SERVICE ESTIMATE, DESIGN REPORT AND CALCULATION OF INTERNAL DEVELOPMENT WORKS

FOR

PROPOSED "AFFORDABLE GROUP HOUSING COLONY AREA MEASURING 9.3625 ACRES (LICENSE NO. 42 OF 2021 DATED 27.07.2021) IN THE REVENUE ESTATE OF VILLAGE KHERKI MAJRA IN SECTOR – 102, GURUGRAM – MANESAR URBAN COMPLEX BEING DEVELOPED BY M/S RUDRAKSHA REALTORS PVT.LTD. AND OTHERS IN COLLABORATION WITH M/S HABITAT TOWNSHIP PVT. LTD.

SERVICE ESTIMATE, DESIGN REPORT AND CALCULATIONS OF INTERNAL DEVELOPMENT WORKS FOR PROPOSED "AFFORDABLE GROUP HOUSING COLONY"AREA MEASURING 9.3625 ACRES (LICENSE No. 42 of 2021 Dated 27.07.2021) IN THE REVENUE ESTATE OF VILLAGE KHERKI MAJRA IN SECTOR – 102, GURUGRAM – MANESAR URBAN COMPLEX BEING DEVELOPED BY M/S RUDRAKSHA REALTORS PVT. LTD. AND OTHERS IN COLLABORATION WITH M/S HABITAT TOWNSHIP PVT.LTD.

Gurugram town of Haryana State situated on N.H. -8 road at a distance of 35 Km from Delhi. Being in the national capital region, the town has fast developing tendency and potential. Further, it has also started sharing the growing residential, commercial and Industrial load of Delhi. In order to review the growing pressure of population in National Capital of Delhi, It has been decided by the Haryana Government to develop various infrastructure facilities in Gurugram Manesar Urban Complex. This report is for a part of service estimate for proposed "Affordable Group Housing Colony" measuring 9.3625 acres (License No. 42 of 2021 dated 27.07.2021) in the revenue estate of village kherki majra in Sector – 102, Gurugram – Manesar urban complex being developed by M/s Rudraksha Realtors Pvt. Ltd. and others in collaboration with M/s Habitat Township Pvt. Ltd. has been prepared with the following provisions which are as under :-

1. **WATER SUPPLY**

The source of water supply in this area is by HSVP Mains. It has been proposed to construct two underground tanks of capacity as per attached details and to location for domestic purpose and for fire protection. The underground tanks will be fed from the HSVP based supply, which will feed O.H. tanks on the roof of the Building and has been designed as per the Hazen Williams formula. Presently there is proposed / under execution HSVP W/S in this area. However the provision of tube wells have been taken due to non availability of water but after getting the approval from the competent authority through tube wells / tankers / any other approved source till HSVP W/Swill made available. The proposed tube wells shall be 510mm bore drilled with reverse rotary rig and installed with 80mm i/d housing pipe and 50mm i/d slotted tube as strainer, hence the provision of 1 Nos Tube Wells have been taken in this estimate.

DESIGN

The scheme has been designed for population of 6710 persons and considering @ 5 persons / units for Affordable Group Housing and other provision etc. The combined quantum of water supply (domestic + flushing) per head / day has been taken as 172.50Liters per head per day as per design calculation.

PUMPING EQUIPMENTS

It has been proposed to install pumping set as described with standby of equal capacity. The provision for standby generating set has also been provided in case of any time electricity failure. Generator will be provided separately or added to the capacity of main generator.

2. **SEWERAGE**

The scheme is designed for sewer connecting to the STP and bypass connection to HSVP sewer scheme. The sewer lines have designed for three times average D.W.F in relation to water supply demand. It has assumed that about 75% of the domestic and flushing water supply shall find its way into the proposed sewer. Sewer lines shall be running by gravity and discharge to STP proposed. Treated water will be used for Irrigation & Flushing purpose (through recycling) under the pipe line system.

3. **STORM WATER DRAINAGE**

It has been proposed to lay R.C.C pipes with required number of manholes for disposal of storm water, which will be connected to the HSVP drain. The intensity of rain fall has been taken as 6.00mm per hour. A minimum size of 400mm i/d R.C.C pipe for storm water drain will be provided and designed as per manning's formula. Necessary provision of rainwater harvesting arrangement has also been taken in this estimate.

4. **ROADS**

Road, Parking and Pavement have been provided to above areas and estimate is prepared as revised specifications adopted by HSVP.

5. **STREET LIGHTING AND ELECTRIFICATION :-**

Provision for external lighting and electrification of proposed area has been made with the ESS.

6. **HORTICULTURE :-**

Estimate and details of plantation, landscaping, signage etc. have been included.

7. **FIRE FIGHING :-**

Provision of Fire Fighting system has been made.

8. **SPECIFICATIONS**

The work will be carried out in accordance with the standard specifications of PH as laid down by the Haryana Government / HSVP.

9. **RATES**

The estimate has been based on the present market rates.

10. **COST**

The total cost of the scheme including cost of all services works out to Rs. 721.86 Lacs (Rupees Seven Crores Twenty One Lacs Eighty Six Thousand only) including 3% contingencies and 49% departmental charges + Price escalation and cost per acre comes out to Rs. 77.10 Lacs.

