WATER IS PRECIOUS

# 14.209 ACRES, SECTOR 95, GURUGRAM, HARYANA

***ESTIMATE FOR PROVIDING WATER SUPPLY, SEWERAGE, STORM WATER DRAINAGE, ROADS, STREET LIGHTING AND HORTICULTURE IN RESPECT OF 14.209 ACRES AFFORDABLE REDIENTIAL PLOTTED COLONY IN SECTOR – 95, GURUGRAM***

CONSERVE

WATER

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# PROJECT REPORT/ ESTIMATE FOR PROVIDING WATER SUPPLY, SEWERAGE, STORM WATER DRAINAGE, ROADS, STREET LIGHTING AND HORTICULTURE IN RESPECT OF 14.209 ACRES (113K-13M-4S) FALLING IN THE REVENUE ESTATE OF VILLAGE DHORKA, SECTOR 95, G.M.U.C. (HR)

## REPORT

THE HARYANA GOVERNMENT HAS PREPARED A MASTER PLAN FOR DEVELOPMENT OF D.D.J.A.Y. AFFORDABLE PLOTTED COLONY AN OVER AREA OF 14.209 ACRES (113K-13M-4S) FALLING IN THE REVENUE ESTATE OF VILLAGE DHORKA, SECTOR 95, G.M.U.C. (HR) BEING DEVELOPED BY - MRS. ANJU CHILLAR IN COLLABORATION WITH LANDMARK APARTMENTS PVT. LTD.

## WATER SUPPLY

### 1 Source

The source of water supply in this area is tubewells at present as the underground water is potable and fit for human consumption. Moreover water available at reasonable depth. The average yield of tubewell with 40-50 ft strainers will be about 25,000 litre per hour. The recharging of underground water table in the belt is stated to be good. However still we shall resort to rain water harvesting system to keep up the recharging system. The numbers of tubewells required for the above area has been worked out and the tubwells will be bored in tune with growth of demand to avoid absolence of the tubewells. The ultimate requirement of tubewells includes provisions of 10% stand by.

### 2 Design

The scheme has been designed for approved population of 4428 persons. The rate of water supply per head per day has been taken as 172.5 litres as per Haryana norms. In addition to above necessary provision of water for Horticulture have been taken in to account for calculating the maximum quantity of water requirement.

For LANDMARK APARTMENTS PVT. LTD.

Authorised Signatory

Ar. VIKAS AHLAWAT
CA/2013/59929

M.J. Engineering Consultants Private Limited
306, Mithilan Building
55, Nehru Place
New Delhi-19

## 3 Pump Chambers and Pumping Machinery

It is proposed to equip each tubewell with an electricity driven set ejecto type or submersible pump capable of delivering of 25,000 litre per hour. It is also proposed to equip required Nos pumping sets with stand by diesel engines / gen set engines for operation during failure of electricity.

## 4 Under Ground Storage

Underground storage tank provision has been made for 420 Kl Capacity in two compartments (210 KL each), which caters for the domestic as well as for fire fighting requirements.

## 5 Boosting Station

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

## 6 Distribution System

The distribution system for this development has been designed to Supply @ 172.5 litre per head her day @ 3 times the average rate of flow on Hazen William formula. Necessary provision for laying CI/DI pipes conforming to relevant IS standards along with valves and specials has been made in the project.

## 7 Rising mains

Rising mains from GMDA water main or sector road to water works has also been proposed and provision has been made in this estimate.

## 8 Sewerage

The sewer lines have been designed for 3 times average DWF in relation to the water supply demand assuming that 80 % of the water supply shall find its way in to the proposed sewer. SW/DWC pipe have been proposed and designed to run half full. The sewers have been designed on 0.7 M per second minimum velocity.

## 9 Storm water Drainage

The storm water drainage is being designed to carry 6.25mm rainfall per hour. Also suitable provisions are contemplated in our scheme to ensure better recharging of underground water table. R.C.C. Hume pipes with minimum 400 mm dia is proposed in this area.

