ATTENTION : ADITYA SHARMA

1/3

DIRECTORATE OF TOWN & COUNTRY PLANNING, HARYANA

SCO-71-75, Sector -17C, Chandigarh
Phone: 0172-2549349, Email: tcphry@gmail.com, www.tcpharyana.gov.in

Memo No. LC-427/DS(R)-2014/ 20268 Dated 27/8/14.

To

Sweta Estates Pvt. Ltd.,
Yale Engineering and Developers Pvt. Ltd.
Babson Engineers and Developers Pvt. Ltd.
Dartmouth Engineers and Developers Pvt. Ltd.
Harward Engineers and Developers Pvt. Ltd.
Cornell Engineers and Developers Pvt. Ltd.
C/o Sweta Estates Pvt. Ltd.,
21/48, Commercial complex,
Malcha Marg, Chanakya Puri,
New Delhi.

Subject: - Approval of the service plan/estimate for Group Housing Colony on land measuring 47.527 acres (Licence No. 2 of 1995, 35-37 of 1996 dated 17.04.1996 & 117-119 of 2004 dated 16.08.2004) in Sector-48, Gurgaon-Manesar Urban Complex- Sweta Estates Pvt. Ltd.

Reference: - Vide letter memo no. CE-I/EE(W)EE-20/2014/9640 dated 08/08/2014 of CA HUDA, Panchkula on the subject noted above.

The service plan/ estimates of the Group Housing Colony being developed on the land measuring 47.527 acres (Licence No. 2 of 1995, 35-37 of 1996 dated 17.04.1996 & 117-119 of 2004 dated 16.08.2004) in Sector-48, Gurgaon-Manesar Urban Complex have been checked and corrected wherever necessary by Chief Administrator, HUDA, Panchkula and hereby approved subject to the following terms and conditions:-

1. You shall pay the proportionate cost of external development charges for setting up of Group Housing colony, for the Services like Water Supply, Sewerage, Storm Water Drainage, Roads, Bridges, Community Buildings, Street Lighting and Horticulture etc. on gross acreage basis as and when determined by HUDA/Director. These charges are modifiable as and when approved by the Authority/Government and modified charges will be binding upon the colonizer.
2. The maintenance Charges for various services like water supply, sewerage, storm water drainage, roads, street lighting and Hort., etc. has been included by the firm in the Sub Work No. VII and the total cost of works out to Rs. 1027.70 lacs. It may be made clear to the colonizer that they are liable to maintain the estate developed by them for 10 years or as per HUDA norms till such time, the colony is taken over by the local authority/State Govt.
3. The category wise area as shown on the plans and proposed density of population thereof has been treated to be correct for estimation/services only.
4. You shall make appropriate provision for fire fighting arrangement as required in the NBC/ISI code should also be provided by you and a Fire safety certificate will be obtained by you from the competent authority

before undertaking any construction. You will be sole responsible for fire safety arrangements.

5. All technical notes and comments incorporated in the estimates in two sheets will also apply. A copy of these is also appended as Annexure-"A".
6. The wiring system of street lighting will be under ground and the specification of the street lighting fixture etc. will be as per relevant standard of HVPNL/DHBVNL.
7. The total height of the building and top of the water tank above ground level has not been defined/indicated on the plans. You shall be responsible for the violation of Air Traffic rules/regulations and height of the building.
8. You shall be fully responsible for making arrangement of disposals of sewerage and storm water drainage till such time these are made available by HUDA/ State Govt. and all link connection with the external system will be made by you at your own cost. You shall have to ensure that the sewer and storm water drainage to be laid by you will be connected by gravity with the master services to be laid / laid by HUDA / State Govt. in this area as per scheme.
9. You shall be solely responsible to lay the services up to the external services laid/to be laid by HUDA on sector dividing road at respective locations/points and correctness of the levels of the colony.
10. You shall use the recycled water for flushing purpose. The firm has made provision of separate flushing line, storage tank, metering system, pumping system and plumbing. It may be clarified to developer that no tap or outlet of any kind will be provided from the flushing lines/plumbing lines for recycled water except for connection to the cistern of flushing tanks and any scouring arrangement.
11. The correctness of the levels of the colony will be sole responsibility of the colonizer for integrating the internal sewer/storm water drainage of the colony by gravity with the master services. In case pumping is required the same will be provided & maintained by colonizer for all the time to come.
12. The separate distribution systems, independent of each other, will be adopted, one for potable water supply and second for recycled water, Home/office/business establishment will have access to two water pipe lines.
13. The rain harvesting system shall be provided by you as per norms and the same shall be kept operational/ maintained all the time. Arrangement for segregation of first rain not to be entered into the system shall also be made by you.
14. The estimates do not include the provision of electrification of the colony, therefore the supervision charges and O & M charges shall be paid by you directly to the HVPN.
15. You shall be solely responsible for the construction of various structures such as RCC underground tank etc. according to the standard

specifications good quality and its workmanship. The structural stability responsibility will entirely rest upon you.

16. In case, some additional structure are required to be constructed and decided by Haryana Urban Development Authority at a later stage, the same will be constructed by your company.
17. You will not make the connection with the master services i.e. water supply, sewerage, storm water drainage without getting its approval from the competent authority.
18. The level of the external services to be provided by the HUDA i.e. water supply sewerage will be proportionate to EDC deposited.
19. In case, it is decided by Govt. that master services be extended on 24 M wide internal circulation road additional amount at rates as decided by the authority will recoverable from colonizer over and above the EDC.
20. You shall follow all the instructions as per Annexure-A of Service Plan Estimate as considered by HUDA.

A copy of the approved service plan/estimates is enclosed herewith. You are requested to supply five additional copies of the approved service plan/estimates to the Chief Engineer, HUDA, Panchkula under intimation to this office.

DA/As above

(Sanjay Kumar)
District Town Planner (HQ)
For Director General, Town and Country Planning
Haryana, Chandigarh

Endst. No. LC-427/DS-(R)-2014/ Dated:

A copy is forwarded to the Chief Administrator, HUDA, Panchkula with reference to his letter No. CE-I/EE(W)EE-20/2014/9640 dated 08/08/2014 for information and necessary action please.

(Sanjay Kumar)
District Town Planner (HQ)
For Director General, Town and Country Planning
Haryana, Chandigarh

From

The Chief Administrator,
HUDA, Panchkula.

To

The Director General,
Town and Country Planning,
Haryana, Chandigarh.

Memo No:- CE-I/EE (W)-II-2014/20806

Dated - 8/8/14

SUB:- **Approval of service plan /estimate for Group Housing Scheme on land measuring 47.527 acres (License No. 2 of 1995, 35 to 37 of 1996 dated 17.04.1996 & 117 to 119 of 2004 dated 16.08.2004) in Sec-48, Sohna Road, Gurgaon being developed by M/S. Sweta Estates Pvt. Ltd.**

Kindly refer to your office Memo No. ZP-26/AD(RA)/2013/335 dated 03.01.2014, vide which the revised building plans of the Commercial Colony cited in the subject above were approved by your office.

The rough cost estimate / service plans for providing Public Health/B&R Services to be provided by the colonizer M/S. Sweta Estates Pvt. Ltd. falling in their Group Housing Colony on land measuring 47.527 acres area (License No. 12 of 1995, 35 to 37 of 1996 dated 17.4.1996 & 117 to 119 of 2004 dated 16.8.2004) in Sector-48, Sohna Road Gurgaon, have been received from SE, HUDA, Circle-II-Gurgaon vide his Memo No. 9589 dated 25.7.2014. The same have been checked and corrected wherever necessary and are sent herewith for execution as well as for Bank Guarantee purpose, subject to the following comments:-

1. EXTERNAL DEVELOPMENT CHARGES:-

The colonizer will have to pay the proportionate cost of external development charges for setting up of Group Housing Colony for the services like water supply, sewerage, storm water drainage, roads, bridges, community building, street lighting and horticulture and Mtc. thereof etc. on gross acreage basis as and when demanded by Competent Authority. These charges will be modifiable as and when approved by the authority -State Govt. and will be binding upon the colonizer.

2. MAINTENANCE OF SERVICES:-

The mtc. Charges for various services like Water Supply, Sewerage, Storm Water Drainage, Roads, Street lighting and Hort., etc. has been included by the firm in the Sub Work No.VII and the total cost of works out to **RS: 1027.70 lacs**. It may be made clear to the colonizer that they are liable to maintain the estate developed by them for 10 years or as per HUDA norms till such time, the colony is taken over by the local authority/State Govt.

3. DENSITY/AREA/POPULATION:-

The overall population density of the colony works out **217 PPA**. The final development plan exhibits the density @ 100-400 PPA part of Sector-48 Gurgaon. This may be checked and confirmed by your office that the overall density of sector is maintained according to the final development plan of Gurgaon Town. The category wise area as shown on the plans and proposed density of population thereof has been treated to be correct for estimation of services only.

4.FIRE FIGHTING:-

The provision made in the estimate has been checked for estimation purposes. However, it may be made clear to the colonizer that the appropriate provision for fire fighting arrangement, as required in the NBC/ISI, should also be provided by the colonizer and fire safety certificate should also be obtained by the colonizer from the competent authority before undertaking any constn. The colonizer will be solely responsible for fire safety arrangement.

5. All technical notes and comments incorporated in this estimate in two sheets will also apply. A copy of these are also appended as Annexure-'A'

6. The title and name of the license may be examined by your office.

7. STREET LIGHTING:-

The wiring system of street lighting will be under ground and the specifications of the street lighting fixture etc. will be as per relevant standard of HVPNL. The firm shall be provided automatic on-off system for street lighting in the complex.

8. AIR TRAFFIC RULES/REGULATIONS:-

The Group Housing Complex consists the construction of multi-storeyed building. RCC water tank has been proposed on the top of the building. The total height of the building and top of the water tank above ground level has not been defined/indicated on the plans. The violation of Air Traffic Rules/Regulations and height of the building may be examined by your office.

SFI
8/8
EE(W) 8/10/14

9. The revised layout plan for setting up of Group Housing Colony in an area of 47.527 acres area approved by your office No. ZP-26/AD(RA)/2013/335 dated 3.01.2014, annexed with the estimate have been considered to be correct for the purpose of estimation/services only.

10. It may be made clear to the colonizer that he will be fully responsible to make the arrangement for disposal of sewage and SWD, till such time these are made available by HUDA and all link connection with the external system will be done by the colonizer/firm at his own cost. The colonizer will have to ensure that the sewer and storm water drainage to be laid by them will be connected by gravity with the master services to be laid/laid by HUDA/State Govt. in this area as per their scheme. In case pumping is required, the same will be done by colonizer for all the time to come.

11 It may also be clarified to the colonizer that he will be solely responsible to lay the services up to the external services laid/to be laid by HUDA on sector dividing road at respective locations/points.

12. It may be clarified to the colonizer that recycled water is proposed to be utilized for flushing purposes. The firm has made provision of separate flushing line, storage tank, metering system, pumping system and plumbing. It may be clarified to developer that no tap or outlet of any kind will be provided from the flushing lines/plumbing lines for recycled water except for connection to the cistern of flushing tanks and any scouring arrangement. Even ablution taps should be avoided.

(i) Two separate distribution systems, independent of each other, will be adopted, one for potable water supply and second for recycled water. Home/office/business establishment will have access to two water pipe lines.

(ii) Potable water and recycled water supply lines will be laid on opposite berms of road. Recycled water lines will be above sewer lines. Wherever unavoidable and if all pipes are required to be laid on same side of road, these will be located from the ground surface in order of descending quality. Potable water shall be above recycled water which should be above sewer. Minimum clear vertical separation between a potable water line and a recycled water line shall be one foot, if not possible then readily identifiable sleeve should be used.

To avoid any accidental use of recycled water for potable purposes all:-

(a) Recycle water pipes, fittings, Appurtenances, valves, taps, meters, hydrants will be of Red Color or painted red.

(b) Sign and symbols signifying and clearly indicating "Recycle Water" "Not fit for Drinking" must invariably be stamped/fixed on outlets, Hydrants Valves both surface and subsurface, Covers and at all conspicuous places of recycle distribution system.

(c) Detectable marker tapes of red color bearing words "Recycle Water" should be fixed at suitable interval on pipes.

(d) Octagonal covers, red in color or painted Red and words "Recycle Water-Not fit for Drinking" embossed on them should be used for recycled water.

(e) HUDA will be supply recycle water for green belts, irrigation, parks only but not for flushing in houses, Group Housing and Commercial area. However, the developer himself from his STP will laid the system for recycle demand of his licensed colony within his premises.

13. It shall be mandatory for the firm to provide dual two button or lever flush system in toilets.

14. The correctness of the levels of the colony will be sole responsibility of the colonizer for integrating the internal sewer/storm water drainage of the colony by gravity with the master services. In case pumping is required, the same will be provided & maintained by colonizer for all the time to come.

15. It may be made clear to the colonizer that the rain harvesting system shall be provided by them as per Central Ground Water Authority norms/Haryana Govt. notification and the same will be kept operational/maintained all the time. Arrangement for segregation of first rain not to be entered into the system shall also be made by the firm/colonizer.

16. CFL Lamp shall be provided by the firm for external lighting in respect of energy conservation.

17. The estimate does not include the provision of electrification of the colony. However it may be made clear to the colonizer that the supervision charges and O & M charges shall be paid by them directly to the HVPNL.

18. The colonizer will be solely responsible for the construction of various structures such as RCC Under Ground Tank etc. according to the standard specifications, good quality and its workmanship. The structural stability responsibility will entirely rest upon the colonizer.

19. In case some additional structures are required to be constructed, as decided by HUDA at a later stage, the same will be binding upon the colonizer. Flow control valves will be installed, preferably of automatic type, on water supply connection with HUDA water supply line.

20. It may be made clear to the colonizer that he will not make any connection with the master services i.e. water supply, sewerage, SWD, without prior approval of the competent authority.

21. In case it is decided by Govt. that HUDA/Govt. will construct 24 Mtrs. Wide road and will extend master services on 24 Mtrs. Internal circulation road then additional amount and rates as decided by the authority/Govt. will be recoverable over and above EDC.

22. Levels of the external services to be provided by HUDA i.e. water supply sewerage will be proportionate to EDC deposited.

23. Provision of 2 Nos. tubewells has been made in the estimate so as to meet the domestic water requirement. However, before boring tubewells, the firm shall obtain requisite permission from Competent Authority of CGWA. There tubewells shall be abandoned as soon as external source of water supply is made available in the area.

24. COMMON SERVICES:-

(i) The service plan estimate does not include the common services like water supply, storage tank on the top of the building block the plumbing works etc. and will be part of building works.

(ii) The firm will provide solar water heating system as per the guidelines issued by the Haryana Govt. Ministry of Environment Govt. of India.

The estimated cost of various services to be provided by the firm for the development of internal services has been checked and corrected for purpose of bank guarantee and execution of works as under:-

Sr. No:	DESCRIPTION	AMOUNT IN LACS.
1.	Water Supply	Rs. 634.08 Lacs.
2.	Sewerage	Rs. 594.99 Lacs.
3.	Storm Water Drainage	Rs. 254.11 Lacs.
4.	Roads	Rs. 715.22 Lacs
5.	Street Lighting	Rs. 109.40 Lacs.
6.	Horticulture	Rs. 82.15 Lacs
7.	Maintenance of services for ten years including resurfacing of road after 1st five years and IInd five years of maintenance.	
		Rs. 1027.70 Lacs.
		Rs. 3417.65 Lacs.

Say Rs: 3417.65 Lacs.

Dev. Cost per acre =3417.65/47.527 acres= Rs. 71.90 Lacs per gross acre.

Two copies of the estimate along with SIX plans and proposal as received are returned herewith duly corrected and signed for further necessary action.

It is requested to get three copies of the estimate/service plan from the colonizer for distribution amongst the field station.

DA/-Estimate in duplicate
along with SIX plans
& Annexure-A.

Executive Engineer (W),
For Chief Administrator, HUDA,
Panchkula.

Endst. No: -

Dated:-

A copy of the above is forwarded to the Superintending Engineer, HUDA, Circle-II-Gurgaon for information with reference to his **Memo No. 9589 dated 25.07.2014.**

Executive Engineer (W),
For Chief Administrator, HUDA,
Panchkula

LC427

Revised ~~PROPOSED~~ RESIDENTIAL GROUP HOUSING

CENTRAL PARK-II PROJECT

SECTOR-48, SOHNA ROAD, GURGAON

(HARYANA)

SUBMISSION REPORT ON SERVICES ESTIMATES

CLIENT:

M/S SWETA ESTATES PVT. LTD.

21/48, Commercial Complex Malcha Marg, Chanakya Puri, New Delhi

CONSULTANT:

KCB ASSOCIATES PVT LTD

PUBLIC HEALTH , FIRE , ELECTRICAL & HVAC SERVICES

G-49 (Basement), Lajpat Naagr-III, New Delhi-110024

Email-bhasin.kc@gmail.com

bhasin.kcb@gmail.com

Contact-011- 4172 0710: 2984 1907

HISTORY SHEET

SUBMISSION REPORT:

Revised Estimate for providing external services i.e. water supply, sewerage and storm water drainage irrigation system for landscaping, road and street lighting for The Proposed RESIDENTIAL GROUP HOUSING PROJECT NAMED AS **"CENTRAL PARK-II"** AT SECTOR-48, SOHNA ROAD, GURGAON, HARYANA (INDIA).

REPORT ON COMPLEX:

Revised
The ~~proposed~~ Group Housing named **"Central Park-II"** have an area of 192334.639 sqm **(Total area of 47.527 Acres)** located in Sector- 48, Sohna Raod at Gurgaon (HR) will be developed by **M/s SWETA ESTATES PVT. LTD.** The proposed Group Housing will have 1687 Flats and 310 E.W.S.. The Revised layout master plans of complete Group Housing is approved by Director Town & Country Planning Department Haryana vide their Memo No. ZP-26 / AD (RA) / 2013 / 335 dtd 03/01/2014.

Name of Tower	No of units		
Tower 1 to 9	404	402+2	2 No Unit Revised in block (B4 & B4')
Tower C,D,G,H,I	235		
Tower A,B,E,F	188		
Tower K,L,M	189		
Tower J,N,O	189		
Tower P	69		
Tower α,β	122		
Tower-THE ROOM	291		
Total	1687		

SERVANT ROOMS	170 Nos
E.W.S -	310 Nos
NURSERY SCHOOL	2 Nos
PRIMARY SCHOOL	2 Nos
COMMUNITY BUILDING	3 Nos

WATER SUPPLY :

The source of water supply shall be HUDA water supply connection and augmented through tubewells. The underground water will be treated by providing pressure filter and chlorination to make it potable, provision for tubewells has also been made in this estimate to provide water mainly to meet the daily domestic demand in case of shortage of city supply and to serve till the city supply is not available. It has been proposed to construct underground tanks of capacity as per attached details for domestic and fire protection purposes. The under ground tanks will be fed from the borewells and HUDA supply, from there water will be pumped to O.H. tanks on the roof of the Buildings. The water supply system has been designed as per the Hazen Willian formula.

DESIGN :

The scheme has been designed for population of approx. 9395 persons considering 5 persons for each DU and 2 persons each for Servant Rooms and 2 persons each for EWS. The rate of water supply per head/day has been taken as 172.5 Litres per head per day for DU and 135 Litres per head per day for Servant room and EWS as per HUDA Norms including flushing water supply.

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 for running / operation of pumps.

SEWERAGE SCHEME :

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

NEHA BHAGRA
CA/2007/39612

This scheme is designed for sewer connecting to proposed Sewage Treatment Plant to be installed in this complex and overflow to be connected to Master Sewer of HUDA Main Scheme. The Sewerage System has been marked on the respective plans.

Sewer lines have been designed for three 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 0.75 mtr/sec self cleaning velocity. Sewer line upto 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.

Necessary design statement for entire sewerage system has been prepared and attached with estimate. Manning's formula has been used on the design of sewerage system.

SEWAGE TREATMENT PLANT :

MBBR /SBR technology will be adopted with super chlorination. All the Sewer to be treated by propsed STP Plant and treated water will be supplied to the Towers for further use for Flushing of WC through dual Plumbing lines and remaining treated water will be used for Irrigation purpose.

STORM WATER DRAINAGE :

It is proposed to lay under ground RCC pipe drains with required number of catch basins which will be connecting to the Rain Water Harvesting Pits and overflow to Master drain of HUDA Main Scheme. Necessary Rainwater Harvesting Structure shall also be constructed to assist the underground aquifer recharge. The intensity of rain fall has been taken as 1/4" per hour. Minimum size of 400 mm RCC storm water line will be provided and designed as per Manning's formula.

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 :

Roads have been provided to above zones and estimate is prepared as per revised specifications adopted by HUDA. Cost of road has been taken in the estimate with sub-grade, sub-base, base course and various surface courses.

STREET LIGHTING :

Provision for lighting on surrounding area has been made.

HORTICULTURE :

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

RATES :

The estimate has been based on the present market rates.

