

**SERVICE ESTIMATE, DESIGN REPORT
AND CALCULATIONS OF
INTERNAL DEVELOPMENT WORKS**

FOR

***"Reach Airia"*
A PROPOSED COMMERCIAL COMPLEX
MEASURING 6.260 ACRES IN SECTOR-68,
GURGAON MANESAR URBAN COMPLEX**

SEPTEMBER- 2014

OWNER

M/S. REACH PROMOTORS PVT LTD.



**SERVICE ESTIMATE, DESIGN REPORT AND CALCULATIONS OF INTERNAL
DEVELOPMENT WORKS FOR THE PROPOSED COMMERCIAL COLONY
MEASURING 6.260 ACRES IN SECTOR-68 AT GURGAON MANESAR URBAN
COMPLEX, HARYANA BEING DEVELOPMENT BY
M/S REACH PROMOTORS PVT LTD**

REPORT

Gurgaon town of Haryana State is situated on Delhi - Jaipur National Highway No.8 at a distance of 30 kms for Delhi. Being in the national capital Region, the town has fast developing tendency and potential. Further, it has also started sharing the growing Industrial load of Delhi. In order to relieve the growing pressure of population in National Capital of Delhi, Haryana Urban Development Authority has already developed residential sector which are inhabited to an extent. Further to the increasing demand HUDA has planned to develop new sectors at outskirts of Gurgaon town. This report and estimate is for approval of 6.260 acres Commercial building, Sector-68, Guragon Manesar Urban Complex, Haryana.

WATER SUPPLY

The source of water supply shall be HUDA water supply connection and this underground water is potable. It has been proposed to construct underground tanks of capacity as per attached details, and at location for domestic purpose and for fire protection. The under ground tanks will be fed from HUDA supply main, from there water will be pumped to O.H tanks on the roof of the building through multistage pump sets for office areas and further distributed to the toilets and pantries by gravity and separate hydropneumatic system has been proposed for retail areas.

DESIGN :

The scheme has been designed for population as given in attached sheet.

PUMPING EQUIPMENTS

It has been proposed to install pumping set as described with standby of equal capacity. Standby electric power requirement is added to the main DG Sets in case of electricity failure and it shall be either provided separately or added to the capacity of main generator.

SEWERAGE SCHEME

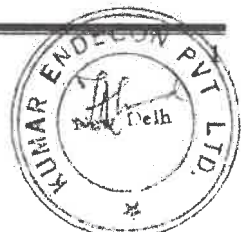
Sewer line from proposed development will be connecting to proposed HUDA Master Sewer. The sewerage system has been marked on the respective plans.

Sewer lines have been designed for 3.0 times average D.W.F in relation to water supply demand. It has been assumed that about 80% of the domestic water supply shall find its way into the proposed sewer. Sewer lines shall be laid to a gradient maintaining minimum 2.46 ft/sec (0.75 m/sec) self cleaning velocity. Sewer line up to 400 mm dia has been designed to run half full and above 400 mm dia has been designed to run three fourth full at peak flow. Necessary provision for laying S.W / RCC pipe sewer line, construction of required number of manholes etc. have been made in the estimate. The sewer line has been designed as per Manning's formulae.

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

Kumar Endecon

"Airia", Sec-68, Service Estimate-February, 2015 (R5)



STORM WATER DRAINAGE:

We are proposing to lay under ground R.C.C pipe drains with required number of catch basins for disposal of storm water which will be connecting rain water harvesting system to recharge the aquifer and surplus storm water will be allowed to flow to the HUDA Master drain along the services road. The intensity of rain fall has been taken as $\frac{1}{4}$ " (6.25mm) per hour and storm water line has been designed as per Manning's formulae.

SPECIFICATIONS:

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

Roads :

Cost of road has been taken in the estimate.

Street Lighting:

Provision for streets lighting has been included.

Horticulture:

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

Rates:

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

Cost:

The total cost of the scheme, including cost of all services works out to be ~~Rs. 735 lakhs~~ ^{719.50} (Rupees ~~SEVEN HUNDRED THIRTY FIVE LAKHS~~ ^{744.11} ~~including 3% contingencies @ 49% departmental charges, price escalation, unforeseen & admin charges etc.~~ ^{including 3% contingencies @ 49% departmental charges, price escalation, unforeseen & admin charges etc.}

For **REACH PROMOTORS PVT LIMITED**

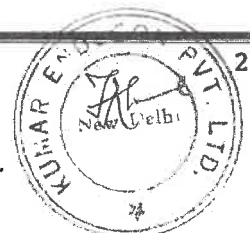
Paramjit Singh

Authorized signatory



Kumar Endecon

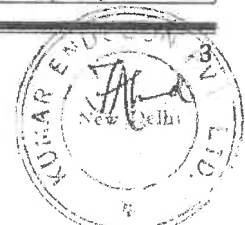
"Airia", Sec-68, Service Estimate-February, 2015 (R5)



I DESIGN CALCULATION:

(i) Domestic Water requirement

| S.NO | DESCRIPTION | Population per/ sqmt | Total Population | Water Requirement in (LPCD) | Total Water Requirement per day | Domestic Requirement | Flushing Requirement |
|------|---|----------------------|--------------------------|-----------------------------|---------------------------------|----------------------------------|---------------------------------|
| 1 | Maintenance staff and security personal in the entire building [Peak hours 200 and non peak hours 50] | L.S | 200 | 45.00 | 9,000.00 | 5,850.00 | 3,150.00 |
| 2 | Retail shopping centre (3959.763 sqmt) Level LG | | | | | | |
| (i) | Fixed | 10 | 396.00 | 45.00 | 17820.00 | 5880.00 | 11,940.00 |
| (ii) | Floating | 3 | 792.00 | 15.00 | 11,880.00 | 3,920.00 | 7,960.00 |
| 2 | Retail shopping centre (9989.838 sqmt) Level UG | | | | | | |
| (i) | Fixed | 10 | 999.00 | 45.00 | 44,955.00 | 14,835.00 | 30,120.00 |
| (ii) | Floating | 3 | 2001.00 | 15.00 | 300,15.00 | 9,905.00 | 20,110.00 |
| 3 | Retail shopping centre (16882.04 sqmt) from Level 1 to 2 (Upper levels) | | | | | | |
| (i) | Fixed | 10 | 1688.00 | 45.00 | 75,960.00 | 25,066.00 | 50,894.00 |
| (ii) | Floating | 6 | 562.00 | 15.00 | 8430.00 | 27,82.00 | 56,48.00 |
| 4 | Office areas (7666.42 sqmt) from Level 3 to 8 (Upper levels) | | | | | | |
| (i) | Fixed | 10 | 766.65 | 45.00 | 34,499.25 | 11384.67 12,074.75 | 2314.33 22,424.50 |
| 5 | Food Court (672 sqmt) - Level 2) | | | | | | |
| (i) | Fixed | 15 | 44.80 67 | 45.00 70 | 2,016.00 4680 | 1,310.40 1350.72 | 705.60 665.28 |
| (ii) | Floating (Seats) | 1.5 | 358.00 381 | 70.00 70 | 250,60.00 26670 | 16,790.00 17868.9 | 8,270.00 8801.10 |
| 6 | Cinema Hall (4902.82 sqmt) (from Level 3 to 4) - 7 halls 1145 seats | | | | | | |
| (i) | Fixed | | | | | | |
| | | L.S | 50 | 45.00 | 2250.00 | 1462.50 | 787.50 |
| | | | | | | 787.50 | 1,462.50 |



| | | | | | | | |
|------|--------------------------------------|-----------------|--------|-------|-----------------------------------|------------------------------------|------------------------------------|
| (ii) | Floating | L.S | 1095 | 15.00 | 16,425.00 | 5,748.75 | 10,676.25 |
| | TOTAL | | | | 2,82,310.00 282,310.00 | 1,04,775.00 1,04,775.00 | 1,77,535.00 1,77,535.00 |
| | SAY | | | | 280 kld | 105 kld | 175 kld |
| 8 | Soft water requirement for DG | DG | 50 KLD | | | | |
| 9 | Water required for Irrigation | 2000sqm @ 5ltr. | 10 kld | | | | |

(B) **Total of domestic and flushing requirement** = 282.59
SAY = 280 KLD

Total domestic requirement = 105 KLD
Total flushing requirement = 175 KLD

STP Capacity @ 80% of total water requirement = 224 KLD

(ii) **Horticulture water requirement (Organized Green)** = 10 KLD

(iii) **Fire Fighting requirement** = 400 KL

II. Summary & Source of water

(i) **Domestic water (from Bore well / HUDA)** = 105 KLD
(ii) **Flushing water (from STP)** = 175 KLD
(iii) **Horticulture (from STP)** = 10 KLD
(iv) **Soft water** = 345 KLD

III. Summary of UGT

(i) **Domestic Raw water tank** = 100 KLD
(ii) **Domestic Treated water tank** = 100 KLD
(iii) **Fire fighting water tank** = 400 KLD (200x2)
(iii) **Flushing & horticulture water tank (In STP)** = 180 KLD

TOTAL CAPACITY = 780 KLD

Therefore it is proposed to construct under ground tank of Raw Water 100 KL (100 x 1), Domestic water 100 KL (100 x 1) Nos and fire fighting tank 400 KL (200 x 2) Nos at one location marked on site plan and flushing water 200 KL (100 x 2) no tank located in STP.



