# PROPOSED BUILDING PLANS FOR HOUSING GROUP COLONY MEASURING 10.744 ACRES LAND (LICENCE NO. 4 OF 2013 DATED 18-02-2013 AT SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON

## SERVICE PLAN ESTIMATE FOR PUBLIC HEALTH ENGINEERING SERVICES WORK

**Client**

**M/S SH. AJIT SINGH AND OTHERS IN COLLABORATION WITH EMAAR MGF LAND LTD.**

**Architect**

**ARCOP ASSOCIATES PVT. LTD.**
Plot-36B, Sector-32, Gurgaon-122001

**MEP Services Consultant**

**PARADISE CONSULTANTS**
Plot No. 129, Pocket –2, Jasola Vihar, New Delhi - 110025

**PROJECT REPORT / ESTIMATES FOR PROVIDING EXTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF PROPOSED BUILDING PLANS FOR HOUSING GROUP COLONY MEASURING 10.744 ACRES LAND (LICENCE NO. 4 OF 2013 DATED 18-02-2013 IN SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA, BEING DEVELOPED BY SH. AJIT SINGH AND OTHERS IN COLLABORATION WITH EMAAR MGF LAND LTD.**

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

**PROPOSED BUILDING PLANS FOR HOUSING GROUP COLONY MEASURING 10.744 ACRES LAND (LICENCE NO. 4 OF 2013 DATED 18-02-2013) FOR PHASE-1** is a residential proposed between **SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA** for development by **EMAAR MGF LAND LTD.**

## 1 Water Supply

The source of water supply shall be HUDA water supply connection. It has been proposed to construct undergorund tanks of capacity as per attached detaileds 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 20000 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 absolence of the tubewells.

### ii.) Design

The scheme has been designed for population of 124 persons in 1.846 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 over flow from the fire compartment so that the water in the fire compartment also remains fresh.

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**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. line (under ground line above 80 mm dia) /uPVC SCH-80 (below 100 mm dia under ground) 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% fo 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 CI/ uPVC pipes 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. DWC/RCC $NP_3$ 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.

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# PROPOSED BUILDING PLANS OF GROUP HOUSING COLONY FOR PHASE-1 IN SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA

## DESIGN CALCULATION

| | | | | | |
|---|---|---|---|---|---|
| 1 | Total No. of Main units | | | 88 Nos. | |
| | Total No. of Service personnel | | | 20 Nos. | |
| | Total No. of EWS units | | | 16 Nos. | |
| | Population per Units (general) | | | 5 persons | |
| | Population per Units (Service personnel) | | | 2 persons | |
| | Population per Units (EWS) | | | 2 persons | |
| | Total population (general) | | | 440 persons | |
| | Total population (Service personnel) | | | 40 persons | |
| | Total population (EWS) | | | 32 persons | |
| | Threrfore, Total Population | | | 512 persons | |
| | | **SAY** | | **512 persons** | |
| | Water requirement for Units per LPCD | @ | 172.50 Lpcd. | | |
| | | | **Domestic @ 65 %** | **Flushing @ 35 %** | |
| | Water requirement for Units | @ | 113.00 | 59.50 Lpd. | |
| | | | 57856 | 30464 Lpd. | |
| | | **or** | **57.86** | **30.46 Kld.** | |
| 2 | **VISITORS @ 10%** | | 52.00 persons | | |
| | Water requirement per person | @ | 15.00 Lpd. | | |
| | | | **Domestic** | **Flushing** | |
| | Water requirement | @ | 5.00 | 10.00 Lpd. | |
| | | | 260 | 520 Lpd. | |
| | | **or** | **0.26** | **0.52 Kld.** | |
| 3 | **COMMON FACILITY** | 200.00 | sq.m | | |
| | | @ | | 1.4 sq.m/per | |
| | **Population** | 143 | | | |
| | Staff @ 10% | 14 | - | - Person | |
| | Visitors @ 90% | 129 | - | - 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 | 642.86 | 357.14 | 285.71 Lpd. | |
| | Visitors | 1928.57 | 642.86 | 1285.71 Lpd. | |
| | | | **1.00** | **1.57 Kld.** | |
| | **Total Domestic Water Requirement For UGT (1 To 3)** | **Total** | **59.12** | **32.56 Kld.** | |
| 4 | **GREEN AREA (1667.53 sqm or 0.412 Acres)** | 0.412 | | | |
| | Daily water requirement @ 25000 lit/Acre | @ | - | 25000 Ltr./Acre | |
| | | | - | 10300.00 Lpd. | |
| | | | **0.00** | **10.30 Kld.** | |

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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. ~~366.14~~ 466.90 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. ~~198.343~~ 252.92 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.

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| | | | | |
|---|---|---|---|---|
| | | **Total** | **0.00** | **10.30 Kld.** |
| **5** | **TOTAL DAILY REQUIREMENT** | | | |
| | a) For Domestic +Flushing use (1 To 3) | | 59.12 | 32.56 Kld. |
| | c) Under Road+ Parks (4) | | 0.00 | 10.30 Kld. |
| | Total Daily Requirement | | 59.12 | 42.86 Kld. |
| | | **SAY** | **60.00** KL | **50.00 Kld.** |
| **6** | **TUBE WELL FOR UGT** | | | |
| | Assuming working hours of tubewells | | | 8 Hours |
| | Assuming discharge/hour of each tubewell | | | 20 KL/Hours |
| | Total domestic demand | | | **59.12 Kld.** |
| | No. of tubewells required | 59.12 /20/8 | | 0.37 |
| | | **Say** | | **1.00 Nos.** |
| **7** | **PUMPING MACHINERY FOR TUBE WELL** | | | |
| | 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 = 20000x60x1/60/60/75/0.6 | | = | 7.41 HP |
| | With 60% efficiency | **Say** | | ~~8.00~~ **HP** 7.50 |
| **8** | **UNDER GROUND TANK** (Dom) | | | |
| | Daily requirement for domestic use | | = | 59.12 Kld. |
| | Capacity of under ground tank | | | |
| | 24 hours storage | 59.12 x 24 / 24 | | 59.12 Kld. |
| | | **Say** | **=** | **100.00 Kld.** |
| | Fire Tank Capacity As/NBC-2016 | | = | 150.00 KLD |
| | | **Say** | = | **150.00 KL** |
| | | **TOTAL** | | **250.00 KL** |

It is proposed to provide under ground tank of capacity **250 KL** which also includes **150 KL** capacity for fire fighting.