## 10 Roads

The roads have been planned 9m wide. The following Specifications have been adopted which are reproduced below :

(1) 250 mm GSB
(2) 250 mm WMM
(3) 50 mm thick B.M
(4) 30 mm BC

The above construction shall be done on well compacted sub gradeas per specifications. Complete work will be carried out as per MORTH specification, IRC guide lines or HUDA specification, which ever applicable.

**11 Street lighting**

The provision has been made on lump sum basis.

**12 Horticulture**

The usual provision of road side plantation of tree guards has been made for all roads. The parks shall be developed by providing lawns etc.

**13 Specifications**

The works will be carried out in accordance with the standard specification of P.H. Department as laid down by GMDA & Haryana Government.

**14 Rates**

Estimate for providing services in this pocket has been prepared on the recent market rates.

**15 Cost**

The total cost of development in this project including various P.H. and B &R services works out to be Rs.~~1533.~~62 Lac.

The cost per ~~gross~~ acre for the phase works out to be Rs.~~107.~~93 lac which covers the provision of services like water supply, sewerage, storm water drainage, roads, street lighting and plantation including maintenance thereof as well as escalation, administrative departmental and unforeseen charges.

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CA/2013/59029

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For LANDMARK APARTMENTS PVT. LTD.

Authorised Signatory

PROJECT:-PROPOSED D.D.J.A.Y. AFFORDABLE PLOTTED COLONY OVER AN OVER AREA OF 14.209 ACRES AT SECTOR 95, TEHSIL & DISTT. GURUGRAM

## DESIGN CALCULATION

| | | | | | |
|---|---|---|---|---|---|
| I | **WATER REQUIREMENT** | | | | |
| A. | | | | | |
| 1.1 | No. of plots | | 246 | Nos. | |
| | Occupancy @ 18 person/plot | | 4428.0 | Person | |
| | | | 4428 | Say | |
| | **Water requirement @ 172.5 ltr/person** | | **763830** | **Liters** | **1.1** |
| | | | | or 763.83 kL. | |
| 1.2 | Commercial area | 0.568 Acre | ~~2299.74~~ | Sq. Mtr. | |
| | ~~Occupancy @ 3 sq.mtr./ person~~ | @ 3200 ltr / Acre | ~~766.58~~ | Person | |
| | ~~Visitor population @ 90% of total population~~ | 18176 Ltr. | ~~689.92~~ | Person | |
| | ~~Staff population @ 10% of total population~~ | | ~~76.66~~ | Person | |
| | **Water requirement** | | | | |
| | ~~Visitor 15 ltr/person~~ | | ~~10348.81~~ | Liters | |
| | ~~Staff 45 ltr/person~~ | | ~~3449.60~~ | Liters | |
| | **Total** | 18176 | **~~13798.41~~** | **Liters** | **1.2** |
| 1.3 | Community Hall | 1.426 | ~~5769.11~~ | Sq. Mtr. | |
| | Occupancy @ 3 sq.mtr./ person | @ 2500 ltr per Acre. | ~~1923.04~~ | Person | |
| | Visitor population @ 90% of total population | | ~~5192.20~~ | Person | |
| | Staff population @ 10% of total population | 35650 | ~~192.30~~ | Person | |
| | **Water requirement** | | | | |
| | Visitor 15 ltr/person | | ~~77882.99~~ | Liters | |
| | Staff 45 ltr/person | | ~~8653.67~~ | Liters | |
| | **Total** | 35650 Ltr. | **~~86536.65~~** | **Liters** | **1.3** |
| | **Total Water Requirement of "A" (1.1+1.2+1.3)** | | **864165.06** | **Liters** | **A** |
| B. | For E.S.S | | **5000.00** | **Liters** | |
| C. | ~~MTC. Staff & Guard etc.~~ | | | 58826 Ltr. or 58.83 kL. | |
| | Considering water requirement for mtc. Staff + Guard etc. L.S. | | ~~20~~ | ~~Person~~ | |
| | **~~Water requirement 45 ltr/person~~** | | **~~900~~** | **~~Liters~~** | |
| | **Total Water Requirement (A+B+C)** | | **~~870065.06~~** | **~~Liters~~** | |
| | | | **~~870~~** | **~~KLD~~** | |
| II | **FIRE DEMAND** | | | | |
| | For U.G.T. i.e. Population | | 4428.0 | Person | **Residential** |
| | (100/(P/1000)^0.5)/3 (Where P is population) | | 70.14 | KL | |
| | Total | | 70.00 | KL | |
| | **Say** | | **70** | **KL** | |
| III | **Garden Irrigation Requirement** | | | 28165.15 or 28.17 kL. | |
| A | Area 4564.854 m2 x ~~8 Ltr.~~ 6.17 ltr | | ~~36518.83~~ | KLD | |
| | **TOTAL** | | **36.52** | **KLD** | |
| | **Say** | | **36** | **KLD** | |

