

**REVISED BUILDING PLAN OF MIX LAND
USE COLONY (88% RESIDENTIAL
COMPONENT & 12% COMMERCIAL
COMPONENT) UNDER TRANSIT ORIENTED
DEVELOPMENT (TOD) POLICY FOR THE
AREA MEASURING 7.0553 ACRES (FALLING
WITHIN TRANSITION ZONE) PART OF
GROUP HOUSING COLONY MEASURING
13.078 ACRES (LICENCE NO. 127 OF 2012
DATED 27.12.2012**

**AT
SEC - 105, GURUGRAM, MANESAR**

**SERVICE PLAN ESTIMATE
FOR
PUBLIC HEALTH ENGINEERING & FIRE SERVICES
WORK**

DEVELOPER

**SH. KANWAR SINGH & OTHERS IN COLLABORATION
WITH 1000 TREES HOUSING PRIVATE LIMITED.**

ARCHITECT

**ATS DESIGN & DEVELOPMENT DIVISION
PLOT NO. -16, SECTOR - 135, NOIDA. (U.P.) 201301**

MEP SERVICES CONSULTANT

**PARADISE CONSULTANTS
PLOT NO.129, BASEMENT, POCKET 2, JASOLA VIHAR, ND-25**

PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF PROPOSED BUILDING PLAN FOR REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0553 ACRES (FALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012) IN SECTOR- 105, GURUGRAM MANESAR URBAN COMPLEX BEING DEVELOPED BY SH. KANWAR SINGH & OTHERS IN COLLABORATION WITH 1000 TREES HOUSING PRIVATE LIMITED .

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

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1 Water Supply

The source of water supply shall be HUDA water supply connection. It has been proposed to construct underground tanks of capacity as per attached detailed for domestic and other purpose. The underground tanks will be filled up from the riser and then pumped to the overhead water tanks of each tower.

i.) Source

The source of water supply in this area is tubewells as the underground water is sweet and fit for human consumption, moreover, the water is available at reasonable depth. The average yield of tubewell with 60'-80' strainer will be about 32000 lph per hour. The recharging of under ground water table in this belt is stated to be good. However still we shall resort to rain water harvesting system to keep up the recharging system. The number of tubewells required for the above area has been worked out to 02 Nos and the tubewells will be bored in tune with growth of demand to avoid absence of the tubewells.

ii.) Design

The scheme has been designed for population of 4110 persons in 13.078 Acre. The rate of water supply per head per day has been taken assumed as 172.5 litres per head per day as per HUDA norms. In addition to above necessary provision of water for Community building, Commercial building, parks etc. have been taken into account for calculating the maximum number of tubewell water required.

iii.) Pumping Equipments

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

iv.) Under Ground Storage

Underground storage tank provision has been made, which caters for the present and a lot of future requirement as well as fire fighting requirement. The water for domestic water compartment shall overflow from the fire compartment so that the water in the fire compartment also remains fresh.

v.) **Boosting Station**

The boosting station is being planned near UGSR catering to the above requirement.

vi.) **Distribution System**

The distribution systems for this development has been designed to supply @ 172.5 Litres per head per day @ 3 times the average rate of flow on 'Hazen Willima' formula with C-100. Necessary provision for laying D.I. pipes only conforming to relevant IS standards along with valves and specials has been made in this estimate.

vii.) **Rising Mains**

Rising mains from HUDA water main on sector road to water works have also been designed and provision for D.I. pipe line (dia as/design) has been made in this estimate.

2 **Sewerage**

This scheme is designed for sewer connecting to the proposed sewage treatment plant. The sewerage system has been marked on the respective plans.

The sewer lines have been designed for 3 times average DWR in relation to the water supply demand assuming that 80% of the domestic water supply shall find its way into the proposed sewer SW pipe sewers have been proposed designed to run half full. The sewers have been designed on 0.76 mtr. per second velocity ie. Self cleansing velocity. Necessary provisions for laying SW pipes manholes etc. has been made in this estimate.

Necessary design statement for entire sewerage system has been prepared and attached with estimate.

3 **Storm Water Drainage**

The storm water drain is being designed to carry 45 mm rain fall per hour. Also suitable provisions are contemplated in our scheme to ensure better recharging of under ground water table in the area. RCC NP₃ pipe drain with minimum 400 mm dia is proposed in this area.

4 **Roads**

Cost of road has been taken in the estimate.

5 **Street Lighting**

Provision for street lighting on surrounding area has been made.

5 **Horticulture**

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



7 **Specifications :**

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

8 **Rates**

Estimates for providing services in this site has been prepared on the recent HUDA rates.

9 **Cost**

The total cost of development in this Project including various PH & B & R services works out to **Rs. 2058.70** ~~Rs. 1762.06 lacs~~ which includes 3% contingency and PE charges and 49% departmental charges also.

The cost per gross acre for this phase works out to **Rs. 154.42** ~~Rs. 134.735~~ **Lacs/acre** which covers the provision of services like water supply, sewerage, storm water drainage, roads, street lighting and plantations including plantations maintenance thereof as well as future expansion whatsoever indicated.

SH. KANWAR SINGH & OTHERS IN COLLABORATION WITH 1000 TREES HOUSING PRIVATE LIMITED

For 1000 TREES HOUSING PVT. LTD.

Authorised Signatory

Authorized Signatory



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DESIGN CALCULATION FOR HOUSING PART

A	Total No. of General Units	740 Nos.		
	Total No. of EWS Units	131 Nos.		
	Total No. of Service Personnel	74 Nos.		
	Population per Units (General)	5 Nos.		
	Population per Units (EWS)	2 Nos.		
	Population per Units (Service Personnel)	2 Nos.		
	Therefore population (General)	3700 persons		
	Therefore population (EWS)	262 persons		
	Therefore population (Servant Units)	148 persons		
1	Therefore Total Population	4110 persons		
		SAY	4110 persons	
	Water requirement for Units (General)	@	172.50 Lpcd.	
		Domestic @ 65 %	Flushing @ 35 %	
	Water requirement for Units (General)	@	113.00	59.50 Lpd.
			464430	244545 Lpd.
		or	464.43	244.55 Kld.
2	Visitors @ 10%		411.00 persons	
	Water requirement	@	15.00 Lpd.	
		Domestic	Flushing	
	Water requirement	@	5.00	10.00 Lpd.
			2055	4110 Lpd.
		or	2.06	4.11 Kld.
3	NURSERY SCHOOL (308.31 sq.m)			
	Ground Floor	308.310	sq.m	
		@		4 sq.m/per
	Population	77		
	Total Population	77		
	Staff @ 10%	8	-	- Person
	Visitors @ 90%	69	-	- Person
	Per Person Water Requirement		Domestic	Flushing
	Staff	45.00	25.00	20.00 Lpd.
	Visitors	15.00	5.00	10.00 Lpd.
	Daily Water Requirement			
	Staff	346.85	192.69	154.16 Lpd.
	Visitors	1040.55	346.85	693.70 Lpd.



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			0.54	0.85 Kld.
4 COMMUNITY (G+1)				
Ground Floor	621.620	sq.m		
Population	@ 345			1.8 sq.m/per
First Floor	377.600	sq.m		
Population of Upper Floors	@ 210			1.8 sq.m/per
Total Population	555			
Staff @ 10%	56	-		- Person
Visitors @ 90%	500	-		- Person
Per Person Water Requirement		Domestic		Flushing
Staff	45.00	25.00		20.00 Lpd.
Visitors	15.00	5.00		10.00 Lpd.
Daily Water Requirement				
Staff	2498.05	1387.81		1110.24 Lpd.
Visitors	7494.15	2498.05		4996.10 Lpd.
		3.89		6.11 Kld.
5 FILTER BACK WASH (ASSUMED LUMPSUM)	@	10.00		0.00 Kld.
Total Domestic Water Requirement (1+2+3+4+5)	Total	480.91		255.61 Kld.
6 Green area (16481.34 sqm or 4.072 Acres)	4.072			
Daily water requirement @ 25000 lit/Acre	@	-		25000 Ltr./Acre
		-		101800.00 Lpd.
		0.00		101.80 Kld.
7 Area under road/paved (28162.11 sqm or 2.856 Acres)	6.958			
Daily water requirement @ 5000 lit/Acre	@	-		5000 Ltr./Acre
		-		34790.00 Lpd.
		0.00		34.79 Kld.
	(6+7)	Total	0.00	136.59 Kld.
I Total daily requirement				
a) For Domestic+Flushing use (1+2+3+4+5)		480.91		255.61 Kld.
b) Under Road+ Parks (6+7)		0.00		136.59 Kld.
Total Daily Requirement		480.91		392.20 Kld.
	SAY	490.00		400.00 Kld.
II Tubewell				
Assuming working hours of tubewells				8 Hours
Assuming discharge/hour of each tubewell				32 KL/Hours
Total domestic demand				480.91 Kld.
No. of tubewells required	480.91 /32/8			1.88
	Say			2.00 Nos.



III Pumping machinery for tubewell

Gross working load	=	45.00 Mtr.
Average fall in SL	=	3.05 Mtr.
Depression head	=	6.10 Mtr.
Friction loss in main	=	2.50 Mtr.
	=	56.65 Mtr.
Say	=	60.00 Mtr.
BHP = $30000 \times 60 \times 1 / 60 / 60 / 75 / 0.6$	=	11.85 11.85 HP
With 60% efficiency	Say	15.55 14.00 HP
		12.50

IV Underground Tank

Daily requirement for domestic use	=	480.91 Kld.
Capacity of under ground tank		
24 hours storage	$480.91 \times 24 / 24$	480.91 Kld.
	Say	500.00 Kld.
Fire Tank Capacity As/NBC-2016	=	660.00 KLD
	Say	660.00 KL
TOTAL		1160.00 KL

It is proposed to provide under ground tank of capacity **1160 KL** which also includes **660 KL** capacity for fire fighting.

Tanks will have six compartments, two for fire, two for raw and the other two for domestic use. The water first enters the fire compartment, then over flows to the raw use compartment so that the water in the fire compartment shall remain fresh.