COST :

The total cost of the scheme, including cost of all services works out to be

~~Rs.2396497431/-~~ Rs 3093712779/- 3417.65 lac OR ~~Rs.50423921/-~~ Rs 65093791/- 71.90 lac Per Acre including 3% contengencies and 49% department charges, price escalation unforseen, Admn. charge,

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

NEHA BHAGRA CA/2007/39612

I. Calculations : Water Supply Demand

S. No	Description	Population			Litres/ Capita/ Day	Total Water Requirement
		No. of Units	Per Unit Occupancy	Total Population	LPCD	In LPD
1	Tower 1 to 9	404	5	2020	172.5	348450
2	Tower C,D,G,H,I	235	5	1175	172.5	202688
3	Tower A,B,E,F	188	5	940	172.5	162150
4	Tower K,L,M	189	5	945	172.5	163013
5	Tower J,N,O	189	5	945	172.5	163013
6	Tower P	69	5	345	172.5	59513
7	Tower α,β	122	5	610	172.5	105225
8	Tower - THE ROOM	291	5	1455	172.5	250988
9	EWS 1687	~~310~~	~~5~~	~~620~~ 1550	135	~~83700~~ 209250
10	SERVANT ROOM	170	2	340	135	45900
11	Nursery School 2 Nos @ 10000					~~30000.00~~ 10000
12	Primary School 2 Nos @ 25000					~~30000.00~~ 50000
13	Community Building ~~3 Nos~~ 1 No Having FAR 3145 @ 25000					~~50000.00~~ 25000
	1 No FAR 510 @ 10000					10000
	1 No FAR 520 @ 10000					10000
	Total			9395		~~1694638~~ 1699640
					Say	~~4700~~ KLD 1825.19

1825

	Total Water Demand :	**KLD**	~~1700~~	1825KL
(a)	For Domestic Purpose : 2/3 of Total Water Demand	**KLD**	~~1133~~	1186KL
(b)	For Flushing Purpose : 1/3 of Total Water Demand	**KLD**	~~567~~	640KL
(c)	**Fresh Domestic water Demand**	KLD	1186 ~~1133~~	
	Say	**KLD**	~~1135~~ 1300	

II. Tubewells

(a)	Yield	KL / Hr	~~8~~ 16	KL/Hr
(b)	Working Hours per Day	Hrs / Day	~~10~~ 16	
(c)	Per Tibewell Total out put per day	KLD	~~80~~ 256	
(d)	Number of Tubewells required (Total Fresh Domestic Water Demand / Per Tubewell output per day)	Nos.	~~14.19~~ 4.43	4.63
(e)	~~Add 10% as standby~~	Nos.	~~1.42~~ 0.44	
	Total	**Nos.**	~~15.61~~	
	Say	**Nos.**	~~16~~ 4.87	4.63

As HUDA will be Primary Source for Domestic Water Supply for the proposed development. Therefore it is proposed to install 50% of total required tubewells for augmentation / standby purposes ~~8~~ Nos. 2

III. Pumping Machinery for Tubewells

(a)	Gross Working Head (Approx 400 Ft deep Bore)	Mtr	122
(b)	Average fall in S.L	Mtr	3
(c)	Depression Head	Mtr	5
(d)	Friction loss in main	Mtr	15
	Total Head	Mtr	145

NEHA BHAGRA CA/2007/39612

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

(e)	Discharge		LPH or KL/Hr	~~8000~~ 16000
(f)	**Horse Power of Tubewell Motor**		HP	~~7.18~~ 14.32
	HP = ~~(8000~~ 16000 X 145 X 1) / (60 X 60 X 75 X 0.6)	**Say**	**HP**	~~7.5~~ 15 HP

IV. Under Ground Tanks

1	UG Tank for Domestic Water Storage		1186
a)	Daily Domestic Water demand	KLD	~~1135~~ 593
b)	~~1/3~~ 1/2 of Daily Domestic Water demand to be Stored in UG Tank	KLD	~~370~~ 367 KLD Say 600 KLD
	Therefore it is proposed to construct Domestic Water Under Ground tank as follows:		
	i) Pump Room No. 1 :	KL	~~150~~ 200
	ii) Pump Room No. 2 :	KL	~~125~~ 200
	iii) Pump Room No. 3 :	KL	~~150~~ 200
2	UG Tank for Fire Water Storage for Tower (High rise, EWS & Infra facilities)		10325
	Total Population	Nos.	~~9395~~
	Fire Water requirement = 100 x Square root of population in thousand in KL	KL	321 ~~307~~
	Say	**KL**	350
	Therefore it is proposed to construct Fire Under Ground tank as follows:		
	i) Pump Room No. 1 :	KL	125
	ii) Pump Room No. 2 :	KL	100
	iii) Pump Room No. 3 :	KL	125

V. BOOSTING MACHINERY for tower (HIGH RISE, EWS Flats & Infrastructural facilities):Domestic Water

i)	**Total Domestic Water Demand**	KLD	1186 ~~1135~~
	a) For Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1 : (615825 x 2/3)/1000 = 411 KLD Say 415 KLD	KLD	415
	b) For Tower J,K,L,M,N,O,P, School & Community Building : Pump Room -2: (495538 x 2/3)/1000 = ~~330~~ KLD 303.69 Say 305	KLD	305 ~~330~~
	c) For Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3 : (~~583275~~ 708825 x 2/3)/1000 = ~~389~~ 472.55 KLD Say ~~390~~ 475 KLD	KLD	475 ~~390~~
ii)	**Pumping per hour @8 hours pumping/day**	KLH	LPM
	a) For Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1	51.82	864
	b) For Tower J,K,L,M,N,O,P, School & Community Building : Pump Room -2	38.12 ~~41.29~~	635 ~~688~~
	c) For Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3	~~48.73~~ 59.38	~~812~~ 990

iii)	**Gross working head:**		
	a) For Tower A,B,C,D,E,F,G,H,I & Q: Pump Room 1		
	Pump below ground	Mtr	10.00
	Height of Terrace	Mtr	59.17
	Tank Inlet height above Terrace	Mtr	4.00
	Residual head	Mtr	35.00
	Friction losses	Mtr	5.00
	Total Head	Mtr	113.17
	Say	Mtr	115
	b) For Tower J,K,L,M,N,O,P & Community Building : Pump Room 2		
	Pump below ground	Mtr	10.00
	Height of Terrace	Mtr	66.20
	Tank Inlet height above Terrace	Mtr	4.00
	Residual head	Mtr	35.00
	Friction losses	Mtr	5.00
	Total Head	Mtr	120.20
	Say	Mtr	125

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	b) For Tower α, β, 1 to 9			
	Pump below ground		Mtr	10.00
	Height of Terrace		Mtr	125.95
	Tank Inlet height above Terrace		Mtr	4.00
	Residual head		Mtr	35.00
	Friction losses		Mtr	5.00
	Total Head		Mtr	179.95
		Say	Mtr	185 ✓
v)	**Motor HP**			
	a) For Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1 : (864 x 115) / (60 x 75 *0.6)		HP	36.80
		Say		3 Nos x 20 HP (2W + 1S)
	b) For Tower J,K,L,M,N,O,P, School & Community Building : Pump Room -2 : (~~688~~ 635 x 125) / (60 x 75 *0.6)		HP	~~31.85~~ 29.40
		Say		3 Nos x ~~20~~ 15 HP (2W + 1S)
	c) For Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3 : (~~812~~ 185 x 185) / (60 x 75 *0.6)		HP	~~55.64~~ 67.83
				3 Nos x ~~20~~ 35 HP (2W + 1S)

VI. BOOSTING MACHINERY for tower (HIGH RISE, EWS Flats & Infrastructural facilities):Flushing Water

i)	**Total Flushing Water Demand**	KLD	~~567~~ 640 ✓
	a) For Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1 : (615825 x 1/3)/1000 = 205 KLD Say 210 KLD	KLD	210 ✓
	b) For Tower J,K,L,M,N,O,P, School & Community Building : Pump Room -2: (495538 x 1/3)/1000 = 165 KLD Say 175 KLD	KLD	175 ✓
	c) For Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3 : (~~583275~~ 708625 x 1/3)/1000 = ~~194~~ 236 KLD Say ~~200~~ 250 KLD	KLD	200 ✓
ii)	**Pumping per hour @8 hours pumping/day**	KLH	LPM
	a) For Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1	26.28	438 ✓
	b) For Tower J,K,L,M,N,O,P, School & Community Building : Pump Room -2	21.90	365 ✓
	c) For Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3	~~25.05~~ 31.25	~~418~~ 520 ✓

iii)	**Gross working head:**			
	a) For Tower A,B,C,D,E,F,G,H,I & Q: Pump Room 1			
	Pump below ground		Mtr	10.00
	Height of Terrace		Mtr	59.17
	Tank Inlet height above Terrace		Mtr	4.00
	Residual head		Mtr	35.00
	Friction losses		Mtr	5.00
	Total Head		Mtr	113.17
		Say	Mtr	115 ✓
	b) For Tower J,K,L,M,N,O,P & Community Building : Pump Room 2			
	Pump below ground		Mtr	10.00
	Height of Terrace		Mtr	66.20
	Tank Inlet height above Terrace		Mtr	4.00
	Residual head		Mtr	35.00
	Friction losses		Mtr	5.00
	Total Head		Mtr	120.20
		Say	Mtr	125 ✓
	b) For Tower α, β, 1 to 9			
	Pump below ground		Mtr	10.00
	Height of Terrace		Mtr	125.95
	Tank Inlet height above Terrace		Mtr	4.00 ✓

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Residual head		Mtr	35.00
Friction losses		Mtr	5.00
Total Head		Mtr	179.95
	Say	Mtr	185

v) **Motor HP** 450

a) For Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1 : (~~438~~ x 115) / (60 x 75 *0.6) — HP ~~18.66~~ 19.16

Say — 3 Nos x 10 HP (2W + 1S)

b) For Tower J,K,L,M,N,O,P, School & Community Building : Pump Room -2 : (365 x 125) / (60 x 75 *0.6) — HP 16.90

Say — 3 Nos x 10 HP (2W + 1S)

c) For Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3 : (~~418~~ x 526 185) / (60 x 75 *0.6) — HP ~~28.64~~ 35.62

3 Nos x ~~15~~ 20 HP (2W + 1S)

VII. Pumps for Fire Protection

S.No.	Parameters	Location	Pump Sets		
1	For Tower A,B,C,D,E,F,G,H,I & Q		Jockey	Main Electric	Diesel
	Residential Tower : Height above 45 m but not exceed 60 m	Pump Room-1			
a)	Discharge in lpm		180	2280	2280
b)	Head in meters		115	115	115
c)	HP		10.0	100.0	100.0
d)	Quantity in nos.		1	2	1
2	For Tower J,K,L,M,N,O,P, School & Community Building		Jockey	Main Electric	Diesel
	Residential Tower : Height above 60 m	Pump Room-2			
a)	Discharge in lpm		180	2280	2280
b)	Head in meters		125	125	125
c)	HP		10	110	110
d)	Quantity in nos.		1	2	1
3	For Tower α, β, 1 to 9, EWS & Servant Room		Jockey	Main Electric	Diesel
	Residential Tower : Height above 60 m	Pump Room-3			
a)	Discharge in lpm		180	2280	2280
b)	Head in meters		185	185	185
c)	HP		15	160	160
d)	Quantity in nos.		1	2	1

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VIII. Generating Sets for complex

S.No.	Parameters	HP	Nos.	Total HP	KW (Total HP x 0.746)	KVA (KW/0.8)
1	Tubewell Pumps	~~7.5~~ 15	~~8~~ 2	~~60~~ 30	~~44.76~~ 22.38	~~55.95~~ 28
2	**Pump Room-1**					
a)	Domestic Water Supply Pumps	20	~~3~~ 2	~~60~~ 40	~~44.76~~ 29.84	~~55.95~~ 44.76
b)	Flushing Water Supply Pumps	10	~~3~~ 2	~~30~~ 20	~~22.38~~ 14.92	~~27.98~~ 22.38
c)	Jockey Pump	10	1	10	7.46	~~9.33~~ 11.19
3	**Pump Room-2**					
a)	Domestic Water Supply Pumps	~~20~~ 15	~~3~~ 2	~~60~~ 30	~~44.76~~ 22.38	~~55.95~~ 33.57
b)	Flushing Water Supply Pumps	10	~~3~~ 2	~~30~~ 20	~~22.38~~ 14.92	~~27.98~~ 22.38
c)	Jockey Pump	10	1	10	7.46	~~9.33~~ 11.19
4	**Pump Room-3**					
a)	Domestic Water Supply Pumps	~~20~~ 35	~~4~~ 2	~~80~~ 70	~~59.60~~ 52.22	~~74.60~~ 78.33
b)	Flushing Water Supply Pumps	~~15~~ 20	~~3~~ 2	40	~~33.57~~ 29.84	~~41.96~~ 44.76
c)	Jockey Pump	15	1	15	11.19	~~13.99~~ 16.78
5	Irrigation Water Pumps	~~5~~	~~3~~	~~185~~ 15	~~138.01~~ 11.19	~~172.51~~ 13.93
	Total KVA					~~546~~ 395.85
	Say					600 KVA 318.91 KVA

Say = 330 KVA.

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STP TREATED WATER CONSUMPTION STATEMENT

S.NO	Description	Unit	Amount (Rs.)
1	Total Water Demand	KLD	1700
2	Treated Water Generated through STP = 80% of Total Water demand	KLD	1360
	STP treated Water Consumption		
A	STP treated Water Consumption in Flushing (1/3 of Total Water demand)	KLD	567
B	Irrigation Work : Landscape and Green area 21.80 Acre approx. @ 25 KLD per Acre = 545 KLD	KLD	545
C	Cooling Towers for DG Set : 4.5 Ltr/ Ton /Hr x 3200TR x 12 Hour : 173 KLD Say 200 KLD	KLD	200
D	Car Wash, Road Wash and Miscellaneous Work	KLD	50
	Total Treated Water Consumption (A+B+C+D+E)		**1362**
	Surplus STP Treated Water		**Nil**

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Project : Central Park-II, Sector-48, Gurgaon

FINAL ABSTRACT OF COST

Project : Central Park-II, Sector-48, Gurgaon

DESCRIPTION			AMOUNT
Sub Work No. I	Water supply & Fire Fighting	Rs.	634.08 Lacs Rs. ~~51323407~~ ~~78186489~~
Sub Work No. II	Sewerage scheme	Rs.	594.99 Lacs Rs. ~~43135674~~ ~~30922287~~
Sub Work No. III	Storm water drainage	Rs.	254.11 Lacs Rs. ~~23770354~~ ~~17945362~~
Sub Work No. IV	Roads works	Rs.	715.22 Lacs ~~50642961~~ ~~81228141~~
Sub Work No. V	Street lighting	Rs.	109.40 Lacs Rs. ~~7293069~~
Sub Work No. VI	Landscaping / HORT.	Rs.	82.15 Lacs Rs. ~~14776631~~ ~~8214789~~
Sub Work No. VII	Maintenance including 10 years Resurfacing of Roads after 1st 5 years & and 2nd years of MTC (as per Huda norms)	Rs.	1027.70 Lacs Rs. ~~78707857~~ ~~85580243~~
		Rs.	3417.65 Lacs
	~~TOTAL AMOUNT (Including 3% contingencies and 49% department charges)~~		Say Rs. 3417.65 Lacs Rs. ~~239649743/-~~ 309371277/-

(~~Rupees Twenty Three Crore Ninety Six Lacs Forty Nine Seven Hundred and Forty Three Only~~)

For M/s SWETA ESTATES PVT. LTD

Dev. Cost Rs. 3417.65 Lacs / 47.527 Acs. = Rs. 71.90 Lacs per gross acre.

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Superintending Engineer, HUDA, Circle-II, Gurgaon

Executive Engineer HUDA Div. [illegible]

Checked subject to comments in forwarding letter No. 9640 Dt. 8/9/14 and notes attached with the estimate

Executive Engineer (W) for Chief Engineer HUDA Panchkula 8/9/14

For Sweta Estates Pvt. Ltd.

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ABSTRACT COST OF SUB WORK NO. I (WATER SUPPLY)

S.NO.	DESCRIPTION		AMOUNT (Rs.)
1	Sub Head No. I	Head works	Rs. 162.60 Lacs ~~24384848~~ ~~14510262~~
2	Sub Head No. II	Fire Fighting Pumping machinery	Rs. 205.64 Lacs. ~~24785405~~ ~~9963272~~
3	Sub Head No. III	Water supply Domestic Distribuition system	Rs. 50.09 Lacs ~~5261872~~ ~~4859781~~
4	Sub Head No. IV	Water supply Rising main from HUDA	Rs. 23.48 Lacs ~~2111139~~ ~~1993729~~
5	Sub Head No. V	Water supply Irrigation	Rs. 8.75 Lacs ~~4801541~~ ~~4661549~~
6	Sub Head No. VI	Water supply Fire Ring Main	Rs. 129.26 Lacs ~~10830685~~ ~~12123963~~
7	Sub Head No. VII	Water supply Flushing Distribuition system	Rs. 55.86 Lacs ~~4496134~~ ~~4858323~~
	TOTAL		Rs. 634.08 Lacs ~~51323407~~ ~~78184489/-~~
	(Carried over to FINAL ABSTRACT OF COST)		

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SUB WORK No. I			Water Supply		
SUB HEAD No. I			Head Works		
S. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Boring and installing ~~400~~ 510 mm tubewell with reverse rotary ring complete with pipe and strainer to a depth of about 120 metre in all respect with ~~7.5~~ 15 HP Submersible pump.	Nos.	~~8~~ 2	700000	14.00 Lacs ~~4000000~~ ~~2000000~~
2	Provision for rising mains, connecting tubewell with water main and byepass arrangments with ~~GI Pipe "B"~~ DF-K9 Class of reputed make				
2.1	100 mm dia	mtr	~~725~~ 150	~~4200~~ 1250/-	1.88 Lacs ~~870000~~
2.2	100 mm dia (in Basements)	mtr	~~300~~ 70	~~1200~~ 1250/-	~~360000~~ 0.88 Lacs ~~84000~~
3	Providing and installing electricity driven submersible pumping set complete with motor and other accessories :				
3.1	Domestic water : Pump Room-1 (Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1)20HP Pump, 115 mtr Head	Nos.	3	220000 ~~40000~~	660000 ~~120000~~
3.2	Domestic water(Tower J,K,L,M,N,O,P, School & Community Building : Pump Room-2) ~~20~~ 15 HP Pump, 125 mtr Head	Nos.	3	~~220000~~ ~~45000~~ 2.00	~~660000~~ ~~135000~~ 6.00 Lacs
3.3	Domestic water(Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3) ~~20~~ 35 HP Pump, 185 mtr Head	Nos.	3	~~2.20000~~ ~~50000~~ 3.50 Lacs	880000 ~~200000~~ 10.50 Lacs
3.4	Flushing water : Pump Room-1 (Tower A,B,C,D,E,F,G,H,I & Q : Pump Room -1)10HP Pump, 115 mtr Head	Nos.	3	160000 ~~25000~~	480000 ~~75000~~
3.5	Flushing water(Tower J,K,L,M,N,O,P, School & Community Building : Pump Room-2) 10HP Pump, 125 mtr Head	Nos.	3	160000 ~~30000~~	480000 ~~90000~~
3.6	Flushing water(Tower α, β, 1 to 9, EWS & Servant Room : Pump Room -3) ~~20~~ HP Pump, 185 mtr Head	Nos.	3	~~200000~~ ~~40000~~ 2.20	~~600000~~ ~~120000~~ 6.60 Lacs
~~3.7~~	~~Horticulture Water Pump 5HP, 50 mtr Head~~	~~Nos.~~	~~3~~	~~50000~~ ~~20000~~	~~150000~~ ~~60000~~
~~16~~ 4	Provision for carriage for materials and other unforseen items.	LS	1	~~50000~~	200000 ~~50000~~
~~17~~ 5	Construction of U.G tanks ~~775~~ 950 KL @ Rs. ~~4000/-~~ 45000/KL (~~425~~ Domestic + 350 Fire) and 350 KL capacity for 60° flushing ~~Tonic near STP~~ 950+350 = 1300 KL @ 3500/- KL	~~LS~~	1	~~3400000~~	~~1275000~~ ~~3400000~~ 95.50 Lacs
~~18~~ 6	Provision for construction of Tubewell chambers of size 1.5 x 1.5 x 1.5 for housing tubewell	Nos.	~~8~~ 2	1.00 ~~35000~~ ~~75000~~	~~280000~~ 2.00 Lacs ~~150000~~
	Total			Rs.	~~15889000~~ ~~9460000~~ 105.56 3.17
	Add 3% contingencies & P.E. Charges			Rs.	~~476670~~ ~~283800~~ 108.72
	Total			Rs.	~~16365670~~ ~~9743800~~ 58.28
	Add 49% Departmental Charges, price escalation, Unforseen Admin charge.			Rs.	~~8019178~~ ~~4774462~~ 162.00
	Grand Total			Rs.	~~14518262~~ 24587848
	(Carried over to abstract of cost of Sub Work No. I)				

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Project : Central Park-II, Sector-48, Gurgaon

SUB WORK No. I
Sub Head No. II — Fire Fighting Pumping Machinery

S. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Pl. see below				
2	Provision for diesel engine generator set each for standby arrangements. For pumps complete with gear head arrangements of ~~600~~KVA capacitiy 330	Nos.	2 1	2.00 Lacs ~~1800000~~	4.00 Lacs ~~1800000~~ 25.00 Lacs
3	Providing and installing pumping set of following capacities for Fire protections:				
3.1	Jockey Pump 180 LPM at 115m head, 10 HP	Nos.	1	~~200000~~ 80000	~~200000~~ 80000
3.2	Jockey Pump 180 LPM at 125m head, 10 HP	Nos.	1	200000 ~~62000~~	~~200000~~ 62000
3.3	Jockey Pump 180 LPM at 185m head, 15 HP	Nos.	1	200000 ~~70000~~	~~200000~~ 70000
3.4	Main Electric Fire Pump 2280 LPM at 115m head 100 HP	Nos.	2	~~1000000~~ ~~300000~~ 7.50	~~2000000~~ ~~600000~~ 15.00
3.5	Main Electric Fire Pump 2280 LPM at 125m head 110 HP	Nos.	2	~~1000000~~ ~~325000~~ 7.50	~~2000000~~ ~~650000~~ 15.00
3.6	Main Electric Fire Pump 2280 LPM at 185m head 160 HP	Nos.	2	~~1500000~~ ~~450000~~ 9.00	~~2400000~~ ~~900000~~ 18.00 Lacs
3.7	Diesel Engine Driven Fire Pump 2280 LPM at 115m head	Nos.	1	~~1800000~~ ~~600000~~	~~1800000~~ ~~600000~~
3.8	Diesel Engine Driven Pump 2280 LPM at 125m head	Nos.	1	~~1800000~~ ~~650000~~	~~1800000~~ ~~650000~~
3.9	Diesel Engine Driven Pump 2280 LPM at 185m head	Nos.	1	~~2000000~~ ~~650000~~	~~2000000~~ ~~650000~~
4	Provision for Chlorination plant complete	Nos.	3	1.00 ~~30000~~ 50000	~~150000~~ 00000 3.00 Lacs
5	Provision for making foundations and erection of Pumping Machinery (Lump sum)	LS	~~3~~	~~200000~~	600000 ~~200000~~
6	Provision for Pipes, valves and sepcials inside boosting chamber (Lump sum)	LS	~~3~~	~~200000~~	600000 ~~200000~~
7	Provision for electric service connection including electrical fittings for tubewell and boosting chamber etc (Lump sum) and cost of Transformer	LS	~~3~~	~~100000~~	~~300000~~ ~~100000~~ 5.00 Lacs
8	Provision for carriage of material and other unforseen items etc (Lump sum)				~~60000~~ 100000
	Total			Rs.	~~16150000~~ ~~6492000~~ 134.00
	Add 3% contingencies & P.E. Charges			Rs.	~~484500~~ ~~194760~~ 4.02
	Total			Rs.	~~16634500~~ ~~6686760~~ 138.02
	Add 49% Departmental Charges, price escalation, unforseen Admn. charges.			Rs.	~~8150705~~ ~~3276512~~ 67.62
	Grand Total			Rs.	~~8963272~~ 24785405 205.64 Lacs
	(Carried over to abstract of cost of Sub Work No. I)				

(i) Prov. and installing electrically driven submersible pumping set capable of delivering about 16 KL / HR. against a total Head of 120 mtr complete with motor and other accessories (15 HP)
2 Nos @ Rs 2.00 Lacs — Rs 4.00 Lacs

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For Sweta Estates Pvt. Ltd.