(B) Area under Road out of 14.209 Acres = 1.76 Acres

Therefore daily water Requirement = 1.76 x 5000. = 8800 Ltr or 8.80 kL

For Sweeping of Roads

| IV | STORAGE | | | |
|---|---|---|---|---|
| | Total Water Requirement (Excluding Fire Demand) | ~~870.00~~ 825 | ~~870~~ 825 | KLD |
| | Hence Domestic Water requirement (67%) 552.75 | ~~582.90~~ | ~~583~~ 555 | KLD |
| | Hence Flushing Water requirement (33%) 272.25 | ~~287.10~~ | ~~287~~ 272+37 | KLD |
| | Domestic Water Storage @ 60% 333 | ~~349.74~~ | 350 | KLD |
| | Flushing Water Storage @ 60% 185.40 | ~~172.26~~ | 172 200 | KLD |
| | It is proposed to construct underground tanks capacity 350 KL for domestic use+ 70 KL for fire fighting; total 420 KL in two compartments of ~~210~~ KL each and ~~172~~ KL for non potable water in STP in two compartment. 200 | | | |
| | **Total Capacity of UGT** | **420** | KLD | |

| V. | TUBEWELL | | | |
|---|---|---|---|---|
| a | Yield | 25 | KL/Hr. | |
| b | Working hrs. per day | 8 | Hr./Day | |
| c | Total water demand 555 | ~~583~~ | KLD | |
| d | No. of tube well reqd. (Water demand/discharge/hr. working per day) | 2.92 | Nos. | |
| e | Add 5% extra. | ~~0.15~~ | ~~Nos.~~ | |
| | 2.77 | ~~3.06~~ | Nos. | |
| | Say | **3** | Nos. | |

In Proposed development Water is to be supplied by GMDA. However, it is proposed to install three no. bore well for augmentation / standby purpose and provision has also been taken in the estimate due to non availability of water but after getting the approval from competent authority. The requirement of flushing water is to be met from treated water from STP.

| i) | **Pumping machinery for Tube well** | | | |
|---|---|---|---|---|
| a | Gross working head | 80 | Meter | |
| b | Average fall in S.L | 2 | Meter | |
| c | Depression head | 6 | Meter | |
| d | Friction loss in main | 10 | Meter | |
| | **Total** | **98** | **Meter** Say 100 mtr. | |
| e | Discharge $\frac{25000 \times 100}{60 \times 60 \times 75 \times 0.66}$ = | 25000 | LPH | |
| | | 6.94 | LPS | |
| | Say | 7.00 | LPS | |
| f | Horse power (HP = (7 x 98) / (75 x 0.60)) | ~~15.24~~ 15.43 | H.P. | |
| | | ~~15~~ 17.50. | **Say** | |
| It is proposed to provide 2 no. (1W+1S) Pumping set of 7 lps discharge at 100 mtr. Head. | | | | |