It is proposed to provide the under ground tank of following capacity :

Capacity of Fire Water Tank-01	330.00 KL.
Capacity of Fire Water Tank-02	330.00 KL.
Capacity of Raw Water Tank-01	125.00 Kld.
Capacity of Raw Water Tank-02	125.00 Kld.
Capacity of Domestic Water Tank-01	125.00 Kld.
Capacity of Domestic Water Tank-02	125.00 Kld.
	UGT

V BOOSTING MACHINERY

UG. Tank

Daily requirement for domestic use	=	480.91 Kld.
Assuming 6 hours pumping	4 pumps (with one standby)	
Discharge/hour	$480.91 / 6 / 4 =$	20.04 KL/Hours
Head of pump		334.60m say 350.00m
i) Suction lifts	=	0.0 Mtr.
ii) Friction loss in M<main & specials	=	4.0 Mtr.
iii) Clear head	=	120.0 Mtr.
iv) Residual head	=	5.0 Mtr.
	=	129.0 Mtr.
BHP of motor	$350 \times 135 / 6 \times 75 \times 0.60$	say 135 mh
		16.0 17.56 HP
		16.0 17.56 HP



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Daily requirement for flushing use (Commercial part added)	=	415.40 Kld.
Assuming 6 hours pumping	4 pumps (with one standby)	
Discharge/hour	415.40 / 6 / 4 =	17.35 KL/Hours
Head of pump		288.47 Lpm
i) Suction lifts	=	say 300 Lpm 0.0 Mtr.
ii) Friction loss in M<main & specials	=	4.0 Mtr.
iii) Clear head	=	120.0 Mtr.
iv) Residual head	=	5.0 Mtr.
	=	129.0 Mtr.
	=	say 135 m
BHP of motor	300 x 135 60 x 75 x 0.60	15.0 13.8 HP 14.0 HP say 15.0

VI PUMPS FOR FIRE PROTECTION

Pump Description	Location	Nos.	Discharge	Head	HP
i) Diesel Driven Pump	Pump Room	2	2850	170.00	
ii) Hydrant Pump	Pump Room	1	2850	170.00	180
iii) Sprinkler Pump	Pump Room	1	2850	170.00	180
iv) Jockey Pump	Pump Room	2	180	170.00	20

Capacity of Gen Set	Nos.	HP		
Domestic Water Transfer Pumps	4	16.0	17.50	70 64 HP
Flushing Water Transfer Pumps	4	15.0		60 56 HP
Tubewell	2	14.0	12.50	25 28 HP
Fire Pump (Jockey)	2	20.0		40 HP
Lighting				25 HP
				213 HP
	220			226
or	213 x 0.746 x 1.50			246.18 238.35 KVA
	Say			240.00 KVA
				250.0

DESIGN CALCULATION (FOR COMMERCIAL PART)

1 COMMERCIAL (8306.53 sq.m)			
Ground Floor (Lower+Upper)	4893.470	sq.m	
	@		3 sq.m/per
Population (Lower+Upper)	1631		
Upper Floors	3413.060	sq.m	
	@		6 sq.m/per
Population of Upper Floors	569		
Total Population	2200		
Staff @ 10%	220	-	- Person
Visitors @ 90%	1980	-	- Person
Per Person Water Requirement		Domestic	Flushing
Staff	45.00	25.00	20.00 Lpd.
Visitors	15.00	5.00	10.00 Lpd.
Daily Water Requirement			
Staff	9900.00	5500.00	4400.00 Lpd.
Visitors	29700.00	9900.00	19800.00 Lpd.
		15.40	24.20 Kld.



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2	FILTER BACK WASH (ASSUMED LUMP SUM)	@	10.00	0.00 Kld.
	Total Domestic Water Requirement (1+2)	Total	25.40	24.20 Kld.
I	Total daily requirement			
	a) For Domestic+Flushing use (1+2)		25.40	24.20 Kld.
		SAY	30.00	30.00 Kld.
II	Tubewell			
	Assuming working hours of tubewells			8 Hours
	Assuming discharge/hour of each tubewell			32 KL/Hours
	Total domestic demand			25.40 Kld.
	No. of tubewells required	25.40 / 32/8		0.10
		Say		1.00 Nos.
III	Pumping machinery for tubewell			
	Gross working load	=		45.00 Mtr.
	Average fall in SL	=		3.05 Mtr.
	Depression head	=		6.10 Mtr.
	Friction loss in main	=		2.50 Mtr.
		=		56.65 Mtr.
	Say	=		60.00 Mtr.
	BHP = $36000 \times 60 \times 1 / 60 / 60 / 75 / 0.6$	=		11.85 13.33 HP
	With 60% efficiency	Say		14.00 12.56 HP
IV	Underground Tank			
	Daily requirement for domestic use	=		25.40 Kld.
	Capacity of under ground tank			
	24 hours storage	25.40 x 24 / 24		25.40 Kld.
	Say	=		30.00 Kld.
	Fire Tank Capacity As/NBC-2016	=		Not Required
	TOTAL			30.00 KL
	It is proposed to provide under ground tank of capacity 30 KL . Tanks will have two compartments for domestic use.			
	It is proposed to provide the under ground tank of following capacity :			
	Capacity of Raw Water Tank			15.00 Kld.
	Capacity of Domestic Water Tank			15.00 Kld.
				UGT
V	BOOSTING MACHINERY			
	UG. Tank			
	Daily requirement for domestic use	=		25.40 Kld.
	Assuming 6 hours pumping	1 pumps (with one standby)		
	Discharge/hour	25.40 / 6 / 1 =		4.23 KL/Hours
	Head of pump			70.56 Lpm
	i) Suction lifts	=	Say 80 Lpm	0.0 Mtr.
	ii) Friction loss in M<main & specials	=		4.0 Mtr.
	iii) Clear head	=		22.0 Mtr.
	iv) Residual head	=		5.0 Mtr.
		=		31.0 Mtr.
	BHP of motor			0.92 0.8 HP
	Capacity of Gen Set			1.0 HP
	Domestic Water Transfer Pumps	Nos. 4	HP 1.0	4 HP

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Tubewell	1	14.0	=	15 HP
Lighting			=	15 HP
				36 HP
or	33	x0.746x1.50		36.93 KVA
	Say			40.00 KVA

34.68

VII Combine Sewage Treatment Plant Capacity (STP.)

Gross Domestic+Flushing water requirement / day	786.12 Kld.
Sewage flow (80% domestic + 100% flushing) of total load	684.86 Kld.
Proposed STP. Capacity	700.00 Kld.
	STP



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Estimate for Providing in Internal Development works

SH. KANWAR SINGH & OTHERS IN COLLABORATION WITH 1000 TREES HOUSING PRIVATE LIMITED.

Description	Amount (Lacs.)
Sub Work - I Water Supply System	₹ 726.14 556.45
Sub Work - II Sewerage System	₹ 220.40 152.47
Sub Work - III Storm Water Drainage System	₹ 140.79 128.97
Sub Work - IV Roads & Footpath	₹ 440.08 431.87
Sub Work - V Street Lighting	₹ 50.18 50.18
Sub Work - VI - Horticulture	₹ 20.60 18.13
Sub Work - VII - Maintenance of Services for 10 years including resurfacing of roads after 1st 5 years & II phase i.e. 10 years of maintenance (as per HUDA norms)	₹ 460.50 424.00

Total 2058.69 1762.06

Cost per Acre = $\frac{2058.70 \text{ lacs}}{13.078} = 157.42 \text{ lacs/Acre}$
(RUPEES SEVENTEEN CRORES SIXTY TWO LACS SIX THOUSAND ONLY)

Say ₹s. 2058.70 lac

SH. KANWAR SINGH & OTHERS IN COLLABORATION WITH 1000 TREES HOUSING PRIVATE LIMITED

For 1000 TREES HOUSING PVT. LTD.

Authorized Signatory

Authorized Signatory



Checked subject to Comments
In forwarding letter No. 164658
Dt. 18.06.2014 and notes
Attached with the estimate

Executive Engineer
HSVP Division No.1
Gurgaon

Executive Engineer (M)
for Chief Engineer-I
HSVP, Panchsula

Superintending Engineer,
HSVP, Circle-I, Gurugram.

Director
Town & Country Planning
Haryana, Chandigarh



हरियाणा शहरी विकास प्राधिकरण

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

CE-I No. 164656

Dated: 19.06.2024

Annexure-A

SUB:- Approval of Service Plan Estimate of services to be laid in Group Housing Colony area measuring 13.078 acres (Under TOD Zone) in Sector-105, Gurugram bearing license no. 127 of 2012 dated 27.12.2012 being developed by M/s 1000 Trees Housing Pvt. Ltd.

Technical note and comments:-

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

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FINAL ABSTRACT OF REVISED COST

Description	Amount (Lacs.)
Sub Head - (I) Head Works	₹ 171.10 lacs 147.55
Sub Head - (II) Pumping Machinery	₹ 159.65 147.25
Sub Head - (III) Distribution System (Dom + Flushing + Fire)	₹ 52.41 51.92
Sub Head - (IV) Irrigation Scheme	₹ 19.54 10.12
Sub Head - (V) Fire Scheme	₹ 70.45 65.74
Total	₹ 473.15 lacs 362.58
Add 3% Contingencies ex. PE charges	14.19 lacs 10.88
Total	₹ 487.34 373.46
Add 49% Departmental Charges, price escalations, unproven	238.80 182.99
Grand Total	₹ 726.14 556.45
(CO to final abstract of cost)	Say ₹ 726.14 556.45



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Sub Work I				Water Supply	
Sub Head No. I				Head Works	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount Rs. (lacs)
1	Boring and installing 510 mm i/d tubewells with reverse/direct rotary rig complete with pipe strainer to a depth of about 80 m. complete.	Nos.	3	1000000.00	30.00 45.0
2	Constructing pump chambers as per standard design of PWD PH/HUDA of size 1.50x1.50 m.	Nos.	3	100000.00	3.00
1	Construction of boosting chambers of suitable size along with under ground tank & pumping machinery and generating set etc. complete in all respects.				
	Details of boosting station				
i)	construction of boosting chambers	Nos.	2	500000.00	10.00
ii)	construction of UG tank (Dom.+ Fire) (for Housing Part)	KL	1160	5500.00	63.80 52.20
ii)	construction of UG tank (Dom.+ Fire) (for commercial Part)	KL	30	5500.00	1.65 1.35
ii)	construction of UG tank (Flushing located @ STP)	KL	400 30 430	5500.00	18.00 23.65
4	Provision for carriage of material and other unforeseen items.	LS	-	-	1.50
5	Provision for facilities staff for Maintenance	LS	-	-	4.50 22.50 171.10 lacs
(C.O. to abstract of cost of Sub-work No.I)					117.55 Lacs
Say					171.10