(Authorized Signatory)

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1. DESIGN CALCULATION :-

Total Area of plot (commercial)	= 9.3625 Acres or 37888.633 Sqm
Permissible Ground Coverage 50% of site area	= 18662.959 Sqm
Proposed Ground Floor	= 9180.072 Sqm
Permissible F.A.R. @ 2.25 (Resi.)+15% IGBC	= 85998.917 Sqm
Proposed F.A.R Achieved (Resi.)	= 85981.718 Sqm
Proposed area of commercial (F.A.R)	= 2833.275 Sqm
Community Building and Creche	= 219.366 Sqm
Milk and Veg. Booth	= 25.50 Sqm

Detail of Units

No. of Units	No. of Floors	No. of Block	Unit / Block	Total Unit	Density
Tower - A1	G + 21	1	175	175	875
Tower - A2	G + 20	1	167	167	835
Tower - A3	G + 20	1	167	167	835
Tower - A4	G + 14	1	119	119	595
Tower - A5	G + 14	1	119	119	595
Tower - A6	G + 14	1	119	119	595
Tower – A7	G + 14	1	119	119	595
Tower – A8	G + 14	1	119	119	595
Tower – A9	G + 14	1	119	119	595
Tower – A10	G + 14	1	119	119	595
Total Density				**1342**	**6710**

I) Water Requirement :-

Total Population	= 6710 Persons
@ 172.50 LPCD	= 11,57,475.00 LPD
Commercial & Community Buildings :-	
• Commercial	= 2833.275 Sqm
a) Considering @ 50 % of total area for Ground floor (2833.275/2)	= 1416.637 Sqm.
@ 3 Sqm./Person	=473 Person
b) Considering @ 50 % of total area for First floor (2833.275/2)	= 1416.637 Sqm.
@ 6 Sqm./Person	= 237 Person
Total population (a + b)	= 710 Person
Considering @ 10 % for shopkeeper	= 71 Person
Water requirement @ 45 LPCD	= 3195.00 LPD
Considering @ 90 % for visitor (710 – 71)	= 639 Person
Water requirement @ 15 % LPCD	= 9585.00 LPD
Total requirement for commercial	= 12780.00 LPD

- Community Building and creche (Area 197.280 Sqm)L.S = 20000.00 LPD
- Milk and Veg. booth (Area 25.50 Sqm) L.S = 5000.00 LPD
- ESS and others misslenius L.S = 4000.00 LPD

Total = 11,99,255.00 LPD Or 1200 KLD
Say 1200 KLD

II. FIRE DEMAND

(i) Population = 6710 Persons
(p) ½ x 100/1000 = (6.71) ½ x 100 = 259.00 KLD Say 260 KLD

III. Garden Irrigation Requirement (For Total Area) = 100.00 KLD

IV. Total Water Requirement for UGT

(Excluding Fire Demand)
Hence Domestic Water Requirement (67%) = 1200 x 67% = 804.00 KLD
Hence Flushing Water Requirement (33%) = 1200 x 33% = 396.00 KLD
@ 60 % per Day Requirement = 490.00 K.L. for Domestic
= 240.00 K.L. for Flushing

But it is proposed to construct an UGT 490 K.L. in two compartment for domestic use and 240 K.L. for non potable water in two compartment (at STP) and 260 K.L. for fire fighting purposes for UGT in two compartment as shown location in the plan.

Total storage Capacity of UGT = 490 + 260 = 750.00 KLD
Total storage Requirement for Flushing and irrigation at STP = 240+ 100 =340 KLD

V. Tube Well For UGT

a) Yield = 15 K.L. / Hr.
b) Working Hour per day = 16 Hr. / Per Day
c) Total water demand (Domestic) = 804 M3/Day
d) Number of tube well required (Water Demand / Discharge / Hr. working Per day) = 3.35 Nos
e) Add 5% extra = 0.17

Total = 3.52 Nos
Say = 4 Nos

Water to the proposed development is to be supplied by HSVP. However consider 25% T.W.'s it is proposed to install only one no tube well for augmentation / standby purposes and provision has also been taken in the estimates due to non availability of water but after getting the approval from the competent authority.

VI) Pumping Machinery for Tube wells

a) Gross Working Head = 60 Mtr
b) Average fall in S.L = 2 Mtr
c) Depression Head = 6 Mtr
d) Friction loss in main = 10 Mtr
Total = 78 Mtr
e) Discharge = 15000 LPH

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(Or 4.17 LPS Say 4.50 LPS)

f) Horse Power

HP = (4.50 x 58) / (75 x 0.60) = 7.80 H.P.

Say = 10.00 H.P.

It is proposed to provide 1 No. pumping set of 4.50 LPS discharge at 78 Mtr head (1W)

VII) Boosting Machinery for domestic water For UGT

Total Water Requirement = 804.00 KLD

Pumping per hour @ 8 hr. pumping / day = 804 /8 KL / hr.
= 100.50 KL / hr.
= 1675.00 lpm = 27.92 lps

Say 2 No. 15.00 lps each

Gross working head For UGT
- Suction lift = 5.00 mts.
- Frictional loss in mains & specials = 5.00 mts.
- Clear Head required = 95.00 mts.

Total = 105.00 mts.

Say = 105.00 mts.

Pump HP = (15.00x105)/(75x0.60)
= 35.00 H.P.

Say = 40.00 HP

It is proposed to provide 3 Nos. of pumping set of 15.00 lps discharge at 105mts Head each (2W + 1S) for UGT.

VIII) Boosting Machinery for flushing water at STP

Total Water Requirement = 396 K.L.D

Pumping per hour @ 8 hr. pumping / day = 396 /8 KL / hr.
= 49.50 KL / hr.
= 825.00 lpm = 13.75 lps,

Say 2 No. 7.00 lps each

Gross working head
- Suction lift = 5.00 mts.
- Frictional loss in mains & specials = 5.00 mts.
- Clear Head required = 95.00 mts.

Total = 105.00 mts.

Say = 105.00 mts.

