

LC-3155

EXTERNAL DEVELOPMENT WORKS DESIGN AND COST ESTIMATES

FOR

**PROPOSED GROUP HOUSING
COLONY AT SECTOR 15 PART-II
(POCKET-II), (ON 2.3828 ACRES) AT
MANESAR URBAN COMPLEX TEHSIL
& DISTRICT GURUGRAM (HR)**

(Licence No. 12 of 2018 dt 9.2.2018)



**DEVELOPED BY
M/S PAX PROPERTIES (P) LTD IN
COLLABORTION WITH ALPHA CORP
DEVELOPMENT PVT LTD.**

PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

REPORT

ESTIMATE FOR PROVIDING WATER SUPPLY, SEWERAGE, STORM WATER DRAINAGE, ROADS, STREET LIGHTING AND HORTICULTURE IN RESPECT OF 2.3828 ACRES MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

Gurgaon of Haryana State situated on National Highway-8 at a distance of 50 Kms from Delhi. Being the National Capital Region, the town has fast developing tendency and potential. Further, it has also started sharing the growing residential/ industrial load of Delhi. In order to relieve the growing pressure of population in National Capital of Delhi, it has been decided by the Haryana Govt. to establish various residential, industrial and other infrastructure sectors in Gurgaon M/S PAX PROPERTIES (P) LTD IN COLLABROTION WITH ALPHA CROP. DEVELOPMENT PVT LTD has been developing Group Housing Colony at SECTOR - 15 PART-II (POCKET-II) (ON 2:3828 ACRES) AT GURUGRAM (HARYANA).

WATER SUPPLY

At present the source of water supply in this area is borewell. As the underground water is potable, provision for 1 number of tubewell has been made on temporary basis in this estimate. It has been proposed to construct the under ground tanks of capacity as per attached details, and at location for domestic purpose and for fire protection. The underground tanks will be fed from the borewell and HUDA supply, which will feed overhead tanks on the roof of the buildings. The water supply system has been designed as per Hazen Williams formula.

DESIGN

The scheme has been designed for population of approx. 600 persons for Housing. The rate of water supply per head / day has been taken as 86.0 liters as per HUDA norms in addition to above necessary provision of water for club and parks etc. have been taken into account for calculating the maximum quantity of water requirement.

PUMPING REQUIREMENTS

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

PUMPING CHAMBER AND PUMPING EQUIPMENTS

It has been proposed to quip each tubewell with an electrically driven set ejecto type or submersible pump capable of driven 18000 liters per hour. The provision for standby generating set has also been provided in case of any electricity failure. Generator will be provided separately or added tothe capacity of main generator.



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UNDERGROUND STORAGE TANK

Underground storage tank provision has been made in two compartments, which cater for the domestic as well as for fire fighting requirement. The water for fire water compartment shall overflow to the domestic compartment so that the water in the fire compartment also remain full & fresh and will not contaminate.

BOOSTING STATION

The boosting station is being planned near underground storage tank catering to above requirement.

DISTRIBUTION SYSTEM

The distribution system for this development has been designed to supply ^{172.50} @ ~~86.0~~ liter per head per day @ 3 times the average rate of flow on Hazen William formula. Necessary provision for laying CI/DI pipes conforming to relevant IS standard along with valves and special has been made in the project. The minimum terminal head at any point will be more than 130 Mtrs. so that it can be serve the G+26 floors construction envisaged in the plan. Minimum pipe dia. for distribution is kept as 100 mm dia.

RISING MAIN

Raising main from HUDA water main or sector road to water work have also been proposed as provision has been made in this estimate.

SEWERAGE SCHEME

This scheme has been designed for sewer connecting to STP & over flow of STP connected to HUDA sewer main. The sewerage system has been marked on respective plans.

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

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



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STORM WATER DRAINAGE

Since the Master Scheme has been proposed with pipe drain, we proposed to lay pipe drains with required number of catch basins for disposal of storm water. The intensity of rain fall has been taken as 40mm per hour. A minimum size of 400 mm dia NP3 pipe storm water pipe will be provided and designed as per Manning's formula.

FIRE

As per N.B.C. (National Buiding Code), fire tanks & required capacity pumps have been provided the plan as shown on the plan. Similarly irrigation pumps of required capacity provided as shown on the plan.

SPECIFICATIONS

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

ROADS

The raods in the colony have been planned as minimum 6 M wide. The following specification have been adopted which are reproduced below:

The specification of 6M wide roads:

Tremix Driveway

Providing & Laying average 125mm, thick M-25 Grade (cement concrete) on the roads with Tremix finishing layer as specified below including all cost of placing, ramming & compacting with screed vibrator, putting dowels for adjoining panel.

1. P.C.C
 2. W.B.M (Layer 1)
- 200mm GSB
250 mm stone aggregate
50 mm Bm.
25 mm thick BC.

STREETLIGHTING

Provision of lighting on surrounding area has been made.



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HORTICULTURE

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

RATES

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

COST

The total cost of the scheme, including cost of all services works out to Rs. ~~171.91~~ ^{323.79} Lacs Including 3% contingencies and 49% departmental charges, price escalation & other unforeseen charges. Cost per acres comes to Rs. ~~74.46~~ ^{136.05} lacs

M/S PAX PROPERTIES (P) LTD IN COLLABORTION WITH ALPHA CORP DEVELOPMENT PVT LTD.

(Authorized Signatory)



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TOTAL WATER REQUIREMENT

(I) DAILY WATER REQUIREMENT TOWER -II

A Residential blocks (G+26)

a) Type 3 BHK	=	86 Units
@ 5Person / unit	=	430 Persons
b) Type 3 BHK + Servent	=	14 Units
@ 7Person / unit	=	98 Persons
c) Type EWS (G+4)	=	18 Units
@ 4 Person / unit	=	72 Persons
		90
Total population	=	<u>618.600</u> Persons
@ 86.0 LPCD (1)	=	51600 Liters/ Day
Say 172.50	=	106605 Liters/ Day
		106605

B Commercial

a) Community Building (142.31 sqm @ 1.4 sqmt/ person @ 15 LPCD)	=	1530 Liters/day
b) Ground Floor Convent shopping (47.738 sqm @ 3 sqmt/ person)	=	16 Persons
i) Shop Keeper @ 10%	=	2 Persons
@ 45 LPCD	=	90 Liters/day
ii) Visitors	=	14 Persons
@ 15 LPCD	=	210 Liters/day
c) Maintenance Staff (Such as Gardener, ESS Staff, Security Guards etc.)	=	25 Persons
@45 LPCD	=	1125 Liters/day
d) Back Wash Filters - 10% AV/WD	=	10000 Liters/day
e) Floating Population 10% of Population	=	60 Persons
@ 15 LPCD	=	900 Liters/day
f) Swimming Pool	=	15000 Liters
Total Commercial	=	28855 Liters/day
Say	=	29000 Liters/day

C Horticulture & Road side plantation

a) Area under Green area 1500.788 sqmt. @ 5 6.17 Liters / sqmt.	=	7504.00 9260.00 Liters/day
b) Area under road & paved area of 6450.221 @ 5 liters/ sqm (9642.834-(1691.825+1500.788) = 6450.221 Sq.m)	=	32251.00 Liters/day
Total	=	41511.00 Liters/day
Or Say	=	40000.00 Liters/day
		12000



The demand of Horticulture & Road work will met from recirculated water after treatment at S.T.P.