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Sub Work I Sub Head No. II		Water Supply Pumping Machinery			
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (in Lakhs)
1	Providing and installing electricity driven electro or submersible pumping set capable of delivering about 32 KL water per hour against a total head of 60 M complete with motor and other accessories. (12.50 lakhs)	Nos.	3	2.50 lakhs 120000.00	7.50 lakhs 3.60
2	Providing & installing electricity driven pumping set capable of delivering 340 LPM of water against a total head of 135 m complete with motor and other accessories (For Domestic - 16 HP) (For housing Part) (17.50 lakhs)	Nos.	(4+1) 5	210000.00 3.50 lakhs	10.50 17.50
2	Providing & installing electricity driven pumping set capable of delivering 80 LPM of water against a total head of 31 m complete with motor and other accessories (Domestic - 1 HP) (For commercial Part)	Nos.	(1+1) 2	20000 120000.00	0.40 2.40
2	Providing & installing electricity driven pumping set capable of delivering 380 LPM of water against a total head of 135 m complete with motor and other accessories (For flushing - 15 HP).	Nos.	4+1 5	300000.00	15.00 10.00
3	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities.				
i)	240 KVA (For housing Part)	Nos.	1	2000000.00	20.00
ii)	40 KVA (For commercial Part)	Nos.	1	400000.00	4.00
4	Providing & installing pumping set of following capacities for fire protection:				
i)	180 LPM @ 170 M Head (20 HP)	Nos.	2	2.50 lakhs 175000.00	5.00 3.50
ii)	2850 LPM @ 170 M Head (180 HP) Hydrant	Nos.	1 20.00	950000.00	9.50 20.00
iii)	2850 LPM @ 170 M Head (180 HP) Sprinkler	Nos.	1 20.00	950000.00	9.50 20.00
iv)	2850 LPM @ 170 M Head (DG Pump)	Nos.	2	1550000.00	31.00
5	Provision for diesel engine genset stand bye arrangements for Tubewells.	Nos.	3	125000.00	3.75
6	Provision for pressure type chlorination plant.	Nos.	3	100000.00	3.00
7	Provision for making foundations & erection of pumping machinery.	LS	-	-	5.00
8	Provision for pipes & specials inside pump chamber.	LS	-	-	3.50
9	Provision for electric services connection including electric fittings for tubewells chambers complete including cost of transformer.	LS	-	-	1.50
10	Provision for carriage for materials and other unforeseen items.	LS	-	-	1.50
(C.O. to abstract of cost of Sub-work No.I)				Total	117.25 159.65 lakhs
				Sav	117.25



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
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Sub Work I Sub Head No. III		Water Supply Distribution System/Rising Main			
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, laying, jointing & testing D.I. pipes including cost of excavation complete as per ISI marked.				
i)	100 mm dia	M	2309 2289	1460.00	3371 3341940.00
ii)	150 mm dia	M	145	2040.00	295800.00
2	Providing, laying, jointing & testing G.I. pipes including cost of excavation complete as per ISI marked.				
i)	32mm dia nominal bore	M	0	550.00	0.00
ii)	40mm dia nominal bore	M	0	650.00	0.00
iii)	50mm dia nominal bore	M	0	750.00	0.00
iv)	65mm dia nominal bore (For commercial Part-Tubewell pipe)	M	20	850.00	17000.00
v)	80mm dia nominal bore	M	0	980.00	0.00
3	Providing, fixing & Testing butterfly valves including cost of complete in all respects.				
i)	100 mm i/d	Nos.	8	10000.00	80000.00 0.96
ii)	150 mm i/d	Nos.	4	15000.00	60000.00
4	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.				
i)	100 mm i/d	Nos.	3	14000.00	42000.00
5	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	6	10000.00	60000.00
6	Providing and fixing indicating plates for valves.	Nos.	21	1000.00	21000.00 0.42
7	Provision for carriage of material	LS	-	-	150000.00
8	Provision for cutting the roads and making to its original conditions.	LS	-	-	200000.00
9	Making water supply connection. <i>with HSE main line</i>	LS	-	-	200000.00
10	Provision for rising main from HUDA water supply line to UG Tank.				
i)	100 mm i/d	M	496 <i>MTL</i>	1460.00	724160.00
(C.O. to abstract of cost of Sub-work No.I)				Total	5241160.00 52.41 lacs
				Say	51.92 Lacs



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
UNDER (TOD) POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

Sub Work I Sub Head No. IV				Water Supply Irrigation	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, laying, jointing & testing uPVC pipe line confirming to IS 4985 including cost of Excavation etc. complete in all respect.				
i)	90 OD	M	1268	1250/- 650.00	15.85 lacs 824200.00
ii)	32 OD	M	90	220.00 450/-	19800.00 0.41
2	Providing and fixing 20mm dia Irrigation hydrant valve complete in all respect.	Nos.	38	1200.00 500/-	45600.00 1.90
3	Providing, fixing & Testing butterfly valves including cost of complete in all respects.				
i)	80 mm i/d	Nos.	2	4750.00 500/-	9500.00 0.10
4	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	2	4500.00 1000	9000.00 0.20
5	Providing and fixing indicating plates for butterfly valve, NRV & air valve etc.	Nos.	4	2000.00	8000.00
6	Provision for carriage of materials etc. and other unforeseen charges.	LS	-	-	50000.00
7	Provision for cutting of roads & making good to its in original condition.	LS	-	-	50000.00
				Total	1012100.00
				Say	Rs 19.54 lacs 10.12 Lacs



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Sub Work I

Sub Head No. V

Fire Scheme

S. No.	Description	Unit	Qty	Rate	Amount (Rs.)
1	Providing, laying, jointing & testing M.S. pipes for fire ring main including cost of Fittings & excavation complete (as per ISI marked) in all respect.				
a)	80 mm dia	M	350	1000.00	350000.00
b)	150 mm dia	M	2509	2000.00 2040	5018000.00 51.18 lacs
2	Providing and fixing External Fire Hydrants complete with masonry chambers.	Nos.	31	15000.00	465000.00
3	Providing, fixing & Testing butter fly valve including cost of complete in all respects.				
a)	80 mm dia	Nos.	31	10000.00	310000.00
b)	150 mm dia	Nos.	5	20000.00 15000	100000.00 0.75 lacs
4	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.				
i)	80 mm i/d	Nos.	31	10000.00	155000.00 3.10 lacs
5	Providing and fixing Fire Brigade connection.				
i)	4 way inlet connection.	Nos.	3	15000.00	45000.00
ii)	2 way withdrawl connection.	Nos.	1	10000.00	10000.00
5	Provision for cutting of roads and carriage of materials etc. and other unforeseen charges	LS	-	-	40000.00 2.50 lacs
6	Provision for indication plates	Nos.	31	1000.00	31000.00 0.62 lacs
7	Provision for carriage of material <i>as other unforeseen items</i>	LS	-	-	50000.00
Total					6574000.00 \$ 70.45 lacs
Say					65.74 \$ 70.45 Lacs



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
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Sub Work II (Part-1)			Sewerage Scheme		
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, lowering, jointing, cutting SW / R.C.C. NPS / UPVC SN-4 Pipe as per IS:15328 and specials into trenches including cost of excavation, bed concrete lot of manholes complete.				
i)	200 mm i/d				
a)	Average depth 0.0 m to 1.5 m	M	373	1700.00	634100.00
b)	Average depth 1.5 m to 4.5 m	M	533	2040.00	1087320.00
ii)	250 mm i/d				
a)	Average depth 0.0 m to 1.5 m	M	0	2150.00	0.00
b)	Average depth 1.5 m to 4.5 m	M	0	2400.00	0.00
iii)	300 mm i/d				
a)	Average depth 1.5 m to 4.5 m	M	82	2550.00 2880/-	209100.00 2.36
iv)	400 mm i/d				
a)	Average depth 1.5 m to 4.5 m	M	0	2650.00	0.00
2	Provision for lighting, watching and temporary diversion of traffic	LS	-	-	500000.00
3	Provision for cutting of roads and carriage of materials etc. and other unforeseen charges.	LS	-	-	300000.00
4	Provision for connection with HUDA. <i>main sewer line</i>	LS	-	-	200000.00
5	Cost of 700 Kld Sewerage Treatment Plant (Note: The STP cost is inclusive of civil part including upto tertiary treatment)	LS	-	<i>700 KLD @ 16000/-</i> KL	7500000.00 <i>112.00 lacs</i>
6	Provision for CI / DI pipe from STP. To Huda Main Line.				
i)	150 mm dia pipe.	M	100	2040.00	204000.00
					<i>143.61 lacs</i>
					9934520.00
					<i>4.31 lacs</i>
Add 3% contingencies <i>& PE charges</i>					298035.6
					<i>147.92 lacs</i>
					10232555.60
					<i>72.48 lacs</i>
Add 49% Deptt. Charges <i>, price escalation, unforeseen Admn.</i>					5013952.244
					<i>220.40 lacs</i>
Total					15246507.84
(C.O. to abstract of cost of Sub-work No. 1)					Say <i>Rs 220.40</i> 152.47 Lacs



PARADISE CONSULTANTS

REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
UNDER (TOD) POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

Sub Work - III

Storm Water Drain

S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, lowering, jointing, cutting RCC NP ₃ pipes and specials into trenches including cost of excavation cost of manholes, ventilating chambers etc. complete in all respects.				
i)	400 mm i/d				
a)	Average depth upto 1.5 m	M	1220	2500.00	3050000.00
b)	Average depth 1.5 m to 4.5 m	M	0	2600.00	0.00
ii)	500 mm i/d				
a)	Average depth upto 1.5 m	M	7	2500.00 3400	17500.00 0.24
b)	Average depth 1.5 m to 4.5 m	M	0	2600.00	0.00
2	Provision for Road Gully & Drain. pipe 300mm d	LS	-	-	311000.00 5.00
3	Provision for cutting of roads and carriage of materials etc. and other unforeseen items	LS	-	-	250000.00 7.50 lacs
4	Provision for disposal arrangements Recharge Pit.	Nos	13	350000.00	4550000.00
5	Provision for lighting, watching and temporary diversion of traffic	LS	-	-	100000.00
6	Provision for connection with HUDA.				
i)	400 mm i/d (Average depth 0.0 m to 3.0 m)	M	50 (6.5)	2500.00	125000.00 2.00
Add 3% contingencies ex PE charges					8403500.00 91.74 lacs
					252105.00 2.75 lacs
Add 49% Deptt. Charges , price escalation, admin. charges					8655605.00 94.49 lacs
					4241246.45 46.30 lacs
					140.79 lacs
Total					12896851.45
SAY					128.97 Lacs
(C.O. to abstract of cost of Sub-work No. 1)					



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
UNDER (TOD) POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