Pump HP = (7.00 x 105) / (75 x 0.60)
= 16.33 HP

Say = 20.00 HP

It is proposed to provide 3 Nos of pumping set of 7.00 lps discharge at 105 mts Head each (2W + 1S)

IX) Boosting Machinery for Irrigation water

Total Water Requirement = 100 KLD

Pumping per hour @ 5 hr. pumping / day = 100 /5 KL / hr.

= 20.00 KL / hr.

= 333.33 lpm = 5.55 lps

Say = 6.00 LPS

Gross working head

- Suction lift = 3.00 mts.
- Frictional loss in mains & specials = 3.00 mts.
- Clear Head required = 25.00 mts.

Total = 31.00 mts.

Say = 31.00 mts.

Pump HP = (6.00 x 31) / (75 x 0.60)

= 4.13 HP

Say = 5.00 HP

It is proposed to provide 2 No. of pumping set of 5.00 lps discharge at 31 mts Head each (1W + 1S)

X) Boosting Machinery for Fire water

Total Water Requirement

Hydrant pump as per CFO Directive = 2280 LPM, 110M Head and 100 H.P = 1 Nos

Jockey pump (Hydrant) as per NBC table No. 23 = 180 LPM, 110M Head and 7.50 H.P = 1 Nos

Diesel pump as per CFO Directive = 2280 LPM, 110 M Head and 100 H.P = 1Nos

Gross working head

- Suction lift = 5.00 mts.
- Frictional loss in mains & specials = 5.00 mts.
- Clear Head required = 100.00 mts.

Total = 110.00 mts.

Jockey Pump HP (Fire) = (3 x 110) / (75 x 0.60)

= 7.33HP

Say = 7.50 HP

XI) DG Set for plumbing

DG Set Requirement		**For UGT**
Submersible Pump	(1 x 10)	= 10.00 HP
Domestic Pump	(2 x 40)	= 80.00 HP
Flushing Pump at STP	(2 x 20)	= 40.00 HP
Street Light and other etc.		= 20.00 HP
Fire Jockey pump		= 7.50 HP
Total pump load		**= 157.50 HP**

= 157.50 x 0.746 x 1.50

= 176.24 K.W

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Total DG capacity = 1 No. 200 KVA

Hence it is proposed to provide 1 No. D.G. Set of 200 KVA capacity for UGT.

XII) FLOW TO SEWAGE TREATMENT PLANT

Total Water Requirement = 650 KLD (804 for domestic & 396 KLD for flushing)

i) 80% of total Domestic Water Demand = 75% of 804 KLD		= 603.00 KLD
ii) 75% of total Flushing Water Demand =75% of 396 KLD		= 297.00 KLD
	Total	**= 900.00 KLD**
Considering 5% marginal factor		= 45.00 KLD
	G. Total	**= 945.00 KLD**
		Say 950 KLD

Proposed STP Capacity = 950 KLD Or 0.95 MLD

(Authorized Signatory)

SUB WORK NO. I **WATER SUPPLY**
Sub Head No. 01 **Head Works**

Sr. NO.	Description	Amount in Rs.
1	a) Construction of U.G. tanks and Fire TanK Including pipes, valve & Specials. 750 KLD @ Rs. 3500/- per K.L.D	2625000
	b) Construction of storage tanks at S.T.P. etc. 340 KLD @ Rs. 3500/- per K.L.D	1190000
2	Provision for construction of Boosting Station 1 Nos @ Rs. 250000/- each	250000.00
3	Boring and installing tube well reverse rotary rig complete with pipes and strainer to a depth of about 58 Mtr complete in all respect. 1 Nos @ Rs. 500000/- each	500000.00
4	Provision for construction of tube well chamber size 1.50m x 1.50m complete in all respect. 1 Nos @ Rs. 80000/- each	80000.00
5	Provision for carriage of material and unforeseen items L.S.	30000.00
6	Provision of specials for tube well & rising main to UGT L.S.	50000.00
	Total	4725000.00
	Say	47.25

(C.O. to Abstract of cost of Sub Work No. I)

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SUB WORK NO. 1 **WATER SUPPLY**
Sub Head No. 02 **Pumping Machinery**

Sr. NO.	Description	Amount in Rs.
1	Providing and installing Hydro pneumatic pumping set of following capacities for domestic water Supply with specials	
	15.00 lps at 105 mts head - 3 No. (2W+1SB) - @ Rs. 2,00,000/- each Set (40.00HP)	600000
2	Providing and installing Hydro Pneumatic pumping set of following capacities for Flushing water supply at STP	
	8.00 lps at 105 mts head - 3 No. (2W+1SB) @ Rs. 1,50,000/- 1 Set (20.00 HP each)	450000.00
3	Providing and installing Submersible pump for tube wells with specials	
	4.50 lps at 58 mts head - 1 Nos (1W) @ Rs. 80,000/- 1 Set (10HP each)	80000.00
4	Provision for construction of ESS = 1 Nos Shed with foundation @ Rs. 1,50,000/- each	150000.00
5	Providing and installing pumping sets of following capacities for Fire Protection etc. with foundation complete	
	- 180 lpm at 110 M head 1 No. @ Rs. 80,000/- (7.50 HP each)	80000.00
	- 2280 lpm at 110 M head 1 No. @ Rs. 6,50,000/- (100 HP each) (Hydrant)	650000.00
	- 2280 lpm at 110 M head 1 No. @ Rs. 8,50,000/- (100 HP) (Diesel Engine)	850000.00
6	Provision for D.G. Set for stand by arrangement for all machinery	
	= 1 No. 200 KVA @ Rs. 10,00,000/- each	1000000.00
7	Provision for making foundations & erection of pumping machinery	50000.00
8	Provision for pipes, valve & specials inside boosting chamber	100000.00
9	Provision for electric services connection including electric fittings for boosting chambers and pump chamber etc.	100000.00
10	Provision for carriage of materials and other unforeseen items L.S.	50000.00
	Total	**4160000.00**
	Say	**41.60**

(C.O. to Abstract of cost of Sub Work No. I)

HABITAT TOWNSHIP PVT. LTD.