Total Water demand (A + B)		81000 135605 Liters/day
Total Water demand (KLD)		81.00 135.60 KLD
Or Say		81.00 135.60 KLD
Domestic water demand 65% of AV/WD of (A) +35% of [B (a+b+c+e) + 100% of B (d+f)]	=	60200.00 95643 Liters/day
Domestic water demand (KLD)	=	60.20 95.64 KLD
Or Say	=	60.00 96.00 KLD
Flushing water demand 35% of AV/WD of (A) +65% of [B(a+b+c+e)]	=	20800.00 39818 Liters/day
Flushing water demand (KLD)	=	20.80 39.82 KLD
Or Say	=	21.00 40.00 KLD
Sewage Treatment Plant Capacity		66900 112350 Liter / Day
Average Sewerage Contribution Considering 80% of AV domestic water demand & 90% of AV/Flushing demand	=	66.90 112.35 KLD
Sewage Treatment Plant Capacity (KLD)	=	70.00 115.00 KLD
Or Say	=	70.00 115.00 KLD
Sewage scheme		
Peak discharge @3 times of sewage discharge plus sub soil infiltration @ 10% of total water demand	=	218100 Liters
	=	48467 GPD
	=	0.09 Cusces

Hence 250 mm dia pipe having design capacity 0.659 cusces is sufficient to carry the above discharge



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(I) BOREWELLS

Approx. discharge of borewells @ 18 KL/hour and working 16 hours/day

(a) Total water demand = KLD	=	60.00
(b) Number of borewells $60/(18 \times 16)$	=	0.21
Add 10% extra	=	0.02
Total	=	0.23
Say	=	<u><u>1 No</u></u>

So, it is proposed to provide 1 No. of tube well. Moreover, the water demand for horticulture purposes is to met from recirculated water after treatment at STP and ultimate water supply is to provided by HUDA.



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(II)	Pumping Machinery for Borewell	
	Gross working Head	= 50.0 Meters
	Average Fall in S.L.	= 5.0 Meters
	Depression Head	= 5.0 Meters
	Friction loss in main + Postive head	= 10.0 Meters
	Total	= 70.0 Meters
	Or Say	= <u>70.0 Meters</u>
	Pump HP = $\frac{18000 \times 70 \times 100}{60 \times 60 \times 75 \times 70}$	= 6.67 H.P.
	Or Say	7.50 H.P.

(III)	Under Ground Water Tanks	
a)	Total Domestic Water Demand	= 60200 ⁹⁶⁰⁰⁰ Liters/day
	Storage (One day)	= 60.20 ^{96.0} KLD
	Or Say	= <u>100.00 KLD</u>
	Fire Tank provided as per N.B.C. norms	= <u>300.00 KLD</u>

But it is proposed to construct an underground tank of 400 KLD having 50.0 KLD for treated water, 50.0 KLD as raw water, and 300 KLD for fire fighting purpose as per location shown on plan i.e. Total 400 K.L.D.

(IV)	Boosting Machinery (Domestic water)	
a)	For Under Ground Tank	
	Total water demand (Domestic)	= 60.00 ^{96.00} KLD
	Pumping 4 hour pumping	= 250.00 ⁴⁰⁰ LPM
	Or Say	= 250.00 ⁴⁰⁰ LPM
	Gross Working Head	
-	Suction lift	= 3.00 Meters
-	Delivery head	= 5.00 Meters
-	Frictional loss in Mains & Specials+ Positive head	= 7.00 Meters
-	Clear head required (G+26) = 10+26x4	= 114 ¹¹⁴ 50.00 Meters
	Total	= 129 ¹²⁹ 65.00 Meters
	Or Say	= <u>Say 130.00 Meters</u>
	Pump HP = $\frac{250 \times 130 \times 100}{60 \times 75 \times 70}$	= 40.32 ^{19.25} H.P.
	Or Say	40.32 ^{12.50} H.P.

It is proposed to provide 2 nos. of motors of ~~12.50~~ ^{20.00} HP sets of ~~250~~ ⁴⁰⁰ LPM discharge at 130 M head (One pump working and one as standby for domestic supply & generator set of same capacity in case of electric failure) for domestic purpose.



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Pumping machinery (Flushing water)

- b) Flushing water supply requirement
- (i) AV water demand = ~~81000~~ liters/day
 - (ii) Flushing water supply demand @35% of (A) + 65% of [B(a+b+c+e)] = ~~20800~~ liters/day
39.82 KL
 - Flushing water demand (KLD) = ~~20.80~~ KLD
 - Or Say = ~~21.00~~ KLD
40.00 + 42 KL for 400
- Pumping per hour @ 4 hour pumping (L.P.M)
- LPM = ~~256.66~~ **341.66**
 - Say = ~~87.50~~ **87.50** LPM
82/4 = 20.5 KLDH
 - Pump HP = $\frac{350 \times 100 \times 130 \times 100}{60 \times 75 \times 60}$ = ~~9.61~~ **4.13** H.P. **16.85**
350 **100.00** LPM
 - Or Say = ~~5.00~~ **17.50** H.P.

It is proposed to provide 2 nos. of motors ~~5.0~~ **17.50** HP sets of ~~100~~ **350** LPM discharge at 130 m head (One pump working & one pump stand by & generator set of same capacity in case of electric failure.)

(V) Irrigation Pumping

- a) Plot Area = 2.3828 Acres
= 9642.83 Sqmt
- Water Demand of Horticulture + Road Area Plantion = 40000.00 LPD
4 Hours Pumping = 166.67 LPM
Say = 170 LPM
Head = 35 Mtr.
Pump HP = $\frac{170 \times 35 \times 100}{60 \times 75 \times 70}$ = 1.89 H.P.
Or Say = 2.00 H.P.

It is proposed to provide 2 nos. of motors of 2.0 HP sets of 170 LPM discharge at 35 M head (One pump are working and one as standby & generator set of same capacity in case of electric failure.)



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(VI) PUMPS FOR FIRE PROTECTION

S. No.	Parameters	Location	Pump sets		
			Jockey	Main	Diesel
1	Discharge in lpm	Pump Room	180 lpm	2850 lpm	2850 lpm
2	Head in metre		130	130	130
3	HP		15	120	120
4	Quantity in nos.		2	2	1

(VII) GENERATING SETS

S. No	Equipment	QTY	HP	Total HP	
1	Borewell	1	7.50	7.5	
2	Fire Jockey pumps	1	18.00	18.0	
3	Booster Pump (for domestic) + Flushing+ irrigation pump	1 + 1 + 1	12.5 + 5.0 20.0 + 17.5 + 2.0	19.5 37.50	
	Total		47.50	42.0	
			39.43	31.33	KW
	Disversity 0.8 & Power factor 0.8		53.15	48.96	KVA
	Or Say			50.00	KVA

It is proposed to add 50 KVA capacity for above said machinery to the main DG set.



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FINAL ABSTRACT OF COST

Sub Work	Description	Amount	
		(Rs.) in Lacs	
I	Water Supply Scheme	106.48	62.11 60.00
II	Sewerage Scheme	32.91	19.18 15.29
III	Storm Water Drainage	28.39	19.56 16.77
IV	Road	62.70	48.78 46.86
V	Street Lighting	9.14	3.65 2.19
VI	Horticulture	1.85	1.37 0.86
VII	Maintenance Charges for 10 Years including Resurfacing of Roads after 1st 5 year & 1nd 5 years of mtc	82.32	27.26 35.45
	Total (in Lacs)	323.79	177.42 191.91
	Cost per acres (2.3828) =	136.05 lacs	80.53

M/S PAX PROPERTIES (P) LTD IN COLLABORTION WITH ALPHA CORP DEVELOPMENT PVT LTD.