Tanks will have four compartments, two for fire, one for raw and the other one for domestic use. The water first enters the raw compartment, then over flows to the fire compartment, then over flows to the domestic 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 | **75.00 Kl.** |
| Capacity of Fire Water Tank-02 | **75.00 Kl.** |
| Capacity of Raw Water Tank | **50.00 Kld.** |
| Capacity of Domestic Water Tank | **50.00 Kld.** |
| | **UGT** |

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**9 BOOSTING MACHINERY**

**UG. TANK**

| | | | | |
|---|---|---|---|---|
| Daily requirement for domestic use | | | = | 59.12 Kld. |
| Assuming 6 hours pumping | 1 pumps (with one standby) | | | |
| Discharge/hour | 59.12 | / 6 / 1 = | | 9.85 KL/Hours |
| Head of pump | | | | 164.17 lpm |
| i) Suction lifts | | | = | 0.0 Mtr. |
| ii) Friction loss in M<main & specials | | | = | 2.0 Mtr. Say 180 lpm |
| iii) Clear head | | | = | 56.0 Mtr. |
| iv) Residual head | | | = | 5.0 Mtr. |
| | | | = | 63.0 Mtr. Say 65m |
| BHP of motor 180x65 / 60x75x0.60 | | | = | 4.33 3.83 HP 5 4.00 **HP** |

**10 PUMPS FOR FIRE PROTECTION**

| | Pump Description | Location | Nos. | Discharge | Head | HP |
|---|---|---|---|---|---|---|
| i) | **Diesel Driven Pump** | Pump Room | **1** | **2280** | **100.00** | **90** |
| ii) | **Hydrant Pump** | Pump Room | **1** | **2280** | **100.00** | **90** |
| iii) | **Jockey Pump** | Pump Room | **1** | **180** | **100.00** | **10** |

| **Capacity of Gen Set** | Nos. | HP | | |
|---|---|---|---|---|
| Domestic Water Transfer Pumps | 1 | ~~4~~ 4.0 | = | ~~4~~ 5 HP |
| Tubewell | 1 | ~~8.0~~ 7.50 | = | 7.50 ~~8~~ HP |
| Fire Pump (Jockey) | 1 | 10.0 | = | 10 HP |
| Lighting | | | = | 25 HP |
| U.G. water tank | | | | ~~47~~ 52.50 HP |
| | | | or | ~~47~~ 52.50 x0.746x1.50 = ~~52.59~~ 58.34 KVA |
| | | | | **Say 60.00 KVA** |

**11 Sewage Treatment Plant Capacity (STP.)**

| | | |
|---|---|---|
| Gross Domestic+Flushing water requirment / day | | 91.67 Kld. |
| Sewage flow 80% of total load | | 73.34 Kld. |
| **Proposed STP. Capacity** Add 5% for marginal factor = | 73.34 kl + 3.66 kl = 77.00 | **80.00 Kld. STP** |

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**Estimate for Providing in Internal Development works**

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| Description | Amount (Lacs.) |
|---|---|
| | |
| **Sub Work - I** Water Supply System | 195.35 ~~132.58~~ |
| | |
| **Sub Work - II** Sewerage System | 32.42 ~~46.72~~ |
| | |
| **Sub Work - III** Storm Water Drainage System | 36.68 ~~39.10~~ |
| | |
| **Sub Work - IV** Roads & Footpath | 113.52 ~~79.28~~ |
| | |
| **Sub Work - V** Street Lighting | 7.07 ~~4.25~~ |
| | |
| **Sub Work - VI** - Horticulture | 7.08 ~~6.46~~ |
| | |
| **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) | 74.78 ~~57.76~~ |
| **Total** | Rs 466.90 ~~366.14~~ |

Dev. Cost Rs 466.90 lacs / 1.8470 acre = Rs 252.78 lacs

~~(RUPEES THREE CRORES SIXTY SIX LACS FOURTEEN THOUSAND ONLY)~~ 252.78 Lacs

**SH. AJIT SINGH AND OTHER IN COLLABORATION WITH EMAAR MGF LAND LTD.**

Executive Engineer
HSVP Division No. V
Gurugram

Superintending Engineer,
HSVP Circle, Gurugram

**Authorized Signatory**

Checked subject to Comments
In forwarding letter No. 4586
Dt. 26/02/2024 ...and notes
Attached

Director
Town & Country Planning
Haryana, Chandigarh

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

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हरियाणा शहरी विकास प्राधिकरण
HARYANA SHEHARI
VIKAS PRADHIKARAN

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

CE-I No. 45869
Dated: 26/02/2024

**Annexure-A**

**SUB:- Approval of service plan estimate of the Group Housing Colony (Licence no. 04 of 2013 dated 18.02.2013) over an area measuring 1.847 acres out of 10.744 acres falling in the revenue estate of Village Bajghera, Sector-112, Gurugram being developed by Sh. Ajit Singh & others in collaboration with Emaar India Ltd. (Formerly known as Emaar MGF Land Ltd.).**

**Technical note and comments:-**

1. All detailed working drawings would have to be prepared by the colonizer for Integrating the internal services proposals with the master proposals of town.
2. The correctness of the levels will be the sole, responsibility of the colonizer for the integration of internal proposals, with the master proposals, of town and will be got confirmed before execution.
3. The material to be used shall the same specifications as are being adopted by 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.

## FINAL ABSTRACT OF REVISED COST

| Description | | Amount (Lacs.) |
|---|---|---|
| | | Rs. in Lacs |
| Sub Head - ( I ) Head Works | 36.75 | ~~21.25~~ |
| Sub Head - ( II ) Pumping Machinery | 51.00 | ~~32.40~~ |
| Sub Head - ( III ) Distribution System (Dom. + Flushing) | 18.15 | ~~15.09~~ |
| Sub Head - ( IV ) Irrigation Scheme | 7.20 | ~~4.57~~ |
| Sub Head - ( V ) Fire Scheme | 14.19 | ~~13.08~~ |
| **Total** | Rs 127.29 | ~~86.39~~ |
| Add 3% Contingencies | 3.82 | ~~2.59~~ |
| | 131.11 | |
| **Total** | 64.24 | ~~88.98~~ |
| Add 49% Departmental Charges | | ~~43.60~~ |
| | 195.35 lac | |
| **Grand Total** | | ~~132.58~~ |
| (CO to final abstract of cost) | **Say** | ~~132.58~~ |

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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. | 1 | 500000.00 | 5.00 |
| 2 | Constructing pump chambers as per standard design of PWD PH/HUDA of size 1.50x1.50 m. | Nos. | 1 | 100000.00 | 1.00 |
| 3 | 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 for UGT | Nos. | 1 | ~~100000.00~~ (L.S) | ~~1.00~~ 4 |
| ii) | construction of UG tank-1&2 (Dom.+ Fire) | KL | 250 | ~~4500.00~~ 5500 | ~~11.25~~ 13.75 |
| 4 | Provision for carriage of material and other unforeseen items. | LS | - | - | 1.50 |
| 5 | Provision for facilites staff for Maintenance | LS | - | - | 1.50 |
| | | | | | 36.75 |
| | (C.O. to abstract of cost of Sub-work No.I) | | | | ~~21.25~~ Lacs |
| | | | | **Say** | ~~21.25~~ Lacs |