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"Airia", Sec-68, Service Estimate-February, 2015 (R5)



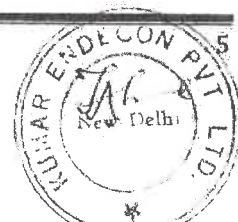
NO OF BORE WELL REQUIRED

| | | |
|----------------------------------|---|--------------------|
| Total domestic requirement | = | 105 KLD |
| Discharge through each tubewell | = | 15 Kl/hr |
| Working hour | = | 8 hrs |
| Total discharge through tubewell | = | 15 x 8 = 120 Kl/hr |
| No of tubewells | = | 105/120 |
| | = | 0.875 Nos |
| Add 10% stand by | = | 0.0875 |
| Total | = | 0.9625 |
| SAY | = | 1 No |

Provide one no of bore well for domestic supply till HUDA supply is made available .

HEAD CALCULATION

| | | |
|-------------|---|---|
| HP required | = | $\frac{15 \times 1000 \times 75}{60 \times 60 \times 75 \times 0.69}$ |
| | = | 6.94 |
| | = | 6.45 BHP |
| SAY | = | 7.50 HP |



| | | | |
|-----|----------------------------------|---|------------------------|
| (A) | Total domestic water requirement | = | 105 KL |
| (i) | Pumping @ 8 hours / day | = | 105 / 8 = 13.125 KL/hr |
| | SAY | = | 225 lpm |

BOOSTING MACHINERY FOR DOMESTIC PUMP

| | | | |
|-------|---|------------|---------------|
| (ii) | Gross working head | | |
| (iii) | Suction lift | = | 0.00 meter |
| (iv) | Friction loss | = | 10.00 meter |
| (v) | Clear head required | = | 50.100 meter |
| (vi) | Basement height | = | 8.250 meter |
| | TOTAL | = | 68.35 meter |
| | SAY | = | 70.00M |
| (vi) | HP = $\frac{225 \times 70}{60 \times 75 \times 0.65}$ | = 5.83 HP, | SAY = 7.50 HP |

It is proposed to provide 2 Nos. pumping sets of 225 lpm @ 70 Mtr. Head (1 Working + 1 Stand by) for Domestic Supply.

| | | | |
|-----|----------------------------------|---|------------------------|
| (B) | Total flushing water requirement | = | 175 KL + 10 KL hook |
| | | | 185 |
| (i) | Pumping @ 8 hours / day | = | 175 / 8 = 21.875 KL/hr |
| | SAY | = | 375 lpm 23.125 |
| | | | 385.41 |

BOOSTING MACHINERY FOR FLUSHING PUMP

| | | | |
|-------|---|---------|---------------|
| (ii) | Gross working head | | |
| (iii) | Suction lift | = | 0.00 meter |
| (iv) | Friction loss | = | 10.00 meter |
| (v) | Clear head required | = | 50.100 meter |
| (vi) | Basement height | = | 8.250 meter |
| | TOTAL | = | 68.35 meter |
| | SAY | = | 70.00M |
| (vi) | HP = $\frac{480}{375} \times \frac{70}{60 \times 75 \times 0.65}$ | = 10.37 | SAY = 10.0 HP |

It is proposed to provide 2 Nos. pumping sets of 375 lpm @ 70 Mtr. Head (1 Working + 1 Stand by) for Flushing Supply.



PUMPS FOR FIRE PROTECTION

| S.NO. | PARAMETERS | LOCATION | PUMP SETS | | | |
|-------|------------------|-----------|-----------|------|-------|--------|
| | | | Jockey | WC | Main | Diesel |
| (a) | Discharge in Lpm | Pump room | 180 | 2280 | 2850 | 2850 |
| (b) | Head in meters | | 110 | 45 | 110 | 110 |
| (c) | HP | | 10.0 | 35.0 | 120.0 | 100.0 |
| (d) | Quantity in Nos | | 1 | 1 | 2 | 1 |

CAPACITY OF DG SETS.

| S.NO. | EQUIPMENT | QTY | HP | Total HP |
|-------|--------------------------|-----|--------|------------|
| (1) | FIRE JOCKEY PUMPS | 1 | 10.0 | 10.0 |
| (2) | BOOSTER PUMPS (Domestic) | 1 | 7.50 | 7.50 |
| (3) | BOOSTER PUMPS (Flushing) | 1 | 10.0 | 10.0 |
| (4) | TUBEWELL PUMPS | 1 | 7.50 | 7.50 |
| | TOTAL | | | 35.00 |
| | | | *0.746 | 26.11 KW |
| | | | *1.5 | 39.165 KVA |
| (5) | Lighting | | | 10.00 KVA |
| | TOTAL | | 49.165 | 47.165 KVA |
| | SAY | | | 50 KVA |

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



**PROPOSED "Airia" COMMERCIAL COLONY (6.260 ACRES) AT SECTOR-68, GURGAON,
HARYANA**

FINAL ABSTRACT OF COST

| S.No. | Descriptions | Amount in Rs. Lacs |
|--------------------------|---------------------------------------|--|
| SUB WORK NO. I | WATER SUPPLY SCHEME | 137.30 139.81 |
| SUB WORK NO. II | SEWERAGE SCHEME | 176.38 78.40 46.85 49.35 |
| SUB WORK NO. III | STORM WATER DRAINAGE | 41.75 28.41 29.41 |
| SUB WORK NO. IV | ROADS & FOOT PATHS | 122.66 159.57 |
| SUB WORK NO. V | STREET LIGHTING | 7.82 24.01 |
| SUB WORK NO. VI | PLANTATION & ROAD SIDE TREES | 6.75 15.16 |
| SUB WORK NO. VII | MTC CHARGES & RESURFACING OF ROADS | 129.05 224.14 |
| TOTAL | | 719.41 719.41 lacs |
| TOTAL | | |
| TOTAL | | |
| SAY IN LAKHS | | 719.51 lacs |
| Deviation of Cost | | |
| Say | | 114.94 lacs |
| | | Lakhs Per Acre |

For REACH PROMOTORS (P) LTD

Superintending Engineer,
HUDA, Circle-II, Gurgaon

AUTHORISED SIGNATORY

Check for comments
in the estimate
with the estimate

Executive Engineer (V)
for Chief Engineer
for Chief Engineer



Director General
Town and Country Planning,
Haryana, Chandigarh

Kumar Endecon
Service Estimate - August, 2014 (R1)

| PROPOSED "Airia" COMMERCIAL COLONY (6.260 ACRES) AT SECTOR-68, GURGAON, HARYANA | | |
|---|--|---|
| SUB WORK No. 1 | Descriptions | Water Supply and Fire Fighting |
| Sub Head No. 01 | Water Supply & Fire Fighting Pumping Machinery | 1,07,50,000.00 86.50 Lacs |
| Sub Head No. 02 | Rising Main From HUDA, water supply distribution lines (Domestic & Flushing) | 9,78,900.00 13.85 Lacs |
| Sub Head No. 03 | Fire fighting Fire Rising Main | 13,25,500.00 13.36 Lacs |
| Sub Head No. 04 | Water supply Irrigation System | 6,78,250.00 1.22 Lacs |
| TOTAL | | 1,37,30,650.00 |
| SAY IN LAKHS | | 137.30/14.93 Lacs |