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SUB WORK No. I — WATER SUPPLY DOMESTIC
SUB HEAD No. III — DISTRIBUTION SYSTEM

S. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)	
1	Providing, laying, jointing and testing of ~~G.I (B class)~~ DI-K9 lines including all fitiings, cost of excavation and Backfillig etc complete in all respects.					
a)	100 mm dia ~~GI Pipe~~ DI-K9	mtr	2153 ~~1853~~	1250/ ~~1200~~	26.91 ~~2223600.00~~	
~~b)~~	~~65 mm dia GI Pipe~~	~~mtr~~	~~624~~	~~750~~	~~468000.00~~	
2	Providing and fixing sluice valve including cost of surface boxes & masonry chambers etc. complete.					
a)	100 mm dia	each	16	12000 ~~5000.00~~	192.000 ~~80000.00~~	
~~b)~~	~~65 mm dia~~	~~each~~	~~30~~	~~6000 4000.00~~	~~180000 120000.00~~	
4	Providing & fixing air valve & scour valves ~~including cost of bricks masonry chamber complete~~.	each	(LS ~~15~~)	~~10000 4500.00~~	150000 ~~67500.00~~	
5	Providing and fixing indicating plates for with sluice valves, air valves & fire hydrants	each	31 ~~15~~	1000 ~~500.00~~	~~15000 7500.00~~ 0.31 Lacs	
6	Provision for carriage for materials and others unforeseen items	LS	1	100000.00	100000.00	
7	Provision for cutting of roads and making good to its original conditions.	LS	1	~~100000.00~~	100000.00	
	Total			Rs.	3428600 ~~3166600~~	32.64 Lacs
	Add 3% contingencies & P.E. Charges			Rs.	~~102858 94998~~	0.98 Lacs
	Total			Rs.	~~3531458 3261598~~	33.62
	Add 49% Departmental Charges, price escalation			Rs.	~~1730444 1598183~~	16.47
	Grand Total unforseen, Admn. Charges			Rs.	~~4859781~~ 5261872	50.09 Lacs
	(Carried over to abstract of cost of Sub Work No. I)					

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SUB WORK No. I			Water Supply		
Sub Head No - IV			Rising Main from HUDA		
S. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Providing, Laying, Jointing and testing DI(K9) pipe lines including all fititngs, cost of excavation and backfilling etc complete in all respect				
a)	150 mm dia	mtr		~~1850~~	
b)	150 mm dia (printed 100, overwritten 150)	mtr	672	~~1300~~ 1575	~~873600~~ 10.58 lacs
c)	100 mm dia ~~GI Pipe~~ DI-K9 (in Basements)	mtr	~~200~~ 100	~~1200~~ 1250	~~240000~~ ~~120000~~ 1.25 lacs
3	Providing and Fixing sluice valve including cost of surface box and masonary chamber etc. complete in all respect -100 mm dia	Each	4	~~5000~~ 12000	~~20000~~ 48000
4	Providing and fixing indicating plates for sluice valve and air valves	Each	4	~~500~~ 1000	~~2000~~ 4000
5	Providing and fixing air release valve and scour valve	Each	3	~~4500~~ 10000	~~13500~~ 30000
6	Provision for carriage of materials and other unforseen items (Lump Sum)	LS	1	~~50000~~	~~50000~~ ~~100000~~ 0.50 lacs
7	Making Water supply connection with HUDA main	LS	1	~~50000~~	50000 100000
8	Provision for cutting of roads and making good to its original condition	LS	1	50000	50000 ~~100000~~ 0.50 lacs
	Total			Rs	~~1290100~~ ~~1375600~~ 14.65
	Add 3% contingencies & P.E. Charges			Rs	~~38973~~ ~~41268~~ 0.44
	Total			Rs	~~1338073~~ ~~1416868~~ 15.09
	Add 49% Departmental Charges, price escalation			Rs	~~655050~~ ~~694265~~ 7.39
	Grand Total labour cess, Admn. charges			Rs	~~4993729~~ ~~2111133~~ 22.48 lacs
	(Carried over to abstract of cost of Sub Work No. I)				

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SUB WORK No. I — WATER SUPPLY
SUB HEAD No. V — IRRIGATION

S. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Providing, laying, jointing and testing HDPE Water Ring around the building with lawn hydrant along road including excavation of trench and backfilling				
a)	~~110 mm OD~~	mtr		1050	
b)	~~80 mm OD~~ irrigation connect to flushing line	mtr	~~2802~~	~~725~~	~~2096700~~
c)	~~50 mm OD~~	mtr	~~885~~	~~500~~	~~442500~~
d)	25 mm OD for Hydrant (600 mm x 90 Nos) including line complete in all respect	mtr	(L.S) ~~54~~	~~245~~	~~13230~~ 5.40 lacs
e)	~~80 mm dia (in Basements)~~	mtr	~~300~~	~~725~~	~~217500~~
2	Providing and fixing valve:				
a)	50mm dia	Each	~~85~~	~~1500~~	~~127500~~
b)	80mm dia	Each	~~20~~	~~4000~~	~~80000~~
3	Providing and fixing indicating plates	Each	20	1000/- ~~500~~	0.20 lacs ~~10000~~
4	Provision for cartage of material and other unforeseen items	LS	1	~~50000~~	50000
					5.70 lacs
	Total			Rs.	~~3037430~~
	Add 3% contingencies & P.E. Charges			Rs.	~~91123~~ 0.17 lacs
	Total			Rs.	~~3128553~~ 5.87 lacs
	Add 49% Departmental Charges, price escalation, unforseen Admin. charges.			Rs.	~~1532991~~ 2.88 lacs
	Grand Total			Rs.	~~4661544~~ 8.75 lacs
	(Carried over to abstract of cost of Sub Work No. I)				

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SUB WORK No. I				WATER SUPPLY		
SUB HEAD No. VI				FIRE RING MAIN		
S. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)	
1	Providing, laying and jointing and testing M.S. pipes including cost of excavation Complete.			1575/ ~~1500~~	64.87 lacs ~~6178500~~	
a)	150 mm dia	mtr	4119	~~1400~~	~~5766600~~	
b)	100 mm dia	mtr		1200 ~~800~~		
c)	80 mm dia	mtr	1076	1000 ~~600~~	1076000 ~~645600~~	
2	Providing and fixing fire hydrants with Chamber and indication plate	each	46	10000/ ~~7500~~	4.60 lacs ~~345000~~	
4	Providing for fixing sluice valve i.e. cost of surface box and masonry chamber complete with indicating plates					
a)	150 mm dia	each	20	15000	300000	
5	Provision for carriage for materials and others unforeseen items	L.S.	1	~~100000~~	100000	
	Total			Rs.	~~7899500~~ ~~7057200~~	84.23 lacs
	Add 3% contingencies & P.E. Charges			Rs.	~~236985~~ ~~211710~~	2.52 lacs
	Total			Rs.	~~8135485~~ ~~7268916~~	86.75 lacs
	Add 49% Departmental Charges, price escalation, unforseen Admin. charges			Rs.	~~3986878~~ ~~3561769~~	42.51 lacs
	Grand Total			Rs.	~~10830685~~ ~~12123963~~	129.26 lacs
	(Carried over to abstract of cost of Sub Work No. I)					

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CA/2007/39612

For Sweta Estates Pvt. Ltd.

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SUB WORK No. I				WATER SUPPLY		
SUB HEAD No. VII				FLUSHING DISTRIBUTION SYSTEM		
S. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)	
1	Providing, laying, jointing and testing Water Ring with all fittings around the building including excavation of trench and backfilling and complete the work in all respect.					
a)	110 mm ~~GI~~ DI-K9	mtr	1720 ~~1573~~ ✓	1250 ~~1200~~ ✓	21.50 ~~1887600~~	Lac
b)	~~50 mm dia GI~~ ✓	mtr	917 ✓	650 ✓	596050 ✓	
2	Providing and fixing valves, including cost of surface boxes and masonry chamber etc. complete in all respect.					
a)	100 mm dia	each	20	~~5000~~ 12000	~~100000~~ 240000	
b)	50 mm dia	each	~~32~~	~~3000~~ 6000	~~96000~~ 192000	
3	Provision for carriage of materials and other unforseen items (Lumpsum)	LS	1		250000	
4.	Prov for over flow line from STP to HUDA line	(LS)			Rs 10.0	Lac
	Total			Rs.	~~2929650~~ ~~3165650~~	36.40 Lac
	Add 3% for contigencies and PH charges			Rs.	~~87890~~ ~~94970~~	1.09 Lac
	Total			Rs.	~~3017540~~ ~~3260620~~	37.49 Lac
	Add 49% Department Charges, Prices Escalation unforseen, admn. Charges			Rs.	~~1478594~~ ~~1597704~~	18.37 Lac
	Grand Total			Rs.	~~4496134~~ ~~4858323~~	55.86 Lac
	(Carried over to abstract of cost of Sub Work No. I)					

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For Sweta Estates Pvt. Ltd.

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QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. : I — **WATER SUPPLY**
SUB HEAD No. : I — **HEAD WORKS**

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	100 mm dia GI Pipe Length	
1	Borewell no.6 - Pump Room 1	100	125	125	
2	Borewell no.5 - Pump Room 3	100	39	39	
3	Borewell no.2 - 15	100	7	7	
4	15 -16	100	48	48	
5	16 -17	100	145	145	
6	17 -Pump Room 2	100	24	24	
7	Borewell no.1 - 18A	100	10	10	
8	Borewell no.3 -19	100	10	10	
9	19 - 20	100	61	61	
10	20 -21	100	99	99	
11	21 -22	100	77	77	
12	22 -23	100	14	14	
13	23 -Borewell no.4	100	12	12	
14	Borewell no. 7 - 25	100	35	35	
15	36 - Borewell no.8	100	19	19	
	TOTAL		725	725	

100 mm ϕ = 150 mtr apply.

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QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. : I
SUB HEAD No. : III

WATER SUPPLY
DOMESTIC DISTRIBUTION SYSTEM

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	100 mm dia Length	~~65 mm dia Length~~
1	Pump Room 3 - 8	100	10	10	
2	8 - 24	100	138	138	
3	24 - 30	100	50	50	
4	30 - 31	100	118	118	
5	31 - 33	100	78	78	
6	33 - 34	100	30	30	
7	33 - 35	100	68	68	
8	35 - 36	100	34	34	
9	26 - 27	100	25	25	
10	27 - 28	100	25	25	
11	28 - 29	100	22	22	
12	29 - 24	100	90	90	
13	31 - 32	100	30	30	
14	32 - 82	100	20	20	
15	81 - 82	~~65~~ 100	20	20	~~20~~
16	82 - 83	100	16	16	
17	83 - 84	65	9		~~9~~
18	83 - 85	100	36	36	
19	85 - 86	65	13		~~13~~
20	85 - 87	100	30	30	
21	87 - 88	65	12		~~12~~
22	87 - 89	100	31	31	
23	89 - 90	65	9		~~9~~
24	89 - 91	100	19	19	
25	91 - 92	65	10		~~10~~
26	Pump Room 1 - 37	100	22	22	
27	37 - 38	65	5		~~5~~
28	37 - 39	65	35		~~35~~
29	Pump Room 1 - 40	100	150	150	
30	40 - 41	65	13		~~13~~
31	40 - 42	100	37	37	
32	42 - 43	65	14		~~14~~
33	42 - 44	100	39	39	
34	44 - 45	65	14		~~14~~
35	44- 46	100	41	41	
36	46 - 47	65	12		~~12~~
37	46 - 48	100	38	38	
38	48 - 49	65	13		~~13~~
39	48 - 50	100	45	45	
40	50 - 51	65	10		~~10~~
41	50 - 52	100	46	46	
42	52 - 53	65	11		~~11~~
43	52 - 54	100	47	47	
44	54 - 55	65	10		~~10~~
45	54 - 56	100	43	43	
46	56 - 57	65	9		~~9~~
47	56 -58	100	32	32	

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48	Pump Room 3 - 76	100	121	121	
49	76 -77	65	8		~~8~~
50	76 - 78	100	21	21	
51	78 - 79	65	8		~~8~~
52	78 -80	~~65~~ 100	~~69~~	69	~~69~~
53	Pump Room 3 - 74	100	47	47	
54	74 -75	65	14		~~14~~
55	74 - 73	~~65~~ 100	~~98~~	98	~~98~~
56	Pump Room 2 - 59	~~65~~ 100	~~48~~	48	~~48~~
57	Pump Room 2 - 60	100	27	27	
58	60 - 61	65	15		~~15~~
59	60 -62	100	40	40	
60	62 - 63	65	14		~~14~~
61	62 - 64	100	63	63	
62	64 - 65	65	10		~~10~~
63	64 - 66	100	46	46	
64	66 -67	65	12		~~12~~
65	66 - 68	100	23	23	
66	68 - 69	65	17		~~17~~
67	68 - 70	100	55	55	
68	70 - 71	65	17		~~17~~
69	70 - 72	~~65~~ 100	~~75~~	75	~~75~~
	TOTAL		2477	~~1853~~	~~624~~

2153 mtr

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QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. : I — **WATER SUPPLY**
SUB HEAD No. : IV — **RISING MAIN FROM HUDA**

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	100 mm dia DI Pipe Length	
1	HUDA Water Supply line - 1	100	50	50	
2	1 -2	100	28	28	
3	2 -3	100	15	15	
4	2 -4	100	30	30	
5	4 - 5	100	19	19	
6	5 -6	100	191	191	
7	6 -8	100	12	12	
8	8 - 9	100	25	25	
9	9 -12	100	69	69	
10	12 - 13	100	108	108	
11	13 -14	100	125	125	
	TOTAL		672	672 ✓	

Sl. No.	Name of Line	Daily Demand in KL	Peak 1.5 Times	Size in MM	Loss of Head per 100m	
1	1-2	1135	1702	100	25.00	2.50
2	2-3(PR-I)	415	623	100	8.80	0.92
3	2-8	720	1080	100	20.00	1.50
4	8-PR-II	330	495	100	11.48	0.73
5	8-PR-III	390	495	100	11.48	0.73

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QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. I — **WATER SUPPLY**
SUB HEAD No. V — **IRRIGATION**

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	80 mm dia HDPE Length	50 mm dia HDPE Length
1	1 -2	50	22		22
2	2- 3	50	23		23
3	3- 4	80	253	253	
4	4- 5	80	77	77	
5	5- 6	80	50	50	
6	6 -7	80	105	105	
7	7- 8	50	67		67
8	7 -9	80	59	59	
9	9 -10	80	60	60	
10	10-11 to 9A	50	22		22
11	10 -11	80	30	30	
12	11- 12	80	107	107	
13	12 -13	80	105	105	
14	13 -14	80	264	264	
15	14 -15	80	71	71	
16	15 -16	80	52	52	
17	16 -17	80	63	63	
18	17 -18	80	24	24	
19	18 -19	80	50	50	
20	19 -20	80	101	101	
21	20- 21	80	50	50	
22	21 -22	80	146	146	
23	22 -23	80	63	63	
24	23 - 23A	50	14		14
25	23 -24	80	39	39	
26	24 -25	80	97	97	
27	25- 26	80	54	54	
28	26 -27	80	100	100	
29	27 -28	80	83	83	
30	27 -29	80	90	90	
31	29 - 30	80	31	31	
32	30A - 31	50	35		35
33	30 - 32	50	48		48
34	30 - 33	80	35	35	
35	33 - 34	80	10	10	
36	34 -35	80	33	33	
37	35 - 36	80	34	34	
38	36 -36A	50	57		57
39	36 - 36B	80	6	6	
40	36 B -37	80	11	11	
41	37 - 37A	50	34		34
42	37 - 38	80	31	31	
43	38 - 38A	50	21		21
44	38 - 39	80	15	15	
45	39 -39A	50	53		53
46	39 -40	80	18	18	
47	40 - 41	80	32	32	
48	40 - 40A	50	12		12

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49	41 - 41A	50	15		15
50	41 - 42	80	9	9	
51	42 - 42A	80	54	54	
52	42A - 43	80	17	17	
53	43 - 43A	50	21		21
54	43 - 44	50	9		9
55	44 - 44A	50	23		23
56	45 - 45A	50	24		24
57	45 - 46	50	31		31
58	46 - 46A	50	19		19
59	46 - 46B	80	8	8	
60	42 - 47	80	14	14	
61	47 - 47A	50	25		25
62	47 - 48	80	26	26	
63	48 - 48A	80	45	45	
64	48 - 49	80	6	6	
65	49 - 49A	50	21		21
66	49 - 50	80	26	26	
67	50 - 50A	50	19		19
68	50 - 50B	50	44		44
69	50 - 51	80	16	16	
70	51 - 51A	50	24		24
71	51 - 52	80	9	9	
72	52 - 52A	50	7		7
73	52 - 53	50	18		18
74	52 - 54	80	7	7	
75	54 - 55	80	54	54	
76	55 - 21	80	24	24	
77	35 - 56	80	13	13	
78	56 - 56A	50	44		44
79	56 - 57	80	7	7	
80	57 - 57A	50	12		12
81	57 - 58	80	22	22	
82	58 - 58A	50	42		42
83	58 - 59	80	8	8	
84	59 - 59A	50	9		9
85	59 -60	80	12	12	
86	60 - 60A	50	46		46
87	60 - 61	80	21	21	
88	61 - 62	80	8	8	
89	62 - 62A	50	24		24
90	62 - 63	80	24	24	
91	63 - 63A	80	13	13	
	TOTAL		**3777**	**2892**	**885**

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For Sweta Estates Pvt. Ltd.

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QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. I — **WATER SUPPLY**
SUB HEAD No. VI — **FIRE RING MAIN**

Sl. No.	Line (From - To)	Length (mtr)	150 mm dia Length	80 mm dia Length
1	1 - 2	284	258	26
2	2 - 7	74	56	18
3	7 - 3	251	153	98
4	3 - 4	102	102	
5	4 - 5	182	117	65
6	5 - 6	137	129	8
7	7 - 8	47	47	
8	8 - 9	66	31	35
9	9 - 10	71	71	
10	10 - 11	91	81	10
11	11 - 12	27	27	
12	11-12 - Pump Room 3	30	30	
13	11 - 13	121	111	10
14	13 - 14	115	106	9
15	14 - 15	20	20	
16	15 - 16	24	24	
17	16 - 17	33	33	
18	17 - 18	33	28	5
19	18 - 15	38	33	5
20	14 - 19	73	53	20
21	19 - 20	109	94	15
22	20 - 10	93	51	42
23	12 - 21	170	119	51
24	21 - 22	498	254	244
25	22 - 23	67	67	
26	22-23 - Pump Room 2	30	30	
27	23 - 24	146	136	10
28	24 - 25	59	59	
29	25 - 26	82	72	10
30	26 - 27	136	126	10
31	27 - 28	158	141	17
32	28 - 8	68	68	
33	29/Pump Room 1 - 30	30	30	
34	30 - 31	97	92	5
35	31 - 32	64	64	
36	32 - 33	152	142	10
37	33 - 30	28	28	
38	32 - 34	205	152	53
39	34 - 35	213	116	97
40	35 - 36	149	108	41
41	36 - 37	76	68	8
42	37 - 38	38	38	
43	38 - 39	159	120	39
44	39 - 40	94	94	
45	40 - 41	166	130	36
46	41 - 42	197	140	57
47	42 - 43	92	70	22
	TOTAL	**5195**	**4119**	**1076**

For Sweta Estates Pvt. Ltd.

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QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. I — **WATER SUPPLY**

SUB HEAD No. VII — **DISTRIBUTION SYSTEM FOR FLUSHING**

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	100 mm dia Length	50 mm dia Length
1	STP 1 - 2	100	13	13	
2	2 - 3	100	25	25	
3	3 - 4	100	82	82	
4	4 - 5	100	39	39	
5	5 - 6	50	7		7
6	5 - 7	100	37	37	
7	7 - 8	50	13		13
8	7 - 9	100	43	43	
9	9 - 10	50	13		13
10	9 - 11	100	47	47	
11	11 - 12	50	14		14
12	11 - 13	100	61	61	
13	13 - 14	50	7		7
14	13 - 15	100	35	35	
15	15 - 16	50	9		9
16	15 - 17	100	44	44	
17	17 - 18	50	21		21
18	17 - 17A	100	34	34	
19	17A - 18A	50	18		18
20	17A - 19	100	38	38	
21	19 - 20	50	18		18
22	19 - 21	100	33	33	
23	21 - 22	50	11		11
24	21 - 23	100	98	98	
25	23 - 24	50	13		13
26	23 - 25	~~50~~ 100	~~36~~	36	36
27	STP 2 - 27	100	30	30	
28	27 - 28	50	13		13
29	27 - 29	100	43	43	
30	29 - 30	50	12		12
31	29 - 32	100	21	21	
32	32 - 33	50	15		15
33	32 - 34	100	46	46	
34	34 - 35	50	15		15
35	34 - 36	100	23	23	
36	36 - 37	100	60	60	
37	37 - 38	100	15	15	
38	38 - 39	50	13		13
39	38 - 40	100	36	36	
40	40 - 41	50	9		9
41	40 - 43	~~50~~ 100	~~61~~	61	~~61~~
42	STP 2 - 45	~~50~~ 100	~~43~~	43	~~43~~
43	STP 3 - 51	100	18	18	
44	51 - 52	100	25	25	
45	52 - 53	100	67	67	
46	53 - 54	100	10	10	
47	54 - 55	100	12	12	
48	55 - 56	50	19		19

For Sweta Estates Pvt. Ltd.

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49	55 - 57	100	45	45	
50	57 - 58	50	23		23
51	57 - 59	50	90		90
52	59 - 60	50	25		25
53	53 - 61	50	68		68
54	61 - 62	50	18		18
55	62 - 63	50	27		27
56	63 - 64	50	23		23
57	STP 3 - 47	100	27	27	
58	47 - 48	50	65		65
59	47 - 49	50	43		43
60	51 - 65	100	77	77	
61	65 - 66	100	18	18	
62	66 - 67	50	10		10
63	66 - 68	100	35	35	
64	68 - 69	50	23		23
65	68 - 70	100	52	52	
66	70 - 71	50	28		28
67	70 - 72	100	13	13	
68	72 - 73	50	27		27
69	72 - 74	100	44	44	
70	74 - 75	50	22		22
71	74 - 76	100	33	33	
72	76 - 77	50	11		11
73	65 - 78	100	94	94	
74	78 - 79	50	28		28
75	78 - 80	100	63	63	
76	80 - 81	100	24	24	
77	81 - 82	100	4	4	
78	82 - 83	100	9	9	
79	83 - 84	50	6		6
	TOTAL		2490	~~4573~~ ✓ 1713 mtr	~~917~~ ✓ 777 mtr

Say 1720 mtr

Say 780 mtr

NEHA BHAGRA
CA/2007/39612

For Sweta Estates Pvt. Ltd.