SUB WORK NO. 1 **WATER SUPPLY**

Sub Head No. 03 **Water Supply Distribution & Rising Main Pipe**

Sr. NO.	Description	Amount in Rs.
1	Providing, laying, jointing & testing pipe lines including cost of excavation etc. complete in all respects	
i)	100mm dia D.I. Pipe 774 Mtr @ Rs. 600/- Per Mtr	464400.00
ii)	150mm i/d D.I. Pipes - 561Mtr @ Rs. 800/- Per Mtr	448800.00
iii)	200mm i/d D.I. Pipes -195 Mtr @ Rs. 1200/- per mtr	234000.00
iv)	250mm i/d D.I. Pipes -38 Mtr @ Rs. 1800/- per mtr	68400.00
2	Providing and fixing sluice valve including cost of surface box and masonry chamber etc. complete in all respect	
	a) 100mm i/d 16 No. @ Rs. 7500/- each	120000.00
	b) 150mm i/d 18No. @ Rs. 10000/- each	180000.00
	c) 200mm i/d 4 No. @ Rs. 15000/- each	60000.00
	d) 250mm i/d 2 No. @ Rs. 20000/- each	40000.00
3	Providing and fixing indicating plates for sluice valve 40 No. @ Rs. 1000/-	40000.00
4	Provision for carriage of materials and other unforeseen items	50000.00
5	Provision for making connection with HSVP Pipe & T.W's etc.	100000.00
6	Provision for cutting the road and making good the same	50000.00
	Total	1855600.00
	Say	18.56

(C.O. to Abstract of cost of Sub Work No. I)

HABITAT TOWNSHIP PVT. LTD. K-1, G... Park ... New Delhi-110016

SUB WORK NO. 01 **WATER SUPPLY**

SUB HEAD NO. 04 **EXTERNAL FIRE HYDRANTS**

Sr. NO.	Description	Amount in Rs.
1	Providing, Laying, jointing and testing Heavy Class M.S. Pipes for fire rising main including cost of fittings, valves, connection etc. complete in all respect	
a)	100mm dia - 252 M @ Rs. 600/- Per Mtr	151200.00
b)	150mm dia -1441 M @ Rs. 900/- Per Mtr	1296900.00
2	Providing and fixing fire Hydrant with accessories 42 No. @ Rs. 7500/- each	315000
3	Provision for Security Services for Fire Arrangement L.S.	50000.00
4	Providing and fixing indicating plate -42 No. @ Rs. 1000/- each	42000.00
6	Provision for carriage of material L.S.	25000.00
	Total	**1880100.00**
	Say	**18.81**

(C.O. to Abstract of cost of Sub Work No. I)

HABITAT TOWNSHIP PVT. LTD.

SUB WORK NO. 01 **WATER SUPPLY**

SUB HEAD NO. 05 **IRRIGATION**

Sr. NO.	Description	Amount in Rs.
1	Providing, Laying, jointing and testing UPVC pipe lines suitable for 6 kg pressure including cost of fittings, valves, connection etc. complete in all respect	
a)	25mm dia - 320 M @ Rs. 300/- Per Mtr	96000.00
b)	80mm dia - 742 M @ Rs. 450/- Per Mtr	333900.00
c)	100mm dia - 528 M @ Rs. 600/- Per Mtr	316800.00
2	Providing and fixing 25mm dia, Irrigation hydrant valve complete in all respect 30 Nos @ Rs. 3000/- each	120000.00
3	Provision for carriage of materials and other unforeseen items L.S.	20000.00
4	Provision for indicating plate with safety box etc. complet in all respect	25000.00
6	Provision for road cutting and making it condition as original L.S.	30000.00
	Total	**941700**
	Say	**9.42**

(C.O. to Abstract of cost of Sub Work No. I)

HABITAT TOWNSHIP PVT. LTD.

SUB WORK NO. II **SEWERAGE SCHEME**

Sr. NO.	Description	Amount in Rs.
1	Providing, jointing, cutting and testing stoneware pipe grade A and lowering into trenches including cost of excavation, bed concrete, cost of manholes etc. complete	
	a) SW Pipe 200mm i/d avg. depths 0 - 2.00M 308 M @ Rs. 1200/- per Mtr	369600.00
	b) SW Pipe 250mm i/d avg depth 2.00 M 110 M @ Rs. 1300/- per Mtr	143000.00
	c) SW Pipe 300mm i/d avg depth 2.75 M 105 M @ Rs. 1500/- per Mtr	157500.00
	d) SW Pipe 400mm i/d avg depth 3.00 M 92 M @ Rs. 1800/- per Mtr	165600.00
2	Providing, laying, jointing & testing pipe lines including cost of excavation etc. complete in all respect - 200mm dia Heavy Class DI pipes (overfow for STP)	
	a) 200MM i/d D.I. Pipe - 100 M @ Rs. 1200/- Per Mtr	120000.00
3	Provision of lighting and watching etc.	30000.00
4	Provision for cartage of material	50000.00
5	Provision for making connection with HSVP	50000.00
1	Provision for construction of Sewerage Treatment Plant (STP) including the cost of tertiary treatment level with recycling storage tank and machinery with all arrangement etc. complete in all respect. = 950 KLD or (0.95 MLD) Capacity L.S.	6000000.00
		7085700.00
	Add 3% contingency & P.H. Services	212571
	Total	**7298271**
	Add 49% Department charges + Price Escalation	3576153
	G. Total	**10874424**
	Say	**108.75**

(C.O. to Final Abstract of Cost)

HABITAT TOWNSHIP PVT. LTD.