Add 3% Contingency & P&B charges = Rs 3.45 Lacs

\$ 118.38 Lacs

Add 49% depl't, price escalation
unforeseen, Admin. charges

\$ 58.00 Lacs

\$ 176.38 Lacs



| Sub -Work No. 1 | | | | Water Supply and Fire Fighting Pump Machinery | |
|------------------|---|------------|-----|---|----------------|
| Sub -Head No. 01 | | | | | |
| SL . NO | Description | Unit | Qty | Rate | Amount |
| 1 | Provision for boring of bore well. | | | | |
| (a) | | Each | 1 | 700000.00 | 7,00,000.00 |
| 2 | Provision for diesel engine generator set each for standby arrangements for T.W & Booster pump complete in all respects with following capacities. | | | | 5-00 |
| (a) | 50 KVA | Each | 1 | LS | -7,50,000.00 |
| 3 | Providing and installing pumping set of following capacity for fire protection. | | | | |
| (a) | 180 lpm at 110m Head, 10.0 HP (Jockey Pump) | Each (L.S) | 1 | 2,00,000.00 | 2,00,000.00 |
| (b) | 2850 lpm at 110m Head, 100 BHP (Diesel Pump) | Each (L.S) | 1 | 10.00 | 10.00 |
| (c) | 2850 lpm at 110m Head, 120 HP (Electric Pump) | Each (L.S) | 1 | 7,50,000.00 | 7,50,000.00 |
| (d) | 2280 lpm at 110m Head, 35 HP (WCurtain Pump) | Each (L.S) | 1 | 4,25,000.00 | 4,25,000.00 |
| 4 | Providing and installing electricity driven pumping set for domestic and flushing supply capable of delivering following capacities of water complete with motor and other accessories. | | | | |
| (a) | Domestic Supply, 225 lpm @ 70 mtr, 7.50 HP | | 2 | 2,00,000.00 | 4,00,000.00 |
| (b) | Flushing Supply, 400 lpm @ 70 mtr, 10.0 HP | | 2 | 2,25,000.00 | 4,50,000.00 |
| (c) | Irrigation Supply, 350 lpm @ 30 mtr, 5.0 HP | | 2 | 75,000.00 | 1,50,000.00 |
| (d) | Tubewell Supply, 250 lpm @ 75 mtr, 7.50 HP | | 2 | 2,00,000.00 | 4,00,000.00 |
| 5 | Provision for chlorination plant complete. | | | | 2,00,000.00 |
| (a) | | Each | 1 | 1,00,000.00 | 1,00,000.00 |
| 6 | Construction of U.G tanks in 6 compartments. | | | | 36,00,000.00 |
| (a) | | KL | 800 | 4500.00 | 36,00,000.00 |
| 7 | Provision for making foundation and erection of pumping Machinery. | | | LS | 1,00,000.00 |
| 8 | Provision for pipes, valves and specials inside the pump chamber and boosting chamber. | | | LS | 2,00,000.00 |
| 9 | Provision for electric service connection including electrical fitting for tube-well and boosting chamber etc. (lumpsum) including cost of transformor. | | | LS | 2,50,000.00 |
| 10 | Provision for carriage of material and other unforeseen items. | | | LS | 50,000.00 |
| 11 | TOTAL Prov. for boosting station with suitable capacity as per P.H. requirements (L.S) | | | | 1,07,50,000.00 |

12) Prov. for rising main from T.W. to U.G. and by Pass arrangement (L.S)

\$ 0.50 lrs
Rs 86.50 lrs



| Sub -Work No. 1 | | | | Rising Main From HUDA, Water supply distribution lines (Domestic & Flushing) | |
|------------------|---|-------|-----|--|-------------|
| Sub -Head No. 02 | | | | | |
| SL.NO | Description | Unit | Qty | Rate | Amount |
| 1 | Providing , laying, jointing and testing of GI pipe lines including cost of excavation etc. complete in all respects. | | | 1250/- | 0.69 Lacs |
| (a) | 50 mm dia (HUDA) Rising main | Metre | 55 | 750.00 | 41,250.00 |
| 2 | Provision of water supply risers line to OHT / with hydropneumatic system from pump room / STP. | | | | |
| (a) | 40 mm | Metre | 215 | 685.00 | 1,47,275.00 |
| (b) | 50 mm | Metre | 190 | 750.00 | 1,42,500.00 |
| (c) | 65 mm | Metre | 225 | 875.00 | 1,96,875.00 |
| (d) | 80 mm (440 m + 390 m) | Metre | 830 | 1050.00 | 2,10,000.00 |
| 3 | Providing and fixing valves including cost of surface boxes and masonry chamber etc. completed in all respects. | | | 1250/- | 10.38 Lacs |
| (a) | 100 mm dia | Each | 2 | 12000.00 | 24,000.00 |
| (b) | 80 mm dia | Each | 1 | 11000.00 | 11,000.00 |
| (c) | 65 mm dia | Each | 1 | 10250.00 | 10,250.00 |
| (d) | 50 mm dia | Each | 1 | 9500.00 | 9,500.00 |
| (e) | 40 mm dia | Each | 1 | 9250.00 | 9,250.00 |
| 4 | Providing and fixing indicating plates for valve and air Valves. | | | | |
| (a) | | Each | 6 | 1000.00 | 6,000.00 |
| 5 | Provision for carriage for materials and other unforeseen items. | | | LS | 1.00 Lacs |
| 6 | Provision for cutting of roads and making good to its original conditions. | | | LS | 50,000.00 |
| 7 | Provision for making connection from HUDA Master line. (2.5) | | | | 3,00,000.00 |
| (a) | 80 mm dia | Each | 1 | | 50,000.00 |
| 8 | Provision for electronic type water meter for HUDA Connection | | | LS | 13.85 Lacs |
| | TOTAL | | | | 9,77,900.00 |

12,27,900/-

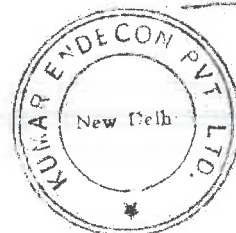


| | Sub -Work No. 1 | | | Fire fighting Fire Rising Main | |
|--------|---|-------|-----|--------------------------------|--------------|
| | Sub -Head No. 03 | | | | |
| SL. NO | Description | Unit | Qty | Rate | Amount |
| 1 | Providing , Laying , jointing and testing M.S pipes lines including cost of excavation etc. complete in all respect. | | | 1575 | 6.46 lac |
| (a) | 150 mm | Metre | 410 | 1500.00 | 6,15,000.00 |
| (b) | 100 mm | Metre | 70 | 1250.00 | 87,500.00 |
| (c) | 80 mm | Metre | 325 | 1000.00 | 3,25,000.00 |
| 2 | Providing & fixing valves including cost of surface boxes and masonry chambers etc. complete in all respects. | | | | 0.30 |
| (a) | 150 mm | Each | 2 | 14000.00 | 28,000.00 |
| 3 | Providing and fixing indicating plates for valve and air valves. | | | 1000/- | 0.02 lac |
| (a) | Each | | 2 | 10000.00 | 20,000.00 |
| 4 | Providing and fixing external fire hydrants etc. | | | | |
| (a) | Each | | 15 | 10000.00 | 1,50,000.00 |
| 5 | Provision for carriage for materials and other unforeseen items. | | | LS | 50,000.00 |
| 6 | Provision for cutting of roads and making good to its original conditions. | | | LS | 50,000.00 |
| | TOTAL | | | | 13,25,500.00 |
| | Material statement for Fire Line refer Annexure-"A" | | | | 13.36 lac |
| | Sub -Work No. 1 | | | Water supply Irrigation System | |
| | Sub -Head No. 04 | | | | |
| SL. NO | Description | Unit | Qty | Rate | Amount |
| 1 | Providing, Laying, Jointing and testing uPVC pipe line Confirming to IS : 4985 including cost of excavation etc. complete in all respect. (Garden Hydrant Line in Ground) | | | | 0.50 lac |
| (a) | 25 mm dia | Meter | 55 | 350 | 19,250.00 |
| (b) | 75 mm dia Connect to P. Line | Meter | 655 | 750 | 4,91,250.00 |
| 3 | Providing and fixing ball valves including cost of surface boxes and masonry chambers etc. complete in all respect. | | | | |
| (a) | 25 mm dia | Each | 12 | 3500 | 42,000.00 |
| (b) | 80 mm dia | Each | 1 | 4750 | 4,750.00 |
| 4 | Providing and fixing air release valve. | | | | |
| (a) | Each | | 2 | 10000 | 20,000.00 |
| 5 | Provision for carriage of Material and other unforeseen Items. | | | LS | 50,000.00 |
| 6 | Provision for cutting of roads and making good to its original conditions. | | | LS | 50,000.00 |
| | TOTAL | | | | 6,77,250.00 |
| | Material statement for GH Line refer Annexure-"B" | | | | 1.22 lac |



