for standby generating set has also been provided in case of any electricity failure.

SEWERAGE SCHEME:

This scheme is designed for sewer connecting to Master Sewer of HUDA Main Scheme. The Sewerage System has been marked on the respective plans.

Sewer lines have been designed for three times average D.W.F. in relation to water supply demand. It has been assumed that about 80% of the domestic water supply shall find its way into the proposed sewer. Sewer lines shall be laid to a gradient maintaining minimum 2.46 ft./Sec self cleaning velocity. Necessary provision for laying S.W. pipe sewer line, construction of required number of manholes etc., have been made in the estimate.

Necessary design statement for entire sewerage system has been prepared and attached with estimate. Manning's formula has been used on the design of sewerage system.

STORM WATER DRAINAGE:

It is proposed to lay underground RCC pipe drains with required number of catch basins for disposal of storm water. The intensity of rain fall has been taken as 1/4" per hour. A minimum size of 400 mm RCC storm water line will be provided and designed as per Manning's formula.

SPECIFICATIONS:

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

For Cyan Design Solutions

Authorised Signatory

Road:
Roads have been provided to above zones and estimate is prepared as per revised specifications adopted by HUDA.

Street Lighting:
Provision for streets also has been made.

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

Rates:
The estimate has been prepared based on the present market rates.

Cost:

The total cost of the scheme, including cost of all services works out to be **Rs. ~~25,80,60,619.00~~** 3018.00 Lacs 2607.13 Lacs
(Rupees ~~Twenty Five Crore Eighty Lacs Sixty Thousand and Six Hundred Nineteen only~~)
including 3% contingencies @ 49% departmental charges. unforseen, Price escalation, Admn. Charges

Authorized Signatory

For Crisp Design Solutions

Authorised Signatory

TOTAL WATER REQUIREMENT: Part - I

Design Calculation:

A. Domestic Water Requirement for Villas V2:

- No of building = 8 Nos.
- No of Villas = 8 Nos.
- Occupancy Per Villas = 7 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements (8x7x172.5) = 9,660 LPD

B. Domestic Water Requirement for Building A&E:

- No of building (34 DU each) = 2 Nos.
- No of Flats = 68 Nos.
- Occupancy Per Flats = 5 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements(2x34x5x172.5) = 58,650 LPD

C. Domestic Water Requirement for Building B,C & D:

- No of building (34 DU each) = 3 Nos.
- No of Flats = 102 Nos.
- Occupancy Per Flats = 5 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements(~~2x51x~~3x34x5x172.5) = 87,975 LPD

D. Domestic Water Requirement for Building L:

- No of building = 1 No.
- No of Flats = 88 Nos.
- Occupancy Per Flats = 5 Nos.
- No of Pent-House = 6 Nos.
- Occupancy Per Pent-House = 7 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements((~~9x5~~ 88x5)+(6x7)x172.5) = ~~88,320~~ 83145 LPD

E. Domestic Water Requirement for Building G,H,K&M:

- No of building = 4 No.
- No of Flats = 376 Nos.
- Occupancy Per Flats = 5 Nos.
- No of Pent-House = 24 Nos.
- Occupancy Per Pent-House = 7 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements((376x5)+(24x7)x172.5) = 3,53,280 LPD

F. Domestic Water Requirement for Building F,J&N:

- No of building (80 DU each) = 3 No.
- No of Flats (+ 4 Pent House) = 240 Nos.
- Occupancy Per Flats = 5 Nos.
- No of Pent-House = 12 Nos.
- Occupancy Per Pent-House = 7 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements((240x5)+(12x7)x172.5) = 2,21,490 LPD

PART - II

No. of main DU. = 254 No.

Pent House / Duplex = 24 No.

EWS = 48 Nos

Population = 254 x 5 = 1270 Person

24 x 7 = 168 Person

48 x 5 = 240 Person

1678 Person @ 172.58 LPCD = 289455 Ltr

or 289.65 KL

Addl. Requirement

Community Buildings = 25 KL

Shopping = 2 KL

27 KL

Total requirement = 289.65 + 27 KL = 316.65 KL

Say 320 KL

Dorm @ 65 % = 208 KL

Flushing @ 35 % = 112 KL

Area under Parks (organised green) = 1.50 Acre

1.50 Acre @ 25 KL/Acre = 37.50 KL

G. Domestic Water Requirement for Building P&Q:

- No of building = 2 No.
- No of Flats = 128 Nos.
- Occupancy Per Flats = 5 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements(128x5x172.5) = 1,10,400 LPD

H. Domestic Water Requirement for Building block U, U1 & W:

- No of building = 26 No.
- No of Flats = 282 Nos.
- Occupancy Per Flats = 5 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements(282x5x172.5) = 2,43,225 LPD

I. Domestic Water Requirement for Building EWS (BLDG BLOCK-T):

- No of building = 1 No.
- No of Flats = 262 Nos.
- Occupancy Per Flats = ~~5~~ 2 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements(262x2x172.5) = ~~70,740 LPD~~

J. Domestic Water Requirement for Building Y:

- No of building = 1 No.
- No of Flats = 144 Nos.
- Occupancy Per Flats = 5 Nos.
- As per HUDA Water demand per Person = 172.5 LPD
- Total Water requirements(144x5x172.5) = 1,24,200 LPD

K. Domestic Water Requirement for community center Building = 36,000 LPD.

L. Domestic Water Requirement for Shopping center = 28,800 LPD.

M. Domestic Water Requirement for Water body & school = 1,20,000 LPD.

N. Horticultural Water Requirement (Organized Green) ~~4.67~~ acre x 25000 Ltrs = ~~1,16,750 LPD~~ = ~~1,16,800 LPD~~

Say

O. For DG Cooling Tower = ~~55,000~~ LPD

Total Daily Water Demand (KLPD)

= (A+B+C+D+E+F+G+H+I+J+K+L+M+N+O)

=

(9.66+58.65+87.98+88.32+353.28+221.49+110.40+243.23+~~70.74~~+124.20+36.6+28.0+120.0+~~116.8~~+~~5.0~~)

= ~~1723.69~~ KLD

Say

= ~~1724.00~~ KLD

P. Fire Storage (As Per NBC of India) = ~~200~~ KL

Total water Requirement for Part-I + II

Domestic + Flushing	Part-I	Part-II	Total
	1702 KL	+ 316.45 KL	= 2018.45 KL
Horti.	153.50 KL	+ 37.50 KL	= 191.00 KL
			2209.45 KL
			Say 2210 KL

Dom. @ 65%
Flu. @ 35%

1106.30 KL + 205.69 KL
595.70 KL + 110.75 KL

Boosting machinery for flushing in Part-I

Flushing requirement = 595.70 KL
Horti = 153.50 KL
749.20 KL Say 750 KL

Head = 110 m
Pumping 12 Hrs/day = 62.50 KLH or 1041.66 LPM
3 Pump working = 347.22 LPM Say 350 LPM

HP of Pump: $\frac{350 \times 110\ m}{60 \times 75 \times 0.60}$ = 14.25 HP Say = 15 HP

PART-B

Domestic water requirement = 205.69 KL Say 210 KL
Pumping Hrs 6 Hrs = 35 KLH. or 583.33 LPM Say = 600 LPM
Head = 65 m

BHP of Pump = $\frac{600 \times 65}{60 \times 75 \times 0.60}$ = 14.44 HP Say = 15 HP

Flushing requirement = 110.75 KL
Horti = 37.50 KL
148.25 KL Say = 150 KL
or 25 KLH
or 416.66 LPM
Say 420 LPM

Pumping 6 Hrs Head 65 m

BHP = $\frac{420 \times 65}{60 \times 75 \times 0.60}$ = 10.11 HP

Say = 10 HP

Q. **Borewell:** (Approx discharge of Borewells = ~~18~~ KL/hr and working for ~~18~~ Hr/day)

a) Total Water Demand = ~~1724.00~~ KLD

b) No. of Borewells (~~1724/18/18~~) = ~~5.32~~

c) ~~Additional 10% as Standby~~ = ~~5.852~~, Say **6.0 Nos.**

R. **Total**

Plumbing Machinery for Borewells

a.	Gross working head	=	55 mtr
b.	Average fall in S.L.	=	5 mtr
c.	Depression head	=	5 mtr
d.	Friction loss in main	=	70 mtr
	Total	=	~~12.22~~ say ~~13.00~~ hp

HP=18000x~~110~~x1/60x60x75x0.6

Under Ground Water Tank

a) One Day Water Requirement = ~~1700~~ KLD

b) Half Days Requirement = ~~850~~ KLD

But it is proposed to construct an underground tank ~~300~~ KL for fire in 2 parts, ~~1700~~ KL Raw Water ~~850~~ KL Domestic water , Total Underground water tank = ~~2750~~ KL.

Boosting Machinery:

Daily Domestic Demand	=	~~1724.00~~ KLD
Pumping for ~~1724~~@12 Hr Pumping/day~~105~~KL/hr, ~~143.67~~x1000/60/3)	=	~~798.16~~ LPM.
Gross working Head	=	70.00 Mtr
Suction Lift (Positive Suction)	=	20.00 Mtr.
Function Loss	=	20.0 Mtr.
Total Head	=	110.0 Mtr.
Say	=	**110.00 Mtr.**

Pump HP $\frac{\sim\sim 798.16 \times 110 \sim\sim}{\sim\sim 60 \times 75 \times 0.65 \sim\sim} = \frac{\sim\sim 87,797.6 \sim\sim}{\sim\sim 2925 \sim\sim} = \sim\sim 30.00 \text{ HP} \sim\sim$

Pump for Fire Protection:

Sl. No	Parameters	Location	Pump Sets			
			Jockey Pump	Main Sprinkler Pump	Main Hydrant Pump	Diesel
a)	Discharge in LPM	Pump Room	180 lpm	2280	2280	2280
b)	Head in Metres		120	120	120	120
c)	HP		8.5	110	110	
d)	Quantity in Nos.		1	1	1	1

Generating Sets:

Tube well Pump	13 x 6	=	78.0 HP
Domestic Pump	30 x 3	=	90.0 HP
HP of Jockey Pump	8.5 x 1	=	8.5 HP
HP of Main Pump	110 x 2	=	220 HP
Total		=	396.50 HP
Say		=	297.4 KVA

It is proposed to add the above capacity to the Main DG set of the building.

Generating Sets

Part - I

(i) T.W. 3 X 10 = 30 HP

(ii) Deen. Pump 3 X 20 = 60 HP

(iii) Flu. Pump 3 X 15 = 45 HP

iv) Jockey Pump 1 X 10 = 10 HP

145 HP

Part - II

1 X 10 = 10 HP

1 X 15 = 15 HP

1 X 5 = 5 HP

1 X 10 = 10 HP

40 HP

145 X 0.746 X 1.25 = 162.25

Add for Lighting = 20.0

162.25 KVA

Say 200 KVA

40 X 0.746 X 1.50 = 44.76

10.0

54.76

Say 60 KVA

Fire Pump

SR.No	Parameter	Location	Pump Sets			
			Jockey Pump	sprinkler Pump	main Hydrant	Diesel Driven
(a)	Discharge in Lpm	Pump Room	180 Lpm	2280 ~~1620~~ Lpm	2280 ~~1620~~ Lpm	2280 ~~1620~~ Lpm
b)	Head in mts		~~80~~ m	~~80~~ m 120	~~80~~ m 120	~~80~~ m 120
c)	HP.		15 HP	110 HP	110 HP	110 HP
			2 Nos	2 Nos	2 Nos	2 Nos

SUB WORK NO. I	WATER SUPPLY SCHEME	3,75,17,737.00	1,81,69,000.00	5,56,86,737.00
SUB WORK NO. II	SEWERAGE SCHEME	4,25,56,696.00	65,24,000.00	4,90,79,696.00
SUB WORK NO. III	STORM WATER DRAINAGE	1,93,73,055.00	56,57,000.00	2,50,30,055.00
SUB WORK NO. IV	ROADS & FOOTHPATH	4,30,46,229.00	73,69,000.00	5,04,15,229.00
SUB WORK NO. V	STREET LIGHTING	48,49,552.00	11,76,000.00	60,25,552.00
SUB WORK NO. VI	ROADS & FOOTHPATH HoRT.	62,83,330.00	13,46,000.00	76,29,330.00
SUB WORK NO. VII	MTC. CHARGES INCLUDING RE-SURFACING OF ROADS (AFTER 1ST 5 YRS AND 2ND YRS OF MTC AS PER HUDA)	5,46,32,020.00	95,62,000.00	6,41,94,020.00
	TOTAL	20,82,57,619.00	4,96,03,000.00	25,80,60,619.00
	Say	20,82,57,619.00	4,96,03,000.00	25,80,60,619.00

873.83

3018.00 Lacs

(Rupees Twenty Five Crore Eighty Lacs Sixty Thousand and Six Hundred Nineteen only)

Cost Per Acre = 3018.00 Lacs / 3607.13 = 65.37 Lacs Per Acre
(37.563 + 7.665)

= 44.823 Acre

For.....

Authorized Signatory

Checked subject to comments in forwarding letter No. 955 Dt. 4/7/13 and notes attached with the estimate

9/7/13

Executive Engineer (W)
for Chief Engineer
HUDA Panchkula

5/7/13

For Crisp Design Solutions

Authorised Signatory

Executive Engineer
Hoda, Div. No. I
Gurgaon

Superintending Engineer
HUDA Circle-I, Gurgaon

SUB WORK NO. I

WATER SUPPLY

SUB WORK NO. 1:

WATER SUPPLY

Part - I + II

S.No.	Head	Description	Amount (Rs.)
1.	SUB HEAD NO. 01	~~Borewell & Rising Main~~ Head Works ₹ 155.61 Lacs	~~1,22,64,500.00~~ 1377500/-
2.	SUB HEAD NO. 02	HUDA Rising Main ₹ 18.98 Lacs	~~5,66,100.00~~ 107150/-
3.	SUB HEAD NO. 03	Pumping Machinery ₹ 110.50 Lacs	~~30,05,000.00~~ 941000/-
4.	SUB HEAD NO. 04	Water Supply Distribution System (Dom + flushing) ₹ 74.76 Lacs	~~12,70,000.00~~ 201975/-
5.	SUB HEAD NO. 05	Fire Fighting ₹ 71.76 Lacs	~~46,06,750.00~~ 674050/-
6.	SUB HEAD NO. 06	Irrigation ₹ 12.56 Lacs	~~27,33,950.00~~ 348950/-
		499.13 Lacs	
		TOTAL	~~2,44,46,300.00~~ 3649725/-
		Add 3% contingencies & PE charges 13.32 Lacs	~~7,33,389.00~~ 109491/-
		TOTAL Rs. 457.45 Lacs	~~2,51,79,689.00~~ 3759216/-
		Add 49% departmental charges, price circulation& unforeseen admin charges ₹ 224.15 Lacs	~~1,23,38,047.61~~ 1842013/-
		TOTAL	~~3,75,17,736.61~~ 5601229/-
		Say 681.60 Lacs	~~3,75,17,737.00~~

Say Rs - 580.13 Lacs

(iii) Capacity 350 LPM, 110 m Head with 15 HP Pump (3 working + 1 standby) in Part I

4 Nos @ ₹ 1.50 Lacs each ₹ 6.00 Lacs

(iv) Domestic transfer Pump 600 LPM at 65 m Head with 15 HP motor Pump (1 working + 1 standby) Part-II

2 Nos @ ₹ 1.50 Lacs each ₹ 3.00 Lacs

(v) 2 Nos Flushing water transfer Pump of 1200 LPM at 65 m Head with 10 HP Pump (one working + one standby) for Flushing in Part- II

2 Nos @ ₹ 1.00 Lac each ₹ 2.00 Lacs

11.00 Lacs

SUB HEAD BOREWELL NO. 01

Part. I + II

Sl. No	Description	Amount (Rs.)
1.	Boring and installing 510mm i/d Bore well with reverse rotary ring complete with pipe and strainer to a depth of about 120 meter 5 Nos. @Rs. 5,00,000/- each. 4 ~~7 80,000/-~~ each.	~~25,00,000.00~~ 28.00 Lacs ~~22,50,000/-~~
2.	Provision for rising mains, connecting Bore well with water main and bye-pass arrangements:	
100	~~85~~mm ~~630~~ M @ Rs. ~~750~~ ~~950~~ 1200/- P.mtr.	6.72 ~~4,72,500.00~~ ~~750000/-~~
150	~~80~~mm ~~269~~ M @ Rs. ~~950~~ 1575 ~~1200/-~~ P.mtr.	2.76 ~~2,55,550.00~~ 2,10,000/-
200	~~100~~mm ~~49~~ M @ Rs. ~~1050~~ 2150 ~~1500/-~~ P.mtr.	~~51,450.00~~ ~~67500/-~~ 1.08 Lac
3.	Providing Booster Pumps: Dom. Part. I	12.00 Lacs
(i) (ii to iv)	Capacity 798.16 lpm @ 110M mtr head, 6 Nos. Rs. ~~2,15,000/-~~ each 20 HP (4 Working + 2 standby)	2.00 ~~6,45,000.00~~ 11.00 Lacs
4.	Construction of UG Tank 2600 KL Rs. 3000/-KL 1820KL including Size ~~3500~~ Per K.L.	63.70 Lacs ~~78,00,000.00~~ ~~967500/-~~
5.	Provision of unseen items/carriage of materials	2.00 ~~90,000.00~~ ~~100000/-~~
6.	Provision for construction of pump chamber of Size 1.5 x 1.5 x 1.5 m for Housing Borewell 3 No. @ Rs. 90,000 1.00 Lac	4.00 ~~4,50,000.00~~ ~~270000/-~~
7.	TOTAL Pair for Pumping machinery Chamber as per Std. design of Pwd (HDD) (2.50)	10.00 ~~1,22,64,500.00~~ ~~1237215000/-~~

MATERIAL STATEMENT OF BOREWELL RISIING MAINS:

S.No.	Name of Line	Discharge KL/HR	Length In Meter			Friction Loss	Total Loss	Velocity Ft/Sec
			100mm Dia Pipe	80 mm Dia Pipe	65 mm Dia Pipe			
1.	TW- UG Tank		49	269	630	0.34		3.06
	Total		49	269	630			

100 65mmØ 150 ~~80~~mmØ 200 ~~100~~mmØ

T.W 1 TO - A = 145 mtr. — —

T.W. 2 TO - A = 75 mtr. — —

A - B = — 175 mtr. —

T.W. 3 to B = 130 mtr. — —

T.W 4 to UGT II = 207 — 45 mtr.