SUB WORK NO. III **STORM WATER DRAINAGE SCHEME**

Sr. NO.	Description	Amount in Rs.
1	Providing, lowering, laying, jointing RCC pipe class Np3 with cement joint,	
	a) RCC Np3 pipe 400mm i/d = 1072M @ Rs. 2000/- Per Mtr	2144000.00
2	Provision for Rain Water Harvesting arrangement including the cost of screening chamber and pit with all type of pipes and other material etc. complete in all respect as per standard drawing and bore upto requirement of site etc. 8 Nos RWH @ Rs. 1,00,000/- each	800000.00
	Provision for road gulley & pipe with connection	
2	Note:- water level of in this area is above 15' or 20' appox.	800000.00
3	Provision for lighting and watching	50000.00
4	Provision for timbering and shoring	50000.00
5	Provision for cartage of material	50000.00
6	Provision for making connection with Govt. storm water drain	200000.00
	Total	**4094000**
	Add 3% contingency & P.H. Services	122820
	Total	**4216820**
	Add 49% Department charges + Price Escalation	2066242
	G. Total	**6283062**
	Say	**62.84**

(C.O. to Final Abstract of Cost)

HABITAT TOWNSHIP PVT. LTD. K-Green Park Main New Delhi-110016

9.3625 ACRES AFFORDABLE GROUP HOUSING COLONY IN SECTOR-102, GURUGRAM

M/SHabitat Township Pvt. Ltd.

HYDRAULIC STATEMENT OF WATER SUPPLY (FLUSHING) RECYCLING OF TREATED SEWAGE WATER

SUBHEAD : FLUSHING WATER SUPPLY SCHEME - DESIGN CALCULATION

S. No.	Line Reference		Tower No.	Unit / Flat			Population @ 5 Person per flat	Water Requirement @ 172.50 LPCD	Other Water Requirement i.e. Commercial, Community Centre / Creche in LPD	Total Water Requirement in LPD	Water Requirement @ 33% of total water requirement	Peak Flow in LPH	Velocity (m/s)	Size of the pipe in (mm)	Total Friction Loss in M/M	Length in (M)	Loss of Head in Line (M)	Formation Level at Lower End	Available Head at Lower end (M)	Terminal Head (M)	Remarks
	From	To		Self	Branch	Total															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	STP	a	0	0	1342	1342	6710	1157475	41780	1199255	395754	148406	0.61	200	0.003	10	0.03	218.40	323.37	104.97	Formation Level at STP = 218.40 M Boosting Head = 105.00 M Flushing Hydraulic Head at STP = 323.40 M
2	a	b	0	0	1342	1342	6710	1157475	29000	1186475	391537	146825	0.61	200	0.003	80	0.24	218.55	323.13	104.58	
3	b	c	A1 to A3	509	476	985	4925	849563	25000	874563	288606	108226	0.62	150	0.005	105	0.53	218.45	322.60	104.15	
4	c	d	A6 to A9	476	0	476	2380	410550	0	410550	135482	50805	0.43	150	0.003	128	0.38	218.60	322.22	103.62	
5	b	d	A4, A5	238	119	357	1785	307913	4000	311913	102931	38599	0.56	150	0.001	100	0.10	218.60	323.03	104.43	
6	d	e	A10	119	0	119	595	102638	0	102638	33870	12701	0.31	100	0.002	130	0.26	218.80	322.77	103.97	
7	a	a1	0	0	0	0	0	0	12780	12780	4217	1582	0.16	100	0.001	84	0.08	218.25	323.29	105.04	
8	c	c1	0	0	0	0	0	0	25000	25000	8250	3094	0.16	100	0.001	35	0.04	218.50	322.56	104.06	

9.3625 ACRES AFFORDABLE GROUP HOUSING COLONY IN SECTOR-102, GURUGRAM

M/S Habitat Township Pvt. Ltd.