**Sub Work I** — **Water Supply**

**Sub Head No. II** — **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 20 KL water per hour against a total head of 60 M complete with motor and other accessories. (7.50 HP) | Nos. | 1 | ~~100000.00~~ 150000.00 | ~~1.00~~ 1.50 |
| 2 | Providing & installing electricity driven pumping set capable of delivering 180 LPM of water against a total head of 63 m complete with motor and other accessories (For Domestic - 5 HP). F. Water Transfer Pump 150 LPM, 65m Head with 5.0 HP | Nos. | 1+1 2 | 1.00 ~~90000.00~~ | 2.00 ~~1.80~~ |
| 3 | Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities. | | 1+1 2 | 1.00 | 2.00 |
| i) | 60 KVA | Nos. | 1 | ~~600000.00~~ (L.S) | ~~6.00~~ |
| 4 | Providing & installing pumping set of following capacities for fire protection: | | | | |
| i) | 180 LPM @ 100 M Head (10 HP) | Nos. | 1 | 2.00 ~~110000.00~~ | 2.0 ~~1.10~~ |
| ii) | 2280 LPM @ 100 M Head (90 HP) Hydrant | Nos. | 1 | 1~~5~~50000.00 | 12.50 ~~5.50~~ |
| iii) | 2280 LPM @ 100 M Head (DG Pump) | Nos. | 1 | 1~~2~~50000.00 | 12.50 ~~8.50~~ |
| 5 | Provision for diesel engine genset stand bye arrangements for Tubewells. | Nos. | 1 | 100000.00 | 1.00 |
| 6 | Provision for cheap pressure type chlorination plant complete. | Nos. | 1 | 100000.00 | 1.00 |
| 7 | Provision for making foundations & erection of pumping machinery. | LS | - | - | 2.00 |
| 8 | Provision for pipes, valves & specials inside the pump chamber. | LS | - | - | 1.50 |
| 9 | Provision for electric services connection including electric fittings for tubewells chambers complete including cost of transformer. | LS | - | - | 2.50 |
| 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** | 51.50 ~~32.40~~ |
| | | | | **Say** | ~~32.40~~ |

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**Sub Work I** — **Water Supply**
**Sub Head No. III** — **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 (Dom.) | M | ~~12~~ 242 m | 1460.00 | ~~17520.00~~ 3.53 lacs |
| 2 | Providing, laying, jointing & testing uPVC SCH-80 (food grade) pipes including cost of excavation (under ground / basement ceiling level) complete as per ISI marked. For flushing water | | | | |
| i) | ~~25 mm dia nominal bore (Plant room to ews qty is also added for flushing)~~ | ~~M~~ | ~~316~~ | ~~270.00~~ | ~~85320.00~~ |
| ii) | ~~32 mm dia nominal bore (Plant room to ews qty is also ad~~ | ~~M~~ | ~~316~~ | ~~370.00~~ | ~~116920.00~~ |
| iii) | ~~40 mm dia nominal bore~~ | ~~M~~ | ~~213~~ | ~~380.00~~ | ~~80940.00~~ |
| iv) | ~~50 mm dia nominal bore~~ | ~~M~~ | ~~233~~ | ~~520.00~~ | ~~121160.00~~ |
| v) | ~~80~~ 150 mm dia nominal bore | M | ~~30~~ 239 | ~~1060.00~~ 1460/ | ~~31800.00~~ 3.49 lacs |
| 3 | Providing, fixing & Testing valves (ball/butterfly) including cost of complete in all respects. | | | | |
| i) | ~~25 mm i/d ball valve~~ | Nos. | ~~1~~ | ~~950.00~~ | ~~950.00~~ |
| ii) | ~~32 mm i/d ball valve~~ | Nos. | ~~2~~ | ~~1640.00~~ | ~~3280.00~~ |
| iii) | ~~40 mm i/d ball valve~~ | Nos. | ~~2~~ | ~~2450.00~~ | ~~4900.00~~ |
| iv) | ~~50 mm i/d butterfly valve~~ | Nos. | ~~2~~ | ~~4450.00~~ | ~~8900.00~~ |
| v) | ~~80 mm i/d butterfly valve~~ | Nos. | ~~1~~ | ~~6060.00~~ | ~~6060.00~~ |
| vi) | ~~100~~ 150 mm i/d butterfly valve | Nos. | ~~4~~ 12 | ~~7810.00~~ 12000/ | ~~31240.00~~ 1.44 lacs |
| 4 | Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects. | | | | |
| i) | ~~50 mm i/d~~ | ~~Nos.~~ | 0 | 10000.00 | 0.00 |
| ii) | ~~100~~ 150 mm i/d | Nos. | 2 | ~~14~~000.00 | ~~28000.00~~ 0.20 |
| 5 | Providing and fixing air valves and scour valves including cost of complete in all respects. | Nos. | 4 | 10000.00 | 40000.00 |
| 6 | Providing and fixing indicating plates for valves. | Nos. | 17 | 1000.00 | ~~17000.00~~ 0.34 |
| 7 | Provision for carriage of material & other unforseen | LS | - | - | 150000.00 |
| 8 | Provision for cutting the roads and making to its original conditions. | LS | - | - | 200000.00 |
| 9 | Making water supply connection. | LS | - | - | 200000.00 |
| 10 | Provision for rising main from HUDA water supply line to UG Tank. | | | | |
| i) | 100 mm i/d | M | 250 | 1460.00 | 365000.00 |
| | | | | | 18.15 lacs |
| | (C.O. to abstract of cost of Sub-work No.I) | | | **Total** | ~~1508990.00~~ |
| | | | | **Say** | ~~15.09~~ **Lacs** |

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**Sub Work I** — **Water Supply**

**Sub Head No. IV** — **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) | 25 OD | M | 60 | 220.00 | 13200.00 |
| ii) | 90 OD | M | 371 | 750.00 | 278250.00 |
| 2 | Providing and fixing 20mm dia Irrigation hydrant valve complete in all respect. | Nos. | 10 | 1200.00 | 12000.00 |
| 3 | Providing, fixing & Testing valves (ball/butterfly) including cost of complete in all respects. | | | | |
| i) | 25 mm i/d ball valve | Nos. | 10 | 950.00 | 9500.00 |
| ii) | 80 mm i/d butterfly valve | Nos. | 1 | 6060.00 | 6060.00 |
| 4 | Providing and fixing air valves and scour valves including cost of complete in all respects. | Nos. | 3 | 4500.00 | 13500.00 |
| 5 | Providing and fixing indicating plates for butterfly valve, NRV, air valve & garden hydrant etc. | Nos. | 24 | 1000.00 | 24000.00 |
| 6 | Provision for carriage of materials etc. and other unforsean charges. | LS | - | - | 50000.00 |
| 7 | Provision for cutting of roads & making good to its in original condition. | LS | - | - | 50000.00 |
| | | | | **Total** | **456510.00** |
| | | | | **Say** | **4.57 Lacs** |

