



MGF

Revised

HUDA SUBMISSION

Development of Sector-62-65 , Gurgaon

By

EMAAR MGF

M/S EMMAR MGF Land Ltd

Sector-62-65

Gurgaon

Prepared by :-

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Submission Report on Development of Eco Friendly Infrastructure Services by EMAAR MGF in 198.03625 Acre in Sector 62- 65 Gurgaon

1 Introduction

Gurgaon has been an important urban centre in the neighborhood of Delhi. The town is known for automobile companies, modern commercial malls, cyber parks & software development centre. The town is located only at 10 Km distance from the Indira Gandhi Airport, Delhi

1.2. Location

Located on the south western border of Delhi, the district lies between 27 degree 39' and 28 degree 32' 25" latitude, and 76 degree 39' 30" and 77 degree 20' 45" longitude.

1.3. Development Proposal by EMAAR MGF

M/S EMAAR MGF Land Ltd. has been authorized to develop a residential colony in Gurgaon Urban Complex, Sector-62-65, Gurgaon (198.036 Acres)

Detail of Area Residential Sector 65-66, Gurgaon, EMAARMGF					
Sr. No.	Description	Size of Plot	Area of each Unit	Plots	Area
1	Residential (Plotted)			1288	341854
1.2	Group Housing				84.47
2	Commercial Area				38566
2.1	Commercial Area	Acres	Nos.		Sq.m
2.2	Nursing Home	7.072			28619
3	Community Area	0.247	4		2000
3.1	Nursery School	Acres	Nos.		Sq.m
3.2	Primary School	0.20	4		3237
3.3	High School	1.00	2		8094
3.4	Crèche	5.00	1		20234
3.5	Religious Building	0.20	1		809
3.6	Club Community	0.20	1		809
3.7	Taxi Stand	2.00	1		8094
3.8	Dispensary	0.500	2		2000
	Sub Total	1.25	1		5059
4	Undetermined use				48336
5	Green Area				47405
6	Area under Roads				46152
	Total Area				244441
					758807
					198.036

License has already been granted to M/S EMAARMGF Land Ltd., to develop part of above area (102.741 Acres)

Huda submission approved for 102.741 Acre amounting to Rs 402002556

2 Roads

2.1. Formation Level of External Master Roads

Sr. No.	Node	Location	Natural	Formation
1	B1	Junction of Sector 61, 62 & 57(90 m & 60 m wide Road)	M	M
2	C1	Junction of Sector 62, 65 & 57 & 50(90 m & 60 m wide Road)	234.78	234.78
3	C2	Junction of Sector 65, 66 & 49 & 50(90 m & 60 m wide Road)	230.65	230.70
4	C3	Junction of Sector 65, 66 & 64 & 67(60 m wide Road)	227.66	230.00
5	C4	Junction of Sector 62, 65 & 63 & 64(60 m wide Road)	229.65	229.78
6	C5	Junction of Sector 61, 62 & 60 & 63(60 m wide Road)	234.23	233.68
			238.90	238.90

2.2. Proposed Average Formation Level of Internal Roads

Name of Block	Average Natural Surface Level	Average Formation Level	Average Depth of Filling	Quantity of Earthwork (198.036 Acres)	Quantity of Earthwork (102.741 Acres)	Quantity of Earthwork (95.295 Acres)
	M	M	M	Cu.M.	Cu.M.	Cu.M.
Block A	228.012	230.200	2.19	45567.0	45567.0	0.0
Block B	229.115	230.609	1.45	69870.5	59269.9	10600.6
Block C	228.746	230.223	1.48	66753.0	65223.4	1529.6
Block D	229.232	230.537	1.30	33910.7	24628.0	9282.7
Block E	229.787	230.419	0.63	13650.5	11932.8	1717.6
Block F	230.738	230.958	0.22	7427.5	0.0	7427.5
Block G	231.887	231.225	-0.66	-11784.2	0.0	-11784.2
Block H	228.944	232.173	3.23	89965.1	0.0	89965.1
Block J	232.977	232.920	-0.06	-26277.1	0.0	-26277.1
Total				289083.1	206621.1	82461.9

2.3. Soil Investigation Results (CBR Value)

- CBR Value : 6%

2.4. Design of road crust

Based on data of C.B.R. values 6% in the area the roads specifications proposed are approximately as under:-

12 m & 15 m Collector Streets

- Sub grade: Existing soil to be pulverized & mechanically compacted
- 300 mm GSB as per MORTH Specification
- 150 mm W.M.M. as per MORTH Specification
- 50 mm BM as per MORTH Specification No.5
- 40 mm MSS as per MORTH Specification No.510

18 m & 24 m wide road

- Sub grade: Existing soil to be pulverized & mechanically compacted
- 300 mm GSB as per MORTH Specification No.401
- 150 mm WMM as per MORTH Specification No.406
- 50 mm DBM as per MORTH Specification
- 40 mm SDBC as per MORTH Specification No.512

Detail of Road Lengths

Description of Road	Total Length	Road Width (Metalled Width)	Total Road Area	Length of Kerb & Channel	Pavement in Commercial	Foot Path
	Mtrs	Mtrs	Sqm	Mtrs	Sqm	Sqm
24 M Wide Road	2042	12 (2x7)	35304	5884	7060.8	5884
18 M Wide Road	588	10 mtr	5292	1176	1411.2	1176
15 M Wide Road	3969	7 mtr	27783	7938	6760	5952.5
12 M Wide Road	2225	5.5 mtr	50737.5	18450	16098	13837.5
Total	46724		119116.5	33448	8472	26851
Add 5% for curves			5955.825	1672.4	423.6	1342.55
Total			125072.33	35120.4	8895.6	28193.55
Rounded Value			125072	35120	8896	28194

9415
 2352
 11768
 588
 12356

112105 30200 mtr

3 Water Supply

3.1. Source of Water Supply

- Main source of water supply is Canal base treated water being supplied by Haryana Urban Development Authority.
- Accordingly two independent water works are proposed to be created for receiving bulk supply from the HUDA/Govt. agency in Sector 65 & 62, Till that time water shall be drawn from existing Tube wells /New Tube wells and carried through rising mains to U.G.T. at Water Works. Here after the water shall be pumped in to the distribution system for the colony.
- HUDA pipe line is proposed on 60 M Wide Road ,Sector 65
- EMMAR MGF Water Works 1 is under construction in Sector 65 at 1435 m distance from HUDA Line.
- It is proposed that 250 mm i/d pipe line is laid from HUDA line to WW1.
- The water works already proposed in open green space No.5 in Sector 65, where an U.G.T and OHSR and Boosting Station is under construction to cater needs of already approved area 102.741 Acres.
- Part of additional area falls in sector 65 adjacent to already approved area.
- Hence it is proposed that water works in sector 65 may be updated to cater the needs of area being developed in Sector 65.
- EMMAR MGF Water Works 2 is proposed in Sector 62 in undetermined use area 1550 sqm.
- EMMAR MGF Water Works 1 is under construction in Sector 62 at 407 m distance from HUDA Pipe line.
- It is proposed that 200 mm i/d pipe line is laid from HUDA Pipe line to WW2.

3.2. Daily Water Demand of 198.036 Acre Area

3.3. Total Area being developed in Sector 65

- Already approved area being developed in Sector 65: 102.741 Acres.
- Additional area being developed in Sector 65: 24.548 Acres.
- Total area being developed in Sector 65 : $102.741 + 24.548 = 127.289$ Acres

3.4. Total Area being developed in Sector 62

- Total area being developed in Sector 62: $95.295 - 24.548 = 70.747$.
- Total area being developed in Sector 62 & 65: $127.289 + 70.747 = 198.036$ Acres.

3.5. Water Demand of total area being developed in Sector 65 & 62

- Total Water Demand : 4839 kl 4566 2892
- Water Demand to meet from fresh water source is : ~~3073~~ kl 1674
- Water Demand to meet from recycled treated water source is : ~~1766~~ kl 963

3.6. Water Demand of total area being developed in Sector 65

- Total Water Demand : ~~2915~~ kl 2750 1787
- Water Demand to meet from fresh water source is : ~~1872~~ kl 963
- Water Demand to meet from recycled treated water source is : ~~1043~~ kl 1816

Water Demand of total area being developed in Sector 62

- Total Water Demand : 1924 kl 1816 1180
- Water Demand to meet from fresh water source is : ~~1201~~ kl 636
- Water Demand to meet from recycled treated water source is : ~~723~~ kl 636

3.7. Fire Demand

- Fire Demand in Liters. $= (P)^{1/2} 100 \times 1000$
- (P is Population in thousands) $= (18.587)^{1/2} \times 100 = 431 \text{ K Ltr}$
- Fire Demand of Sector 65 $= 431 \times 10328 / 18587 = 240 \text{ KL}$
- Fire Demand of Sector 62 $= 402 \times 8068 / 18587 = 1 \text{ KL}$

3.8. Design of Tube wells in the Project site area.

- Total water demand = 3000 Klitres
- Demand to be met from Local Tube wells = $0.4 \times 3000 = 1200 \text{ Klitres}$
- Add 10% more as stand by
- **Total demand = $1200 + 120 = 1320 \text{ Klitres}$**
- Anticipated yield from one Tube well = 25000 Ltrs/ Hr.
- Assuming 16 Hrs. running of Tube well
- Anticipated yield from one Tube well = $25000 \times 16 = 400000 \text{ Ltrs}$ or 400 KI
- No of Tube wells = $1320 / 400 = 3.3$ **Say 4 Nos.**

3.9. Pumping Machinery for Tube wells

Average Spring level	=	25.00M	
Average fall in spring level	=	3.05 M	
Depression head	=	6.10 M	
Friction loss in main	=	2.50M	
Head up to UGT	=	36.65M,	Say 40 M
BHP = $25000 \times 40 \times 1 / (60 \times 60 \times 75 \times 0.60)$	=	6.17 BHP,	Say 10 BHP

3.10. Over Head Service Reservoir Sector 65

- Capacity of OHSR 1/4th of daily demand = $\frac{1787}{4} = 447 \text{ KL}$
- Providing one no Over Head Service cum Balancing Reservoir of **500** kl. Capacity 30 M height.

Sector 62

- Capacity of OHSR 1/4th of daily demand = $\frac{1180}{4} = 295 \text{ KL}$
- Providing one no Over Head Service cum Balancing Reservoir of **300** kl. Capacity 30 M height.

3.11. Under Ground Tank

Under Ground Tank in Sector -65

- Capacity of CWT @ 1/3 of daily demand = $\frac{1180}{3} = 396 \text{ KL}$
- Add for Fire Fighting Demand = 240 KL
- Net capacity Provided = $396 + 240 = 636 \text{ KL}$
- It is proposed to construct Under Ground tank of 900Kls. capacity in three compartments,
- Hence depth of reservoir may be proposed 3 m with free board 0.3m
- Underground storage reservoir is proposed to be constructed in three compartments.
- First compartment of size 10mx9mx3m is proposed to meet Fire demand.
- Two compartments of size 10mx11mx 3m & 10mx10mx 3m each are proposed to meet storage demand.

- Capacity provided $270+330+300=900\text{KL}$
- 3.12. Under Ground Tank in Sector -62**
- 3.13. Capacity of CWT @ 1/3 of daily demand = $\frac{1180}{3}=394$ say 400KL
- 3.14. Add for Fire Fighting Demand = 192 KL
- 3.15. Net capacity Provided = $400+192=592\text{KL}$
- 3.16. It is proposed to construct Under Ground tank of 630KLs. capacity in three compartments,
- 3.17. Hence depth of reservoir may be proposed 3 m with free board 0.3m
- 3.18. Underground storage reservoir is proposed to be constructed in three compartments.
- 3.19. First compartment of size 10mx9mx3m is proposed to meet Fire demand.
- 3.20. Two compartments of size 10mx12mx 3m is proposed to meet storage demand.
- 3.21. Capacity provided $270+360=630\text{KL}$
- 3.22. Pumping Machinery and Water Works**

- The minimum No. of pumps will be three nos. to meet demand
- The Horizontal Centrifugal type of Pumps having adequate discharge and head are proposed to be used. Efficiency of Pump & Motor is assumed as 60%

3.23. Pumping Machinery

Pumping Machinery for Sector 65

- Daily Pumping Hour = 16
- Average pumping per Hour = $\frac{1180}{16}=73.75$ say 74 KL
- Nos. of pumps proposed 2Nos + 1 No. Stand by
- Hourly pumping by one pump = $\frac{73.75}{2}=36.875$ or 37 Ltr PS
- Hence it is proposed to install 3 Nos. pumping set Horizontal Centrifugal / submersible type of 20LPS discharge each set against a head of 45 Mtr to meet average demand. 2 working + 1 standby

Pumping Machinery for Sector 62

Plotted Area

- Daily Pumping Hour = 16
- Average pumping per Hour = $\frac{913}{16}=57.06$ KL
- Nos. of pumps proposed 2Nos + 1 No. Stand by
- Hourly pumping by one pump = $\frac{57.06}{2}=28.53$ or 29 Ltr PS
- Hence it is proposed to install 3 Nos. pumping set Horizontal Centrifugal / submersible type of 20LPS discharge each set against a head of 45 Mtr to meet average demand (2W + 1 standby)

Group Housing Area

- Daily Pumping Hour = 16
- Average pumping per Hour = $\frac{288}{16}=18$ KL
- Nos. of pumps proposed 1Nos + 1 No. Stand by
- Hourly pumping by one pump = 18 KL or 8.3 Ltr PS
- Hence it is proposed to install 2 Nos. pumping set Horizontal Centrifugal / submersible type of 10LPS discharge each set against a head of 45 Mtr to meet average demand.

3.24. Distribution Net Work

Providing, stringing, cutting and jointing D.I. pipe (Class K-7) Zinc coating outside the pipe and cement lining inside including cost of excavation	WW1	WW2	Total	
(For Distribution)	6830		9989	
100 mm id	7883	3159	11042	Mtr
150 mm id	2075	1022	3097	Mtr
200 mm id	573	1534	2107	Mtr
250 mm id	203	403	606	Mtr

30 mm id 521+60 = 581 mtr

Rising Main

- Rising main for connecting Group housing from WW2 is 160 m, 150 mm i/d
- Rising main for connecting to tube wells with UGT, & HUDA Source to UGT is tabulated below.

Provision for Rising main	Provision for Rising main from Tube well to UGT	Provision for Rising main from HUDA Source to UGT	Total length	
150 mm id	1053	460	1513	Mtr
200 mm id	292	407	699	Mtr
250 mm id	384	1435	1819	Mtr

4 Waste Water

4.1. Connectivity of Internal Waste Water to Master Sewerage System

Sr. No.	Node Point	Distance	Location	Diameter of pipe	NSL	FL	Invert Level
		M		mm/id	M	M	M
1	A13-A21	0	60 m wide Road dividing Sector 62 & 65	600	230.69	234.50	227.65
2	A21-A22	1100	Junction of Sector 62, 65 & 57 & 50 (90 m & 60 m wide Road)	600	230.65	230.70	226.40
3		1500	Junction of Sector 65, 66 & 49 & 50 (90 m & 60 m wide Road)	1000	228.15	228.75	221.08
4	A3-A2		Junction of Sector 62, 65 & 63 & 64 (60 m wide Road)	1000	232.82	234.50	229.69
5	A2-A22	1500	Junction of Sector 65, 66 & 64 & 67 (60 m wide Road)	1200	229.50	229.60	225.51/ 222.88
6		1500	Junction of Sector 65, 66 & 49 & 50 (90 m & 60 m wide Road)	1200	228.15	228.75	221.08

4.2. Estimation of Waste Water Demand

- Estimated Generation of Waste Water 3009KLitres
- 30% Quantity of Waste Water to be treated up to tertiary Level: 900KLitres. Rest shall go in to the Master Sewer System.
- Breakup of STP is given as under

Description	Quantity waste water generation		Capacity of STP	
	KLD	MLD	MLD	KLD
STP1 ✓	1248.40	843.12	0.84	250
STP2 ✓		450.05	0.45	125
STP3		405.28	0.41	125
STP3 ✓		1002.32	1.00	300
STP 5		308.24	0.31	100
	3009.00	3.01	0.90	900.00

4.3. Design of Waste water Collection System

4.3.1. Pipe Sewer Length for Waste Water Collection System

Providing salt glazed stone ware pipes grade 'A' in standard length of 600 mm each pipe marked with IS: 651 and their lowering, cutting, jointing and testing, including cost of excavation, bed concrete, Man holes jointing materials as well as carriage, loading, unloading stacking, handling, remanding etc., complete in all respects to the satisfaction of Engineer in Charge.		Length
200 mm id S.W Pipe		11205
i) Average Depth up to 2 M		11646 M
250 mm id S.W Pipe		735
i) Average Depth 2 M to 4 M		506 M
300 mm id S.W Pipe		534
i) Average Depth 2 M to 4M		866 M
400 mm id S.W Pipe		2500
ii) Average Depth 2 M to 4M		2746 M

4.3.2. Pipe Line Length for Recycling System

Sr. No.	Description	63mm o/d	75 mm o/d	90mm o/d	110 mm o/d	140 mm o/d	160 mm o/d	180 mm o/d	210 mm o/d
		M	M	M	M	M	M	M	M
	(Distribution Main)	PVC CLASS 6						AC Pipe Class 25	
1	STP1	3073	219	0.0	460.	157.	124.	107	0.0
2	STP 2	929.	849	187	0.0	173.	20.	0.00	0.0
3	STP3	1906.	351	27	227.	0.	217.	0.0	0.0
4	STP4	1112.	771	310.	1666.	0.	1510.	0.0	266.
5	Sub Total	7020.	2190.	524.	2353.	330.	1871.	107.	266.