DESIGN CALCULATION OF STORM WATER DRAINAGE SCHEME

INTENCITY OF RAIN FALL = 0.006 MTR /HR

IMPERMEABILITY FACTOR = 0.6

S. No.	Name of Node		Area (Self)	Area (Self)	Branch Area	Total Area	Total Area	Rain fall	Discharge @ 17.36 LPS/ Hector	Length	Pipe dia	Slope	Velocity	Cap. Of drain	Fall + Extra Fall	Ground Level		Formation Level		Invert Level		Depth of M.H's		Average Depth	Remarks
	From	To	IN SQM	In Acre	In Acre	In Acre	In Hector	mm / hr.	IN LPS	In Mtr	In mm	In Mtr	IN m/sec	IN LPS	IN Mtr	Start	End	Start	End	Start	End	Start	End		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
1	A	B	4700	1.16	0	1.16	0.47	6.00	8.15	150	400	570	0.76	98.57	0.26	218.40	218.40	218.85	218.60	216.85	216.59	2.00	2.01	2.01	RWH - 1
2	B	C	3850	0.95	1.16	2.11	0.85	6.00	14.82	115	400	570	0.76	98.57	0.20	218.40	218.30	218.60	218.55	216.59	216.39	2.01	2.16	2.09	RWH - 2
3	C	D	2640	0.65	2.11	2.76	1.12	6.00	19.39	160	400	570	0.76	98.57	0.28	218.30	218.10	218.55	218.25	216.39	216.11	2.16	2.14	2.15	RWH - 3
4	D4	D3	3950	0.98	0	0.98	0.40	6.00	6.88	150	400	570	0.76	98.57	0.26	218.40	218.30	218.65	218.45	216.85	216.59	1.80	1.86	1.83	RWH - 4
5	D5	D3	2700	0.67	0	0.67	0.27	6.00	4.71	110	400	570	0.76	98.57	0.19	218.40	218.30	218.60	218.45	216.80	216.61	1.80	1.84	1.82	
6	D3	D2	200	0.05	1.65	1.70	0.69	6.00	11.94	12	400	570	0.76	98.57	0.02	218.30	218.30	218.45	218.45	216.59	216.57	1.86	1.88	1.87	
7	D6	D2	4500	1.11	0	1.11	0.45	6.00	7.80	105	400	570	0.76	98.57	0.18	218.30	218.30	218.55	218.45	217.05	216.87	1.50	1.58	1.54	RWH - 5
8	D2	D1	1200	0.30	2.81	3.11	1.26	6.00	21.85	45	400	570	0.76	98.57	0.08	218.30	218.30	218.45	218.40	216.57	216.49	1.88	1.91	1.90	RWH - 6
9	D1	D	6775	1.67	3.11	4.78	1.93	6.00	33.58	165	400	570	0.76	98.57	0.29	218.30	218.10	218.40	218.25	216.49	216.20	1.91	2.05	1.98	RWH - 7
10	D	Govt. S.W.D. LINE	600	0.15	7.54	7.69	3.11	6.00	54.02	60	400	570	0.76	98.57	0.11	218.10	218.90	218.25	218.10	216.11	216.00	2.14	2.10	2.12	RWH - 8

MATERIAL STATEMENT OF STORM WATER DRAINAGE SCHEME

Sr. No.	Line Reference		400mm i/d RCC Np3 Pipe Length in Mtr
	From	To	
1	A	B	150
2	B	C	115
3	C	D	160
4	D4	D3	150
5	D5	D3	110
6	D3	D2	12
7	D6	D2	105
8	D2	D1	45
9	D1	D	165
10	D	Govt. SWD line	60
	Total Length		**1072**

Total Length 400mm i/d RCC Np3 pipe = 1072 Mtr

Total Rain Water Harvesting (RWH) = 8 Nos

HABITAT TOWNSHIP PVT. LTD. K-1, Green Park Extn. New Delhi-110016

HYDRAULIC STATEMENT OF WATER SUPPLY (DOMESTIC)

SUBHEAD : DOMESTIC WATER SUPPLY SCHEME - DESIGN CALCULATION

S. No.	Line Reference		Tower No.	Flat / Unit			Population @ 5 Person per flat	Water Requirement @ 172.50 LPCD	Other Water Requirement i.e. Commercial / Community Centre and Creche etc.	Total Water Requirement in LPD	Water Requirement @ 67% of total water requirement	Peak Flow in LPH	Velocity (m/s)	Size of the pipe in (mm)	Total Friction Loss in M/M	Length in (M)	Loss of Head in Line (M)	Formation Level at Lower End	Available Head at Lower end (M)	Terminal Head (M)	Remarks
	From	To		Self	Branch	Total			In LPD												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	U.G.T.	A	0	0	1342	1342	6710	1157475	41780	1199255	803501	301320	0.70	250	0.004	10	0.04	218.50	323.41	104.91	Formation Level at Water Works i.e. UGT = 218.45 M Boosting Head = 105.00 M Hydraulic Head = 323.45 M
2	A	B	0	0	1342	1342	6710	1157475	29000	1186475	794938	298109	0.69	250	0.003	28	0.08	218.55	323.33	104.78	
3	B	C	A1 to A3	509	476	985	4925	849563	25000	874563	585957	219739	0.74	200	0.005	105	0.53	218.45	322.80	104.35	
4	C	D	A6 to A9	476	0	476	2380	410550	0	410550	275069	103153	0.62	1500	0.005	128	0.64	218.60	322.16	103.56	
5	B	D	A4, A5	238	119	357	1785	307913	4000	311913	208981	78370	0.62	1500	0.005	100	0.50	218.60	322.83	104.23	
6	D	E	A10	119	0	119	595	102638	0	102638	68767	25788	0.47	100	0.005	130	0.65	218.80	322.18	103.38	
7	A	A1	0	0	0	0	0	0	12780	12780	8563	3211	0.23	100	0.001	125	0.13	218.25	323.28	105.03	
8	C	C1	0	0	0	0	0	0	25000	25000	16750	6281	0.23	100	0.001	35	0.04	218.50	322.76	104.26	

SUBHEAD : IRRIGATION WATER SUPPLY SCHEME - DESIGN CALCULATION (HORTICULTURE)

HYDRAULIC STATEMENT OF IRRIGATION WATER SUPPLY

S. No.	Line Reference	Population	Peak Flow in LPH	Velocity (m/s)	Size of the pipe required (in mm)	Size of the Pipe Recommend (mm)	Hydraulic Radius	Total Friction Loss in m/m	Length (M)	Loss of Head in Line (M)	Formation Level	Available head (M)
1	From Flushing Water Supply line	100000 (100 K.L.)	-	-	25.00	25	-	-	320	-	-	-

Note :- **60 Nos connections are to be done from flushing water supply line i.e. 30 Nos x 8 Mtr/each = 240 Mtr for 25mm i/d**