Sub Work IV			Road Work		
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Provision for leveling & earth filling as per site condition 13.078 acre @ 175000/acre	Acres	13.078	175000	2288650.00
2	Construction of road by:- i) Providing GSB 200 mm thick. ii) 250 mm thick W.M.M. stone aggregate. iii) 50 mm thick BDM BDM iv) 30 mm thick BC complete in all respect.	Sq. mtr.	11559.0 13160	1500	17338500.00 197.40 lacs
3	Provision for making approach and pavement to building block by providing concrete pavement or tiles. Etc.	Sq. mtr.	3468.00	650 1000	2254200.00 34.68 la
4	Provision for parking arrangement @ 1500 / sqm traffic light se channel	Sq. mtr.	2320.0 (4.5)	1500	3480000.00 2.0 la
5	Provision for kerb stone with complete specification.	mtr.	3798.0	600	2278800.00
6	Provision for Carriage of material Exother unproven	LS.		200000.00	200000.00 5.0
7	Provision for traffic lighting and guide map/ indicators	LS.		300000.00	300000.00 3
Total					28140150.00 286.76 la 8.60 la
Add 3% contingencies ex PE. charges					844204.50 295.36 la 144.72 la
Total					28984354.50
Add 49 % department charges , price escalation, unproven adun					289.84 Lacs 440.08 lacs 142.02 Lacs
SAY					431.87 Lacs

C.O. to final abstract of cost



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
UNDER (TOD) POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

Sub Work V				Street Lighting	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing street lighting on internal roads as per standard specifications of HVPNL with CFL	per acre	13.078	250000.00	3269500.00
	Add 3% contingencies <i>EA PE charges</i>				98085.00
				Total	3367585.00
	Add 49% Deptt. Charges, <i>price escalation, unforeseen admin</i>				1650116.65
				Total	5017702.00
				SAY	<i>₹</i> 50.18 Lacs

c.o. to final abstract of cost



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
UNDER (TOD) POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

Sub Work VI			Horticulture		
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Development of lawn area				
	a) Trenching the ordinary soil upto depth of 60 cm. Including removal & packing of serviceable material & disposing at a lead of 50 M and making up the trenched area to proper level by filling with earth mixed with manure before & after flooding trench with water including cost of imported earth & manure.				
	b) Rough dressing of trenched area.				
	c) Grassing including watering & maintenance of lawns free from weeds & fit for mowing in rows including hedges, shrubs & green belts (as per HUDA Norms)				
	4.072 acres @ Rs. 1.5 lacs.	per acre	4.072	150000.00	6,10,800
	317 trees @ Rs. 1800/- each				5,70,600
	(3798/12)=316.5 nos. approx, say-317 nos.				7.32 lacs
	Add 3% contingency charges				1181400.00 13.43 lacs
	Add 49% Deptt. Charges				35442.00 0.40 lacs
				Total	1216842.00 13.83 lacs
				Total	596252.58 6.77 lacs
				Say	1813094.58 20.60 lacs
					18.13 Lacs

C.O. to final abstract of cost



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT)
UNDER (TOD) POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

Sub Work VII				Maintenance Charges & Resurfacing of Roads	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Provision for maintenance charges for water supply, sewerage, storm water drainage, roads, street light, horticulture etc. complete including operation & establishments charges as per HUDA norms after completion & resurfacing of roads after 10 years or 1st phase.				
	13.078 acres @ 8 lacs per acre	per acre	13.078	800000.00	10462400.00
2	Provision for resurfacing & strengthening of road (with 50mm thick BM + 50 mm thick BC) after five years of Ist phase @ 660/- per sqm	Sq. mtr.	13160 11559.0	660/-	86.87 lacs 7628940.00
3	Provision for resurfacing & strengthening of road (with 50mm thick BM + 50 mm thick BC) after ten years of 2 nd phase @ 825/- per sqm	Sq. mtr.	13160 11559.0	825/-	108.57 lacs 9536175.00
				Total	300.06 lacs 27627515.00
	Add 3% contingency & PE charges				9.00 lacs 828825.45
				Total	309.06 lacs 28456340.45
	Add 49% Departmental charges, price escalation, unknown Admin.				151.44 lacs 13943606.82
				Total	460.50 lacs 42399947.27
		say			424.00 Lacs
					Rs 460.50 lacs

c.o. to final abstract of cost



WATER SUPPLY QUANTITY SHEET

DOMESTIC WATER SUPPLY QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
1	UGT-1	D1	35.0	150
2.	D1	D2	116.0	100
3.	D1	D3	115.0	100
4.	D2	D3	51.0	100
5.	D3	D4	61.0	100
6.	D4	D5	106.0	100
7.	D5	D6	23.0	100
8.	D4	D6	82.0	100
9.	D2	D7	52.0	100
10.	D7	D8	25.0	100
11.	D8	D9	140.0	100
12.	D7	D9	168.0	100
13.	D8	D8a	75.0	100
14.	UGT-2	D9	93.0	100

FLUSHING WATER SUPPLY QUANTITY SHEET

1	STP	F1	35.0	150
2.	F1	F2	138.0	100
3.	F1	F3	89.0	100
4.	F2	F3	51.0	100
5.	F3	F4	61.0	100
6.	F4	F5	106.0	100
7.	F5	F6	23.0	100
8.	F4	F6	82.0	100
9.	F2	F7	52.0	100
10.	F7	F8	25.0	100
11.	F8	F9	140.0	100
12.	F7	F9	168.0	100
13.	F8	F8a	130.0	100



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT) UNDER (TOD)
POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
<u>TUBE WELL WATER SUPPLY QUANTITY SHEET</u>				
1	Tube Well 01	T1	48.0	100
2.	Tube Well 02	T1	69.0	100
3.	T1	UGT-1	75.0	150
4.	Tube Well 03	UGT-2	20.0	100
<u>HUDA WATER SUPPLY QUANTITY SHEET</u>				
1	HUDA MUNICIPAL LINE	M1	22.0	100
2.	M1	UGT-1	392.0	100
3.	M1	UGT-2	82.0	100
Description			Length in (MTR)	Pipe Dia (MM)
Domestic and Flushing			0	32
Domestic and Flushing			0	40
Domestic and Flushing			0	50
Domestic and Flushing			20	100
Domestic and Flushing			0	80
Domestic, Flushing & Tube Well Water Supply line			2289 2309	100
Domestic, Flushing & Tube Well Water Supply line			145	150
Description			Length in (MTR)	Pipe Dia (MM)
Municipal Water Supply line			496.0	100
100 Dia Valve			8	Nos.
150 Dia Valve			4	Nos.
100 Dia Non Return Valve			3	Nos.
Air Valve			6	Nos.



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT) UNDER (TOD)
POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

IRRIGATION WATER SUPPLY QUANTITY SHEET				
S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	OD
1	S.T.P	G1	35.0	90
2.	G1	G2	138.0	90
3.	G1	G3	89.0	90
4.	G2	G3	51.0	90
5.	G3	G4	61.0	90
6.	G4	G5	106.0	90
7.	G5	G6	23.0	90
8.	G4	G6	82.0	90
9.	G2	G7	52.0	90
10.	G7	G8	168.0	90
11.	G8	G9	140.0	90
12.	G7	G9	25.0	90
13.	G9	G10	108.0	90
14.	G10	G11	37.0	90
15.	G10	G12	96.0	90
16.	G12	G11	57.0	90
Irrigation Water Supply line			1268.0	90
Irrigation Water Supply line (tappoff from ringmain)			90.0	32
Irrigation Water Supply line (tappoff from ringmain)			450.0	25
Garden Hydrant			38	Nos.
80 Dia Valve			2	Nos.
Air Valve			2	Nos.



TITLE : FIRE QUANTITY SHEET				
FIRE HYDRANT QUANTITY SHEET				
S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
1	U.G.T	B1	35.0	150
2.	B1	B2	138.0	150
3.	B1	B3	115.0	150
4.	B2	B3	51.0	150
5.	B3	B4	61.0	150
6.	B4	B5	106.0	150
7.	B5	B6	23.0	150
8.	B4	B6	82.0	150
9.	B2	B7	52.0	150
10.	B7	B8	168.0	150
11.	B8	B9	140.0	150
12.	B7	B9	25.0	150
13.	B9	B10	108.0	150
14.	B10	B11	37.0	150
15.	B10	B12	96.0	150
16.	B11	B12	57.0	150
FIRE SPRINKLER QUANTITY SHEET				
1	U.G.T	BB1	35.0	150
2.	BB1	BB2	138.0	150
3.	BB1	BB3	115.0	150
4.	BB2	BB3	51.0	150
5.	BB3	BB4	61.0	150
6.	BB4	BB5	106.0	150
7.	BB5	BB6	23.0	150
8.	BB4	BB6	82.0	150
9.	BB2	BB7	52.0	150
10.	BB7	BB8	168.0	150
11.	BB7	BB9	25.0	150



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S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
12.	BB8	BB9	140.0	150
13.	BB7	BB9	25.0	150
1	4WAY INLET	Hydrant Line	12.0	150
2.	4WAY INLET	Sprinkler Line	15.0	150
3.	4WAY INLET SPR	UGT	150.0	150
4.	2WAY WITHDRAWL	UGT	17.0	150
80 mm Dia Pipe (Tapoff from ring main for EFH)			350.0	mtr.
100 mm Dia Pipe			60.0	mtr.
150 mm Dia Pipe			2509.0	mtr.
External Fire Hydrant			31	Nos.
80 Dia Valve			31.0	Nos.
150 Dia Valve			5.0	Nos.
80 Dia Non Return Valve			31.0	Nos.