5 Storm Water Drainage

5.1. Planning of Storm Water Drainage System

- The following factors are taken into consideration for planning of the drainage system.
- The pattern of natural slope of the site, its extent and direction.
- The natural drainage system in the downstream area (outside the project area)
- The main source of Runoff are categorized as under
 - Run off from Roof Top Area
 - Run off from Road Top Area
- The Runoff will be collected through Drains. These drains takes storm water into nearest lateral drains and then into Trunk Drains constructed in utility corridors, which ultimately takes the storm water to the disposal point.

5.2. Adopted Design Criteria

- External Storm water Drainage along Master Roads is provided to cater for rain fall up to Intensity@ 3.12 mm /Hr.
- Internal Storm water Drainage is provided to cater for rain fall up to Rain Fall Intensity @ 6.25 mm /Hr.

5.3. Connectivity of Internal Storm Water System with Master Proposal

Sr. No	Node Point	Distance	Location	Diameter of pipe	Natural Surface	Formation Level	Invert Level
		M		M	M	M	M
1	C4-C1	1450	60 m wide Road dividing Sector 62 & 65	1.8M	230.75	234.60	231.28
2	C1 C1-C2	1620	Junction of Sector 62 ,65 & 57 &50(90 m&	6.6 M	230.65	230.70	228.31
3	C2		Junction of Sector 65 ,66 & 49 &50(90 m&		228.25	228.75	226.0/225.55
4	C11 C11-C9	1500	Junction of Sector 62 ,65 & 63 &64(60 m	2.0M	232.82	234.50	232.50
5	C9 C9-C2	1590	Junction of Sector 65 ,66 & 64 &67(60 m	1200	227.93	229.50	226.35
6	C2		Junction of Sector 65 ,66 & 49 &50(90 m&		228.25	228.75	226.0/225.55

5.4. Storm Pipe/Drain of Internal Storm Water System

Providing, stringing, cutting and jointing RCC NP-3 pipe and specials in to Trenches including cost of excavation, cost of manholes, Road Gullies, ventilating chambers etc., complete in all respect.				Length
400 mm dia				13127 M
500 mm dia				271 M
600 mm dia	679	791		M
700 mm dia	405	546		M

5.5. Recharge Wells

Tributary Area						
Description	Sqm	Hectare	Acre	Run off Coefficient	Run off Factor	No. of Recharge Well
Residential	341854	34.190	84.47			
Residential Constructed , 414 Plots	122490	12.250	30.27	55%	0.374	11
Residential Plotted (1288-414=864)Plots	219364	21.940	54.21	55%	0.374	20
Group Housing Area	38556	3.860	9.53	55%	0.374	3
Road Area	244441	24.440	60.40	72%	0.444	33
Commercial & Utility Area	130415	13.040	32.23	51%	0.371	
Green Area	46152	4.620	11.40			
Total	801418	80	198	59%	0.37	57

- Total Rain Fall =588 mm
- Total Rain Fall occurs in 43.5 Hrs in 36 days.
- Below Average Rain Fall occurs in 23.5 Hrs in 14 days.
- Rainfall contributing towards Recharging =413.75 mm
- Total Tributary Area =198 Acres.
- **Residential Area (Constructed Area)**
- Total Rain Fall=588 mm=0.588 M
- Runoff Factor =0.374
- Constructed Residential Area=122492 Sqm
- Total Quantum of Rain fall =Total Rainfall in mm/1000*Runoff factor* Area in Sqm
- =588/1000*0.374*122492
- =26844 Cum
- Injection well is designed to take quantum of Average Rain fall only.



- Total Rain fall Hrs are 43.5 hrs. out of which 26.5 hrs are when rainfall is more than or equal to average rainfall. & 17 hrs are for below average rain fall rainfall
- Total Rain Fall = $20 \times 13.52 + 23.5 \times 6.1 = 413.75 \text{ M}$
- Runoff Factor = 0.0.374
- Constructed Residential = 122492 Sqm
- Total Quantum of Rain fall = Total Rainfall in mm/1000*Runoff factor* Area in Sqm
- = $413.75/1000 \times 0.374 \times 122492$
- = 18956 Cum
- Total Quantum of Water injected by one well in 43.5 hrs = $(19.2+20) \times 43.5 = 1705 \text{ Cum}$
- No. of Injection well required = $18956/1705 = 11.11 = 11 \text{ Nos}$
- **Residential Area (Plotted Area)**
- Total Rain Fall = 588 mm = 0.588 M
- Runoff Factor = 0.374
- Constructed Residential Area = 219374 Sqm
- Total Quantum of Rain fall = Total Rainfall in mm/1000*Runoff factor* Area in Sqm
- = $588/1000 \times 0.374 \times 219374$
- = 48242 Cum
- Injection well is designed to take quantum of Average Rain fall only.
- Total Rain fall Hrs are 43.5 hrs. out of which 26.5 hrs are when rainfall is more than or equal to average rainfall. & 17 hrs are for below average rain fall rainfall
- Total Rain Fall = $20 \times 13.52 + 23.5 \times 6.1 = 413.75 \text{ M}$
- Runoff Factor = 0.0.374
- Constructed Residential = 219374 Sqm
- Total Quantum of Rain fall = Total Rainfall in mm/1000*Runoff factor* Area in Sqm
- = $413.75/1000 \times 0.374 \times 219374$
- = 33946 Cum
- Total Quantum of Water injected by one well in 43.5 hrs = $(19.2+20) \times 43.5 = 1705 \text{ Cum}$
- No. of Injection well required = $33946/1705 = 19.90 = 20 \text{ Nos}$
- **Group Housing Area**
- Total Rain Fall = 588 mm = 0.588 M
- Runoff Factor = 0.374
- Area = 38556 Sqm
- Total Quantum of Rain fall = Total Rainfall in mm/1000*Runoff factor* Area in Sqm
- = $588/1000 \times 0.371 \times 38556 = 8479 \text{ Cum}$
- Injection well is designed to take quantum of Average Rain fall only.
- Total Rain fall Hrs are 43.5 hrs. out of which 26.5 hrs are when rainfall is more than or equal to average rainfall. & 17 hrs are for below average rain fall rainfall
- Total Rain Fall = $20 \times 13.52 + 23.5 \times 6.1 = 413.75 \text{ M}$
- Runoff Factor = 0.374
- Balance Area = 38556 Sqm
- Total Quantum of Rain fall = Total Rainfall in mm/1000*Runoff factor* Area in Sqm
- = $413.75/1000 \times 0.371 \times 38556 = 5966 \text{ Cum}$

- Total Quantum of Water injected by one well in 43.5 hrs $= (19.2 + 20) \times 43.5 = 1705 \text{ Cum}$
- No. of Injection well required $= 5966 / 1705 = 3 \text{ Nos}$
- **Road & Green Area**
- Total Rain Fall $= 588 \text{ mm} = 0.588 \text{ M}$
- Runoff Factor $= 0.371$
- Area $= 421008 \text{ Sqm}$
- Total Quantum of Rain fall $= \text{Total Rainfall in mm} / 1000 \times \text{Runoff factor} \times \text{Area in Sqm}$
- $= 588 / 1000 \times 0.371 \times 421008 = 91308 \text{ Cum}$
- Injection well is designed to take quantum of Average Rain fall only.
- Total Rain fall Hrs are 43.5 hrs. out of which 26.5 hrs are when rainfall is more than or equal to average rainfall. & 17 hrs are for below average rain fall rainfall
- Total Rain Fall $= 20 \times 13.52 + 23.5 \times 6.1 = 413.75 \text{ M}$
- Runoff Factor $= 0.371$
- Balance Area $= 421008 \text{ Sqm}$
- Total Quantum of Rain fall $= \text{Total Rainfall in mm} / 1000 \times \text{Runoff factor} \times \text{Area in Sqm}$
- $= 413.75 / 1000 \times 0.371 \times 421008 = 64625 \text{ Cum}$
- Total Quantum of Water injected by one well in 43.5 hrs $= (19.2 + 20) \times 43.5 = 1705 \text{ Cum}$
- No. of Injection well required $= 64625 / 1705 = 33 \text{ Nos}$
- 6 **Horticulture / Arboriculture**
- Green area acts in the similar manner as lungs perform in human body. Hence its development is important for eco friendly development.
- Fine grassing is proposed in all the parks.
- Shrubs and creepers will be provided at suitable places.
- Road side plantation will be carried out as per norms i.e. at 12 m c/c on foot paths.

6.1. Horticulture / Arboriculture

Horticulture & Road Side Plantation

Horticulture & Road Side Plantation		Total 198 Acres
Sr No	Description	Total Qty.
1	DEVELOPMENT OF GREEN AREA a) Trenching the ordinary soil up to depth of 60 cm i.e. removal and stacking of serviceable material & disposing by spreading and leveling within a lead of 50 M and making up the trench area for proper levels by filling with earth or earth mixed with manure before and after flooding trench with water excluding cost of imported earth and manure. b) Supply and stacking sludge at site including royalty and carriage Green Area C) Rough dressing of turned area Grassing with "DOOB GRASS" i.e. watering & maintenance of lawns for 30 days till the grass forms a thick lawn, free from weeds and fit moving in rows 7.5 cm part in either direction including provision for hedges and barbed wire around park d) Maintenance of lawns for a period of 1 year	7.232 Acres
2	Road Side Plantation and plantation along the roads and above after distance of each 12 m	1416 Nos.

7 Street Lighting

- 150 Watt sodium vapour lamps have been proposed on 24 m road on both sides at 40 m distance in a staggered manner i.e. 20 m centre to centre.
- 150 Watt sodium vapour lamps have been proposed on 18 m road on one side at 25m distance.
- At road junctions also 150 Watt sodium vapour lamps have been proposed.
- Height of tubular pole for 24 m, 18 m wide roads and road junctions will be 6.75 m above ground level and 1.25 m below ground level.
- It is proposed to provide CFL Lamp 15 mt. & 12 mt wide roads on one side @25 m c/c with height of pole above road level is 5.75 m. & with 1.5 m projection..
- The distance of pole from metalled edge is 1.40 m.
- Street Lights have been proposed at a spacing of 40mts. on both sides of the 24- mts. wide roads i.e., these shall be located alternately for proper lighting on both sides. The actual spacing would thus be 20mts.

8 SPECIFICATIONS:

- The work will be carried out in accordance with the MORTH, HARYANA PWD & HUDA specification/ Guide lines.
- Specification s in detail has been submitted at time of calling tenders

9 RATES

- The Costing for providing services in this project has been prepared on the basis of recent market rates and H.S.R.

10 COSTING

- The total cost of the project : **103.29** ~~69.60~~ Cr.
- The cost of development in this project comes out to be **54.80** ~~25.15~~ Lacs per acre

Sr.	Description		Total Cost in
	Sub Work No	Sub Work Name	198 Acre
1	Sub Work No. 1	Roads	219139506
2	Sub Work No. 2	Water Supply	82545528
3	Sub Work No. 3	Waste Water & Recycling	54949748
4	Sub Work No. 4	Storm Water Drainage	40392767
	Sub Work No. 4A	Recharge Wells Road, Plotted ,Commercial, Utility & Green Area	10129020
	Sub Work No. 4B	Additional Recharge Wells for Constructed Area	10129020
5	Sub Work No. 5	Horticulture	3093507
6	Sub Work No. 6	Lighting & Fittings	8422602
	Sub Total		428801698
	Sub work No. 7 (Maintenance of services including Resurfacing of roads after first 5 years & Second after 10 yrs. of mtc.		267131724
	Sub Total		695933422
	Cost / Acre		3514176
	Estimate approved by HUDA authorities for 102.741 Acre Area		402002556
	Balance Amount		293930866

Daily Water Demand of 198.036 Acre Area

Residential Plotted Colony EMMAR					Daily Water Requirement				
Sr.	Size of Plot		Plots	Water Allowance	Water Requirement				
1	Width	Area of each Unit / Plot			Total	Fresh Water Source	Recycled Water Source		
	M	SQM	Nos.	Ltrs./Capita/Day	Ltrs./	% use	Ltrs./Day	%	Ltrs./Day
1	Residential		1288	2795363	2706514	70%	1894560	30%	811954
1.1	Group Housing	9.53	1	172.5	410981	70%	287687	30%	123294
2	Commercial	Acres	Nos.						
2.1	Commercial	7.07		32000	226240		203616		22624
2.2	Nursing Home 1	0.247	1	5000	5000	90%	159120	10%	17680
2.3	Nursing Home 2	0.247	1	5000	5000	100%	5000	0%	0
2.4	Nursing Home 3	0.247	1	5000	5000	100%	5000	0%	0
2.5	Nursing Home 4	0.247	1	5000	5000	100%	5000	0%	0
					196800.0		179120.0		17680.0
3	Utility Area	Acres	Nos.		246240		223616		22624
3.1	Nursery School	0.2	4	10000	40000	90%	36000	10%	4000
3.2	Primary School	1	2	50000	100000	90%	90000	10%	10000
3.3	High School	5	1	150000	150000	90%	135000	10%	15000
3.4	Dispensary	1.25	1	25000	25000	90%	22500	10%	2500
3.5	Crèche	0.2	1	10000	10000	90%	9000	10%	1000
3.6	Religious	0.2	1	10000	10000	100%	10000	0%	0
3.7	Community	2	1	50000	50000	90%	45000	10%	5000
3.8	Sub Post Office	0.01	1	10000	10000	90%	9000	10%	1000
3.9	Taxi Stand	0.5	2	5000	10000	90%	9000	10%	1000
	Sub Total	10.36			405000		365500		39500
4	Undetermined	11.714		25000	292850	90%	263565	10%	29285
5	Green Area	7.230		25000	180750	10%	18075	90%	162675
6	Area under Road			10000	645660	10%	64566	90%	581094
	Total Area /				4838555		3073073		1765483
					4839		3073		1766
					4566 KLD		2892		1674 KL