Received for

(Authorized Signatory)

Executive Engineer
HSVP Division No.1,
Gurugram

Superintending Engineer
HSVP, Circle-II, Gurugram

Addl. Chief Engineer
HSVP, Gurugram

Checked subject to comments
in forwarding letter No. 245371
Dt. 17.12.18 and notes
attached with the estimate

Superintending Engineer (HQ)
for Chief Engineer 1 HSVP
Ranchkula

Director
Town & Country Planning
Haryana, Chandigarh



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Sub Work No.1		Water Supply	
Sub Head	Description		Amount (Rs.) in lacs
1	Head Works	₹ 41.51 lacs	21.27
2	Pumping Machinery	₹ 47.57 lacs	23.71
3	Rising Main	₹ 4.90 lacs	3.89 3.76
4	Distribution System (Domestic Flushing water)	₹ 7.52 lacs	5.32 4.85
5	Fire Fighting	₹ 3.30 lacs	2.95 2.36
6	Irrigation	₹ 1.68 lacs	4.77 4.05
Say (In Lacs)		₹ 106.48 lacs	60.00 62.11



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Sub Work No-1				Water Supply	
Sub Work No-01				Head Works	
SI No	DESCRIPTION	Qty	Rate		AMOUNT (In Lacs.)
1	Boring and installing 200 mm i/d tubewell with reverse rotary rig complete with pipe and strainer to depth of about 80 m in all respect 2 Nos. @ Rs. 300000/- each	1	x 300000	Rs.	3.00
2	Provision for Rising Main connecting Bore-well with water main and by-pass arrangement				
2.1	80 mm dia G.I. Pipe	20	x 800	Rs.	0.16
3	Providing Boosting arrangement by pumps (7.5 HP) (capacity 400 lpm at 130 M head, 1 no. @ Rs. 30,000/- each (for Tube Well) For Dem. work	(1+1) 2	x 30000	Rs.	4.00
4	Providing Boosting arrangement by pumps 12.50 HP, capacity 250 LPM at 130 M head, 2 nos. each @ Rs. 50,000/- each (For UGT) complete with panel, foundation etc. Flushing	(1+1) 2	x 50000	Rs.	1.00
3	Provision for carriage of materials and other unforeseen items	1	x 30000	Rs.	0.30
6	Construction of U.G. tanks of total cap. 400 KL @ Rs. 2200 per Kt. incl. 300 Kt for fire and 100 Kt for drinking purpose work	400 + 100 500	x 2200	Rs.	8.80
5	Provision for borewell chamber of size 1.5 x 1.5 x 1.5 m For Housing borewell 2 Nos. @ Rs. 30,000/- each corr. of boosting chamber of suitable capacity as per P.H. sy.	1	x 30000	Rs.	0.30
TOTAL					15.00
Add 3% contingencies				Rs.	0.45
TOTAL				Rs.	15.45
Add 49% Department charges, Price Escalation & other unforeseen Charges.				Rs.	7.83
TOTAL COST				Rs.	23.28

42.97 lacs

Material statement of Borewell Rising Mains

S. No.	Name of line	Length of 80 mm dia. pipe	Length of 100 mm dia pipe
1	Borewell no. 1 to UGT	20	
	Total	20	0



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Sub Work No-1				Water Supply		
Sub Work No-02				Pumping Machinery		
SI No	DESCRIPTION	Qty	Rate		AMOUNT (In Lacs.)	
1	Providing and installing electricity driven Submersible pumping set capable of delivery about 18 Kl / Hr. of water against a total Head of 70 M complete with motor and other accessories, 1 No @ 35,000/-	1	x	35000	Rs.	0.35
2	Provision for diesel engine genset each for standby arrangements for T.W., booster pumps complete with gear head arrangement. 1 No. 50 KVA	1	x	250000 (L.S.)	Rs.	2.50 5.00
2	Providing and installing pumping set of following capacities for Fire protections :-					
(i)	180 lpm at 130 M head 2 Nos. Jockey Pump @ Rs. 65,000/-	2	x	65000 2.0	Rs.	2.00 1.30
(ii)	2850 lpm at 130 M head 2 No. Main Fire Pump @ Rs. 3,00,000/-	2	x	300000 1.50 120 HP	Rs.	7.50 6.00
(iii)	2850 lpm at 130 M head 1 No. Diesel Pump @ Rs. 350,000/-	1	x	350000 (120 HP)	Rs.	16.00 3.50
3	Providing for chlorination plant complete. 1 set @ 30,000/-	1	x	30000 (L.S.)	Rs.	1.00 0.30
4	Provision for making foundations and erection of Pumping machinery @ Rs.30000/-	1	x	30000 (L.S.)	Rs.	1.00 0.30
5	Provision for pipes, valves and specials inside boosting chamber - 1 Set (L.S.) Rs. 30000/- for each	1	x	30000 (L.S.)	Rs.	1.50 0.30
6	Provision for electric services connection including electric fitting for tube wells & boosting chamber & cost of transformer etc. Rs. 60000/-	1	x	60000 (L.S.)	Rs.	2.50 0.60
7	Provision for carriage of material and unforeseen item. L.S. Rs. 30000/-	1	x	30000 (L.S.)	Rs.	0.50 0.30
TOTAL					Rs.	31.00 16.45
Add 3% contingencies & P.C. charges					Rs.	0.93 0.46
TOTAL					Rs.	31.93 15.91
Add 49% Department charges, Price Escalation & other unforeseen Charges.					Rs.	7.80
TOTAL COST					Rs.	15.64 23.71

B 47.57 lacs



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Sub Work No-1					Water Supply	
Sub Work No-03					Rising Main from HUDA	
SI No	DESCRIPTION	Qty	Rate		AMOUNT (In Lacs)	
1	Providing, laying, jointing & testing 80 mm dia. G.I. pipe lines including cost of excavation complete in all respects.	105	@ 800 12500	Rs.	1.31	-0.84
2	Providing and fixing 60 mm dia. sluice valves including cost of surface boxes and masonry chambers etc., complete in all respects.	1	@ 40000 10000 12000	Rs.	0.40	-0.10
3	Providing and fixing indicating plates for sluice valves, air valves and fire hydrants.	1	@ 10000 1000 1000	Rs.	0.10	-0.010
4	Provision for carriage of material & other foreseen items etc., L.S.	1	(L.S.) 30000	Rs.	0.30	
5	Provision for making connection with HUDA main (L.S.) 1 job complete in all respect	1	(L.S.) 60000	Rs.	0.60	
6	Provision for cutting road and making good the same (L.S.) 1 job	1	(L.S.) 60000	Rs.	0.60	
TOTAL				Rs.	2.54	2.45
Add 3% contingencies <i>ELP charges</i>				Rs.	0.07	0.07
TOTAL				Rs.	2.61	2.52
Add 49% Department charges, Price Escalation & other unforeseen Charges.				Rs.	1.28	1.24
TOTAL COST				Rs.	3.89	3.76