| Sub -Work No. II | | Sewerage System | | | |
|-------------------|---|--------------------|--------|------------------|--------------------------|
| SL. NO | Description | Unit | Qty | Rate | Amount |
| 1 | Providing and fixing DI K-7 pipes excluding all fittings & drip seal joints, including painting, MS clamps and cutting holes in walls and floors where ever required and making good complete in all respects. (Pipes in ground & STP overflow bypass line) <i>CP/DI pipe</i> | <i>Mtr</i> | 45 | <i>2150/-</i> | <i>Rs 0.97 lacs</i> |
| (a) | 150 mm dia <i>CP/DI pipe</i> | Meter | 75.80 | <i>1500</i> | <i>1,20,000.00</i> |
| (b) | 200 mm dia | Meter | 155.22 | <i>-2000/250</i> | <i>4,40,000.00</i> |
| 2 | Provision for lighting and watching. | | | LS | <i>1.00</i> 25,000.00 |
| 3 | Provision for carriage of Material and other unforeseen Items. | | | LS | 50,000.00 |
| 4 | Provision for making connection with HUDA Master sewer. | | | LS | <i>30000/-</i> 50,000.00 |
| 5 | Capacity of STP (225 KLD) (<i>Tertiary treatment level</i>) | | | LS | 40,00,000.00 |
| | TOTAL | | | <i>4935000/-</i> | <i>46,85,000.00</i> |
| | SAY IN LAKHS <i>(*) Pl. see oppo.</i> | | | <i>49.35</i> | <i>46.85</i> |
| | Material statement for Sewer Line refer Annexure-"D" | | | | |
| Sub -Work No. III | | Storm Water System | | | |
| SL. NO | Description | Unit | Qty | Rate | Amount |
| 1 | Providing lowering, and laying jointing R.C.C pipe class NP-3 cutting specials manholes etc. complete in all respect. | | | <i>1500/-</i> | <i>0.15 lacs</i> |
| (a) | 250 mm dia. | Metre | 10 | <i>-875</i> | <i>8,750.00</i> |
| (b) | 400 mm dia. | Metre | 230 | <i>1750/250</i> | <i>4,02,500.00</i> |
| 2 | Provision for Road gully chambers & connecting pipe. <i>300 mm dia</i> | | | LS | 1,00,000.00 |
| 3 | Provision for rainwater harvesting arrangements @ Rs. 1.25 lacs per acre for approx 6.260 acres by providing recharging well. (<i>Zero discharge Concept</i>) | | | <i>6 Nos</i> | 8,00,000.00 |
| 4 | Provision for covered drain of suitable size complete with perforated RCC cover. | | | | |
| (a) | 300 mm X 200 mm plus 100mm free board at gradient 1:450 | Metre | 980 | 1000 | 9,80,000.00 |
| 5 | Provision for lighting watering and timbering drains & other unforeseen charges & carriage of materials. | | | LS | <i>2.00</i> 50,000.00 |
| 6 | Provision for connection with HUDA 1 No. on master sewer | | | LS | <i>1,00,000.00</i> |
| | TOTAL | | | | <i>28,41,250.00</i> |
| | SAY IN LAKHS | | | | <i>28.41</i> |
| | Material statement for Storm Line refer Annexure-"E" | | | | |

Add 3% Contingency & P.B. charge *Rs 27.20 lacs*
Rs 0.82 lacs
 Add 49% dep't, unforeseen, price escalation *Rs 28.02 lacs*
 Admin. charges *Rs 13.73 lacs*
Rs 41.75 lacs



| Sub -Work No.IV | | | Roads and Footpaths | | |
|-----------------|--|------|---------------------|-------------------|---------------------------|
| SL.NO | Description | Unit | Qty | Rate | Amount |
| 1 | Provision for leveling and earth filling as Per site condition, | | | 1.25 | 7.83 lac |
| | | Acre | 6.260 | 100000 | 6,26,000.00 |
| 2 | The necessary provision for construction of roads parking etc has been made in the estimate according to the HUDA norms the following specification has been proposed. | | | | |
| (I) | Constriction of roads by providing granular sub base 300 mm as per MORT & H specifications conforming to clause 401 grading -II 400.1 | | | | |
| (II) | Providing and laying spreading & compacting hand broken/crushed stone aggregate to wet mix conforming to physical requirement laid in 400 of MORT & H specification n in two layers (Compacting to 250mm (125+125mm) by taking material 1:32 times of the (thickness of the layer) including premixing of material with water in mechanical mixer. | | | | |
| (III) | 50mm thick D.B.M | | | | |
| (IV) | 40mm DOBL | | | | |
| (a) | Sqm | | 8500.00 | 1250 | 1,06,25,000.00 |
| 3 | Provision for kerbs and channels | | | | |
| (a) | Metre | | 775.00 | 600/m | 4,65,000.00 |
| 4 | Provision for making approach and pavement to building. | | | | |
| 5 | Provision for carriage of materials & other unforeseen Itmes. | | | | |
| 6 | TOTAL Provision for kerbs and channels, Traffic light control etc | | | | |
| | SAY IN LAKHS PL. see also | | | | |
| | Material statement for Road refer Annexure-"C" | | | | |
| Sub -Work No.V | | | Street Lighting | | |
| SL.NO | Description | Unit | Qty | Rate | Amount |
| 1 | Providing Street lighting on roads as per standard specification of HVPN. with CPL | | | 2.50 lac | 15.65 lac |
| (a) | Acre | | 6.260 | 125000 | 7,82,500.00 |
| | TOTAL | Acre | | 125000 | 7,82,500.00 |
| | SAY IN LAKHS | | | | |

Add 3% Contingency & P.S charges

Add 4% elebt, unforeseen, price escalation
Admin. charges

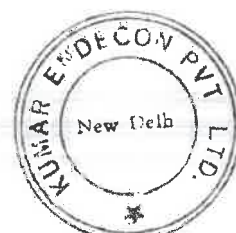
\$ 15.65 lac

\$ 0.46 lac

\$ 16.11 lac

\$ 7.90 lac

\$ 24.01 lac

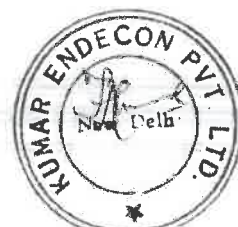


| Sub -Work No.VI | | Plantation and road side trees | | | |
|-------------------|--|-------------------------------------|---------|-----------|----------------|
| SL.NO | Description | Unit | Qty | Rate | Amount |
| 1 | Development of lawn areas | | | | |
| (i) | Acres | | 6.260 | 100000 | 6,26,000.00 |
| (a) | Trenching the ordinary soil up to dept of 60cm including removal and stacking serviceable material and disposing of by spreading and leveling within a lead of 50m and making up the trenches area to proper leads by filling with earth mixed with manure before and after flooding trench with water including cost of imported earth and manure. | | | | |
| (b) | Rough dressing of turfed area | | | | |
| (c) | Grassing with "Doob Grass" including watering and maintenance of lawns for 30 days till the grass forms a thick lawn, free from weeds and fit for moving in rows 7.5 m Apart in either direction including provision for hedges and barbed wire fencing around park 9.958 Acres @ 70000 per acre. | | | | |
| 2 | Providing tress, guards and planting tress along road at 6.0 m internals for 6.0m wide road Total road length = 640M 775 No of Tress 775 = 640/12 = 53.33 no. 64.58 Say = 55 65 Cost Analysis of Planting Trees Excavation = 30.00 Manure = 60.00 Tree plants = 60.00 Tree guards = 50.00 = Rs. 900 per tree 750/- Total 750/- 6.49 Lacs | | | | |
| (a) | Each | | 65 | 900 | 49,500.00 |
| | TOTAL | | Nos | | 6,75,500.00 |
| | SAY IN LAKHS | Pl. See oppo. | | | 6.75 |
| Sub -Work No. VII | | MTC. Charges & Resurfacing of Roads | | | |
| SL.NO | Description | Unit | Qty | Rate | Amount |
| 1 | Provision for MTC charges for water supply, sewerage storm water drainage, roads, street light and horticulture complete in all respect. | | | | |
| (a) | Acres | | 6.260 | 500000.00 | 31,30,000.00 |
| 2 | Resurfacing of roads after Ist 5 Years by providing 25 B.C | | | | |
| (a) | Sqm | | 8500.00 | 400.00 | 34,00,000.00 |
| 3 | Provision for resurfacing of roads after 10 years by providing 40 D.B.M & 25 B.C | | | | |
| (a) | Sqm | | 8500.00 | 750.00 | 63,75,000.00 |
| | TOTAL | | | | 1,46,05,000.00 |
| | SAY IN LAKHS | Add 3% Contingency & PD charges | | | 1.46 129.05 |