Waste Water Estimation of 198.036 Acre Area

Residential Plotted Colony EMMAR				Daily Water Requirement		Anticipated Waste Water	
Sr.	Size of Plot		Plots	Water Allowance	Water Total	Net Water	Average
1	Width	Area of each Unit / Plot					
	M	SQM	Nos.	Ltrs./Capita/Day	Ltrs./ Day	Ltrs./Day	Ltrs./Day
1	Residential	(10254 263)	1288		2706514	2706514	2029885
1.1	Group Housing	9.53	1	172.5	410981	410981	308235.94
2	Commercial	Acres	Nos.				
2.1	Commercial	7.07		25000	176800	176800	132600
2.2	Nursing Home 1	0.247	1	5000	5000	5000	3750
2.3	Nursing Home 2	0.247	1	5000	5000	5000	3750
2.4	Nursing Home 3	0.247	1	5000	5000	5000	3750
2.5	Nursing Home 4	0.247	1	5000	5000	5000	3750
					196800.0	196800.0	147600.0
3	Utility Area	Acres	Nos.				
3.1	Nursery School	0.2	4	10000	40000	40000	30000
3.2	Primary School	1	2	50000	100000	100000	75000
3.3	High School	5	1	150000	150000	150000	112500
3.4	Dispensary	1.25	1	25000	25000	25000	18750
3.5	Crèche	0.2	1	10000	10000	10000	7500
3.6	Religious	0.2	1	10000	10000	10000	7500
3.7	Community	2	1	50000	50000	50000	37500
3.8	Sub Post Office	0.01	1	10000	10000	10000	7500
3.9	Taxi Stand	0.5	2	5000	10000	10000	7500
	Sub Total	10.36			405000	405000	303750
4	Undetermined	11.714		25000	292850	292850	219638
5	Green Area	7.230		25000	180750		
6	Area under			10000	645660		
	Total Area /				4838555	4012145	3009109
					4839	4012	3009

Final Abstract of Cost of Sector 62,65,Gurgaon, Total Area=198.036 (Original submission : 102.741, Additional Area 95.295Acre being developed by EMMAR MGF

Sr. No.	Description		Total Cost in Lacs.
	Sub Work No	Sub Work Name	
1	Sub Work No. 1	Roads	2758.61 249139506 2863.95 lacs
2	Sub Work No. 2	Water Supply	874.20 82545528 1070.82 lacs
3	Sub Work No. 3	Waste Water & Recycling (Sewerage)	588.57 54949748 1754.52 lacs
4	Sub Work No. 4	Storm Water Drainage	407.00 40392767 682.37 lacs
	Sub Work No. 4A	Recharge Wells Road,Plotted ,Commercial,Utility & Green Area	117.30 11728342 75.97 lacs
	Sub Work No. 4B	Additional Recharge Wells for Constructed Area	85.30 lacs
5	Sub Work No. 5	Horticulture	21.00 3093507 52.02 lacs
6	Sub Work No. 6	Lighting & Fittings	123.86 8422602 723.25 lacs
	Subwork No. 7 (Maintenance of services including Resurfacing of roads after first 5 years & Second after 10 yrs.of mtc		3247.16 267131721 3769.14 lacs
	Sub Total		8235.00 lacs
	Cost / Acre		11077.35 lacs

Executive Engineer (W)
for Chief Engineer
HUDA Panchkula

Superintending Engineer,
HUDA, Circle-II, Gurgaon

Executive Engineer
HUDA Division No. 1
GURGAON

Cost Estimation of Sub Work No. 1
(Roads)

SUB HEAD NO. 1		Total 198.036 Acres	Roads		
S No	Description	TotalQty.	Unit	Rate in	Amount in 198Acre
1	Providing for leveling & earth filling includes providing good earth transportation from source to site, laying in layer, rolling & watering & compaction to the desired specification complete as per MORT & H specifications for road & bridge works Clause - 305 for all leads and lifts as per site conditions	198.036 <i>Group Housing Area 9.53</i> <i>198.506</i>	Acres	75000 <i>125000/-</i>	14852700 <i>24754500/-</i> <i>235.63 lacs</i>
2	Construction of Road By i) Providing GSB 200 mm thick as per MORT & ii) Providing Laying, spreading and compacting graded stone aggregates as per Table 400-11 to Wet Mix Macadam specifications - 406 MORT&H, IV Revision, including premixing the mixed materials with water to OMC in Mechanical mixer (Plug Mill) carriage of mixed material by tipper to site, laying in uniform layers using paver in subbase / base course, on a well prepared sub base and compacting with power and vibratory roller to achieve & desired density, including cost of material complete. <i>250 mm thick stone aggregate</i>	125072 <i>112105</i>	sq mtr	800 <i>1000/-</i>	100057600 <i>112112000/-</i> <i>1121.05 lacs</i>
	Providing, laying & compaction of B.M. (Bituminous Macadam) 50 mm thick with grading 2 as per table No. 500.10 and minimum 4.5% bitumen of 60/70 grade as per MORT&H specifications for road & bridge works 2001 (Revision IV) clause. 507.1 to 507.8 for all leads & lifts etc. complete in all respects to the satisfaction of the Engineer in charge				
	<i>40 mm thick mis-sal surfacing. SDBc</i>				
	Providing & Fixing kerbs & channels of C.C. M-20 grade as per standard size including back filling etc. complete in all respects.	35120 <i>30200</i>	mtr	600/- <i>400/-</i>	14048000 <i>12080000/-</i> <i>120.80 lacs</i>
4	Provision for foot path on both sides on 18 m & 24 m Road with pre cast tiles of cement concrete 1:1.5:3 in pavement Commercial area+ Footpath.	37090 <i>26700</i>	sq mtr	350 <i>750/-</i>	12981500 <i>20025000/-</i> <i>200.25 lacs</i>
5	Provision for Guide Maps	L S			<i>500000</i>
6	Provision for demarcation Barjees	L S			<i>300000</i>
7	Provision for Traffic Lights	L S			<i>300000</i>
8	Provision for carriage of material & unforeseen items	L S			<i>500000</i>
9	Provision for Plot Indicators, Road Marking Strips & Post Delinators.	L S			<i>100000</i>
10	<i>Provision for culverts on Nallah. (5 Nos)</i>	<i>100000</i>			<i>500000</i>
Sub Total					<i>1000000</i>
Add 3 % Contingency charges					<i>30000</i>
Total					<i>1030000</i>
Add 49% Charges on account of Escalation, Over Head & Super vision Charges					<i>504700</i>
Grand Total					<i>1534700</i>

Abstract of Sub Work No. 2

(Water Supply)

SUB HEAD NO. 1

Water works, Boosting Station

SUB HEAD NO. 2

Pumping Machinery

SUB HEAD NO. 3

Distribution System & Rising Main

Total

Add 3 % Contingency charges

Total

Add 49% Charges on account of Escalation, Over Head & Super vision Charges

Grand Total

SUB HEAD NO. 1

WW1

WW2

Total

Water works, Boosting Station

Sr No

Description

Qty.

Qty.

Total
198.036
Aeres

Unit

Rate in

Amount in

1 Boring & installing 21 " i/d tube wells reverse rotary rigs complete with pipes & strainer to depth of about 80 m complete

3

0

4

No

700000

28.00 lac

2 Construction of Pump Chamber

4

0

4

No

225000

900000

3 Construction of Boundary wall and gate around the water works

1

1

2

LS

200000

400000

4 Construction of Boundary wall and gate around the Tube wells

4

0

4

LS

100000

400000

5 Development of campus of water works including construction of approach roads footpath hedges and development of lawns and plantation etc complete at water works site

1

1

2

LS

100000

200000

6 Development of Tube well site including construction of approach roads footpath hedges and development of lawns and plantation etc complete at Tube well site

4

0

4

LS

50000

200000

7 Construction of RCCOHSR of following capacity including cost of stair case, inlet, outlet, over flow, scour pipe and valves etc complete in all respect with 30 m staging height (2 site)

500

300

800

KL

15000

120.00 lac

8 Construction of Boosting Chamber

1

1

2

No

600000

1200000

9 Construction of RCC Under Ground Clear Water Storage Tank (Domestic, Flush, Fire) in three compartments including inlet outlet & over flow

900

630

1530

KL

3500

5355000/-

10 Provision for Carriage of materials and other unforeseen

1

1

2

LS

100000

200000

11 Provision for Staff Quarter for Maintenance staff

Area Nos. Cost in lacs

350 sft 2 3.5 7.00

440 sft 2 4.4 8.80

600 sft 1 6 6.00

21.80

21.80

LS

2180000

2180000

Total Cost

18770000
268.35 lac
19735000/-

188.506

SUB HEAD NO. 2

WW1

WW2

Total

198.036

Acres

Pumping Machinery

Providing & installing electrically driven submersible pumping set capable of delivering about 6.4 kl water per hour against head of 40m complete with motor and other accessories

4

0

4

No

200000

8.00
400000

Provision for pressure type chlorination plant

4

0

4

No

1.00
800004.00
320000

Provision for making foundation for machinery

4

0

4

No

25000

100000

Provision for pipes & valves

4

0

4

No

25000

100000

Pumping Machinery (4 No Horizontal centrifugal pumps 20 LPS at 45 M Head stand by 1 No Horizontal centrifugal pumps 20 LPS at 45 M Head Total 4 pumps 20 HP)

5
3

3

8
6

No

250000

15.00
2000000

Pumping Machinery (1 No Horizontal centrifugal pumps 10 LPS at 45 M Head stand by 1 No Horizontal centrifugal pumps 10 LPS at 45 M Head : 10HP) For Group Housing area

0

3

3

No

150000

450000

Provision for Gen Set 75Kva capacity

1

1

2

LS

1500000

3000000

Provision for electric service connection including electric fitting for boosting chamber etc including

1

1

2

LS

150000

350000

Provision for unforeseen items

LS

500000

10,00,000

757000

3720000

SUB HEAD NO. 3

Total

198.036A

Acres

188.506

Distribution System & Rising Main

Group Housing (-) Area

Sr No

Description

Qty.

Qty.

Total Qty.

Unit

Rate in

Amount in

Providing, stringing, cutting and jointing D.I. pipe (Class K-7) Zinc coating outside the pipe and cement lining inside including cost of excavation

WW1

WW2

(For Distribution)

100 mm id

6830

7883

3159

9989

11042

Mtr

1250/-

950.00

124.86

10489900

150 mm id

2075

1022

1665

3740

2687

Mtr

1575/-

1350.00

58.91

3627450

200 mm id

573

1534

2107

Mtr

2150/-

1900.00

45.30

4003300

250 mm id

203

403

0

403

Mtr

2615/-

2500.00

5.31

1007500

300 mm id

521

348

60

408

581

Mtr

3580/-

2800.00

26.34

1142400

	(Rising Main)						
2/NS Recom mendat ion of Comm tee	Providing and fixing cast iron double flanged sluice valve/ Butter Fly Valve PN 1.6 marked with IS: 14846 including cost of all joint of material, carriage, loading, unloading, stacking, handling etc complete in all respect of the satisfaction to the Engineer - in charge.						
	100 mm id	14	4	18	Nos.	10000 12000	180000 2.16 lacs
	150 mm id	7	3	10	Nos.	15000 18000	105000 1.80000
	200 mm id	2	5	7	Nos.	20000 24000	40000 1.40 lacs
	250 mm id	3	0	3	Nos.	24000 18000/-	72000 0.72
	300 mm id	4	0	4	Nos.	30000 30000	120000 1.20
3/ 28.10(A)	Providing and fixing C.I. doubleAir valves marked with IS : 14845 including carriage, loading, unloading, stacking, handling, re-handling etc., drilling, tapping, screwing in valves connections complete in all respects to the satisfaction of Engineer-in-charge 100mm i/d.	10	8	18	Nos.	7500 10000/-	135000 1.80 lacs
4/NS	Providing & fixing Fire Hydrants duly ISI marked conforming to specifications complete in all respects & Construction of Brick masonry Haud for Sluice Valves & Fire hydrant including surface boxes complete as per Public Health Standard	16	8	24	Nos.	10000 7500/-	180000 2.40 lacs
5	Provision for indicating Arrow plates for Sluice valve & Fire hydrant	56	28	84	Nos.	1000 1000/-	84000 84000
6	Provision for Carriage of material	1	1	2	LS	50000 50000	100000 5.00
7	Provision for Cutting of Roads and making good to its original condition	1	1	2	LS	200000 200000	400000 5.00
8	Provision for Rising main	Provision for Rising main from Tube well to UGT	Provision for Rising main from HUDA Source to UGT				
	150 mm id	1053	160 160	1213 1213	Mtr	1350.00 1575/-	1637550 16.59
	200 mm id	292	407 407	699 699	Mtr	1900.00 3150/-	1328100 15.03
	250 mm id	384	1435 1435	1819 1819	Mtr	2500.00 2615/-	4547500 47.53
2/NS Recom mendat ion of Comm tee	Providing and fixing cast iron double flanged sluice valve/ Butter Fly Valve PN 1.6 marked with IS: 14846 including cost of all joint of material, carriage, loading, unloading, stacking, handling etc complete in all respect of the satisfaction to the Engineer - in charge.						
	150 mm id	5	1	6	Nos.	12000 15000/-	72000 90000/-
	200 mm id	2	1	3	Nbs.	14000 17500/-	28000 0.60
	250 mm id	2	2	4	Nos.	20000 24000/-	80000 0.96 lacs
9	Providing and fixing cast iron double flanged sluice valve/ Butter Fly Valve PN 1.6 marked with IS: 14846 including cost of all joint of material, carriage, loading, unloading, stacking, handling etc complete in all respect of the satisfaction to the Engineer - in charge.						
	WW2 to Group Housing Area 150 mm id		160 160	160 160	Mtr	1350.00 1350.00	216000 216000
	Total						29296100 29653200/-
							358.39 lacs

**Abstract of Sub Work No. 3
(Waste Water Collection System)**

No. of Sub Head	Name of Sub Head	Amount in
Sub Head No. 1	Waste Water collection/Sewerage	198 Acre
Sub Head No. 2	Recycling of Treatment Water	31867300
	Total Cost	31867300
	Add 3 % Contingency charges	956019
	Total	32823319
	Add 49% Charges on account of Escalation, Over Head & Super vision Charges	16187525.37
	Grand Total	49010844.8

Cost Estimation of Waste Water / Sewerage

SUB HEAD NO. 1

Sr. No.	Description	Qty.	Qty.	Total Qty	Unit	Rate in	Amount in
							198 Acre
1	Providing salt glazed stone ware pipes grade 'A' in standard length of 600 mm each pipe marked with IS: 651 and their lowering, cutting, jointing and testing, including cost of excavation, bed concrete, Man holes jointing materials as well as carriage, loading, unloading stacking, handling, rehandling etc, complete in all respects to the satisfaction of Engineer in Charge.						
	200 mm id S.W Pipe			11205			140.06 Lacs
	i) Average Depth up to 2 M			11646	M	1250	14557500
	250 mm id S.W Pipe			735			0
	i) Average Depth 2 M to 4 M			506	M	1500	759000
	300 mm id S.W Pipe			534			0
	i) Average Depth 2 M to 4M			866	M	1800	1558800
	400 mm id S.W Pipe			2500			0
	ii) Average Depth 2 M to 4M			2746	M	2500	6865000
2	Provision for oblique junction			1	LS	50000	50000
3	Provision for temporary Timbering			1	LS	100000	100000
4	Provision for providing & fixing Vent shafts at suitable places as per requirement of Public Health Departments			1	LS	500000	500000
5	Provision for Sewerage Treatment Plant (Tertiary level Treatment)			0.9	mld	10000000	9000000
6	Provision for cutting of roads and carriage for materials and other unforeseen charges etc.			1	LS	100000	100000
7	Prov. for making connection with HUDA sewer line for over flow from STP.			2	LS	500000	1000000
	Total						31867300

8) Prov. for CPDS pipe for crossing Nallah.
200 mm & 400 mm (suitable capacity) (LS)