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ABSTRACT COST OF SUB WORK NO. II (SEWERAGE SCHEME)

SUB WORK No. II					SEWERAGE SCHEME
S.NO.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Providing, jointing, cutting and testing SW pipe class "A" and towering in to trenches including cost of Excavation, bed concrete, cost of manholes etc. complete				
a)	SW pipe 300 mm i/d avg. depth 0-4 M	mtr	549	2000/ ~~1450~~	10.98 Lac ~~796050~~
b)	SW pipe 250 mm i/d avg. depth 0-3M	mtr	1169 ~~1152~~	1700/ ~~1250~~	~~1461250~~ 19.86 ~~1440000~~
c)	SW pipe 200 mm i/d avg. depth 0-2 M	mtr	706 ~~728~~	1250/ ~~1000~~	~~705000~~ 8.83 ~~723000~~
2	Provision for timbering & shoring (L.S.), Vent Pipe + Lighting	LS	1	~~300000~~	25.00 Lac ~~300000~~
3	Provision for road surface charges and remaking its in original condition (L.S.)	LS	1	~~50000~~	3.00 Lac ~~50000~~
4	Provision for connection to existing main HUDA sewer line	LS	1	~~50000~~	1.50 Lac ~~50000~~
5	The cost estimated for STP (80% of 1700KLD = 1360KLD Say 1400KLD, STP-1: 500KLD, STP-2: 400KLD, STP-3: 500KLD) (3 Nos)	LS	1	~~15000000~~ ~~6000000~~	~~15000000~~ ~~5000000~~ 300.00 Lac
6	Providing, Laying, Jointing and testing DI(K9) pipe lines including all fititngs, cost of excavation and backfilling etc complete in all respect				
a)	150 mm dia	mtr	857	1575/ ~~1850~~	13.50 Lac ~~1585450~~
7	Provision for carriage for materials and other unforseen items.	LS	1	~~200000~~	5.00 Lac ~~200000~~
	Total				~~2011875~~ ~~8650050~~ 387.69
	Add 3% contigencies & PH charges				~~604465~~ ~~256772~~ 11.63
	Total				~~2075925~~ ~~8845822~~ 399.32
	Add 49% departmental charges, price esclation unforseen, admn. Charges				~~1016974~~ ~~4319753~~ 195.67
	Grand Total				~~43135574~~ 594.99
					~~30922287~~ Lac
	(Carried over to FINAL ABSTRACT OF COST)				

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For Sweta Estates Pvt. Ltd.

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QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. II — **SEWAGE**

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	200 mm dia	250 mm dia	300 mm dia
1	63 - 64	200	29	29		
2	64 - 65	200	45	45		
3	65 - 66	200	19	19		
4	66 -1	250	62		62	
5	1 - 2	250	24		24	
6	2 - 3	250	30		30	
7	3 - 4	250	16		16	
8	4 - 5	250	30		30	
9	5 - 6	250	33		33	
10	6 - 7	250	25		25	
11	7 - 8	250	33		33	
12	8 - 9	250	32		32	
13	9 - 10	250	37		37	
14	10 - 11	250	15		15	
15	11 - 12	300	13			13
16	12 - 13	300	23			23
17	13 - 14	300	29			29
18	14 - 15	300	16			16
19	15 - 16	300	30			30
20	16 - 17	300	27			27
21	17 - 18	300	11			11
22	18 - 19	300	30			30
23	19 - 20	300	25			25
24	20 - 21	300	42			42
25	21 - 22	300	30			30
26	22 - 23	300	28			28
27	23 - 24	300	20			20
28	24 - 25	300	13			13
29	25 - 26	300	13			13
30	26 - STP 1	300	12			12
31	STP 1 - HUDA Ext	300	30			30
32	27 - 28	200	30	30		
33	28 - 29	200	30	30		
34	29 - 30	200	18	18		
35	30 - 31	250	30		30	
36	31 - 84	250	24		24	
37	67 - 68	250	18		18	
38	68 - 69	250	17		17	
39	69 - 70	250	36		36	
40	70 - 75	250	14		14	
41	71 - 72	200	23	23		
42	72 - 74	200	36	36		
43	73 - 74	200	25	25		
44	74 - 75	200	19	19		
45	75 - 78	250	28		28	
46	78 - 79	250	13		13	
47	79 - 80	250	20		20	
48	80 - 81	250	30		30	
49	81 - 82	300	22			22
50	82 - 83	300	32			32

For Sweta Estates Pvt. Ltd.

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SUB WORK No. II

SEWAGE

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	200 mm dia	250 mm dia	300 mm dia
51	83 - 84	300	36			36
52	84 - 85	300	30			30
53	85 - STP 3	300	11			11
54	85 - 86	250	12		12	
55	86 - 87	250	34		34	
56	87 - 88	250	34		34	
57	88 - 89	250	43		43	
58	89 - 90	250	22		22	
59	90 - 91	250	34		34	
60	91 - 92	250	29		29	
61	92 - 93	200	13	13		
62	93 - 94	200	10	10		
63	94 - 95	200	20	20		
64	95 - 96	200	15	15		
65	96 - 97	200	13	13		
66	97 - 98	200	12	12		
67	99 - 100	200	15	15		
68	100 - 101	200	30	30		
69	101 - 102	200	30	30		
70	102 - 103	200	30	30		
71	103 - 104	250	14		14	
72	104 - 89	250	30		30	
73	32 - 33	200	14	14		
74	33 - 34	200	30	30		
75	34 - 35	200	25	25		
76	35 - 36	200	35	35		
77	36 - 37 / STP-2	300	26			26
78	36 - 38	250	34		34	
79	38 - 39	250	38		38	
80	39 - 40	250	15		15	
81	40 - 41	250	18		18	
82	41 - 42	250	27		27	
83	42 - 43	250	12		12	
84	43 - 44	250	10		10	
85	44 -45	250	30		30	
86	45 - 46	250	17		17	
87	46 - 47	250	24		24	
88	47 - 48	250	34		34	
89	48 - 49	250	12		12	
90	49 - 50	250	39		39	
91	50 - 51	250	40		40	
92	51 - 52	200	50	50		
93	52 - 53	200	30	30		
94	53 - 54	200	28	28		
95	54 - 55	200	32	32		
	TOTAL		**2424** mtr	**706** mtr	**1169** mtr	**549** mtr

NEHA BHAGRA
CA/2007/39612

For Sweta Estates Pvt. Ltd.

Authorise Signatory/Signatories

Project : Central Park-II, Sector-48, Gurgaon

QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. II

SEWAGE
SEWER OVER-FLOW LINE

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	150mm D.I.	Remark
1	STP 1 - 1	150	20	20	
2	1 - 2	150	25	25	
3	2 - 3	150	100	100	
4	3 - 4	150	50	50	
5	4 - 5	150	150	150	
6	6 - 6	150	60	60	
7	6 - 7	150	12	12	
7	7 - 8	150	40	40	
8	8 - 9	150	80	80	
	STP 2 - 9	150	20	20	
9	9 - 10	150	70	70	
10	10 - 11	150	175	175	
11	STP 3 - 11	150	20	20	
12	11 - Huda Ext	150	35	35	
	TOTAL		857	857	

mtrs.

NEHA BHAGRA
CA/2007/39612

Project : Central Park-II, Sector-48, Gurgaon

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

ABSTRACT COST OF SUB WORK NO. III (STORM WATER DRAINAGE)

SUB WORK No. III — STORM WATER DRAINAGE

S.NO.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Providing and laying RCC Pipe drain class NP-3 with cement joints manholes, excavation etc. complete in all respect.				
a)	400 mm dia	mtr	3013	~~1400~~	~~4218200~~
b)	~~400~~ 900 mm dia 3583 mtr	mtr	570 ~~707~~	2500/- ~~1200~~	~~684000~~ ~~920400~~ 89.58 Lacs
2	Provision for Road gullies	LS	1	~~300000~~	10-00 ~~300000~~
3	Provision for shoring & Timbering	LS	1	~~200000~~	200000
4	Provision for Lighting, Watching	LS	1	~~200000~~	200000
5	Provision for carriage of Material	LS	1	~~100000~~	5.00 Lacs ~~100000~~
6	Provision for making connection to HUDA Line (L.S.)	LS	1	~~50000~~	2.00 Lacs ~~50000~~
7	Rain water recharge well 19 Nos of design with Zero discharge @ Rs 312677.63/No	~~Ave~~ ~~each~~	~~47.527~~ ~~19~~	~~312677.63~~ ~~500000~~	~~5940875~~ ~~9500000~~ ✓ 50-00
8	Pt. see below				5-00
	Total		~~19~~	~~125 lacs/Ave~~	~~15488600~~ ~~11693075~~ 165.58
	Add 3% for contigencies and PH charges				~~464650~~ ~~350792~~ 4.96
	Total				~~15953258~~ ~~12043867~~ 170.54
	Add 49% Department Charges, Prices Escalation unforseen, admn. Charges				~~7817096~~ ~~5901495~~ 83.57
	Grand Total				~~23770354~~ ~~17945362~~ 254.11 Lacs

(Carried over to FINAL ABSTRACT OF COST)

NEHA BHAGRA CA/2007/39612

8) Prov. for cutting of roads & making good to its in original condition (L.S) Rs 5-00 lacs.

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

QUANTITY TAKE-OFF : MATERIAL STATEMENT

SUB WORK No. III

STORM WATER DRAINAGE

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	400 mm dia	400 mm dia
1	1 - 2	400	23	23	
2	2 - 4	400	38	38	
3	3 - 4	400	25	25	
4	4 - 11	400	14	14	
5	6 - 9	400	34	34	
6	7 - 8	400	29	29	
7	8 - 9	400	20	20	
8	9 - 10	400	30		30
9	10 - 11	400	31		31
10	11 - 12	400	34		34
11	12 - 13	400	22		22
12	13 - 14	400	23		23
13	14- 15	400	30		30
14	15 - 16	400	26		26
15	16 - 17	400	28		28
16	17 - 18	400	35		35
17	18 - 22	400	6		6
18	19 - 20	400	17	17	
19	20 - 21	400	30	30	
20	21 - 22	400	21	21	
21	22 - 39	400	30		30
22	23 - 24	400	28	28	
23	24 - 25	400	30	30	
24	25 - 26	400	13	13	
25	26 - 27	400	28	28	
26	27 - 28	400	17	17	
27	28 - 29	400	13	13	
28	29 - 30	400	33		33
29	30 - 31	400	38		38
30	31 - 32	400	31		31
31	32 - 33	400	36		36
32	33 - 34	400	~~226~~ 29	~~197~~ 0	29
33	34 - 35	400	18		18
34	35 - 36	400	42		42
35	36 - 37	400	20		20
36	37 - 38	400	30		30
37	38 - 39	400	35		35
38	39 - Huda Ext	400	30		30
39	40 - 41	400	29	29	
40	41 - 42	400	33		33
41	42 - 43	400	30		30
42	43 - 44	400	30		30
43	44 - 45	400	30		30
44	45 - 46	400	43		43

Project : Central Park-II, Sector-48, Gurgaon

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

NEHA BHAGRA
CA/2007/39612

SUB WORK No. III

STORM WATER DRAINAGE

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	400 mm dia	400 mm dia
45	46 - 47	400	9		9
46	47 - Huda Ext	400	20		20
47	47 - 48	400	20		20
48	48 - 49	400	30		30
49	49 - 55	400	30		30
50	50 - 51	400	30		30
51	51 - 52	400	30		30
52	52 - 53	400	30		30
53	53 - 54	400	43		43
54	54 - 55	400	8		8
55	55 - 56	400	75		75
56	56 - 61	400	23		23
57	Huda Ext - 57	400	15		15
58	57 - 58	400	12		12
59	58 - 59	400	28		28
60	59 - 60	400	17		17
61	60 - 61	400	27		27
62	61 - 62	400	17	17	
63	62 - 63	400	30	30	
64	63 - 64	400	28		28
65	64 - 65	400	25		25
66	65 - 66	400	10		10
67	66 - Huda Ext	400	7		7
68	67 - 68	400	28		28
69	68 - 69	400	39		39
70	69 - 70	400	15		15
71	70- 71	400	21		21
72	71 - 78	400	25		25
73	72 - 73	400	22	22	
74	73 - 74	400	30	30	
75	74 - 75	400	30	30	
76	75 - 76	400	30		30
77	76 - 77	400	18		18
78	77 - 78	400	21		21
79	78 - 79	400	24		24
80	79 - 80	400	24		24
81	80 - Huda Ext	400	27		27
82	81 - 82	400	21		21
83	82 - 83	400	31		31
84	83 - 84	400	14		14
85	84 - 85	400	30		30
86	85 - 86	400	33		33
87	86 - 87	400	23		23
88	87 - 88	400	36		36
89	88 - 89	400	27		27
90	89 - 90	400	42		42
91	90 - 91	400	10		10

Project : Central Park-II, Sector-48, Gurgaon

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

NEHA BHAGRA
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SUB WORK No. III

STORM WATER DRAINAGE

Sl. No.	Line (From - To)	Dia (mm)	Length (mtr)	400 mm dia	400 mm dia
92	91 - 92	400	21		21
93	92 - 93	400	27		27
94	93 - 94	400	29		29
95	94- 95	400	16		16
96	95 - 96	400	30		30
97	96 - 97	400	27		27
98	97 - 97 A	400	10		10
99	97 A - 97 B	400	34		34
100	97 B - 98	400	38		38
101	98 - 99	400	29		29
102	99 - 100	400	30		30
103	100 - 101	400	29		29
104	101 - RWH-11	400	24		24
105	RWH-11 - Huda Ext	400	25		25
106	102 - 103	400	30		30
107	103 - 104	400	30		30
108	104 - 105	400	30		30
109	105- 106	400	30		30
110	106 - 107	400	26		26
111	107 - 108	400	25		25
112	108 - 109	400	31		31
113	109 - 110	400	39		39
114	110 - 111	400	22		22
115	111 - 112	400	30		30
116	112 - 113	400	15		15
117	113 - 114	400	30		30
118	114 - 115	400	17		17
119	115 - 116	400	6		6
120	116- 117	400	19		19
121	117 - 117A	400	25		25
122	117A - 117B	400	39		39
123	117B - 99	400	22		22
124	118 - 119	400	32	32	
125	119 - 120	400	12		12
126	120 - 121	400	39		39
127	121 - 122	400	40		40
128	122 - 123	400	18		18
129	123 - 124	400	34		34
130	124 - 125	400	30		30
131	125 - 126	400	30		30
132	126 - 127	400	43		43
133	127 - 128	400	18		18
134	128 - 129	400	37		37
135	129 - Huda Ext	400	18		18
	TOTAL		~~3780~~ 3583	~~767~~ 570 mtr	3013 mtr

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

NEHA BHAGRA CA/2007/39612

Project : Central Park-II, Sector-48, Gurgaon

ABSTRACT COST OF SUB WORK NO. IV (ROAD AND PATHS)

SUB WORK No. IV | ROAD AND PATHS

S.NO.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Provision for leveling and earth filling as per site conditions.	per Acre	47.527	100000	4752700
2	Construction of road as per following specification	Sqm	~~27522~~ 32000	~~850~~ 1000	~~23393700~~ ~~38400000~~ 320-00
i)	providing granular sub base (GSB)150mm thick as per MORT&H specification conforming to clause 401 grading II 400.				
ii)	Providing, laying, sperading and compacting wet mix macadam (WMM) conforming to physical requirement laid in Clause 400 of MORT&H specificattion in two layers (compacted to 250 mm(~~0.75~~ 125 +0.~~75~~ 125 mm) by taking material 1.32 times of the (thickness of the layer) including premixing of material with water in mechnical mix. 300 mm GSB 250mm WMM				
iii)	D 50mm thick B.M				
iv)	~~20mm thick mix~~ 40mm thick BC SDBC				
3	Provision for kerbs & channels on both side of road of CC 1:2.5:5	Rmtr	~~4587~~ 10000	600/-	~~2752200~~ 6000000
4	The area of road pavement (approach to block)	LS	1	1500000	1500000
5	Provision for guide map and other indicating board etc. L.S.	LS	1	~~50000~~ 250000	~~50000~~ 250000
6	Provision for traffic light arrangement L.S.	LS	1	~~50000~~ 25000	~~50000~~ 25000 1.00 lac
7	Provision for carriage of material & other unforeseen charges	LS	1	~~500000~~	500000
8.	Provision for C.Con pavement + site development	LS			1500000
	Total		Rs	466.03	52927700 ~~32008600~~ ~~39927700~~
	Add 3% contingencies & P.E. Charges		~~1587831~~	13.98 Rs.	~~909958~~ ~~1195881~~
	Total		~~54515531~~	480.01 Rs.	~~33988558~~ ~~41118881~~
	Add 49% Departmental Charges, price escalation, unforseen Admn. charges		~~26712610~~	235.21 Rs.	~~16654393~~ ~~20148920~~
	Grand Total		~~81228141~~ /=	Rs. 715.22 lacs	~~50642951~~ ~~61162961~~
	(Carried over to FINAL ABSTRACT OF COST)				

NEHA BHAGRA ★ CA/2007/39612 ★

For Sweta Estates Pvt. Ltd.

Authorise Signatory/Signatories

QUANTITY TAKE-OFF : ROAD AND PATHS

SUB WORK No. IV — **ROAD AND PATHS**

S.NO.	Road No.	Length (mtr)	Width (mtr)	Total Area (Sqm)
1	Road-R1	285.00	6.00	1710.00
2	Road-R2	207.00	6.00	1242.00
3	Road-R3	38.00	6.00	228.00
4	Road-R4	224.00	6.00	1344.00
5	Road-R5	115.00	6.00	690.00
6	Road-R6	290.00	6.00	1740.00
7	Road-R7	227.00	6.00	1362.00
8	Road-R8	232.00	6.00	1392.00
9	Road-R9	80.00	6.00	480.00
10	Road-R10	162.00	6.00	972.00
11	Road-R11	445.00	6.00	2670.00
12	Road-R12	98.00	6.00	588.00
13	Road-R13	320.00	6.00	1920.00
14	Road-R14	35.00	6.00	210.00
15	Road-R15	35.00	6.00	210.00
16	Road-R16	322.00	6.00	1932.00
17	Road-R17	120.00	6.00	720.00
18	Road-R18	615.00	6.00	3690.00
19	Road-R19	55.00	6.00	330.00
20	Road-R20	410.00	6.00	2460.00
21	Road-R21	42.00	6.00	252.00
22	Road-R22	230.00	6.00	1380.00
	Total	**4587.00** ✓		**27522.00** ✓

Surface Parking
area as per plan = 1400 Sqm = 1400

(ST-01)

TOTAL = 28922

Add 10% for Curves = 2892

Grand total = 31814 Sqm.
say 32000 Sqm ✓

Kerbs & channel 2×4587 mtr = 9174 Rmtr
1400/2.5 = 560

TOTAL = 9734
say 10000 Mtr ✓

NEHA BHAGRA CA/2007/39612

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

ABSTRACT COST OF SUB WORK NO. V (STREET LIGHT)

SUB WORK No. V — **STREET LIGHTING**

S.NO.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Providing Street lighting with underground on roads as per standard with CFL				
	H.P.W.P specification.				
	Total area 47.527 acres @ Rs. 100,000/-per acre				~~4752700~~ 71.29 Lacs
	Total				~~4752700~~ 71.29 Lacs
	Add 3% contingencies & P.E. Charges			Rs.	142581 2.13 Lacs
	Total			Rs.	~~4895281~~ 73.42 Lacs
	Add 49% Departmental Charges, unforseen, price escalation			Rs.	~~2398688~~ 35.98 Lacs
	Grand Total Admn. charges			Rs.	~~7293969~~ 109.40 Lacs
	(Carried over to FINAL ABSTRACT OF COST)				

NEHA BHAGRA
CA/2007/39612

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

ABSTRACT COST OF SUB WORK NO. VI (LANDSCAPING)

ESTIMATE FOR DEVELOPMENT OF LAWNS & PLANTATION OF ROAD SIDE TREES

SUB WORK No. VI

S.NO	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)	
1	Development of Lawn Areas:					
a)	Trenching of ordinary soil upto depth of 60 cm i/c removal & stacking of serviceable material And disposing by spreading & leveling within B lead of 50M And making up the trench Area of proper levels by filling with earth or earth mixed with manure before And After flooring trench with Water including cost of imported earth And manure.	Per Acre	47.527	100000	4752700	
b)	Rough dressing of turfed Area					
c)	Grassing with "Doob grass" i/c Watering and maintenance of Lawns for 30 days till the grass forms B thick Lawn, free from weeds And fit mowing in rows 7.5 cm apart in either direction including provision for hedges and barbed wire around park. Approx ~~47.527~~ 21.80 Acres organized green @Rs. ~~100,000~~/-					
2	Providing tree guards and Planting trees along road at 4.5 m interval and Landscape area	Nos.	~~6500~~ 800	750	~~4875000.00~~ 600000	
	No. of trees ~~6500~~					
	Cost analysis of planting trees : - Excavation - Rs. 30.00 - manure - Rs. 60.00 - Tree Plant - Rs. 60.00 - Tree Guards - Rs.600.00 Rs.750.00					
	Total			Rs.	~~5352700~~ ~~0627700~~	53.53
	Add 3% contingencies & P.E. Charges			Rs.	~~160581~~ ~~288831~~	1.61
	Total			Rs.	~~5513281~~ ~~0916531~~	55.14
	Add 49% Departmental Charges			Rs.	~~2701508~~ ~~4859100~~	27.02
	Grand Total			Rs.	~~14775631~~	82.15
					~~8214789~~	Lacs
	(Carried over to FINAL ABSTRACT OF COST)					

Nos of Plants = 4587/12 = 382 Nos.
@12 nos c/c

Plants in Green open Area
@40 Plants Per Acre
= 3414 Sqm = 337 Nos

Total Plants = 719 Nos.
Say 720 Nos.