| PROJECT : "Airia " COMMERTIAL COMPLEX AT GURGAON, HARYANA MATERIAL STATEMENT OF FIRE FIGHTING LINE | | | | | | |
|---|-------------------|-------------|--------------------|------------------------|-------|--------|
| S. No. | ReferenceLine | Dia of Pipe | Pipe Length (m) | Length of line In mtr. | | |
| | | | | 80mm | 100mm | 150 mm |
| 1 | EFH-1 to F-1 | 80 | 9 | 9 | 0 | 0 |
| 2 | EFH-2 to F-1 | 80 | 30 | 30 | 0 | 0 |
| 3 | F-1 to F-2 | 100 | 33 | 0 | 33 | 0 |
| 4 | EFH-3 to F-3 | 80 | 56 | 56 | 0 | 0 |
| 5 | EFH-4 to F-4 | 80 | 5 | 5 | 0 | 0 |
| 6 | EFH-5 to F-4 | 80 | 46 | 46 | 0 | 0 |
| 7 | F-4 to F-3 | 100 | 4 | 0 | 4 | 0 |
| 8 | F-3 to F-5 | 100 | 9 | 0 | 9 | 0 |
| 9 | F-5 to F-2 | 150 | 94 | 0 | 0 | 94 |
| 10 | F-2 to F-6 | 150 | 2 | 0 | 0 | 2 |
| 11 | EFH-6 to F-6 | 80 | 20 | 20 | 0 | 0 |
| 12 | F-6 to F-7 | 150 | 45 | 0 | 0 | 45 |
| 13 | EFH-7 to F-7 | 80 | 20 | 20 | 0 | 0 |
| 14 | F-7 to F-8 | 150 | 47 | 0 | 0 | 47 |
| 15 | EFH-8 to F-9 | 80 | 14 | 14 | 0 | 0 |
| 16 | EFH-9 to F-9 | 80 | 57 | 57 | 0 | 0 |
| 17 | F-9 to F-8 | 100 | 7 | 0 | 7 | 0 |
| 18 | F-8 to F-10 | 150 | 88 | 0 | 0 | 88 |
| 19 | F-5 to F-11 | 150 | 85 | 0 | 0 | 85 |
| 20 | EFH-10 to F-12 | 80 | 10 | 10 | 0 | 0 |
| 21 | EFH-11 to F-12 | 80 | 52 | 52 | 0 | 0 |
| 22 | F-12 to F-11 | 100 | 13 | 0 | 13 | 0 |
| 23 | F-11 to F-10 | 150 | 27 | 0 | 0 | 27 |
| 24 | F-10 to PUMP ROOM | 150 | 15 | 0 | 0 | 15 |
| | | | | | | |
| TOTAL | | | 788.0 | 319.0 | 66.0 | 403.0 |
| SAY | | | 805.0 | 325.0 | 70.0 | 410.0 |

800 mtr mtr mtr mtr



Kumar Endecon

"Airia" - (MS-Fire) - August, 2014

| PROJECT:- "Airia" COMMERTIAL AT GURGAON, HARYANA | | | | | | | | |
|--|----------------|-----------------|------------------------------------|----------|----------|----------|----------|------------|
| MATERIAL STATEMENT FOR GARDEN HYDRANT | | | | | | | | |
| S. No. | Reference Line | Pipe Length (m) | Length of line In mtr. (uPVC pipe) | | | | | |
| | | | 25mm | 32mm | 40mm | 50 mm | 63 mm | 75 mm |
| 1 | GH-1 to G-1 | 22 | 22 | 0 | 0 | 0 | 0 | 0 |
| 2 | G-1 to G-2 | 62 | 0 | 0 | 0 | 0 | 0 | 62 |
| 3 | GH-2 to G-2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| 4 | G-2 to G-3 | 152 | 0 | 0 | 0 | 0 | 0 | 152 |
| 5 | GH-3 to G-3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| 6 | G-3 to G-4 | 43 | 0 | 0 | 0 | 0 | 0 | 43 |
| 7 | GH-4 to G-4 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| 8 | G-4 to G-5 | 43 | 0 | 0 | 0 | 0 | 0 | 43 |
| 9 | GH-5 to G-5 | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| 10 | G-5 to G-6 | 32 | 0 | 0 | 0 | 0 | 0 | 32 |
| 11 | GH-6 to G-6 | 14 | 14 | 0 | 0 | 0 | 0 | 0 |
| 12 | G-6 to G-7 | 30 | 0 | 0 | 0 | 0 | 0 | 30 |
| 13 | GH-7 to G-7 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 14 | G-7 to G-8 | 200 | 0 | 0 | 0 | 0 | 0 | 200 |
| 15 | GH-8 to G-8 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| 16 | G-8 to G-9 | 36 | 0 | 0 | 0 | 0 | 0 | 36 |
| 17 | G-1 to G-9 | 39 | 0 | 0 | 0 | 0 | 0 | 39 |
| 18 | G9 to STP | 12 | 0 | 0 | 0 | 0 | 0 | 12 |
| | | | | | | | | |
| | TOTAL | 697 | 48 | 0 | 0 | 0 | 0 | 649 |
| | SAY | 710 | 55 | 0 | 0 | 0 | 0 | 655 |



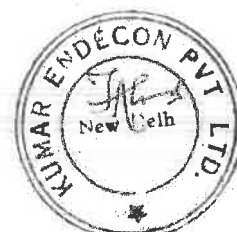
Kumar Endecon

"Airia"- (MS-Garden Hydrant) -August, 2014

PROJECT:- "Airia " COMMERTIAL AT GURGAON, HARYANA

MATERIAL STATEMENT FOR ROAD

| S. No. | Road Name (m) | Road Length (m) | 5.0 M WIDE | 6.00 M WIDE | 7.50 M WIDE | 9.00 M WIDE | 12.00 M WIDE | 16.0 M WIDE |
|--------------|------------------------------------|----------------------------|---------------|----------------|----------------|-----------------------|-----------------------|----------------|
| 1 | R1 to R2 | 40 | 0 | 40 | 0 | 0 | 0 | 0 |
| 2 | R2 to R3 | 82 | 82 | 0 | 0 | 0 | 0 | 0 |
| 3 | R3 to R4 | 48 | 0 | 0 | 0 | 48 | 0 | 0 |
| 4 | R4 to R5 | 15 | 0 | 0 | 0 | 0 | 0 | 15 |
| 5 | R5 to R6 | 58 | 0 | 58 | 0 | 0 | 0 | 0 |
| 6 | R6 to R7 | 52 | 0 | 52 | 0 | 0 | 0 | 0 |
| 7 | R7 to R8 | 20 | 0 | 0 | 20 | 0 | 0 | 0 |
| 8 | R8 to R9 | 156 | 0 | 0 | 156 | 0 | 0 | 0 |
| 9 | R9 to R10 | 12 | 0 | 0 | 0 | 0 | 12 | 0 |
| 10 | R10 to R11 | 34 | 0 | 34 | 0 | 0 | 0 | 0 |
| 11 | R12 to R13 | 48 | 0 | 48 | 0 | 0 | 0 | 0 |
| 11 | R11 to R1 | 35 | 0 | 0 | 35 | 0 | 0 | 0 |
| 12 | R12 to R13' | 95 | 0 | 0 | 0 | 0 | 95 | 0 |
| | | | | | | | | |
| Total Length | | 695 | 82 | 232 | 211 | 48 | 107 | 15 |
| SAY | Add 10% | 735 ✓ | 90 | 240 | 220 | 55 | 110 | 20 |
| Total Area | | 4875 4975.00 | 450 Sq.m | 1440 Sq.m | 1650 Sq.m | 385 450 | 770 605 | 280 |
| | | | | | | | | |
| (i) | Total Road Length (Metre) | | | 735.00 | | | | |
| (ii) | Total Road Area | | 4875 | 4975.00 | Sq.m | | | |
| (iii) | Add 5 % for curves | | | 36.75 | | | | |
| | Total for Kerb & Channel | | | 771.75 | Mtr | | | |
| | SAY | | | 775.00 | Mtr | | | |
| (iv) | Parking = (265x5x2.5) = 3312.50 m2 | | | 3312.50 | | | | |
| (v) | Grand total | | | 8287.50 | Sq.m | | | |
| | | | | 8187.50 | | | | |
| | SAY | | | 8500.00 | Sq.m | | | |
| | | | | | | | | |
| | | | | | | | | |