33117300/-
5.00 Lacs
8 846.70 Lacs

SUB HEAD NO. 2				Total 198 Acres	Recycling of Treated Waste Water		
Sr. No.	Description	Qty.	Qty.	Total Qty	Unit	Rate in	Amount in
1	Providing Stringint, cutting and jointing PVC Pipe of 6 kg cm ² pressure including cost of escavation complete in all respect						198 Acre
	63 mm i/d			7020	Mtr	150/- 100	1053000/- 702000
	75 mm i/d			2190	Mtr	175/- 100	383250/- 219000
	90 mm i/d			524	Mtr	250/- 100	131000/- 52400
	110 mm o/d		19257	2353	Mtr	1250/- 360	24071 847080
	140 mm o/d			330	Mtr	500	165000
	160 mm o/d		2117	1871	Mtr	780 1575/-	1459380 33.34 Lacs
	Providing Stringint, cutting and jointing AC Pipe of 25 kg cm ² pressure including cost of escavation complete in all respect						
	180 mm o/d			107	Mtr	1494	159858
	210 mm o/d		601	266	Mtr	1907 2150/-	507262 12.92 Lacs
2	Providing and fixing Butter Fly Valves Ball Valve in C.I body with integrally moulded liner of nitrile or EPDM as per IS 13095 in PN						
	63 mm i/d			24	Nos	1800	43200
	75 mm i/d			6	Nos	2100	12600
	90 mm i/d			4	Nos	2300	9200
	110 mm o/d			40 6	Nos	12000/- 2500	4.80 Lacs 15000
	140 mm o/d			2	Nos	3000	6000
	160 mm o/d			9 11	Nos	15000 3500	1.65 Lacs 31500
	180 mm o/d			2	Nos	4000	8000
	210mm o/d			2 5	Nos	20000 4667	1.00 Lacs 14001
3/28.13	Providing and fixing C.I double Air Valves Butter fly Valves Marked with IS 14845 including carriage loading			1	Nos	3098	3098
4	Providing for indicating Arrow Plates for sluice valve and Air valves			57	Nos	1000	57000
5	Construction of Sluice valve Hardies			57	Nos	5000	285000
6	Provision for providing and fixing Lawn Hyderents/sprinklers with sprinkler system at a distance of 30 m centre to centre on the periphery (green land) complete in all respects			43	Nos	3500/- 1000	1.51 Lacs 43000
							296.53 Lacs 5232429/- 3937575

Cost Estimation of Sub Work No. 4 (Storm Water Drainage)							
Sub Head No.1			Total 198 Acres		Storm Water Drainage		
Sr No	Description	Qty.	Qty.	Total Qty.	Unit	Rate in	Amount in 198 Acre
1	Providing, stringing, cutting and jointing RCC NP-3 pipe and specials in to Trenches including cost of excavation, cost of manholes, Road Gullies, ventilating chambers etc., complete in all respect.						
	400 mm dia			13127	M	2500/- 1450.00	328-18 las 19034150
	500 mm dia			271	M	3400/- 1850.00	9-21 las 501350
	600 mm dia			679	M	4070 2800.00	27-64 las 2214800
	700 mm dia			405	M	5885 2975.00	20-60 las 1624350
	Provision for road gullies with pipe connection 300 mm d (L.S)			1	L.S	45000	20-00 45000
3	Provision for Shoring & Timbering, Lighting & Watching & temporary diversion of traffic			1	L.S	100000	10-00 100000
4	Provision for cutting of road & making good to its original conditions			1	L.S	200000	200000
5	Provision for temporary disposal arrangement of water.			1	L.S	2500000	2500000
6	Provision for connection of proposed system with HUDA System			1	L.S	200000	200000
Total Cost							26510650
Add 3 % Contingency charges							795319.50
Sub Total							27305969.50
Add 49% Charges on account of Escalation, Over Head & Super vision Charges							13384448.25
Grand Total							40690417.75
Cost Estimation of Sub Work No. 4 A (Recharge Well Road, Other & Green Area)							
Sr. No.	No. of Sub Head	Name. of Sub Head					
1	Sub Head No.1	Recharge wells Road Area					
	Road & Green Area						
		Qty	Unit	Rate in Rs			198 Acre
1.1	Construction of Recharge wells	33	Nos	150000			4950000 49.50 la
1.2	Construction of Desilting Chamber	33	Nos	81579			2692107 1.49 las
	Sub Total						7642107 50.99
Add 3 % Contingency charges							229263.21 24.98
Total							7871370 75.97
Add 49% Charges on account of Escalation, Over Head & Super vision Charges							3856974 39.47 las
Grand Total							11728344

Say Rs. 407.00 las.

Say Rs. 11730 las.

**Cost Estimation of Sub Work No. 4 B
(Additional Recharge Well for Constructed Area)**

Sr. No.	No. of Sub Head	Name. of Sub Head			
	Sub Head No. I	(Additional Recharge Well for Constructed Area)			
	(Additional Recharge Well for Constructed Area)				
		Qty	Unit	Rate in Rs	Amount
1.1	Construction of Recharge wells	24	Nos	150000	3600000
1.2	Construction of Desilting Chamber	24	Nos	81579	1957896
	Sub Total				5557896
	Add 3 % Contingency ^{type} charges				166736.88
	Total				5724633
	Add 49% Charges on account of Esculation ,Over Head & Super vision Charges				2805070
	Grand Total				8529703

Say Rs. 85.30 lacs.

Cost Estimation of Sub Work No. 5 (Horticulture)							
Sr. No.	Sub Head No. 1	Already Approved Area 102 Acres	Additional Area 96 Acres	Total 198 Acres	Horticulture		
Sr No	Description	Qty.	Qty.	Total Qty.	Unit	Rate in	Amount in
	DEVELOPMENT OF GREEN AREA						198.036 198 Acre 9.53 188.506 Acre
1	a) Trenching the ordinary soil up to depth of 60 cm i.e. removal and stacking of serviceable material & disposing by spreading and leveling within a lead of 50 M and making up the trench area for proper levels by filling with earth or earth mixed with manure before and after flooding trench with water excluding cost of imported earth and manure. Area of Road						
	b) Supply and stacking sludge at site including royalty and carriage Green Area	7.23	3.37	10.597	Acres	1.50 lacs 90000	15.90 lacs 953704.1864
	c) Rough dressing of turfed area Grassing with "DOOB GRASS" i.e. watering & maintenance of lawns for 30 days till the grass forms a thick lawn, free from weeds and fit moving in rows 7.5 cm part in either direction including provision for hedges and barbed wire around park.						
	d) Maintenance of lawns or turfing of slopes for a period of 1 year						
2	Road Side Plantation and plantation along the roads and above after distance of each 12 m Detail of Cost						
i	Trees/ Shurbs = 60 Rs						
ii	Excavation = 30 Rs						
	Manure = 60 Rs						
	Tree Guard = 600 Rs	2400		2400			18.00 lacs
	Total Cost of 1 Tree = 750	1416		1416	No	750	1062000
	Total					33.90 lacs	2015708
	Add 3 % Contingency charges					1.02	60471
	Sub Total					34.92	2076179
	Add 49% Charges on account of Escalation, Over Head & Super vision Charges					17.10	1017328
	Grand Total					52.02 lacs	3093507

Say Rs. 31.00 lacs.

c.o. to final abstract of cost

Cost Estimation of Sub Work No. 6 (Street Lighting & Fittings)							
Sub Work No. 6				Lighting & Fittings			
Sr. No.	Description			Total 198 Acres 036 9.53	Unit	Rate in	Amount in
1	Provision for Streetlighting on Roads as per standard specifications complete in all respect (CFL) MVPNL.		Group Housing (-) Area	188.506 64.560	Acres	+25000/- 85000 2.50 lacs	198 Acre 8070750/- 5488110 471.27 lacs
	Total cost						8070750/- 5488110
	Add 3% Contingency charges		CAPE				14.14 lacs 242123/- 164643
	Sub Total						485.41 lacs 8312875/- 5652753
	Add 49% Charges on account of Escalation, Over Head & Super vision Charges						237.85 lacs 4073308/- 2769849
	Grand Total						723.25 lacs 12386181/- 8422602

Say Rs. 723.25
123.86 lacs.

C. o. to final abstract of cost

Maintenance charges for 10 years & Resurfacing of Roads after 5 & 10 years							
Sub Work No. 7				Maintenance charges for 10 years & Resurfacing of Roads after 5 & 10 years			
Sr. No.	Sub Head No 1	Allready Aprooved Area 102Acres	Additional Area 96Acres	Total 198Acres	Unit	Rate in *	Amount in *
							198.036
Sr No	Description	Qty.	Qty.	TotalQty.	Unit	Rate in *	Amount in *
						G.H. area (-)	498Acre 9.53
1	Provision for maintenance charges of Roads, Water supply, Sewerage, Storm water drainage, Horticulture, Street light etc complete in all respect as per HUDA norms after completion.			198.036 188.506	Acres	500000	99018000 942.5365
2	Provision for Resurfacing of Roads after 5 years, 100 mm thick with 25 mm thick pre mix carpet with seal coat with mechanical mixer.			112105 +25,072	Sqm	600/- 350.00	75043200/- 43775200 672.6365
3	Provision for Resurfacing of Roads after 10 years 25 mm thick pre mix carpet with seal coat with mechanical mixer.			112105 +25,072	Sqm	750/- 300/- 250.00	840.7965 37521600/- 31268000 2455.9565
Total cost				211582800/-			174061200- 73.6765
Add 3 % Contingency charges				6347484/-			5221836 2529.62
Sub Total				217930284/-			179283036 1239.52
Add 49% Charges on account of Escalation, Over Head & Super vision Charges				106785839/-			87848688 3769.1465
Grand Total				824716123/-			267131724

Say Rs. 324716123/-
c.o. to final as street & cost

Design Statements for Road

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels		Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
	Key Nodes	Natural Surface Levels		Formation Level							
	G1.	229.000		230.520	228.440	231.000	230.047				
	F11	232.180		228.440	228.280	230.047	230.105				
	J	230.000									
	H7	228.500									
	H18	228.500									
	J5	235.650									
	G16	234.820									
1	A-A1	26.5 ✓	24	230.520	228.440	231.000	230.047				26.5
2	A1-A2	115 ✓	24	228.440	228.280	230.047	230.105				115
3	A2-B	71 ✓	24	228.280	227.990	230.105	230.105				71
4	A1-A10	26 ✓	15	228.440	228.430	230.047	230.151		26		
5	A10-A13	31 ✓	15	228.430	225.990	230.151	229.708		31		
6	A10-A3	105 ✓	15	228.430	228.090	230.151	230.109		105		
7	A3-A2	74 ✓	15	228.090	228.280	230.109	230.105		74		
8	A3-A4	56 ✓	15	228.090	228.060	230.109	230.137		56		
9	A4-A8	43 ✓	12	228.060	228.130	230.137	230.219	43			
10	A4-A5	36 ✓	15	228.060	228.240	230.137	230.165		36		
11	A5-A9	43 ✓	12	228.240	228.690	230.165	230.169	43			
12	A5-A6	55 ✓	15	228.240	227.980	230.165	230.170		55		

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels				Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Upstream Level	Downstream Level	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
13	A6-A7	56 ✓	15	227.980	227.240	230.170	230.189				56 ✓		
14	A7-A7	28 ✓	15	227.240	227.420	230.189	230.200				28 ✓		
15	A6-A11	105 ✓	12	227.980	227.490	230.170	230.197			105			
16	A7-A12	105	15	227.240	227.940	230.189	230.208				105 ✓		
17	A12-A11	56	15	227.940	227.490	230.208	230.197				56 ✓		
18	A11-A14	50	15	227.490	227.480	230.197	230.207				50		
19	A-B6	258 ✓	24	230.520	231.690	231.000	231.645						258
20	B6-B4	142 ✓	18	231.690	231.290	231.645	230.834					142	
21	B4-B3	220 ✓	18	231.290	228.080	230.834	230.157					220	
22	B3-B1	123 ✓	18	228.080	228.520	230.157	230.144					123	
23	B1-B9	74 ✓	24	228.520	227.950	230.144	230.201						74
24	B9-B10	61 ✓	12	227.950	228.440	230.201	230.177			61			
25	B10-B12	36 ✓	12	227.880	227.880	230.177	230.165			36			
26	B10-B13	110 ✓	12	228.440	228.060	230.177	230.188			110			
27	B1-C26	39 ✓	24	228.520	228.150	230.144	230.079						39
28	C26-B	48 ✓	24	228.150	227.990	230.079	229.999						48
29	B-B'	71 ✓	24	227.990	228.370	229.999	230.014						71
30	B-B2	136 ✓	15	227.990	228.670	229.999	230.027				136		
31	B2-B5	75 ✓	15	228.670	229.040	230.027	230.042				75		

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels			Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Mtr	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
32	B3-B7	74	12	228.080	228.140	230.157	230.165	230.184	74			
33	B7-B8	189	12	228.140	230.450	230.165	230.184		189			
34	B4-B17	75	18	231.290	230.980	230.834	230.964				75	
35	B17-B18	46	15	230.980	231.430	230.964	230.973		46			
36	B18-B19	68	15	231.430	231.860	230.973	231.000		68			
37	B19-B20	37	15	231.860	232.100	231.000	231.296		37			
38	B18-B22	90	12	231.430	230.590	230.973	230.920		90			
39	B22-B27	83	12	230.590	227.830	230.920	230.856		83			
40	B22-B21	94	15	230.590	228.860	230.920	230.795		94			
41	B19-B28	172	15	231.860	227.660	231.000	230.983		172			
42	B28-B29	33	15	227.660	227.760	230.983	230.987		33			
43	B28-B27	68	15	227.660	227.830	230.983	230.854		68			
44	B27-B26	47	15	227.830	227.860	230.854	230.540		47			
45	B17-B16	48	15	230.980	230.310	230.964	230.954		48			
46	B16-B15	68	15	230.310	228.700	230.954	230.682		68			
47	B15-B14	40	15	228.700	228.270	230.682	230.686		40			
48	B16-B21	90	12	230.310	228.860	230.954	230.791		90			
49	B21-B25	84	12	228.860	228.380	230.791	230.604		84			
50	B25-B26	48	15	228.380	227.860	230.604	230.542		48			
51	B15-B24	174	15	228.700	228.360	230.682	230.633		174			
52	B24-B23	33	15	228.360	228.060	230.633	230.639		33			
53	B24-B30	190	12	228.360	228.310	230.633	230.671		190			

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels		Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
54	B24-B25	73	15	228.360	228.380	230.633	230.603	73			
							230.604				
55	B9-C1	84	24	227.950	228.000	230.201	230.173				84
56	C1-C	162	24	228.000	228.040	230.173	230.189				162
57	C-C21	45	24	228.040	228.170	230.189	230.230				45
58	C21-E	110	24	228.170	228.670	230.230	230.304				110
59	C1-C2	47	15	228.000	228.220	230.173	230.181		47		
60	C2-C3	68	15	228.220	228.440	230.181	230.188		68		
61	C3-C4	93	12	228.440	229.060	230.188	230.219	93			
62	C2-C21	117	15	228.220	228.090	230.181	230.201		117		
63	C21-C22	70	15	228.090	228.250	230.201	230.224		70		
64	C21-C21	50	15	228.090	228.170	230.201	230.232		50		
							230.230				
65	C3-C19	67	12	228.440	228.620	230.188	230.233	67			
66	C19-C22	48	12	228.620	228.250	230.233	230.223	48			
							230.224				
67	C19-C20	93	12	228.620	229.020	230.233	230.223	93			
68	C4-C20	67	15	229.060	229.020	230.219	230.226		67		
							230.223				
69	C20-C23	50	15	229.020	228.890	230.226	230.152		50		
70	C23-C17	57	12	228.890	228.590	230.152	230.251	57			
71	C22-C17	46	12	228.250	228.590	230.223	230.250	46			
72	C17-E	28	18	228.590	228.670	230.251	230.307			28	
							230.304				
73	C26-C25	45	12	228.150	228.710	230.079	230.151	45			