DETAIL OF MAIN LINE (PVC) FOR IRRIGATION

S. No.	Line Reference		Length in Mtr	Size of p.v.c. Pipe (in Mtr)		Remarks
	From	To		80mm	100mm	
1	S.T.P.	a	15		15	
2	a	b	25		25	
3	b	c	75		75	
4	c	q	55		55	
5	q	p	115		115	
6	p	o	60	60		
7	o	o1	50	50		
8	a	d	42		42	
9	d	e	36		36	
10	e	f	35		35	
11	f	g	20		20	
12	g	h	110		110	
13	h	i	30	30		
14	i	j	72	72		
15	j	k	25	25		
16	k	l	60	60		
17	i	l	125	125		
18	k	m	25	25		
19	m	m1	25	25		
20	m	m2	25	25		
21	h	n	200	200		
22	n	o	45	45		
Total			1270	742	528	

HABITAT TOWNSHIP PVT. LTD. New Delhi-110016

TOTAL MATERIAL STATEMENT FOR WATER SUPPLY i.e. DOMESTIC, FLUSHING & RISING MAIN ETC.

S. No.	Description	Size of pipe upto valve in 100mm	Size of pipe upto valve in 150mm	Size of pipe upto valve in 200mm	Size of pipe upto valve in 250mm
1	Domestic	290 M	228 M	105 M	38 M
2	Flushing	249 M	333 M	90 M	-
3	Rising Main	175 M	-	–	–
	Total	**714 M**	**561 M**	**195 M**	**196 M**

HABITAT TOWNSHIP PVT. LTD. K-1 Green Park Main New Delhi-110016

MATERIAL STATEMENT FOR SEWERAGE SCHEME

S. No.	Line No.		Length (In Mtr)	Pipe Dia	Av. Depth	Length in Mtr			
						200mm i/d	250mm i/d	300mm i.d	400mm i.d
	From	To				0 to 2.00 Mtr	0 to 2.00 Mtr	0 to 2.50 Mtr	0 to 3.00
1	A	B	100	200	1.32	100			
2	B	C	115	200	1.67	115			
3	C2	C1	110	250	1.61		110		
4	C3	C1	28	200	1.04	28			
5	C1	C	105	300	1.93			105	
6	C	D	80	400	2.16				80
7	D1	D	65	200	1.20	65			
8	D	S.T.P.	12	400	2.16				12
9	STP - HSVP / Sewer By Pumping 200mm i/d D.I. Pipe = 100 Mtr								
	Total		615			308	110	105	92

200mm i/d Pipe Length 308 Mtr
250mm i/d Pipe Length 110 Mtr
300mm i/d Pipe Length 105 Mtr
400mm i/d Pipe Length 92 Mtr
200mm i/d D.I. Pipe (By Pumping) = 100 Mtr

HABITAT TOWNSHIP PVT. LTD. K-1, Green Park New Delhi-110016

FINAL ABSTRACT OF COST

SR. NO.	SUB WORK	DESCRIPTION	AMOUNT (Rs. In Lacs)
1	SUB WORK NO.I	WATER SUPPLY SCHEME	208.32
2	SUB WORK NO. II	SEWERAGE SCHEME	108.75
3	SUB WORK NO. III	STORM WATER DRAINAGE	62.84
4	SUB WORK NO. IV	ROAD AND FOOTPATH	106.15
5	SUB WORK NO. V	STREET LIGHTING	14.37
6	SUB WORK NO. VI	HORTICULTURE (PLANTATION &ROAD SIDE TREES)	9.42
7	SUB WORK NO. VII	MTC. OF SERVICES & RESURFACING OF ROADS (After 1st 5 years of 1st Phase & Next 5 years in 2nd Phase)	212.01
		TOTAL	721.86
TOTAL : (Rupees Seven Crore Twenty One Lacs Eighty Six Thousand only)			

Cost Per Acre = Rs.721.86 Lacs / 9.3625 = 77.10 Lacs Per Acre

AUTHORISED SIGNATORY

HABITAT TOWNSHIP PVT. LTD. K-1 Green Park Main New Delhi-110016

SUB WORK NO. 1 (Abstract of cost) **WATER SUPPLY SCHEME**

SR. NO.	SUB WORK	DESCRIPTION	AMOUNT (Rs. In Lacs)
1	Sub Head No. 01	Head Works	47.25
2	Sub Head No. 02	Pumping Machinery	41.60
3	Sub Head No. 03	Water Supply Distribution & Rising main pipe	18.56
4	Sub Head No. 04	External Fire Hydrants	18.81
6	Sub Head No. 05	Irrigation	9.52
		TOTAL	135.74
		Add 3% contingency & P.H. Services	4.07
		Total	139.81
		Add 49% Department charges + Price Escalation	68.51
		G. Total	208.32
		Say in Lacs	208.32

(C.O. to Final Abstract Of Cost)

HABITAT TOWNSHIP PVT. LTD. K-1 Green Park Main New Delhi-110016

Sub Work No. IV **ROAD AND FOOTPATH**

S. No.	Description	Unit	Qty	Rate (In Rs.)	Amount (In Rs.)
1	Provision for leveling & earth filling as per site conditions	Per Acre	9.3625	80000	749000
2	i) Providing and laying 100mm thick PCC under pavement, cement concrete of specified grade 1:4:8 and 150mm thick RMC grade M-40 ii) Providing and laying Bituminous road (250mm GSB, 300mm WMM, 50mm DBM, 40mm BC).	Sqm	11387	300	3416100
3	Provision for kerbs & channels of C.C. 1.2:4	Metre	1603	340	545020
4	Provision for arrangement of guide map and indicating board etc.	LS			50000
5	Provision for parking arrangement with 100mm thick PCC under pavement cement concrete of specified grade 1:4:8 and 150mm thick RMC Grade M-40 or Bituminous road with 250mm GSB, 300mm WMM, 50mm thick DBM & 40mm thick BC etc. as per requirement of site for surface car parking and approach to Tower / Blocke etc. complete in all respect	Sqm	8425	250	2106250
5	Provision for carriage of material	LS			50000
	Sub Total				**6916370**
	Add 3% contingencies & PH Services				207491
	Sub Total				**7123861**
	Add 49% Departmental Charges + Price Escalation				3490692
	Total				**10614553**
	Say Rs. In Lacs				**106.15**