Kumar Endecon

"Airia" - (MS-Road) - August, 2014

PROJECT:- "Atria" COMMERCIAL COMPLEX AT GURGAON, HARYANA

DESIGN CALCULATION FOR SEWERAGE SYSTEM

| S.No | Manhole | Average Discharge (Self) | Previous Discharge | Progress. Discharge | Peak Flow 3 times of progress. Discharge | Ground water Infiltration @ 5000 ltr/km/day | TOTAL Discharge | FINAL Discharge | Length of line (in m) | Dia of Pipe (in mm) | Slope 1 IN | Total Fall | Velocity (in m/sec) | Discharge Cap. of Pipe (in lps) | Ground Elevation | | Invert Elevation | | Ave. Depth | Remarks |
|------|-----------------------|--------------------------|--------------------|---------------------|--|---|-----------------|-----------------|-----------------------|---------------------|------------|------------|---------------------|---------------------------------|------------------|-----------|------------------|-----------|------------|---------|
| | | | | | | | | | | | | | | | Upper End | Lower End | Upper End | Lower End | | |
| 1 | S1-S2 | 324.31 | 0.00 | 324.31 | 972.92 | 0.78 | 973.70 | 11.27 | 155.0 | 200 | 225 | 0.69 | 0.75 | 11.85 | 226.00 | 226.00 | 224.05 | 223.36 | 3.27 | |
| 2 | S2 to (STP) | 324.31 | 0.00 | 324.31 | 972.92 | 0.23 | 973.15 | 11.26 | 45.0 | 200 | 225 | 0.20 | 0.75 | 11.85 | 226.00 | 226.00 | 223.36 | 223.16 | 4.06 | |
| 3 | BY Pass Line From STP | | | | | 0.00 | | 0.00 | 75.0 | 150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| | | | | | | | | | 275.0 | | | | | | | | | | | |

200 mm Ø S.W. Pipe = 155 m

200 mm Ø CI Pipe = 45 m

150 mm Ø CI Pipe = 75 m



| PROJECT:- "Airia" COMMERTIAL COMPLEX AT GURGAON, HARYANA | | | | | | |
|--|--------------------------|-------------|------------------|------------------------|------------------|----------------|
| MATERIAL STATEMENT FOR SEWERAGE SYSTEM | | | | | | |
| S.No | Manhole | Dia of Pipe | Length | Length of line In mtr. | | |
| | | (mm) | (mm) | 150 | 200 | 250 |
| 1 | S1-S2 | 200 | 155 | 0 | 155 | 0 |
| 2 | S2 to (STP) | 200 | 45 | 0 | 45 | 0 |
| 3 | BY Pass Line From STP | 150 | 75 | 75 | 0 | 0 |
| TOTAL | | | 275.0 | 75.0 | 200.0 | 0.0 |
| SAY | | | 300.0 | 80.0 | 220.0 | 0.0 |