B - UGT - 2 = — 50

~~350 mtr.~~ 557 m 175 mtr. ~~45 mtr.~~ 50

Say 560 m

Part I + II

SUB WORK NO. 1:

Rising main

SUB HEAD ~~RISING MAIN FROM HUDA~~ NO. 02

Sl. No	Description	Amount (Rs.)
1.	Providing, laying, jointing and testing pipe lines including cost of excavation etc. complete in all respects.	9.55 lacs ~~6,66,000/-~~
a)	200mm dia pipe 444m @Rs. ~~950/-~~ M 1500/- P.mtr.	4.80 lacs ~~4,21,800.00~~
2.	Providing and fixing sluice valve including cost of surface boxes and masonary chambers etc. complete in all respects.	
a)	200mm i/d 1 No. @Rs. ~~10,000/-~~ each 20,000	0.40 ~~40,000.00~~
3.	Providing and fixing indicating plates for sluice valve and air valves	
a)	– 3 Nos. @Rs. ~~600/-~~ each 1800/-	~~1,800.00~~
4.	Providing and fixing air release valve and sour valve 1 No. each @ Rs. ~~7500/-~~ each 10000/-	0.20 lacs ~~7,500.00~~
5.	Provision for carriage for materials and other unforeseen items (L/S)	1.00 lac ~~25,000.00~~
6.	Provision for cutting of roads and making good to its original conditions (L/S)	1.00 lac ~~50,000.00~~
7.	Provision for making connection with HUDA (L/S)	~~3,00,000/-~~ 2.00 lacs ~~50,000.00~~
	TOTAL	~~5,66,100.00~~ 10,71,500/- 18.98 lacs

Friction Loss Calculation of HUDA rising mains: Part-II

S.No.	Daily Demand in KL	1-1/2 ~~Litre~~ times Daily Demand	Supply duration hr	Length Metre	Dia MM	Friction Loss in line	Velocity Ft/sec
1.	~~100 KL~~ 1855	~~320~~ 2783	6	444	~~200~~ 300	----- 3.90	~~6.02~~ 3.32

~~8.80~~ m/1000 m

SUB WORK NO. 1:

Pumping machinery

SUB HEAD ~~PUMPING MACHINERY~~ NO. 03

Sl. No	Description	Amount (Rs.)
1.	Providing and installing electricity driven submersible pumping set capable of delivering about ~~16~~ KL/Hr of water against a total head of ~~110~~m complete with motor and other accessories 10HP ~~1~~ No. @ ~~1,95,000/-~~ 2,50,000/-	~~1,95,000.00~~ ~~2,50,000/-~~ 2.00 lacs
2.	Provision for diesel engine Genset each for standby arrangements for T.W. & booster pump complete with gear head arrangements of following capacities ~~1~~ 1 No of ~~200 KVA~~ 200+60 = 260 KVA	~~4,50,000.00~~ 22.50 ~~50,00,000/-~~
3.	Providing & installing pumping set of following capacity for fire protection	4.00
a)	180 lpm at 110m head 1 No. Jockey Pump @ Rs. ~~2,00,000/-~~ (8.5 HP) 1+1	~~1,70,000.00~~ ~~3,00,000/-~~ 2

b)	2280 lpm at 110m head 1 No. main fire pump @ Rs. 485000/-	4,85,000.00
c)	2280 lpm at 110m head 1 No. sprinkler pump @ Rs. 485000/-	4,85,000.00
d)	2280 lpm at 110m head 1 No. @ Rs. 7,50,000/- (Diesel engine pump)	7,50,000.00
4.	Provision for chlorination plant completes 1 no. @ Rs. 80,000/- each.	80,000.00
5.	Provision for making foundations and erection of pumping machinery: 1 set @ Rs. 80,000/- each (L.S)	80,000.00
6.	Provision for pipes, valves and specials inside the boosting chamber – 1 Sets @Rs. 1,00,000/- each. (L.S)	1,00,000.00
7.	Provision for electric service connection including electrical fittings for borewell and boosting chamber etc. – 1 Sets including cost of Transfer L/S both side (L.S)	1,50,000.00
8.	Provision for carriage of material and other unforeseen items etc. L/S	60,000.00
	TOTAL	30,05,000.00

SUB WORK NO. 1:

Part (I + II)

SUB HEAD WATER SUPPLY DISTRIBUTION NO. 04

Distribution System Dom + Flushing

Sl. No	Description	Amount (Rs.)
1.0	Providing, laying, jointing and testing CI/DI pipe lines including fittings, valves, cost of excavation etc. complete in all respects.	45.65 Lac
a)	100mm 980 M @ Rs. 950 P.mtr.	9,31,000.00
b)	65mm 450 M @ Rs. 600 P.mtr.	2,70,000.00
c)	50mm 35 M @ Rs. 400 P.mtr.	14,000.00
2.	Provision for carriage of materials and other unforeseen items	35,000.00
3.	Providing and fixing valves 65 mm dia 2 No. @ Rs. 10,000/-	20,000.00
	TOTAL (L.S)	12,70,000.00

Friction Loss Calculation Boosting Line:

S.No.	Line	Daily Demand 3 times	Length Metre	Dia MM	Friction Loss in line	Velocity Ft/sec
1.	UGT-Over Head Tank	2600	980	100	----	----

4) Providing and fixing non return valve Complete in all respect (L.S) — 2.50 Lac

5) Providing and fixing indicating plate for Sluice valve / Air valve etc (L.S) — 0.50 Lac

6) making w/s Connection on Master Road — 1.00 Lac

7) Provision for cutting of road & making good to its in original condition (L.S) — 2.00 Lac

74.76 Lac

Part I + B

SUB WORK NO. 1:

SUB HEAD ~~FIRE RAISING MAIN~~. 05

Fire Fighting

Sl. No	Description	Amount (Rs.)
1.	Providing, laying, jointing and testing MS pipe lines for fire raising main including cost of fittings, valves connection etc. complete in all respects	53.05 Lacs
a)	150mm MS pipe 2767 m @ Rs. ~~1350~~/- M	~~37,35,450.00~~
b)	80 mm i/d 148 m @ Rs. ~~800~~/- M	5.20 Lacs ~~88,800.00~~
2.	Providing and fixing sluice valves 150 mm dia 20 Nos. @ Rs 12000/-	3.36 ~~2,40,000.00~~
3.	Providing and fixing fire hydrants 69 Nos. @ Rs. 7500/- each.	~~4,42,500.00~~ 7.60 Lac
4.	Provision for carriage for materials (L/S)	1.00 1,00,000.00
5.	Prov. & fixing of Indicator plants 79 No @ Rs. 1000/- each	79,000/-
	TOTAL	~~46,06,750.00~~ 67,40,500/- 71.2 Lac

SUB WORK NO. 1:

SUB HEAD ~~IRRIGATION SYSTEM~~ NO. 06

IRRIGATION System Part I + B

S. No.	Description	Amount (Rs.)
1.	Providing, laying, jointing and testing pipes lines conforming to IS: 4985 including cost of excavation etc. complete in all respects.	Plating 33,12,000/-
a)	~~100mm dia 2760 meter @ Rs 950~~	~~26,22,000.00~~ 10 - in Lacs
b)	25mm dia ~~58~~ meter @ Rs ~~300~~	32450/- ~~17,700.00~~
2.	Providing and fixing 20mm dia. irrigation hydrant valve complete in all respect	8,65,200/- 2.06 Lacs
a)	59 Nos. @Rs. ~~750~~/each	~~44,250.00~~
3.	Provision for carriage of materials and other unforeseen items	~~50,000.00~~
	TOTAL	12.56 ~~27,33,950.00~~ 34,82,950/-

MATERIAL STATEMENT- IRRIGATION SYSTEM

S. No.	Name line	PIPE LENGTH IN M		IRRIGATION hydrant
		25 dia.	100 dia.	
1	STP –MAIN RING	59	2760	
	TOTAL	**59**	**2760**	59

Part (I+II)

SUB WORK NO. II

SEWERAGE WORK

SUB WORK NO. II:

SEWERAGE SCHEME

S. No	Description	Amount (Rs.)
1.	Providing, jointing, cutting & testing SW pipe CLASS B and lowering including cost of excavation, bed concrete ,cost of manholes etc. complete. in all respects.	
a)	250 dia SW Pipe 3372 M @ Rs. 1250 - P.mtr	70.86 67,44,000/- 0.23 Lac 25,29,000.00
b)	From STP 150mm CILA pipe 450 m @Rs 1350 - P.mtr.	7.09 Lac 12,00,000.00
2.	Provision for lighting and watching	1,00,000.00
3.	Provision for cartage of material & other unforeseen item	1,00,000.00
4.	Provision for road cut and making good to its in original condition LS	5,00,000.00
5.	Provision for sewerage treatment plant LS	175.00 Lac
6.	sewer for connection with HUDA main LS	1.00 Lac 15.00 Lac
	TOTAL	2,77,29,000.00
	Add 3% contingencies & PE charges	8,31,970.00
	TOTAL	2,85,60,870.00
	Add 49% departmental charges, price circulation& unforeseen admin charges	1,39,94,826.63
	TOTAL	4,25,55,696.30
	(Cost to final abstract of cost) Say	4,25,55,696.00

(2) Provision for sewage sump well alongwith pumping machinery complete in all respect (1.5) @ 15.00 Lac

MATERIAL STATEMENT- (S.W) SEWERAGE LINE

SL No	SEWERAGE LINE FROM-TO	Length of line	Dia of Pipe	Slope 1 IN	Fall in Line
		Mtr	MM		Mtr
1.0	MH1 to MH5	85	250	200	1.93
1.1	MH5 – MH13	23	250	200	0.58
1.2	MH6 – MH20	180	250	200	0.10
1.3	MH20 – MH31	75	250	200	0.56
1.4	MH31 – MH47	15	250	200	0.08
1.5	MH32 to MH34	30	250	200	0.45
1.6	MH34 to MH37	8	250	200	0.44
1.7	MH35 – MH345	157	250	200	0.11
1.8	MH45 – MH55	204	250	200	0.13
1.9	MH55 - MH66	69	250	200	0.66
1.10	MH66 – MH117	54	250	200	0.05
1.11	MH67 – MH75	215	250	200	0.06
1.12	MH75 – MH83	165	250	200	0.06
1.13	MH83 – MH116	10	250	200	0.06
1.14	MH84 – MH92	83	250	200	2.36
1.15	MH92 – MH104	27	250	200	0.03
1.16	MH93 to MH103	103	250	200	0.16
1.17	MH103 – MH104	27	250	200	0.12
1.18	MH104 – MH116	19	250	200	0.06
1.19	MH105 to MH115	122	250	200	0.60
1.20	MH115 to MH117	50	250	200	1.00
1.21	MH118 – MH129	83	250	200	0.08
1.22	MH129 – MH131	19	250	200	0.04
1.23	MH130 to MH140	74	250	200	0.40
1.24	MH140 to MH149	81	250	200	0.67
1.25	MH149 – MH162	20	250	200	0.06
1.26	MH150 to MH160	84	250	200	0.38
1.27	MH160 to MH165	60	250	200	0.13
1.28	MH165 to MH195	10	250	200	0.38
1.29	MH166 – MH170	45	250	200	0.09
1.30	MH170 – MH180	111	250	200	0.09
1.31	MH180 – MH188	76	250	200	0.05
1.32	MH188 to MH194	61	250	200	0.39
1.33	MH194 to MH197	40	250	200	0.33
1.34	MH197 to MH202	30	250	200	0.27
1.35	MH198 – MH209	104	250	200	0.04
1.36	MH209 to MH218	15	250	200	0.14
1.37	MH210 to MH213	45	250	200	0.52
1.38	MH213 to MH215	20	250	200	0.68
1.39	MH214 to MH219	69	250	200	0.34
1.40	MH219 – MH247	20	250	200	0.10
1.41	MH220 to MH227	107	250	200	0.33
1.42	MH227 – MH237	28	250	200	0.06
1.43	MH226 – MH230	73	250	200	0.05
1.44	MH235 – MH245	140	250	200	0.71
1.45	MH245 – MH249	69	250	200	0.78
1.46	MH249 – MH260	17	250	200	0.06
1.47	MH250 – MH255	82	250	200	0.78
1.48	MH255 – MH259	45	250	200	0.03
1.49	MH259 - MH261	35	250	200	0.78
	Total	3372			

+ SEC Page 8

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DESIGN STATEMENT

Carrying cap of 250 mm dia. Sewer line at half flow at 2.46ft/second at discharge 0.416 cusec

Max. Discharge from proposed site

Domestic demand = 1259.00 kld

Sewerage generated = 1259 kld x 0.80 = 1070.15 kld say 1160 kld = 138cusec

Three Nos. of STP = 850 KLD, 250 KLD & 60 KLD

Design discharge of proposed sewer line = 0.649 cusec

There fore proposed pipe diameter is enough

Bypass pumping to Huda sewer

Total sewage discharge	=	850 kld	250 kld	60 kld
Average discharge	=	60.71 klh	17.86 klh	4.29 klh
Peak	=	3.0	3.0	3.0
Peak discharge	=	182.13	53.58	12.87

HYDRAULIC CALCULATION

S.No.	Line	PEAK DISCHARGE	Length Metre	Dia MM	Friction Loss in line	Velocity Mtr/Sec
1.	STP 1 - SEWER	182.13 KLH	450	150	0.30	0.74
2.	STP 2 - SEWER	53.58 KLH	500	150	0.30	0.74
3.	STP 3 - SEWER	12.87 KLH	150	150	0.30	0.74

SUB WORK NO. III

STORM WATER DRAINAGE

SUB WORK NO. III:

Page (I + II)

STORM WATER DRAINAGE (RCC MAIN PIPE DRAIN)

Sl. No	Description	Amount (Rs.)
1.	Providing, jointing, cutting & testing RCC NP3 pipes and specials into trenches including manholes, chambers etc. excavation, back-filling and disposal of surplus earth complete in all respects.	

a)	400 dia. RCC Pipe 3684 M @ Rs. 4400 per mtr.	61,57,600,00
b)	Provision for road gullies & Pipe connection L.S.	10,00,000.00
c)	Providing for lighting watching & temporary diversion of traffic	1,00,000.00
2.	Provision for rain water harvesting arrangements (approx. 37.1575 Acre @ 1 lacs/Acre)	37,15750.00
3.	Provision for carriage of material & other unforeseen item	1,50,000.00
4.	Drain for connection with HUDA main (L/S)	30,00,000.00
	TOTAL	1,26,23350.00
	Add 3% contingencies & PE charges	378700.50
	TOTAL	13002050.50
	Add 49% departmental charges, price circulation& unforeseen admin charges	6371004.745
	TOTAL	1,93,73,055.245
	(Cost to final abstract of cost) say	1,93,73,055.00

(8)

5) Provision for over flow line 250mm ϕ CI pipe from Sump Well to master Drain
456.87 @ ₹ 2615/mtr ₹ 11.77 lacs

c) Provision for SWD sump well alongwith Pump chamber from low lying area (1.5) ₹ 30.00 lacs

7) Provision for cutting of roads and making good to its in original condition (1.5) ₹ 2.00 lacs

₹ 43.77 lacs

MATERIAL STATEMENT- (RCC) DRAINAGE LINE

SL No	STORM LINE FROM-TO	Length of line	Dia of Pipe	Slope 1 IN	Fall in Line
	PART-I				
		Mtr	MM		Mtr
1	MH1 to MH5	118	400	600	0.18
1.1	MH5 to MH-10	96	400	600	0.12
1.2	MH10 to MH-15	63	400	600	0.09
1.3	MH15 to MH20	125	400	600	0.18
1.4	MH20 to MH-24	103	400	600	0.18
1.5	MH24 to MH-42	18	400	600	0.01
1.6	MH25 to MH30	55	400	600	0.07
1.7	MH30 to MH-35	55	400	600	0.07
1.8	MH35 to MH41	13	400	600	0.02
1.9	MH36 – MH40	82	400	600	0.11
1.10	MH31 to MH45	81	400	600	0.11
1.11	MH-45 to MH48	72	400	600	0.10
1.12	MH48 to MH53	23	400	600	0.08
1.13	MH49 to MH55	108	400	600	0.18
1.14	MH55 to MH-58	14	400	600	0.01
1.15	MH56 to MH-60	94	400	600	0.12
1.16	MH60 to MH65	78	400	600	0.11
1.17	MH65 to MH-70	87	400	600	0.012
1.18	MH-70 to MH75	108	400	600	0.18
1.19	MH75 to MH80	103	400	600	0.18
1.20	MH80 to MH85	83	400	600	0.12
1.21	MH86 to MH-90	63	400	600	0.08
1.22	MH90 to MH93	62	400	600	0.08
1.23	MH93 to MH100	4	400	600	0.01
1.24	MH94 to MH-100	114	400	600	0.18
1.25	MH85 to MH89	17	400	600	0.05
1.26	MH100 to MH105	57	400	600	0.08
1.27	MH105 to MH-108	52	400	600	0.08
1.28	MH108 to MH110	16	400	600	0.02
1.29	MH109 to MH115	82	400	600	0.15
1.30	MH115 to MH-141	18	400	600	0.02
1.31	MH116 to MH-120	59	400	600	0.11
1.32	MH120 to MH126	88	400	600	0.18
1.33	MH126 to MH-130	66	400	600	0.08
1.34	MH-130 to MH133	52	400	600	0.08
1.35	MH133to MH140	18	400	600	0.03
1.36	MH134 to MH140	88	400	600	0.08
1.37	MH140 to MH145	68	400	600	0.13
1.38	MH145 to MH150	72	400	600	0.09
1.39	MH150 to MH154	39	400	600	0.07
1.40	MH154 to MH174	27	400	600	0.07
1.41	MH155 to MH160	79	400	600	0.11
1.42	MH160 to MH164	54	400	600	0.12
	MH164 to MH173	21	400	600	0.06
1.43	MH165 to MH180	79	400	600	0.16
1.44	MH170 to MH179	152	400	600	0.30
	TOTAL	3043			
		PART – II			
2.1	MH180 to MH185	46	400	600	0.03
2.2	MH185 to MH190	69	400	600	0.18
2.3	MH190 – MH195	60	400	600	0.17

SL No	STORM LINE FROM-TO	Length of line	Dia of Pipe	Slope 1 IN	Fall in Line
2.4	MH195 to MH200	109	400	600	0.30
	TOTAL	284			
		PART –III			
3.1	MH201 to MH205	80	400	600	0.11
3.2	MH205 to MH-210	121	400	600	0.25
3.3	MH210 to MH215	114	400	600	0.20
3.4	MH215 to MH218	42	400	600	0.08
	Total	357			
	Total (PART – I+II+II)	3684			

DRAIN PIPE DESIGN

Site area = 37.1757 acre,
Runoff = 0.796 cusec
Carrying capacity of 400 mm dia at 2.47 ft/sec velocity = 3.10 Cusec
Therefore, proposed drain size is enough to carry discharge from site.