**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 | 60 | 1000.00 | 60000.00 |
| b) | 150 mm dia | M | 486 | ~~1850.00~~ 2040/ | ~~899100.00~~ 9.91 |
| 2 | Providing and fixing External Fire Hydrants complete with masonary chambers. | Nos. | 4 | 15000.00 | 60000.00 |
| 3 | Providing, fixing & Testing butter fly valve including cost of complete in all respects. | | | | |
| a) | 80 mm dia | Nos. | 4 | 10000.00 | 40000.00 |
| b) | 150 mm dia | Nos. | 4 | 20000.00 | 80000.00 |
| 4 | Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects. | | | | |
| i) | 80 mm i/d | Nos. | 4 | 15000.00 | 40000.00 |
| 5 | Providing and fixing Fire Brigade connection. | | | | |
| i) | 4 way inlet connection. | Nos. | 2 | 15000.00 | 30000.00 |
| ii) | 2 way withdrawl connection. | Nos. | 1 | 10000.00 | 10000.00 |
| 5 | Provision for cutting of roads and carriage of materials etc. and other unforsean charges | LS | - | - | 40000.00 |
| 6 | Providing and fixing indicating plates for butterfly valve, NRV, fire brigade & fire hydrant etc. | Nos. | 19 | 2000.00 | 38000 ~~19000.00~~ |
| 7 | Provision for carriage of material & other unforseen items. | LS | - | - | 50000.00 14.19 Lacs |
| | | | **Total** | | ~~1308100.00~~ |
| | | | **Say** | | ≈ 14.19 ~~13.08~~ **Lacs** |

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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/~~DWC/RCC~~ $NP_3$ pipes and specials into trenches including cost of excavation, bed concrete lot of manholes complete. | | | | |
| **i)** | **200 mm i/d** | | | 1700 | 45900 |
| a) | Average depth 0.0 m to 1.5 m | M | 27 | ~~1050.00~~ | ~~28350.00~~ |
| b) | Average depth 1.5 m to 4.5 m | M | 119 | ~~1200.00~~ 1800 | ~~142800.00~~ 2.14 |
| **ii)** | **250 mm i/d** | | | | |
| a) | Average depth 0.0 m to 1.5 m | M | 0 | ~~1200.00~~ | 0.00 |
| b) | Average depth 1.5 m to 4.5 m | M | 0 | 2000 ~~1400.00~~ | 0.00 |
| 2 | Provision for lighting, watching and temporary diversion of traffic | LS | - | - | 100000.00 |
| 3 | Provision for cutting of roads and carriage of materials etc. and other unforsean charges. | LS | - | - | 100000.00 |
| 4 | Provision for Sewer connection with HUDA. | LS | - | - | 100000.00 |
| 5 | Cost of **80 Kld** Sewerage Treatment Plant **(Note:** The STP cost is inclusive of civil & electromechanical ~~part including flushing water transfer pumps~~) | @ Rs 16000/ ~~LS~~ | - | - | 12.80 lacs ~~2500000.00~~ |
| 6 | Provision for CI / DI pipe from STP. To Huda Main Line. | | | | |
| i) | 100 mm dia pipe. | M | 50 | 1460.00 | 73000.00 |
| | | | | | 21.13 lacs ~~3044150.00~~ |
| | Add 3% contingencies | | | | 0.63 lacs ~~91324.5~~ |
| | | | | | ~~3135474.50~~ 21.76 |
| | Add 49% Deptt. Charges | | | | 10.66 ~~1536382.505~~ |
| | | | | **Total** | ~~**4671857.01**~~ 32.42 |
| | (C.O. to abstract of cost of Sub-work No. 1) | | | **Say** | ~~**46.72**~~ **Lacs** |

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**Sub Work - III** **Storm Water Drain**

| S. No. | Description | Unit | Qty | Rate (Rs.) | Amount (Rs.) |
|---|---|---|---|---|---|
| 1 | Providing, lowering, jointing, cutting ~~DWC~~/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 | 279 | 2500.00 | ~~697500.00~~ 7.43 lacs |
| b) | Average depth 1.5 m to 4.5 m | M | ~~18~~ 297 m | ~~2600.00~~ | ~~46800.00~~ |
| 2 | Provision for Road Gully & Drain. pipe 300 mm | LS | - | - | 250000.00 |
| 3 | Provision for cutting of roads and carriage of materials etc. and other unforseen items | LS | - | - | 250000.00 |
| 4 | Provision for disposal arrangements Recharge Pit. | Nos | 2 | 350000.00 | 700000.00 |
| 5 | Provision for lighting, watching and temporary diversion of traffic | LS | - | - | 100000.00 |
| 6 | Provision of uPVC SCH-80 pipe for lifting water (overflow pumping) from drainage sumps (located at site level) to outside HUDA storm water line. | | | | |
| i) | 150mm dia nominal bore | M | 170 | ~~2960.00~~ 9040 | ~~503200.00~~ 3.43 lacs 23.90 |
| | | | | | ~~2547500.00~~ 8.72 |
| | Add 3% contingencies | | | | ~~76425.00~~ 24.62 lacs |
| | | | | | ~~2623925.00~~ 12.60 lacs |
| | Add 49% Deptt. Charges | | | | ~~1285723.25~~ 36.68 lacs |
| | | | | **Total** | ~~**3909648.25**~~ |
| | (C.O. to abstract of cost of Sub-work No. 1 | | | **SAY** | ~~**39.10**~~ **Lacs** |