| ii) | **Boosting machinery for domestic water for UGT** 555 | | | |
|---|---|---|---|---|
| | **Total Water Requirement** | ~~583~~ | KLD | |
| | Pumping per hour @ 8 hr. pumping / day 69.375 | ~~72.88~~ | KL/Hr. | |
| | 34.68 | ~~20.24~~ LPH | ~~LPS~~ | |
| | Considered 2W+1SB pumps 578 LPM. | ~~10.12~~ | LPS | |
| | Say | 10.0 | LPS | |
| | **Gross working head** Say = 600 LPM. | | | |
| a | Suction lift | 7 | Meter | |
| b | Friction loss in mains & specials | 6 | Meter | |
| c | Clear Head required | 30 | Meter | |
| d | Residual | ~~2~~ | Meter | |
| | **Total** 43 | ~~50~~ | **Meter** | |
| | **Say** 45 | ~~50~~ | **Meter** | |
| e | Horse power (HP = (10 x ~~50~~ 45 / (75 x 0.60)) 10.0 | ~~11.1~~ | H.P. | |
| | | **10.0** | **H.P Say** | |

It is proposed to provide 3 no. Pumps (2W+1SB), Flow of each shall be 10 lps at 50 mtr. Head in UGT.

| | | | | | |
|---|---|---|---|---|---|
| **iii)** | **Boosting machinery for Flushing water at STP** | | | | |
| | **Total Water Requirement (Flushing + Irrigation)** | 309 | ~~323~~ | KLD | |
| | Pumping per hour @ 8 hr. pumping / day | 38.62. | ~~40.38~~ | KL/Hr. | |
| | | 10.72. | ~~11.22~~ | LPS | |
| | Say | 642LPM. | 11.0 | LPS | |
| | **Gross working head** | Say = 650LPM. | | | |
| a | Suction lift | | 7 | Meter | |
| b | Friction loss in mains & specials | | 6 | Meter | |
| c | Clear Head required | | 30 | Meter | |
| d | Residual | | ~~2~~ | Meter | |
| | **Total** | 45 | ~~50~~ | **Meter** | |
| | **Say** | 45 | ~~50~~ | **Meter** | |
| e | Horse power (HP = (11 x ~~50~~ 45) / (75 x 0.60)) | 11.0 | ~~12.22~~ | H.P. | |
| | | | **12.50** | **Say** | |
| | It is proposed to provide 2 no. Pumps (1W+1SB), Flow of each shall be 11 lps at ~~50~~ mtr. Head in STP. | | | | |
| **iv)** | **DG Set for Plumbing** | | | | |
| | **DG Set requirement** | | | | |
| | Submersible Pump (~~1x15~~) 3x15 | 45 | ~~15~~ | HP | |
| | Domestic Pump (2x10) | | 20 | HP | |
| | Flushing Pump (1x~~12~~) 12.50 | | 12.50 | HP | |
| | For External ~~electrification~~ Lighting. | | 5 | HP | |
| | **Total Pump Load** | 82.50 | ~~52~~ | **HP** | |
| | **Total DG capacity** 85 | 85 | ~~40~~ | **KVA** | |

Hence it is proposed to provide 1 no. DG set of ~~40~~ KVA capacity.

| | | | | | |
|---|---|---|---|---|---|
| **v)** | **FLOW TO SEWAGE TREATMENT PLANT** DOM & Flushing water | | 825.00 | | |
| | Total water Requirement = ~~583 KLD for Domestic + 287 KLD for flushing~~ | | ~~870.00~~ | KLD | |
| a | 80% of total Domestic water demand = 80% of ~~583 KLD~~ 825 KLD | | ~~466.40~~ | KLD | |
| b | ~~80% of total Flushing water demand = 80% of 287 KLD~~ | 660.00 | ~~229.60~~ | KLD | |
| | ~~Total~~ Add 5% for Marginal factor | 33000 | ~~696.00~~ | KLD | |
| | **Say Proposed STP Capacity** | 693KL. | ~~700~~ | **KLD** | |