SUB WORK NO. IV

ROADS & FOOTPATH

Part (I+II)

SUB WORK NO. IV:

Road & Footpath

S. No.	Description	Unit	Qty	Rate	Amount (Rs.)
1	Provision for leveling & earth filling as per site condition ~~37.1575~~ 45.48 acre @ ~~125000~~ 1.00 Lac/acre	Acres	~~37.158~~ 45.48	~~125000~~ 1.00 Lac	~~46,44,687.50~~ 45.48 Lacs
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) 26595.813 sqm.X0.10 m = 2659.581 cum say 2660 cum @ 950/ cum~~ 300mm Thick Granular Sub Base	Cu. mtr.	~~2660.0~~	~~950~~	~~25,27,000.00~~
	ii) ~~Wearing coat (top coat) 100 mm thick (53-22.4) mm gauge compacted to 75mm thick conforming to MOT specifications (table 400-6, grading no 3) 26595.813 sqm.X0.10 m = 2659.581 cum say 2660 cum @ 950/cum~~ 250mm Thick WBM Macadam	Cu. mtr.	~~2660.0~~	~~950~~	~~25,27,000.00~~

Roads falls on basement

HSR. 10.29 CC 1:8:16 with stone ↳ aggregate 20 mm nominal size in foundation and Plinth

HSR. 10.132 C.C 1:2:4 with stone aggregate 20 mm nominal size in Pavement, roads, Taxi tracks, and runways laid to required slope and camber including consolidation finishing and tamping complete

Taking 10 mtrs length

1:8:16 $10 \times 6 \times 0.05\ m = 3\ cum$ @ ₹ 336.25 P.cum = 1008.75

$10 \times 10 \times 0.075\ m = 7.5\ cum$ @ ₹ 336.25 = 2521.87

1:2:4 Qty as above

3 cum @ ₹ 729.30 P.cum = 2187.90

7.5 cum @ ₹ 729.30 P.cum = 5469.75

6 m wide road = 1008.75 + 2187.90 = 3196.65

Add 34% C.P. 10868.61

14062.40

Rate per mtr = 14062.40 / 10 = 1406.24 P.mtr

15 & 18 m = 2521.87 + 5469.75 = ₹ 7991.62

Add 340% CP. = ₹ 27171.50

35163.12

Rate per mtr = 35163.12/10 = 3516.31 P.mtr

6 m. 2810 mtr @ ₹ 1406.24 = 3940294

15 & 18 m. 545 m @ ₹ 3516.31 = 1916389.58

2310418.58

Say 23.10 Lacs

Area of metalled Road = 27100 Sqm

Surface Car Parking = 568 Nos

$568 \times 2.50 \times 5.0\ m$ = 7100 Sqms

Total Surface area = 27100 + 7100 = 34200

Length for Kerb & Channel = 3430.0m + 339.55 = 3770.55

50mm Thick Dense bituminous macadam and 20 mm thick M.S.S type (A)

	iii) 25mm thick pre-mix carpet with seal coat 26595.813 sqm. say 26596 sqm @ 265/ sqm	Sq. mtr.	34200 26598.0	Local 859/- 265	290.7 Lacs 26596000/- 70,47,940.00
2(a)	Paved Road (Centre Portion)			Per Sqm.	23.10 Lacs
3	Provision for making approach and pavement to building block by providing concrete pavement or tiles. Etc. 11664.017 sqm. Say 11664 sqm @ 500 / sqm.	Sq. mtr.	11664.0	500	@ 20.00 Lacs 58,32,000.00
4	Provision for parking arrangement 7100 sqm @ 500/sqm Kerb & channel 1:1½:3 Complete in all respect	Road Sq. mtr.	48000 7100	600/ 500	24.00 Lacs 5325000/- 35,50,000.00
5	Provision for Carriage of material	LS.		Per Sqm. 960000	5.00 Lacs 9,60,000.00
6	Provision for traffic lighting and guide map/ indicators	LS.		960000	5.28 Lacs 9,60,000.00
	4.846934116				
			Total	413.76 Lacs	2,80,48,627.50
	Add 3% contingencies & P.C Charges			12.41 Lacs	8413768/-
				426.17 Lacs	8,41,458.83
				208.82 Lacs	13295581/-
				4584721	2,88,90,086.33
	Add 49 % department charges, Unforseen price escalation, Admin. charges		Total	22367137/-	2,88,90,086.33
				634.99 Lacs	1,41,56,142.30
		SAY		6801435/-	4,30,46,228.62

Say Rs 680.20 Lacs

Say Rs 635.00 Lacs

SUB WORK NO. V

STREET LIGHTING

SUB WORK NO. IV:

Part - I + II

Street Lighting

Sl. No	Description	Amount (Rs.)
1.	Providing external lighting on roads as per standard specifications of HVPN, Approx. ~~37.1757~~ 36.1966 Acres @ Rs. ~~85,000~~/- Acre	~~31,59,935.00~~ 45.48 lacs
	Add 3% contingencies & PH charges 1.00 lacs.	~~94,796.00~~ 1.36
	TOTAL	~~32,54,733.00~~ 46.84
	Add 49% departmental charges, Highrise, price Escalation, Actual charges,	~~15,94,819.49~~ 22.95
	TOTAL	~~4848552.24~~ 69.79 lacs
	(Cost to final abstract of cost) Say	**~~48,49,552~~**

Rs. 71.32 lacs

2) Planting of trees with tree guard on road at 12 m interval

Road Length = Main Road / 12 = 334 Nos

Say 350 Nos

Cost of one tree

excavation	=	30 /- each
manure	=	60 /- each
Tree Plant	=	60 /- each
Tree Guard	=	600 /- each
	$	750 /- each

SUB WORK NO. VI

HORTICULTURE

(Part I+II)

SUB WORK NO. VI:

Horticulture:

S. No.	Description	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 proper level by filling with earth mixed with manure before & after plodding trench with water including cost of imported earth & manure.	
	b) Rough dressing of trenched area.	
	c) Grassing with "doob grass" including watering & maintenance of lawns free from weeds & fit for mowing in rows including hedges, shrubs & green belts (as per HUDA Norms) 30926.83 Sqm or 7.64 Acre	7.64 lacs
	7.64 1.00	37157.50/-
	37.1575 acres @ Rs. 0.90 lacs.	3,344,175.00
	1000 trees @ Rs. 750/- each Tree with manure (Tree plant) Guard 350 930/- 750/-	750,000.00 2.63 lacs
	4464750/-	40,94,175.00 10.27 lacs
	Add 3% contingency charges 139373/-	1,22,825.25 0.31 lacs
	4785123/- TOTAL	42,17,000.25 10.58 lacs
	Add 49% Deptt. Charges, Price escalation 2344710/-	20,66,330.12 5.18 lacs
	Unforeseen, Admn Charges 7129833/- TOTAL	62,83,330.37 15.76 lacs

c.o. to final abstract of cost

SUB WORK NO. VII

MAINTENANCE OF SERVICES

SUB WORK NO. VI: Part (I+II)

Maintenance Charges & Resurfacing of Roads

S.No	Description	Amount (Rs.)
1.	Provision for maintenance charges for water supply, sewerage, storm water drainage, roads, street light, horticulture etc., complete including operation and establishment charges as per HUDA norms after completion and resurfacing of roads after 10 years.	
a)	~~37.1757~~ 45.4763 acres @Rs. 5.0 lacs per acre	227.38 lac ~~1,85,87,850.00~~
2.	Provision for resurfacing of roads after last 5 years of maintenance road area ~~45,359.83 say 45,360~~ 34200 sq.m @ Rs. ~~250~~ 400/- 600/- P.mtr	~~1,13,40,000.00~~ ~~27216000/-~~ 136.80
3.	Provision of resurfacing of roads after 10 years road area 45,359.83 say 45,360 sq.m @ Rs. ~~125~~ 300/- P.mtr.	~~56,70,000.00~~ ~~13608000/-~~ 205.20
	Total	~~3,55,97,850.00~~ ~~59411850/-~~ 569.38
	Add 3% contingencies & PH charges	~~10,67,935.50~~ ~~1782356/-~~ 17.08
	Total	~~3,66,65,785.50~~ ~~61194206/-~~ 586.46
	Add 49% departmental charges, unforseen, price escalation, Admn. charge	~~1,79,66,234.90~~ ~~29985160/-~~ 287.37
	Total	~~5,46,32,020.40~~ ~~91179366/-~~ 873.83
	(Cost of final abstract of cost) Say	~~5,46,32,020.00~~

911.80 lacs

For Crisp Design Solutions

Authorised Signatory

Sl. No	SEWER LINE FROM/TO	Length of Sec	NUMBER OF POPULATION	CUMMULATIVE POPULATION	Average water requirement @150 LPD	Sewl Load (70% of water requirement)		Progressive Discharge	Progressive Discharge (Average)	Progressive Discharge (Peak)	Inclination @ 2/3 Av. Discharge	Total Discharge	Dia of Pipe	Slope 1 IN	Fall in Line	Velocity in	Capacity of Pipe	Levels at Start		Levels at End	
																		Ground Lvl at Start	Invert Lvl at Start	Ground Lvl at End	Invert Lvl at End
		Mtr			LPD	LPD	KLD	KLD	LPS	LPS	LPS	lps	MM		Mtr	m/sec	lps	mtr	mtr	mtr	mtr
1	B1-B2	35	50	50	75000.00	56250.00	5.63	5.63	0.07	0.20	0.02	0.21	250	195	0.18	0.75	18.46	0.00	-1.60	0.00	-1.68
2	B2-B3	37	450	500	750000.00	562500.00	56.25	56.25	0.65	1.95	0.15	2.12	250	195	0.19	0.75	18.46	0.00	-1.68	0.00	-1.76
3	B3-B4	10	20	520	78000.00	58500.00	57.38	57.38	0.66	1.99	0.17	2.16	250	195	0.05	0.75	18.46	0.00	-1.76	0.00	-1.82
4	B4-B5	12	10	530	79500.00	59625.00	58.50	58.50	0.68	2.03	0.17	2.20	250	195	0.06	0.75	18.46	0.00	-1.82	0.00	-1.88
5	B5-B6	17	0	530	79500.00	59625.00	58.50	58.50	0.68	2.03	0.17	2.20	250	195	0.09	0.75	18.46	0.00	-1.88	0.00	-1.94
6	B6-B7	10	10	540	81000.00	60750.00	59.63	59.63	0.69	2.07	0.17	2.24	250	195	0.05	0.75	18.46	0.00	-1.94	0.00	-2.02
7	B7-B8	8	10	540	81000.00	60750.00	59.75	60.75	0.70	2.11	0.18	2.29	250	195	0.04	0.75	18.46	0.00	-2.02	0.00	-2.06
8	B8-B9	17	50	50	75000.00	56250.00	5.63	5.63	0.07	0.20	0.02	0.21	200	145	0.12	0.75	11.81	0.00	-1.60	0.00	-1.72
9	B9-B10	18	10	60	90000.00	67500.00	6.75	6.75	0.08	0.23	0.02	0.25	200	145	0.12	0.75	11.81	0.00	-1.72	0.00	-1.84
10	B10-B11	18	10	70	105000.00	78750.00	7.88	7.88	0.09	0.27	0.02	0.29	200	145	0.12	0.75	11.81	0.00	-1.84	0.00	-1.97
11	B11-B12	17	10	80	120000.00	90000.00	9.00	9.00	0.10	0.31	0.03	0.34	200	145	0.12	0.75	11.81	0.00	-1.97	0.00	-2.09
12	B12-B13	30	10	90	135000.00	101250.00	10.13	10.13	0.12	0.35	0.03	0.38	200	145	0.07	0.75	11.81	0.00	-2.09	0.00	-2.15
13	B13-B14	15	10	100	150000.00	112500.00	11.25	11.25	0.13	0.39	0.03	0.42	200	145	0.05	0.75	11.81	0.00	-2.15	0.00	-2.24
14	B15-B16	22	50	600	103500.00	77625.00	77.63	77.63	0.90	2.70	0.22	2.92	250	195	0.11	0.75	18.46	0.00	-2.06	0.00	-2.17
15	B16-B17	21	301	901	148500.00	111375.00	111.38	111.38	1.29	3.87	0.32	4.19	250	195	0.11	0.75	18.46	0.00	-2.17	0.00	-2.28
16	B17-B18	30	10	1000	150000.00	112500.00	112.50	112.50	1.30	3.91	0.33	4.23	250	195	0.05	0.75	18.46	0.00	-2.28	0.00	-2.33
17	B19-B20	35	10	1010	151500.00	113625.00	113.63	113.63	1.32	3.95	0.33	4.27	250	195	0.08	0.75	18.46	0.00	-2.33	0.00	-2.41
18	B21-B22	22	400	1410	211500.00	158625.00	158.63	158.63	1.84	5.51	0.46	5.97	250	195	0.11	0.75	18.46	0.00	-2.41	0.00	-2.52
19	B22-B29	20	10	1420	213000.00	159750.00	159.75	159.75	1.85	5.55	0.46	6.01	250	195	0.10	0.75	18.46	0.00	-2.52	0.00	-2.62
20	B23-B24	22	50	50	75000.00	56250.00	5.63	5.63	0.07	0.20	0.02	0.21	200	145	0.15	0.75	11.81	0.00	-1.60	0.00	-1.75
21	B24-B25	25	10	60	90000.00	67500.00	6.75	6.75	0.08	0.23	0.02	0.25	200	145	0.17	0.75	11.81	0.00	-1.75	0.00	-1.92
22	B25-B26	20	0	60	90000.00	67500.00	6.75	6.75	0.08	0.23	0.02	0.25	200	145	0.14	0.75	11.81	0.00	-1.92	0.00	-2.06
23	B27-B28	23	10	70	105000.00	78750.00	7.88	7.88	0.09	0.27	0.02	0.30	200	145	0.16	0.75	11.81	0.00	-2.06	0.00	-2.22
24	B28-B29	15	0	70	105000.00	78750.00	7.88	7.88	0.09	0.27	0.02	0.30	200	145	0.10	0.75	11.81	0.00	-2.22	0.00	-2.32
25	B29-B30	35	0	1480	221500.00	166125.00	167.63	167.63	1.94	5.82	0.49	6.31	250	195	0.18	0.75	18.46	0.00	-2.62	0.00	-2.70
26	B30-B31	35	400	1880	283500.00	212625.00	212.63	212.63	2.46	7.38	0.62	8.00	250	195	0.18	0.75	18.46	0.00	-2.70	0.00	-2.77
27	B31-B32	12	0	1880	283500.00	212625.00	212.63	212.63	2.46	7.38	0.62	8.00	250	195	0.06	0.75	18.46	0.00	-2.77	0.00	-2.84
28	B32-B33	20	10	1900	285000.00	213750.00	213.75	213.75	2.47	7.42	0.62	8.04	250	195	0.10	0.75	18.46	0.00	-2.84	0.00	-2.94