TITLE - SEWERAGE QUANTITY SHEET

S.No.	Line No.		Length	Pipe Dia		Depth			EXCAVATION			
						Start	End	Avg	0.0 - 1.5	1.5 - 3.0	3.0 - 4.5	4.5 - 6.0
-	From	To	(mtr.)	(mm)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1	S1	S2	221.0	200	0.200	1.00	1.69	1.35	221.0	0.0	0.0	0.0
2.	S2	S3	261.0	200	0.200	1.69	2.51	2.10	0.0	261.0	0.0	0.0
3.	S3a	S3	44.0	200	0.200	1.00	1.14	1.07	44.0	0.0	0.0	0.0
4.	S3	S4	76.0	300	0.300	2.61	2.74	2.68	0.0	76.0	0.0	0.0
5.	S5	S6	108.0	200	0.200	1.00	1.34	1.17	108.0	0.0	0.0	0.0
6.	S6	S7	186.0	200	0.200	1.34	1.92	1.63	0.0	186.0	0.0	0.0
7.	S7	S4	86.0	200	0.200	1.92	2.19	2.05	0.0	86.0	0.0	0.0
8.	S4	STP	6.0	300	0.300	2.74	2.76	2.75	0.0	6.0	0.0	0.0
Total			988.0						373.0	615.0	0.0	0.0
Excavation Depth												
Description		(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)							
200 mm Dia pipe		373.0	533.0	0.0	0.0							
250 mm Dia pipe		0.0	0.0	0.0	0.0							
300 mm Dia pipe		0.0	82.0	0.0	0.0							
400 mm Dia pipe		0.0	0.0	0.0	0.0							



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT) UNDER (TOD) POLICY
FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

TITLE : STORM WATER QUANTITY SHEET											
S.No.	Line No.		Length	Size of Pipe		Depth			EXCAVATION		
	From	To		(mm)	(mtr.)	Start	End	Avg.	0.0 -1.5	1.5 - 3.0	3.0 - 4.5
			(mtr.)			(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1	A1	A2	25.0	400	0.400	1.20	1.31	1.25	25.0	0.0	0.0
2	A2	D.C.-01	2.0	400	0.400	1.20	1.33	1.27	2.0	0.0	0.0
3	D.C.-01	R.P.-01	3.0	400	0.400	1.33	1.34	1.33	3.0	0.0	0.0
4	R.P.-01	A3	7.0	400	0.400	1.34	1.34	1.34	7.0	0.0	0.0
5	A3	A4	114.0	400	0.400	1.20	1.21	1.21	114.0	0.0	0.0
6	A4	D.C.-02	2.0	400	0.400	1.21	1.25	1.23	2.0	0.0	0.0
7	D.C.-02	R.P.-02	2.0	400	0.400	1.25	1.26	1.26	2.0	0.0	0.0
8	R.P.-02	A5	3.0	400	0.400	1.26	1.26	1.26	3.0	0.0	0.0
9	A5	A6	73.0	400	0.400	1.20	1.21	1.20	73.0	0.0	0.0
10	A6	D.C.-03	6.0	400	0.400	1.21	1.28	1.24	6.0	0.0	0.0
11	D.C.-03	R.P.-03	2.0	400	0.400	1.28	1.29	1.28	2.0	0.0	0.0
12	R.P.-03	A7	4.0	400	0.400	1.29	1.29	1.29	4.0	0.0	0.0
13	A7	A8	36.0	400	0.400	1.20	1.21	1.20	36.0	0.0	0.0
14	A8	D.C.-04	3.0	400	0.400	1.21	1.32	1.26	3.0	0.0	0.0
15	D.C.-04	R.P.-04	3.0	400	0.400	1.32	1.34	1.33	3.0	0.0	0.0
16	R.P.-04	A9	2.0	400	0.400	1.34	1.34	1.34	2.0	0.0	0.0
17	A9	A10	80.0	400	0.400	1.20	1.21	1.20	80.0	0.0	0.0
18	A10	D.C.-05	2.0	400	0.400	1.21	1.28	1.24	2.0	0.0	0.0
19	D.C.-05	R.P.-05	2.0	400	0.400	1.28	1.29	1.29	2.0	0.0	0.0
20	R.P.-05	A11	4.0	400	0.400	1.29	1.30	1.30	4.0	0.0	0.0
21	A11	A12	47.0	400	0.400	1.20	1.29	1.25	47.0	0.0	0.0
22	A12	D.C.-06	2.0	400	0.400	1.29	1.30	1.29	2.0	0.0	0.0
23	D.C.-06	R.P.-06	2.0	400	0.400	1.30	1.30	1.30	2.0	0.0	0.0
24	R.P.-06	A13	2.0	400	0.400	1.20	1.21	1.20	2.0	0.0	0.0
25	A13	A14	72.0	400	0.400	1.21	1.31	1.26	72.0	0.0	0.0
26	A14	D.C.-07	2.0	400	0.400	1.31	1.31	1.31	2.0	0.0	0.0



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT) UNDER (TOD) POLICY
FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

S.No.	Line No.		Length	Size of Pipe		Depth			EXCAVATION			
						Start	End	Avg.	0.0 -1.5	1.5 - 3.0	3.0 - 4.5	
-	From	To	(mtr.)	(mm)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	
27.	<i>D.C.-07</i>	<i>R.P.-07</i>	2.0	400	0.400	1.31	1.32	1.31	2.0	0.0	0.0	
28.	<i>R.P.-07</i>	A15	2.0	400	0.400	1.20	1.23	1.21	2.0	0.0	0.0	
29.	A15	A16	45.0	400	0.400	1.23	1.28	1.25	45.0	0.0	0.0	
30.	A16	<i>D.C.-08</i>	2.0	400	0.400	1.28	1.29	1.29	2.0	0.0	0.0	
31.	<i>D.C.-08</i>	<i>R.P.-08</i>	3.0	400	0.400	1.29	1.29	1.29	3.0	0.0	0.0	
32.	<i>R.P.-08</i>	A17	3.0	400	0.400	1.20	1.21	1.20	3.0	0.0	0.0	
33.	A17	A18	66.0	400	0.400	1.21	1.26	1.24	66.0	0.0	0.0	
34.	A18	<i>D.C.-09</i>	3.0	400	0.400	1.26	1.29	1.28	3.0	0.0	0.0	
35.	<i>D.C.-09</i>	<i>R.P.-09</i>	2.0	400	0.400	1.29	1.29	1.29	2.0	0.0	0.0	
36.	<i>R.P.-09</i>	A19	2.0	400	0.400	1.20	1.21	1.20	2.0	0.0	0.0	
37.	A19	A20	72.0	400	0.400	1.21	1.26	1.23	72.0	0.0	0.0	
38.	A21	<i>A22</i>	35.0	400	0.400	1.26	1.26	1.26	35.0	0.0	0.0	
39.	<i>A22</i>	<i>D.C.-10</i>	1.0	400	0.400	1.26	1.26	1.26	1.0	0.0	0.0	
40.	<i>D.C.-10</i>	<i>R.P.-10</i>	3.0	400	0.400	1.26	1.26	1.26	3.0	0.0	0.0	
41.	<i>R.P.-10</i>	A23	3.0	400	0.400	1.26	1.26	1.26	3.0	0.0	0.0	
42.	A23	A24	67.0	400	0.400	1.26	1.26	1.26	67.0	0.0	0.0	
43.	A24	<i>D.C.-11</i>	3.0	400	0.400	1.26	1.26	1.26	3.0	0.0	0.0	
44.	<i>D.C.-11</i>	<i>R.P.-11</i>	3.0	400	0.400	1.26	1.26	1.26	3.0	0.0	0.0	
45.	<i>R.P.-11</i>	A25	2.0	400	0.400	1.26	1.26	1.26	2.0	0.0	0.0	
46.	A25	A26	50.0	400	0.400	1.26	1.26	1.26	50.0	0.0	0.0	
47.	A26a	A26	132.0	400	0.400	1.26	1.26	1.26	132.0	0.0	0.0	
48.	A26	A27	101.0	400	0.400	1.26	1.26	1.26	101.0	0.0	0.0	
49.	A27	<i>D.C.-12</i>	2.0	400	0.400	1.26	1.26	1.26	2.0	0.0	0.0	
50.	<i>D.C.-12</i>	<i>R.P.-12</i>	5.0	400	0.400	1.26	1.26	1.26	5.0	0.0	0.0	
51.	<i>R.P.-12</i>	A28	5.0	400	0.400	1.26	1.26	1.26	5.0	0.0	0.0	
52.	A28	A20	90.0	400	0.400	1.26	1.26	1.26	90.0	0.0	0.0	
53.	A20	<i>D.C.-13</i>	3.0	500	0.500	1.26	1.26	1.26	3.0	0.0	0.0	
54.	<i>D.C.-13</i>	<i>R.P.-13</i>	4.0	500	0.500	1.26	1.26	1.26	4.0	0.0	0.0	
55.	<i>R.P.-13</i>	<i>Over Flow To HUDA</i>	14.0	400	0.400	1.26	1.26	1.26	14.0	0.0	0.0	
Total			1227.0						1227.0	0.0	0.0	
Excavation Depth												
Description			(0.0 - 1.5)	(1.5 - 3.0)								(3.0 - 4.5)
400 mm Dia pipe			1220.0	0.0								0.0
500 mm Dia pipe			7.0	0.0								0.0



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT 12% COMMERCIAL COMPONENT) UNDER (TOD) POLICY FOR AREA MEASURING 13.078 ACRES AT SEC - 105, GURUGRAM

TITLE : ROAD QUANTITY SHEET								
MATERIAL STATEMENT FOR ROAD								
AREA OF METALLED ROAD								
S.NO.	ROAD NAME		LENGTH (m)	6 M WIDE	7.5 M WIDE	9 M WIDE	Metal Portion (m)	AREA
-	FROM	TO						
1	R-1	R-1	16.00	16.00			6.00	96.00
2.	R-2	R-2	16.00	16.00			6.00	96.00
3.	R-3	R-3	19.00	19.00			6.00	114.00
4	R-4	R-4	60.00	60.00			6.00	360.00
5	R-5	R-5	68.00		68.00		7.50	510.00
6	R-6	R-6	83.00	83.00			6.00	498.00
7	R-7	R-7	65.00	65.00			6.00	390.00
8	R-8	R-8	118.00	118.00			6.00	708.00
9	R-9	R-9	33.00		33.00		7.50	247.50
10	R-10	R-10	176.00	176.00			6.00	1056.00
11	R-11	R-11	36.00	36.00			6.00	216.00
12	R-12	R-12	144.00	144.00			6.00	864.00
13	R-13	R-13	69.00	69.00			6.00	414.00
14	R-14	R-14	55.00	55.00			6.00	330.00
15	R-15	R-15	72.00	72.00			6.00	432.00
16	R-16	R-16	108.00	108.00			6.00	648.00
17	R-17	R-17	18.00	18.00			6.00	108.00
18	R-18	R-18	63.00	63.00			6.00	378.00
19	R-19	R-19	139.00	139.00			6.00	834.00
20	R-20	R-20	80.00	80.00			6.00	480.00
21	R-21	R-21	55.00	55.00			6.00	330.00
22	R-22	R-22	71.00	71.00			6.00	426.00
23	R-23	R-23	120.00	120.00			6.00	720.00
23	R-24	R-24	42.00	42.00			6.00	252.00
TOTAL			1726.00					10507.50
ADD 10% FOR CURVES			172.6					1050.75
TOTAL			1898.60					11558.25
SAY			1899.00					11559.00

Car on surface = 128 No.

