SERVICE ESTIMATE, DESIGN REPORT AND CALCULATION OF

INTERNAL DEVELOPMENT WORKS

FOR

**PROPOSED "AFFORDABLE RESIDENTIAL PLOTTED COLONY''
(UNDER DEEN DAYAL JAN AWAS YOJNA – 2016) AREA
MEASURING 10.725 ACRES (LICENSE NO. 131 OF 2019
DATED 12.12.2019) IN THE REVENUE ESTATE OF SECTOR –
2, SOHNA, DISTT. - GURUGRAM BEING DEVELOPED BY M/S
SHREE VARDHMAN DEVELOPERS PVT. LTD. AND OTHER.**

SERVICE ESTIMATE, DESIGN REPORT AND CALCULATIONS OF INTERNAL DEVELOPMENT WORKS FOR PROPOSED "AFFORDABLE RESIDENTIAL PLOTTED COLONY'' (UNDER DEEN DAYAL JAN AWAS YOJNA – 2016) AREA MEASURING 10.725 ACRES (LICENSE NO. 131 OF 2019 DATED 12.12.2019) IN THE REVENUE ESTATE OF SECTOR – 2, SOHNA, DISTT. - GURUGRAM BEING DEVELOPED BY M/S SHREE VARDHMAN DEVELOPERS PVT. LTD. AND OTHER.

Sohna town of Haryana State situated on N.H. -248-a road at a distance of 54 Km from Delhi. Being in the national capital region, the town has developing tendency and potential. Further, it has also started sharing the growing residential, commercial and Industrial load of Delhi. In order to review the growing pressure of population in National Capital of Delhi, It has been decided by the Haryana Government to develop various infrastructure facilities in Sohna, Distt. - Gurugram Urban Complex. This report is for a part of service estimate for proposed "Affordable Residential Plotted Colony" (under Deen Dayal Jan Awas Yojna – 2016) measuring 10.725 acres (License No. 131 of 2019 dated 12.12.2019) in the revenue estate of Sector – 02, Sohna Distt. - Gurugram being developed by M/s Shree Vardhman Developers Pvt. Ltd. and other. has been prepared with the following provisions which are as under :-

1. **WATER SUPPLY**

    The source of water supply in this area is by HSVP Mains. It has been proposed to construct underground tanks of capacity as per attached details and to location for domestic purpose and for fire protection. The underground tankswill be fed from the HSVP based supply, which will feed O.H. tanks on the roof of the Building and has been designed as per the Hazen Williams formula. Presently there is proposed HSVP W/S in this area. However the provision of tube well have been taken due to non availability of water but after getting the approval from the competent authority through tube wells / tankers / any other approved source till HSVP W/Swill made available. The proposed tube wells shall be 510mm bore drilled with reverse rotary rig and installed with 80mm i/d housing pipe and 50mm i/d slotted tube as strainer, hence the provision of Two Nos Tube Wells have been taken in this estimate.

    DESIGN

    The scheme has been designed for population of 2525 persons considering @ 13.50 persons/unit for Affordable Residential Plotted Colony and other provision etc. The combined quantum of water supply (domestic + flushing) per head / day has been taken as 172.50 Liters per head per day as per design calculation.

    PUMPING EQUIPMENTS

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

2. **SEWERAGE**

The scheme is designed for sewer connecting to the STP and bypass connection to HSVP sewer scheme. The sewer lines have designed for three times average D.W.F in relation to water supply demand. It has assumed that about 80% of the domestic and flushing water supply shall find its way into the proposed sewer. Sewer lines shall be running by gravity and discharge to STP proposed. Treated water will be used for Irrigation & Flushing purpose (through recycling) under the pipe line system.

3. **STORM WATER DRAINAGE**

It has been proposed to lay R.C.C Np3 pipeswith required number of manholes for disposal of storm water, which will be connected to the HSVP drain. The intensity of rain fall has been taken as 6.00mm per hour. A minimum size of 400mm i/d R.C.C Np3 pipes for storm water drain will be provided and designed as per manning's formula. Necessary provision of rainwater harvesting arrangement has also been taken in this estimate.