SL No	SEWER LINE FROM-TO	Length of line	NUMBER OF POPULATION	CUMMULATIVE POPULATION	Average water requirement @150 LPD	Sol Load (75% of water requirement)		Progressive Discharge	Progressive Discharge (Average)	Progressive Discharge (Peak)	Infiltration @ 20% Av. Discharge	Total Discharge	Dia of Pipe	Slope 1 IN	Fall in Line	Velocity In	Capacity of Pipe	Levels at Start: Ground Lvl at Start	Levels at Start: Invert Lvl at Start	Levels at End: Ground lvl at End	Levels at End: Invert Lvl at End	REMARKS
29	B33-B34	20	0	1900	285000.00	213750.00	213.75	213.75	2.47	7.42	0.62	8.04	250	195	0.10	0.75	18.46	0.00	-2.94	0.00	-3.04	
30	B34-B35	20	400	2300	345000.00	258750.00	258.75	258.75	2.99	8.98	0.75	9.73	250	195	0.10	0.75	18.46	0.00	-3.04	0.00	-3.14	
31	B35-B36	21	0	2300	345000.00	258750.00	258.75	258.75	2.99	8.98	0.75	9.73	250	195	0.11	0.75	18.46	0.00	-3.14	0.00	-3.25	
32	B36-B37	20	10	2310	346500.00	259875.00	259.88	259.88	3.01	9.02	0.75	9.78	250	195	0.10	0.75	18.46	0.00	-3.25	0.00	-3.35	
33	B37-B38	20	300	2610	391500.00	293625.00	293.63	293.63	3.40	10.20	0.85	11.04	250	195	0.10	0.75	18.46	0.00	-3.35	0.00	-3.46	
34	B38-B39	20	10	2620	393000.00	294750.00	294.75	294.75	3.41	10.23	0.85	11.09	250	195	0.10	0.75	18.46	0.00	-3.46	0.00	-3.56	
35	B39-B40	20	400	3020	453000.00	339750.00	339.75	339.75	3.93	11.80	0.98	12.78	250	195	0.10	0.75	18.46	0.00	-3.56	0.00	-3.66	
36	B40-B41	22	0	3020	453000.00	339750.00	339.75	339.75	3.93	11.80	0.98	12.78	250	195	0.11	0.75	18.46	0.00	-3.66	0.00	-3.77	
37	B41-B42	15	200	3220	483000.00	362250.00	362.25	362.25	4.19	12.58	1.05	13.63	250	195	0.08	0.75	18.46	0.00	-3.77	0.00	-3.85	
38	B42-B43	17	300	3520	528000.00	396000.00	396.00	396.00	4.58	13.75	1.15	14.90	250	195	0.09	0.75	18.46	0.00	-3.85	0.00	-3.93	
39	B43-B44	20	0	3520	528000.00	396000.00	396.00	396.00	4.58	13.75	1.15	14.90	250	195	0.10	0.75	18.46	0.00	-3.93	0.00	-4.04	
40	B66-B65	20	50	100	15000.00	11250.00	11.25	11.25	0.13	0.39	0.03	0.42	250	195	0.10	0.75	18.46	0.00	-1.60	0.00	-1.70	
41	B65-B64	20	350	450	67500.00	50625.00	50.63	50.63	0.59	1.76	0.15	1.90	250	195	0.10	0.75	18.46	0.00	-1.70	0.00	-1.80	
42	B64-B63	19	0	450	67500.00	50625.00	50.63	50.63	0.59	1.76	0.15	1.90	250	195	0.10	0.75	18.46	0.00	-1.80	0.00	-1.90	
43	B63-B62	15	10	460	69000.00	51750.00	51.75	51.75	0.60	1.80	0.15	1.95	250	195	0.08	0.75	18.46	0.00	-1.90	0.00	-1.98	
44	B62-B61	20	300	760	114000.00	85500.00	85.50	85.50	0.99	2.97	0.25	3.22	250	195	0.10	0.75	18.46	0.00	-1.98	0.00	-2.08	
45	B61-B60	21	10	770	115500.00	86625.00	86.63	86.63	1.00	3.01	0.25	3.26	250	195	0.11	0.75	18.46	0.00	-2.08	0.00	-2.19	
46	B60-B59	12	300	1070	160500.00	120375.00	120.38	120.38	1.39	4.18	0.35	4.53	250	195	0.06	0.75	18.46	0.00	-2.19	0.00	-2.25	
47	B59-B58	15	0	1070	160500.00	120375.00	120.38	120.38	1.39	4.18	0.35	4.53	250	195	0.08	0.75	18.46	0.00	-2.25	0.00	-2.33	
48	B58-B57	15	10	1080	162000.00	121500.00	121.50	121.50	1.41	4.22	0.35	4.57	250	195	0.08	0.75	18.46	0.00	-2.33	0.00	-2.41	
49	B57-B56	20	250	1330	199500.00	149625.00	149.63	149.63	1.73	5.20	0.43	5.63	250	195	0.10	0.75	18.46	0.00	-2.41	0.00	-2.51	
50	B56-B54	15	0	1330	199500.00	149625.00	149.63	149.63	1.73	5.20	0.43	5.63	250	195	0.08	0.75	18.46	0.00	-2.51	0.00	-2.58	
51	B53-B52	15	0	1330	199500.00	149625.00	149.63	149.63	1.73	5.20	0.43	5.63	250	195	0.08	0.75	18.46	0.00	-2.58	0.00	-2.66	
52	B52-B51	15	250	1580	237000.00	177750.00	177.75	177.75	2.06	6.17	0.51	6.69	250	195	0.08	0.75	18.46	0.00	-2.66	0.00	-2.74	
53	B51-B50	20	0	1580	237000.00	177750.00	177.75	177.75	2.06	6.17	0.51	6.69	250	195	0.10	0.75	18.46	0.00	-2.74	0.00	-2.84	
54	B50-B49	20	0	1580	237000.00	177750.00	177.75	177.75	2.06	6.17	0.51	6.69	250	195	0.10	0.75	18.46	0.00	-2.84	0.00	-2.94	
55	B49-B48	20	250	1830	274500.00	205875.00	205.88	205.88	2.38	7.15	0.60	7.74	250	195	0.10	0.75	18.46	0.00	-2.94	0.00	-3.04	
56	B48-B47	15	0	1830	274500.00	205875.00	205.88	205.88	2.38	7.15	0.60	7.74	250	195	0.08	0.75	18.46	0.00	-3.04	0.00	-3.12	
57	B47-B46	20	18	1848	277200.00	207900.00	207.90	207.90	2.41	7.22	0.60	7.82	250	195	0.10	0.75	18.46	0.00	-3.12	0.00	-3.23	
57	B46-B45	20	0	1848	277200.00	207900.00	207.90	207.90	2.41	7.22	0.60	7.82	250	195	0.10	0.75	18.46	0.00	-3.23	0.00	-3.33	
58	B67-B68	20	200	200	30000.00	22500.00	22.50	22.50	0.26	0.78	0.07	0.85	200	145	0.14	0.75	11.81	0.00	-1.60	0.00	-1.74	
59	B68-B69	19	0	200	30000.00	22500.00	22.50	22.50	0.26	0.78	0.07	0.85	200	145	0.13	0.75	11.81	0.00	-1.74	0.00	-1.87	
60	B69-B70	21	200	400	60000.00	45000.00	45.00	45.00	0.52	1.56	0.13	1.69	200	145	0.14	0.75	11.81	0.00	-1.87	0.00	-2.01	

SL No	SEWER LINE FROM-TO	Length of line	NUMBER OF POPULATION	CUMMULATIVE POPULATION	Average water requirement @150 LPD	Self Load (15% of water requirement)		Progressive Discharge	Progressive Discharge (Average)	Progressive Discharge (Peak)	Infiltration @ 25% Av. Discharge	Total Discharge	Dia of Pipe	Slope 1 /N	Fall in Line	Velocity In	Capacity of Pipe	Levels at Start		Levels at End		RE
																		Ground Lvl. at Start	Invert Lvl at Start	Ground lvl. at End	Invert Lvl at End	
61	B70-B71	25	0	400	60000.00	45000.00	45.00	45.00	0.52	1.56	0.13	1.69	300	145	0.17	0.75	11.81	0.00	-2.01	0.00	-2.19	
62	B71-B76	15	0	400	60000.00	45000.00	45.00	45.00	0.52	1.56	0.13	1.69	300	145	0.10	0.75	11.81	0.00	-2.19	0.00	-2.29	
63	B72-B73	12	250	250	37500.00	28125.00	28.13	28.13	0.33	0.98	0.08	1.06	200	145	0.08	0.75	11.81	0.00	-1.50	0.00	-1.68	
64	B73-B74	20	0	250	37500.00	28125.00	28.13	28.13	0.33	0.98	0.08	1.06	200	145	0.14	0.75	11.81	0.00	-1.68	0.00	-1.82	
65	B74-B75	25	0	250	37500.00	28125.00	28.13	28.13	0.33	0.98	0.08	1.06	200	145	0.17	0.75	11.81	0.00	-1.82	0.00	-1.99	
66	B75-B76	20	250	500	75000.00	56250.00	56.25	56.25	0.65	1.95	0.16	2.12	200	145	0.14	0.75	11.81	0.00	-1.99	0.00	-2.13	
67	B76-B77	15	0	900	135000.00	101250.00	101.25	101.25	1.17	3.51	0.29	3.81	200	145	0.10	0.75	11.81	0.00	-2.29	0.00	-2.39	
68	B77-B45	20	0	900	135000.00	101250.00	101.25	101.25	1.17	3.52	0.29	3.81	200	145	0.14	0.75	11.81	0.00	-2.39	0.00	-2.53	
69	B45-B44	5	0	2748	412230.00	309150.00	309.15	309.15	3.58	10.75	0.89	11.63	250	195	0.03	0.75	18.45	0.00	-3.23	0.00	-3.25	
69	B45-S79	5	0	2268	340200.00	270150.00	270.15	270.15	8.16	24.48	2.04	26.52	300	250	0.02	0.75	26.51	0.00	-4.04	0.00	-4.06	
Total		1232																				

DESIGN OF STORM WATER DRAINAGE SYSTEM FOR PALM DRIVE

SL NO	NAME OF DRAI	LENGTH IN MM	Area to be drained (Acres) Sqm Area	AREA IN ACRE			DISCHARGE IN CUM/SEC 10CIA C=0.6,I=25mm	DIA OF PIPE	SLOPE 1 IN	VELOCITY (m/sec)	LEVEL AT START		FALL	LEVEL AT END		RE
				SELF	ADDL	TOTAL					F.L	LL		F.L	LL	
1	A1-A2	17	1500	1.37	0.37	0.74	0.01	400	375	0.742	0.00	-1.60	0.05	0.00	-1.65	
2	A2-A3	18	1400	0.35	0.72	1.06	0.02	400	600	0.586	0.00	-1.65	0.03	0.00	-1.68	
3	A3-A4	17	1800	0.44	1.16	1.61	0.02	400	600	0.586	0.00	-1.68	0.03	0.00	-1.70	
4	A4-A5	10	1000	0.25	1.41	1.66	0.02	400	600	0.586	0.00	-1.70	0.02	0.00	-1.72	
5	A5-A6	12	1200	0.30	1.70	2.00	0.03	400	600	0.586	0.00	-1.72	0.02	0.00	-1.74	
6	A6-A7	17	1400	0.35	2.05	2.40	0.04	400	600	0.586	0.00	-1.74	0.03	0.00	-1.77	
7	A7-A8	18	1600	0.25	2.30	2.55	0.04	400	600	0.586	0.00	-1.77	0.03	0.00	-1.80	
8	A8-A9	25	1600	0.25	2.55	2.79	0.04	400	600	0.586	0.00	-1.80	0.04	0.00	-1.84	
9	A10-A11	10	400	0.10	2.64	2.74	0.04	400	600	0.586	0.00	-1.84	0.02	0.00	-1.86	
10	A11-A12	22	2000	0.49	3.14	3.63	0.05	400	600	0.586	0.00	-1.86	0.04	0.00	-1.89	
11	A12-A14	10	1000	0.25	3.39	3.63	0.05	400	600	0.586	0.00	-1.89	0.02	0.00	-1.91	
12	A15-A16	12	1000	0.25	3.63	3.88	0.06	400	600	0.586	0.00	-1.91	0.02	0.00	-1.93	
13	A16-A17	25	3600	0.40	4.03	4.42	0.07	400	600	0.586	0.00	-1.93	0.04	0.00	-1.97	
14	A18-A19	10	2400	0.59	4.62	5.21	0.08	400	600	0.586	0.00	-1.97	0.02	0.00	-1.99	
15	A20-A21	12	1200	0.30	4.92	5.21	0.08	400	600	0.586	0.00	-1.99	0.02	0.00	-2.01	
16	A20-A27	21	1800	0.44	5.36	5.81	0.09	400	600	0.586	0.00	-2.01	0.04	0.00	-2.04	
17	A21-A22	25	1400	0.35	0.35	0.69	0.01	400	600	0.586	0.00	-1.60	0.04	0.00	-1.64	
18	A22-A23	20	2400	0.59	0.94	1.53	0.02	400	600	0.586	0.00	-1.64	0.03	0.00	-1.68	
18	A23-A24	20	3600	0.89	1.83	2.72	0.04	400	600	0.586	0.00	-1.68	0.03	0.00	-1.71	
20	A24-A25	20	2400	0.59	2.42	3.01	0.05	400	600	0.586	0.00	-1.71	0.03	0.00	-1.74	
21	A25-A26	20	1500	0.37	2.79	3.16	0.05	400	600	0.586	0.00	-1.74	0.03	0.00	-1.78	
22	A26-A27	20	1000	0.25	3.04	3.29	0.05	400	600	0.586	0.00	-1.76	0.03	0.00	-1.81	
23	A27-A28	20	3600	0.89	8.40	9.29	0.14	400	600	0.586	0.00	-2.04	0.05	0.00	-2.08	
24	A28-A29	15	2400	0.59	8.99	9.59	0.14	400	600	0.586	0.00	-2.08	0.02	0.00	-2.10	

SL NO	NAME OF DRAI	LENGTH IN MM	Area to be drained (Acres) Sqm Area	AREA IN ACRE			DISCHARGE IN CUM/SEC 30CIA C=0.6,I=25mm	DIA OF PIPE	SLOPE 1IN	VELOCITY (m/sec)	LEVEL AT START		FALL	LEVEL AT END		Remarks
				SELF	ADDL	TOTAL					F.L	I.L		F.L	I.L	
25	A29-A35	15	1250	0.30	9.29	9.59	0.14	400	600	0.586	0.00	-2.10	0.03	0.00	-2.13	
26	A30-A31	20	1800	0.44	0.44	0.88	0.01	400	600	0.586	0.00	-1.60	0.03	0.00	-1.63	
27	A31-A32	20	1400	0.35	0.79	1.14	0.02	400	600	0.586	0.00	-1.63	0.03	0.00	-1.67	
28	A32-A33	20	1000	0.25	1.04	1.28	0.02	400	600	0.586	0.00	-1.67	0.03	0.00	-1.70	
29	A33-A34	20	1500	0.37	1.41	1.78	0.03	400	600	0.586	0.00	-1.70	0.03	0.00	-1.73	
30	A34-A35	16	1000	2.40	1.80	2.20	0.03	400	600	0.586	0.00	-1.73	0.03	0.00	-1.76	
31	A36-A37	20	2400	0.59	11.09	11.69	0.18	400	600	0.586	0.00	-2.13	0.03	0.00	-2.16	
32	A37-A38	20	800	0.20	11.29	11.49	0.17	400	600	0.586	0.00	-2.16	0.03	0.00	-2.19	
33	A38-A39	20	400	0.10	11.39	11.49	0.17	400	600	0.586	0.00	-2.19	0.03	0.00	-2.23	
34	A39-A40	20	1150	0.25	11.64	11.89	0.18	400	600	0.586	0.00	-2.23	0.03	0.00	-2.26	
35	A40-A41	15	1300	0.30	11.93	12.23	0.18	400	600	0.586	0.00	-2.26	0.03	0.00	-2.29	
36	A41-A42	20	1000	0.25	12.18	12.43	0.19	400	600	0.586	0.00	-2.29	0.03	0.00	-2.32	
37	A42-A43	10	1200	0.30	12.48	12.77	0.19	400	600	0.586	0.00	-2.32	0.02	0.00	-2.34	
38	A43-A44	20	1600	0.40	12.87	13.27	0.20	400	600	0.586	0.00	-2.34	0.03	0.00	-2.37	
39	A44-A45	15	800	0.20	13.07	13.27	0.20	400	600	0.586	0.00	-2.37	0.03	0.00	-2.39	
40	A45-A46	20	1200	0.30	13.37	13.66	0.20	400	600	0.586	0.00	-2.39	0.03	0.00	-2.43	
41	A46-A47	10	1000	0.25	13.62	13.86	0.21	400	600	0.586	0.00	-2.43	0.02	0.00	-2.44	
42	A47-A48	15	2400	0.59	14.21	14.80	0.22	400	600	0.586	0.00	-2.44	0.03	0.00	-2.47	
43	A48-A49	15	1000	0.25	14.46	14.70	0.22	400	600	0.586	0.00	-2.47	0.03	0.00	-2.49	
44	A49-A50	20	400	0.10	14.55	14.65	0.22	400	600	0.586	0.00	-2.49	0.03	0.00	-2.53	
45	A50-A51	20	1100	0.25	14.80	15.05	0.23	400	600	0.586	0.00	-2.53	0.03	0.00	-2.56	
46	A51-A52	20	1200	0.30	15.10	15.39	0.23	400	600	0.586	0.00	-2.56	0.03	0.00	-2.59	
47	A52-A53	20	800	0.20	15.30	15.49	0.23	400	600	0.586	0.00	-2.59	0.03	0.00	-2.63	
48	A53-A54	15	400	0.10	15.39	15.49	0.23	400	600	0.586	0.00	-2.63	0.03	0.00	-2.65	
49	A54-A55	15	1600	0.09	15.79	16.38	0.24	400	600	0.586	0.00	-2.65	0.03	0.00	-2.68	
50	A55-A56	20	1200	0.30	16.09	16.38	0.25	400	600	0.586	0.00	-2.68	0.03	0.00	-2.71	
51	A56-A57	20	1200	0.30	16.38	16.68	0.25	400	600	0.586	0.00	-2.71	0.03	0.00	-2.74	