Area = $2.50 \text{ m} \times 5.0 \text{ m} \times 128 = 1600 \text{ Sqm}$

Total area = $11559 + 1600 = 13159 \text{ Sqm}$

Say 13160 Sqm



PROJECT : REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0553 ACRES (FALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012 AT SEC - 105, GURUGRAM, MANESAR

TITLE : TUBE WELL WATER SUPPLY DESIGN

S.No.	Line No.		Average Demand	Peak Demand @ 1.5 Times	Flow Rate	Length	Head Loss	Total Head Loss	Velocity	Pipe Dia
-	From	To	klph.	klph.	lpm.	mtr.	mtr./ mtr.	mtr.	m/sec	mm
1	Tube Well 01	T1	30.06	45.09	751.42	48.0	0.047	2.25	1.594	100
2	Tube Well 02	T1	30.06	45.09	751.42	69.0	0.047	3.24	1.594	100
3	T1	UGT-1	60.11	90.17	1502.84	75.0	0.024	1.76	1.417	150
3	Tube Well 03	UGT-2	1.59	2.38	39.69	20.0	0.002	0.03	0.199	65



PROJECT : REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0553 ACRES (FALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012 AT SEC - 105, GURUGRAM, MANESAR

TITLE : HYDRAULIC DESIGN CHART FOR MUNICIPAL WATER SUPPLY CONNECTION LINE FROM HUDA

S.No	Line No.		Average Demand		Peak Demand @ 1.5 Times	Flow Rate	Pipe Length	Head Loss	Total Head Loss	Velocity	Pipe Dia
	From	To	kld.	kl/hr.							
-	HUDA MUNICIPAL LINE	M1	480.91	21.9	32.8	546.5	22.0	0.026	0.57	1.159	100
1	M1	UGT-1	455.51	20.7	31.1	517.6	392.0	0.024	9.23	1.098	100
2	M1	UGT-2	25.40	1.2	1.7	28.9	82.0	0.000	0.01	0.061	100

Note : HUDA supply line calculation has been done as / 22 hours.



PROJECT : REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0553 ACRES (FALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012 AT SEC - 105, GURUGRAM, MANESAR

TITLE : HYDRAULIC DESIGN CHART FOR MUNICIPAL WATER SUPPLY CONNECTION LINE FROM HUDA

S.No	Line No.		Average Demand		Peak Demand @ 1.5 Times	Flow Rate	Pipe Length	Head Loss	Total Head Loss	Velocity	Pipe Dia
	From	To	kld.	kl/hr.							
-	HUDA MUNICIPAL LINE	M1									
1		M1	480.91	21.9	32.8	546.5	22.0	0.026	0.57	1.159	100
2	M1	UGT-1	455.51	20.7	31.1	517.6	392.0	0.024	9.23	1.098	100
3	M1	UGT-2	25.40	1.2	1.7	28.9	82.0	0.000	0.01	0.061	100

Note : HUDA supply line calculation has been done as / 22 hours.



PROJECT : REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0553 ACRES (FALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012 AT SEC - 105, GURUGRAM, MANESAR

(Pump Riser Calculation Sheet)

Domestic Water Supply Design Calculation For Towers and Commercials

Line No.		Probable demand (lps)	Probable demand (cum/hr)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fitts (%)	Eq. Length (mtr.)	Total length (mtr.)	Head loss (line (mtr.))	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available at ground level	Residual Head Available at Ground LVL	Residual Head Available at inlet of tank	Maximum Tower Height From Pump Room To OHT
1	1A	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
UGT-1	D1	22.264	80.15	150	0.019	35.0	5	1.75	36.75	0.695	0.695	1.259	129.00	128.30	-	-
	D2	11.132	40.08	100	0.038	116.0	5	5.80	121.80	4.600	5.295	1.417	128.30	123.71	-	-
	D3	11.132	40.08	100	0.038	115.0	5	5.75	120.75	4.560	9.855	1.417	123.71	119.15	-	-
	D2	11.132	40.08	100	0.038	51.0	5	2.55	53.55	2.022	11.877	1.417	119.15	117.12	-	-
	D3	6.503	23.41	100	0.014	61.0	5	3.05	64.05	0.894	12.771	0.827	117.12	116.23	-	-
	D4	6.503	23.41	100	0.014	106.0	5	5.30	111.30	1.553	14.324	0.827	116.23	114.68	-	-
	D5	6.503	23.41	100	0.014	23.0	5	1.15	24.15	0.337	14.661	0.827	114.68	114.34	-	-
	D4	6.503	23.41	100	0.014	82.0	5	4.10	86.10	1.201	15.525	0.827	114.34	113.14	-	-
	D2	8.375	30.15	100	0.022	52.0	5	2.60	54.60	1.217	15.878	1.066	113.14	111.92	-	-
	D7	8.375	30.15	100	0.022	25.0	5	1.25	26.25	0.585	16.110	1.066	111.92	111.34	-	-
D8	8.375	30.15	100	0.022	140.0	5	7.00	147.00	3.278	19.156	1.066	111.34	108.06	-	-	
D7	8.375	30.15	100	0.022	168.0	5	8.40	176.40	3.933	20.044	1.066	108.06	104.12	-	-	
D8	2.778	10.00	100	0.003	75.0	5	3.75	78.75	0.227	19.383	0.353	104.12	103.90	-	-	
UGT-2	D9	1.176	4.23	100	0.001	93.0	5	4.65	97.65	0.057	20.101	0.150	103.90	103.84	-	-

FOR HOUSING PART

Flow Rate	22.264 lps
or	1335.9 LPM
No. of Pumps (4 W + 1 S)	334.0 LPM
Say	340.0 LPM
Maximum Building Height	120 m
Pump Head	129.00 m
Pump HP	16.0 HP
Say	16.0 HP

FOR COMMERCIAL PART

Flow Rate	1.176 lps
or	70.6 LPM
No. of Pumps (1 W + 1 S)	70.6 LPM
Say	80.0 LPM
Maximum Building Height	22 m
Pump Head	31.00 m
Pump HP	0.8 HP
Say	1.0 HP



Flushing Water Supply Design Calculation For Towers and Commercials

Line No.	Probable demand (lps)	Probable demand (cum/hr)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fits (%)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available at ground level	Residual Head Available at Ground LVL	Residual Head Available at inlet of tank	Maximum Tower Height From Pump Room To OHT
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
STP	F1	18.312	150	0.013	35.0	5	1.75	36.75	0.484	0.484	1.036	129.00	128.52	-	-
F1	F2	8.596	100	0.023	138.0	5	6.90	144.90	3.390	3.874	1.094	128.52	125.13	-	-
F1	F3	8.596	100	0.023	89.0	5	4.45	93.45	2.186	6.060	1.094	125.13	122.94	-	-
F2	F3	8.596	100	0.023	51.0	5	2.55	53.55	1.253	7.313	1.094	122.94	121.69	-	-
F3	F4	4.661	100	0.008	61.0	5	3.05	64.05	0.482	7.796	0.593	121.69	121.20	-	-
F4	F5	4.661	100	0.008	106.0	5	5.30	111.30	0.838	8.634	0.593	121.20	120.37	-	-
F5	F6	4.661	100	0.008	23.0	5	1.15	24.15	0.182	8.816	0.593	120.37	120.18	-	-
F4	F6	4.661	100	0.008	82.0	5	4.10	86.10	0.648	9.464	0.593	120.18	119.54	-	-
F2	F7	3.905	100	0.005	52.0	5	2.60	54.60	0.296	9.760	0.497	119.54	119.24	-	-
F7	F8	3.905	100	0.005	25.0	5	1.25	26.25	0.142	9.903	0.497	119.24	119.10	-	-
F8	F9	3.905	100	0.005	140.0	5	7.00	147.00	0.798	10.700	0.497	119.10	118.30	-	-
F7	F9	3.905	100	0.005	168.0	5	8.40	176.40	0.957	11.657	0.497	118.30	117.34	-	-
F8	F8a	1.194	100	0.001	130.0	5	6.50	136.50	0.083	11.740	0.152	117.34	117.26	-	-

Flow Rate	18,312 lps
or	
No. of Pumps (4 W + 1 S)	
Say	
Maximum Building Height	120 m
Pump Head	129.00 m
Pump HP	13.1 HP
Say	14.0 HP



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0553 ACRES (CALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012 AT SEC - 105, GURUGRAM, MANESAR)

TITLE: HYDRAULIC SEWAGE CHART

S.No.	Line No.		Gross Water Requirement (Load on Line) (lps)	Sewage Flow (Self Load on Line) LPD	Sewage Flow (Self Load on Line) KLD	Previous Load (kld)	Progressive Discharge (kld)	Progressive Discharge (Average) (lps)	Progressive Discharge (Peak) (lps)	Infiltration @ 25% Av. Discharge (lps)	Total Discharge (lps)	Length (mtr)	Pipe Size (mm)	Slope (1 in)	Fall (mtr)	Velocity (m/s)	Capacity of Pipe (lps)	Levels at Start (mtr)				Levels at End (mtr)				Manhole Depth at Start (mtr)	Manhole Depth at End (mtr)	Average Depth (mtr)
	From	To																FRL	FSL	IL	FRL	FSL	IL	FRL	FSL			
1.	S1	S2	261300	209040	1000	0.00	209.04	2.42	7.26	0.60	7.86	221.0	200	320	0.69	0.76	23.84	224.450	223.650	223.45	224.450	222.96	222.76	224.450	222.96	1.00	1.69	1.35
2.	S2	S3	130065	104052		209.04	313.09	3.62	10.87	0.91	11.78	261.0	200	320	0.82	0.76	23.84	224.450	222.959	222.76	224.450	222.14	221.94	224.450	222.14	1.69	2.51	2.10
3.	S3a	S3	22755	18204		0.00	18.20	0.21	0.63	0.05	0.68	44.0	200	320	0.14	0.76	23.84	224.450	223.650	223.45	224.450	223.51	223.31	224.450	223.51	1.00	1.14	1.07
4.	S3	S4	0	0		331.30	331.30	3.83	11.50	0.96	12.46	76.0	300	550	0.14	0.76	53.62	224.450	222.144	221.84	224.450	222.01	221.71	224.450	222.01	2.61	2.74	2.68
5.	S5	S6	71560	57248		0.00	57.25	0.66	1.99	0.17	2.15	108.0	200	320	0.34	0.76	23.84	224.450	223.650	223.45	224.450	223.31	223.11	224.450	223.31	1.00	1.34	1.17
6.	S6	S7	165600	132480		57.25	189.73	2.20	6.59	0.55	7.14	186.0	200	320	0.58	0.76	23.84	224.450	223.313	223.11	224.450	222.73	222.53	224.450	222.73	1.34	1.92	1.63
7.	S7	S4	108675	86940		189.73	276.67	3.20	9.61	0.80	10.41	86.0	200	320	0.27	0.76	23.84	224.450	222.731	222.53	224.450	222.46	222.26	224.450	222.46	1.92	2.19	2.05
8.	S4	STP	0	0		607.96	607.96	7.04	21.11	1.76	22.87	6.0	300	550	0.01	0.76	53.62	224.450	222.006	221.71	224.450	221.99	221.69	224.450	221.99	2.74	2.76	2.75

Formula Used:

Peak factor is considered as 3 times for population upto 20,000 persons & above 30,000 person peak factor is considered 2.5 times.

$$\text{Velocity (m/s)} = (1/n) \times (A/P)^{2/3} \times (1/\text{slope})^{1/5}$$

n=01 for DWT pipe (Manning's Coefficient)

A=Area of x section of pipe in sqm.