NEHA BHAGRA CA/2007/39612

For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

ABSTRACT COST OF SUB WORK NO. VII (MAINTENANCE CHARGES)

ESTIMATE FOR MAINTENANCE CHARGES AND RESURFACING OF RAODS

SUB WORK No. VII — MAINTENANCE CHARGES & RESURFACING OF ROADS

S.NO.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	a) Provision for maintenance charges for water supply, sewerage, storm water drainage, roads, street light, horticulture etc. complete including operation and establishment charges as per HUDA norms after completion and resurfacing of roads after 10 years. 47.527 acre @Rs. 5.00 lacs per acre	Per Acre	47.527	500000 ✓	23763500
2	Provision for resurfacing of roads after Ist 5 years of maintenance ~~@Rs. 350 per sqm.~~ By Providing 40mm DBM & 40mm BC	Per Sqm	32000 ~~27522~~	600 ~~350~~	20000000 ~~9632700~~ 192.6
3	Provision of resurfacing of roads after 10 years @Rs. ~~650 per sqm~~ 40mm BC	Per Sqm	32000 ~~27522~~	350 ~~650~~	11200000 ~~17889300~~ 240-r
					669.64
	Total			Rs.	55763500 ~~51285500~~ 20.09
	Add 3% contingencies & P.E. Charges			Rs.	1672905 ~~1538565~~ 689.73
	Total			Rs.	57436405 ~~52824065~~ 337.97
	Add 49% Departmental Charges, Unforseen, price escalation			Rs.	28143838 ~~25883792~~ 1027.70
	Grand Total Admn. charges.			Rs.	~~78707867~~
	(Carried over to FINAL ABSTRACT OF COST)				25580243

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For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

Project : Central Park-II, Sector-48, Gurgaon

DESIGN CALCULATION FOR SEWER

S.No.	Name of line	Length in mtr	MAIN UNIT (A)				SERVANTS UNIT (B)				School Club & Commercial (C)		EWS UNIT (D)				Total Water Demand in Liter / Day (A+B+C+D)	Self 80% of total demand	Peak Load @ 3X Av. Load	Subsoil Infiltration @25% of Av Load	Total Discharge in LPD	Total in LPS	Pipe dia in mm	Velocity in mtr/sec	Capacity half full in lps	Slope	Fall /Drop in mtrs	Starting Level		End Level	
			Total nos of Unit	Population per Unit	Total Poulation	Water Demand @172.5 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @172.5 liter per day	School, Club & Commercial Population	Water Demand @ 45 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @135 liter per day												G.L.	I.L.	G.L.	I.L.
	STP-1																													
1	63 - 64	29	291	5	1455	250988											250988	200790	602370	50198	652568	7.55	200	0.75	12.5	1:150	0.19	+ 224.00	+ 222.70	+ 224.00	+ 222.51
2	64 - 65	45	291	5	1455	250988											250988	200790	602370	50198	652568	7.55	200	0.75	12.5	1:150	0.30	+ 224.00	+ 222.51	+ 224.00	+ 222.21
3	65 - 66	19	291	5	1455	250988											250988	200790	602370	50198	652568	7.55	200	0.75	12.5	1:150	0.13	+ 224.00	+ 222.21	+ 224.00	+ 222.08
4	66 -1	62	338	5	1690	291525											291525	233220	699660	58305	757965	8.77	250	0.79	20	1:200	0.31	+ 224.00	+ 222.08	+ 224.00	+ 221.77
5	1 - 2	24	338	5	1690	291525											291525	233220	699660	58305	757965	8.77	250	0.79	20	1:200	0.12	+ 224.00	+ 221.77	+ 224.00	+ 221.65
6	2 - 3	30	385	5	1925	332063											332063	265650	796950	66413	863363	9.99	250	0.79	20	1:200	0.15	+ 224.00	+ 221.65	+ 224.00	+ 221.50
7	3 - 4	16	385	5	1925	332063											332063	265650	796950	66413	863363	9.99	250	0.79	20	1:200	0.08	+ 224.00	+ 221.50	+ 224.00	+ 221.42
8	4 - 5	30	385	5	1925	332063											332063	265650	796950	66413	863363	9.99	250	0.79	20	1:200	0.15	+ 224.00	+ 221.42	+ 224.00	+ 221.27
9	5 - 6	33	432	5	2160	372600											372600	298080	894240	74520	968760	11.21	250	0.79	20	1:200	0.17	+ 224.00	+ 221.27	+ 224.00	+ 221.11
10	6 - 7	25	479	5	2395	413138											413138	330510	991530	82628	1074158	12.43	250	0.79	20	1:200	0.13	+ 224.00	+ 221.11	+ 224.00	+ 220.98
11	7 - 8	33	526	5	2630	453675											453675	362940	1088820	90735	1179555	13.65	250	0.79	20	1:200	0.17	+ 224.00	+ 220.98	+ 224.00	+ 220.82
12	8 - 9	32	573	5	2865	494213											494213	395370	1186110	98843	1284953	14.87	250	0.79	20	1:200	0.16	+ 224.00	+ 220.82	+ 224.00	+ 220.66
13	9 - 10	37	573	5	2865	494213											494213	395370	1186110	98843	1284953	14.87	250	0.79	20	1:200	0.19	+ 224.00	+ 220.66	+ 224.00	+ 220.47
14	10 - 11	15	573	5	2865	494213											494213	395370	1186110	98843	1284953	14.87	250	0.79	20	1:200	0.08	+ 224.00	+ 220.47	+ 224.00	+ 220.40
15	11 - 12	13	573	5	2865	494213											494213	395370	1186110	98843	1284953	14.87	300	0.83	30	1:250	0.05	+ 224.00	+ 220.40	+ 224.00	+ 220.34
16	12 - 13	23	573	5	2865	494213											494213	395370	1186110	98843	1284953	14.87	300	0.83	30	1:250	0.09	+ 224.00	+ 220.34	+ 224.00	+ 220.25
17	13 - 14	29	573	5	2865	494213											494213	395370	1186110	98843	1284953	14.87	300	0.83	30	1:250	0.12	+ 224.00	+ 220.25	+ 224.00	+ 220.14
18	14 - 15	16	620	5	3100	534750											534750	427800	1283400	106950	1390350	16.09	300	0.83	30	1:250	0.06	+ 224.00	+ 220.14	+ 224.00	+ 220.07
19	15 - 16	30	620	5	3100	534750											534750	427800	1283400	106950	1390350	16.09	300	0.83	30	1:250	0.12	+ 224.00	+ 220.07	+ 224.00	+ 219.95
20	16 - 17	27	667	5	3335	575288											575288	460230	1380690	115058	1495748	17.31	300	0.83	30	1:250	0.11	+ 224.00	+ 219.95	+ 224.00	+ 219.84

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Authorise Signatory/Signatories

S.No.	Name of line	Length in mtr	MAIN UNIT (A)				SERVANTS UNIT (B)				School,Club & Commerical (C)		EWS UNIT (D)				Total Water Demand in Liter / Day (A+B+C+D)	Self 80% of total demand	Peak Load @ 3X Av. Load	Subsoil Infiltration @25% of Av Load	Total Discharge in LPD	Total in LPS	Pipe dia in mm	Velocity in mtr/sec	Capacity half full in lps	Slope	Fall /Drop in mtrs	G.L.	I.L.	G.L.	I.L.
			Total nos of Unit	Population per Unit	Total Poulation	Water Demand @172.5 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @172.5 liter per day	School, Club & Commerical Population	Water Demand @ 45 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @135 liter per day																
21	17 - 18	11	667	5	3335	575288											575288	460230	1380690	115058	1495748	17.31	300	0.83	30	1:250	0.04	+ 224.00	+ 219.84	+ 224.00	+ 219.80
22	18 - 19	30	714	5	3570	615825											615825	492660	1477980	123165	1601145	18.53	300	0.83	30	1:250	0.12	+ 224.00	+ 219.80	+ 224.00	+ 219.68
23	19 - 20	25	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.10	+ 224.00	+ 219.68	+ 224.00	+ 219.58
24	20 - 21	42	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.17	+ 224.00	+ 219.58	+ 224.00	+ 219.41
25	21 - 22	30	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.12	+ 224.00	+ 219.41	+ 224.00	+ 219.29
26	22 - 23	28	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.11	+ 224.00	+ 219.29	+ 224.00	+ 219.18
27	23 - 24	20	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.08	+ 224.00	+ 219.18	+ 224.00	+ 219.10
28	24 - 25	13	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.05	+ 224.00	+ 219.10	+ 224.00	+ 219.05
29	25 - 26	13	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.05	+ 224.00	+ 219.05	+ 224.00	+ 219.00
30	26 - STP 1	12	714	5	3570	615825					200	9000					624825	499860	1499580	124965	1624545	18.80	300	0.83	30	1:250	0.05	+ 224.00	+ 219.00	+ 224.00	+ 218.95
	STP 1 to Huda Ext :																														
31	STP 1 - HUDA Ext	30			0	0											0	0	0	0	0	0.00	300	0.83	30	1:250	0.12	+ 224.00	+ 222.70	+ 224.00	+ 222.58
	STP-3 :																														
	Line-1																														
32	27 - 28	30	61	5	305	52613	62	2	124	21390							74003	59202	177606	14801	192407	2.23	200	0.75	12.5	1:150	0.20	+ 224.00	+ 222.70	+ 224.00	+ 222.50
33	28 - 29	30	61	5	305	52613	62	2	124	21390							74003	59202	177606	14801	192407	2.23	200	0.75	12.5	1:150	0.20	+ 224.00	+ 222.50	+ 224.00	+ 222.30
34	29 - 30	18	61	5	305	52613	62	2	124	21390							74003	59202	177606	14801	192407	2.23	200	0.75	12.5	1:150	0.12	+ 224.00	+ 222.30	+ 224.00	+ 222.18
35	30 - 31	30	122	5	610	105225	124	2	248	42780							148005	118404	355212	29601	384813	4.45	250	0.79	20	1:200	0.15	+ 224.00	+ 222.18	+ 224.00	+ 222.03
36	31 - 64	24	122	5	610	105225	124	2	248	42780							148005	118404	355212	29601	384813	4.45	250	0.79	20	1:200	0.12	+ 224.00	+ 222.03	+ 224.00	+ 221.91
	Line-2																														
37	67 - 68	18	46	5	230	39675											39675	31740	95220	7935	103155	1.19	250	0.79	20	1:200	0.09	+ 224.00	+ 222.70	+ 224.00	+ 222.61
38	68 - 69	17	46	5	230	39675											39675	31740	95220	7935	103155	1.19	250	0.79	20	1:200	0.09	+ 224.00	+ 222.61	+ 224.00	+ 222.53
39	69 - 70	36	46	5	230	39675											39675	31740	95220	7935	103155	1.19	250	0.79	20	1:200	0.18	+ 224.00	+ 222.53	+ 224.00	+ 222.35
40	70 - 75	14	46	5	230	39675											39675	31740	95220	7935	103155	1.19	250	0.79	20	1:200	0.07	+ 224.00	+ 222.35	+ 224.00	+ 222.28

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S.No.	Name of line	Length in mtr	MAIN UNIT (A)				SERVANTS UNIT (B)				School, Club & Commercial (C)		EWS UNIT (D)				Total Water Demand in Liter / Day (A+B+C+D)	Self 80% of total demand	Peak Load @ 3X Av. Load	Subsoil infiltration @25% of Av Load	Total Discharge in LPD	Total in LPS	Pipe dia in mm	Velocity in mtr/sec	Capacity half full in lps	Slope	Fall /Drop in mtrs	G.L.	I.L.	G.L.	I.L.
			Total nos of Unit	Population per Unit	Total Poulation	Water Demand @172.5 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @172.5 liter per day	School, Club & Commercial Population	Water Demand @ 45 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @135 liter per day														
41	71 - 72	23		5	0	0					335	15075					15075	12060	36180	3015	39195	0.45	200	0.75	12.5	1:150	0.15	+ 224.00	+ 222.70	+ 224.00	+ 222.55
42	72 - 74	36		5	0	0					335	15075					15075	12060	36180	3015	39195	0.45	200	0.75	12.5	1:150	0.24	+ 224.00	+ 222.55	+ 224.00	+ 222.31
43	73 - 74	25		5	0	0					335	15075					15075	12060	36180	3015	39195	0.45	200	0.75	12.5	1:150	0.17	+ 224.00	+ 222.70	+ 224.00	+ 222.53
44	74 - 75	19		5	0	0					335	15075					15075	12060	36180	3015	39195	0.45	200	0.75	12.5	1:150	0.13	+ 224.00	+ 222.53	+ 224.00	+ 222.41
45	75 - 78	28	46	5	230	39675					335	15075					54750	43800	131400	10950	142350	1.65	250	0.79	20	1:200	0.14	+ 224.00	+ 222.28	+ 224.00	+ 222.14
46	78 - 79	13	46	5	230	39675					335	15075					54750	43800	131400	10950	142350	1.65	250	0.79	20	1:200	0.07	+ 224.00	+ 222.14	+ 224.00	+ 222.07
47	79 - 80	20	46	5	230	39675					335	15075					54750	43800	131400	10950	142350	1.65	250	0.79	20	1:200	0.10	+ 224.00	+ 222.07	+ 224.00	+ 221.97
48	80 - 81	30	92	5	460	79350					335	15075					94425	75540	226620	18885	245505	2.84	250	0.79	20	1:200	0.15	+ 224.00	+ 221.97	+ 224.00	+ 221.82
49	81 - 82	22	138	5	690	119025					335	15075					134100	107280	321840	26820	348660	4.04	300	0.83	30	1:250	0.09	+ 224.00	+ 221.82	+ 224.00	+ 221.73
50	82 - 83	32	138	5	690	119025					335	15075					134100	107280	321840	26820	348660	4.04	300	0.83	30	1:250	0.13	+ 224.00	+ 221.73	+ 224.00	+ 221.60
51	83 - 84	36	138	5	690	119025					335	15075					134100	107280	321840	26820	348660	4.04	300	0.83	30	1:250	0.14	+ 224.00	+ 221.60	+ 224.00	+ 221.46
52	84 - 85	30	260	5	1300	224250	124	2	248	42780	335	15075					282105	225684	677052	56421	733473	8.49	300	0.83	30	1:250	0.12	+ 224.00	+ 221.46	+ 224.00	+ 221.34
	Line-3A																													
53	97 - 98	12		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	200	0.75	12.5	1:150	0.08	+ 224.00	+ 222.70	+ 224.00	+ 222.62
54	96 - 97	13		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	200	0.75	12.5	1:150	0.09	+ 224.00	+ 222.62	+ 224.00	+ 222.53
55	95 - 96	15		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	200	0.75	12.5	1:150	0.10	+ 224.00	+ 222.53	+ 224.00	+ 222.43
56	94 - 95	20		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	200	0.75	12.5	1:150	0.13	+ 224.00	+ 222.43	+ 224.00	+ 222.30
57	93 - 94	10		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	200	0.75	12.5	1:150	0.07	+ 224.00	+ 222.30	+ 224.00	+ 222.23
58	92 - 93	13		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	200	0.75	12.5	1:150	0.09	+ 224.00	+ 222.23	+ 224.00	+ 222.15
59	91 - 92	29		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	250	0.79	20	1:200	0.15	+ 224.00	+ 222.15	+ 224.00	+ 222.00
60	90 - 91	34		5	0	0					335	15075	310	2	620	83700	98775	79020	237060	19755	256815	2.97	250	0.79	20	1:200	0.17	+ 224.00	+ 222.00	+ 224.00	+ 221.83
61	89 - 90	22		5	0	0					670	30150	310	2	620	83700	113850	91060	273240	22770	296010	3.43	250	0.79	20	1:200	0.11	+ 224.00	+ 221.83	+ 224.00	+ 221.72
	Line-3B																													

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S.No.	Name of line	Length in mtr	MAIN UNIT (A)				SERVANTS UNIT (B)				School, Club & Commerical (C)		EWS UNIT (D)				Total Water Demand in Liter/ Day (A+B+C+D)	Self 80% of total demand	Peak Load @ 3X Av. Load	Subsoil Infiltration @25% of Av Load	Total Discharge in LPD	Total in LPS	Pipe dia in mm	Velocity in mtr/sec	Capacity half full in lps	Slope	Fall /Drop in mtrs	G.L.	I.L.	G.L.	I.L.
			Total nos of Unit	Population per Unit	Total Poulation	Water Demand @172.5 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @172.5 liter per day	School, Club & Commerical Population	Water Demand @ 45 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @135 liter per day															
62	99 - 100	15	88	5	440	75900											75900	60720	182160	15180	197340	2.28	200	0.75	12.5	1:150	0.10	+ 224.00	+ 222.70	+ 224.00	+ 222.60
63	100 - 101	30	133	5	665	114713											114713	91770	275310	22943	298253	3.45	200	0.75	12.5	1:150	0.20	+ 224.00	+ 222.60	+ 224.00	+ 222.40
64	101 - 102	30	178	5	890	153525											153525	122820	368460	30705	399165	4.62	200	0.75	12.5	1:150	0.20	+ 224.00	+ 222.40	+ 224.00	+ 222.20
65	102 - 103	30	178	5	890	153525											153525	122820	368460	30705	399165	4.62	200	0.75	12.5	1:150	0.20	+ 224.00	+ 222.20	+ 224.00	+ 222.00
66	103 - 104	14	222	5	1110	191475											191475	153180	459540	38295	497835	5.76	250	0.79	30	1:200	0.00	+ 224.00	+ 222.00	+ 224.00	+ 222.00
67	104 - 69	30	222	5	1110	191475											191475	153180	459540	38295	497835	5.76	250	0.75	12.5	1:150	0.00	+ 224.00	+ 222.00	+ 224.00	+ 222.00
	Line-3 (3A+3B)																														
68	88 - 89	43	266	5	1330	229425					670	30150	310	2	620	83700	343275	274620	823860	68655	892515	10.33	250	0.79	20	1:200	0.22	+ 224.00	+ 221.72	+ 224.00	+ 221.51
69	87 - 88	34	266	5	1330	229425					670	30150	310	2	620	83700	343275	274620	823860	68655	892515	10.33	250	0.79	20	1:200	0.17	+ 224.00	+ 221.51	+ 224.00	+ 221.34
70	86 - 87	34	266	5	1330	229425					670	30150	310	2	620	83700	343275	274620	823860	68655	892515	10.33	250	0.79	20	1:200	0.17	+ 224.00	+ 221.34	+ 224.00	+ 221.17
71	85 - 86	12	266	5	1330	229425					670	30150	310	2	620	83700	343275	274620	823860	68655	892515	10.33	250	0.79	20	1:200	0.06	+ 224.00	+ 221.17	+ 224.00	+ 221.11
	Final Connection to STP-3																														
72	85 - STP 3	11	648	5	3240	558900	124	2	248	42780	1005	45225	310	2	620	83700	730605	584484	1753452	146121	1899573	21.99	300	0.83	30	1:250	0.04	+ 224.00	+ 221.11	+ 224.00	+ 221.06
	STP-2																														
	Line-1																														
73	32 - 33	14	69	5	345	59513	46	2	92	15870							75383	60306	180918	15077	195995	2.27	200	0.75	12.5	1:150	0.09	+ 224.00	+ 222.70	+ 224.00	+ 222.61
74	33 - 34	30	69	5	345	59513	46	2	92	15870							75383	60306	180918	15077	195995	2.27	200	0.75	12.5	1:150	0.20	+ 224.00	+ 222.61	+ 224.00	+ 222.41
75	34 - 35	25	69	5	345	59513	46	2	92	15870							75383	60306	180918	15077	195995	2.27	200	0.75	12.5	1:150	0.17	+ 224.00	+ 222.41	+ 224.00	+ 222.24
76	35 - 36	35	69	5	345	59513	46	2	92	15870							75383	60306	180918	15077	195995	2.27	200	0.75	12.5	1:150	0.23	+ 224.00	+ 222.24	+ 224.00	+ 222.01
	Line-2																														
77	54 - 55	32		5	0	0					450	20250					20250	16200	48600	4050	52650	0.61	200	0.75	12.5	1:150	0.21	+ 224.00	+ 222.70	+ 224.00	+ 222.49
78	53 - 54	28		5	0	0					450	20250					20250	16200	48600	4050	52650	0.61	200	0.75	12.5	1:150	0.19	+ 224.00	+ 222.49	+ 224.00	+ 222.30
79	52 - 53	30		5	0	0					450	20250					20250	16200	48600	4050	52650	0.61	200	0.75	12.5	1:150	0.20	+ 224.00	+ 222.30	+ 224.00	+ 222.10
80	51 - 52	50		5	0	0					450	20250					20250	16200	48600	4050	52650	0.61	200	0.75	12.5	1:150	0.33	+ 224.00	+ 222.10	+ 224.00	+ 221.77

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			Total nos of Unit	Population per Unit	Total Poulation	Water Demand @172.5 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @172.5 liter per day	School, Club & Commercal Population	Water Demand @ 45 liter per day	Total nos of Unit	Populatio n per Unit	Total Poulation	Water Demand @135 liter per day																
81	50 - 51	40	63	5	315	54338					450	20250					74588	59670	179010	14916	193926	2.24	250	0.79	20	1:200	0.20	+ 224.00	+ 221.77	+ 224.00	+ 221.57
82	49 - 50	39	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.20	+ 224.00	+ 221.57	+ 224.00	+ 221.37
83	48 - 49	12	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.06	+ 224.00	+ 221.37	+ 224.00	+ 221.31
84	47 - 48	34	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.17	+ 224.00	+ 221.31	+ 224.00	+ 221.14
85	46 - 47	24	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.12	+ 224.00	+ 221.14	+ 224.00	+ 221.02
86	45 - 46	17	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.09	+ 224.00	+ 221.02	+ 224.00	+ 220.94
87	44 -45	30	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.15	+ 224.00	+ 220.94	+ 224.00	+ 220.79
88	43 - 44	10	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.05	+ 224.00	+ 220.79	+ 224.00	+ 220.74
89	42 - 43	12	126	5	630	108675					450	20250					128925	103140	309420	25785	335205	3.88	250	0.79	20	1:200	0.06	+ 224.00	+ 220.74	+ 224.00	+ 220.68
90	41 - 42	27	189	5	945	163013					450	20250					183263	146610	439830	36653	476483	5.51	250	0.79	20	1:200	0.14	+ 224.00	+ 220.68	+ 224.00	+ 220.54
91	40 - 41	18	252	5	1260	217350					450	20250					237600	190080	570240	47520	617760	7.15	250	0.79	20	1:200	0.09	+ 224.00	+ 220.54	+ 224.00	+ 220.45
92	39 - 40	15	315	5	1575	271688					450	20250					291938	233550	700650	58388	759038	8.79	250	0.79	20	1:200	0.08	+ 224.00	+ 220.45	+ 224.00	+ 220.38
93	38 - 39	38	378	5	1890	326025					450	20250					346275	277020	831060	69255	900315	10.42	250	0.79	20	1:200	0.19	+ 224.00	+ 220.38	+ 224.00	+ 220.19
94	36 - 38	34	378	5	1890	326025					450	20250					346275	277020	831060	69255	900315	10.42	250	0.79	20	1:200	0.17	+ 224.00	+ 220.19	+ 224.00	+ 220.02
	Final Connection to STP-2																														
95	36 - 37 / STP-2	26	447	5	2235	385538	46	2	92	15870	450	20250					421658	337326	1011978	84332	1096310	12.69	300	0.83	30	1:250	0.10	+ 224.00	+ 220.02	+ 224.00	+ 219.91

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For Sweta Estates Pvt. Ltd.