S.W PIPE

CI/DI

CI/DI

150 mm d CI/DI = 75 mtr
 200 mm d CI/DI = 45 mtr
 200 mm d S.W. Pipe = 155 mtr



PROJECT "Atria" COMMERTIAL COMPLEX AT GURGAON, HARYANA

DESIGN CALCULATION FOR STORM WATER DRAINAGE SYSTEM

| Sl. NO | Reference Line | AREA SERVED (IN ACRE) | | Runoff Assuming @ 1/4" Per Hour | TOTAL Discharge m ³ /min | FINAL Discharge (q) LPS | Dia of Pipe MM | Slope | Velocity | | Discharge Capacity Of Pipe/Drain (Q) LPS | Length of Line | FALL | GROUND LEVEL | | INVERT LEVEL | | DEPTH OF LINE | | Average Depth | Remark |
|---------------|-------------------|-----------------------|----------|---------------------------------|-------------------------------------|-------------------------|----------------|-------|----------|-------|--|----------------|-------|----------------|--------------|----------------|--------------|---------------|-----------|---------------|--------|
| | | Self | Previous | IN m ³ /hr | IN m ³ /min | IN LPS | IN MM | IN M | ft/sec | m/sec | IN | IN M | IN M | Level At Start | Level At End | Level At Start | Level At End | Upper End | Lower End | | |
| 1 | SD1-SD-2 | 1.45 | 0.00 | 23.833 | 0.397 | 6.620 | 400 | 450 | 2.56 | 0.78 | 98.209 | 55 | 0.122 | 226.000 | 226.000 | 225.10 | 224.98 | 0.900 | 1.022 | 0.961 | |
| 2 | SD2- RCP-01 (Ext) | 0.00 | 1.45 | 23.833 | 0.397 | 6.620 | 400 | 450 | 2.56 | 0.78 | 98.209 | 15 | 0.033 | 226.000 | 226.000 | 224.978 | 224.94 | 1.022 | 1.056 | 1.039 | |
| 3 | SD3-SD-4 | 1.85 | 0.00 | 30.408 | 0.507 | 8.447 | 400 | 450 | 2.56 | 0.78 | 98.209 | 22 | 0.049 | 226.000 | 226.000 | 225.10 | 225.05 | 0.900 | 0.949 | 0.924 | |
| 4 | SD4-SD-5 | 0.85 | 1.85 | 44.380 | 0.740 | 12.328 | 400 | 450 | 2.56 | 0.78 | 98.209 | 80 | 0.178 | 226.000 | 226.000 | 225.05 | 224.87 | 0.949 | 1.127 | 1.038 | IL |
| 5 | SD6-SD-5 | 1.40 | 0.00 | 23.012 | 0.384 | 6.392 | 400 | 450 | 2.56 | 0.78 | 98.209 | 33 | 0.073 | 226.000 | 226.000 | 225.10 | 225.03 | 0.900 | 0.973 | 0.937 | CL |
| 6 | SD5- RCP-02 (Ext) | 0.00 | 4.10 | 67.391 | 1.123 | 18.720 | 400 | 450 | 2.56 | 0.78 | 98.209 | 20 | 0.044 | 226.000 | 226.000 | 224.87 | 224.83 | 1.127 | 1.171 | 1.149 | |
| COVERED DRAIN | | | | | | | | | | | | | | | | | | | | | |
| 1 | D1-D2 | 0.74 | 0.00 | 12.184 | 0.203 | 3.385 | 300 | 450 | 2.12 | 0.64 | 53.893 | 210 | 0.467 | 226.000 | 226.000 | 225.80 | 225.33 | 0.200 | 0.667 | 0.433 | |
| 2 | D3-D2 | 0.25 | 0.00 | 4.061 | 0.068 | 1.128 | 300 | 450 | 2.12 | 0.64 | 53.893 | 35 | 0.078 | 226.000 | 226.000 | 225.80 | 225.72 | 0.200 | 0.278 | 0.239 | CL |
| 3 | D2-SD5 | 0.00 | 0.99 | 16.246 | 0.271 | 4.513 | 300 | 450 | 2.12 | 0.64 | 53.893 | 5 | 0.011 | 226.000 | 226.000 | 225.33 | 225.32 | 0.667 | 0.678 | 0.672 | |
| 4 | D4-D5 | 0.25 | 0.00 | 4.061 | 0.068 | 1.128 | 300 | 450 | 2.12 | 0.64 | 53.893 | 35 | 0.078 | 226.000 | 226.000 | 225.80 | 225.72 | 0.200 | 0.278 | 0.239 | |
| 5 | D5-D6 | 0.49 | 0.25 | 12.184 | 0.203 | 3.385 | 300 | 450 | 2.12 | 0.64 | 53.893 | 35 | 0.078 | 226.000 | 226.000 | 225.72 | 225.64 | 0.278 | 0.356 | 0.317 | |
| 6 | D6-D7 | 0.37 | 0.74 | 18.277 | 0.305 | 5.077 | 300 | 450 | 2.12 | 0.64 | 53.893 | 30 | 0.067 | 226.000 | 226.000 | 225.64 | 225.58 | 0.356 | 0.422 | 0.389 | |
| 7 | D7-D8 | 0.00 | 1.11 | 18.277 | 0.305 | 5.077 | 300 | 450 | 2.12 | 0.64 | 53.893 | 5 | 0.011 | 226.000 | 226.000 | 225.58 | 225.57 | 0.422 | 0.433 | 0.428 | |
| 8 | D8-SD6 | 0.25 | 1.11 | 22.338 | 0.372 | 6.205 | 300 | 450 | 2.12 | 0.64 | 53.893 | 5 | 0.011 | 226.000 | 226.000 | 225.57 | 225.56 | 0.433 | 0.444 | 0.439 | |
| 9 | D5-D9 | 0.74 | 0.00 | 12.184 | 0.203 | 3.385 | 300 | 450 | 2.12 | 0.64 | 53.893 | 80 | 0.178 | 226.000 | 226.000 | 225.80 | 225.62 | 0.200 | 0.378 | 0.289 | |
| 10 | D9-D10 | 0.25 | 0.74 | 16.246 | 0.271 | 4.513 | 300 | 450 | 2.12 | 0.64 | 53.893 | 35 | 0.078 | 226.000 | 226.000 | 225.62 | 225.54 | 0.378 | 0.456 | 0.417 | |
| 11 | D11-D10 | 0.49 | 0.00 | 8.123 | 0.135 | 2.256 | 300 | 450 | 2.12 | 0.64 | 53.893 | 45 | 0.100 | 226.000 | 226.000 | 225.80 | 225.70 | 0.200 | 0.300 | 0.250 | |
| 12 | D10-D12 | 1.11 | 1.48 | 42.646 | 0.711 | 11.846 | 300 | 450 | 2.12 | 0.64 | 53.893 | 125 | 0.278 | 226.000 | 226.000 | 225.54 | 225.27 | 0.456 | 0.733 | 0.594 | |
| 13 | D12-D13 | 0.00 | 2.59 | 42.646 | 0.711 | 11.846 | 300 | 450 | 2.12 | 0.64 | 53.893 | 5 | 0.011 | 226.000 | 226.000 | 225.27 | 225.26 | 0.733 | 0.744 | 0.739 | |
| 14 | D13-D14 | 0.74 | 2.59 | 54.830 | 0.914 | 15.231 | 300 | 450 | 2.12 | 0.64 | 53.893 | 65 | 0.144 | 226.000 | 226.000 | 225.26 | 225.11 | 0.744 | 0.889 | 0.817 | |
| 15 | D14-SD2 | 0.25 | 3.34 | 58.892 | 0.982 | 16.359 | 300 | 450 | 2.12 | 0.64 | 53.893 | 5 | 0.011 | 226.000 | 226.000 | 225.11 | 225.10 | 0.889 | 0.900 | 0.894 | |
| 16 | D6-D15 | 0.25 | 0.00 | 4.061 | 0.068 | 1.128 | 300 | 450 | 2.12 | 0.64 | 53.893 | 70 | 0.156 | 226.000 | 226.000 | 225.80 | 225.64 | 0.200 | 0.356 | 0.278 | |
| 17 | D14-D15 | 0.25 | 0.00 | 4.061 | 0.068 | 1.128 | 300 | 450 | 2.12 | 0.64 | 53.893 | 40 | 0.089 | 226.000 | 226.000 | 225.80 | 225.71 | 0.200 | 0.289 | 0.244 | |
| 18 | D15-D16 | 0.00 | 0.49 | 8.123 | 0.135 | 2.256 | 300 | 450 | 2.12 | 0.64 | 53.893 | 5 | 0.011 | 226.000 | 226.000 | 225.64 | 225.63 | 0.156 | 0.367 | 0.361 | |
| 19 | D8-D16 | 0.49 | 0.49 | 16.246 | 0.271 | 4.513 | 300 | 450 | 2.12 | 0.64 | 53.893 | 100 | 0.222 | 226.000 | 226.000 | 225.80 | 225.58 | 0.200 | 0.422 | 0.311 | |
| 20 | D16-D17 | 0.12 | 1.48 | 26.400 | 0.440 | 7.333 | 300 | 450 | 2.12 | 0.64 | 53.893 | 40 | 0.089 | 226.000 | 226.000 | 225.58 | 225.49 | 0.422 | 0.571 | 0.467 | |
| 15 | D14-SD2 | 0.00 | 1.61 | 26.400 | 0.440 | 7.333 | 300 | 450 | 2.12 | 0.64 | 53.893 | 5 | 0.011 | 226.000 | 226.000 | 225.49 | 225.48 | 0.571 | 0.522 | 0.517 | |
| | | | | | | | | | | | | 980 | | | | | | | | | |

| PROJECT:- "Airia" COMMERTIAL COMPLEX AT GURGAON, HARYANA | | | | | | | |
|--|----------------------|-------------|--------|------------------------|--------|--------|-------|
| MATERIAL STATEMENT FOR STORM WATER DRAINAGE SYSTEM | | | | | | | |
| S.No | SW Line | Dia of Pipe | Length | Length of line In mtr. | | | |
| | | (mm) | (m) | 250 | 300 mm | 400 mm | 500mm |
| 1 | SD1-SD-2 | 400 | 55 | 0 | 0 | 55 | 0 |
| 2 | SD2- RCP-01 (Ext) | 400 | 15 | 0 | 0 | 15 | 0 |
| 3 | SD3-SD-4 | 400 | 22 | 0 | 0 | 22 | 0 |
| 4 | SD4-SD-5 | 400 | 80 | 0 | 0 | 80 | 0 |
| 5 | SD6-SD-5 | 400 | 33 | 0 | 0 | 33 | 0 |
| 6 | SD5- RCP-02 (Ext) | 400 | 20 | 0 | 0 | 20 | 0 |
| TOTAL | | | | | 0 | 225 | 0 |
| SAY | | | 230 | | 0 | 230 | 0 |

| COVERED DRAIN | | | | | | | |
|---------------|----------|-------|--------|------------------------|--------|--------|-------|
| S.No | SW Drain | Width | Length | Length of line In mtr. | | | |
| | | (mm) | (m) | 250 mm | 300 mm | 400 mm | 500mm |
| 1 | D1-D2 | 300 | 210 | 0 | 210 | 0 | 0 |
| 2 | D3-D2 | 300 | 35 | 0 | 35 | 0 | 0 |
| 3 | D2-SD5 | 300 | 5 | 0 | 5 | 0 | 0 |
| 4 | D4-D5 | 300 | 35 | 0 | 35 | 0 | 0 |
| 5 | D5-D6 | 300 | 35 | 0 | 35 | 0 | 0 |
| 6 | D6-D7 | 300 | 30 | 0 | 30 | 0 | 0 |
| 7 | D7-D8 | 300 | 5 | 0 | 5 | 0 | 0 |
| 8 | D8-SD6 | 300 | 5 | 0 | 5 | 0 | 0 |
| 9 | D5-D9 | 300 | 80 | 0 | 80 | 0 | 0 |
| 10 | D9-D10 | 300 | 35 | 0 | 35 | 0 | 0 |
| 11 | D11-D10 | 300 | 45 | 0 | 45 | 0 | 0 |
| 12 | D10-D12 | 300 | 125 | 0 | 125 | 0 | 0 |
| 13 | D12-D13 | 300 | 5 | 0 | 5 | 0 | 0 |
| 14 | D13-D14 | 300 | 65 | 0 | 65 | 0 | 0 |
| 15 | D14-SD2 | 300 | 5 | 0 | 5 | 0 | 0 |
| 16 | D6-D15 | 300 | 70 | 0 | 70 | 0 | 0 |
| 17 | D14-D15 | 300 | 40 | 0 | 40 | 0 | 0 |
| 18 | D15-D16 | 300 | 5 | 0 | 5 | 0 | 0 |
| 19 | D8-D16 | 300 | 100 | 0 | 100 | 0 | 0 |
| 20 | D16-D17 | 300 | 40 | 0 | 40 | 0 | 0 |
| 15 | D14-SD2 | 300 | 5 | 0 | 5 | 0 | 0 |
| TOTAL | | | 980 | | 980 | 0 | 0 |
| SAY | | | 980 | | 980 | 0 | 0 |