P = Wetted Perimeter in m

Capacity of pipe (lps) = Area of x-section of pipe in sqm x velocity in m/s x 1000x1/2 (Sewers are designed to run half full)

Abbreviation Used:

IL=Invert level of pipe

FSL=Full supply level

FRL=Formation Road Level

GL=Connection Level



REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0553 ACRES (FALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012 AT SEC - 105, GURUGRAM, MANESAR)

LOAD ON SEWAGE LINES

S.No.	Name of Sewer Line		Residential Sewage Load								Non Residential Sewage Load		Residential + Non Residential Load		
			Apartment Unit	Population @ 5 persons / Unit Nos.	Water Reurment @ 172.5 Ltr/day/Person		Service Person		Population @ 2 persons / Unit Nos.	Water Reurment @ 172.5 Ltr/day/Person lpd.	Amenity sqm.	Water Reurment @ Lumsum / day lpd.	Gross Water Requirement (Load on Line) lpd.	Sewage Flow (Self Load on Line) lpd.	Sewage Flow (Self Load on Line) kld.
					Unit	Nos.	Unit	Person							
-	From	To	-	5	172.5	-	-	2	172.5	-	-	-	80%	1000	
1.	S1	S2	280	1400	241500	0	0	0	0	Commercial	19800	261300	209040	209.04	
2.	S2	S3	136	680	117300	37	74	74	12765	-	0	130065	104052	104.05	
3.	S3a	S3	0	0	0	37	74	74	12765	Community	9900	22755	18204	18.20	
4.	S3	S4	0	0	0	0	0	0	0	-	0	0	0	0.00	
5.	S5	S6	6	30	5175	131	262	262	45195	Commercial+Nursery School	21190	71560	57248	57.25	
6.	S6	S7	192	960	165600	0	0	0	0	-	0	165600	132480	132.48	
7.	S7	S4	126	630	108675	0	0	0	0	-	0	108675	86940	86.94	
8.	S4	STP	0	0	0	0	0	0	0	-	0	0	0	0.00	
-	-	-	740	3700	638250	205	410	410	70725	-	50980.00	759955.00			



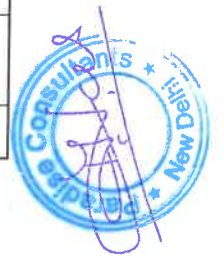
REVISED BUILDING PLAN OF MIX LAND USE COLONY (88% RESIDENTIAL COMPONENT & 12% COMMERCIAL COMPONENT) UNDER TRANSIT ORIENTED DEVELOPMENT (TOD) POLICY FOR THE AREA MEASURING 7.0533 ACRES (FALLING WITHIN TRANSITION ZONE) PART OF GROUP HOUSING COLONY MEASURING 13.078 ACRES (LICENCE NO. 127 OF 2012 DATED 27.12.2012 AT SEC - 105, GURUGRAM, MANESAR

TITLE: HYDRAULIC STORM WATER DESIGN CHART

S.No.	Line No.		Length (mtr.)	Catchment Area (Sq.m.)			Discharge @ 45 mm/hr rainfall (lps)	Pipe dia (mm)	Slope 1 in (mm)	Velocity m/sec. m/sec.	Capacity of pipe lps.	Fall in line mtr.	Levels at start (mtr.)			Levels at End (mtr.)			Manhole Depth		
	From	To		Self	Progg.	Total							FRL	FSL	IL	FRL	FSL	IL	FRL	FSL	IL
1	A1	A2	25.0	1560.0	0.0	1560.0	11.70	400	570	0.60	75.63	0.04	224.45	223.65	223.25	224.45	223.61	223.21	1.20	1.24	1.22
2	A2	D.C.-01	2.0	290.0	1560.0	1850.0	13.88	400	570	0.60	75.63	0.00	224.45	223.61	223.21	224.45	223.60	223.20	1.24	1.25	1.25
3	D.C.-01	R.P.-01	3.0	0.0	1850.0	1850.0	13.88	400	570	0.60	75.63	0.01	224.45	223.60	223.20	224.45	223.60	223.20	1.25	1.25	1.25
4	R.P.-01	A3	7.0	0.0	925.0	925.0	6.94	400	570	0.60	75.63	0.01	224.45	223.65	223.25	224.45	223.64	223.24	1.20	1.21	1.21
5	A3	A4	114.0	5330.0	925.0	6255.0	46.91	400	570	0.60	75.63	0.20	224.45	223.64	223.24	224.45	223.44	223.04	1.21	1.41	1.31
6	A4	D.C.-02	2.0	290.0	6255.0	6545.0	49.09	400	570	0.60	75.63	0.00	224.45	223.44	223.04	224.45	223.43	223.03	1.41	1.42	1.41
7	D.C.-02	R.P.-02	2.0	0.0	6545.0	6545.0	49.09	400	570	0.60	75.63	0.00	224.45	223.43	223.03	224.45	223.43	223.03	1.42	1.42	1.42
8	R.P.-02	A5	3.0	0.0	3272.5	3272.5	24.54	400	570	0.60	75.63	0.01	224.45	223.65	223.25	224.45	223.64	223.24	1.20	1.21	1.20
9	A5	A6	73.0	3600.0	3272.5	6872.5	51.54	400	570	0.60	75.63	0.13	224.45	223.64	223.24	224.45	223.64	223.24	1.21	1.33	1.27
10	A6	D.C.-03	6.0	460.0	6872.5	7332.5	54.99	400	570	0.60	75.63	0.01	224.45	223.52	223.12	224.45	223.51	223.11	1.33	1.34	1.34
11	D.C.-03	R.P.-03	2.0	0.0	7332.5	7332.5	54.99	400	570	0.60	75.63	0.00	224.45	223.51	223.11	224.45	223.50	223.10	1.34	1.35	1.35
12	R.P.-03	A7	4.0	0.0	3666.3	3666.3	27.50	400	570	0.60	75.63	0.01	224.45	223.65	223.25	224.45	223.64	223.24	1.20	1.21	1.20
13	A7	A8	36.0	2030.0	3666.3	5696.3	42.72	400	570	0.60	75.63	0.06	224.45	223.64	223.24	224.45	223.58	223.18	1.21	1.27	1.24
14	A8	D.C.-04	3.0	330.0	5696.3	6026.3	45.20	400	570	0.60	75.63	0.01	224.45	223.58	223.18	224.45	223.57	223.17	1.27	1.28	1.27
15	D.C.-04	R.P.-04	3.0	0.0	6026.3	6026.3	45.20	400	570	0.60	75.63	0.01	224.45	223.57	223.17	224.45	223.57	223.17	1.28	1.28	1.28
16	R.P.-04	A9	2.0	0.0	3013.1	3013.1	22.60	400	570	0.60	75.63	0.00	224.45	223.65	223.25	224.45	223.65	223.25	1.20	1.20	1.20
17	A9	A10	80.0	3890.0	3013.1	6903.1	51.77	400	570	0.60	75.63	0.14	224.45	223.65	223.25	224.45	223.51	223.11	1.20	1.34	1.27
18	A10	D.C.-05	2.0	290.0	6903.1	7193.1	53.95	400	570	0.60	75.63	0.00	224.45	223.51	223.11	224.45	223.50	223.10	1.34	1.35	1.35
19	D.C.-05	R.P.-05	2.0	0.0	7193.1	7193.1	53.95	400	570	0.60	75.63	0.00	224.45	223.50	223.10	224.45	223.50	223.10	1.35	1.35	1.35
20	R.P.-05	A11	4.0	0.0	3596.6	3596.6	26.97	400	570	0.60	75.63	0.01	224.45	223.65	223.25	224.45	223.64	223.24	1.20	1.21	1.20
21	A11	A12	47.0	2490.0	3596.6	6086.6	45.65	400	570	0.60	75.63	0.08	224.45	223.64	223.24	224.45	223.56	223.16	1.21	1.29	1.25
22	A12	D.C.-06	2.0	290.0	6086.6	6376.6	47.82	400	570	0.60	75.63	0.00	224.45	223.56	223.16	224.45	223.56	223.16	1.29	1.29	1.29
23	D.C.-06	R.P.-06	2.0	0.0	6376.6	6376.6	47.82	400	570	0.60	75.63	0.00	224.45	223.56	223.16	224.45	223.55	223.15	1.29	1.30	1.29