3.19 lacs
0.10 lacs
3.29 lacs
1.61 lacs
4.90 lacs

Material Statement and design statement of HUDA Rising Mains

S. No.	Name of line		Dia. in mm	Length in m from municipal to U.G.T.
1	Municiple Main To UGT		60	105 m



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Sub Work No-1				Water Supply	
Sub Head No-04				Distribution system	
SI No	DESCRIPTION	Qty	Rate		AMOUNT (In Lacs)
1	Providing, laying, jointing & testing D.I. pipes including cost of excavation complete as per ISI marked. <i>D=1m + Flushing water-line</i>	200	@	800	Rs. 2.50
	100 mm I/D			12500	Rs. 1.80
2	Providing, laying, jointing & testing G.I. pipes including cost of excavation complete as per ISI marked.				
	50 mm I/D	30	@	350	Rs. 0.11
	65 mm I/D	30	@	500	Rs. 0.15
2	Providing and Fixing sluice valves including cost of brick masonry chamber complete in all respect.				
	100 mm I/D	10	@	10000	Rs. 1.20
	65 mm I/D	3	@	2000	Rs. 0.40
	50 mm I/D	3	@	1600	Rs. 0.05
3	Providing and Fixing air valves and scour valves including cost of brick masonry chamber complete.	1	@	20000 10000 10000	Rs. 0.20
4	Providing and Fixing indicating plates for sluice valves	10	@	2000 1000 1000	Rs. 0.10
5	Provision for carriage of material & other foreseen items etc., (L.S). 1 Job including cutting of road and making the same.	1	@	60000 70,000	Rs. 0.70
TOTAL					Rs. 3.47
Add 3% contingencies					Rs. 0.10
TOTAL					Rs. 3.57
Add 49% Department charges, Price Escalation & other unforeseen Charges.					Rs. 1.75
TOTAL COST					Rs. 5.32

Flushing water supply line

4.90

0.15

5.05

2.47

7.52



**PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II, (POCKET-II) (ON 2.3828 ACRES) AT
MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)**

S. No.	Description	200 mm	150 mm	100 mm	80 mm	65 mm	50 mm
(A)	Domestic						
	Ring Main						
1	UGT- W1	-	-	10	-	-	-
2	W1-W2	-	-	40	-	-	-
3	W2-Tower - II Shaft	-	-	20	-	-	-
4	W2-Tower - II	-	-	20	-	-	-
5	To fill O.H.T. riser to building shafts					(3 No. x 10 Mtr.) =	
	TOTAL	0	0	90	0	30	0
(A)	Flushing						
1	STP- FWS1	-	-	10	-	-	-
2	FWS1-FWS2	-	-	30	-	-	-
3	FWS2-FWS3	-	-	60	-	-	-
4	FWS3-FWS4	-	-	10	-	-	-
5	Riser to building shafts (AV) & fill O.H.T.s	-	-	-	-	-	(3 No. x 10 Mtr.) = 30
	TOTAL	0	0	110	0	0	30
	GRAND TOTAL	0	0	200	0	30	30



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART-II, (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

DOMESTIC WATER SUPPLY (HYDRAULIC CHART) TOWER-2 (POCKET-II)

S. No	Ref of line	Length in mts	Self			Additional		AVWD	Domestic Water demand @ 85% of AVWD Apts +35% commercial	Peak Demand @ 3 time of AVWD	Dia of Pipe	Velocity	Loss of Head in 1000 M (mts)	Loss of head in the line (mts)	Level in start			Remarks
			3 BHK @ 5 persons /3BHK + Servants @ 7 person/unit + EWS @ 4 Person / Unit @ 172.5 LPCD	Floating Population @ 10% of Population 15 LPCD	Community center+ Backwash, Staff, Shops & Swimming Pool (LPD)	3 BHK @ 5 persons /3BHK + Servants @ 7 person/unit + EWS @ 4 Person / Unit @ 172.5 LPCD	Floating Population @ 10% of Population 15 LPCD								Community center+ Backwash, Staff, Shops & Swimming Pool (LPD)	KLD	HL	
1	A: UGT																	Ground level = 216.26 Mir UGT Bed level= 213.26 Mir
2	UGT-W1	10							94.65	283.95				342.25	216.26	126.00		Add Building head G+26 = 10+4+26 = 114 mts Add suction head = 5 mtrs Add Delivery head= 3mtr Add positive head = 3 mtrs Add friction losses = 4 mir Head level = 342.26 mts
3	W1-W2	40	EWS 18 unit 72 person = 12420 Ltr	7 Persons = 105 Ltrs	Backwash + Shops + Staff = 10000 + 300*1125=11425 Ltrs + Community center + Backwash	3 BHK 86 unit @ 5 persons / 3BHK + Servants 14 unit + EWS 18 Unit = 600 Persons = 103500 Ltrs.	60 Persons = 900Ltrs	Community Center+ backwash +staff + Shop+ Swimming Pool = 1530*10000+1125*300 =27955	132.35	283.95	100	0.75	3.80	342.22	216.26	125.96		
4	W2-Tower-II	20	3 BHK + 3 BHK Servant = 528 Persons = 91080 Ltrs.	52 Persons = 780 Ltrs	Community Centre + Swimming Pool = 1530*15000 =16530 Ltrs.	3BHK + 3BHK + Servant =528 Person = 91080 Ltrs.	52 Persons = 780Ltrs		132.35	283.95	100	0.75	3.80	341.90	216.26	125.73		
								75.01	225.03	100	0.75	2.60	0.17	341.82	216.26	125.59		

Note: 1. Cold Water supply line will be laid as per HUDA / NBC Norms.
2. Head Level has been calculated with reference to Road Level 216.26.



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART - II, (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

FLUSHING WATER CAPACITY (HYDRAULIC CHART) TOWER-2 (POCKET-II)

S. No	Ref of line	Length In mts	Self		Community center+ Backwash, Staff + Shops & Swimming Pool (LPD)	3 BHK @ 5 persons / 3BHK + Servents @ 7 person/unit + EWS @ 4 Person / Unit @ 172.5 LPCD	Floating Population @ 10% of Population @ 15 LPCD	Additional Floating Population @ 10% of Population @ 15 LPCD	Community center+ Backwash, Staff + Shops & Swimming Pool (LPD)	AVWD KLD	Domestic Water demand @ 35% of AVWD Apts + 65% of commercial	Peak Demand @ 3 time of AVWD	Dia of Pipe	Velocity	Loss of Head in 1000 M (mts)	Loss of head in the line (mts)	Level in start		Remarks	
			3 BHK @ 5 persons / 3BHK + Servents @ 7 person/unit + EWS @ 4 Person / Unit @ 172.5 LPCD	TH													GL	HL		
1	At STP	-	-	-	-	3 BHK 86 unit @ 5 persons / 3BHK + Servents 14 unit + EWS 18 Unit = 600 Persons = 103500 Ltrs	60 Persons = 900 Ltrs	60 Persons = 900 Ltrs	Community Center+ backwash +staff + Shop+ Swimming Pool = 1530+10000+1125+300 = 27955 Ltrs	132.35	37.70	113.10	-	-	-	-	342.26	216.26	126.30	Ground level = 216.26 Mtr STP Bed level=209.26 Mtr Add Building head G+26 = 70-26x4 = 1.4 mts Add suction head = 5 mts Add Delivery head= 7 mtr Add positive head = 3 mtrs Add friction losses = 4 mtr Head level = 342.26 mts
2	STP-FWS1	10	-	-	-	3 BHK 86 unit @ 5 persons / 3BHK + Servents 14 unit + EWS 18 Unit = 600 Persons = 103500 Ltrs	60 Persons = 900 Ltrs	60 Persons = 900 Ltrs	Community Center+ backwash +staff + Shop+ Swimming Pool = 1530+10000+1125+300 = 27955 Ltrs	132.35	37.70	113.10	100	0.75	3.80	0.04	342.22	216.26	125.94	
3	FWS1-FWS2	30	EWS 18 unit 72 person = 12420 Ltr	7 Person = 105 Ltrs	Backwash + Shops + Staff = 13000 + 300+1125=11425 Ltrs	3 BHK 86 unit + 3BHK + Servents 14 unit = 91080 Ltrs.	52 Person = 780 Ltrs	52 Person = 780 Ltrs	Community Centre + Swimming Pool = 1530 +15000 = 16530 Ltrs	132.35	37.7	113.1	100	0.75	3.80	0.13	342.09	216.26	125.81	
4	FWS-2 FWS-3	60	-	-	Community Center + Swimming Pool = 1530 +15000 = 16530 Ltrs	3 BHK 86 unit + 3BHK + Servents 14 unit = 91080 Ltrs.	52 Person = 780 Ltrs	52 Person = 780 Ltrs	-	108.39	35.38	100.14	100	0.75	3.80	0.28	341.79	216.26	125.53	
5	FWS-3 FWS-4	10	3 BHK 86 unit + 3BHK + Servents 14 unit = 91080 Ltrs.	52 Person = 780 Ltr	-	-	-	-	-	91.86	32.39	97.17	100	0.75	3.60	0.14	341.65	216.26	125.39	