SL.NO	NAME OF DEA	LENGTH IN MM	Area to be drained (Acres) Sqm Area	AREA IN ACRE			DISCHARGE IN CUM/SEC 28CIA C=0.6,I=25mm	DIA OF PIPE	SLOPE 1 IN	VELOCITY (m/sec)	LEVEL AT START		FALL	LEVEL AT END		Remarks
				SELF	ADDL	TOTAL					F.L	T.L		F.L	T.L	
30	A57-A58	20	1000	0.25	16.63	16.88	0.25	400	600	0.586	0.00	-2.74	0.03	0.00	-2.78	
31	A58-A59	30	600	0.15	16.78	16.93	0.25	400	600	0.586	0.00	-2.78	0.03	0.00	-2.81	
54	A59-A60	20	1200	0.30	17.07	17.37	0.26	400	600	0.588	0.00	-2.81	0.03	0.00	-2.84	
55	A60-A61	20	800	0.20	17.27	17.47	0.26	400	600	0.586	0.00	-2.84	0.05	0.00	-2.88	
56	A61-A62	20	400	0.10	17.37	17.47	0.26	400	600	0.586	0.00	-2.88	0.03	0.00	-2.91	
57	A62-A63	15	2200	0.54	17.91	18.46	0.28	400	600	0.586	0.00	-2.91	0.03	0.00	-2.94	
58	A63-A64	18	1800	0.45	18.31	18.77	0.28	400	600	0.586	0.00	-2.94	0.03	0.00	-2.97	
59	A64-A65	18	1400	0.35	18.66	19.00	0.29	400	600	0.586	0.00	-2.97	0.03	0.00	-3.00	
60	A65-A66	20	800	0.20	18.85	19.05	0.29	400	600	0.586	0.00	-3.00	0.03	0.00	-3.03	
61	A66-A67	18	600	0.15	19.00	19.15	0.29	400	600	0.586	0.00	-3.03	0.03	0.00	-3.06	
62	A67-A68	12	1000	0.25	19.25	19.50	0.29	400	600	0.586	0.00	-3.06	0.02	0.00	-3.08	
63	A68-A75	10	600	0.15	19.40	19.55	0.29	400	600	0.586	0.00	-3.08	0.02	0.00	-3.10	
64	A69-A70	20	3000	0.49	0.49	0.98	0.01	400	600	0.586	0.00	-1.60	0.03	0.00	-1.63	
65	A70-A71	20	400	0.10	0.59	0.69	0.01	400	600	0.586	0.00	-1.63	0.03	0.00	-1.67	
66	A71-A72	20	1000	0.25	0.84	1.09	0.02	400	600	0.586	0.00	-1.67	0.03	0.00	-1.70	
67	A72-A73	20	600	0.15	0.99	1.14	0.02	400	600	0.586	0.00	-1.70	0.03	0.00	-1.73	
68	A73-A74	15	1400	0.35	1.33	1.68	0.03	400	600	0.586	0.00	-1.73	0.03	0.00	-1.76	
69	A74-A75	20	1600	0.40	1.78	2.18	0.03	400	600	0.586	0.00	-1.76	0.03	0.00	-1.79	
70	A75-A76	20	1000	0.25	21.13	21.37	0.32	400	600	0.586	0.00	-3.10	0.03	0.00	-3.13	
71	A76-A77	30	1200	0.30	21.43	21.72	0.33	400	600	0.586	0.00	-3.13	0.03	0.00	-3.16	
72	A77-A78	20	1400	0.35	21.77	22.12	0.33	400	600	0.586	0.00	-3.16	0.03	0.00	-3.20	
73	A78-A79	20	1000	0.25	22.00	22.26	0.33	400	600	0.586	0.00	-3.20	0.03	0.00	-3.23	
74	A79-A80	20	1200	0.30	22.31	22.61	0.34	400	600	0.586	0.00	-3.23	0.03	0.00	-3.26	
75	A79- Ext.	20	1600	0.40	22.73	23.10	0.35	400	600	0.586	0.00	-3.26	0.03	0.00	-3.30	
76	A38-A97	25	1000	0.25	0.25	0.49	0.01	400	600	0.586	0.00	-1.60	0.04	0.00	-1.64	
77	A97-A76	15	1500	0.38	0.62	0.99	0.01	400	600	0.586	0.00	-1.64	0.03	0.00	-1.67	

SL.NO	NAME OF DRA	LENGTH IN MM	Area to be drained (Acres) Sqm Area	AREA IN ACRE			DISCHARGE IN CUM/SEC DIA C=0.6 I=25mm	DIA OF PIPE	SLOPE 1 IN	VELOCITY (m/sec)	LEVEL AT START		FALL	LEVEL AT END		Remarks
				SELF	ADDL	TOTAL					F.L	T.L		F.L	T.L	
78	A96-A95	15	1400	0.40	1.01	1.41	0.02	400	600	0.586	0.00	-1.67	0.05	0.00	-1.69	
79	A95-A94	20	800	0.20	1.21	1.41	0.02	400	600	0.586	0.00	-1.69	0.03	0.00	-1.73	
80	A94-A93	20	1200	0.30	1.51	1.80	0.03	400	600	0.586	0.00	-1.73	0.03	0.00	-1.76	
81	A93-A92	20	2400	0.59	2.10	2.69	0.04	400	600	0.586	0.00	-1.76	0.05	0.00	-1.75	
82	A92-A91	20	1500	0.37	2.47	2.84	0.04	400	600	0.586	0.00	-1.79	0.03	0.00	-1.83	
83	A91-A90	20	2000	0.49	2.97	3.46	0.05	400	600	0.586	0.00	-1.83	0.03	0.00	-1.86	
84	A90-A89	25	1000	0.25	3.21	3.46	0.05	400	600	0.586	0.00	-1.86	0.04	0.00	-1.90	
85	A89-A88	15	2000	0.49	3.71	4.20	0.06	400	600	0.586	0.00	-1.90	0.03	0.00	-1.93	
86	A88-A87	10	1500	0.37	4.08	4.45	0.07	400	600	0.586	0.00	-1.93	0.03	0.00	-1.96	
87	A87-A86	10	1000	0.25	4.32	4.57	0.07	400	600	0.586	0.00	-1.96	0.03	0.00	-1.99	
88	A86-A85	20	1600	0.40	4.72	5.11	0.08	400	600	0.586	0.00	-1.99	0.03	0.00	-2.02	
89	A85-A84	15	1200	0.30	5.02	5.31	0.08	400	600	0.586	0.00	-2.02	0.03	0.00	-2.05	
90	A84-A83	15	1000	0.25	5.26	5.51	0.08	400	600	0.586	0.00	-2.05	0.03	0.00	-2.07	
91	A83-A82	15	2400	0.59	5.86	6.45	0.10	400	600	0.586	0.00	-2.07	0.03	0.00	-2.10	
92	A82-A81	20	1200	0.30	6.15	6.45	0.10	400	600	0.586	0.00	-2.10	0.03	0.00	-2.13	
93	A81-A80	20	1600	0.37	6.52	6.89	0.10	400	600	0.586	0.00	-2.13	0.03	0.00	-2.16	
94	A80-Ext	20	2000	0.49	29.73	30.22	0.45	400	600	0.586	0.00	-2.16	0.05	0.01	-2.20	
95	A99-A100	20	2400	0.59	0.59	1.19	0.02	400	600	0.586	0.00	-1.69	0.03	0.00	-1.63	
96	A100-A101	20	2400	0.59	1.19	1.78	0.03	400	600	0.586	0.00	-1.63	0.03	0.00	-1.67	
97	A101-A102	15	3600	0.89	2.08	2.97	0.04	400	600	0.586	0.00	-1.67	0.03	0.00	-1.69	
98	A102-A103	15	1200	0.30	2.37	2.67	0.04	400	600	0.586	0.00	-1.69	0.03	0.00	-1.72	
99	A103-A104	20	1200	0.30	2.67	2.97	0.04	400	600	0.586	0.00	-1.72	0.03	0.00	-1.75	
100	A104-A105	15	1600	0.40	3.06	3.46	0.05	400	600	0.586	0.00	-1.75	0.03	0.00	-1.78	
101	A105-A106	15	1200	0.30	3.36	3.66	0.05	400	600	0.586	0.00	-1.78	0.03	0.00	-1.80	
102	A106-A107	20	3400	0.59	3.95	4.55	0.07	400	600	0.586	0.00	-1.80	0.03	0.00	-1.83	
103	A107-A108	15	1200	0.30	4.25	4.55	0.07	400	600	0.586	0.00	-1.83	0.03	0.00	-1.86	
104	A108-A109	20	1200	0.30	4.55	4.84	0.07	400	600	0.586	0.00	-1.86	0.03	0.00	-1.89	
105	A109-A110	15	1600	0.40	4.94	5.34	0.08	400	600	0.586	0.00	-1.89	0.03	0.00	-1.92	

SL NO	NAME OF DRAI	LENGTH IN MM	Area to be drained (Acres) Sqm Area	AREA IN ACRE			DISCHARGE IN CUM/SEC 10CIA C=0.6,I=25mm	DIA OF PIPE	SLOPE 1 IN	VELOCITY (m/sec)	LEVEL AT START		FALL	LEVEL AT END	
				SELF	ADDL	TOTAL					F.L	LL		F.L	LL
106	A110-A111	15	2000	0.49	5.44	5.93	0.09	400	600	0.586	0.00	-1.92	0.03	0.00	-1.94
107	A111-A112	20	1600	0.40	5.83	6.23	0.09	400	600	0.586	0.00	-1.94	0.03	0.00	-1.98
108	A112-A113	15	2000	0.49	6.33	6.82	0.10	400	600	0.586	0.00	-1.98	0.03	0.00	-2.00
109	A113-A114	15	2300	0.57	6.89	7.46	0.11	400	600	0.586	0.00	-2.00	0.03	0.00	-2.03
110	A114-A115	15	1000	0.25	7.14	7.39	0.11	400	600	0.586	0.00	-2.03	0.03	0.00	-2.05
111	A115-A116	15	1800	0.44	7.59	8.03	0.12	400	600	0.586	0.00	-2.05	0.03	0.00	-2.08
112	A117-A118	20	800	0.20	7.78	7.98	0.12	400	600	0.586	0.00	-2.08	0.03	0.00	-2.11
113	A118-out	15	1200	0.30	8.08	8.38	0.13	400	600	0.586	0.00	-2.11	0.03	0.00	-2.13
	Total	2021			37.81										

PROJECT : GROUP HOUSING "PALM TERRACE SELECT" SECTOR - 66, GURGOAN (HARYANA)				
DOMESTIC WATER SUPPLY QUANTITY SHEET				
S.NO	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
ZONE - I	FOR TOWER - (01 To 12)			
1.	*Plant Room*	DC1	10.0	100
2.	DC1	DC2	4.0	100
3.	DC2	DC3	20.0	80
4.	DC3	DC4	32.0	80
5.	DC4	DC5	26.0	80
6.	DC5	DC5a	7.0	50
7.	DC5	DC6	26.0	65
8.	DC6	DC7	32.0	65
9.	DC7	DC8	20.0	65
10.	DC8	DC9	52.0	50
11.	DC2	DC10	17.0	65
12.	DC10	DC11	37.0	65
13.	DC11	DC12	32.0	65
14.	DC12	DC13	32.0	65
15.	DC13	DC14	32.0	50
ZONE - II	FOR (EWS & SHOPPING)			
16.	*Plant Room*	DB1	10.0	40
17.	DB1	DB2	144.0	32
18.	DB1	DB3	100.0	25
ZONE - III	FOR (CLUB)			
19.	*Plant Room*	DA1	10.0	40
20.	DA1	DA2	58.0	40
FLUSHING WATER SUPPLY QUANTITY SHEET				
S.NO	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
ZONE - I	FOR TOWER - (01 To 12)			
1.	*S.T.P*	FC1	2.0	80
2.	FC1	FC2	13.0	65
3.	FC2	FC3	35.0	65
4.	FC3	FC4	31.0	65
5.	FC4	FC5	24.0	65
6.	FC5	FC5a	7.0	40
7.	FC5	FC6	23.0	65
8.	FC6	FC7	32.0	65
9.	FC7	FC8	80.0	50
10.	FC8	FC9	31.0	40
11.	FC1	FC10	21.0	65
12.	FC10	FC11	31.0	65
13.	FC11	FC12	31.0	50
14.	FC12	FC13	31.0	40
ZONE - II	FOR (EWS & SHOPPING)			
15.	*S.T.P*	FB1	3.0	32
16.	FB1	FB2	100.0	25
17.	FB1	FB3	130.0	35

ZONE - II FOR (CLUB)				
18.	S.T.P	FA1	11.0	32
19.	FA1	FA2	62.0	32

TUBE WELL WATER SUPPLY QUANTITY SHEET

S.NO	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
1	Tube Well-01	TW1	203.0	100
2.	Tube Well-02	TW1	4.0	100
3	TW1	U.G.T	78.0	150
4.	Municipal	U.G.T	200.0	65

	Length in (MTR)	Pipe Dia (MM)
Domestic & Flushing Water Supply line	330.0	25
Domestic & Flushing Water Supply line	225.0	32
Domestic & Flushing Water Supply line	147.0	40
Domestic & Flushing Water Supply line	132.0	50
Domestic & Flushing Water Supply line	416.0	65
Domestic & Flushing Water Supply line	80.0	80
Domestic & Flushing Water Supply line	14.0	100

	Length in (M)	Pipe Dia
Municipal Water Supply line	200.0	65
Tube Well Water Supply line	207.0	100
Tube Well Water Supply line	78.0	150
25 Dia Valve	3	Nos.
32 Dia Valve	3	Nos.
80 Dia Valve	1	Nos.
100 Dia Valve	3	Nos.
150 Dia Valve	1	Nos.
100 Dia Non Return Valve	2	Nos.
Air Valve	2	Nos.

PROJECT : GROUP HOUSING "PALM TERRACE SELECT" SECTOR - 66, GURGOAN (HARYANA)

IRRIGATION WATER SUPPLY QUANTITY SHEET

S.NO	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
1.	S.T.P	IR1	9.0	65
2.	IR1	IR2	4.0	65
3.	IR2	IR2a	60.0	25
4.	IR2	IR3	20.0	65
5.	IR3	IR4	41.0	65
6.	IR4	IR5	27.0	65
7.	IR5	IR5a	42.0	25
8.	IR5	IR6	109.0	65
9.	IR2	IR6	50.0	65
10.	IR6	IR6a	61.0	20
11.	Garden Hydrant Connection Pipe		10.0	25

	Length in (M)	Pipe Dia
Irrigation Water Supply line	173.0	25
Irrigation Water Supply line	290.0	65

Garden Hydrant	9	Nos.
65 Dia Valve	1	Nos.
Air Valve	1	Nos.

PROJECT : GROUP HOUSING "PALM TERRACE SELECT" SECTOR - 66, GURGAON (HARYANA)

FIRE QUANTITY SHEET

S.NO	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mm.
1.	U.G.Tank	FF1	20.0	150
2.	FF1	FF2	5.0	150
3.	FF2	FF3	34.0	150
4.	FF3	FF3a	21.0	100
5.	FF3a	FF3b	46.0	80
6.	FF3	FF4	63.0	150
7.	FF4	FF4a	17.0	100
8.	FF4a	FF4b	46.0	80
9.	FF4a	FF4c	17.0	80
10.	FF4	FF5	88.0	150
11.	FF5	FF5a	10.0	100
12.	FF5a	FF5b	33.0	80
13.	FF5a	FF5c	12.0	80
14.	FF5	FF6	68.0	150
15.	FF6	FF6a	6.0	100
16.	FF6a	FF6b	31.0	80
17.	FF6a	FF6c	14.0	80
18.	FF6	FF7	69.0	150
19.	FF7	FF7a	20.0	100
20.	FF7a	FF7b	27.0	80
21.	FF7a	FF7c	17.0	80
22.	FF7	FF8	95.0	150
23.	FF8	FF8a	19.0	150
24.	FF8a	FF8b	34.0	80
25.	FF8a	FF8c	10.0	80
26.	FF8a	FF8d	29.0	150
27.	FF8d	FF8e	55.0	150
28.	FF8e	FF8f	42.0	100
29.	FF8f	FF8g	43.0	80
30.	FF8d	FF8h	13.0	100
31.	FF8h	FF8i	42.0	80
32.	FF8	FF2	55.0	150

	Length	
80 mm Dia Pipe	372.0	mtr.
100 mm Dia Pipe	129.0	mtr.
150 mm Dia Pipe	681.0	mtr.