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DESIGN CALCULATION FOR STORM WATER DRAINAGE

S.No.	Name of Line	Length in mtr	Catchment area: Self area in sqm	Self area in acres	Additional area in acres	Total area in acres	Total discharge in LPS @ 28 LPS per acre	Dia in mm	Slope	Fall /Drop in mtr	Capacity in LPS	Velocity in mtr/sec	Starting Level: G.L.	Starting Level: I.L.	End Level: G.L.	End Level: I.L.	Remarks
1	1 - 2	23	500	0.12	0.2	0.32	9.06	400	1:450	0.08	49	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.92	
2	2 - 4	38	500	0.12	0.2	0.32	9.06	400	1:450	0.13	49	0.68	+ 224.00	+ 222.92	+ 224.00	+ 222.80	
3	3 - 4	25	500	0.12	0.3	0.42	11.86	400	1:450	0.08	49	0.68	+ 224.00	+ 222.80	+ 224.00	+ 222.71	
4	4 - 11	14	1000	0.25	0.5	0.75	20.92	400	1:450	0.05	49	0.68	+ 224.00	+ 222.71	+ 224.00	+ 222.67	
5	6 - 9	34	300	0.07	0.2	0.27	7.68	400	1:450	0.11	49	0.68	+ 224.00	+ 222.67	+ 224.00	+ 222.55	
6	7 - 8	29	300	0.07	0.2	0.27	7.68	400	1:450	0.10	49	0.68	+ 224.00	+ 222.55	+ 224.00	+ 222.46	
7	8 - 9	20	300	0.07	0.2	0.27	7.68	400	1:450	0.07	49	0.68	+ 224.00	+ 222.46	+ 224.00	+ 222.39	
8	9 - 10	30	600	0.15	0.4	0.55	15.35	400	1:450	0.10	86	0.68	+ 224.00	+ 222.39	+ 224.00	+ 222.29	
9	10 - 11	31	600	0.15	0.4	0.55	15.35	400	1:450	0.10	86	0.68	+ 224.00	+ 222.29	+ 224.00	+ 222.19	
10	11 - 12	34	1600	0.40	0.7	1.10	30.67	400	1:450	0.11	86	0.68	+ 224.00	+ 222.19	+ 224.00	+ 222.07	
11	12 - 13	22	1600	0.40	0.7	1.10	30.67	400	1:450	0.07	86	0.68	+ 224.00	+ 222.07	+ 224.00	+ 222.00	
12	13 - 14	23	2200	0.54	1	1.54	43.22	400	1:450	0.08	86	0.68	+ 224.00	+ 222.00	+ 224.00	+ 221.92	
13	14- 15	30	2200	0.54	1	1.54	43.22	400	1:450	0.10	86	0.68	+ 224.00	+ 221.92	+ 224.00	+ 221.82	
14	15 - 16	26	2800	0.69	1.2	1.89	52.97	400	1:450	0.09	86	0.68	+ 224.00	+ 221.82	+ 224.00	+ 221.74	
15	16 - 17	28	2800	0.69	1.5	2.19	61.37	400	1:450	0.09	86	0.68	+ 224.00	+ 221.74	+ 224.00	+ 221.64	
16	17 - 18	35	2800	0.69	1.5	2.19	61.37	400	1:450	0.12	86	0.68	+ 224.00	+ 221.64	+ 224.00	+ 221.53	
17	18 - 22	6	2800	0.69	1.5	2.19	61.37	400	1:450	0.02	86	0.68	+ 224.00	+ 221.53	+ 224.00	+ 221.51	
18	19 - 20	17	750	0.19	0.3	0.49	13.59	400	1:450	0.06	49	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.94	
19	20 - 21	30	1500	0.37	0.3	0.67	18.78	400	1:450	0.10	49	0.68	+ 224.00	+ 222.94	+ 224.00	+ 222.84	
20	21 - 22	21	1500	0.37	0.8	1.17	32.78	400	1:450	0.07	49	0.68	+ 224.00	+ 222.84	+ 224.00	+ 222.77	
21	22 - 39	30	4300	1.06	2.3	3.36	94.14	400	1:450	0.10	86	0.68	+ 224.00	+ 221.51	+ 224.00	+ 221.41	
22	23 - 24	28		0.00	0.2	0.20	5.60	400	1:450	0.09	49	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.91	
23	24 - 25	30		0.00	0.2	0.20	5.60	400	1:450	0.10	49	0.68	+ 224.00	+ 222.91	+ 224.00	+ 222.81	
24	25 - 26	13	450	0.11	0.5	0.61	17.11	400	1:450	0.04	49	0.68	+ 224.00	+ 222.81	+ 224.00	+ 222.76	
25	26 - 27	28	900	0.22	0.5	0.72	20.23	400	1:450	0.09	49	0.68	+ 224.00	+ 222.76	+ 224.00	+ 222.67	
26	27 - 28	17	900	0.22	0.5	0.72	20.23	400	1:450	0.06	49	0.68	+ 224.00	+ 222.67	+ 224.00	+ 222.61	
27	28 - 29	13	1500	0.37	0.7	1.07	29.98	400	1:450	0.04	49	0.68	+ 224.00	+ 222.61	+ 224.00	+ 222.57	

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S.No.	Name of Line	Length in mtr	Catchment area				Total discharge in LPS @ 28 LPS per acre	Dia in mm	Slope	Fall /Drop in mtr	Capacity in LPS	Velocity in mtr/sec	Starting Level		End Level		Remarks
			Self area in sqm	Self area in acres	Additional area in acres	Total area in acres							G.L.	I.L.	G.L.	I.L.	
28	29 - 30	33	2100	0.52	0.7	1.22	34.13	400	1:450	0.11	86	0.68	+ 224.00	+ 222.57	+ 224.00	+ 222.46	
29	30 - 31	38	2100	0.52	1	1.52	42.53	400	1:450	0.13	86	0.68	+ 224.00	+ 222.46	+ 224.00	+ 222.33	
30	31 - 32	31	2100	0.52	1	1.52	42.53	400	1:450	0.10	86	0.68	+ 224.00	+ 222.33	+ 224.00	+ 222.23	
31	32 - 33	36	2100	0.52	1	1.52	42.53	400	1:450	0.12	86	0.68	+ 224.00	+ 222.23	+ 224.00	+ 222.11	
32	33 - 34	29	2100	0.52	1.2	1.72	48.13	400	1:450	0.75	86	0.68	+ 224.00	+ 222.11	+ 224.00	+ 221.36	
33	34 - 35	18	3050	0.75	1.5	2.25	63.10	400	1:450	0.06	86	0.68	+ 224.00	+ 221.36	+ 224.00	+ 221.30	
34	35 - 36	42	3050	0.75	1.5	2.25	63.10	400	1:450	0.14	86	0.68	+ 224.00	+ 221.30	+ 224.00	+ 221.16	
35	36 - 37	20	3050	0.75	1.7	2.45	68.70	400	1:450	0.07	86	0.68	+ 224.00	+ 221.16	+ 224.00	+ 221.09	
36	37 - 38	30	3050	0.75	1.7	2.45	68.70	400	1:450	0.10	86	0.68	+ 224.00	+ 221.09	+ 224.00	+ 220.99	
37	38 - 39	35	3050	0.75	1.7	2.45	68.70	400	1:450	0.12	86	0.68	+ 224.00	+ 220.99	+ 224.00	+ 220.87	
38	39 - Huda Ext	30	7350	1.82	4	5.82	162.84	400	1:450	0.10	86	0.68	+ 224.00	+ 220.87	+ 224.00	+ 220.77	
39	40 - 41	29	600	0.15		0.15	4.15	400	1:450	0.10	49	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.90	
40	41 - 42	33	1200	0.30		0.30	8.30	400	1:450	0.11	86	0.68	+ 224.00	+ 222.90	+ 224.00	+ 222.79	
41	42 - 43	30	1200	0.30	0.2	0.50	13.90	400	1:450	0.10	86	0.68	+ 224.00	+ 222.79	+ 224.00	+ 222.69	
42	43 - 44	30	1200	0.30	0.2	0.50	13.90	400	1:450	0.10	86	0.68	+ 224.00	+ 222.69	+ 224.00	+ 222.59	
43	44 - 45	30	1200	0.30	0.2	0.50	13.90	400	1:450	0.10	86	0.68	+ 224.00	+ 222.59	+ 224.00	+ 222.49	
44	45 - 46	43	1200	0.30	0.4	0.70	19.50	400	1:450	0.14	86	0.68	+ 224.00	+ 222.49	+ 224.00	+ 222.35	
45	46 - 47	9	1200	0.30	0.4	0.70	19.50	400	1:450	0.03	86	0.68	+ 224.00	+ 222.35	+ 224.00	+ 222.32	
46	50 - 51	30	600	0.15	0.2	0.35	9.75	400	1:450	0.10	86	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.90	
47	51 - 52	30	1200	0.30	0.2	0.50	13.90	400	1:450	0.10	86	0.68	+ 224.00	+ 222.90	+ 224.00	+ 222.80	
48	52 - 53	30	1800	0.44	0.2	0.64	18.05	400	1:450	0.10	86	0.68	+ 224.00	+ 222.80	+ 224.00	+ 222.70	
49	53 - 54	43	2400	0.59	0.4	0.99	27.80	400	1:450	0.14	86	0.68	+ 224.00	+ 222.70	+ 224.00	+ 222.56	
50	54 - 55	8	2400	0.59	0.4	0.99	27.80	400	1:450	0.03	86	0.68	+ 224.00	+ 222.56	+ 224.00	+ 222.53	
51	49 - 55	30	2400	0.59	0.4	0.99	27.80	400	1:450	0.10	86	0.68	+ 224.00	+ 222.53	+ 224.00	+ 222.43	
52	48 - 49	30	2400	0.59	0.4	0.99	27.80	400	1:450	0.10	86	0.68	+ 224.00	+ 222.43	+ 224.00	+ 222.33	
53	47 - 48	20	2400	0.59	0.4	0.99	27.80	400	1:450	0.07	86	0.68	+ 224.00	+ 222.33	+ 224.00	+ 222.26	
54	47 - Huda Ext	20	3600	0.89	0.8	1.69	47.30	400	1:450	0.07	86	0.68	+ 224.00	+ 222.26	+ 224.00	+ 222.20	
55	55 - 56	75	500	0.12		0.12	3.46	400	1:450	0.25	86	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.75	

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S.No.	Name of Line	Length in mtr	Catchment area				Total discharge in LPS @ 28 LPS per acre	Dia in mm	Slope	Fall /Drop in mtr	Capacity in LPS	Velocity in mtr/sec	Starting Level		End Level		Remarks
			Self area in sqm	Self area in acres	Additional area in acres	Total area in acres							G.L.	I.L.	G.L.	I.L.	
56	56 - 61	23	500	0.12	0.2	0.32	9.06	400	1:450	0.08	86	0.68	+ 224.00	+ 222.75	+ 224.00	+ 222.67	
57	60 - 61	27	500	0.12	0.2	0.32	9.06	400	1:450	0.09	86	0.68	+ 224.00	+ 222.67	+ 224.00	+ 222.58	
58	59 - 60	17	500	0.12	0.2	0.32	9.06	400	1:450	0.06	86	0.68	+ 224.00	+ 222.58	+ 224.00	+ 222.53	
59	58 - 59	28	1100	0.27	0.7	0.97	27.21	400	1:450	0.09	86	0.68	+ 224.00	+ 222.53	+ 224.00	+ 222.43	
60	57 - 58	12	1100	0.27	0.7	0.97	27.21	400	1:450	0.04	86	0.68	+ 224.00	+ 222.43	+ 224.00	+ 222.39	
61	Huda Ext - 57	15	1100	0.27	0.7	0.97	27.21	400	1:450	0.05	86	0.68	+ 224.00	+ 222.39	+ 224.00	+ 222.34	
62	61 - 62	17		0.00	0.2	0.20	5.60	400	1:450	0.06	49	0.68	+ 224.00	+ 222.58	+ 224.00	+ 222.53	
63	62 - 63	30		0.00	0.2	0.20	5.60	400	1:450	0.10	49	0.68	+ 224.00	+ 222.53	+ 224.00	+ 222.43	
64	63 - 64	28	1000	0.25	0.5	0.75	20.92	400	1:450	0.09	86	0.68	+ 224.00	+ 222.43	+ 224.00	+ 222.33	
65	64 - 65	25	1000	0.25	0.5	0.75	20.92	400	1:450	0.08	86	0.68	+ 224.00	+ 222.33	+ 224.00	+ 222.25	
66	65 - 66	10	1000	0.25	0.5	0.75	20.92	400	1:450	0.03	86	0.68	+ 224.00	+ 222.25	+ 224.00	+ 222.22	
67	66 - Huda Ext	7	1000	0.25	0.5	0.75	20.92	400	1:450	0.02	86	0.68	+ 224.00	+ 222.22	+ 224.00	+ 222.19	
68	67 - 68	28	1300	0.32	0.2	0.52	14.59	400	1:450	0.09	86	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.91	
69	68 - 69	39	1300	0.32	0.5	0.82	22.99	400	1:450	0.13	86	0.68	+ 224.00	+ 222.91	+ 224.00	+ 222.78	
70	69 - 70	15	1300	0.32	0.5	0.82	22.99	400	1:450	0.05	86	0.68	+ 224.00	+ 222.78	+ 224.00	+ 222.73	
71	70- 71	21	1300	0.32	0.5	0.82	22.99	400	1:450	0.07	86	0.68	+ 224.00	+ 222.73	+ 224.00	+ 222.66	
72	71 - 78	25	1300	0.32	0.5	0.82	22.99	400	1:450	0.08	86	0.68	+ 224.00	+ 222.66	+ 224.00	+ 222.57	
73	72 - 73	22		0.00	0.2	0.20	5.60	400	1:450	0.07	49	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.93	
74	73 - 74	30		0.00	0.2	0.20	5.60	400	1:450	0.10	49	0.68	+ 224.00	+ 222.93	+ 224.00	+ 222.83	
75	74 - 75	30		0.00	0.2	0.20	5.60	400	1:450	0.10	49	0.68	+ 224.00	+ 222.83	+ 224.00	+ 222.73	
76	75 - 76	30	1300	0.32	0.5	0.82	22.99	400	1:450	0.10	86	0.68	+ 224.00	+ 222.73	+ 224.00	+ 222.63	
77	76 - 77	18	1300	0.32	0.5	0.82	22.99	400	1:450	0.06	86	0.68	+ 224.00	+ 222.63	+ 224.00	+ 222.57	
78	77 - 78	21	1300	0.32	0.8	1.12	31.39	400	1:450	0.07	86	0.68	+ 224.00	+ 222.57	+ 224.00	+ 222.50	
79	78 - 79	24	2600	0.64	1.3	1.94	54.38	400	1:450	0.08	86	0.68	+ 224.00	+ 222.50	+ 224.00	+ 222.42	
80	79 - 80	24	2600	0.64	1.3	1.94	54.38	400	1:450	0.08	86	0.68	+ 224.00	+ 222.42	+ 224.00	+ 222.34	
81	80 - Huda Ext	27	2600	0.64	1.3	1.94	54.38	400	1:450	0.09	86	0.68	+ 224.00	+ 222.34	+ 224.00	+ 222.25	
82	81 - 82	21	600	0.15	0.2	0.35	9.75	400	1:450	0.07	86	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.93	
83	82 - 83	31	600	0.15	0.2	0.35	9.75	400	1:450	0.10	86	0.68	+ 224.00	+ 222.93	+ 224.00	+ 222.83	

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S.No.	Name of Line	Length in mtr	Catchment area				Total discharge in LPS @ 28 LPS per acre	Dia in mm	Slope	Fall /Drop in mtr	Capacity in LPS	Velocity in mtr/sec	Starting Level		End Level		Remarks
			Self area in sqm	Self area in acres	Additional area in acres	Total area in acres							G.L.	I.L.	G.L.	I.L.	
84	83 - 84	14	1200	0.30	0.2	0.50	13.90	400	1:450	0.05	86	0.68	+ 224.00	+ 222.83	+ 224.00	+ 222.78	
85	84 - 85	30	1200	0.30	0.4	0.70	19.50	400	1:450	0.10	86	0.68	+ 224.00	+ 222.78	+ 224.00	+ 222.68	
86	85 - 86	33	2000	0.49	0.4	0.89	25.03	400	1:450	0.11	86	0.68	+ 224.00	+ 222.68	+ 224.00	+ 222.57	
87	86 - 87	23	2800	0.69	0.4	1.09	30.57	400	1:450	0.08	86	0.68	+ 224.00	+ 222.57	+ 224.00	+ 222.49	
88	87 - 88	36	3400	0.84	0.6	1.44	40.32	400	1:450	0.12	86	0.68	+ 224.00	+ 222.49	+ 224.00	+ 222.37	
89	88 - 89	27	4000	0.99	0.6	1.59	44.47	400	1:450	0.09	86	0.68	+ 224.00	+ 222.37	+ 224.00	+ 222.28	
90	89 - 90	42	4000	0.99	0.6	1.59	44.47	400	1:450	0.14	86	0.68	+ 224.00	+ 222.28	+ 224.00	+ 222.14	
91	90 - 91	10	4000	0.99	0.8	1.79	50.07	400	1:450	0.03	86	0.68	+ 224.00	+ 222.14	+ 224.00	+ 222.11	
92	91 - 92	21	4000	0.99	0.8	1.79	50.07	400	1:450	0.07	86	0.68	+ 224.00	+ 222.11	+ 224.00	+ 222.04	
93	92 - 93	27	4000	0.99	0.8	1.79	50.07	400	1:450	0.09	86	0.68	+ 224.00	+ 222.04	+ 224.00	+ 221.95	
94	93 - 94	29	4800	1.19	1	2.19	61.20	400	1:450	0.10	86	0.68	+ 224.00	+ 221.95	+ 224.00	+ 221.85	
95	94- 95	16	4800	1.19	1	2.19	61.20	400	1:450	0.05	86	0.68	+ 224.00	+ 221.85	+ 224.00	+ 221.80	
96	95 - 96	30	5600	1.38	1	2.38	66.74	400	1:450	0.10	86	0.68	+ 224.00	+ 221.80	+ 224.00	+ 221.70	
97	96 - 97	27	5600	1.38	1.2	2.58	72.34	400	1:450	0.09	86	0.68	+ 224.00	+ 221.70	+ 224.00	+ 221.61	
98	97 - 97 A	10	5600	1.38	1.2	2.58	72.34	400	1:450	0.03	86	0.68	+ 224.00	+ 221.61	+ 224.00	+ 221.58	
99	97 A - 97 B	34	6400	1.58	1.2	2.78	77.87	400	1:450	0.11	86	0.68	+ 224.00	+ 221.58	+ 224.00	+ 221.46	
100	97 B - 98	38	6900	1.70	1.2	2.90	81.33	400	1:450	0.13	86	0.68	+ 224.00	+ 221.46	+ 224.00	+ 221.34	
101	98 - 99	29	6900	1.70	1.2	2.90	81.33	400	1:450	0.10	86	0.68	+ 224.00	+ 221.34	+ 224.00	+ 221.24	
102	99 - 100	30	6900	1.70	4.7	6.40	179.33	400	1:450	0.10	86	0.68	+ 224.00	+ 221.24	+ 224.00	+ 221.14	
103	100 - 101	29	6900	1.70	5.2	6.90	193.33	400	1:450	0.10	86	0.68	+ 224.00	+ 221.14	+ 224.00	+ 221.04	
104	101 - RWH-11	24	6900	1.70	5.7	7.40	207.33	400	1:450	0.08	86	0.68	+ 224.00	+ 221.04	+ 224.00	+ 220.96	
105	RWH-11 - Huda Ext	25	6900	1.70	6.2	7.90	221.33	400	1:450	0.08	86	0.68	+ 224.00	+ 220.96	+ 224.00	+ 220.88	
106	102 - 103	30		0.00	0.5	0.50	14.00	400	1:450	0.10	86	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.90	
107	103 - 104	30		0.00	0.5	0.50	14.00	400	1:450	0.10	86	0.68	+ 224.00	+ 222.90	+ 224.00	+ 222.80	
108	104 - 105	30		0.00	1	1.00	28.00	400	1:450	0.10	86	0.68	+ 224.00	+ 222.80	+ 224.00	+ 222.70	
109	105- 106	30		0.00	1	1.00	28.00	400	1:450	0.10	86	0.68	+ 224.00	+ 222.70	+ 224.00	+ 222.60	
110	106 - 107	26		0.00	1.5	1.50	42.00	400	1:450	0.09	86	0.68	+ 224.00	+ 222.60	+ 224.00	+ 222.51	
111	107 - 108	25		0.00	1.5	1.50	42.00	400	1:450	0.08	86	0.68	+ 224.00	+ 222.51	+ 224.00	+ 222.43	

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S.No.	Name of Line	Length in mtr	Catchment area				Total discharge in LPS @ 28 LPS per acre	Dia in mm	Slope	Fall /Drop in mtr	Capacity in LPS	Velocity in mtr/sec	Starting Level		End Level		Remarks
			Self area in sqm	Self area in acres	Additional area in acres	Total area in acres							G.L.	I.L.	G.L.	I.L.	
112	108 - 109	31		0.00	2	2.00	56.00	400	1:450	0.10	86	0.68	+ 224.00	+ 222.43	+ 224.00	+ 222.33	
113	109 - 110	39		0.00	2	2.00	56.00	400	1:450	0.13	86	0.68	+ 224.00	+ 222.33	+ 224.00	+ 222.20	
114	110 - 111	22		0.00	2	2.00	56.00	400	1:450	0.07	86	0.68	+ 224.00	+ 222.20	+ 224.00	+ 222.12	
115	111 - 112	30		0.00	2.5	2.50	70.00	400	1:450	0.10	86	0.68	+ 224.00	+ 222.12	+ 224.00	+ 222.02	
116	112 - 113	15		0.00	2.5	2.50	70.00	400	1:450	0.05	86	0.68	+ 224.00	+ 222.02	+ 224.00	+ 221.97	
117	113 - 114	30		0.00	2.5	2.50	70.00	400	1:450	0.10	86	0.68	+ 224.00	+ 221.97	+ 224.00	+ 221.87	
118	114 - 115	17		0.00	3	3.00	84.00	400	1:450	0.06	86	0.68	+ 224.00	+ 221.87	+ 224.00	+ 221.82	
119	115 - 116	6		0.00	3	3.00	84.00	400	1:450	0.02	86	0.68	+ 224.00	+ 221.82	+ 224.00	+ 221.80	
120	116- 117	19		0.00	3	3.00	84.00	400	1:450	0.06	86	0.68	+ 224.00	+ 221.80	+ 224.00	+ 221.73	
121	117 - 117A	25		0.00	3.5	3.50	98.00	400	1:450	0.08	86	0.68	+ 224.00	+ 221.73	+ 224.00	+ 221.65	
122	117A - 117B	39		0.00	3.5	3.50	98.00	400	1:450	0.13	86	0.68	+ 224.00	+ 221.65	+ 224.00	+ 221.52	
123	117B - 99	22		0.00	3.5	3.50	98.00	400	1:450	0.07	86	0.68	+ 224.00	+ 221.52	+ 224.00	+ 221.45	
124	118 - 119	32		0.00	0.5	0.50	14.00	400	1:450	0.11	49	0.68	+ 224.00	+ 223.00	+ 224.00	+ 222.89	
125	119 - 120	12	600	0.15	0.5	0.65	18.15	400	1:450	0.04	86	0.68	+ 224.00	+ 222.89	+ 224.00	+ 222.85	
126	120 - 121	39	600	0.15	0.5	0.65	18.15	400	1:450	0.13	86	0.68	+ 224.00	+ 222.85	+ 224.00	+ 222.72	
127	121 - 122	40	1200	0.30	0.75	1.05	29.30	400	1:450	0.13	86	0.68	+ 224.00	+ 222.72	+ 224.00	+ 222.59	
128	122 - 123	18	1800	0.44	0.75	1.19	33.45	400	1:450	0.06	86	0.68	+ 224.00	+ 222.59	+ 224.00	+ 222.53	
129	123 - 124	34	4400	1.09	0.75	1.84	51.43	400	1:450	0.11	86	0.68	+ 224.00	+ 222.53	+ 224.00	+ 222.42	
130	124 - 125	30	7000	1.73	1	2.73	76.42	400	1:450	0.10	86	0.68	+ 224.00	+ 222.42	+ 224.00	+ 222.32	
131	125 - 126	30	9600	2.37	1	3.37	94.40	400	1:450	0.10	86	0.68	+ 224.00	+ 222.32	+ 224.00	+ 222.22	
132	126 - 127	43	12200	3.01	1	4.01	112.39	400	1:450	0.14	86	0.68	+ 224.00	+ 222.22	+ 224.00	+ 222.07	
133	127 - 128	18	14800	3.66	1.2	4.86	135.97	400	1:450	0.06	86	0.68	+ 224.00	+ 222.07	+ 224.00	+ 222.01	
134	128 - 129	37	17400	4.30	1.2	5.50	153.96	400	1:450	0.12	86	0.68	+ 224.00	+ 222.01	+ 224.00	+ 221.89	
135	129 - Huda Ext	18	20000	4.94	1.2	6.14	171.94	400	1:450	0.06	86	0.68	+ 224.00	+ 221.89	+ 224.00	+ 221.83	