Note: 1. Flushing Water supply line will be laid as per HUDA / NBC Norms.
2. Head Level has been calculated with reference to Road Level 216.26.



**PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II, (POCKET-II) (ON 2.3828 ACRES) AT
MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)**

Sub Work No-1						Water Supply
Sub Work No-05						Fire fighting
SI No	DESCRIPTION	Qty		Rate		AMOUNT (In Lacs.)
1	Providing, laying jointing & testing M.S. pipe lines for rising main including cost of fitting, valves, connection etc., complete in all respects.					
	150 mm I/D for Ring Main	20	@	2000/- 157200.00	Rs.	0.40 0.79024
	100 mm I/D for Tanker Inlet	10	@	12500.00	Rs.	0.25010 0.12
	80 mm I/D for Yard hydrant fire Brigade connection	6	@	800.00 1000	Rs.	0.06 0.05
2	Providing & fixing valve including cost of surface boxes and masonry chambers etc. complete in all respects					
	- 150 mm dia.	1	@	12000.00		0.15 0.28
	- 100 mm dia.	1	@	12000.00		0.02
	- 80 mm dia.	4	@	5000.00		0.20
3	Providing and fixing fire Hydrant with accessories	4	@	10000.00 7000.00	Rs.	0.40 0.28
4	Providing for carriage of material (L.S.) 1 jobs	1	@	30000.00	Rs.	0.25 0.30
5	Providing and fixing Indicating plate	7	@	850.00	Rs.	0.06
	TOTAL			1000/-	Rs.	1.93154 2.16
	Add 3% contingencies <i>Eq PE Charges</i>				Rs.	0.05005 0.06
	TOTAL				Rs.	1.98159 2.22
	Add 49% Department charges, Price Escalation & other unforeseen Charges.				Rs.	0.97078 1.08
	TOTAL COST				Rs.	2.95236 3.30

Material Statement of Fire ring – MS – 150mm dia

S. No.	Location	200 mm dia pipe	150 mm dia pipe	100 mm dia pipe	80 mm dia pipe	Fire Hydrant
1	Tanker inlet connection	-	-	10	-	-
2	Fire Brigade 4 way	-	20	-	-	-
3	Two Way drawout Pipe	-	20	-	-	-
4	Yard Hydrants = 4 Nos. x 1.5 Meters	-	-	-	6	4
	Total	0	20	10	6	4

Fire Hydrant System

1	Valves 150mm dia	2 Nos.
2	Valves 100mm dia	1 No.
3	Valves 80mm dia	4 Nos.
4	Fire Hydrants	4 Nos.
5	Fire Brigade Connections	1 No.



**PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT
MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)**

Sub Work No-1						Water Supply	
Sub Work No-06						Irrigation	
Sl No	DESCRIPTION	Qty		Rate		AMOUNT (In Lacs)	
1	Providing, laying, jointing and testing uPVC pipe line conforming to I.S 4985 including cost of excavation etc., complete in all respects.						
25)	20 mm O/D for Garden Pipe	27 (25)	@	170 200	Rs.	0.05 0.05	
	75 mm O/D for Ring Main	445	@	350	Rs.	1.56	
	110 mm O/D from STP to Ring Main	25	@	500	Rs.	0.13	
2	Providing and fixing Irrigation hydrant valve complete in all respect.	18	@	800 3500	Rs.	0.14 0.35	
3	Provision for carriage of material & other foreseen items etc., (L.S.) 1 jobs				Rs.	0.25	
4	Providing & fixing ball valve 20 mm	18	@	250	Rs.	0.05	
5	Providing & fixing sluice valve complete with chamber.						
	- 65 mm dia.	1	@	9000	Rs.	0.03	
	- 100 mm dia.	1	@	4000	Rs.	0.04	
6	Providing and fixing Irrigation pump 2 HP, 170 LPM @ 35 Mtr. Head complete with foundation & control panel etc.	2	@	20000 50,000	Rs.	0.40 1.00	
TOTAL						Rs.	3.252.64 1.10
Add 3% contingencies						Rs.	0.09 0.08 0.03
TOTAL						Rs.	3.342.72 1.13
Add 49% Department charges, Price Escalation & other unforeseen Charges.						Rs.	1.63 1.33 0.55
TOTAL COST						Rs.	4.974.05 1.68

Material statement of Irrigation System

S. No.	Line Name	110 mm OD	75 mm OD	20 mm OD	Irrigation Hydrants
1	Pump Room to ring main.	25	-		
2	Garden hydrant ring main around the building	-	445		
3	Garden hydrant 18 x 1.5 mts (AV)	-	-	27	
4	Garden hydrant	-	-		18
	Total	25	445	27	18



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II, (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

Sub Work No-II					Sewerage Scheme	
SI No	DESCRIPTION	Qty	Rate		AMOUNT (In Lacs)	
1	Providing, jointing, cutting and testing S.W pipe class 'A' / S.W /RCC and lowering into trenches including cost of excavation, bed concrete, cost of manhole etc., complete in all respects.					
	250 mm I/D Avg. depth upto 0 - 4.00 M (S.W. Pipe) <i>120</i>	<i>155</i>	<i>2000</i> @ <i>1200.00</i>	Rs.	<i>3.10</i> 1.86 <i>2.40</i>	
	<i>DP</i> Pipe) <i>150mm dia = 35 mtr @ ₹ 1575/- mtr</i>				<i>0.55</i>	
2	Provision for lighting and watching L.S	1	@ <i>(L.S)</i> 30000.00	Rs.	0.50	
3	Provision for timbering and shuttering L.S.	1	@ <i>(L.S)</i> 30000.00	Rs.	0.50	
4	Provision of 300 mm dia line form STP to HUDA main by pumping (L.S)	1	@ <i>(L.S)</i> 60000.00 100000.00	Rs.	<i>0.50</i> 0.80 <i>1.00</i>	
5	Providing boosting arrangement by 2 nos. pump for flushing water supply 5.0 HP capacity 100 L.P.M. 130 Meter Head	<i>2</i>	@ 30000.00	Rs.	<i>0.60</i>	
5	Provision for making STP (KLD) <i>115KLD up to treatment tank</i>	<i>20</i>	@ <i>(L.S)</i> 7000.00	Rs.	<i>1.50</i> 4.90	
7	Provision for carriage of maternal (L.S.)	1	@ 30000.00 100000.00	Rs.	<i>0.90</i> 0.30 <i>1.00</i>	
7	Provision of cutting road & making it good as same in original condition - 1 job <i>and making connection</i>	1	@ <i>(L.S)</i> 70000.00	Rs.	<i>1.50</i> 0.70 <i>1.60</i>	
TOTAL <i>with new main</i>				Rs.	<i>21.45</i> 9.96 <i>12.51</i>	
Add 3% contingencies <i>& PE charges</i>				Rs.	<i>0.64</i> 0.30 <i>0.34</i>	
TOTAL				Rs.	<i>22.09</i> 10.26 <i>11.83</i>	
Add 49% Department charges, price escalation, other for unforeseen charges.				Rs.	<i>10.82</i> 5.93 <i>6.30</i>	
TOTAL COST				Rs.	<i>32.91</i> 16.19 <i>16.72</i>	