External Fire Hydrant (EFH)	17	Nos.
80 Dia Valve	17	Nos.
100 Dia Valve	9	Nos.
150 Dia Valve	4	Nos.
80 Dia Non Return Valve	17	Nos.

PROJECT : GROUP HOUSING "PALM TERRACE SELECT" SECTOR - 66, GURGOAN (HARYANA)
TITLE - SEWERAGE QUANTITY SHEET

S.No.	Line No.		Length	Dia of Pipe		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	14.0	250	0.250	1.60	1.67	1.64	16.72	0.0	14.0	0.0	0.0
2.	S2	S3	16.5	250	0.250	1.67	1.65	1.61	19.29	0.0	16.5	0.0	0.0
3.	S3	S4	15.0	250	0.250	1.65	1.73	1.69	19.45	0.0	15.0	0.0	0.0
4.	S4	S5	18.5	250	0.250	1.73	1.83	1.78	25.05	0.0	18.5	0.0	0.0
5.	S5	S6	15.0	250	0.250	1.83	1.91	1.87	21.17	0.0	15.0	0.0	0.0
6.	S6	S7	7.0	250	0.250	1.91	1.95	1.93	10.14	0.0	7.0	0.0	0.0
7.	S7	S8	11.5	250	0.250	1.95	2.01	1.98	17.03	0.0	11.5	0.0	0.0
8.	S8	S9	15.0	250	0.250	2.01	2.09	2.05	22.89	0.0	15.0	0.0	0.0
9.	S9	S10	17.0	250	0.250	2.09	2.18	2.13	25.87	0.0	17.0	0.0	0.0
10.	S10	S11	16.0	250	0.250	2.18	2.26	2.22	28.19	0.0	16.0	0.0	0.0
11.	S11	S12	21.0	250	0.250	2.26	2.37	2.32	35.71	0.0	21.0	0.0	0.0
12.	S12	S13	9.5	250	0.250	2.37	2.42	2.40	16.65	0.0	9.5	0.0	0.0
13.	S13	S14	16.0	250	0.250	2.42	2.51	2.46	28.74	0.0	16.0	0.0	0.0
14.	S14	S15	14.5	250	0.250	2.51	2.58	2.54	29.80	0.0	14.5	0.0	0.0
15.	S15	S16	16.0	250	0.250	2.58	2.67	2.62	30.41	0.0	16.0	0.0	0.0
16.	S16	S17	14.5	250	0.250	2.67	2.74	2.70	29.31	0.0	14.5	0.0	0.0
17.	S17	S18	16.0	250	0.250	2.74	2.83	2.78	32.09	0.0	16.0	0.0	0.0
18.	S18	S19	14.5	250	0.250	2.83	2.90	2.86	29.83	0.0	14.5	0.0	0.0
19.	S22	S23	24.5	250	0.250	1.50	1.63	1.56	29.69	0.0	24.5	0.0	0.0
20.	S23	S24	24.5	250	0.250	1.63	1.76	1.69	31.75	0.0	24.5	0.0	0.0
21.	S24	S25	11.5	250	0.250	1.76	1.82	1.79	15.61	0.0	11.5	0.0	0.0
22.	S25	S19	27.0	250	0.250	1.82	1.96	1.89	38.43	0.0	27.0	0.0	0.0
23.	S19	S20	16.0	250	0.250	2.90	2.99	2.94	33.75	0.0	16.0	0.0	0.0
24.	S20	S21	12.0	250	0.250	2.99	3.05	3.02	25.88	0.0	0.0	12.0	0.0
25.	S26	S27	21.5	250	0.250	1.50	1.61	1.56	25.96	0.0	21.5	0.0	0.0
26.	S27	S28	16.0	250	0.250	1.61	1.70	1.66	20.33	0.0	16.0	0.0	0.0
27.	S28	S29	14.5	250	0.250	1.70	1.77	1.74	19.19	0.0	14.5	0.0	0.0
28.	S29	S30	16.0	250	0.250	1.77	1.89	1.82	22.00	0.0	16.0	0.0	0.0
29.	S30	S31	14.5	250	0.250	1.89	1.93	1.90	20.70	0.0	14.5	0.0	0.0
30.	S31	S32	16.0	250	0.250	1.93	2.02	1.98	23.67	0.0	16.0	0.0	0.0
31.	S32	S33	15.5	250	0.250	2.02	2.10	2.06	23.77	0.0	15.5	0.0	0.0
32.	S33	S34	17.5	250	0.250	2.10	2.19	2.15	27.62	0.0	17.5	0.0	0.0
33.	S34	S35	16.0	250	0.250	2.19	2.28	2.23	26.36	0.0	16.0	0.0	0.0

S.No.	Line No.		Length	Dia of Pipe		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.)
34.	S35	S36	17.0	250	0.250	2.28	2.37	2.32	26.96	0.0	17.0	0.0	0.0
35.	S36	S21	12.5	250	0.250	2.37	2.43	2.40	21.93	0.0	12.5	0.0	0.0
36.	S21	STP.	7.0	300	0.300	3.05	3.08	3.06	16.48	0.0	0.0	7.0	0.0
Total			666.0						886.0	0.0	547.0	19.0	0.0

Pipe in excavation depth				
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
250 mm Dia pipe	0.0	547.0	12.0	0.0
300 mm Dia pipe	0.0	0.0	7.0	0.0

PROJECT :- GROUP HOUSING "PALM TERRACE SELECT" SECTOR - 66, GURGOAN (HARYANA)

TITLE :- STORM WATER QUANTITY SHEET

S.No.	Line No.		Length	Size of Pipe		Depth			Excavation Depth	EXCAVATION		
						Start	End	Avg.		0.0 - 1.5	1.5 - 3.0	3.0 - 4.5
			(mtr.)	(mm)	(M)	(mtr.)	(mtr.)	(mtr.)	(cum.)	(mtr.)	(mtr.)	(mtr.)
1.	A1	A2	16.0	400	0.400	1.50	1.53	1.52	32.68	0.0	16.0	0.0
2.	A2	A3	16.0	400	0.400	1.53	1.58	1.56	29.53	0.0	16.0	0.0
3.	A3	A4	16.0	400	0.400	1.56	1.59	1.57	29.98	0.0	16.0	0.0
4.	A4	A5	16.0	400	0.400	1.59	1.62	1.60	30.43	0.0	16.0	0.0
5.	A5	A6	19.0	400	0.400	1.62	1.65	1.63	36.72	0.0	19.0	0.0
6.	A6	A7	14.5	400	0.400	1.65	1.67	1.66	28.45	0.0	14.5	0.0
7.	A7	A8	16.0	400	0.400	1.67	1.70	1.69	31.82	0.0	16.0	0.0
8.	A8	A9	16.0	400	0.400	1.70	1.73	1.72	32.27	0.0	16.0	0.0
9.	A10	A11	8.5	400	0.400	1.50	1.51	1.51	15.36	0.0	8.5	0.0
10.	A11	A9	13.0	400	0.400	1.51	1.54	1.53	23.74	0.0	13.0	0.0
11.	A9	RP-01	8.5	400	0.400	1.73	1.74	1.74	13.24	0.0	8.5	0.0
12.	A12	A13	17.5	400	0.400	1.50	1.53	1.52	31.77	0.0	17.5	0.0
13.	A13	A14	16.0	400	0.400	1.53	1.56	1.54	29.52	0.0	16.0	0.0
14.	A14	A15	16.0	400	0.400	1.56	1.59	1.57	29.98	0.0	16.0	0.0
15.	A15	A16	16.0	400	0.400	1.59	1.61	1.60	30.41	0.0	16.0	0.0
16.	A16	A17	13.0	400	0.400	1.61	1.64	1.63	25.04	0.0	13.0	0.0
17.	A17	A18	16.0	400	0.400	1.64	1.67	1.65	31.23	0.0	16.0	0.0
18.	A18	A19	16.0	400	0.400	1.67	1.69	1.68	31.68	0.0	16.0	0.0
19.	A19	A20	16.0	400	0.400	1.69	1.72	1.71	32.13	0.0	16.0	0.0
20.	A20	A21	13.5	400	0.400	1.72	1.75	1.73	27.46	0.0	13.5	0.0
21.	A21	RP-01	7.5	400	0.400	1.75	1.76	1.75	15.39	0.0	7.5	0.0
22.	RP-01	B1	6.0	400	0.400	1.50	1.51	1.51	10.83	0.0	6.0	0.0
23.	B1	B2	21.5	400	0.400	1.51	1.55	1.53	39.33	0.0	21.5	0.0
24.	B6	B2	15.5	400	0.400	1.50	1.53	1.51	28.11	0.0	15.5	0.0
25.	B2	B3	15.5	400	0.400	1.55	1.58	1.56	28.86	0.0	15.5	0.0
26.	B3	B4	15.5	400	0.400	1.58	1.60	1.59	29.28	0.0	15.5	0.0
27.	B4	B5	18.5	400	0.400	1.60	1.64	1.62	35.50	0.0	18.5	0.0
28.	B5	RP-02	3.5	400	0.400	1.64	1.64	1.64	6.78	0.0	3.5	0.0
29.	RP-02	C1	11.5	400	0.400	1.50	1.52	1.51	20.82	0.0	11.5	0.0
30.	C1	C2	15.0	400	0.400	1.52	1.55	1.53	27.50	0.0	15.0	0.0
31.	C2	C3	15.0	400	0.400	1.55	1.57	1.56	27.89	0.0	15.0	0.0
32.	C3	C4	10.5	400	0.400	1.57	1.59	1.58	19.76	0.0	10.5	0.0
33.	C4	C5	13.5	400	0.400	1.59	1.61	1.60	25.69	0.0	13.5	0.0
34.	C5	C6	15.0	400	0.400	1.61	1.64	1.63	28.92	0.0	15.0	0.0
35.	C6	RP-03	4.0	400	0.400	1.64	1.65	1.64	7.78	0.0	4.0	0.0
36.	RP-03	D1	3.0	400	0.400	1.50	1.51	1.50	5.41	0.0	3.0	0.0
37.	D1	D2	7.5	400	0.400	1.51	1.52	1.51	13.59	0.0	7.5	0.0
38.	D2	D3	15.5	400	0.400	1.52	1.55	1.53	28.40	0.0	15.5	0.0
39.	D3	D4	15.5	400	0.400	1.55	1.57	1.56	28.82	0.0	15.5	0.0
40.	D4	D6	15.5	400	0.400	1.57	1.60	1.59	29.24	0.0	15.5	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
			(mtr.)	(mm)	(M)	(mtr.)	(mtr.)	(mtr.)	(cum.)	(mtr.)	(mtr.)	(mtr.)
41.	D5	D6	14.5	400	0.400	1.60	1.63	1.61	27.73	0.0	14.5	0.0
42.	D6	D7	16.5	400	0.400	1.63	1.65	1.64	32.01	0.0	16.5	0.0
43.	D7	RP-04	5.0	400	0.400	1.65	1.66	1.66	9.79	0.0	5.0	0.0
44.	RP-04	G5	9.0	400	0.400	1.50	1.52	1.51	16.27	0.0	9.0	0.0
45.	E1	E2	15.5	400	0.400	1.50	1.53	1.51	28.11	0.0	15.5	0.0
46.	E2	E3	15.5	400	0.400	1.53	1.55	1.54	28.53	0.0	15.5	0.0
47.	E3	E4	15.5	400	0.400	1.55	1.58	1.57	28.95	0.0	15.5	0.0
48.	E4	E5	16.5	400	0.400	1.58	1.61	1.60	31.26	0.0	16.5	0.0
49.	E5	E6	15.0	400	0.400	1.61	1.64	1.62	28.86	0.0	15.0	0.0
50.	E6	RP-05	7.0	400	0.400	1.64	1.65	1.64	13.60	0.0	7.0	0.0
51.	RP-05	F1	3.0	400	0.400	1.50	1.51	1.50	5.41	0.0	3.0	0.0
52.	F1	F2	15.0	400	0.400	1.51	1.53	1.52	27.28	0.0	15.0	0.0
53.	F2	F3	15.0	400	0.400	1.53	1.56	1.54	27.87	0.0	15.0	0.0
54.	F3	F4	17.0	400	0.400	1.56	1.59	1.57	31.84	0.0	17.0	0.0
55.	F4	F5	17.0	400	0.400	1.59	1.62	1.60	32.34	0.0	17.0	0.0
56.	F5	F6	21.5	400	0.400	1.62	1.66	1.64	41.53	0.0	21.5	0.0
57.	F6	F7	17.5	400	0.400	1.66	1.68	1.67	34.49	0.0	17.5	0.0
58.	F7	RP-06	8.5	400	0.400	1.69	1.70	1.69	16.94	0.0	8.5	0.0
59.	RP-06	G1	8.0	400	0.400	1.50	1.51	1.51	14.46	0.0	8.0	0.0
60.	G1	G2	17.0	400	0.400	1.51	1.54	1.53	31.09	0.0	17.0	0.0
61.	G2	G3	16.0	400	0.400	1.54	1.57	1.56	29.73	0.0	16.0	0.0
62.	G3	G4	15.0	400	0.400	1.57	1.60	1.59	28.28	0.0	15.0	0.0
63.	G4	RP-07	5.5	400	0.400	1.60	1.61	1.60	10.67	0.0	5.5	0.0
64.	G5	G6	13.0	400	0.400	1.52	1.54	1.53	23.75	0.0	13.0	0.0
65.	G6	G7	15.0	400	0.400	1.54	1.56	1.55	27.76	0.0	15.0	0.0
66.	G7	G8	12.0	400	0.400	1.56	1.59	1.58	22.51	0.0	12.0	0.0
67.	G8	RP-07	6.0	400	0.400	1.59	1.60	1.59	11.35	0.0	6.0	0.0
68.	RP-07	To Huda Drain	10.0	500	0.500	1.50	1.51	1.51	19.87	0.0	10.0	0.0
Total			907.0						1714.0	0.0	907.0	0.0

Excavation Depth			
	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)
400 mm Dia pipe	0.0	897.0	0.0
500 mm Dia pipe	0.0	10.0	0.0

Area statement for METTALIC ROAD (PART-02) (A1)									
S.no.	Discription	Type	Number	Dimension			Calculation	Result	
				Length	Height	Breadth			
Addition									
41	M41	Rectangle	1	105.279		6.000	Length X breadth	631.674	SQ.MT
42	M42	Rectangle	1	28.008		5.700	Length X breadth	159.634	SQ.MT
43	M43	Rectangle	1	44.223		6.000	Length X breadth	265.338	SQ.MT
44	M44	Rectangle	1	15.512		4.571	Length X breadth	70.905	SQ.MT
45	M45	Rectangle	1	6.000		34.096	Length X breadth	204.575	SQ.MT
46	M46	Rectangle	1	12.300		6.000	Length X breadth	73.800	SQ.MT
47	M47	Rectangle	1	32.934		6.000	Length X breadth	197.604	SQ.MT
							Total Addition =	1603.532	SQ.MT
							ADD 10 % FOR CURVED ROAD	160.353	SQ.MT
							Total Mettalic Road Area (A1)=	1763.885	SQ.MT

Area statement for HARD PAVED ROAD (PART-02) (B1)									
S.no.	Discription	Type	Number	Dimension			Calculation	Result	UNIT
				Length		Breadth			
Addition									
31	H31	Rectangle	1	6.000		12.410	Length X breadth	74.460	SQ.MT
32	H32	Rectangle	1	6.000		59.388	Length X breadth	356.328	SQ.MT
33	H33	Rectangle	1	6.000		28.700	Length X breadth	172.200	SQ.MT
34	H34	Rectangle	1	6.000		18.915	Length X breadth	113.490	SQ.MT
35	H35	Rectangle	1	6.000		7.930	Length X breadth	47.580	SQ.MT
36	H36	Rectangle	1	6.000		117.316	Length X breadth	703.898	SQ.MT
37	H37	Rectangle	1	6.000		20.632	Length X breadth	123.792	SQ.MT
38	H38	Rectangle	1	6.000		96.407	Length X breadth	578.442	SQ.MT
39	H39	Rectangle	1	6.000		28.093	Length X breadth	168.558	SQ.MT
40	H40	Rectangle	1	6.000		115.778	Length X breadth	694.668	SQ.MT
41	H41	Rectangle	1	6.000		51.727	Length X breadth	310.362	SQ.MT
42	H42	Rectangle	1	6.000		46.759	Length X breadth	280.554	SQ.MT
43	H43	Rectangle	1	6.000		5.640	Length X breadth	33.840	SQ.MT
44	H44	Rectangle	1	6.000		63.310	Length X breadth	379.860	SQ.MT
45	H45	Rectangle	1	6.000		9.270	Length X breadth	55.620	SQ.MT
46	H46	Rectangle	1	6.000		19.182	Length X breadth	115.092	SQ.MT
							Total Addition =	4208.742	SQ.MT
							ADD 10 % FOR CURVED ROAD	420.874	SQ.MT
							Total Mettalic Road Area (B1)=	4629.616	SQ.MT

Dev C...