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels		Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
74	C25-C5	75	12	228.710	228.590	230.151	230.159	75			
75	C5-C2	124	15	228.590	228.220	230.159	230.180		124		
							230.181				
76	C5-C6	71	15	228.590	229.070	230.159	230.177		71		
77	C6-C12	21	12	229.070	228.960	230.177	230.181	21			
78	C6-C3	124	12	229.070	228.440	230.177	230.189	124			
							230.188				
79	C6-C7	29	15	229.070	228.960	230.177	230.184		29		
80	C7-C8	61	15	228.960	228.740	230.184	230.196		61		
81	C7-C9	118	12	228.960	229.500	230.184	230.205	118			
82	C8-C4	125	15	228.740	229.060	230.196	230.219		125		
							230.219				
83	C8-C10	61	12	228.740	229.480	230.196	230.216	61			
84	C10-C11	28	12	229.480	229.080	230.216	230.222	28			
85	C11-C15	138	12	229.080	229.420	230.222	230.314	138			
86	C15-C16	68	12	229.420	229.580	230.314	230.328	68			
87	C15-C18	139	12	229.420	229.230	230.314	230.430	139			
88	C18-C14	67	24	229.230	228.810	230.430	230.396		67		
89	C11-C13	219	12	229.080	229.090	230.222	230.344	219			
90	C13-C23	68	12	229.090	228.890	230.344	230.149	68			
							230.152				
91	C13-C14	45	12	229.090	228.810	230.344	230.395	45			
							230.396				
92	B26-D12	217	12	227.860	228.310	230.542	230.651	217			
93	D12-D11	101	12	228.310	229.000	230.651	230.701	101			
94	D11-D13	48	12	229.000	229.000	230.701	230.711	48			

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels			Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Mtr	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
95	D13-D14	128	12	229.000	228.250		230.711	230.736	128			
96	D12-D10	60	12	228.310	228.340		230.651	230.531	60			
97	D10-D9	33	12	228.340	228.360		230.531	230.600	33			
98	D10-D8	76	12	228.340	228.470		230.531	230.500	76			
99	D8-D7	33	12	228.470	228.550		230.500	230.602	33			
100	D8-D5	62	12	228.470	229.000		230.500	230.469	62			
101	D5-D6	37	15	229.000	229.000		230.469	230.839		37		
102	D5-D15	91	15	229.000	229.500		230.469	230.460		91		
103	D15-D2	100	15	229.500	228.810		230.460	230.450		100		
104	D2-D1	12	15	228.810	228.840		230.450	230.446		12		
105	D2-D3	62	15	228.810	228.740		230.450	230.657		62		
106	D3-D4	98	12	228.740	228.570		230.657	230.755	98			
107	D15-D16	169	12	229.500	229.970		230.460	230.426	169			
108	D16-D17	59	12	229.970	230.120		230.426	230.438	59			
109	D17-D22	136	12	230.120	230.810		230.438	230.411	136			
110	D17-D18	88	24	230.120	228.780		230.438	230.456				88
111	D18-D19	45	12	228.780	228.970		230.456	230.465	45			
112	D19-D20	40	12	228.970	228.770		230.465	230.473	40			
113	D20-D21	55	12	228.770	229.340		230.473	230.484	55			
114	D16-D23	81	12	229.970	229.830		230.426	230.443	81			
115	D23-D24	1	12	229.830	230.000		230.443	230.464	1			
116	D24-D25	61	12	230.000	230.000		230.464	230.452	61			
117	D24-D27	60	12	230.000	230.130		230.464	230.584	60			
118	D27-D26	45	12	230.130	230.000		230.584	230.674	45			

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels			Formation Levels			12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Mtr	Upstream Level	Downstream Level	Mtr				
		Mtr	Mtr	Mtr	Mtr		Mtr	Mtr		Mtr	Mtr	Mtr	Mtr
119	E-E7	45	24	228.670	228.700		230.307	230.344					
120	E7-E1	19	24	228.700	228.500		230.344	230.360					45
121	E7-E2	105	12	228.700	228.990		230.344	230.432		105			19
122	E-E11	97	24	228.670	229.040		230.307	230.387					
123	E11-C14	24	24	229.040	228.810		230.387	230.395					97
124	E11-E2	45	12	229.040	228.990		230.387	230.432		45			24
125	E2-E8	66	12	228.990	229.500		230.432	230.446		66			
126	E8-E9	19	12	229.500	229.880		230.446	230.450		19			
127	E2-E4	71	12	228.990	228.920		230.432	230.440		71			
128	E4-E10	34	12	228.920	229.590		230.440	230.443		34			
129	E10-E8	59	12	229.590	229.500		230.443	230.449		59			
130	E4-E5	54	12	228.920	229.020		230.440	230.494		54			
131	E5-E6	87	12	229.020	229.160		230.494	230.513		87			
132	C18-E18	63	24	229.230	230.210		230.430	230.436					63
133	E18-E19	17	24	230.210	230.030		230.436	230.438					17
134	E19-E'	135	24	230.030	229.750		230.438	229.838					135
135	E19-E12	77	12	230.030	230.170		230.438	230.449		77			
136	E12-E12'	14	12	230.170	230.200		230.449	230.452		14			
137	E12-E13	28	12	230.170	230.200		230.449	230.454		28			
138	E13-E16	42	12	230.200	229.980		230.454	230.463		42			
139	E13-E14	34	12	230.200	230.170		230.454	230.477		34			
140	E14-E15	17	12	230.170	230.080		230.477	230.494		17			

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels			Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Mtr	Upstream Level	Downstream Level				
141	E14-E17	Mtr	Mtr	230.170	230.490	Mtr	230.477	230.494	Mtr	Mtr	Mtr	Mtr
142	D27-F1	1	12	230.000	228.500		230.674	230.715	1			
143	F1-F2	65	12	228.500	228.500		230.715	230.728	65			
144	F3-F4	61	12	228.500	228.500		230.728	230.740	61			
145	F3-F5	250	12	228.500	228.500		230.728	230.678	250			
146	G1-G2	82	24	229.000	229.830		230.500	230.582				82
147	G2-F11	1	24	229.830	232.180		230.582	230.906				1
148	F11-F10	76	12	232.180	231.520		230.906	231.033	76			
149	F10-F7	87	12	231.520	231.030		231.033	231.207	87			
150	F7-F6	33	12	231.030	231.020		231.207	231.273	33			
151	F7-F8	66	12	231.030	230.970		231.207	231.339	66			
152	F8-F9	21	12	230.970	231.500		231.339	231.381	21			
153	F8-F11	87	12	230.970	232.180		231.339	230.904	87			
154	G1-G3	44	12	229.000	229.000		230.500	230.588	44			
155	G3-G4	214	12	229.000	229.460		230.588	231.301	214			
156	G3-G5	72	15	229.000	229.240		230.588	231.068	72			
157	G5-G9	185	12	229.240	230.320		231.068	231.993	185			
158	G5-G6	121	15	229.240	232.750		231.068	232.278	121			
159	G6-G7	46	12	232.750	230.340		232.278	232.738	46			
160	G6-G8	108	12	232.750	231.040		232.278	232.494	108			
161	G8-G10	49	12	231.040	231.360		232.494	232.592	49			

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels		Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
162	G10-G11	72	12	231.360	232.490	232.592	232.664	72			
163	G10-G12	146	12	231.360	232.970	232.592	233.176	146			
164	G12-G13	65	12	232.970	232.890	233.176	233.501	65			
165	G13-G14	79	12	232.890	233.650	233.501	233.896	79			
166	G14-G15	33	12	233.650	233.670	233.896	234.061	33			
167	G15-G16	132	24	233.670	234.820	234.061	234.589				132
							232.100				
168	H-H1	47	24	228.500	228.500	231.000	231.082				47
169	H1-H2	140	24	228.500	228.500	231.082	231.325				140
170	H1-H1'	14	12	228.500	228.500	231.082	231.106	14			
171	H1'-H3	66	12	228.500	228.500	231.106	231.119	66			
172	H1'-H4	190	12	228.500	228.500	231.106	231.437	190			
173	H4-H5	48	12	228.500	228.500	231.437	231.533	48			
174	H5-H6	48	12	228.500	228.500	231.533	231.629	48			
175	H6-H7	37	12	228.500	228.500	231.629	231.703	37			
							231.700				
176	H4-H8	121	12	228.500	228.500	231.437	231.461	121			
177	H8-H9	64	12	228.500	228.500	231.461	231.474	64			
178	H9-H10	124	12	228.500	228.500	231.474	231.498	124			
179	H6-H10	49	12	228.500	228.500	231.629	231.498	49			
179	H10-H11	133	12	228.500	228.500	231.498	232.258	133			
180	H11-H12	59	12	228.500	228.500	232.258	232.270	59			
181	H11-H13	38	12	228.500	228.500	232.258	232.448	38			
182	H14-H15	117	12	228.500	228.500	232.448	233.033	117			
183	H15-H16	28	24	228.500	228.500	233.033	233.028				28
184	H15-H17	17	24	228.500	228.500	233.033	233.071				17
185	H17-H18	15	24	228.500	228.500	233.071	233.100				15
186	H17-H19	68	15	228.500	228.500	233.071	233.085		68		

Sr No.	Name of Road	Length of Road	Width of Road	Natural Surface Levels		Formation Levels		12 M Wide Road	15 M Wide Road	18 M Wide Road	24 M Wide Road
				Upstream Level	Downstream Level	Upstream Level	Downstream Level				
		Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
187	H19-H20	131	15	228.500	228.500	233.085	233.111		131		
188	H21-H22	255	12	228.500	228.500	233.028	233.079	255			
189	H22-H23	34	12	228.500	228.500	233.079	233.086	34			
190	H23-H24	200	12	228.500	228.500	233.086	233.126	200			
191	H24-H25	31	12	228.500	228.500	233.126	233.132	31			
192	H24-H26	33	12	228.500	228.500	233.126	233.132	33			
193	H16-J	1	24	228.500	230.000	233.028	232.902				1
194	J-J1	37	24	230.000	230.320	232.902	232.994				37
195	J1-J2	20	24	230.320	230.500	232.994	233.044				20
196	J2-J3	53	24	230.500	230.970	233.044	233.177				53
197	J3-J4	73	24	230.970	233.000	233.177	233.907				73
198	J4-J5	112	24	233.000	235.650	233.907	235.027				112
199	J5-J9	230	24	235.650	235.050	235.027	235.073				230
200	J5-J6	32	24	235.650	236.020	235.027	235.347				32
201	J6-J7	28	24	236.020	236.000	235.347	235.627				28
202	J6-J8	188	12	236.020	236.410	235.347	236.421	188			
203	J1-J16	101	15	230.320	230.820	232.994	233.015		101		
204	J16-J17	35	15	230.820	230.930	233.015	233.022		35		
205	J16-J18	69	15	230.820	232.000	233.015	233.001		69		
206	J2-J14	38	12	230.500	230.760	233.044	233.052	38			
207	J14-J15	54	12	230.760	230.000	233.052	233.063	54			
208	J3-J18	125	12	230.970	232.000	233.177	233.005	125			
209	J18-J19	69	15	232.000	234.000	233.005	233.311		69		
210	J4-J19	149	15	233.000	234.000	233.907	233.311		149		
211	J19-J20	35	15	234.000	233.870	233.311	233.661		35		
212	J10-J11	80	12	234.530	230.870	235.073	234.273	80			
213	J11-J12	45	12	230.870	230.420	234.273	234.282	45			
214	J11-J13	93	12	230.870	234.470	234.273	234.292	93			
		16724						9225	3969	588	2942

Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line						Sluice Valves					Fire Hydrant			
					Head Loss per M	Total Head Loss	Head Loss Progressive	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	WW-1-A14	30	300	471	0.0029	0.086	0.086	29.91	0	0	0	0	30					1					
2	A14-A11	33	300	3152	0.0029	0.095	0.181	29.82	0	0	0	0	33										
3	A11-A12	55	300	863	0.0027	0.151	0.332	29.67	0	0	0	0	55										
4	A11-A6	118	250	5866	0.0000	0.000	0.182	29.82	0	0	0	118	118						1				
5	A12-A7	118	300	6089	0.0067	0.787	1.119	28.88	0	0	0	118	118										
6	A7-A6	55	300	1978	0.0064	0.352	1.471	28.53	0	0	0	55	55										
7	A7-A7	30	100	1140	0.0000	0.000	1.119	28.88	30	0	0	0	0										
8	A6-A5	55	300	1978	0.0026	0.144	1.615	28.39	0	0	0	0	55										
9	A5-A4	36	300	1457	0.0026	0.093	1.707	28.29	0	0	0	0	36										
10	A5-A9	50	100	1454	0.0000	0.001	1.615	28.38	50	0	0	0	0										
11	A4-A3	57	300	2010	0.0025	0.144	1.851	28.15	0	0	0	0	57										
12	A4-A8	50	100	1721	0.0000	0.001	1.708	28.29	50	0	0	0	0										
13	A3-A2	82	300	2402	0.0024	0.198	2.050	27.95	0	0	0	0	82										
14	A3-A10	118	100	5197	0.0003	0.039	1.891	28.11	118	0	0	0	0										
15	A10-A13	40	100	1297	0.0000	0.000	1.891	28.11	40	0	0	0	0										
16	A1-A2	130	100	2040	0.0080	1.036	3.086	26.91	130	0	0	0	0										
17	A1-A	127	100	28465	0.0079	1.006	4.092	25.91	127	0	0	0	0										
18	A2-B	70	250	11325	0.0047	0.331	2.381	27.62	0	0	0	70	0										
19	B-B2	150	100	8773	0.0003	0.044	2.425	27.57	150	0	0	0	0										
20	B2-B5	60	100	7818	0.0001	0.005	2.430	27.57	60	0	0	0	0										
21	B-C26	42	250	1096	0.0042	0.177	2.557	27.44	0	0	0	42	0										
22	C26-B1	42	200	1539	0.0112	0.471	3.029	26.97	0	0	42	0	0										

Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line						Sluice Valves					Fire Hydrant			
					Head Loss per M	Total Head Loss	Head Loss Proportion	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d
24	C25-C26	37	200	1321	0.0001	0.002	2.560	27.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	C5-C25	76	200	2014	0.0000	0.004	2.563	27.44	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0
26	C5-C2	124	150	4623	0.0000	0.001	2.565	27.44	0	124	0	0	0	0	0	0	0	0	0	0	0	0	0
27	C5-C6	70	150	2259	0.0001	0.008	2.571	27.43	0	70	0	0	0	0	0	0	0	0	0	0	0	0	0
28	C6-C3	123	100	9333	0.0001	0.014	2.584	27.42	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	C6-C7	24	150	1046	0.0003	0.007	2.578	27.42	24	24	0	0	0	0	0	0	0	0	0	0	0	0	0
30	C7-C9	117	100	4769	0.0001	0.013	2.591	27.41	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	C7-C8	70	150	2437	0.0000	0.001	2.579	27.42	20	70	0	0	0	0	0	0	0	0	0	0	0	0	0
32	B1-B3	126	200	4486	0.0044	0.556	3.585	26.41	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0
33	B3-B7	77	100	1209	0.0002	0.019	3.604	26.40	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	B7-B8	194	100	8065	0.0002	0.047	3.651	26.35	194	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	B3-B4	217	200	16433	0.0030	0.875	4.460	25.54	0	0	217	0	0	0	0	0	0	0	0	0	0	0	0
36	B6-B4	142	100	9541	0.0004	0.058	4.518	25.48	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	A-B6	153	100	5965	0.0000	0.006	4.525	25.48	153	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	B4-B17	75	200	1177	0.0033	0.247	4.707	25.29	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0
39	B17-B18	49	100	6105	0.0028	0.138	4.845	25.15	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	B18-B19	67	100	2952	0.0012	0.083	4.929	25.07	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	B19-B20	32	100	1943	0.0000	0.000	4.929	25.07	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	B19-B28	172	100	10783	0.0009	0.156	5.085	24.91	172	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	B28-B29	35	100	2015	0.0000	0.001	5.086	24.91	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	B28-B27	67	100	2811	0.0000	0.003	5.088	24.91	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	B18-B22	90	100	3921	0.0003	0.026	4.872	25.13	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Design of Pipe Line				Length of Pipe Line						Sluice Valves						Fire Hydrant			
				Total Area	Head Loss per M	Total Head Loss	Head Loss Progres	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d
46	B22-B27	83	100	3393	0.0001	0.010	5.099	24.90	83	0	0	0	0										
47	B27-B26	47	100	6009	0.0000	0.002	5.101	24.90	47	0	0	0	0										
48	B17-B16	45	150	1974	0.0069	0.447	5.154	24.85	0	45	0	0	0										
49	B16-B15	70	100	3000	0.0051	0.356	5.510	24.49	70	0	0	0	0										
50	B15-B14	14	100	3357	0.0001	0.001	5.511	24.49	14	0	0	0	0										
51	B15-B24	174	150	12114	0.0038	0.663	6.173	23.83	174	174	0	0	0										
52	B24-B30	182	100	10481	0.0008	0.149	6.322	23.68	182	0	0	0	0										
53	B24-B25	73	100	2905	0.0000	0.003	6.176	23.82	73	0	0	0	0										
54	B16-B21	90	150	3758	0.0059	0.529	5.683	24.32	0	90	0	0	0										
55	B21-B22	94	100	5656	0.0001	0.011	5.694	24.31	94	0	0	0	0										
56	B21-B25	84	150	3664	0.0051	0.429	6.112	23.89	0	84	0	0	0										
57	B25-B26	48	150	1926	0.0048	0.229	6.342	23.66	0	48	0	0	0										
58	B26-B12	215	150	10989	0.0046	0.993	7.335	22.67	0	215	0	0	0										
59	D12-D11	101	100	4711	0.0037	0.370	7.704	22.30	101	0	0	0	0										
60	D11-D11'	33	100	518	0.0024	0.081	7.785	22.21	33	0	0	0	0										
61	D11'-D13	16	100	251	0.0006	0.009	7.794	22.21	16	0	0	0	0										
62	D13-D14	133	100	5119	0.0006	0.075	7.869	22.13	133	0	0	0	0										
63	D11'-D25	61	100	957	0.0008	0.049	7.834	22.17	61	0	0	0	0										
64	D25-D24	73	100	2329	0.0008	0.058	7.892	22.11	73	0	0	0	0										
65	D24-D27	53	100	861	0.0006	0.029	7.921	22.08	53	0	0	0	0										
66	D27-D26	41	100	1313	0.0000	0.001	7.922	22.08	41	0	0	0	0										
67	D27-F1	212	100	3328	0.0004	0.089	8.010	21.99	212	0	0	0	0										
68	F1-F2	28	100	6372	0.0004	0.011	8.022	21.98	28	0	0	0	0										
69	D12-D10	60	100	1611	0.0113	0.677	8.012	21.99	60	0	0	0	0										
70	D10-D9	28	100	1108	0.0000	0.000	8.012	21.99	28	0	0	0	0										

Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line						Sluice Valves					Fire Hydrant			
					Head Loss per M	Total Head Loss	Head Loss Progressive	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d
71	D10-D8	76	100	4513	0.0103	0.779	8.791	21.23	76	0	0	0	0										
72	D8-D7	19	100	1040	0.0000	0.000	8.791	21.23	19	0	0	0	0										
73	D8-D5	64	100	2120	0.0079	0.504	9.295	20.70	64	0	0	0	0										
74	D5-D6	43	100	1806	0.0000	0.001	9.297	20.70	43	0	0	0	0										
75	D5-D15	91	100	4996	0.0065	0.591	9.886	20.11	91	0	0	0	0										
76	D15-D2	102	100	5615	0.0012	0.121	10.007	19.99	102	0	0	0	0										
77	D2-D3	64	100	1980	0.0003	0.021	10.028	19.97	64	0	0	0	0										
78	D3-D4	98	100	6353	0.0002	0.022	10.049	19.95	98	0	0	0	0										
79	D15-D16	171	100	14706	0.0013	0.226	10.111	19.89	171	0	0	0	0										
80	D16-D17	62	100	973	0.0002	0.012	10.123	19.88	62	0	0	0	0										
81	D17-D18	92	100	3534	0.0002	0.017	10.141	19.86	92	0	0	0	0										
82	D18-D19	41	100	644	0.0001	0.003	10.144	19.86	41	0	0	0	0										
83	D19-D20	40	100	628	0.0001	0.003	10.147	19.85	40	0	0	0	0										
84	D20-D21	43	100	3686	0.0001	0.003	10.150	19.85	43	0	0	0	0										
85	B1-B9	72	150	3183	0.0080	0.577	3.606	26.39	0	72	0	0	0										
86	B9-B10	51	100	2701	0.0002	0.010	3.615	26.38	51	0	0	0	0										
87	B10-B12	56	100	1513	0.0000	0.000	3.615	26.38	56	0	0	0	0										
88	B10-B13	97	100	4534	0.0001	0.009	3.624	26.38	97	0	0	0	0										
89	B9-C1	85	150	4391	0.0070	0.596	4.202	25.80	0	85	0	0	0										
90	C1-C2	43	100	675	0.0102	0.439	4.641	25.36	43	0	0	0	0										
91	C2-C21	115	100	4482	0.0002	0.022	4.663	25.34	115	0	0	0	0										
92	C21-C22	70	100	1099	0.0000	0.002	4.665	25.33	70	0	0	0	0										
93	C22-C19	50	100	5871	0.0000	0.001	4.666	25.33	50	0	0	0	0										

Design Statement of Water Supply

Design Statement of Water Supply																									
Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line						Sluice Valves						Fire Hydrant				
					Head Loss per M	Total Head Loss	Head Loss	Head Progressive	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	
94	C22-C23	107	100	1679	0.0000	0.000	4.665	25.33	107	0	0	0	0	0											
95	C2-C3	67	100	1052	0.0081	0.544	5.186	24.81	67	0	0	0	0	0											
96	C3-C4	94	100	5491	0.0060	0.561	5.746	24.25	94	0	0	0	0	0											
97	C3-C19	67	100	2725	0.0002	0.017	5.202	24.80	67	0	0	0	0	0											
98	C19-C20	94	100	3483	0.0001	0.011	5.213	24.79	94	0	0	0	0	0											
99	C20-C23	50	150	1958	0.0000	0.000	5.214	24.79	0	50	0	0	0	0											
100	C23-C13	67	150	1052	0.0000	0.000	5.214	24.79	0	67	0	0	0	0											
101	C4-C20	67	100	2811	0.0000	0.003	5.749	24.25	67	0	0	0	0	0											
102	C4-C8	128	100	4648	0.0038	0.492	6.238	23.76	128	0	0	0	0	0											
103	C8-C10	59	150	2099	0.0029	0.173	6.412	23.59	59	59	0	0	0	0											
104	C10-C11	22	150	345	0.0026	0.057	6.468	23.53	22	22	0	0	0	0											
105	C11-C15	143	150	2244	0.0095	0.064	6.533	23.47	143	143	0	0	0	0											
106	C15-C16	57	100	4241	0.0001	0.006	6.539	23.46	57	57	0	0	0	0											
107	C15-C18	146	150	4661	0.0001	0.019	6.552	23.45	146	146	0	0	0	0											
108	C11-C13	225	100	12328	0.0010	0.231	6.699	23.30	225	0	0	0	0	0											
109	C13-C14	51	150	1680	0.0000	0.000	6.699	23.30	0	51	0	0	0	0	1										
110	C1-C	166	150	8035	0.0162	2.691	6.892	23.11	166	166	0	0	0	0											
111	C-C21	40	150	3129	0.0133	0.532	7.425	22.58	40	40	0	0	0	0											
112	C21-C21	51	100	800	0.0000	0.000	7.425	22.58	51	0	0	0	0	0											
113	C21-E	166	150	7383	0.0108	1.146	8.571	21.43	166	166	0	0	0	0	1										
114	E7-E2	102	100	4028	0.0001	0.008	0.008	29.99	102	0	0	0	0	0											
115	E-E11	103	150	5217	0.0061	0.629	9.201	20.80	103	103	0	0	0	0											
116	E11-E2	40	100	628	0.0010	0.042	9.242	20.76	40	0	0	0	0	0											

Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line						Sluice Valves						Fire Hydrant																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
					Head Loss per M	Total Head Loss	Head Loss progressive	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line								Sluice Valves					Fire Hydrant																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
					Head Loss per M	Total Head Loss	Head Loss	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	No.	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	No.	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
140	G6-G8	107	200	4557	0.0052	0.554	0.851	29.15	0	0	107	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</

Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line						Sluice Valves					Fire Hydrant																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
					Head Loss per M	Total Head Loss	Head Loss	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Design Statement of Water Supply

Sr No.	Name of Road	Length of Pipe	Size	Total Area	Design of Pipe Line				Length of Pipe Line						Sluice Valves					Fire Hydrant																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
					Head Loss per M	Total Head Loss	Head Loss Progres- sive	Terminal Head	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	100 mm i/d	150 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Quality

Design Statement of Rising Main from TW

Sr. No.	Name of Water Supply Line	Length of Water Supply Line	Pipe Size	Frictional Head Loss per 1000 m	Other Losses HI	Total loss per 1000 mtr.	Fall	Hydraulic level Up Stream	Hydraulic level Down Stream	Average Value	Head Available	Length of pipe						Sluice Valve			Non Return Valves	Scour Valves																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Design Statement of Recycling of Treated Waste Water

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Sr No.	Name of Water Pipe line	Length in m	Outer Diameter of Water Pipe line in mm	Design of Pipe Line				Length of pipe										No of Sluice Valves																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
				Head Loss per M	Total Head Loss	Terminal Head	110 mm old		115 mm old		117.5 mm old		140 mm old		160 mm old		210 mm old	63mm old	75 mm old	90mm old	110 mm old	140 mm old	160 mm old	180 mm old	210 mm old																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Design Statement of Recycling of Treated Waste Water

Sr No.	Name of Water Pipe line	Length	Outer Diameter of Water Pipe line	Design of Pipe Line				Length of pipe												No of Sluice Valves				
				Head Loss per M	Total Head Loss	Head Loss Progressive	Terminal Head	63mm o/d	75 mm o/d	90mm o/d	110 mm o/d	140 mm o/d	160 mm o/d	180 mm o/d	210 mm o/d	63mm o/d	75 mm o/d	90mm o/d	110 mm o/d	140 mm o/d	160 mm o/d	180 mm o/d	210 mm o/d	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
30	B6-A	125	165	0.0003	0.043	3.342	21.66	125			135													
31	B4-B17	77	160	0.0046	0.351	3.374	21.63				77													
32	B17-B18	43	165	0.0182	0.782	4.156	20.84	43			43													
33	B18-B19	70	165	0.0032	0.227	4.383	20.62	70			70													
34	B19-B28	173	165	0.0018	0.314	4.697	20.30	173			173													
35	B18-B22	90	165	0.0010	0.088	4.245	20.76	90			90													
36	B22-B27	82	165	0.0002	0.020	4.264	20.74	82			82													
37	B17-B16	51	165	0.0080	0.407	3.781	21.22		51		51													
38	B16-B21	90	165	0.0036	0.326	4.106	20.89	90			90													
39	B21-B22	94	165	0.0006	0.055	4.161	20.84	94			94													
40	B21-B25	84	165	0.0004	0.035	4.141	20.86	84			84													
41	B16-B15	67	165	0.0060	0.404	4.185	20.82	67			67					1								
42	B15-B24	174	165	0.0039	0.681	4.866	20.13	174			174					1								
43	B15-B14	45	165	0.0001	0.003	4.188	20.81	45			45													
44	B1-B9	77	165	0.0051	0.391	1.310	23.69		77		77													
45	B9-B10	64	165	0.0089	0.572	1.882	23.12	64			64													
46	B10-B12	26	165	0.0000	0.001	1.883	23.12	26			26													
47	B10-B13	104	165	0.0067	0.698	2.581	22.42	104			104													
48	B13-C1	63	165	0.0026	0.163	2.744	22.26	63			63													
49	C1-C	95	165	0.0009	0.086	2.830	22.17	95			95													
		4140						3073	219	0	460	150	124	107	330	16	2	2	2	1	2	2	1	
50	STP2-X2	20	160	0.0019	0.039	0.039	24.96																	
51	X2-D12	173	160	0.0028	0.488	0.526	24.47																	
52	D12-D11	100	160	0.0027	0.268	0.795	24.21																	
53	D11-D11	27	160	0.0018	0.048	0.842	24.16			100														
54	D11-D25	70	75	0.0012	0.087	0.929	24.07			27														
55	D25-D24	63	75	0.0011	0.067	0.996	24.00																	
56	D24-D27	60	75	0.0006	0.038	1.034	23.97																	
57	D27-D26	17	75	0.0000	0.001	1.035	23.97																	



Design Statement of Recycling of Treated Waste Water

Sr No.	Name of Water Pipe line	Length	Outer Diameter of Water Pipe line	Design of Pipe Line				Length of pipe										No of Static Valves					
				Head Loss per M	Total Head Loss	Head Loss Progressive	Terminal Head	63mm w/d	75 mm w/d	90mm w/d	110 mm w/d	140 mm w/d	160 mm w/d	180 mm w/d	210 mm w/d	63mm w/d	75 mm w/d	90mm w/d	110 mm w/d	140 mm w/d	160 mm w/d	180 mm w/d	210 mm w/d
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
58	D11-D13	22	165	0.0024	0.053	0.895	24.10	24			22												
59	D13-D14	108	165	0.0023	0.250	1.145	23.85	108			196												
60	D12-D10	60	165	0.0084	0.503	1.029	23.97	*		60	60												
61	D10-D9	30	165	0.0001	0.002	1.031	23.97	30			30												
62	D10-D8	76	175	0.0180	1.366	2.395	22.61		76		76												
63	D8-D7	36	165	0.0000	0.001	2.396	22.60	36			74												
64	D8-D5	61	175	0.0137	0.838	3.233	21.77		61		61												
65	D5-D6	26	165	0.0001	0.003	3.236	21.76	26			26												
66	D5-D15	91	175	0.0110	1.001	4.233	20.77		91		91												
67	D15-D16	169	165	0.0021	0.355	4.588	20.41		169		169												
68	D16-D17	55	175	0.0007	0.041	4.629	20.37		55		55												
69	D17-D18	85	175	0.0006	0.051	4.680	20.32		85		85												
70	D18-D19	50	165	0.0005	0.027	4.707	20.29	50			50												
71	D19-D20	39	165	0.0004	0.016	4.723	20.28	39			39												
72	D20-D21	46	165	0.0003	0.014	4.737	20.26	46			46												
73	D15-D2	99	165	0.0049	0.484	4.718	20.28	99			99												
74	D2-D3	61	165	0.0013	0.082	4.799	20.20	61			61												
75	D3-D4	88	165	0.0009	0.084	4.883	20.12	88			88												
76	X2-B26	102	175	0.0019	0.196	0.235	24.77		102		102												
77	B26-B24	73	165	0.0029	0.209	0.444	24.56	73			73												
78	B24-B30	181	165	0.0029	0.517	0.961	24.04	181			181												
79	B26-B29	70	165	0.0003	0.019	0.980	24.02	70			70												
80	STP3-X3	2158	160					2158			1965	173	193										
81	X3-C15	132	160	0.0046	0.083	0.083	24.92		849		18		20										
82	C15-C16	72	165	0.0028	0.203	0.286	24.71	72			132												
83	C15-C11	121	175																				
84	X3-C14	67	160	0.0035	0.235	0.318	24.68		124		67												
85	C14-C13	40	110	0.0085	0.342	0.660	24.34																
86	C13-C11	216	165	0.0040	0.859	1.519	23.48	216			40												
87	C23-C13	70	110	0.0060	0.421	1.080	23.92				70												
88	C20-C23	50	110	0.0034	0.171	1.252	23.75				50												
89	C19-C20	91	165	0.0001	0.012	1.264	23.74		41		91												
90	C23-C22	103	165	0.0068	0.703	1.783	23.22	103			103												