Material statement of Sewerage System – As per drawing sheet

S. No.	Name of Pipe Line	Length of Pipe in M			
		150 mm	300 mm	250 mm	200 mm
1	S1-S2 <i>PIPE running along ceiling basement (DP)</i>	<i>35</i>	-	<i>35</i>	<i>DI PIPE</i>
2	S2-S3	-	-	20	<i>S.W. PIPE</i>
3	S3-S4	-	-	60	
4	S4-S5	-	-	30	
5	S5-STP	-	-	10	-
	Total	<i>35 m</i>	0	<i>155</i>	0

120 m



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

TOTAL WATER REQUIREMENT

(I) DAILY WATER REQUIREMENT TOWER -II

A Residential blocks (G+26)

a) Type 3 BHK	=	86 Units
@ 5Person / unit	=	430 Persons
b) Type 3 BHK + Servent	=	14 Units
@ 7Person / unit	=	98 Persons
c) Type EWS (G+4)	=	18 Units
@ 4 Person / unit	=	72 Persons
		90
Total population	=	<u>618 600</u> Persons
@ 86.0 LPCD (1)	=	<u>106605</u> 54600 Liters/ Day
Say 172.50	=	52000 Liters/ Day
		106605

B Commercial

a) Community Building (142.31 sqm @ 1.4 sqmt/ person @ 15 LPCD)	=	1530 Liters/day
b) Ground Floor Convent shopping (47.738 sqm @ 3 sqmt/ person)	=	16 Persons
i) Shop Keeper @ 10%	=	2 Persons
@ 45 LPCD	=	90 Liters/day
ii) Visitors	=	14 Persons
@ 15 LPCD	=	210 Liters/day
c) Maintenance Staff (Such as Gardener, ESS Staff, Security Guards etc.)	=	25 Persons
@45 LPCD	=	1125 Liters/day
d) Back Wash Filters - 10% AV/WD	=	10000 Liters/day
e) Floating Population 10% of Population	=	60 Persons
@ 15 LPCD	=	900 Liters/day
f) Swimming Pool	=	15000 Liters
Total Commercial	=	28855 Liters/day
Say	=	29000 Liters/day

C Horticulture & Road side plantation

a) Area under Green area 1500.788 sqmt. @ 5 ^{6.17} Liters / sqmt.	=	7504.00 ⁹²⁶⁰ Liters/day
b) Area under road & paved area of 6450.221 @ 5 liters/ sqm (9642.834-(1691.825+1500.788) = 6450.221 Sq.m)	=	32251.00 Liters/day
Total	=	39755.00 ^{41511.00} Liters/day
Or Say	=	40000.00 Liters/day



The demand of Horticulture & Road work will met from recirculated water after treatment at S.T.P.

Total Water demand (A + B)		135605	
Total Water demand (KLD)	106605 + 29000 =	136.0	81.00 Liters/day
Or Say			81.00 KLD
			81.00 KLD
		136.0	
Domestic water demand 65% of AV/WD of (A) +35% of [B (a+b+c+e) + 100% of B (d+f)]	=	60200.00	Liters/day
Domestic water demand (KLD)	=	95643	
Or Say	=	60.20	KLD 95.64
	=	60.00	KLD
		96.0	
Flushing water demand 35% of AV/WD of (A) +65% of [B(a+b+c+e)]	=	20800.00	Liters/day
Flushing water demand (KLD)	=	39818	
Or Say	=	20.80	KLD 39.82
	=	21.00	KLD
		40.0	
Sewage Treatment Plant Capacity		112350	
Average Sewerage Contribution Considering 80% of AV domestic water demand & 90% of AV/Flushing demand	=	66900	Liter / Day
Sewage Treatment Plant Capacity (KLD)	=	112.35	
Or Say	=	66.90	KLD
	=	70.00	KLD
		115.0	
Sewage scheme			
Peak discharge @3 times of sewage discharge plus sub soil infiltration @ 10% of total water demand	=		218100 Liters
	=		48467 GPD
	=		0.09 Cusces

Hence 250 mm dia pipe having design capacity 0.659 cusces is sufficient to carry the above discharge



Kalra

PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART-II, [POCKET-II] (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)
(Hydraulic Design Sewerage Scheme) (Pocket-II)

Sl. No.	Name of Line	Length in Meter	3 BHK @ 5 persons / BHK + Servant @ 7 Person/unit @ 172.5 LPCD	EWS @ 2 person/OU @ 172.5 LPCD	Floating population 10% of Population @ 15 LPCD	Community center, Backwash, Swimming Pool & Shops	Staff @ 45 LPCD / Person	3 BHK @ 5 persons / BHK + Servant @ 7 Person/unit @ 172.5 LPCD	EWS @ 2 person/OU @ 172.5 LPCD	Floating population 10% of Population @ 15 LPCD	Community center, Backwash, Swimming Pool & Shops	Staff @ 45 LPCD / Person	Average Daily Water Demand	Average Discharge 30% of Domestic + 30% of flushing	Sub Soil Infiltration @ 10% of AV/WD	Peak Discharge @ 3 Times of AV Discharge including Sub Soil Infiltration	Size of pipe in cusec (dia)	Position of Pipe Capacity in cusec	Gradient	Drop	Level at Start G.L.	Level at End	
1	S1-S2	35	3 BHK 43 unit + 3 BHK + Servant 7 unit = 284 person = 48540 Ltrs.	-	26 Person = 390 Ltrs	-	-	3 BHK 43 unit + 3 BHK + Servant 7 unit = 284 person = 48540 Ltrs.	-	26 Person = 390 Ltrs	-	-	45.98	38.380	4.50	0.048	250	0.659	1:180	0.28	216.26	216.26	216.08
2	S2-S3	20	-	-	-	-	-	3 BHK 43 unit + 3 BHK + Servant 7 unit = 284 person = 48540 Ltrs.	-	26 Person = 390 Ltrs	-	-	45.98	38.38	4.60	0.048	250	0.659	1:180	0.11	216.26	215.08	214.69
3	S3-S4	60	3 BHK 43 unit + 3 BHK + Servant 7 unit = 284 person = 48540 Ltrs.	-	26 Person = 390 Ltrs	Community center, Backwash, Shops + Swimming Pool = 28830	25 Person = 1125 Ltrs.	3 BHK 43 unit + 3 BHK + Servant 7 unit = 284 person = 48540 Ltrs.	-	26 Person = 390 Ltrs	Community center, Backwash, Shops + Swimming Pool = 28830	25 Person = 1125 Ltrs.	119.92	88.30	11.89	0.126	250	0.659	1:180	0.18	216.26	214.69	214.51
4	S4-S5	30	-	-	-	-	-	3 BHK 86 unit + 460 Person + 3 BHK Servant 98 Person = 528 Person = 91180 Ltrs.	-	52 Person = 780 Ltrs	Community center, Backwash, Shops + Swimming Pool = 28830	25 Person = 1125 Ltrs.	119.92	88.30	11.98	0.126	250	0.659	1:180	0.32	216.26	214.51	214.19
5	S5-STP	10	-	-	-	-	-	EWS 18 Unit 72 Person = 12420 Ltrs.	EW 18 Unit 72 Person = 12420 Ltrs.	56 Person = 840 Ltrs	Community center, Backwash, Shops + Swimming Pool = 28830	25 Person = 1125 Ltrs.	132.20	109.78	13.24	0.140	250	0.659	1:190	0.05	216.26	214.19	214.15