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Friction Loss Calculation:
$Pm = 6.05(Qm^{1.85}/C^{1.85} \times dm^{4.87})10^5$

Domestic Water Calculation

S NO	Line No	MAIN UNIT (A)				SERVANTS UNIT (B)				School,Club & Commercial (C)		EWS UNIT (D)				Total Water Demand liter per day(A+B+C+D)	Pipe size in mm D	Total Water Demand liter per day@2/3(Residential + school & Commercial)	Peak Water Demand for Over Head Tank Filling (8 hr) LPH	Flow rate in LPM	Flow rate in M^3/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (p)	Velocity in pipe M/SEC	Starting Level		End Level	
		Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	School & Commercial Population	Water Demand @ 45 liter per day	Total No. of Unit	Population per Unit	Total Population	Total Water demand @135 lpd											GL	IL	GL	IL
1	Pump Room 3 - 8	266	5	1330	229425					720	32400	310	2	620	83700	345525	100	230350	28794	480	0.008	10	0.0002	0.00	1.01	+ 224.00	+ 223.40	+ 224.00	+ 223.40
2	8 - 24	266	5	1330	229425					720	32400	310	2	620	83700	345525	100	230350	28794	480	0.008	138	0.0021	0.29	1.01	+ 224.00	+ 223.40	+ 224.00	+ 223.40
3	24 - 30	266	5	1330	229425					385	17325	310	2	620	83700	330450	100	220300	27538	459	0.008	50	0.0008	0.04	0.97	+ 224.00	+ 223.40	+ 224.00	+ 223.40
4	30 - 31	266	5	1330	229425					385	17325	310	2	620	83700	330450	100	220300	27538	459	0.008	118	0.0018	0.21	0.97	+ 224.00	+ 223.40	+ 224.00	+ 223.40
5	31 - 33									385	17325	310	2	620	83700	101025	100	67350	8419	140	0.002	78	0.0012	0.09	0.30	+ 224.00	+ 223.40	+ 224.00	+ 223.40
6	33 - 34									50	2250					2250	100	1500	188	3	0.000	30	0.0005	0.01	0.01	+ 224.00	+ 223.40	+ 224.00	+ 223.40
7	33 - 35									335	15075	310	2	620	83700	98775	100	65850	8231	137	0.002	68	0.0010	0.07	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
8	35 - 36											310	2	620	83700	83700	100	55800	6975	116	0.002	34	0.0005	0.02	0.24	+ 224.00	+ 223.40	+ 224.00	+ 223.40
9	26 - 27									335	15075					15075	100	10050	1256	21	0.000	25	0.0004	0.01	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
10	27 - 28									335	15075					15075	100	10050	1256	21	0.000	25	0.0004	0.01	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
11	28 - 29									335	15075					15075	100	10050	1256	21	0.000	22	0.0003	0.01	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
12	29 - 24									335	15075					15075	100	10050	1256	21	0.000	90	0.0014	0.12	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
13	31 - 32	266	5	1330	229425											229425	100	152950	19119	319	0.005	30	0.0005	0.01	0.67	+ 224.00	+ 223.40	+ 224.00	+ 223.40
14	32 - 82	266	5	1330	229425											229425	100	152950	19119	319	0.005	20	0.0003	0.01	0.67	+ 224.00	+ 223.40	+ 224.00	+ 223.40
15	81 - 82	44	5	220	37950											37950	65	25300	3163	53	0.001	20	0.0003	0.01	0.26	+ 224.00	+ 223.40	+ 224.00	+ 223.40
16	82 - 83	222	5	1110	191475											191475	100	127650	15956	266	0.004	16	0.0002	0.00	0.56	+ 224.00	+ 223.40	+ 224.00	+ 223.40
17	83 - 84	44	5	220	37950											37950	65	25300	3163	53	0.001	9	0.0001	0.00	0.26	+ 224.00	+ 223.40	+ 224.00	+ 223.40
18	83 - 85	178	5	890	153525											153525	100	102350	12794	213	0.004	36	0.0005	0.02	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
19	85 - 86	45	5	225	38813											38813	65	25875	3234	54	0.001	13	0.0002	0.00	0.27	+ 224.00	+ 223.40	+ 224.00	+ 223.40
20	85 - 87	133	5	665	114713											114713	100	76475	9559	159	0.003	30	0.0005	0.01	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
21	87 - 88	45	5	225	38813											38813	65	25875	3234	54	0.001	12	0.0002	0.00	0.27	+ 224.00	+ 223.40	+ 224.00	+ 223.40
22	87 - 89	88	5	440	75900											75900	100	50600	6325	105	0.002	31	0.0005	0.01	0.22	+ 224.00	+ 223.40	+ 224.00	+ 223.40
23	89 - 90	44	5	220	37950											37950	65	25300	3163	53	0.001	9	0.0001	0.00	0.26	+ 224.00	+ 223.40	+ 224.00	+ 223.40
24	89 - 91	44	5	220	37950											37950	100	25300	3163	53	0.001	19	0.0003	0.01	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
25	91 - 92	44	5	220	37950											37950	65	25300	3163	53	0.001	10	0.0002	0.00	0.26	+ 224.00	+ 223.40	+ 224.00	+ 223.40

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S.NO	Line No.	MAIN UNIT (A)				SERVANTS UNIT (B)				School,Club & Commerical (C)		EWS UNIT (D)				Total Water Demand liter per day(Residental + School & Commerical) (A+B+C+D)	Pipe size in mm D	Total Water Demand liter per day@2/3(Residental + school & Commerical)	Peak Water Demand for Over Head Tank Filling (6 hr) LPH	Flow rate in LPM	Flow rate in M³/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (p)	Velocity in pipe M/SEC	Starting Level		End Level	
		Total No of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	Total No of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	School & Commercial Population	Water Demand @ 45 liter per day	Total No of Unit	Population per Unit	Total Population	Total Water demand @135 lpd											GL	IL	GL	IL
26	Pump Room 3 - 76	138	5	690	119025											119025	100	79350	9919	165	0.003	121	0.0018	0.22	0.35	+ 224.00	+ 223.40	+ 224.00	+ 223.40
27	76 -77	46	5	230	39675											39675	65	26450	3306	55	0.001	8	0.0001	0.00	0.27	+ 224.00	+ 223.40	+ 224.00	+ 223.40
28	76 - 78	92	5	460	79350											79350	100	52900	6613	110	0.002	21	0.0003	0.01	0.23	+ 224.00	+ 223.40	+ 224.00	+ 223.40
29	78 - 79	46	5	230	39675											39675	65	26450	3306	55	0.001	8	0.0001	0.00	0.27	+ 224.00	+ 223.40	+ 224.00	+ 223.40
30	79 -80	46	5	230	39675											39675	65	26450	3306	55	0.001	69	0.0010	0.07	0.27	+ 224.00	+ 223.40	+ 224.00	+ 223.40
31	Pump Room 3 - 74	122	5	610	105225	124	2	248	42780							148005	100	98670	12334	206	0.003	47	0.0007	0.03	0.43	+ 224.00	- 223.40	+ 224.00	+ 223.40
32	74 -75	61	5	305	52613	62	2	124	21390							74003	65	49335	6167	103	0.002	14	0.0002	0.00	0.51	+ 224.00	+ 223.40	+ 224.00	+ 223.40
33	74 - 73	61	5	305	52613	62	2	124	21390							74003	65	49335	6167	103	0.002	98	0.0015	0.14	0.51	+ 224.00	+ 223.40	+ 224.00	+ 223.40
34	Pump Room 1 - 37	291	5	1455	250988											250988	100	167325	20916	349	0.006	22	0.0003	0.01	0.73	+ 224.00	+ 223.40	+ 224.00	+ 223.40
35	37 - 38	145	5	725	125063											125063	65	83375	10422	174	0.003	5	0.0001	0.00	0.86	+ 224.00	+ 223.40	+ 224.00	+ 223.40
36	37 - 39	146	5	730	125925											125925	65	83950	10494	175	0.003	35	0.0005	0.02	0.87	+ 224.00	+ 223.40	+ 224.00	+ 223.40
37	Pump Room 1 - 40	423	5	2115	364838											373838	100	249225	31153	519	0.009	150	0.0023	0.34	1.09	+ 224.00	+ 223.40	+ 224.00	+ 223.40
38	40 - 41	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	13	0.0002	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
39	40 - 42	376	5	1880	324300					200	9000					333300	100	222200	27775	463	0.008	37	0.0006	0.02	0.97	+ 224.00	+ 223.40	+ 224.00	+ 223.40
40	42 - 43	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	14	0.0002	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
41	42 - 44	329	5	1645	283763					200	9000					292763	100	195175	24397	407	0.007	39	0.0006	0.02	0.86	- 224.00	+ 223.40	+ 224.00	+ 223.40
42	44 - 45	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	14	0.0002	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
43	44- 46	282	5	1410	243225					200	9000					252225	100	168150	21019	350	0.006	41	0.0006	0.03	0.74	+ 224.00	+ 223.40	+ 224.00	+ 223.40
44	46 - 47	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	12	0.0002	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
45	46 - 48	235	5	1175	202688					200	9000					211688	100	141125	17641	294	0.005	38	0.0006	0.02	0.62	+ 224.00	+ 223.40	+ 224.00	+ 223.40
46	48 - 49	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	13	0.0002	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
47	48 - 50	188	5	940	162150					200	9000					171150	100	114100	14263	238	0.004	45	0.0007	0.03	0.50	+ 224.00	+ 223.40	+ 224.00	+ 223.40
48	50 - 51	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	10	0.0002	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
49	50 - 52	141	5	705	121613					200	9000					130613	100	87075	10884	181	0.003	46	0.0007	0.03	0.38	+ 224.00	+ 223.40	+ 224.00	+ 223.40
50	52 - 53	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	11	0.0002	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
51	52 - 54	94	5	470	81075					200	9000					90075	100	60050	7506	125	0.002	47	0.0007	0.03	0.26	+ 224.00	+ 223.40	+ 224.00	+ 223.40
52	54 - 55	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	10	0.0002	0.00	0.34	- 224.00	+ 223.40	+ 224.00	+ 223.40

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S.NO	Line No.	MAIN UNIT (A)				SERVANTS UNIT (B)				School,Club & Commerical (C)		EWS UNIT (D)				Total Water Demand liter per day(Residential + School & Commerical) (A+B+C+D)	Pipe size in mm D	Total Water Demand liter per day@2/3(Residental + school & Commerical)	Peak Water Demand for Over Head Tank Filling (8 hr) LPH	Flow rate in LPM	Flow rate in M^3/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (p)	Velocity in pipe M/SEC	Starting Level		End Level	
		Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	Total No of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	School & Commercial Population	Water Demand @ 45 liter per day	Total No. of Unit	Population per Unit	Total Population	Total Water demand @135 lpd											GL	IL	GL	IL
53	54 - 56	47	5	235	40538					200	9000					49538	100	33025	4128	69	0.001	43	0.0006	0.03	0.14	+ 224.00	+ 223.40	+ 224.00	+ 223.40
54	56 - 57	47	5	235	40538					200	9000					49538	65	33025	4128	69	0.001	9	0.0001	0.00	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
55	56 -58									200	9000					9000	100	6000	750	13	0.000	32	0.0005	0.02	0.03	+ 224.00	+ 223.40	+ 224.00	+ 223.40
56	Pump Room 2 - 59									450	20250					20250	65	13500	1688	28	0.000	48	0.0007	0.03	0.14	+ 224.00	+ 223.40	+ 224.00	+ 223.40
57	Pump Room 2 - 60	447	5	2235	385538	46	2	92	15870							401408	100	267605	33451	558	0.009	27	0.0004	0.01	1.17	+ 224.00	+ 223.40	+ 224.00	+ 223.40
58	60 - 61	63	5	315	54338	46	2	92	15870							70208	65	46805	5851	98	0.002	15	0.0002	0.00	0.49	+ 224.00	+ 223.40	+ 224.00	+ 223.40
59	60 -62	384	5	1920	331200	46	2	92	15870							347070	100	231380	28923	482	0.008	40	0.0006	0.02	1.01	+ 224.00	+ 223.40	+ 224.00	+ 223.40
60	62 - 63	63	5	315	54338	46	2	92	15870							70208	65	46805	5851	98	0.002	14	0.0002	0.00	0.49	+ 224.00	+ 223.40	+ 224.00	+ 223.40
61	62 - 64	321	5	1605	276863	46	2	92	15870							292733	100	195155	24394	407	0.007	63	0.0009	0.06	0.86	+ 224.00	+ 223.40	+ 224.00	+ 223.40
62	64 - 65	63	5	315	54338	46	2	92	15870							70208	65	46805	5851	98	0.002	10	0.0002	0.00	0.49	+ 224.00	+ 223.40	+ 224.00	+ 223.40
63	64 - 66	258	5	1290	222525	46	2	92	15870							238395	100	158930	19866	331	0.006	46	0.0007	0.03	0.70	+ 224.00	+ 223.40	+ 224.00	+ 223.40
64	66 -67	63	5	315	54338	46	2	92	15870							70208	65	46805	5851	98	0.002	12	0.0002	0.00	0.49	+ 224.00	+ 223.40	+ 224.00	+ 223.40
65	66 - 68	195	5	975	168188	46	2	92	15870							184058	100	122705	15338	256	0.004	23	0.0003	0.01	0.54	+ 224.00	+ 223.40	+ 224.00	+ 223.40
66	68 - 69	63	5	315	54338	46	2	92	15870							70208	65	46805	5851	98	0.002	17	0.0003	0.00	0.49	+ 224.00	+ 223.40	+ 224.00	+ 223.40
67	68 - 70	132	5	660	113850	46	2	92	15870							129720	100	86480	10810	180	0.003	55	0.0008	0.05	0.38	+ 224.00	+ 223.40	+ 224.00	+ 223.40
68	70 - 71	63	5	315	54338	46	2	92	15870							70208	65	46805	5851	98	0.002	17	0.0003	0.00	0.49	+ 224.00	+ 223.40	+ 224.00	+ 223.40
69	70 - 72	69	5	345	59513	46	2	92	15870							75383	65	50255	6282	105	0.002	75	0.0011	0.08	0.52	+ 224.00	+ 223.40	+ 224.00	+ 223.40

Pump Room No-3

Pump below ground	5	mtr
Height of Terrace	125.95	mtr
Residual Pressure	35	mtr
Friction losses	5.13	mtr
Total losses	171.08	mtr
Say	185	mtr

Total pressure loss in bar

Pump Room-1	0.61
Pump Room-2	0.32
Pump Room-3	0.96

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For Sweta Estates Pvt. Ltd.

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Friction Loss Calculation:
Pm = 6.05(Qm^1.85/C^1.85 X dm^4.87)10^5

Flushing Water Calculation

S NO	Line No.	MAIN UNIT (A) Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	SERVANTS UNIT (B) Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	School Club & Commerical (C) School & Commercial Population	Water Demand @ 45 liter per day	EWS UNIT (D) Total No. of Unit	Population per Unit	Total Population	Total Water demand @135 lpd	Total Water Demand liter per day(Resident al+school & Commerical) (A+B+C+D)	Pipe size/ Dia in mm	Total Water Demand liter per day@1/3(Residental + school & Commercial)	Peak Water Demand for Over Head Tank Filling (8 hr) LPH	Flow rate in LPM	Flow rate in M³/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (P)	Velocity in pipe M/SEC	Starting Level GL	Starting Level IL	End Level GL	End Level IL
1	STP 1 - 2	714	5	3570	615825					200	9000					624825	100	416550	52069	868	0.014	13	0.0002	0.003	1.83	+ 224.00	- 223.40	+ 224.00	+ 223.40
2	2 - 3	714	5	3570	615825					200	9000					624825	100	416550	52069	868	0.014	25	0.0004	0.009	1.83	+ 224.00	+ 223.40	+ 224.00	+ 223.40
3	3 - 4	714	5	3570	615825					200	9000					624825	100	416550	52069	868	0.014	82	0.0012	0.101	1.83	+ 224.00	+ 223.40	+ 224.00	+ 223.40
4	4 - 5	714	5	3570	615825					200	9000					624825	100	416550	52069	868	0.014	39	0.0006	0.023	1.83	+ 224.00	+ 223.40	+ 224.00	+ 223.40
5	5 - 6	714	5	3570	615825					200	9000					624825	50	416550	52069	868	0.014	7	0.0001	0.001	7.30	+ 224.00	+ 223.40	+ 224.00	+ 223.40
6	5 - 7	714	5	3570	615825											615825	100	410550	51319	855	0.014	37	0.0006	0.021	1.80	+ 224.00	+ 223.40	+ 224.00	+ 223.40
7	7 - 8	47	5	235	40538											40538	50	27025	3378	56	0.001	13	0.0002	0.003	0.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
8	7 - 9	667	5	3335	575288											575288	100	383525	47941	799	0.013	43	0.0006	0.028	1.68	+ 224.00	+ 223.40	+ 224.00	+ 223.40
9	9 - 10	47	5	235	40538											40538	50	27025	3378	56	0.001	13	0.0002	0.003	0.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
10	9- 11	620	5	3100	534750											534750	100	356500	44563	743	0.012	47	0.0007	0.033	1.56	+ 224.00	+ 223.40	+ 224.00	+ 223.40
11	11 - 12	47	5	235	40538											40538	50	27025	3378	56	0.001	14	0.0002	0.003	0.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
12	11 - 13	573	5	2865	494213											494213	100	329475	41184	686	0.011	61	0.0009	0.056	1.44	+ 224.00	+ 223.40	+ 224.00	+ 223.40
13	13 - 14	47	5	235	40538											40538	50	27025	3378	56	0.001	7	0.0001	0.001	0.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
14	13 - 15	526	5	2630	453675											453675	100	302450	37806	630	0.011	35	0.0005	0.018	1.33	+ 224.00	+ 223.40	+ 224.00	+ 223.40
15	15 - 16	47	5	235	40538											40538	50	27025	3378	56	0.001	9	0.0001	0.001	0.47	+ 224.00	- 223.40	+ 224.00	+ 223.40
16	15 - 17	479	5	2395	413138											413138	100	275425	34428	574	0.010	44	0.0007	0.029	1.21	+ 224.00	- 223.40	+ 224.00	+ 223.40
17	17 - 18	47	5	235	40538											40538	50	27025	3378	56	0.001	21	0.0003	0.007	0.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
18	17 - 17A	432	5	2160	372600											372600	100	248400	31050	518	0.009	34	0.0005	0.017	1.09	+ 224.00	+ 223.40	- 224.00	+ 223.40
19	17A - 18A	47	5	235	40538											40538	50	27025	3378	56	0.001	18	0.0003	0.005	0.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
20	17A - 19	385	5	1925	332063											332063	100	221375	27672	461	0.008	38	0.0006	0.022	0.97	+ 224.00	+ 223.40	+ 224.00	+ 223.40
21	19 - 20	47	5	235	40538											40538	50	27025	3378	56	0.001	18	0.0003	0.005	0.47	+ 224.00	+ 223.40	- 224.00	+ 223.40

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For Sweta Estates Pvt. Ltd.

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S.NO	Line No.	MAIN UNIT (A) Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	SERVANTS UNIT (B) Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	School,Club & Commerical (C) School & Commercial Population	Water Demand @ 45 liter per day	EWS UNIT (D) Total No. of Unit	Population per Unit	Total Population	Total Water demand @135 lpd	Total Water Demand liter per day(Residential+school & Commerical) (A+B+C+D)	Pipe size/ Dia in mm	Total Water Demand liter per day@1/3(Residental+school & Commercial)	Peak Water Demand for Over Head Tank Filling (8 hr) LPH	Flow rate in LPM	Flow rate in M^3/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (p)	Velocity in pipe M/SEC	Starting Level GL	Starting Level IL	End Level GL	End Level IL
22	19 - 21	338	5	1690	291525											291525	100	194350	24294	405	0.007	33	0.0005	0.016	0.85	+ 224.00	+ 223.40	+ 224.00	+ 223.40
23	21 - 22	47	5	235	40538											40538	50	27025	3378	56	0.001	11	0.0002	0.002	0.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
24	21 - 23	291	5	1455	250988											250988	100	167325	20916	349	0.006	98	0.0015	0.144	0.73	+ 224.00	+ 223.40	+ 224.00	+ 223.40
25	23 - 24	145	5	725	125063											125063	50	83375	10422	174	0.003	13	0.0002	0.003	1.46	+ 224.00	+ 223.40	+ 224.00	+ 223.40
26	23 - 25	146	5	730	125925											125925	50	83950	10494	175	0.003	36	0.0005	0.019	1.47	+ 224.00	+ 223.40	+ 224.00	+ 223.40
27	STP 2 - 27	378	5	1890	326025					450	20250					346275	100	230850	28856	481	0.008	30	0.0005	0.014	1.01	+ 224.00	+ 223.40	+ 224.00	+ 223.40
28	27 - 28	63	5	315	54338					450	20250					74588	50	49725	6216	104	0.002	13	0.0002	0.003	0.87	+ 224.00	+ 223.40	+ 224.00	+ 223.40
29	27 - 29	315	5	1575	271688					450	20250					291938	100	194625	24328	405	0.007	43	0.0006	0.028	0.85	+ 224.00	+ 223.40	+ 224.00	+ 223.40
30	29 - 30	63	5	315	54338					450	20250					74588	50	49725	5216	104	0.002	12	0.0002	0.002	0.87	+ 224.00	+ 223.40	+ 224.00	+ 223.40
31	29 - 32	252	5	1260	217350					450	20250					237600	100	158400	19800	330	0.006	21	0.0003	0.007	0.69	+ 224.00	+ 223.40	+ 224.00	+ 223.40
32	32 - 33	63	5	315	54338					450	20250					74588	50	49725	6216	104	0.002	15	0.0002	0.003	0.87	+ 224.00	+ 223.40	+ 224.00	+ 223.40
33	32 - 34	189	5	945	163013					450	20250					183263	100	122175	15272	255	0.004	46	0.0007	0.032	0.54	+ 224.00	+ 223.40	+ 224.00	+ 223.40
34	34 - 35	63	5	315	54338					450	20250					74588	50	49725	6216	104	0.002	15	0.0002	0.003	0.87	+ 224.00	+ 223.40	+ 224.00	+ 223.40
35	34 - 36	126	5	630	108675					450	20250					128925	100	85950	10744	179	0.003	23	0.0003	0.008	0.38	+ 224.00	+ 223.40	+ 224.00	+ 223.40
36	36 - 37	126	5	630	108675					450	20250					128925	100	85950	10744	179	0.003	60	0.0009	0.054	0.38	+ 224.00	+ 223.40	+ 224.00	+ 223.40
37	37 - 38	126	5	630	108675					450	20250					128925	100	85950	10744	179	0.003	15	0.0002	0.003	0.38	+ 224.00	+ 223.40	+ 224.00	+ 223.40
38	38 - 39	63	5	315	54338					450	20250					74588	50	49725	6216	104	0.002	13	0.0002	0.003	0.87	+ 224.00	+ 223.40	+ 224.00	+ 223.40
39	38 - 40	63	5	315	54338					450	20250					74588	100	49725	6216	104	0.002	36	0.0005	0.019	0.22	+ 224.00	+ 223.40	+ 224.00	+ 223.40
40	40 - 41	63	5	315	54338					450	20250					74588	50	49725	6216	104	0.002	9	0.0001	0.001	0.87	+ 224.00	+ 223.40	+ 224.00	+ 223.40
41	40 - 43									450	20250					20250	50	13500	1688	28	0.000	61	0.0009	0.056	0.24	+ 224.00	+ 223.40	+ 224.00	+ 223.40
42	STP 2 - 45	69	5	345	59513	46	5	230	39675							99188	50	66125	8266	138	0.002	43	0.0006	0.028	1.16	+ 224.00	+ 223.40	+ 224.00	+ 223.40
43	STP 3 - 51	138	5	690	119025					335	15075					134100	100	89400	11175	186	0.003	18	0.0003	0.005	0.39	+ 224.00	+ 223.40	+ 224.00	+ 223.40