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Sr No	Name of Water Pipe line	Length m	Outer Diameter of Water Pipe line mm	Design of Pipe Line				Length of pipe								No of Sluice Valves							
				Head Loss per M	Total Head Loss	Head Loss Progressive	Terminal Head	63mm o/d		75 mm o/d		90mm o/d		110 mm o/d		140 mm o/d		160 mm o/d		180 mm o/d		210 mm o/d	
								Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr	Mtr
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
91	C22-C21	70	113	0.0000	0.003	1.786	23.21	20			70												
92	C22-C19	47	113	0.0001	0.286	2.072	22.93	47			47												
93	C19-C3	67	113	0.0002	0.014	2.086	22.91	67			67												
94	C20-C4	67	110	0.0028	0.188	1.440	23.56				67												
95	C4-C3	91	113	0.0013	0.118	1.558	23.44	91			91												
96	C3-C2	70	113	0.0000	0.002	1.560	23.44	20			70												
97	C4-C8	128	113	0.0270	3.458	4.898	20.10	128			128												
98	C8-C10	58	113	0.0001	0.007	4.905	20.10				58												
99	C10-C11	31	113	0.0000	0.000	4.905	20.09				31												
100	C7-C8	45	113	0.0172	0.773	5.671	19.33	45			45												
101	C7-C9	100	113	0.0015	0.152	5.823	19.18	100			100												
102	C6-C7	46	113	0.0077	0.355	6.026	18.97	46			46												
103	C6-C3	125	113	0.0062	0.774	6.799	18.20	125			125												
104	C6-C5	70	113	0.0000	0.003	6.028	18.97	70			70												
105	C14-E11	27	110	0.0045	0.122	0.440	24.56			27	27												
106	E11-E	109	113	0.0012	0.132	0.572	24.43	109			109												
107	E11-E2	50	113	0.0070	0.348	0.788	24.21			50													
108	E2-E4	74	113	0.0071	0.525	1.313	23.69	74			74												
109	E4-E5	60	113	0.0030	0.178	1.491	23.51	60			60												
110	E5-E6	87	113	0.0008	0.069	1.560	23.44	87			87												
111	E2-E8	70	113	0.0006	0.043	0.831	24.17	20			70												
112	E8-E10	60	113	0.0004	0.025	0.855	24.14	60			60												
113	E10-E4	39	113	0.0001	0.002	0.858	24.14	39			39												
114	E7-E2	107	113	0.0006	0.065	0.853	24.15	107			107												
115	E-E7	50	113	0.0000	0.001	0.853	24.15	50			50												
116	STP3-24	2728	210	0.0032	0.065	0.065	24.94	1966	351	37	227	0	217	0	0	11	2	0	2	0	2	0	0
								2284			2284												

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Sr No.	Name of Water Pipe line	Length	Outer Diameter of Water Pipe line	Design of Pipe Line				Length of pipe										No of Sluice Valves					
				Head Loss per M	Total Head Loss	Head Loss Progressive	Terminal Head	63mm o/d	75 mm o/d	90mm o/d	110 mm o/d	140 mm o/d	160 mm o/d	180 mm o/d	210 mm o/d	63mm o/d	75 mm o/d	90mm o/d	110 mm o/d	140 mm o/d	160 mm o/d	180 mm o/d	210 mm o/d
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
117	X4-G6	87	115	0.0265	2.302	2.367	22.63	87								1							
118	G6-G7	42	115	0.0003	0.014	2.380	22.62	42															
119	G6-G8	110	115	0.0098	1.076	3.443	21.56	110															
120	G8-G10	51	115	0.0061	0.312	3.755	21.25	51															
121	G10-G11	59	115	0.0002	0.015	3.769	21.23	59															
122	G10-G12	145	115	0.0039	0.561	4.316	20.68	145								1							
123	G12-G13	63	115	0.0015	0.095	4.411	20.59	63															
124	X3-G5	21	210	0.0025	0.052	0.117	24.88								21								
125	G5-G9	190	115	0.0004	0.075	0.192	24.81		190														
126	G5-G3	72	210	0.0022	0.155	0.272	24.73								72								
127	G3-G4	200	115	0.0004	0.080	0.352	24.65																
128	G3-G1	46	160	0.0076	0.351	0.623	24.38						46										
129	G1-G2	61	160	0.0076	0.463	1.087	23.91						61										
130	G2-F11	241	160	0.0074	1.791	2.878	22.12						241										1
131	F11-F10	72	110	0.0001	0.005	2.883	22.12				72									1			
132	F10-F7	87	110	0.0000	0.004	2.887	22.11				87												
133	F11-F8	87	210	0.0008	0.071	2.950	22.05																
134	F8-F7	66	210	0.0008	0.052	3.001	22.00								66								
135	F8-F9	19	110	0.0000	0.000	2.950	22.05				19												
136	F7-F6	35	160	0.0028	0.099	3.100	21.90						35										
137	F6-F5	97	160	0.0023	0.224	3.323	21.68						97								1		
138	F5-F3	261	110	0.0002	0.051	3.374	21.63				261												
139	F3-F4	51	110	0.0000	0.000	3.375	21.63				51												
140	F5-F3	288	160	0.0018	0.533	3.856	21.14						288								2		
141	H3-H1	69	160	0.0017	0.117	3.973	21.03						69										
142	H1-H4	191	160	0.0016	0.311	4.284	20.72						191								1		
143	H4-H5	48	110	0.0000	0.002	4.286	20.71				48												
144	H5-H6	46	110	0.0000	0.000	4.286	20.71				46												
145	H6-H7	23	110	0.0000	0.000	4.286	20.71				23												
146	H4-H8	121	110	0.0079	0.952	5.236	19.76				121												
147	H8-H9	64	110	0.0070	0.447	5.683	19.32				64												
148	H9-H10	124	110	0.0067	0.836	6.519	18.48				124												
149	H10-H11	133	110	0.0059	0.782	7.300	17.70				133												
150	H11-H12	57	110	0.0000	0.001	7.301	17.70				57												
151	H11-H13	36	110	0.0046	0.167	7.467	17.53				36												

Design Statement of Recycling of Treated Waste Water

Sr No.	Name of Water Pipe line	Length in m	Outer Diameter of Water Pipe line in mm	Design of Pipe Line				Length of pipe												No of Slates Valves					
				Head Loss per M	Total Head Loss	Head Loss Progressive	Terminal Head	63mm o/d	75 mm o/d	90mm o/d	110 mm o/d	140 mm o/d	160 mm o/d	180 mm o/d	210 mm o/d	63mm o/d	75 mm o/d	90mm o/d	110 mm o/d	140 mm o/d	160 mm o/d	180 mm o/d	210 mm o/d		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
152	H13-H14	45	110	0.0044	0.197	7.665	17.34				45														
153	H14-H15	107	110	0.0043	0.461	8.126	16.87				167														
154	H15-H17	18	110	0.0033	0.059	8.183	16.81				18														
155	H17-H19	74 *	110	0.0032	0.240	8.425	16.57				74				*							*			
156	H19-H20	109	110	0.0001	0.008	8.433	16.57				109														
157	F11-J17	482	160	0.0010	0.465	3.344	21.66						482												
158	J17-J16	33	110	0.0049	0.161	3.505	21.50				33										2				
159	J16-J1	95	160	0.0048	0.452	3.957	21.04				95					1									
160	J1-J	20	160	0.0001	0.003	3.960	21.04				20														
161	J1-J2	22	160	0.0008	0.017	3.974	21.03				22														
162	J2-J14	44	160	0.0007	0.031	4.005	20.99				44														
163	J14-J15	50	160	0.0006	0.030	4.035	20.96				50					1									
164	J16-J18	70	110	0.0028	0.199	3.704	21.30				70														
165	J18-J3	120	176	0.0009	0.108	3.813	21.19				120						1								
166	J3-J4	72	176	0.0000	0.002	3.815	21.19				72						1								
167	J18-J19	68	110	0.0016	0.111	3.815	21.18				68														
168	J19-J20	30	160	0.0000	0.000	3.816	21.18				30														
169	J19-J4	143	160	0.0035	0.499	4.315	20.69				143								1						
170	J4-J5	113	160	0.0023	0.255	4.570	20.43				113								1						
169	J5-J6	24	160	0.0001	0.001	4.571	20.43				24														
170	J6-J8	66	160	0.0002	0.014	4.585	20.42				66					1									
171	J5-J9	189	160	0.0033	0.626	5.195	19.80				189														
172	J9-J13	33	160	0.0044	0.147	5.342	19.66				33						1								
173	J13-J11	94	160	0.0039	0.368	5.710	19.29				94														
174	J11-J12	50	160	0.0002	0.009	5.719	19.28				50														
175	J11-J10	81	160	0.0008	0.063	5.773	19.23				81					1									
	Grand Total	5635									5635														
	Total	14661									14661														

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Sector 62-65 EMAAR MGF (Gurgaon)

Storm water pipe to Recharge Well 300mmØ

S. No.	Rechage Well No	Length	Recharge Well Location	Storm Size
1	2	3	5	4
1	RW1	11	D13-D11'	400
2	RW2	2	B12-B3'	400
3	RW3	6	A-A1	400
4	RW4	3	A12-A1	400
5	RW5	10	A8-A4	400
6	RW6	24	A1-A2	400
7	RW7	24	C8-C4	400
8	RW8	7	B1-B3	700
9	RW9	6	B13-B10	400
10	RW10	23	C-C1	600
11	RW11	8	B8-B7	400
12	RW12	16	B21-B16	400
13	RW13	13	C15-C18	400
14	RW14	42	B24-B16	400
15	RW15	10	B22-B18	400
16	RW16	12	B27-B22	400
17	RW17	16	B25-B21	400
18	RW18	18	B26-D12	400
19	RW19	5	B30-B24	400
20	RW20	6	D11-D12	400
21	RW21	25	D11'-D11	400
22	RW22	11	D3-D2	400
23	RW23	9	D15-D16	400
24	RW24	9	D20-D19	400
25	RW25	0	UD-0.303	0
26	RW26	9	C22-E'	400
27	RW27	7	C18-C14	400
28	RW28	8	E8-E2	400
29	RW29	7	E5-E4	400
30	RW30	5	E6-E5	400
31	RW31	6	C23-E'	400
32	RW32	6	C15-C18	400
33	RW33	16	C11-C14	400
34	RW34	1	C9-C7	400
35	RW35	20	C23-E'	400

Sector 62-65 EMAAR MGF (Gurgaon)

Storm water pipe to Recharge Well 300mmØ

S. No.	Recharge Well No	Length	Recharge Well Location	Storm Size
1	2	3	5	4
36	RW36	8	C20-C19	400
37	RW37	13	C6-C3	400
38	RW38	13	D27-D24	400
39	RW39	15	G5-G3	400
40	RW40	8	G4-G3	400
41	RW41	7	G6-G5	400
42	RW42	9	G9-G5	400
43	RW43	6	G11-G10	400
44	RW44	6	G12-G10	400
45	RW45	15	G13-G12	400
46	RW46	81	G13-G12	400
47	RW47	9	J6-Output	400
48	RW48	4	J3'-J4	400
49	RW49	2	J11-J13	400
50	RW50	7	F10-F7	400
51	RW51	8	F6-F7	400
52	RW52	13	F5-F3	400
53	RW53	0	UD-0.082	0
54	RW54	11	H5-H4	400
55	RW55	10	H9-H10	400
56	RW56	18	H19-H17	400
57	RW57	1	H22-H21	400
Total		665		

Design Statement of Waste Water Collection System

Appurtenances of Waste Water Collection System

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Quantity of Waste Water flow during peak hours	Size of sewer line	Formation Level		Invert Level		Length of Sewer Pipe Line						No. of Man Holes				No. of Lamp Holes	No. of Vent Shafts
			Self	Branch	Total			Lower end	Upper end	Lower end	200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d					
KLD	KLD	KLD	M	M	M	M	M	M	M	M	M	M	M	M	M	M	No.	No.	No.	No.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	C21-C21	23	25.39	0.0	25.39	76.2	200	230.232	230.201	229.032	228.927		23						1			1	
2	C21-C2	87	23.44	25.4	48.83	146.5	200	230.201	230.180	228.927	228.532		87						1			1	
3	C2-C5	153	31.44	48.8	80.27	240.8	200	230.181	230.159	228.532	227.837		153						1			1	
4	C5-C25	72	8.69	80.3	88.96	266.9	200	230.159	230.151	227.837	227.509		72						1	0		1	
5	C25-C26	51	9.45	89.0	98.41	295.2	200	230.151	230.079	227.509	227.277		51				3					3	
6	C26-B	53	2.03	98.4	100.43	301.3	200	230.079	230.000	227.277	227.037		53						0	0		0	
7	B5-B2	64	13.78	0.0	13.78	41.3	200	230.042	230.027	228.842	228.551		64				3					3	
8	B2-B	138	13.95	13.8	27.73	83.2	200	230.027	230.000	228.551	227.923		138				7					7	
9	B-A2	71	47.38	128.2	175.54	326.6	200	230.000	230.105	227.037	226.714		71						0			0	
10	A2-A3	66	8.73	175.5	184.28	552.8	200	230.109	230.105	226.714	226.414		66				3					3	
11	A7-A7	12	5.24	0.0	5.24	15.7	200	230.200	230.189	229.000	228.945		12				1					1	
12	A7-A6	59	8.73	5.2	13.97	41.9	200	230.189	230.170	228.945	228.677		59				3					3	
13	A6-A5	55	8.73	14.0	22.71	68.1	200	230.170	230.165	228.677	228.427		55				3					3	
14	A9-A5	31	5.24	0.0	5.24	15.7	200	230.169	230.165	228.969	228.828		31				2					2	
15	A5-A4	36	6.99	27.9	34.93	104.8	200	230.165	230.137	228.427	228.264		36				2					2	
16	A8-A4	30	6.48	0.0	6.48	19.4	200	230.219	230.137	229.019	228.883		30				2					2	
17	A4-A3	55	8.73	41.4	50.14	150.4	200	230.137	230.109	228.264	228.014		55				3					3	
18	A3-A10	92	26.20	234.4	260.62	781.8	200	230.151	230.109	226.414	225.996	225.896	92				5					5	
19	A7-A12	82	16.59	0.0	16.59	49.8	200	230.189	230.208	228.989	228.616		82				4					4	
20	A12-A11	57	16.59	16.6	33.18	99.6	200	230.208	230.197	228.616	228.357		57										
21	A6-A11	84	27.93	0.0	27.93	83.8	200	230.170	230.197	228.997	228.615		84				4					4	
22	A11-A13	130	27.93	61.1	89.04	267.1	200	230.197	229.708	228.357	227.766		130										

Design Statement of Waste Wat. Collection System

Appurtenances of Waste Water Collection System

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Waste Water flow during peak hours	Size of sewer line	Formation Level		Invert Level		Length of Sewer Pipe Line							No. of Man Holes				No. of Lamp Holes	No. of Vent Shafts	
			Self	Branch	Total			KLD	KLD	mm	Lower end		Upper end	Lower end		200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d						
											M	M		M	M					M	M				
23	A13-A10	15	5.24	89.0	94.28	282.8	200	229.708	230.151	227.766	227.598	15													
24	A10-A1	24	0.00	354.9	354.89	1064.7	300	230.151	230.055	225.896	225.842														
25	A1-X1	35	0.00	0.0	0.00	0.0	300	230.055	230.055	225.842	225.665														
26	B24-B15	174	55.89	0.0	55.89	167.7	200	230.633	230.682	228.703	227.912														
27	B14-B15	18	12.16	0.0	12.16	36.5	200	230.686	230.682	229.486	229.405	174													
28	B15-B16	67	13.97	68.0	82.02	246.1	200	230.682	230.954	227.912	227.607	18													
29	B25-B21	74	13.97	0.0	13.97	41.9	200	230.604	230.795	229.404	229.068	67													
30	B22-B21	69	8.73	0.00	8.73	26.20	200	230.920	230.795	229.720	229.407	74													
31	B21-B16	90	13.97	22.71	36.68	110.03	200	230.795	230.954	229.068	228.659	69													
32	B16-B17	51	3.49	118.70	122.19	366.57	200	230.954	230.964	227.607	227.375	90													
33	B28-B19	173	34.03	0.00	34.03	102.08	200	230.983	231.000	229.727	228.941	51													
34	B20-B19	8	4.30	0.00	4.30	12.90	200	231.296	231.000	230.096	230.060	173													
35	B19-B18	70	5.24	38.33	43.56	130.69	200	231.000	230.973	228.941	228.622	8													
36	B27-B22	72	8.73	0.00	8.73	26.20	200	230.856	230.920	229.720	229.393	70													
37	B22-B18	90	10.48	8.73	19.21	57.64	200	230.920	229.393	229.393	228.984														
38	B18-B17	43	3.49	62.78	66.27	198.81	200	229.393	230.964	228.622	228.427														
39	B17-B4	77	0.00	188.46	188.46	565.38	200	230.964	230.834	227.375	227.025	43													
40	A-B6	125	8.61	0.00	8.61	25.84	200	231.000	231.645	229.800	229.232														
41	B6-B4	142	22.59	8.61	31.21	93.62	200	231.645	230.834	229.232	228.586														
42	B4-B3	223	41.92	219.66	261.58	784.74	200	230.834	230.157	227.025	226.012														
43	C-B13	100	0.00	0.00	0.00	0.00	200	230.189	230.188	228.989	228.534	223													