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**Sub Work IV** **Road Work**

| S. No. | Description | Unit | Qty | Rate (Rs.) | Amount (Rs.) |
|---|---|---|---|---|---|
| 1 | Provision for leveling & earth filling as per site condition 1.846 acre @ 175000/acre | Acres | 1.8460 | 175000 | 323050.00 |
| 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~~ DBM iv) 30 mm thick BC complete in all respect. | Sq. mtr. | 2287.0 | 1500 | 3430500.00 |
| 3 | Provision for making approach and pavement to building block by providing concrete pavement or tiles. Etc. | Sq. mtr. | 344.00 | 1200 ~~650~~ | 4.13 ~~223600.00~~ |
| 4 | Provision for parking arrangement @ 1500 / sqm 116×2.50×5.0 = 1375+5% = 1443.75 sqm | Sq. mtr. | ~~139.0~~ | 1500 | 22.50 ~~208500.00~~ |
| 5 | Provision for kerb stone with complete specification. | mtr. | 800.0 | 600 | 480000.00 |
| 6 | Provision for Carriage of material & other unforseen items | LS. | ± | ~~200000.00~~ | 200000.00 |
| 7 | Provision for traffic lighting and guide map/ indicators | LS. | | ~~300000.00~~ | 300000.00 |
| | | | | **Total** | ~~5165650.00~~ & 73.97 lacs 2.21 lacs |
| | Add 3% contingencies | | | | ~~154969.50~~ 76.18 lacs 37.34 lacs |
| | | | | | ~~5320619.50~~ |
| | | | | **Total** | ~~53.21~~ Lacs 113.52 |
| | Add 49 % department charges | | | | ~~26.07~~ Lacs |
| | | | | **SAY** | ~~79.28~~ **Lacs** |

c.o.t to final asstract of cost

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**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 | 1.8460 | 150000.00 | 4.62 lacs ~~276900.00~~ |
| | Add 3% contingencies | | | | 0.13 lacs ~~8307.00~~ 4.75 lacs |
| | | | | **Total** | ~~285207.00~~ 2.32 lacs |
| | Add 49% Deptt. Charges | | | | ~~139751.43~~ 7.07 lacs |
| | | | | **Total** | **~~424958.00~~** |
| | | | | **SAY** | 7.07 ~~4.25~~ **Lacs** |

c.o. to final assessment of cost

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**Sub Work VI** **Horticulture**

| S. No. | Description | Unit | Qty | Rate (Rs.) | Amount (Rs.) |
|---|---|---|---|---|---|
| 1 | Development of lawn area<br>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 prope level by filling with earth mixed with manure befor & after flodding 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) | | | | |
| | 1.846 acres @ Rs. 1.5 lacs. | per acre | 1.8460 | 150000.00 | 2,76,900 |
| | 80 trees @ Rs. ~~1800~~/- each 2310 | | | | ~~1,44,000~~ 1.85 |
| | | | | | ~~420900.00~~ 4.62 |
| | Add 3% contingency charges | | | | ~~12627.00~~ 0.13 |
| | | | | Total | ~~433527.00~~ 4.75 |
| | Add 49% Deptt. Charges | | | | ~~212428.23~~ 2.33 |
| | | | | Total | ~~645955.23~~ 7.08 lacs |
| | | | | Say | ~~6.46~~ Lacs |

c.o. to final abstract of cost

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**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. | | | | |
| | 1.846 acres @ 8 lacs per acre | per acre | 1.8460 | 800000.00 | 1476800.00 |
| 2 | Provision for resurfacing & strengthening of road (with 50mm thick BM + 50 mm thick BC) after five years of Ist phase @ 450/- per sqm | Sq. mtr. | 2287.0 | 660/ ~~450~~ | 15.09 lacs ~~1029150.00~~ |
| 3 | Provision for resurfacing & strengthening of road (with 50mm thick BM + 50 mm thick BC) after ten years of 2nd phase @ 550/- per sqm | Sq. mtr. | 2287.0 | 825/ ~~550~~ | 18.87 lacs ~~1257850.00~~ |
| | | | | **Total** | 48.73 lacs ~~3763800.00~~ |
| | Add 3% contingency & PE charges | | | | 1.46 lacs ~~112914.00~~ |
| | | | | **Total** | 50.19 lacs ~~3876714.00~~ 24.59 lacs |
| | Add 49% Departmetal charges | | | | ~~1899589.86~~ 24.78 lacs |
| | | | | **Total** | ~~5776303.86~~ |
| | | | | **say** | **57.76 Lacs** |

C. o. to final abstract of cost

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| WATER SUPPLY QUANTITY SHEET | | | | |
|---|---|---|---|---|
| S.No. | Line No | | Length of Pipe | Dia of Pipe |
| | From | To | mtr. | mtr. |
| **DOMESTIC WATER SUPPLY QUANTITY SHEET** | | | | |
| 1 | ***UGT*** | D1 | 12.0 | 100 |
| 2. | D1 | D2 | ~~50.0~~ 31 | ~~50~~ |
| 3. | D2 | D2a | 16.0 | ~~63~~ |
| 4. | D2 | D3 | 72.0 | ~~50~~ |
| 5. | D1 | D1a | 111.0 | ~~50~~ |
| | | | 242 m | |
| **FLUSHING WATER SUPPLY QUANTITY SHEET** | | | | |
| 1 | ***STP*** | F1 | 10.0 | ~~80~~ |
| 2. | F1 | F2 | 118.0 | ~~40~~ |
| 3. | F2 | F2a | 16.0 | ~~25~~ |
| 4. | F2 | F3 | 72.0 | ~~40~~ |
| 5. | F1 | F1a | 23.0 | ~~40~~ |
| | | | 239 m + 242 = 481 m | |
| **TUBE WELL WATER SUPPLY QUANTITY SHEET** | | | | |
| 1 | **TUBE WELL-01** | ***UGT*** | 20.0 | ~~60~~ |
| **HUDA WATER SUPPLY QUANTITY SHEET** | | | | |
| 1 | **HUDA** | ***UGT*** | 250.0 | 100 |

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| S.No. | Line No | | Length of Pipe | Dia of Pipe |
|---|---|---|---|---|
| | From | To | mtr. | mtr. |
| **Description** | | | **Length in (MTR)** | **Pipe Dia (MM)** |
| Domestic and Flushing Water Supply line | | | 16.0 | 25 |
| Domestic and Flushing Water Supply line | | | 16.0 | 32 |
| Domestic and Flushing Water Supply line | | | 213.0 | 40 |
| Domestic and Flushing Water Supply line | | | 233.0 | 50 |
| Domestic and Flushing Water Supply line | | | 30.0 | 80 |
| Domestic, Flushing & Tube Well Water Supply line | | | 12.0 | 100 |
| **Description** | | | **Length in (MTR)** | **Pipe Dia (MM)** |
| HUDA Water Supply line | | | 250.0 | 100 |
| | | | | |
| **Description** | | | **Qty.** | **Unit** |
| 25 Dia Valve | | | 1 | Nos. |
| 32 Dia Valve | | | 2 | Nos. |
| 40 Dia Valve | | | 2 | Nos. |
| 50 Dia Valve | | | 2 | Nos. |
| 80 Dia Valve | | | 1 | Nos. |
| 100 Dia Valve | | | 4 | Nos. |
| 50 Dia Non Return Valve | | | 0 | Nos. |
| 100 Dia Non Return Valve | | | 2 | Nos. |
| Air Valve | | | 4 | Nos. |