(Authorised Signatory)

Crisp Design Solutions
Paradise Consultants

PROJECT : GROUP HOUSING "PALM TERRACE SELECT" SECTOR - 66, GURGOAN (HARYANA)

TITLE : TUBE WELL WATER DESIGN CHART

S.NO	Line No.		Average Demand	Peak Demand @ 1.5 Times	Flow Rate	Length of Pipe	Head Loss mtr./ mtr.	Total Head Loss	Velocity	Dia of Pipe
	From	To	lph.	lph.	lpm.	mtr.	mtr.	mtr.	m/sec	mm
1.	Tube Well-01	TW1	18.00	27.00	450.00	185.0	0.018	3.36	0.954	100
2.	Tube Well-02	TW1	18.00	27.00	450.00	10.0	0.018	0.18	0.954	100
3.	TW1	U.G.T	36.00	54.00	900.00	149.0	0.009	1.36	0.848	150

PROJECT :- PALM TERRACE SELECT GROUP HOUSING SECTOR 4/5, GURGOAN, HARYANA

TITLE :- HYDRAULIC STORM WATER DESIGN CHART

S.No.	Line No.		Length	Catchment Area (Sqm.)			Discharge @ 50 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	50% runoff (lps)	(mm)	(mm)	m/sec.	lps.	mtr.	FRL	FSL	IL	FRL	FSL	IL	Start	End	Depth
1.	A1	A2	16.0	691.0	0.0	691.0	3.48	400	570	0.60	75.63	0.03	228.50	227.40	227.05	228.50	227.37	226.97	1.50	1.53	1.52
2.	A2	A3	55.0	598.0	691.0	1289.0	6.45	400	570	0.60	75.63	0.03	228.50	227.37	226.97	228.50	227.34	226.94	1.53	1.56	1.55
3.	A3	A4	18.0	633.0	1289.0	1922.0	9.61	400	570	0.60	75.63	0.03	228.50	227.34	226.94	228.50	227.31	226.91	1.56	1.59	1.57
4.	A4	A5	16.0	548.0	1922.0	2470.0	12.35	400	570	0.60	75.63	0.03	228.50	227.31	226.91	228.50	227.28	226.88	1.59	1.62	1.60
5.	A5	A6	18.0	650.0	2470.0	3120.0	15.60	400	570	0.60	75.63	0.03	228.50	227.28	226.88	228.50	227.25	226.85	1.62	1.65	1.63
6.	A6	A7	14.5	496.0	3120.0	3616.0	18.08	400	570	0.60	75.63	0.03	228.50	227.25	226.85	228.50	227.22	226.83	1.65	1.67	1.66
7.	A7	A8	16.0	573.0	3616.0	4189.0	20.95	400	570	0.60	75.63	0.03	228.50	227.22	226.83	228.50	227.20	226.80	1.67	1.70	1.69
8.	A8	A9	16.0	540.0	4189.0	4729.0	23.65	400	570	0.60	75.63	0.03	228.50	227.20	226.80	228.50	227.17	226.77	1.70	1.73	1.72
9.	A10	A11	8.5	291.0	0.0	291.0	1.46	400	570	0.60	75.63	0.01	228.50	227.40	227.00	228.50	227.39	226.99	1.50	1.51	1.51
10.	A11	A9	13.0	445.0	291.0	736.0	3.68	400	570	0.60	75.63	0.02	228.50	227.39	226.99	228.50	227.36	226.96	1.51	1.54	1.53
11.	A9	RP-01	6.5	223.0	5465.0	5688.0	28.44	400	570	0.60	75.63	0.01	228.50	227.17	226.77	228.50	227.16	226.76	1.73	1.74	1.74
12.	A12	A13	17.5	600.0	0.0	600.0	3.00	400	570	0.60	75.63	0.03	228.50	227.40	227.00	228.50	227.37	226.97	1.50	1.53	1.52
13.	A13	A14	16.0	582.0	600.0	1182.0	5.91	400	570	0.60	75.63	0.03	228.50	227.37	226.97	228.50	227.34	226.94	1.53	1.56	1.54
14.	A14	A15	16.0	530.0	1182.0	1712.0	8.56	400	570	0.60	75.63	0.03	228.50	227.34	226.94	228.50	227.31	226.91	1.56	1.59	1.57
15.	A15	A16	16.0	593.0	1712.0	2305.0	11.53	400	570	0.60	75.63	0.03	228.50	227.31	226.91	228.50	227.28	226.88	1.59	1.61	1.60
16.	A16	A17	13.0	445.0	2305.0	2750.0	13.75	400	570	0.60	75.63	0.02	228.50	227.28	226.88	228.50	227.25	226.86	1.61	1.64	1.63
17.	A17	A18	16.0	668.0	2750.0	3358.0	16.79	400	570	0.60	75.63	0.03	228.50	227.25	226.86	228.50	227.23	226.83	1.64	1.67	1.65
18.	A18	A19	16.0	520.0	3358.0	3878.0	19.39	400	570	0.60	75.63	0.03	228.50	227.23	226.83	228.50	227.21	226.81	1.67	1.69	1.68
19.	A19	A20	16.0	548.0	3878.0	4426.0	22.13	400	570	0.60	75.63	0.03	228.50	227.21	226.81	228.50	227.18	226.78	1.69	1.72	1.71
20.	A20	A21	13.5	462.0	4426.0	4888.0	24.44	400	570	0.60	75.63	0.02	228.50	227.18	226.78	228.50	227.16	226.76	1.72	1.75	1.73
21.	A21	RP-01	7.5	257.0	4888.0	5145.0	25.73	400	570	0.60	75.63	0.01	228.50	227.16	226.76	228.50	227.14	226.74	1.75	1.76	1.75
22.	RP-01	B1	6.0	0.0	5688.0	5688.0	32.50	400	570	0.60	75.63	0.01	228.50	227.40	227.00	228.50	227.39	226.99	1.50	1.51	1.51
23.	B1	B2	21.5	795.0	5688.0	7235.6	36.18	400	570	0.60	75.63	0.04	228.50	227.39	226.99	228.50	227.35	226.95	1.51	1.55	1.53
24.	B6	B2	15.5	520.0	0.0	520.0	2.60	400	570	0.60	75.63	0.03	228.50	227.40	227.00	228.50	227.37	226.97	1.50	1.53	1.51
25.	B2	B3	15.5	550.0	7795.6	8305.6	41.53	400	570	0.60	75.63	0.03	228.50	227.35	226.95	228.50	227.32	226.92	1.55	1.58	1.56

			Length	Catchment Area (Sqm.)			Discharge @ 30 mm / hr rainfall	Pipe dia	Slope 1 in	Velocity m/sec.	Capacity of Pipe	Full at this	Levels at start (mtr.)			Levels at End (mtr.)			Depth (mtr.)	Avg.
26.																				
27.	B4	B3	11.5	560.0	6305.8	8926.8	44.48	400	570	0.60	75.63	0.00	228.96	227.52	226.92	226.50	227.36	226.50	1.58	1.56
28.	B5	B4	18.5	633.0	6905.8	8926.8	47.64	400	570	0.60	75.63	0.00	228.66	227.30	226.90	226.50	227.16	226.50	1.50	1.54
29.	RP-02	B5	3.5	120.0	6905.8	9644.8	48.24	400	570	0.60	75.63	0.01	228.50	227.20	226.90	226.50	227.16	226.50	1.50	1.50
30.	C1	C1	11.5	0.0	5789.3	5789.3	28.95	400	570	0.60	75.63	0.00	228.50	227.26	226.88	226.50	227.16	226.50	1.60	1.64
31.	C2	C2	15.1	540.0	5789.3	6329.3	31.66	400	570	0.60	75.63	0.00	228.50	227.40	227.00	226.50	227.26	226.50	1.64	1.63
32.	C3	C3	15.0	530.0	6329.3	6859.3	34.30	400	570	0.60	75.63	0.00	228.50	227.48	227.00	226.50	227.38	226.50	1.64	1.64
33.	C4	C4	10.5	360.0	6859.3	7219.3	36.10	400	570	0.60	75.63	0.00	228.50	227.35	226.95	226.50	227.33	226.50	1.52	1.61
34.	C5	C5	13.5	462.0	7219.3	7681.3	38.41	400	570	0.60	75.63	0.02	228.50	227.33	226.93	226.50	227.33	226.50	1.55	1.57
35.	C6	C6	15.0	500.0	7681.3	8181.3	40.91	400	570	0.60	75.63	0.02	228.50	227.31	226.91	226.50	227.31	226.50	1.57	1.56
36.	RP-03	C6	4.0	150.0	8181.3	8331.3	41.66	400	570	0.60	75.63	0.00	228.50	227.31	226.91	226.50	227.29	226.50	1.58	1.58
37.	D1	D1	3.0	0.0	4898.8	4898.8	24.99	400	570	0.60	75.63	0.01	228.50	227.29	226.89	226.50	227.29	226.50	1.58	1.58
38.	D2	D2	7.5	270.0	4898.8	5298.8	26.34	400	570	0.60	75.63	0.01	228.50	227.26	226.86	226.50	227.26	226.50	1.61	1.61
39.	D3	D3	13.5	550.0	5298.8	6318.8	28.90	400	570	0.60	75.63	0.01	228.50	227.40	227.00	226.50	227.25	226.50	1.64	1.63
40.	D4	D4	16.5	930.0	6318.8	6348.8	28.90	400	570	0.60	75.63	0.01	228.50	227.38	226.98	226.50	227.39	226.50	1.64	1.64
41.	D5	D5	15.5	570.0	6348.8	6918.8	31.74	400	570	0.60	75.63	0.02	228.50	227.38	226.98	226.50	227.38	226.50	1.61	1.50
42.	D6	D6	14.5	886.0	6918.8	7414.8	34.69	400	570	0.60	75.63	0.13	228.50	227.36	226.96	226.50	227.30	226.50	1.52	1.51
43.	D7	D7	16.5	965.0	7414.8	7979.8	37.07	400	570	0.60	75.63	0.03	228.50	227.35	226.85	226.50	227.33	226.50	1.55	1.53
44.	RP-04	D7	5.0	97.0	7979.8	8150.8	38.50	400	570	0.60	75.63	0.03	228.50	227.30	226.80	226.50	227.30	226.50	1.57	1.56
45.	E1	D8	9.0	0.0	4898.5	4898.5	40.75	400	570	0.60	75.63	0.01	228.50	227.27	226.87	226.50	227.27	226.50	1.60	1.58
46.	E2	E1	15.5	560.0	0.0	560.0	24.45	400	570	0.60	75.63	0.01	228.50	227.25	226.85	226.50	227.25	226.50	1.65	1.63
47.	E3	E2	15.5	551.0	560.0	1130.0	3.05	400	570	0.60	75.63	0.02	228.50	227.40	227.00	226.50	227.24	226.64	1.65	1.66
48.	E4	E4	13.5	540.0	1130.0	1670.0	8.35	400	570	0.60	75.63	0.03	228.50	227.40	227.00	226.50	227.38	226.99	1.50	1.66
49.	E5	E5	16.5	960.0	1670.0	2235.0	11.18	400	570	0.60	75.63	0.03	228.50	227.37	226.97	226.50	227.37	226.97	1.50	1.52
50.	E6	E6	15.0	510.0	2235.0	2745.0	13.74	400	570	0.60	75.63	0.03	228.50	227.35	226.95	226.50	227.35	226.95	1.50	1.51
51.	RP-05	RP-05	7.0	240.0	2745.0	2938.0	14.94	400	570	0.60	75.63	0.03	228.50	227.32	226.92	226.50	227.32	226.92	1.55	1.54
52.	F1	F1	3.0	0.0	1792.8	1792.8	8.96	400	570	0.60	75.63	0.01	228.50	227.29	226.89	226.50	227.29	226.89	1.56	1.57
53.	F2	F2	15.0	350.0	1792.8	2142.8	11.71	400	570	0.60	75.63	0.01	228.50	227.26	226.86	226.50	227.26	226.86	1.61	1.64
	F3	F3	15.0	510.0	2142.8	2652.8	14.26	400	570	0.60	75.63	0.03	228.50	227.37	226.97	226.50	227.34	226.94	1.53	1.54

Palm Terrace Gated

S.No.	Line No.		Length	Catchment Area (Sqm.)			Discharge @ 39 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.
54.	F3	F4	17.0	600.0	2852.8	3452.8	37.26	400	570	0.60	75.63	0.03	228.50	227.34	226.94	228.50	227.31	226.91	1.56	1.59	1.57
55.	F4	F5	17.0	582.0	3452.8	4034.8	30.17	400	570	0.60	75.63	0.03	228.50	227.31	226.91	228.50	227.28	226.88	1.59	1.62	1.60
56.	F5	F6	21.5	736.0	4034.8	4770.8	23.85	400	570	0.60	75.63	0.04	228.50	227.28	226.88	228.50	227.24	226.84	1.62	1.65	1.64
57.	F6	F7	17.5	599.0	4770.8	5369.8	26.85	400	570	0.60	75.63	0.03	228.50	227.24	226.84	228.50	227.21	226.81	1.66	1.69	1.67
58.	F7	RP-06	8.5	291.0	5369.8	5660.8	28.30	400	570	0.60	75.63	0.01	228.50	227.21	226.81	228.50	227.20	226.80	1.69	1.70	1.69
59.	RP-06	G1	8.0	0.0	3098.5	3098.5	16.58	400	570	0.60	75.63	0.01	228.50	227.40	227.00	228.50	227.39	226.99	1.50	1.51	1.51
60.	G1	G2	17.0	582.0	3096.5	3678.5	19.69	400	570	0.60	75.63	0.03	228.50	227.38	226.98	228.50	227.36	226.96	1.51	1.54	1.53
61.	G2	G3	16.0	548.0	3678.5	4526.5	22.63	400	570	0.60	75.63	0.03	228.50	227.36	226.96	228.50	227.33	226.93	1.54	1.57	1.56
62.	G3	G4	15.0	513.0	4526.5	5039.5	25.20	400	570	0.60	75.63	0.03	228.50	227.33	226.93	228.50	227.30	226.90	1.57	1.60	1.59
63.	G4	RP-07	5.5	188.0	5039.5	5228.5	26.14	400	570	0.60	75.63	0.01	228.50	227.30	226.90	228.50	227.29	226.89	1.60	1.61	1.60
64.	G5	G6	13.0	445.0	4890.5	5335.5	26.68	400	570	0.60	75.63	0.02	228.50	227.38	226.98	228.50	227.36	226.96	1.52	1.64	1.58
65.	G6	G7	15.0	520.0	5335.5	5855.5	29.28	400	570	0.60	75.63	0.03	228.50	227.36	226.96	228.50	227.34	226.94	1.54	1.56	1.55
66.	G7	G8	12.0	411.0	5855.5	6266.5	31.33	400	570	0.60	75.63	0.02	228.50	227.34	226.94	228.50	227.31	226.91	1.56	1.59	1.58
67.	G8	RP-07	6.0	206.0	6266.5	6472.5	32.36	400	570	0.60	75.63	0.01	228.50	227.31	226.91	228.50	227.30	226.90	1.59	1.60	1.59
68.	RP-07	To Huda Drain	10.0	0.0	11700.9	11700.9	58.50	500	770	0.60	117.98	0.01	228.50	227.30	227.00	228.50	227.49	226.09	1.50	1.51	1.51

PROJECT :- PALM TERRACE SELECT GROUP HOUSING SECTOR-36, GURGOAN, HARYANA

LOAD ON SEWAGE LINES

			Residential Sewage Load						Non Residential Sewage Load		Residential + Non Residential Load		
S.No.	Name of Sewer Line		Main Apartment	Population @ 5 persons / 2,3,4 bhk Unit & 7 person for Penthouse	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) lpd	Sewage Flow (Split Load on Line) lpd	Sewage Flow (Split Load on Line) lps
	From	To	No. of unit	5 & 7	172.5	No. of unit	2	172.5				80%	1000
1.	S1	S2	16	84	14490	0	0	0	-	0.00	14490	11592	11.59
2.	S2	S3	4	20	3450	0	0	0	-	0.00	3450	2760	2.76
3.	S3	S4	16	84	14490	0	0	0	Club	25000.00	39490	31592	31.59
4.	S4	S5	4	20	3450	0	0	0	-	0.00	3450	2760	2.76
5.	S5	S6	16	84	14490	0	0	0	-	0.00	14490	11592	11.59
6.	S6	S7	4	20	3450	0	0	0	-	0.00	3450	2760	2.76
7.	S7	S8	0	0	0	0	0	0	-	0.00	0	0	0.00
8.	S8	S9	16	84	14490	0	0	0	-	0.00	14490	11592	11.59
9.	S9	S10	4	20	3450	0	0	0	-	0.00	3450	2760	2.76
10.	S10	S11	0	0	0	0	0	0	-	0.00	0	0	0.00
11.	S11	S12	0	0	0	0	0	0	-	0.00	0	0	0.00
12.	S12	S13	0	0	0	0	0	0	-	0.00	0	0	0.00
13.	S13	S14	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
14.	S14	S15	18	94	16215	0	0	0	-	0.00	16215	12972	12.97
15.	S15	S16	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
16.	S16	S17	18	94	16215	0	0	0	-	0.00	16215	12972	12.97
17.	S17	S18	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
18.	S18	S19	18	94	16215	0	0	0	-	0.00	16215	12972	12.97
19.	S22	S23	0	0	0	48	96	16560	-	0.00	16560	13248	13.25
20.	S23	S24	0	0	0	0	0	0	-	0.00	0	0	0.00
21.	S24	S25	0	0	0	0	0	0	-	0.00	0	0	0.00
22.	S25	S19	0	0	0	0	0	0	-	0.00	0	0	0.00
23.	S19	S20	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
24.	S20	S21	20	104	17940	0	0	0	-	0.00	17940	14352	14.35
25.	S26	S27	0	0	0	0	0	0	Shopping	2000.00	2000	1600	1.60
26.	S27	S28	18	94	16215	0	0	0	-	0.00	16215	12972	12.97
27.	S28	S29	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
28.	S29	S30	18	94	16215	0	0	0	-	0.00	16215	12972	12.97
29.	S30	S31	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
30.	S31	S32	20	104	17940	0	0	0	-	0.00	17940	14352	14.35
31.	S32	S33	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
32.	S33	S34	0	0	0	0	0	0	-	0.00	0	0	0.00
33.	S34	S35	20	104	17940	0	0	0	-	0.00	17940	14352	14.35
34.	S35	S36	6	30	5175	0	0	0	-	0.00	5175	4140	4.14
35.	S36	S21	0	0	0	0	0	0	-	0.00	0	0	0.00
36.	S21	STP	0	0	0	0	0	0	-	0.00	0	0	0.00
			278	1438	248055	48	96	16560		27000	291615	233292	233.29
												Say	250.00