S.No.	Line No.		Length (mtr.)	Catchment Area (Sq.m.)			Discharge @ 45 mm/hr rainfall (lps)	Pipe dia (mm)	Slope 1 in (mm)	Velocity m/sec.	Capacity of pipe lps.	Fall in line mtr.	Levels at start (mtr.)				Levels at End (mtr.)			Manhole Depth		
	From	To		Self	Progg.	Total							FRL	FSL	IL	FRL	FSL	IL	Start	End	Avg.	Depth
24.	R.P.-06	A13	2.0	0.0	3188.3	3188.3	23.91	400	570	0.60	75.63	0.00	224.45	223.65	223.25	224.45	223.65	223.25	1.20	1.20	1.20	1.20
25.	A13	A14	72.0	3550.0	3188.3	6738.3	50.54	400	570	0.60	75.63	0.13	224.45	223.65	223.25	224.45	223.52	223.12	1.20	1.33	1.33	1.27
26.	A14	D.C.-07	2.0	290.0	6738.3	7028.3	52.71	400	570	0.60	75.63	0.00	224.45	223.52	223.12	224.45	223.52	223.12	1.33	1.33	1.33	1.33
27.	D.C.-07	R.P.-07	2.0	0.0	7028.3	7028.3	52.71	400	570	0.60	75.63	0.00	224.45	223.52	223.12	224.45	223.51	223.11	1.33	1.34	1.34	1.34
28.	R.P.-07	A15	2.0	0.0	3514.1	3514.1	26.36	400	570	0.60	75.63	0.00	224.45	223.65	223.25	224.45	223.65	223.25	1.20	1.20	1.20	1.20
29.	A15	A16	45.0	2410.0	3514.1	5924.1	44.43	400	570	0.60	75.63	0.08	224.45	223.65	223.25	224.45	223.57	223.17	1.20	1.28	1.28	1.24
30.	A16	D.C.-08	2.0	290.0	5924.1	6214.1	46.61	400	570	0.60	75.63	0.00	224.45	223.57	223.17	224.45	223.56	223.16	1.28	1.29	1.29	1.28
31.	D.C.-08	R.P.-08	3.0	0.0	6214.1	6214.1	46.61	400	570	0.60	75.63	0.01	224.45	223.56	223.16	224.45	223.56	223.16	1.29	1.29	1.29	1.29
32.	R.P.-08	A17	3.0	0.0	3107.1	3107.1	23.30	400	570	0.60	75.63	0.01	224.45	223.65	223.25	224.45	223.64	223.24	1.20	1.21	1.21	1.20
33.	A17	A18	66.0	2800.0	3107.1	5907.1	44.30	400	570	0.60	75.63	0.12	224.45	223.64	223.24	224.45	223.53	223.13	1.21	1.32	1.32	1.26
34.	A18	D.C.-09	3.0	130.0	5907.1	6037.1	45.28	400	570	0.60	75.63	0.01	224.45	223.53	223.13	224.45	223.52	223.12	1.32	1.33	1.33	1.32
35.	D.C.-09	R.P.-09	2.0	0.0	6037.1	6037.1	45.28	400	570	0.60	75.63	0.00	224.45	223.52	223.12	224.45	223.52	223.12	1.33	1.33	1.33	1.33
36.	R.P.-09	A19	2.0	0.0	3018.5	3018.5	22.64	400	570	0.60	75.63	0.00	224.45	223.65	223.25	224.45	223.65	223.25	1.20	1.20	1.20	1.20
37.	A19	A20	72.0	4490.0	3018.5	7508.5	56.31	400	570	0.60	75.63	0.13	224.45	223.65	223.25	224.45	223.52	223.12	1.20	1.33	1.33	1.27
38.	A21	A22	35.0	2180.0	0.0	2180.0	16.35	400	570	0.60	75.63	0.06	224.45	223.65	223.25	224.45	223.59	223.19	1.20	1.26	1.26	1.23
39.	A22	D.C.-10	1.0	70.0	2180.0	2250.0	16.88	400	570	0.60	75.63	0.00	224.45	223.59	223.19	224.45	223.59	223.19	1.26	1.26	1.26	1.26
40.	D.C.-10	R.P.-10	3.0	0.0	2250.0	2250.0	16.88	400	570	0.60	75.63	0.01	224.45	223.59	223.19	224.45	223.58	223.18	1.26	1.27	1.27	1.27
41.	R.P.-10	A23	3.0	0.0	1125.0	1125.0	8.44	400	570	0.60	75.63	0.01	224.45	223.65	223.25	224.45	223.64	223.24	1.20	1.21	1.21	1.20
42.	A23	A24	67.0	4180.0	1125.0	5305.0	39.79	400	570	0.60	75.63	0.12	224.45	223.64	223.24	224.45	223.53	223.13	1.21	1.32	1.32	1.26
43.	A24	D.C.-11	3.0	190.0	5305.0	5495.0	41.21	400	570	0.60	75.63	0.01	224.45	223.53	223.13	224.45	223.52	223.12	1.32	1.33	1.33	1.33
44.	D.C.-11	R.P.-11	3.0	0.0	5495.0	5495.0	41.21	400	570	0.60	75.63	0.01	224.45	223.52	223.12	224.45	223.52	223.12	1.33	1.33	1.33	1.33
45.	R.P.-11	A25	2.0	0.0	2747.5	2747.5	20.61	400	570	0.60	75.63	0.00	224.45	223.65	223.25	224.45	223.65	223.25	1.20	1.20	1.20	1.20
46.	A25	A26	50.0	1120.0	2747.5	3867.5	29.01	400	570	0.60	75.63	0.09	224.45	223.65	223.25	224.45	223.56	223.16	1.20	1.29	1.29	1.25
47.	A26a	A26	132.0	3590.0	0.0	3590.0	26.93	400	570	0.60	75.63	0.23	224.45	223.65	223.25	224.45	223.42	223.02	1.20	1.43	1.43	1.32
48.	A26	A27	101.0	2780.0	7457.5	10237.5	76.78	400	480	0.66	82.41	0.21	224.45	223.42	223.02	224.45	223.21	222.81	1.43	1.64	1.64	1.54
49.	A27	D.C.-12	2.0	90.0	10237.5	10327.5	77.46	400	480	0.66	82.41	0.00	224.45	223.21	222.81	224.45	223.20	222.80	1.64	1.65	1.65	1.64



S.No.	Line No.		Length (mtr.)	Catchment Area (Sqm.)			Discharge @ 45 mm/hr rainfall (lps)	Pipe dia (mm)	Slope 1 in (mm)	Velocity m/sec. m/sec.	Capacity of pipe lps.	Fall in line mtr.	Levels at start (mtr.)				Levels at End (mtr.)				Manhole Depth		
	From	To		Self	Progg.	Total							FRL	FSL	IL	FRL	FSL	IL	Start	End	Avg.		
50.	D.C.-12	R.P.-12	5.0	0.0	10327.5	10327.5	77.46	400	480	0.66	82.41	0.01	224.45	223.20	222.80	224.45	223.19	222.79	1.65	1.66	1.65		
51.	R.P.-12	A28	5.0	0.0	5163.8	5163.8	38.73	400	570	0.60	75.63	0.01	224.45	223.65	223.25	224.45	223.64	223.24	1.20	1.21	1.20		
52.	A28	A20	90.0	3820.0	5163.8	8983.8	67.38	400	570	0.60	75.63	0.16	224.45	223.64	223.24	224.45	223.48	223.08	1.21	1.37	1.29		
53.	A20	D.C.-13	3.0	130.0	16492.3	16622.3	124.67	500	630	0.66	130.43	0.00	224.45	223.48	222.98	224.45	223.48	222.98	1.47	1.47	1.47		
54.	D.C.-13	R.P.-13	4.0	0.0	16622.3	16622.3	124.67	500	630	0.66	130.43	0.01	224.45	223.48	222.98	224.45	223.47	222.97	1.47	1.48	1.47		
55.	R.P.-13	Over Flow To HUDA	14.0	0.0	8311.1	8311.1	62.33	400	570	0.60	75.63	0.02	224.45	223.65	223.25	224.45	223.63	223.23	1.20	1.22	1.21		
				52960.0																			

Formula Used:

Velocity(m/s) = $(1/n) \times (\lambda/P)^{2/3} \times (1/\text{slope})^{1/5}$

n = 0.15 for RCC pipe (Manning's Coefficient)

A = Area of x-section of pipe in sqm.

P = Wetted Perimeter in m

Capacity of pipe (lps) = Area of x-section of pipe in sqm x velocity in m/s x 1000x1/2 (Storm water are designed to run full flow)

Abbreviation Used:

IL = Invert level of pipe

FSL = Full supply level

FRL = Formation Road Level

CL = Connection Level



PROJECT : PROPOSED GROUP HOUSING "ATS 1000 TRESS" AT GURGAON			
SUBJECT : RUNOFF CALCULATION & RAIN WATER HARVESTING			
(A)	Calculations for Infiltration Storm Water		
	Rainfall Intensity for Design	0.045	m/hr
	Total Plot Area	52924.70	Sqm
a.)	Ground Coverage/Terrace Area	8281.25	Sqm
b.)	Proposed Greens Area	16481.34	Sqm
c.)	Road Area/Paved Area	28162.11	Sqm
1	For Roof / Terrace only		
(i)	Average Runoff co-efficient for terraces and other built-up areas.	0.80	
(ii)	Area-(a.) considered (For Ground Coverage/Terrace Area only)	8281.25	m ²
(iii)	Theoretical Volume of Infiltration Wells required. Approximately (Total Area x 0.80 x 0.45)	298.13	m ³ /hr
2	For Greens Area on Ground		
(i)	Average Runoff co-efficient for landscaped, green and other open areas.	0.20	
(ii)	Area -(b.) considered (For Proposed Greens Area)	16481.34	m ²
(iii)	Theoretical Volume of Infiltration Wells required. Approximately (Total Area x 0.2 x 0.45)	148.33	m ³ /hr
3	For road & paved areas:		
(i)	Average Runoff co-efficient for road & paved area	0.60	
(ii)	Area-(c.) considered (For Road Area/Paved Area)	28162.11	m ²
(iii)	Theoretical Volume of Infiltration Wells required. Approximately (Total Area x 0.60 x 0.45)	760.38	m ³ /hr
4	Total Volume Generated per hour (1+2+3)		
	For 15 minute holding capacity	1206.83	m ³ /hr
		301.71	m ³
5	Size of the Desilting Chamber		
i)	Length (L) of Desilting Chamber	3.00	m
ii)	Width (W) of Desilting Chamber	1.50	m
iii)	Depth of Desilting Chamber	1.50	m
iv)	Volume of 1 Desilting Chamber	6.75	m ³
6	Size of the Wells		
i)	Dia of Recharge well	3.00	m
ii)	Water Depth of Recharge well	2.00	m
iii)	Volume of 1 Infiltration well	14.13	m ³
iv)	500 mm layer of coarse sand, 500 mm layer of gravel, 500 mm layer of boulders	1.50	m
v)	Volume of 1.5 m depth of coarse sand, gravel and boulders	10.60	m ³
vi)	Water absorption in coarse sand, gravel and boulders assumed @ 50%	5.30	m ³
vii)	Absorption capacity of Recharge pit @ 50% of yeild capacity of borewell		
viii)	Yeild capacity of borewell (Assumed)	30.00	m ³ /hr
ix)	Water absorption @ 60%	15.00	m ³ /hr
x)	Absorption capacity in 15 minutes	3.75	m ³
xi)	Total capacity of Recharge Pit	29.93	m ³
xii)	Number of Infiltration Wells Provided	13.00	Nos.
xiii)	Total Rainwater holding/Absorbing capacity	389.07	m ³
ivx)	Surplus Rainwater Disposal to City Drain	-87.37	m ³