Note:- 1 The Man hole shall be constructed as per HUDAN N.B.C Norms
2 All the level have been taken with Reference to road level

= 216.26



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

Sub Work No-III

Storm water drain

S. No.	DESCRIPTION	Qty		Rate		AMOUNT (In Lacs)
1	Providing, lowering, laying and jointing R.C.C NP-3 pipes and specials into trenches including manholes, chambers etc., excavation, back filling and disposal of surplus earth complete in all respects.					10.25 lacs 6.15
1.1	400 mm I/D Avg. depth upto 2.0 M.	410	@	2500	Rs.	5.13
2	Provision for Road Gullies L.S. <i>With 300 mm dia pipe connection</i>	1	@	100000	Rs.	1.00 0.60 ✓
3	Provision for lighting and watching	1	@	30000	Rs.	0.30 0.50
4	Provision for timbering and shoring L.S.	1	@	250000	Rs.	0.25 0.30 0.50
5	Provision for carriage of material & other foreseen items etc., L.S.	1	@	60000	Rs.	0.50
6	Provision for Rain water harvesting arrangements for 2 Nos. Rain Water Harvesting	2	@	250000	Rs.	5.00 3.40
7	Provision for temporary connection with HUDA <i>on main drain</i>	1	(45)	60000	Rs.	1.00 0.60
TOTAL						Rs. 19.55 10.93 12.75
Add 3% contingencies <i>eg. PE charges</i>						Rs. 0.58 0.33 0.38
TOTAL						Rs. 20.13 11.25 13.13
Add 49% Department charges, price escalation, other for unforeseen						Rs. 9.94 5.51 6.43
TOTAL						Rs. 30.07 16.77 19.56

8 28.39 lacs

c.o. to final abstract of cost



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

STORM WATER DRAIN

S. No	Name of Drain	400mm dia RCC pipe
Rain Water Harvesting - 1		
1	D1-D2	115
2	D2-D3	30
3	D3-RWH-1	5
4	Over flow Pipe	5
	Total	155
Rain Water Harvesting - 2		
5	D4-D5	60
6	D5-D9	25
7	D6-D7	55
8	D7-D8	75
9	D8-D9	10
10	D9-D10	5
11	D10 to RWH-2	5
12	Over flow Pipe -City Drain	20
	Total	255
	Grand Total	410



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II, (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT.

**GURUGRAM (HR)
Hydraulic Design Chart**

Storm Water Drain

Calculations are based on Manning Formula $V = (1.486/n) \times m^{2/3} \times s^{1/2}$ in F.P.S System

Sl. No.	Name of Line	Length in Meter	Catchment Area in sqmt		Total Area Discharge in Cusec (1 Acre = 1 Cusec)	Velocity (ft/sec)	Design Capacity of Pipe (Cusec)	Gradient	Drop (Mtr.)	Level at Start			Level at End				
			Self	Additional						G.L. (Mtr.)	I.L. (Mtr.)	Depth (Mtr.)	G.L. (Mtr.)	I.L. (Mtr.)	Depth (Mtr.)		
Rain Water Harvesting - 1																	
1	D1-D2	115	80 X 25 = 65X21 = 2000+1365 = 3365	-	3365	0.831	400	0.75	3.30	1:500	0.23	216.26	215.36	0.90	216.26	215.13	1.13
2	D2-D3	30	30 x 10 = 300	Line D1-D2 = 3665	3665	0.905	400	0.75	3.30	1:500	0.06	216.26	215.07	1.19	216.26	215.01	1.25
3	D3 - RWH-1	5	-	Line D2-D3 = 3665	3665	0.905	400	0.75	3.30	1:500	0.01	216.26	215.01	1.25	216.26	215.00	1.26
Rain Water Harvesting - 2																	
4	D4-D5	60	55 X 21 = 1155	-	1155	0.285	400	0.75	3.30	1:500	0.12	216.26	215.36	0.90	216.26	215.25	1.01
5	D5-D9	25	42 X 25 = 1176	Line D4 -D5 = 1155	2331	0.576	400	0.75	3.30	1:500	0.05	216.26	215.25	1.01	216.26	215.20	1.06
6	D6-D7	55	55 X 42 = 2310	-	2310	0.571	400	0.75	3.30	1:500	0.11	216.26	215.36	0.90	216.26	215.25	1.01
7	D7-D8	75	75 X 9.5 = 712.5	Line D6 -D7 = 2310	3022.5	0.747	400	0.75	3.30	1:500	0.15	216.26	215.25	1.01	216.26	215.10	1.16
8	D8-D9-D10	15	42 X 15 = 630	Line D7 -D8 = 3022.5	3652.5	0.903	400	0.75	3.30	1:500	0.03	216.26	215.10	1.16	216.26	215.07	1.19
	10 RWH2	5	-	Line D8- D9 + Line D5-D9 = 3652.5+2331.00=5983.5	5983.5	1.479	400	0.75	3.30	1:500	0.01	216.26	215.07	1.19	216.26	215.06	1.20



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

SUB WORK NO. - IV				Road Work		AMOUNT (In Lacs)
SI No	DESCRIPTION	Qty		Rate		
1	Provision for leveling - earth filling / cutting as per site conditions. (In Acres) Area = 2.3828 Acre	2.382800	@	150000	Rs.	2.38
2	Tremix - Driveway	2900.000	Sq.m	60000		3.54
3	Providing & Laying average 125mm, thick M-25 Grade (cement concrete) on the roads with Tremix finishing layer as specified below including all cost of placing, ramming & compacting with screed vibrator, putting dowels for adjoining panel. <i>200mm GSB 250mm Stone 50mm B.M. 25mm BC.</i>	362.50	Cum	6500	Rs.	23.56
3-1	P.G.C	290.00	Cum	1200		31.80
3-2	W.B.M (Layer 1)	290.00	Cum	1200		31.80
4	Provision of Paved path of C.C. 1:2:4	580	@	220	Rs.	4.28
6	Provision for Kerbs & channels of CC 1:2:4	580	@	270	Rs.	1.57
6	Provision for making approach to each block for C.C. pavements L.S.	1	@	60000	Rs.	0.60
5	Provision of guide maps at selected place (L.S.)	1	@	20000	Rs.	0.20
8	Provision for Demarcating Durgies - L.S.	1	@	20000	Rs.	0.20
9	Provision for Plot Indicator - L.S.	1	@	20000	Rs.	0.20
10	Provision for Parking Arrangement, L.S.	1	@	60000	Rs.	0.60
9	Provision of carriage of material and unforeseen items - L.S.	1	@	60000	Rs.	0.60
TOTAL				100000	Rs.	40.83
Add 3% contingencies & PE. charges					Rs.	1.23
TOTAL					Rs.	42.06
Add 49% Department charges, price escalation, other for unforeseen charges.					Rs.	20.62
TOTAL					Rs.	62.70