4. **ROADS**

Road, Parking and Pavement have been provided to above areas and estimate is prepared as revised specifications adopted by HSVP.

5. **STREET LIGHTING AND ELECTRIFICATION :-**

Provision for external lighting and electrification of proposed area has been made.

6. **HORTICULTURE :-**

Estimate and details of plantation, landscaping, signage etc. have been included.

7. **FIRE FIGHING :-**

Provision of Fir Fighting system has been made.

8. Provision for Electric Panel or ESS provision has also been made in this estimate.

9. **SPECIFICATIONS**

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

10. **RATES**

The estimate has been based on the present market rates.

11. **COST**

The total cost of the scheme including cost of all services works out to Rs. 456.53 Lacs (Rupees Four Crores Fiftty Six Lacs Fifty Three Thousand only) including 3% contingencies and 49% departmental charges + Price escalation and cost per acre comes out to Rs. 42.57 Lacs.

(Authorized Signatory)

1.   DESIGN CALCULATION :-

Total Area of plot	= 10.725 Acres
Permissible Area under Plots	= 6.7288 Acres
Proposed Area under Plots	= 5.5300 Acres
Permissible Commercial Area	= 0.4141 Acres
Proposed Commercial Area	= 0.4140 Acres
Proposed community Centre	= 1.0725 Acres
Area of Milk booth	= 27.50 Sqm
Area under other services	= L.S.
Proposed Plots	= 187 Plots

2.   Water Requirement :-

i)   Total Plots = 187 Plots
Total Population @ 13.50 Persons/Plot 2524.50 Persons
@ 172.50 LPCD = 435476.25 LPD

ii)   Commercial area = 1675.527Sqm
@ 3 Sqm/person = 559 Person @ 45LPCD = 25155.00 LPD

iii)   Community Centre (Area 1.0725 Acres) = 27000.00 LPD

iv)   Milk booth L.S. = 5000.00 LPD

v)   All other services L.S. = 15000.00 LPD

Total = 507631.25 LPD   Or 508.00 KLD

Say 550.00 KLD

II.   FIRE DEMAND

(i)   Population = 2525 Persons
(p) ½ x 100/1000 = (2.525) ½ x 100 = 158.90 KLD   Say 200 KLD

III.   Garden Irrigation Requirement (For Total Area) = 100.00 KLD

IV.   Total Water Requirement for UGT
(Excluding Fire Demand)
Hence Domestic Water Requirement (67%) = 550 x 67% = 369.00 KLD
Hence Flushing Water Requirement (33%) = 550 x 33% = 181.00 KLD
Half Day Requirement@ 60% = 250K.L. for Domestic
= 125 K.L. for Flushing

But it is proposed to construct an underground tank i.e. 250 K.L. in two compartment for domestic use and125 K.L. for non potable water in two compartment (at STP) and 200 K.L. for fire fighting purposes for UGT in two compartment as shown location in the plan.

Total Capacity of UGT   = 250 + 200   = 450.00 KLD
Total Requirement for Flushing and Irrigation at STP = 125+100   = 225.00 KLD

VI.   Tube Well   For UGT

a)   Yield = 15 K.L. / Hr.
b)   Working Hour per day = 16 Hr. / Per Day
c)   Total water demand = 369M3/Day
d)   Number of tube well required = 1.54Nos
(Water Demand / Discharge / Hr. working Per day)
e)   Add 5% extra = 0.08

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	Total	= 1.62Nos
	Say	= 2 Nos

(Water to the proposed development is to be supplied by HSVP. Howeverconsider @ 50% T.W.'s i.e. 1 No. T.W. to install for proposed requirement of water for augmentation / standby purposes and provision has also been taken in the estimates due to non availability of water but after getting the approval from the competent authority.