Design Statement of Waste Wat. Collection System

Appurtenances of Waste Water Collection System

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Quantity of Waste Water flow during peak hours		Size of sewer line	Formation Level		Invert Level		Length of Sewer Pipe Line						No. of Man Holes			No. of Lamp Holes	No. of Vent Shafts
			Self	Branch	Total	KLD	KLD	mm	M	M	M	M	200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	No.	No.	No.
44	B13-B10	106	33.18	0.0	33.18	99.6	99.6	200	230.188	230.177	228.534	228.053	106					3				6	
45	B12-B10	24	1.75	0.0	1.75	5.2	5.2	200	230.165	230.177	228.965	228.856	24				1				2		
46	B9-B10	35	17.47	0.0	17.47	52.4	52.4	200	230.201	230.177	229.001	228.842	35				2				3		
47	B10-B3	78	0.00	52.40	52.40	157.2	157.2	200	230.177	0.000	228.053	227.698	78										
48	B1-B3	74	10.48	0.00	10.48	31.44	31.44	200	230.144	230.157	228.944	228.608	74				4				4		
49	B3-B3	29	0.00	0.00	0.00	0.00	0.00	200	230.157	230.157	227.698	227.566	29				1				1		
50	B3-B7	104	0.00	324.46	324.46	973.37	973.37	250	230.157	230.165	225.962	225.702	104					5			5		
51	B8-B7	140	26.20	0.00	26.20	78.60	78.60	200	230.184	230.165	228.984	228.347	140				7				7		1
52	B7-X1	25	0.00	350.66	350.66	1051.97	1051.97	300	230.165	230.055	225.702	225.646	25				0				0		
53	X1-STP1	35	137.57	705.55	843.117	2529.35	843.117	400	230.047	230.047	225.546	225.496											
	STP1- HUDA Sewer	260	0.00	843.12	843.12	2529.3	843.12	400	230.047	230.047	225.496	225.149								9			
	STP 2-																						
54	D26-D27	20	5.24	0.00	5.24	15.72	15.72	200	230.674	230.584	229.474	229.383	20				1				1		
55	D27-D24	60	27.62	5.24	32.86	98.59	98.59	200	230.584	230.464	229.383	229.111	60				3				3		
56	D24-D25	60	8.34	32.86	41.20	123.60	123.60	200	230.464	230.452	229.111	228.838	60				3				3		
57	D25-D11	72	0.00	41.20	41.20	123.60	123.60	200	230.452	230.707	228.838	228.511	72					0			0		
58	D14-D13	114	41.92	0.00	41.92	125.75	125.75	200	230.736	230.711	229.536	229.018	114				6				6		
59	D13-D11	21	0.00	41.92	41.92	125.8	125.8	200	230.711	230.707	229.018	228.923	21				1				1		
60	D11-D11	27	0.00	83.12	83.12	249.35	249.35	200	230.707	230.701	228.511	228.388	27					0			0		
61	D11-D12	100	22.07	83.12	105.18	315.54	315.54	200	230.701	230.651	228.388	227.933	100					0			0		
62	D21-D20	48	13.97	0.00	13.97	41.9	41.9	200	230.484	230.473	229.284	229.066	48				2				2		
63	D20-D19	40	0.00	13.97	13.97	41.92	41.92	200	230.473	230.465	229.066	228.884	40				2				2		
64	D19-D18	49	0.00	13.97	13.97	41.92	41.92	200	230.465	230.456	228.884	228.661	49				2				2		
65	D18-D17	84	8.73	13.97	22.71	68.12	68.12	200	230.456	230.438	228.661	228.279	84				4				4		
66	D17-D16	56	0.00	22.71	22.71	68.1	68.1	200	230.438	230.460	228.279	228.025	56							0	0		
67	D16-D15	168	36.09	22.71	58.71	176.1	176.1	200	230.460	230.469	228.025	227.261	168							0	0		

Design Statement of Waste Water Collection System

Appurtenances of Waste Water Collection System

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Quantity of Waste Water flow during peak hours	Size of sewer line	Formation Level			Invert Level			Length of Sewer Pipe Line						No. of Man Holes				No. of Lamp Holes	No. of Vent Shafts
			Self	Branch	Total			Lower end	Upper end	Lower end		200 mm i/d	300 mm i/d	400 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d					
						KLD	KLD			KLD	M										M	M	M		
68	D4-D3	79	25.05	0.00	25.05	75.16	200	230.755	230.657	229.555	229.196	79				4						4			
69	D3-D2	61	4.52	24.03	29.57	88.71	200	230.657	230.450	229.196	228.918	61				3						3			
70	D2-D15	99	31.44	29.57	61.01	183.03	200	230.450	230.469	228.918	228.468	99				5						5			
71	D15-D5	91	27.95	119.72	147.66	442.98	200	230.500	230.469	227.261	226.847	91				5						5			
72	D6-D5	25	8.09	0.00	8.09	24.28	200	230.839	230.469	229.639	229.526	25				1						1			
73	D5-D8	61	8.73	155.75	164.49	493.46	200	230.531	230.500	226.847	226.570	61				3						3			
74	D7-D8	23	3.83	0.00	3.83	11.49	200	230.602	230.500	229.402	229.297	23				1						1			
75	D8-D10	76	22.71	168.32	191.02	573.06	200	230.651	230.531	226.570	226.225	76				4						4			
76	D9-D10	31	5.24	0.00	5.24	15.72	200	230.600	230.531	229.400	229.259	31				2						2			
77	D10-D12	60	5.24	196.26	201.50	604.50	200	230.651	230.651	226.225	225.952	60				0						0			
78	D12-B26	362	50.51	306.68	357.19	1071.57	250	230.651	230.651	225.902	225.497	162				8						8			
79	B29-B26	338	26.20	0.00	26.20	78.60	200	230.987	230.651	229.787	229.159	138				7						7			
80	B30-B24	169	49.19	0.0	49.19	147.6	200	230.671	230.633	229.471	228.703	169				8						8			
80	B24-B26	121	17.47	49.2	66.66	200.0	200	230.633	230.651	228.703	228.153	121				6						6			
81	B26-B26	43	0.00	66.7	66.66	200.0	200	230.542	230.651	228.153	227.957	43				2						2			
82	B26-STP2	25	0.00	450.05	450.05	1350.1	400	230.633	230.469	225.347	225.311			25	0							0			
	STP2- HUDA Sewer	392	0.00	450.05	450.05	1350.1	400	230.469	230.469	225.311	224.789			392								13			
83	C6-C3	93	13.97	0.0	13.97	41.9	200	230.177	230.189	228.977	228.554	93				5						5			
84	C3-C4	91	20.96	14.0	34.93	104.8	200	230.189	230.219	228.554	228.141	91				5						5			
85	C8-C4	76	15.72	0.0	15.72	47.2	200	230.196	230.196	228.996	228.651	76				4						4	1		
86	C4-C20	67	10.48	50.7	61.13	183.4	200	230.223	230.219	228.141	227.836	67				3						3			
87	C21-C22	44	5.24	0.0	5.24	15.7	200	230.201	230.233	229.001	228.801	44				2						2			
88	C22-C19	47	0.00	5.2	5.24	15.7	200	230.223	230.224	228.801	228.587	47				2						2			
89	C3-C19	40	8.73	0.0	8.73	26.2	200	230.189	230.224	228.989	228.807	40				2						2			
90	C19-C20	68	10.48	14.0	24.45	73.4	200	230.224	230.223	228.587	228.278	68				3						3			
91	C20-C23	50	6.99	85.6	92.57	277.7	200	230.149	230.223	227.836	227.609	50				3						3	1		

Design Statement of Waste Water Collection System

Appurtenances of Waste Water Collection System

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Quantity of Waste Water flow during peak hours		Size of sewer line	Formation Level		Invert Level		Length of Sewer Pipe Line						No. of Man Holes			No. of Lamp Holes	No. of Vent Shafts		
			Self	Branch	Total	KLD	KLD		M	M	Lower end		Upper end		200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d			400 mm i/d	
											M	M	M	M											M
92	C23-C13	70	0.00	92.6	92.57	277.7	200	230.149	230.344	227.609	227.291	70													
93	C9-C7	94	17.47	0.0	17.47	52.4	200	230.205	230.184	229.005	228.578	94													
94	C6-C7	48	3.49	0.0	3.49	10.5	200	230.177	230.184	228.977	228.759	48													
95	C7-C8	45	6.99	21.0	27.95	83.8	200	230.184	230.196	228.578	228.373	45													
96	C8-C10	46	6.99	27.9	34.93	104.8	200	230.196	230.216	228.373	228.164	46													
97	C10-C11	61	15.72	34.9	50.65	152.0	200	230.216	230.222	228.164	227.887	61													
98	C11-C13	193	36.68	50.7	87.33	262.0	200	230.222	230.344	227.887	227.010	193													
99	C13-C14	40	5.24	179.9	185.14	555.4	200	230.344	230.396	227.010	226.828	40													
100	E6-E5	80	24.97	0.0	24.97	74.9	200	230.513	230.494	229.313	228.949	80													
101	E5-E4	55	15.72	25.0	40.69	122.1	200	230.494	230.440	228.949	228.699	55													
102	E4-E2	74	6.99	40.7	47.68	143.0	200	230.440	230.432	228.699	228.363	74													
103	E7-E2	76	14.35	0.0	14.35	43.0	200	230.344	230.432	229.144	228.799	76													
104	E10-E8	55	8.73	0.0	8.73	26.2	200	230.443	230.446	229.243	228.993	55													
105	E8-E2	70	0.00	8.7	8.73	26.2	200	230.446	230.432	228.993	228.675	70													
106	E2-E11	50	19.21	70.8	89.97	269.9	200	230.432	230.387	228.363	228.136	50													
107	E11-C14	27	3.49	90.0	93.46	280.4	200	230.396	230.387	228.136	228.013	27													
110	C14-C18	67	10.48	278.6	289.07	867.2	200	230.430	230.396	226.828	226.523	67													
108	C16-C15	61	34.93	0.0	34.93	104.8	200	230.328	230.314	229.128	228.851	61													
109	C15-C18	131	17.72	34.9	52.65	158.0	200	230.314	230.430	228.851	228.255	131													
110	E15-E14	16	2.92	0.00	2.92	8.76	200	230.494	230.477	229.294	229.221	16													
111	E17-E14	33	14.58	0.00	14.58	43.74	200	230.494	230.477	229.294	229.144	33													
112	E14-E13	34	7.29	17.50	24.79	74.37	200	230.477	230.454	229.144	228.989	34													
113	E16-E13	33	13.93	0.00	13.93	41.79	200	230.463	230.454	229.263	229.113	33													
114	E13-E12	34	6.38	38.72	45.10	135.30	200	230.454	230.449	228.989	228.835	34													

Design Statement of Waste Water Collection System

Appurtenances of Waste Water Collection System

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Quantity of Waste Water flow during peak hours	Size of sewer line	Formation Level		Invert Level		Length of Sewer Pipe Line						No. of Man Holes			No. of Lamp Holes	No. of Vent Shafts
			Self	Branch	Total			Lower end	Upper end	Lower end	200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d				
						KLD													KLD	KLD		
115	E12-E12	8	3.65	0.00	3.65	10.94	200	230.452	230.449	229.242	229.216	8								0		
116	E12-E19	80	12.99	48.75	61.73	185.20	200	230.449	230.438	228.835	228.471	80				4				4		
117	E-E19	65	1.82	0.00	1.82	5.47	200	230.193	230.438	228.993	228.698	65				3				3		
118	E19-X3	52	0.00	63.6	63.56	190.7	200	230.438	233.801	228.471	228.235	52								0		
119	C18-X3	17	0.00	63.6	63.56	190.7	300	230.438	233.801	226.423	226.389		17				1			1		
120	X3-STP-3	20	0.00	405.3	405.28	1215.8	300	233.801	230.430	226.389	226.349		20			0		1		1		
	STP-3- HUDA Sewer	246	0.00	405.28	405.28	1215.8	400	230.430	230.430	226.349	226.021			246					8			
	STP 4-																					
121	J15-J14	40	66.64	0.00	66.64	199.93	200	233.063	233.052	232.163	231.981	40				2				2		
122	J14-J2	45	0.00	66.64	66.64	199.9	200	233.052	233.044	231.981	231.776	45				2				2		
123	J2-J1	21	0.00	66.64	66.64	199.93	200	233.044	232.994	231.776	231.681	21				1				1		
124	J-J1	18	14.61	0.00	14.61	43.84	200	232.902	232.994	232.002	231.920	18				1				1		
125	J1-J16	95	27.95	81.26	109.20	327.61	200	232.994	233.015	231.681	231.249	95				5				5	1	
126	J8-J6	59	17.43	0.00	17.43	52.3	200	235.800	235.347	234.600	234.332	59				3				3		
127	J6-J5	23	0.00	17.43	17.43	52.3	200	235.347	235.027	234.332	234.227	23				1				1		
128	J10-J11	81	23.01	0.00	23.01	69.0	200	235.073	234.273	234.173	233.805	81				4				4		
129	J12-J11	42	11.55	0.0	11.55	34.6	200	234.282	234.273	233.382	233.191	42				2				2		
130	J11-J13	91	21.27	34.6	55.83	167.5	200	234.273	234.292	233.191	232.777	91				5				5		
131	J13-J9	35	0.00	55.8	55.83	167.5	200	234.292	235.073	232.777	232.618	35				2				2		
132	J9-J5	190	11.34	55.83	67.17	201.51	200	235.073	235.027	232.618	231.755	190				10				10		
133	J5-J4	114	15.09	84.60	99.69	299.1	200	235.027	233.907	231.755	231.236	114				6				6		
134	J3-J4	31	6.21	0.00	6.21	18.6	200	233.177	233.907	232.277	232.136	31				2				2		
135	J4-J19	143	22.71	105.90	128.60	385.8	200	233.907	233.311	231.236	230.586	143				7				7		

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Quantity of Waste Water flow during peak hours	Size of sewer line	Formation Level			Invert Level			Length of Sewer Pipe Line						No. of Man Holes			No. of Lamp Holes	No. of Vent Shafts																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
			Self	Branch	Total			Lower end		Upper end	Lower end		200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
								M	M		M	M								M	M	M			M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Design Statement of Waste Water Collection System

Appurtenances of Waste Water Collection System

Sr. No	Line No.	Length of Sewer Line	Quantity of Waste Water generated			Quantity of Waste Water flow during peak hours	Size of sewer line	Formation Level		Invert Level		Length of Sewer Pipe Line						No. of Man Holes				No. of Lamp Holes	No. of Vent Shafts																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
			Self	Branch	Total			KLD	KLD	mm	Lower end		Upper end		Lower end	200 mm i/d	250 mm i/d	300 mm i/d	400 mm i/d	200 mm i/d	250 mm i/d			300 mm i/d	400 mm i/d																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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