| IRRIGATION WATER SUPPLY QUANTITY SHEET | | | | |
|---|---|---|---|---|
| S.No. | Line No | | Length of Pipe | Dia of Pipe |
| | From | To | mtr. | OD |
| 1 | ***S.T.P*** | G1 | 10.0 | 90 |
| 2. | G1 | G2 | 162.0 | 90 |
| 3. | G2 | G3 | 120.0 | 90 |
| 4. | G1 | G3 | 79.0 | 90 |

| **Description** | **Length in (MTR)** | **Pipe Dia (MM)** |
|---|---|---|
| Irrigation Water Supply line | **60.0** | **25** |
| Irrigation Water Supply line | **371.0** | **90** |

| **Description** | **Qty.** | **Unit** |
|---|---|---|
| Garden Hydrant | **10** | **Nos.** |
| 25 Dia Valve | **10** | **Nos.** |
| 90 Dia Valve | **1** | **Nos.** |
| Air Valve | **3** | **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 | 12.0 | 150 |
| 2. | B1 | B2 | 103.0 | 150 |
| 3. | B1 | B3 | 111.0 | 150 |
| | | | | |
| 1 | **4 WAY F.B. INLET** | **UGT** | 250.0 | 150 |
| 2. | **2 WAY F.B. WITHDRAWAL** | **UGT** | 10.0 | 150 |

| **Description** | **Length in (MTR)** | **Pipe Dia (MM)** |
|---|---|---|
| 80 mm Dia Pipe | **60.0** | **mtr.** |
| 150 mm Dia Pipe | **486.0** | **mtr.** |

| **Description** | **Qty.** | **Unit** |
|---|---|---|
| External Fire Hydrant | **4.0** | **Nos.** |
| 80 Dia Valve | **4.0** | **Nos.** |
| 150 Dia Valve | **4.0** | **Nos.** |
| 80 Dia Non Return Valve | **4.0** | **Nos.** |

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**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 | 27.0 | 200 | 0.200 | 1.20 | 1.39 | 1.30 | 27.0 | 0.0 | 0.0 | 0.0 |
| 2. | S2 | S3 | 98.0 | 200 | 0.200 | 1.39 | 2.09 | 1.74 | 0.0 | 98.0 | 0.0 | 0.0 |
| 3. | S3 | S4 | 13.0 | 200 | 0.200 | 2.09 | 2.19 | 2.14 | 0.0 | 13.0 | 0.0 | 0.0 |
| 4. | S4 | ***STP.*** | 8.0 | 200 | 0.200 | 2.19 | 2.24 | 2.21 | 0.0 | 8.0 | 0.0 | 0.0 |
| **Total** | | | **146.0** | | | | | | **27.0** | **119.0** | **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 | 27.0 | 119.0 | 0.0 | 0.0 |
| 250 mm Dia pipe | 0.0 | 0.0 | 0.0 | 0.0 |
| 300 mm Dia pipe | 0.0 | 0.0 | 0.0 | 0.0 |
| 400 mm Dia pipe | 0.0 | 0.0 | 0.0 | 0.0 |

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**TITLE : STORM WATER QUANTITY SHEET**

| 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.) |
| 1. | A1 | A2 | 50.0 | 400 | 0.400 | 1.30 | 1.39 | 1.34 | 50.0 | 0.0 | 0.0 |
| 2. | A2 | ***D.C.-01*** | 2.0 | 400 | 0.400 | 1.39 | 1.39 | 1.39 | 2.0 | 0.0 | 0.0 |
| 3. | ***D.C.-01*** | ***R.P.-01*** | 6.0 | 400 | 0.400 | 1.39 | 1.40 | 1.40 | 6.0 | 0.0 | 0.0 |
| 4. | ***R.P.-01*** | A3 | 9.0 | 400 | 0.400 | 1.30 | 1.32 | 1.31 | 9.0 | 0.0 | 0.0 |
| 5. | A3 | A4 | 33.0 | 400 | 0.400 | 1.32 | 1.37 | 1.34 | 33.0 | 0.0 | 0.0 |
| 6. | A4 | A5 | 77.0 | 400 | 0.400 | 1.37 | 1.51 | 1.44 | 77.0 | 0.0 | 0.0 |
| 7. | A5 | ***D.C.-02a*** | 16.0 | 400 | 0.400 | 1.51 | 1.54 | 1.52 | 0.0 | 16.0 | 0.0 |
| 8. | ***D.C.-02a*** | ***R.P.-02*** | 2.0 | 400 | 0.400 | 1.54 | 1.54 | 1.54 | 0.0 | 2.0 | 0.0 |
| 9. | ***A6*** | A7 | 47.0 | 400 | 0.400 | 1.30 | 1.38 | 1.34 | 47.0 | 0.0 | 0.0 |
| 10. | A7 | A8 | 51.0 | 400 | 0.400 | 1.38 | 1.47 | 1.43 | 51.0 | 0.0 | 0.0 |
| 11. | A8 | D.C.-02 | 2.0 | 400 | 0.400 | 1.47 | 1.48 | 1.47 | 2.0 | 0.0 | 0.0 |
| 12. | D.C.-02 | ***R.P.-02*** | 2.0 | 400 | 0.400 | 1.48 | 1.48 | 1.48 | 2.0 | 0.0 | 0.0 |
| 13. | ***R.P.-02*** | ***To HUDA by Pumping line*** | 170.0 | 150 | 0.150 | 1.05 | 1.05 | 1.05 | 170.0 | 0.0 | 0.0 |
| **Total** | | | **467.0** | | | | | | **449.0** | **18.0** | **0.0** |

| **Excavation Depth** | | | |
|---|---|---|---|
| Description | (0.0 - 1.5) | (1.5 - 3.0) | (3.0 - 4.5) |
| 400 mm Dia pipe | 279.0 | 18.0 | 0.0 |

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**TITLE : ROAD QUANTITY SHEET**