(C.O. to Final Abstract of cost)

HABITAT TOWNSHIP PVT. LTD. K-1, Green Park Main New Delhi-110016

Sub Work No. V **STREET LIGHTING**

S. No.	Description	Unit	Qty	Rate (In Rs.)	Amount (In Rs.)
1	Provision for Street Lighting at surrounding area as per standard specifications of HVPN etc. complete	Acre	9.3625	10000	93625.00
	Add 3% contingencies & PH Services				2808.75
	Total				**96433.75**
	Add 49% Departmental Charges + Price Escalation				47252.54
	Total				**143686.29**
	Say Rs. In Lacs				**14.37**

(C.O. to Final Abstract of cost)

HABITAT TOWNSHIP PVT. LTD. K-1, Green Park New Delhi-110016

Sub Work No. VI **HORTICULTURE**

S. No.	Description	Unit	Qty	Rate (In Rs.)	Amount (In Rs.)
1	Development of Lawn Areas				
a.	Trenching of ordinary soil upto depth of 60 cm i/c removal & stacking of serviceable material & disposing by spreading and levelling 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 i/c cost of imported earth and manure with all fitting and valve etc. complete				
b.	Rough dressing of turfed area				
c	Grassing with "Cynadon dactylon" i/c watering and maintenance of lawns for 30 days till the grass forms a thick lawn, free from weeds and fit for moving in row 7.5 cm part in eighter direction				
d	organized green 4688.91 Sqm Or 1.16 Acres (As per detail given in green park area calculation)	Acre	1.16	250000	290000
2	Providing and planting trees along boundary @ 6 m interval (Length appx 1603M) = 1603/6 =268 Nos Say No. of trees = 270 Nos Cost details : Excavation = Rs. 73 Manure = Rs. 300 Tree Plant = Rs. 850 Total Rs. = Rs. 1223				
		Each	270	1223	330210
	Total				**620210**
	Add 3% contingencies & PH Services				18606
	Total				**638816**
	Add 49% Departmental Charges + Price Escalation				313021
	Total				**951837**
	Say Rs. In Lacs				**9.52**

(C.O. to Final abstract of cost)

HABITAT TOWNSHIP PVT. LTD. K-1, Green Park New Delhi-110016

Sub Work No. VII **Mtc. Of services & Resurfacing of Road**

S. No.	Description	Unit	Qty	Rate (In Rs.)	Amount (In Rs.)
1	Mtc. Of water supply, sewer, storm water drain, roads, street light, hort. Etc. for period of 10 years including operation charges full establishment etc. complete in all respects 4.3375 acres @ Rs. 1.00 lacs per acre	Acre	9.3625	100000	936250
2	Provision for resurfacing of roads after 5 years of 1st phase with provision of 50mm thiCK BM including leveling coarse and 25mm BC as per crust design whichever is safer	Sqm	11387 + 8425 =19812	250	4953000
3	2nd phase after next five years of 1st phase (50mm DBM & 25mm BC or as per crust design whichever is safer	Sqm	19812	400	7924800
	Sub Total				**13814050**
	Add 3% contingencies & PH Services				414422
	Sub Total				**14228472**
	Add 49% Departmental Charges				6971951
	Total				**21200423**
	Say Rs. In Lacs				**212.01**

(C.O. to Final abstract of cost)

HABITAT TOWNSHIP PVT. LTD. K-1, Green Park Main New Delhi-110016

Material Statement of Road Works

Sr. No.	Road No.	Length	Width	Area	
1	1 (6m)	70.00	6.00	420.00	Sqm
2	2 (6m)	210.00	6.00	1260.00	Sqm
3	3 (6m)	185.00	6.00	1110.00	Sqm
4	4 (6m)	145.00	6.00	870.00	Sqm
5	5 (6m)	60.00	6.00	360.00	Sqm
6	6 (6m)	122.00	6.00	732.00	Sqm
7	7 (6m)	170.00	6.00	1020.00	Sqm
8	8 (6m)	170.00	6.00	1020.00	Sqm
9	9 (12m)	75.00	5.50	412.50	Sqm
10	10 (24m)	175.00	2x7.00	2450.00	Sqm
11	11 (24m)	85.00	2x7.00	1190.00	Sqm
	G. Total	**1467.00**		**10844.50**	Sqm
Add 5% extra for curves				542	Sqm
Total				**11387**	**Sqm**

ii) Kerbs & Channels

i)	6 Mtr wide Road	1132.00 Mtr
i)	12 Mtr wide Road	75.00 Mtr
iii)	24 Mtr wide Road (2 x 160Mtr)	320.00 Mtr
	Total	**1527.00 Mtr**
	Add. 5% Extra for Curves	76.00 Mtr
	G. Total	**1603.00 Mtr**

II) PARKING :-

(i) Surface Car Parking = 634 Nos

Area = 634 Nos x 2.50 Mtr x 5.00 Mtr = 7925.00 Sqm

ii) Approach of Towers L.S. = 500.00 Sqm

Total = 8425.00Sqm Say 8425.00 Sqm.

HABITAT TOWNSHIP PVT. LTD. K-1, Green Park Main New Delhi-110016