I)   **Pumping Machinery for Tube wells**

    a) Gross Working Head   = 80 Mtr
    b) Average fall in S.L   = 2 Mtr
    c) Depression Head   = 6 Mtr
    d) Friction loss in main   = 10 Mtr
       Total   = 98 Mtr
    e) Discharge   = 15000 LPH (Or 4.17 LPS Say 4.50 LPS)
    f) Horse Power
       HP = (4.50 x 98) / (75 x 0.60)   = 9.80 H.P.   Say= 10.00 H.P.

It is proposed to provide 1 No. pumping set of 4.50 LPS discharge at 98Mtr head (1W)

II)   **Boosting Machinery for domestic water For UGT**

    Total Water Requirement   **= 369.00 KLD**
    Pumping per hour @ 8 hr. pumping / day= 369 /8 KL / hr.
                                            = 46.125 KL / hr.
                                            = 768.75lpm = 12.82lps
                                            Say 2 No. 8.00 lps each

    Gross working head   For UGT
    - Suction lift   = 5.00 mts.
    - Frictional loss in mains & specials   = 10.00 mts.
    - Clear Head required   = 30.00 mts.
    Total   = 45.00 mts.
    Say   = 45.00 mts.
    Pump HP   = (8.00x45)/(75x0.60)
                                         = 8.00 H.P.
                Say   = 10.00 HP

It is proposed to provide 3 No. of pumping set of 8.00 lps discharge at 45mts Head each (2W + 1S) for UGT

III)   **Boosting Machinery for flushing water at STP**

    Total Water Requirement   **= 181 K.L.D**
    Pumping per hour @ 8 hr. pumping / day   = 181 /8 KL / hr.
                                            = 22.625 KL / hr.
                                          = 377.08 lpm = 6.28 lps,
                                          Say 2 No.4.00lps each

    Gross working head
    - Suction lift   = 5.00 mts.
    - Frictional loss in mains & specials   = 10.00 mts.
    - Clear Head required   = 30.00 mts.
    Total   = 45.00 mts.
    Say   = 45.00 mts.

Pump HP   = (4.00 x 45) / (75 x 0.60)

         = 4.00HP

Say   = 5.00 HP

It is proposed to provide 3 Nos of pumping set of 4.00 lps discharge at 45 mts Head each (2W + 1S)

IV) Boosting Machinery for Irrigation water

Total Water Requirement   **= 100 KLD**

Pumping per hour @ 5 hr. pumping / day   = 100 /5 KL / hr.

         = 20.00 KL / hr.

         = 333.33lpm = 5.55 lps

Say   = 7.00 LPS

Gross working head

- Suction lift   = 3.00 mts.
- Frictional loss in mains & specials   = 3.00 mts.
- Clear Head required   = 24.00 mts.

Total   = 30.00 mts.

Say   = 30.00 mts.

Pump HP   = (7.00 x 30) / (75 x 0.60)

         = 4.67 HP

Say   = 5.00 HP

It is proposed to provide 2 No. of pumping set of 7.00 lps discharge at 30mts Head each (1W + 1S)

V) DG Set for plumbing

DG Set Requirement

Submersible Pump   (1 x 10)   = 10 HP

Domestic Pump   (2 x 10)   = 20 HP

Flushing Pump   (2 x5)   = 10 HP

Street Light and other etc.   = 25 HP

Total pump load   **= 65 HP**

         = 65.00 x 0.746 x 1.50

         = 72.73 K.W

Total DG capacity   **= 1 No. 75 KVA**

Hence it is proposed to provide 1 No. D.G. Set of 75 KVA capacity

FLOW TO SEWAGE TREATMENT PLANT

Total Water Requirement = 369 KLD for domestic & 181 KLD for flushing

i) 80% of total Domestic Water Demand = 80% of 369 KLD   = 295.20 KLD

ii) 80% of total Flushing Water Demand =80% of 181 KLD   = 144.80KLD

         Total   **= 440.00 KLD**

Considering 5% marginal factor   = 66.00 KLD

         G. Total   **= 506.00 KLD**

         Say 550 KLD

Proposed STP Capacity = 550 KLD Or 0.55 MLD

(Authorized Signatory)