c.u. to final abstract of cost



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

Road Work

ROAD AREA CHART - POCKET-2						
ITEM	NO.	FORMULA	LENGTH (Metres)	BREADTH (m) (Metres)	HEIGHT (m)	AREA (SQ. M.)
1	1	1	40.743	13.500		550.031
2	1	1	9.125	6.000		54.750
3	1					110.732
4	1	1	6.000	30.172		181.032
5	1	1	16.589	5.004		83.011
6	1	0.5	16.589	11.773		97.651
7	1	0.5	16.956	11.292		96.734
8	1	0.5	24.351	11.292		137.486
9	1	0.5	24.314	11.463		139.356
10	1	1	8.067	12.815		103.379
11	1	1	4.200	9.818		41.236
12	1	1	6.000	12.813		76.878
13	1	1	3.948	10.820		43.112
14	1	0.5	6.713	10.920	2.868	25.286
15	1	0.5	2.734	2.139		2.924
16	1	1	6.000	30.850		185.100
17	1					116.375
18	1	1	30.398	6.000		182.388
19	1					55.948
20	1	1	13.532	6.000		81.192
21	1	0.5	1.045	6.000		3.135
22	1					20.412
23	1	0.5	6.000	4.193		12.579
24	1	1	6.000	11.875		71.250
25	1	1	6.000	10.565		63.390
26	1	0.5	6.000	0.204		0.612
TOTAL (X) =						2534.977
TOTAL ROAD AREA = X						2534.977
Total						2534.98
Add 10% curves.						263.60
Total						2788.47 2534.98
Add for Surface plaza / parking						100.00
Total						2888.47 2634.96
Say						2900.80 2650.80
Total Length of road			261.304			
Add 10% curves			26.1304			
Total Length			287 261.304			
Say			290 265	Mtrs.		

No. of Car Parking (open surface)

8 Nos.

Say

8 Nos.

Area = 8X5.0X2.5 =

100 Sqmts.

~~Pave Path on both side of Road = 290 x 2 =~~

~~.580-Sqmts.~~



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

Sub Work No-V					Street Lighting	
Sl No	DESCRIPTION	Qty	Rate		AMOUNT (In Lacs)	
1	Providing street lighting on roads as per standard specifications on HVPN <i>with CFL</i>				2.38	
	Area = 2.3828 Acre	2.382800	@	100000 60000	Rs. 1.43 5.96 lacs	
	TOTAL			2.50 lacs	Rs. 1.43 2.38	
	Add 3% contingencies <i>PE charges</i>			Acres	Rs. 0.04 0.07 0.18	
	TOTAL				Rs. 1.47 2.45 6.14	
	Add 49% Department charges, price escalation, other for unforeseen charges.				Rs. 0.72 1.20 3.00	
	TOTAL				Rs. 2.19 3.65 9.14 lacs	

c.o. to final abstract of cost



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

Sub Work No-VI					Plantation & Road side trees	
SI No	DESCRIPTION	Qty	Rate		AMOUNT (In Lacs)	
1	Development of Lawn Area :- a) Trenching the ordinary soil upto depth of 60 cm. including removal and packing of serviceable material and disposing at a lead of 50 M. and making up the trenched area to proper level by filling with earth mixed with manure before and after flooding trench with water including cost of imported earth and manure. b) Rough dressing of trenched area. c) Grassing with "doob grass" including watering and maintenance of lawns free from weeds and fit for moving in rows 7.50 cm. in either direction including for hedges and grill and barred wire fencing around park and green belts (As per HUDA norms) Area 1500.788 sqmt = 0.370					
		0.370	150000/- 70000	Rs.	0.37 0.26	
2	Providing & Planting of trees with tree guards on roads at 12 m intervals Total Road Length (M.) Trees @ 12 M. c/c Say (2 x 24) = 48 Or Say 50	265 200 242 50	ACM ACM		0.55	
	Cost of One Tree :- Excavation (Rs.) 50/- 60.00 Manure (Rs.) 50/- 90.00 Tree Plants (Rs.) 50/- 150.00 Tree Guards (Rs.) 450/- 1000.00 Total Cost (each) 1300/-					
	Cost of Total trees	50	@ 1300/600	Rs.	0.45 0.80 0.65	
	TOTAL		900	Rs.	0.58 0.82 1.20	
	Add 3% contingencies eg. PE Charts			Rs.	0.02 0.10 0.04	
	TOTAL			Rs.	0.58 0.92 1.24	
	Add 49% Department charges, price escalation, other for unforeseen charges.			Rs.	0.28 0.45 0.64	
	TOTAL			Rs.	0.86 1.37 1.85	

c.o. to incl abstract of cost





हरियाणा शहरी विकास प्राधिकरण

HARYANA SHEHRI
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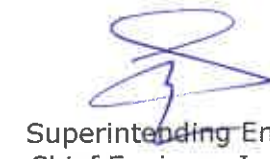
Email : cencrhsvp@gmail.com

Address: C-3, HSVP, HQ Sector-6
Panchkula

C.E. No:

Dated:

7. Potability of water will be checked and confirmed and the tube-wells will be put into operation after getting chemical analysis of water tested.
8. Only C.I/D.I pipes will be used in water supply and flushing system, UPVC/HDPE pipe for irrigation purposes.
9. A minimum 100 i/d C.I/D.I, 200mm i/d SW and 400mm id RCC NP-3 pipes will be used for water supply, sewerage and storm water drainage respectively.
10. Standard X-section for S.W. pipes sewer, RCC pipes sewer etc. will be followed as are being adopted in Haryana Public Health Engineering Deptt.or HSVP.
11. The X-section, width of roads, will be followed as approved by the Chief Town Planner, Haryana, Chandigarh. The kerbs and channels will also be provided as per approved X-section and specifications.
12. The specifications for various roads will be followed as per IRC/MORTH specifications.
13. The wiring system of street lighting and specifications of street lighting fixture will be as per relevant standards.
14. This shall confirm to such other conditions as are incorporated in the approved estimate and the letter of approval.


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



PROPOSED GROUP HOUSING COLONY AT SECTOR 15 PART -II , (POCKET-II) (ON 2.3828 ACRES) AT MANESAR URBAN COMPLEX TEHSIL & DISTT. GURUGRAM (HR)

SUB WORK NO. VII:				MTC. CHARGES AND RESURFACING OF ROADS.		
SI No	DESCRIPTION	Qty		Rate		AMOUNT (In Lacs)
1	Provision for maintenance charges for water supply, sewerage, storm water, drainage, roads, street light, Hort., etc. complete including operation & establishment charges as per HUDA norms after completion. Area = 2.3828 Acre	2.382800	@	350000 300000	Rs.	8.33 7.15
2	Provision for resurfacing of roads after first five years of maintenance i.e. 100mm thick B.M. with 25mm thick premix carpet with seal coat with mechanical paver. (Sqm)	2650 2,900	@	7.50/las / ACRE 600/-	Rs.	17.87 8.70
3	Provision for resurfacing of roads after 10 years of Mtc. i.e. 25mm thick premix carpet with seal coat with mechanical paver. (Sqm)	2650 2,900	@	750/-	Rs.	19.98 las 7.25
TOTAL					Rs.	23.10
Add 3% contingencies & PE Charges					Rs.	0.69
TOTAL					Rs.	23.79
Add 49% Department charges, price escalation, other for unforeseen charges.					Rs.	11.96
TOTAL					Rs.	35.75

Rs. 82.32 las

c.o. to final abstract of cost