PROJECT :- PALM TERRACE SELECT GROUP HOUSING SECTOR-66, GURGOAN, HARYANA

TITLE :- HYDRAULIC SEWAGE CHART

S.No	Line No		Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line) CFD	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	Ground Levels at Start	Invert Levels at Start	Ground Levels at End	Invert Levels at End	Manhole Start Depth	Manhole End Depth	Average Depth
	From	To	lpd	80%	1000	lpd	cfd	lps	lps	lps	lps	(mtr.)	(mm)	(mm)	(mtr.)	(MM) (+)	lps	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1.	S1	S2	14400	11552	11.59	0.00	11.59	0.13	0.40	0.03	0.54	14.0	250	150	0.07	0.76	18.70	228.50	227.00	226.50	226.93	1.50	1.57	1.54
2.	S2	S3	3459	2760	2.76	11.59	14.35	0.17	0.50	0.04	0.54	15.5	250	150	0.06	0.76	18.70	228.50	226.93	226.50	226.84	1.57	1.66	1.61
3.	S3	S4	39480	31552	31.50	14.35	45.84	0.53	1.60	0.13	1.73	15.0	250	150	0.06	0.76	18.70	228.50	226.84	226.50	226.77	1.66	1.73	1.69
4.	S4	S5	3459	2760	2.76	45.84	48.70	0.56	1.69	0.14	1.83	16.5	250	150	0.10	0.76	18.70	228.50	226.77	226.50	226.67	1.73	1.83	1.78
5.	S5	S6	14400	11552	11.59	48.70	60.30	0.70	2.09	0.17	2.27	15.0	250	150	0.06	0.76	18.70	228.50	226.67	226.50	226.59	1.83	1.91	1.87
6.	S6	S7	3459	2760	2.76	60.30	63.06	0.73	2.19	0.18	2.37	7.0	250	150	0.04	0.76	18.70	228.50	226.59	226.50	226.55	1.91	1.95	1.93
7.	S7	S8	0	0	0.00	63.06	63.06	0.73	2.19	0.18	2.37	11.5	250	150	0.05	0.76	18.70	228.50	226.55	226.50	226.48	1.95	2.01	1.98
8.	S8	S9	14400	11552	11.59	63.06	74.65	0.86	2.59	0.22	2.81	15.5	250	150	0.08	0.76	18.70	228.50	226.48	226.50	226.41	2.01	2.09	2.05
9.	S9	S10	3460	2760	2.76	74.65	77.41	0.90	2.69	0.22	2.91	17.0	250	150	0.09	0.76	18.70	228.50	226.41	226.50	226.32	2.09	2.18	2.13
10.	S10	S11	0	0	0.00	77.41	77.41	0.90	2.69	0.22	2.91	16.5	250	150	0.08	0.76	18.70	228.50	226.32	226.50	226.24	2.18	2.26	2.22
11.	S11	S12	0	0	0.00	77.41	77.41	0.90	2.69	0.22	2.91	21.0	250	150	0.11	0.76	18.70	228.50	226.24	226.50	226.13	2.26	2.37	2.32
12.	S12	S13	0	0	0.00	77.41	77.41	0.90	2.69	0.22	2.91	9.0	250	150	0.05	0.76	18.70	228.50	226.13	226.50	226.08	2.37	2.42	2.40
13.	S13	S14	5175	4140	4.14	77.41	81.55	0.94	2.83	0.24	3.07	16.0	250	150	0.09	0.76	18.70	228.50	226.08	226.50	225.99	2.42	2.51	2.46
14.	S14	S15	16215	12972	12.97	81.55	94.52	1.09	3.28	0.27	3.56	14.5	250	150	0.08	0.76	18.70	228.50	225.99	226.50	225.92	2.51	2.58	2.54
15.	S15	S16	5175	4140	4.14	94.52	98.66	1.14	3.43	0.29	3.71	16.0	250	150	0.08	0.76	18.70	228.50	225.92	226.50	225.83	2.58	2.67	2.62
16.	S16	S17	16215	12972	12.97	98.66	111.63	1.29	3.88	0.32	4.20	14.5	250	150	0.08	0.76	18.70	228.50	225.83	226.50	225.75	2.67	2.74	2.70
17.	S17	S18	5175	4140	4.14	111.63	115.77	1.34	4.02	0.33	4.35	16.0	250	150	0.08	0.76	18.70	228.50	225.75	226.50	225.67	2.74	2.83	2.78
18.	S18	S19	16215	12972	12.97	115.77	128.74	1.49	4.47	0.37	4.84	14.5	250	150	0.08	0.76	18.70	228.50	225.67	226.50	225.60	2.83	2.90	2.86
19.	S22	S23	16560	13248	13.25	0.00	13.25	0.15	0.46	0.04	0.50	24.5	250	150	0.13	0.76	18.70	228.50	227.00	226.50	226.87	1.50	1.63	1.56
20.	S23	S24	0	0	0.00	13.25	13.25	0.15	0.46	0.04	0.50	24.0	250	150	0.13	0.76	18.70	228.50	226.87	226.50	226.74	1.63	1.76	1.69
21.	S24	S25	0	0	0.00	13.25	13.25	0.15	0.46	0.04	0.50	11.5	250	150	0.06	0.76	18.70	228.50	226.74	226.50	226.68	1.76	1.82	1.79
22.	S25	S19	0	0	0.00	13.25	13.25	0.15	0.46	0.04	0.50	27.0	250	150	0.14	0.76	18.70	228.50	226.68	226.50	226.54	1.82	1.96	1.89
23.	S19	S20	5175	4140	4.14	141.99	146.13	1.69	5.07	0.42	5.50	16.0	250	150	0.08	0.76	18.70	228.50	225.60	226.50	225.51	2.90	2.99	2.94
24.	S20	S21	17940	14352	14.35	146.13	160.48	1.86	5.57	0.46	6.04	12.0	250	150	0.06	0.76	18.70	228.50	225.51	226.50	225.43	2.99	3.05	3.02
25.	S26	S27	2000	1600	1.60	0.00	1.60	0.02	0.06	0.00	0.06	21.5	250	150	0.11	0.76	18.70	228.50	227.00	226.50	226.89	1.50	1.61	1.56
26.	S27	S28	16215	12972	12.97	1.60	14.57	0.17	0.51	0.04	0.55	16.0	250	150	0.08	0.76	18.70	228.50	226.89	226.50	226.80	1.61	1.70	1.66
27.	S28	S29	5175	4140	4.14	14.57	18.71	0.22	0.65	0.05	0.70	14.5	250	150	0.08	0.76	18.70	228.50	226.80	226.50	226.73	1.70	1.77	1.74
28.	S29	S30	16215	12972	12.97	18.71	31.68	0.37	1.10	0.09	1.19	15.0	250	150	0.09	0.76	18.70	228.50	226.73	226.50	226.64	1.77	1.86	1.82
29.	S30	S31	5175	4140	4.14	31.68	35.82	0.41	1.24	0.10	1.35	14.5	250	150	0.08	0.76	18.70	228.50	226.64	226.50	226.57	1.86	1.93	1.90
30.	S31	S32	17940	14352	14.35	35.82	50.18	0.58	1.74	0.15	1.89	16.0	250	150	0.09	0.76	18.70	228.50	226.57	226.50	226.48	1.93	2.02	1.98
31.	S32	S33	5175	4140	4.14	50.18	54.32	0.63	1.89	0.16	2.04	19.5	250	150	0.09	0.76	18.70	228.50	226.48	226.50	226.40	2.02	2.10	2.06

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 @ 20% Av. Discharge	Total Discharge	Length	Pipe Size	Slope (1 in)	Fall	Velocity	Capacity of Pipe	Ground Levels at Start	Invert Levels at Start	Ground Levels at End	Invert Levels at End	Manhole Start Depth	Manhole End Depth	Average Depth
	From	To	Kld	80%	1000	Kld.	Kld.	lps	lps.	lps.	lps.	(mtr.)	(mm)	(mm)	(mtr.)	(m/s) (v)	lps	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
32.	533	534	0	0	0.00	54.32	54.32	0.63	1.89	0.09	2.04	17.1	250	150	0.09	0.76	18.70	228.50	226.40	228.50	226.01	2.10	2.10	2.10
33.	534	535	17940	14352	14.35	54.32	68.67	0.79	2.38	0.10	2.58	16.0	250	150	0.09	0.75	18.70	228.50	226.31	228.50	226.02	2.19	2.28	2.23
34.	535	536	5171	4140	4.14	68.67	72.81	0.84	2.53	0.11	2.74	17.0	250	150	0.09	0.76	18.70	228.50	226.22	228.50	226.03	2.28	2.37	2.32
35.	536	521	0	0	0.00	72.81	72.81	0.84	2.53	0.11	2.74	12.0	250	150	0.07	0.76	18.70	228.50	226.13	228.50	226.07	2.37	2.43	2.40
36.	521	STP.	0	0	0.00	233.29	233.29	2.70	8.10	0.38	8.78	7.0	300	200	0.03	0.75	26.5	228.50	225.45	228.50	225.42	3.05	3.08	3.06
																					Max.	3.05	3.08	3.06

(Pump Riser Calculation Sheet)

Line No.		Probable demand (lps)	Assumed pipe dia. (mm)	Head loss (m/m)	Pipe length (m)	Eq. Length fitts (%)	Eq. Length (m)	Total length (m)	Head loss line (m)	Head loss prog (m)	Vel (m/Sec)	Residual Head Available at terrace	Pump Head Available in basement	Residual Head Available at inlet of tank
1		2	3	4	5	6	7	8	9	10	11	12	13	
Domestic Water Supply		Zone - I (Tower - 01 To 12)												
DC14	DC13	0.644	50	0.006	77.0	5	3.85	80.85	0.455	0.46	0.160	59.40	59.95	4.49
DC13	DC12	1.287	65	0.006	77.0	5	3.85	80.85	0.468	0.97	0.213	59.95	60.92	4.85
DC12	DC11	1.931	65	0.012	77.0	5	3.85	80.85	0.971	1.05	0.320	60.92	61.97	5.92
DC11	DC10	2.627	65	0.021	47.0	5	2.35	49.35	1.047	2.24	0.435	61.97	64.21	6.97
DC10	DC2	3.322	65	0.033	65.0	5	3.25	68.25	2.238	0.68	0.550	64.21	64.26	9.21
DC9	DC8	0.540	50	0.004	67.0	5	3.35	70.35	0.285	0.28	0.151	59.41	59.69	4.41
DC8	DC7	1.080	65	0.004	65.0	5	3.25	68.25	0.279	0.61	0.179	59.69	60.30	4.69
DC7	DC6	1.620	65	0.009	67.0	5	3.35	70.35	0.610	0.95	0.268	60.30	61.24	5.30
DC6	DC5	2.159	65	0.015	61.0	5	3.05	64.05	0.948	0.65	0.358	61.24	61.89	6.24
DC5a	DC5	0.644	50	0.006	52.0	5	2.60	54.60	0.308	0.65	0.160	61.24	61.89	6.24
DC5	DC4	2.803	80	0.009	71.0	5	3.55	74.55	0.649	1.03	0.307	61.89	62.92	6.89
DC4	DC3	3.447	80	0.013	77.0	5	3.85	80.85	1.032	1.28	0.377	62.92	64.21	7.92
DC3	DC2	4.142	80	0.018	68.0	5	3.40	71.40	1.281	0.08	0.453	64.21	64.28	9.21
DC2	DC1	7.465	100	0.015	4.0	5	0.20	4.20	0.076	0.36	0.522	64.28	64.64	9.28
DC1	*Plant Room*	7.465	100	0.015	19.0	5	0.95	19.95	0.359	0.359	0.522	64.64	65.00	
		Flow Rate	7.465 lps											
		(1 W + 1 S)			447.9	LPM								
		Height Building			55	m								
		Pump Head			65.00	m								
		Pump HP			10.8	HP								
		Say			12.6	HP								

Line No.		Probable demand (lps)	Assumed pipe dia. (mm)	Head loss (m/m)	Pipe length (m)	Eq. Length fitts (%)	Eq. Length (m)	Total length (m)	Head loss line (m)	Head loss prog (m)	Vel (m/sec)	Residual Head Available at terrace	Pump Head Available in basement	Residual Head Available at inlet of tank
1		2	3	4	5	6	7	8	9	10	11	12	13	
Flushing Water Supply		Zone - I (Tower - 01 To 12)												
FC13	FC12	0.347	40	0.005	76.0	5	3.80	79.80	0.424	0.52	0.152	63.55	64.06	8.55
FC12	FC11	0.693	50	0.005	76.0	5	3.80	79.80	0.516	0.30	0.154	64.06	64.37	9.06
FC11	FC10	1.040	65	0.004	76.0	5	3.80	79.80	0.304	0.56	0.172	64.37	64.93	9.37
FC10	FC1	1.414	65	0.007	79.0	5	3.95	82.95	0.559	0.04	0.234	64.93	64.96	9.93
FC9	FC8	0.291	40	0.004	66.0	5	3.30	69.30	0.266	0.32	0.137	59.98	60.30	4.98
FC8	FC7	0.581	50	0.005	65.0	5	3.25	68.25	0.318	0.18	0.153	60.30	60.30	5.30
FC7	FC6	0.872	65	0.003	67.0	5	3.35	70.35	0.194	0.28	0.144	60.50	60.78	5.50
FC6	FC5	1.163	65	0.005	58.0	5	2.90	60.90	0.288	0.55	0.153	60.78	61.33	5.78
FC5a	FC5	0.347	40	0.005	52.0	5	2.60	54.60	0.290	0.55	0.152	60.78	61.33	5.78
FC5	FC4	1.509	65	0.008	69.0	5	3.45	72.45	0.551	0.09	0.250	61.33	62.22	6.33
FC4	FC3	1.856	65	0.011	76.0	5	3.80	79.80	0.890	1.37	0.307	62.22	63.59	7.22
FC3	FC2	2.231	65	0.016	83.0	5	4.15	87.15	1.395	1.34	0.369	63.59	64.93	8.59
FC2	FC1	2.605	65	0.021	61.0	5	3.05	64.05	1.339	0.04	0.432	64.93	64.96	9.93
FC1	S.T.P	4.019	80	0.017	2.0	5	0.10	2.10	0.036	0.035	0.440	64.96	65.00	
			Fow Rate		4.019	lps								
			(1 W + 1 S)		241.2	LPM								
			Height Building		55	m								
			Pump Head		65.00	m								
			Pump HP		5.8	HP								
			SAY		7.5	HP								

C.E. No. 4557
Dated 9/7/13
Annexure-A

SUB: - **Approval of service plan /estimate for Group Housing Colony area measuring 45.4767 acres Village-Badshahpur, Sec-66, Gurgaon(License No. 228 of 2007 dated 27.03.2007, No. 93 of 2008 dated 12.05.2008 & No. 50 of 2010 dated 24.06.2010) being developed by Active Promoters Pvt. Ltd. & B.C.C. Properties Pvt. Ltd. & Others in collaboration with M/S. Emaar MGF Land 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.
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.

C.E. No. 957
Dated:- 9/7/13

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.

9/7/13

Executive Engineer (W),
For **Chief Administrator, HUDA,**
Panchkula

8/7/13

Line No.		Probable demand (lps)	Assumed pipe dia. (mm)	Head loss (m/m)	Pipe length (m)	Eq. Length fitts (%)	Eq. Length (m)	Total length (m)	Head loss line (m)	Head loss prog (m)	Vel (m/sec)	Residual Head Available at terrace	Pump Head Available in basement	Residual Head Available at inlet of tank
1		2	3	4	5	6	7	8	9	10	11	12	13	
Domestic Water Supply		Zone - III (CLUB)												
DA2	DA1	0.752	40	0.022	83.00	5	4.15	87.15	1.943	0.234	0.329	28.82	30.77	3.82
DA1	Plant Room	0.752	40	0.022	10.00	5	0.50	10.50	0.234	0.234	0.329	30.77	31.00	
			Flow Rate		0.752	lps								
			(1 W + 1 S)		45.1	LPM								
			Height Building		25	m								
			Pump Head		31.00	m								
			Pump HP		0.5	HP								
			SAY		1.00	HP								
Flushing Water Supply		Zone - III (CLUB)												
FA2	FA1	0.405	32	0.021	87.00	5	4.35	91.35	1.919	0.243	0.277	28.84	30.76	3.84
FA1	S.T.P	0.405	32	0.021	11.00	5	0.55	11.55	0.243	0.243	0.277	30.76	31.00	
			Flow Rate		0.405	lps								
			(1 W + 1 S)		24.3	LPM								
			Height Building		25	m								
			Pump Head		31.00	m								
			Pump HP		0.3	HP								
			SAY		1.00	HP								