**MATERIAL STATEMENT FOR ROAD**

**AREA OF METALLED ROAD**

| S. No. | Road Name | | Length | 6.0 M Wide | 7.0 M Wide | 12.0 M Wide | Metal Portion (Mtr.) | AREA |
|---|---|---|---|---|---|---|---|---|
| | From | To | Mtr. | | | | | |
| 1 | R-1 | R-1 | 95.00 | 95.00 | - | - | 6.00 | 570.00 |
| 2. | R-2 | R-2 | 32.92 | 32.92 | - | - | 6.00 | 197.52 |
| 3. | R-3 | R-3 | 66.13 | 66.13 | - | - | 6.00 | 396.78 |
| 4 | R-4 | R-4 | 15.43 | 15.43 | - | - | 6.00 | 92.58 |
| 5 | R-5 | R-5 | 29.63 | 29.63 | - | - | 6.00 | 177.78 |
| 6 | R-6 | R-6 | 40.38 | 40.38 | - | - | 6.00 | 242.28 |
| 7 | R-7 | R-7 | 38.90 | 38.90 | - | - | 6.00 | 233.41 |
| 8 | R-8 | R-8 | 44.60 | 44.60 | - | - | 6.00 | 267.60 |
| **TOTAL** | | | **362.99** | | | | | **2177.95** |
| **ADD 5 % FOR CURVES** | | | **36.2992** | | | | | **108.90** |
| **TOTAL** | | | **399.29** | | | | | **2286.85** |
| **SAY** | | | **400.00** | | | | | **2287.00** |

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**PROJECT : PROPOSED BUILDING PLANS OF GROUP HOUSING COLONY FOR PHASE-1 IN SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA**

**TITLE : TUBE WELL WATER SUPPLY DESIGN**

| S.No. | Line No. | | Daily Demand | Average Demand | Peak Demand @ 1.5 Times | Flow Rate | Length | Head Loss | Total Head Loss | Velocity | Pipe Dia |
|---|---|---|---|---|---|---|---|---|---|---|---|
| - | From | To | Kld | klph. | klph. | lpm. | mtr. | mtr./ mtr. | mtr. | m/sec | mm |
| 1. | Tube Well-01 | ***UGT*** | 62.75 | 7.84 | 11.77 | 196.09 | 20.0 | 0.012 | 0.23 | 0.650 | 80 |

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**PROJECT : PROPOSED BUILDING PLANS OF GROUP HOUSING COLONY FOR PHASE-1 IN SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA**

**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. | lph. | lpm. | mtr. | mtr./ mtr. | mtr. | m/sec | mm |
| 1 | HUDA | ***UGT*** | 62.75 | 2.9 | 4.3 | 71.3 | 120.0 | 0.001 | 0.07 | 0.151 | 100 |

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

**PROJECT : PROPOSED BUILDING PLANS OF GROUP HOUSING COLONY FOR PHASE-1 IN SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA**

**(Pump Riser Calculation Sheet)**

**Domestic Water Supply Design Calculation For Towers**

| 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 terrace | 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 |
| *UGT 1 - D1* | 2.905 | 10.46 | **100** | 0.003 | 12.0 | 5 | 0.60 | 12.60 | 0.040 | 0.040 | 0.370 | 64.00 | 63.96 | 7.96 | 56.00 |
| *D1 - D2* | 1.453 | 5.23 | **50** | 0.025 | 50.0 | 5 | 2.50 | 52.50 | 1.335 | 1.335 | 0.739 | 19.00 | 17.66 | 6.66 | 11.00 |
| *D2 - D2a* | 0.087 | 0.31 | **32** | 0.001 | 16.0 | 5 | 0.80 | 16.80 | 0.020 | 0.020 | 0.108 | 83.00 | 82.98 | 7.98 | 75.00 |
| *D2 - D3* | 1.453 | 5.23 | **50** | 0.025 | 72.0 | 5 | 3.60 | 75.60 | 1.922 | 1.922 | 0.739 | 19.00 | 17.08 | 6.08 | 11.00 |
| *D1 - D1a* | 1.453 | 5.23 | **50** | 0.025 | 111.0 | 5 | 5.55 | 116.55 | 2.964 | 2.964 | 0.739 | 23.13 | 20.17 | 5.04 | 15.13 |

| | |
|---|---|
| Flow Rate | **2.905** lps |
| No. of Pumps (1 W + 1 S) | **174.3 LPM** |
| **SAY** | **180.0 LPM** |
| Maximum Building Height | 45 m |
| Pump Head | **64.00** m |
| Pump HP | 4.13 HP |
| **Say** | **5.00 HP** |

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## Flushing Water Supply Design Calculation For Towers

| 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 terrace | 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* | 1.597 | 5.75 | **80** | 0.003 | 10.0 | 5 | 0.50 | 10.50 | 0.032 | 0.032 | 0.317 | 64.00 | 63.97 | 3.97 | 60.00 |
| *F1 - F2* | 0.798 | 2.87 | **40** | 0.025 | 118.0 | 5 | 5.90 | 123.90 | 3.084 | 3.084 | 0.635 | 19.00 | 15.92 | 0.92 | 15.00 |
| *F2 - F2a* | 0.034 | 0.12 | **25** | 0.001 | 16.0 | 5 | 0.80 | 16.80 | 0.012 | 0.012 | 0.070 | 83.00 | 82.99 | 3.99 | 79.00 |
| *F2 - F3* | 0.798 | 2.87 | **40** | 0.025 | 72.0 | 5 | 3.60 | 75.60 | 1.882 | 1.882 | 0.635 | 19.00 | 17.12 | 2.12 | 15.00 |
| *F1 - F1a* | 0.798 | 2.87 | **40** | 0.025 | 23.0 | 5 | 1.15 | 24.15 | 0.601 | 0.601 | 0.635 | 21.27 | 20.67 | 3.40 | 17.27 |

| | |
|---|---|
| Flow Rate | **1.597** lps |
| No. of Pumps (1 W + 1 S) | **95.8 LPM** |
| **SAY** | **100.0 LPM** |
| Maximum Building Height | 45 m |
| Pump Head | **64.00** m |
| Pump HP | 2.3 HP |
| **Say** | **3.0 HP** |

**PROJECT : PROPOSED BUILDING PLANS OF GROUP HOUSING COLONY FOR PHASE-1 IN SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA**