PROJECT:- "Atria" COMMERTIAL COMPLEX AT GURGAON, HARYANA
DESIGN CALCULATION FOR DOMESTIC WATER SYSTEM (35% of 45.00 = 15.75)

| S. NO | Reference line | Water Req. (In LPD) | Total Requirement (In LPD) | Other requirement (In LPD) | Total Water Requirement (In LPD) | Peak Requirement @ 3.0 times of Water Requirement (In LPD) | Total Water Requirement (In LPM) | Dia of Riser pipe (In MM) | Velocity (m/sec) | Length of Line (Mtr) | (S) Slope of pipe (m/m) | Head Loss for line Length (In Mtr) | Fitting Loss @ 10% of pipe length (In Mtr) | Total Head Loss (In Mtr) | Ground Level (In Mtr) | Tank height from ground level (In Mtr) | Terminal Head U. End (In Mtr) | L. End (In Mtr) | Residual head at drawl point (In Mtr) |
|-------|----------------|---------------------|----------------------------|----------------------------|----------------------------------|--|----------------------------------|---------------------------|------------------|----------------------|-------------------------|------------------------------------|--|--------------------------|-----------------------|--|-------------------------------|-----------------|---------------------------------------|
| 1 | D1-Pump Room | 0.00 | 35000.00 | 0.00 | 35000.00 | 105000.000 | 72.917 | 40 | 0.968 | 215.0 | 0.054 | 11.673 | 1.167 | 12.840 | 0.000 | 43.350 | 48.350 | 61.190 | 17.84 |
| 2 | D2-Pump Room | 0.00 | 70000.00 | 0.00 | 70000.00 | 210000.000 | 145.833 | 65 | 0.733 | 225.0 | 0.018 | 4.144 | 0.414 | 4.559 | 0.000 | 30.000 | 35.000 | 39.559 | 9.56 |

Municipal Supply

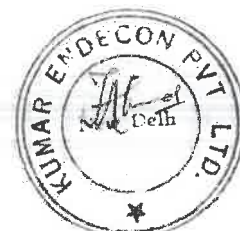
| | | | | | | | | | | | | | | | | | | | |
|---|---------------------------|------|----------|------|----------|-----------|--------|----|-------|------|-------|-------|-------|-------|-------|-------|--------|--------|------|
| 1 | Huda connection Pump Room | 0.00 | 26250.00 | 0.00 | 26250.00 | 78750.000 | 54.688 | 50 | 0.464 | 55.0 | 0.011 | 0.591 | 0.059 | 0.650 | 0.000 | 5.000 | 10.000 | 10.650 | 5.65 |
|---|---------------------------|------|----------|------|----------|-----------|--------|----|-------|------|-------|-------|-------|-------|-------|-------|--------|--------|------|



| PROJECT:- "Airia" COMMERTIAL COMPLEX AT GURGAON, HARYANA MATERIAL STATEMENT OF DOMESTIC WATER LINE | | | | | | | | |
|--|---------------------------|----------------------|----------------|-----------------------|------------------|-----------------|------------------|----------------|
| S. No. | Reference Line | Dia of pipe | Length of Pipe | Length of line In (m) | | | | |
| | | (mm) | | 32mm | 40mm | 50mm | 65mm | 80mm |
| 1 | D1-Pump Room | 40 100 | 215.0 | 0.0 | 215.0 | 0.0 | 0.0 | 0.0 |
| 2 | D2-Pump Room | 65 100 | 225.0 | 0.0 | 0.0 | 0.0 | 225.0 | 0.0 |
| Municipal Supply | | | | | | | | |
| 3 | Huda connection-Pump Room | 100 50 | 55.0 | 0.0 | 0.0 | 55.0 | 0.0 | 0.0 |
| | | | | | | | | |
| TOTAL | | | 495.0 | 0.0 | 215.0 | 55.0 | 225.0 | 0.0 |
| SAY | | | 495.0 | 0.0 | 215.0 | 55.0 | 225.0 | 0.0 |

100 mm ϕ Dom. water supply line = 215m + 225m = 440 m
 100 mm ϕ Flushing water supply line = 188 + 200 m = 388 m
 say 390 m

Total = 100 mm ϕ = 440 + 390 = 830 m.

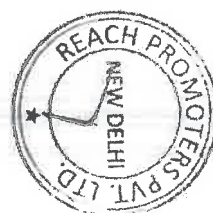
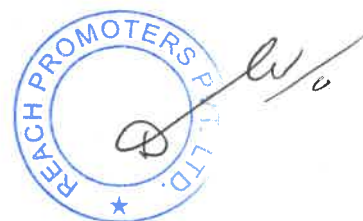


PROJECT:- "Atria" COMMERTIAL COMPLEX AT GURGAON, HARYANA
DESIGN CALCULATION FOR FLUSHING WATER SYSTEM (65% of 45.00 = 29.25)

| S. NO | Reference line | Water Req. | Total Requirement | Other requirement | Total Water Requirement | Peak Requir. @ 3.0 times of Water Requirement | Total Water Requirement. | Dia of Riser pipe | Velocity | Length of Line | (S) Slope of pipe | Head Loss for line Length | Fitting Loss @ 10% of pipe length | Total Head Loss | Ground Level | Tank height from ground level | Terminal Head | Residual head at drain point | |
|-------|----------------|------------|-------------------|-------------------|-------------------------|---|--------------------------|-------------------|----------|----------------|-------------------|---------------------------|-----------------------------------|-----------------|--------------|-------------------------------|-----------------|------------------------------|-------|
| | | (In LPD) | (In LPD) | (In LPD) | (In LPD) | (In LPD) | (In LPM) | (In MM) | m/sec | (In Mtr) | (In m/m) | (In Mtr) | (In Mtr) | (In Mtr) | (In Mtr) | (In Mtr) | U. End (In Mtr) | L. End (In Mtr) | |
| 1 | F1-STP | 58333.33 | 58333.33 | 0.00 | 58333.33 | 175000.000 | 121.528 | 50 | 1.032 | 188 | 0.047 | 8.866 | 0.887 | 9.753 | 0.000 | 43.350 | 48.350 | 58.403 | 14.75 |
| 2 | F2-STP | 116666.67 | 116666.67 | 0.00 | 116666.67 | 350000.000 | 243.056 | 65 | 1.221 | 200 | 0.047 | 9.487 | 0.949 | 10.436 | 0.000 | 30.000 | 35.000 | 45.436 | 15.44 |



| PROJECT:- "Airia " COMMERTIAL COMPLEX AT GURGAON, HARYANA MATERIAL STATEMENT OF FLUSHING WATER LINE | | | | | | | | |
|---|-------------------|-----------------------|-------------------|-----------------------|------|----------------|------|----------------|
| S. No. | Reference Line | Dia of pipe | Length of Pipe | Length of line In (m) | | | | |
| | | (mm) | (m) | 32mm | 40mm | 50mm | 65mm | 80mm |
| 1 | F1-STP | 100 100 | 188 | 0 | 0 | 188 | 0 | 0 |
| 2 | F2-STP | 80 100 | 200 | 0 | 0 | 0 | 0 | 200 |
| | | | | | | | | |
| | TOTAL | | 388 | 0 | 0 | 188 | 0 | 200 |
| | SAY | | 390 | 0 | 0 | 190 | 0 | 200 |



| HOT WATER REQUIREMENT AND ENERGY CONSERVATION FOR "Airia" COMMERCIAL COMPLEX AT SECTOR 68, GURGAON, HARYANA | | | | | | | | |
|--|--|------------|--|--------------------------------|---|--|--|--|
| SL.N O | No.of Persons | Population | Hot water required per head per day | Total hot water requirement | Solar hot water required at 20% of total hot water required | Average solar panel required on terrace (125 litre capacity) | Energy savings in KWH/day [(H.W demand X $\Delta T(45^{\circ}C)/860(Kcal/hour)] \times$ 90%(efficiency)] | Total energy saving (In KWH/day) |
| (a) | Office Areas - from 3 rd to 8 th Floor Plan | | | | | | | |
| | Total Area = 7666.42 sq.m | 7666.42 | | | | | | |
| | Total Population @ 10m ² / Person | 767 | 15 | 11499.630 | 2299.926 | 18 | 108.31 | 108.31 |
| | TOTAL | 767 | | 11499.63 | | 18 | SAY | 110 KWH/day |