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S.NO	Line No.	MAIN UNIT (A)				SERVANTS UNIT (B)				School,Club & Commerical (C)		EWS UNIT (D)				Total Water Demand liter per day (Resident al + school & Commerical) (A+B+C+D)	Pipe size/ Dia in mm	Total Water Demand liter per day@1/3(Residental + school & Commerical)	Peak Water Demand for Over Head Tank Filling (8 hr) LPH	Flow rate in LPM	Flow rate in M^3/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (p)	Velocity in pipe M/SEC	Starting Level		End Level	
		Total No of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	Total No. of Unit	Population per Unit	Total Population	Total Water demand @172.5 lpd	School & Commerical Population	Water Demand @ 45 liter per day	Total No. of Unit	Population per Unit	Total Population	Total Water demand @135 lpd											GL	IL	GL	IL
44	51 - 52	138	5	690	119025					335	15075					134100	100	89400	11175	186	0.003	25	0.0004	0.009	0.39	+ 224.00	+ 223.40	+ 224.00	+ 223.40
45	52 - 53	138	5	690	119025					335	15075					134100	100	89400	11175	186	0.003	67	0.0010	0.067	0.39	+ 224.00	+ 223.40	+ 224.00	+ 223.40
46	53 - 54	138	5	690	119025											119025	100	79350	9919	165	0.003	10	0.0002	0.002	0.35	+ 224.00	+ 223.40	+ 224.00	+ 223.40
47	54 - 55	138	5	690	119025											119025	100	79350	9919	165	0.003	12	0.0002	0.002	0.35	+ 224.00	+ 223.40	+ 224.00	+ 223.40
48	55 - 56	46	5	230	39675											39675	50	26450	3306	55	0.001	19	0.0003	0.005	0.46	+ 224.00	+ 223.40	+ 224.00	+ 223.40
49	55 - 57	92	5	460	79350											79350	100	52900	6613	110	0.002	45	0.0007	0.030	0.23	+ 224.00	+ 223.40	+ 224.00	+ 223.40
50	57 - 58	46	5	230	39675											39675	50	26450	3306	55	0.001	23	0.0003	0.008	0.46	+ 224.00	+ 223.40	+ 224.00	+ 223.40
51	57 - 59	46	5	230	39675											39675	50	26450	3306	55	0.001	90	0.0014	0.122	0.46	+ 224.00	+ 223.40	+ 224.00	+ 223.40
52	59 - 60	46	5	230	39675											39675	50	26450	3306	55	0.001	25	0.0004	0.009	0.46	+ 224.00	+ 223.40	+ 224.00	+ 223.40
53	53 - 61		5	0	0					335	15075					15075	50	10050	1256	21	0.000	68	0.0010	0.069	0.18	+ 224.00	+ 223.40	+ 224.00	+ 223.40
54	61 - 62		5	0	0					335	15075					15075	50	10050	1256	21	0.000	18	0.0003	0.005	0.18	+ 224.00	+ 223.40	+ 224.00	+ 223.40
55	62 - 63		5	0	0					335	15075					15075	50	10050	1256	21	0.000	27	0.0004	0.011	0.18	+ 224.00	+ 223.40	+ 224.00	+ 223.40
56	63 - 64		5	0	0					335	15075					15075	50	10050	1256	21	0.000	23	0.0003	0.008	0.18	+ 224.00	+ 223.40	+ 224.00	+ 223.40
57	STP 3 - 47	122	5	610	105225	124	2	248	42780							148005	100	98670	12334	206	0.003	27	0.0004	0.011	0.43	+ 224.00	+ 223.40	+ 224.00	+ 223.40
58	47 - 48	61	5	305	52613	62	2	124	21390							74003	50	49335	6167	103	0.002	65	0.0010	0.063	0.86	+ 224.00	+ 223.40	+ 224.00	+ 223.40
59	47 - 49	61	5	305	52613	62	2	124	21390							74003	50	49335	6167	103	0.002	43	0.0006	0.028	0.86	+ 224.00	+ 223.40	+ 224.00	+ 223.40
60	51 - 65	266	5	1330	229425					385	17325	310	2	620	83700	330450	100	220300	27538	459	0.008	77	0.0012	0.089	0.97	+ 224.00	+ 223.40	+ 224.00	+ 223.40
61	65 - 66	266	5	1330	229425											229425	100	152950	19119	319	0.005	18	0.0003	0.005	0.67	+ 224.00	+ 223.40	+ 224.00	+ 223.40
62	66 - 67	44	5	220	37950											37950	50	25300	3163	53	0.001	10	0.0002	0.002	0.44	+ 224.00	+ 223.40	+ 224.00	+ 223.40
63	66 - 68	222	5	1110	191475											191475	100	127650	15956	266	0.004	35	0.0005	0.018	0.56	+ 224.00	+ 223.40	+ 224.00	+ 223.40
64	68 - 69	44	5	220	37950											37950	50	25300	3163	53	0.001	23	0.0003	0.008	0.44	+ 224.00	+ 223.40	+ 224.00	+ 223.40
65	68 - 70	178	5	890	153525											153525	100	102350	12794	213	0.004	52	0.0008	0.041	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40

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For Sweta Estates Pvt. Ltd.

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Flushing Water Hydraulic

S.NO	Line No	MAIN UNIT (A)				SERVANTS UNIT (B)				School Club & Commerical (C)		EWS UNIT (D)				Total Water Demand liter per day Resident + school & Commercial (A+B+C+D)	Pipe size/ Dia in mm	Total Water Demand liter per day@1/3(Residental + school & Commerica l)	Peak Water Demand for Over Head Tank Filling (8 hr) LPH	Flow rate in LPM	Flow rate in M³/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (p)	Velocity in pipe M/SEC	Starting Level		End Level	
		Total No. of Unit	Populatio n per Unit	Total Populatio n	Total Water demand @172.5 lpd	Total No. of Unit	Populatio n per Unit	Total Populatio n	Total Water demand @172.5 lpd	School & Commerical Populatio n	Water Demand @ 45 liter per day	Total No. of Unit	Populatio n per Unit	Total Populatio n	Total Water demand @135 lpd											GL	IL	GL	IL
66	70 - 71	45	5	225	38813											38813	50	25875	3234	54	0.001	28	0.0004	0.012	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
67	70 - 72	133	5	665	114713											114713	100	76475	9559	159	0.003	13	0.0002	0.003	0.34	+ 224.00	+ 223.40	+ 224.00	+ 223.40
68	72 - 73	45	5	225	38813											38813	50	25875	3234	54	0.001	27	0.0004	0.011	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
69	72 - 74	88	5	440	75900											75900	100	50600	6325	105	0.002	44	0.0007	0.029	0.22	+ 224.00	+ 223.40	+ 224.00	+ 223.40
70	74 - 75	44	5	220	37950											37950	50	25300	3163	53	0.001	22	0.0003	0.007	0.44	+ 224.00	+ 223.40	+ 224.00	+ 223.40
71	74 - 76	44	5	220	37950											37950	100	25300	3163	53	0.001	33	0.0005	0.016	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
72	76 - 77	44	5	220	37950											37950	50	25300	3163	53	0.001	11	0.0002	0.002	0.44	+ 224.00	+ 223.40	+ 224.00	+ 223.40
73	65 - 78									385	17325	310	2	620	83700	101025	100	67350	8419	140	0.002	94	0.0014	0.133	0.30	+ 224.00	+ 223.40	+ 224.00	+ 223.40
74	78 - 79									50	2250					2250	50	1500	188	3	0.000	28	0.0004	0.012	0.03	+ 224.00	+ 223.40	+ 224.00	+ 223.40
75	78 - 80									335	15075	310	2	620	83700	98775	100	65850	8231	137	0.002	63	0.0009	0.060	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
76	80 - 81											310	2	620	83700	83700	100	55800	6975	116	0.002	24	0.0004	0.009	0.24	+ 224.00	+ 223.40	+ 224.00	+ 223.40
77	81 - 82											310	2	620	83700	83700	100	55800	6975	116	0.002	4	0.0001	0.000	0.24	+ 224.00	+ 223.40	+ 224.00	+ 223.40
78	82 - 83											310	2	620	83700	83700	100	55800	6975	116	0.002	9	0.0001	0.001	0.24	+ 224.00	+ 223.40	+ 224.00	+ 223.40
79	83 - 84											310	2	620	83700	83700	50	55800	6975	116	0.002	6	0.0001	0.001	0.98	+ 224.00	+ 223.40	+ 224.00	+ 223.40

STP No-3

Pump below ground	5	mtr
Height of Terrace	125.95	mtr
Residual Pressure	35	mtr
Friction lossas	0.56	mtr
Total losses	166.51	mtr
Say	185	mtr

STP No-1

Pump below ground	5.00	mtr
Height of Terrace	59.09	mtr
Residual Pressure	35.00	mtr
Friction losses	2.81	mtr
Total losses	101.9	mtr
Say	115	mtr

Total pressure loss in bar

STP-1	0.57
STP-2	0.26
STP-3	0.56

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For Sweta Estates Pvt. Ltd.

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Garden hydrant Calculation

Friction Loss Calculation:

$Pm = 6.05(Qm^{1.85}/C^{1.85} \times dm^{4.87})10^5$

S.NO	Line No.	Pipe size in mm D	Total Water Demand per day in Liter (24 hr)	Peak Water Demand for irrigation (8 hr) LPH	Flow rate in LPM	Flow rate in M3/SEC	Total pipe length in mtr	Frictional resistance in bar per meter of pipe	Total Pressure loss in bar (p)	Velocity in pipe M/SEC	Starting Level		End Level	
											GL	IL	GL	IL
	Zone-1													
1	1 -2	50	6000	750	12.5	0.0002	22	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
2	2- 3	50	12000	1500	25	0.0004	23	0.0001	0.003	0.21	+ 224.00	+ 223.40	+ 224.00	+ 223.40
3	3- 4	80	42000	5250	87.5	0.0015	253	0.0013	0.320	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
4	4- 5	80	18000	2250	37.5	0.0006	77	0.0004	0.030	0.12	+ 224.00	+ 223.40	+ 224.00	+ 223.40
5	5- 6	80	30000	3750	62.5	0.0010	50	0.0003	0.013	0.21	+ 224.00	+ 223.40	+ 224.00	+ 223.40
6	6 -7	80	42000	5250	87.5	0.0015	105	0.0005	0.055	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
7	7- 8	50	54000	6750	112.5	0.0019	67	0.0003	0.022	0.95	+ 224.00	+ 223.40	+ 224.00	+ 223.40
8	7 -9	80	54000	6750	112.5	0.0019	59	0.0003	0.017	0.37	+ 224.00	+ 223.40	+ 224.00	+ 223.40
9	9 -10	80	66000	8250	137.5	0.0023	60	0.0003	0.018	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
10	10-11 to 9A	50	6000	750	12.5	0.0002	22	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
11	10 -11	80	66000	8250	137.5	0.0023	30	0.0002	0.005	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
12	11- 12	80	90000	11250	187.5	0.0031	107	0.0005	0.057	0.62	+ 224.00	+ 223.40	+ 224.00	+ 223.40
13	12 -13	80	108000	13500	225	0.0038	105	0.0005	0.055	0.74	+ 224.00	+ 223.40	+ 224.00	+ 223.40
14	13 -14	80	156000	19500	325	0.0054	264	0.0013	0.348	1.07	+ 224.00	+ 223.40	+ 224.00	+ 223.40
15	14 -15	80	168000	21000	350	0.0058	71	0.0004	0.025	1.15	+ 224.00	+ 223.40	+ 224.00	+ 223.40
16	15 -16	80	180000	22500	375	0.0063	52	0.0003	0.014	1.23	+ 224.00	+ 223.40	+ 224.00	+ 223.40
17	16 -17	80	186000	23250	387.5	0.0065	63	0.0003	0.020	1.27	+ 224.00	+ 223.40	+ 224.00	+ 223.40
	Zone-2													
18	17 -18	80	6000	750	12.5	0.0002	24	0.0001	0.003	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40

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For Sweta Estates Pvt. Ltd.

Authorised Signatory/Signatories

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											GL	IL	GL	IL
19	18 -19	80	12000	1500	25	0.0004	50	0.0003	0.013	0.08	+ 224.00	+ 223.40	+ 224.00	+ 223.40
20	19 -20	80	30000	3750	62.5	0.0010	101	0.0005	0.051	0.21	+ 224.00	+ 223.40	+ 224.00	+ 223.40
21	20- 21	80	42000	5250	87.5	0.0015	50	0.0003	0.013	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
22	21 -22	80	66000	8250	137.5	0.0023	146	0.0007	0.107	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
23	22 -23	80	66000	8250	137.5	0.0023	63	0.0003	0.020	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
24	23 - 23A	50	6000	750	12.5	0.0002	14	0.0001	0.001	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
25	23 -24	80	78000	9750	162.5	0.0027	39	0.0002	0.008	0.53	+ 224.00	+ 223.40	+ 224.00	+ 223.40
26	24 -25	80	96000	12000	200	0.0033	97	0.0005	0.047	0.66	+ 224.00	+ 223.40	+ 224.00	+ 223.40
	Zone-3													
27	25- 26	80	78000	9750	162.5	0.0027	54	0.0003	0.015	0.53	+ 224.00	+ 223.40	+ 224.00	+ 223.40
28	26 -27	80	66000	8250	137.5	0.0023	100	0.0005	0.050	0.45	+ 224.00	+ 223.40	+ 224.00	+ 223.40
29	27 -28	80	42000	5250	87.5	0.0015	83	0.0004	0.034	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
30	27 -29	80	24000	3000	50	0.0008	90	0.0005	0.041	0.16	+ 224.00	+ 223.40	+ 224.00	+ 223.40
31	29 - 30	80	18000	2250	37.5	0.0006	31	0.0002	0.005	0.12	+ 224.00	+ 223.40	+ 224.00	+ 223.40
32	30A - 31	50	12000	1500	25	0.0004	35	0.0002	0.006	0.21	+ 224.00	+ 223.40	+ 224.00	+ 223.40
33	30 - 32	50	6000	750	12.5	0.0002	48	0.0002	0.012	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
34	30 - 33	80	12000	1500	25	0.0004	35	0.0002	0.006	0.08	+ 224.00	+ 223.40	+ 224.00	+ 223.40
35	33 - 34	80	6000	750	12.5	0.0002	10	0.0001	0.001	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
	Zone-4													
36	34 -35	80	6000	750	12.5	0.0002	33	0.0002	0.005	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
37	35 - 36	80	6000	750	12.5	0.0002	34	0.0002	0.006	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
38	36 -36A	50	6000	750	12.5	0.0002	57	0.0003	0.016	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40

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Authorise Signatory/Signatories

Garden Hydrant

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											GL	IL	GL	IL
39	36 - 36B	80	6000	750	12.5	0.0002	6	0.0000	0.000	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
40	36 B -37	80	6000	750	12.5	0.0002	11	0.0001	0.001	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
41	37 - 37A	50	6000	750	12.5	0.0002	34	0.0002	0.006	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
42	37 - 38	80	12000	1500	25	0.0004	31	0.0002	0.005	0.08	+ 224.00	+ 223.40	+ 224.00	+ 223.40
43	38 - 38A	50	6000	750	12.5	0.0002	21	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
44	38 - 39	80	18000	2250	37.5	0.0006	15	0.0001	0.001	0.12	+ 224.00	+ 223.40	+ 224.00	+ 223.40
45	39 -39A	50	6000	750	12.5	0.0002	53	0.0003	0.014	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
46	39 -40	80	24000	3000	50	0.0008	18	0.0001	0.002	0.16	+ 224.00	+ 223.40	+ 224.00	+ 223.40
47	40 - 41	80	30000	3750	62.5	0.0010	32	0.0002	0.005	0.21	+ 224.00	+ 223.40	+ 224.00	+ 223.40
48	40 - 40A	50	6000	750	12.5	0.0002	12	0.0001	0.001	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
49	41 - 41A	50	6000	750	12.5	0.0002	15	0.0001	0.001	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
50	41 - 42	80	42000	5250	87.5	0.0015	9	0.0000	0.000	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
51	42 - 42A	80	12000	1500	25	0.0004	54	0.0003	0.015	0.08	+ 224.00	+ 223.40	+ 224.00	+ 223.40
52	42A - 43	80	6000	750	12.5	0.0002	17	0.0001	0.001	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
53	43 - 43A	50	6000	750	12.5	0.0002	21	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
54	43 - 44	50	6000	750	12.5	0.0002	9	0.0000	0.000	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
55	44 - 44A	50	6000	750	12.5	0.0002	23	0.0001	0.003	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
56	45 - 45A	50	6000	750	12.5	0.0002	24	0.0001	0.003	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
57	45 - 46	50	6000	750	12.5	0.0002	31	0.0002	0.005	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
58	46 - 46A	50	6000	750	12.5	0.0002	19	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
59	46 - 46B	80	12000	1500	25	0.0004	8	0.0000	0.000	0.08	+ 224.00	+ 223.40	+ 224.00	+ 223.40
60	42 - 47	80	54000	6750	112.5	0.0019	14	0.0001	0.001	0.37	+ 224.00	+ 223.40	+ 224.00	+ 223.40

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											GL	IL	GL	IL
61	47 - 47A	50	6000	750	12.5	0.0002	25	0.0001	0.003	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
62	47 - 48	80	72000	9000	150	0.0025	26	0.0001	0.003	0.49	+ 224.00	+ 223.40	+ 224.00	+ 223.40
63	48 - 48A	80	6000	750	12.5	0.0002	45	0.0002	0.010	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
64	48 - 49	80	90000	11250	187.5	0.0031	6	0.0000	0.000	0.62	+ 224.00	+ 223.40	+ 224.00	+ 223.40
65	49 - 49A	50	6000	750	12.5	0.0002	21	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
66	49 - 50	80	96000	12000	200	0.0033	26	0.0001	0.003	0.66	+ 224.00	+ 223.40	+ 224.00	+ 223.40
67	50 - 50A	50	6000	750	12.5	0.0002	19	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
68	50 - 50B	50	6000	750	12.5	0.0002	44	0.0002	0.010	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
69	50 - 51	80	108000	13500	225	0.0038	16	0.0001	0.001	0.74	+ 224.00	+ 223.40	+ 224.00	+ 223.40
70	51 - 51A	50	6000	750	12.5	0.0002	24	0.0001	0.003	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
71	51 - 52	80	114000	14250	237.5	0.0040	9	0.0000	0.000	0.78	+ 224.00	+ 223.40	+ 224.00	+ 223.40
72	52 - 52A	50	6000	750	12.5	0.0002	7	0.0000	0.000	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
73	52 - 53	50	6000	750	12.5	0.0002	18	0.0001	0.002	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
74	52 - 54	80	120000	15000	250	0.0042	7	0.0000	0.000	0.82	+ 224.00	+ 223.40	+ 224.00	+ 223.40
75	54 - 55	80	120000	15000	250	0.0042	54	0.0003	0.015	0.82	+ 224.00	+ 223.40	+ 224.00	+ 223.40
76	55 - 21	80	120000	15000	250	0.0042	24	0.0001	0.003	0.82	+ 224.00	+ 223.40	+ 224.00	+ 223.40
	Zone-5													
77	35 - 56	80	6000	750	12.5	0.0002	13	0.0001	0.001	0.04	+ 224.00	+ 223.40	+ 224.00	+ 223.40
78	56 - 56A	50	6000	750	12.5	0.0002	44	0.0002	0.010	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
79	56 - 57	80	12000	1500	25	0.0004	7	0.0000	0.000	0.08	+ 224.00	+ 223.40	+ 224.00	+ 223.40
80	57 - 57A	50	6000	750	12.5	0.0002	12	0.0001	0.001	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
81	57 - 58	80	18000	2250	37.5	0.0006	22	0.0001	0.002	0.12	+ 224.00	+ 223.40	+ 224.00	+ 223.40

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											GL	IL	GL	IL
82	58 - 58A	50	6000	750	12.5	0.0002	42	0.0002	0.009	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
83	58 - 59	80	24000	3000	50	0.0008	8	0.0000	0.000	0.16	+ 224.00	+ 223.40	+ 224.00	+ 223.40
84	59 - 59A	50	6000	750	12.5	0.0002	9	0.0000	0.000	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
85	59 -60	80	30000	3750	62.5	0.0010	12	0.0001	0.001	0.21	+ 224.00	+ 223.40	+ 224.00	+ 223.40
86	60 - 60A	50	6000	750	12.5	0.0002	46	0.0002	0.011	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
87	60 - 61	80	36000	4500	75	0.0013	21	0.0001	0.002	0.25	+ 224.00	+ 223.40	+ 224.00	+ 223.40
88	61 - 62	80	42000	5250	87.5	0.0015	8	0.0000	0.000	0.29	+ 224.00	+ 223.40	+ 224.00	+ 223.40
89	62 - 62A	50	6000	750	12.5	0.0002	24	0.0001	0.003	0.11	+ 224.00	+ 223.40	+ 224.00	+ 223.40
90	62 - 63	80	48000	6000	100	0.0017	24	0.0001	0.003	0.33	+ 224.00	+ 223.40	+ 224.00	+ 223.40
91	63 - 63A	80	48000	6000	100	0.0017	13	0.0001	0.001	0.33	+ 224.00	+ 223.40	+ 224.00	+ 223.40

Pump below ground	5.00	mtr	**Total pressure loss in bar**
Residual Pressure	20.00	mtr	Zone-1 **1.01**
Friction losses	19.04	mtr	Zone-2 **0.26**
Total losses	44.04	mtr	Zone-3 **0.17**
Say	**50.00**	mtr	Zone-4 **0.16**
			Zone-5 **0.04**

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