**TITLE : HYDRAULIC SEWAGE DESIGN CHART**

| S.No. | Line No. | | Gross Water Requirement (Load on Line) | Sewage Flow (Self Load on Line) LPD | Sewage Flow (Self Load on Line) KLD | Previous Load | Progressive Discharge | Progressive Discharge (Average) | Progressive Discharge (Peak) | Infilteration @ 25% Av. Discharge | Total Discharge | Length | Pipe Size | Slope (1 in) | Fall | Velocity | Capacity of Pipe | Levels at start (mtr) | | | Levels at End (mtr) | | | Manhole Start Depth | Manhole Start End | Average Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | From | To | (lps.) | 80% | 1000 | (kld.) | (kld.) | (lps.) | (lps.) | (lps.) | (lps.) | (mtr.) | (mm) | (mm) | (mtr.) | (m/s) (v) | (lps.) | FRL | FSL | IL | FRL | FSL | IL | (mtr) | (mtr) | (mtr) |
| 1 | S1 | S2 | 20828 | 16662 | 16.66 | 0.00 | 16.66 | 0.19 | 0.58 | 0.05 | 0.63 | 27.0 | 200 | 140 | 0.193 | 0.76 | 24.033 | 0.75 | -0.25 | -0.45 | 0.75 | -0.44 | -0.64 | 1.20 | 1.39 | 1.30 |
| 2. | S2 | S3 | 41655 | 33324 | 33.32 | 16.66 | 49.99 | 0.58 | 1.74 | 0.14 | 1.88 | 98.0 | 200 | 140 | 0.700 | 0.76 | 24.033 | 0.75 | -0.44 | -0.64 | 0.75 | -1.14 | -1.34 | 1.39 | 2.09 | 1.74 |
| 3. | S3 | S4 | 20828 | 16662 | 16.66 | 49.99 | 66.65 | 0.77 | 2.31 | 0.19 | 2.51 | 13.0 | 200 | 140 | 0.093 | 0.76 | 24.033 | 0.75 | -1.14 | -1.34 | 0.75 | -1.24 | -1.44 | 2.09 | 2.19 | 2.14 |
| 4. | S4 | *STP.* | 0 | 0 | 0.00 | 66.65 | 66.65 | 0.77 | 2.31 | 0.19 | 2.51 | 8.0 | 200 | 140 | 0.057 | 0.76 | 24.033 | 0.75 | -1.24 | -1.44 | 0.75 | -1.29 | -1.49 | 2.19 | 2.24 | 2.21 |


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**PROJECT : PROPOSED BUILDING PLANS OF GROUP HOUSING COLONY FOR PHASE-1 IN SECTOR 112, GURGAON, MANESAR, URBAN COMPLEX, GURGAON, HARYANA**

**TITLE : HYDRAULIC STORM WATER DESIGN CHART**

| S.No. | Line No. | | Length | Catchment Area (Sqm.) | | | Discharge @ 45 mm/hr rainfall | Pipe dia | Slope 1 in | Velocity m/sec. | Capacity of pipe | Fall in line | Levels at start (mtr.) | | | Levels at End (mtr.) | | | Manhole Depth | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | Depth (mtr.) | | Avg. |
| - | From | To | (mtr.) | Self | Progg. | Total | 60% runoff (lps) | (mm) | (mm) | m/sec. | lps. | mtr. | FRL | FSL | IL | FRL | FSL | IL | Start | End | Depth |
| 1. | A1 | A2 | 50.0 | 1290.0 | 0.0 | 1290.0 | 9.68 | 400 | 570 | 0.60 | 75.63 | 0.09 | 0.750 | -0.15 | -0.55 | 0.750 | -0.24 | -0.64 | 1.30 | 1.39 | 1.34 |
| 2. | A2 | ***D.C.-01*** | 2.0 | 60.0 | 1290.0 | 1350.0 | 10.13 | 400 | 570 | 0.60 | 75.63 | 0.00 | 0.750 | -0.24 | -0.64 | 0.750 | -0.24 | -0.64 | 1.39 | 1.39 | 1.39 |
| 3. | ***D.C.-01*** | ***R.P.-01*** | 6.0 | 0.0 | 1350.0 | 1350.0 | 10.13 | 400 | 570 | 0.60 | 75.63 | 0.01 | 0.750 | -0.24 | -0.64 | 0.750 | -0.25 | -0.65 | 1.39 | 1.40 | 1.40 |
| 4. | ***R.P.-01*** | A3 | 9.0 | 0.0 | 675.0 | 675.0 | 5.06 | 400 | 570 | 0.60 | 75.63 | 0.02 | 0.750 | -0.15 | -0.55 | 0.750 | -0.17 | -0.57 | 1.30 | 1.32 | 1.31 |
| 5. | A3 | A4 | 33.0 | 850.0 | 675.0 | 1525.0 | 11.44 | 400 | 570 | 0.60 | 75.63 | 0.06 | 0.750 | -0.17 | -0.57 | 0.750 | -0.22 | -0.62 | 1.32 | 1.37 | 1.34 |
| 6. | A4 | A5 | 77.0 | 1980.0 | 1525.0 | 3505.0 | 26.29 | 400 | 570 | 0.60 | 75.63 | 0.14 | 0.750 | -0.22 | -0.62 | 0.750 | -0.36 | -0.76 | 1.37 | 1.51 | 1.44 |
| 7. | A5 | ***D.C.-02a*** | 16.0 | 410.0 | 3505.0 | 3915.0 | 29.36 | 400 | 570 | 0.60 | 75.63 | 0.03 | 0.750 | -0.36 | -0.76 | 0.750 | -0.39 | -0.79 | 1.51 | 1.54 | 1.52 |
| 8. | ***D.C.-02a*** | ***R.P.-02*** | 2.0 | 0.0 | 3915.0 | 3915.0 | 29.36 | 400 | 570 | 0.60 | 75.63 | 0.00 | 0.750 | -0.39 | -0.79 | 0.750 | -0.39 | -0.79 | 1.54 | 1.54 | 1.54 |
| 9. | A6 | A7 | 47.0 | 1210.0 | 0.0 | 1210.0 | 9.08 | 400 | 570 | 0.60 | 75.63 | 0.08 | 0.750 | -0.15 | -0.55 | 0.750 | -0.23 | -0.63 | 1.30 | 1.38 | 1.34 |
| 10. | A7 | A8 | 51.0 | 1310.0 | 1210.0 | 2520.0 | 18.90 | 400 | 570 | 0.60 | 75.63 | 0.09 | 0.750 | -0.23 | -0.63 | 0.750 | -0.32 | -0.72 | 1.38 | 1.47 | 1.43 |
| 11. | A8 | ***D.C.-02*** | 2.0 | 60.0 | 2520.0 | 2580.0 | 19.35 | 400 | 570 | 0.60 | 75.63 | 0.00 | 0.750 | -0.32 | -0.72 | 0.750 | -0.33 | -0.73 | 1.47 | 1.48 | 1.47 |
| 12. | ***D.C.-02*** | ***R.P.-02*** | 2.0 | 0.0 | 2580.0 | 2580.0 | 19.35 | 400 | 570 | 0.60 | 75.63 | 0.00 | 0.750 | -0.33 | -0.73 | 0.750 | -0.33 | -0.73 | 1.48 | 1.48 | 1.48 |
| 13. | ***R.P.-02*** | ***To HUDA by Pumping line*** | 170.0 | 0.0 | NA | NA | NA | 150.0 | NA | NA | NA | NA | 0.750 | -0.15 | -0.30 | 0.750 | -0.15 | -0.30 | 1.05 | 1.05 | 1.05 |

**Formula Used:**

Velocity(m/s)=(1/n)x(A/P)^(2/3)*(1/slope)^.5

n=.015 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 x1000x1/2 (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

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