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ANALYSIS & DESIGN OF WATER DISTRIBUTION NETWORK OF URBAN AREA BY WATERGEMS SOFTWARE

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Abstract: Paper is regarding water distribution network of urban areas. In this we studied all parameters of water like pressure, velocity, demand and majorly head losses. In this paper we have designed a specific water distribution network for urban areas considering all total demands, by demand method.

***Index Terms* - WaterGems, Water Distribution Network, Urban Areas.**

CHAPTER 1

I. INTRODUCTION

Water distribution network is necessary infrastructure for supply of water. It connects consumers to sources of water using hydraulic components such as pipes, valves, pumps and tanks. Primary aim of water distribution network is to deliver water to meet the demands on pressure and quality. Pune is the city with major of water distribution problems. As it is faster growing city it has to keep water distribution network good for keeping the pace of the water demand growth in various parts of the town. WaterGems is hydraulic modeling software which is used for analysis and design of water distribution network. Google Earth used for ensuring layout of water distribution network and Satellite image of study. The study presents hydraulic analysis of Bibwewadi territory of Pune city.

II. SCOPE OF PROJECT

- To design a proper water distribution network across the area.
- To reduce water loss and Non-Revenue Water.
- Ensure sustainable and economical Water Supply service.
- Helps to manage water supply and demand.
- To convert exiting intermittent WS system to 24 x 7 WS system which incudes transmission, storage and distribution of clear water to selected area.

III. NEED OF WATER SUPPLY PROJECTS

- Provide 24x7 equitable distribution of the water with adequate pressures, as per CPHEEO guidelines.
- Planning of the “Active Leakage Control system”, to reduce the Non –Revenue Water To acceptable level of 15 % as per CPHEEO guidelines.
- To achieve the goal of continuous pressurized water supply in a reasonable time period.
- To ensure safe and equitable water supply on the basis of DMAs population in Pune city for the period of next 5 years (2017-2022).
- To ensure the distribution of the water during the entire day (24x7 modality).
- To reduce the level of water losses and Non-Revenue Water.

- To ensure the technical and economical sustainability of the water supply service.

IV. AIM

- To Analyze and Design Water Distribution Network of Urban Area.

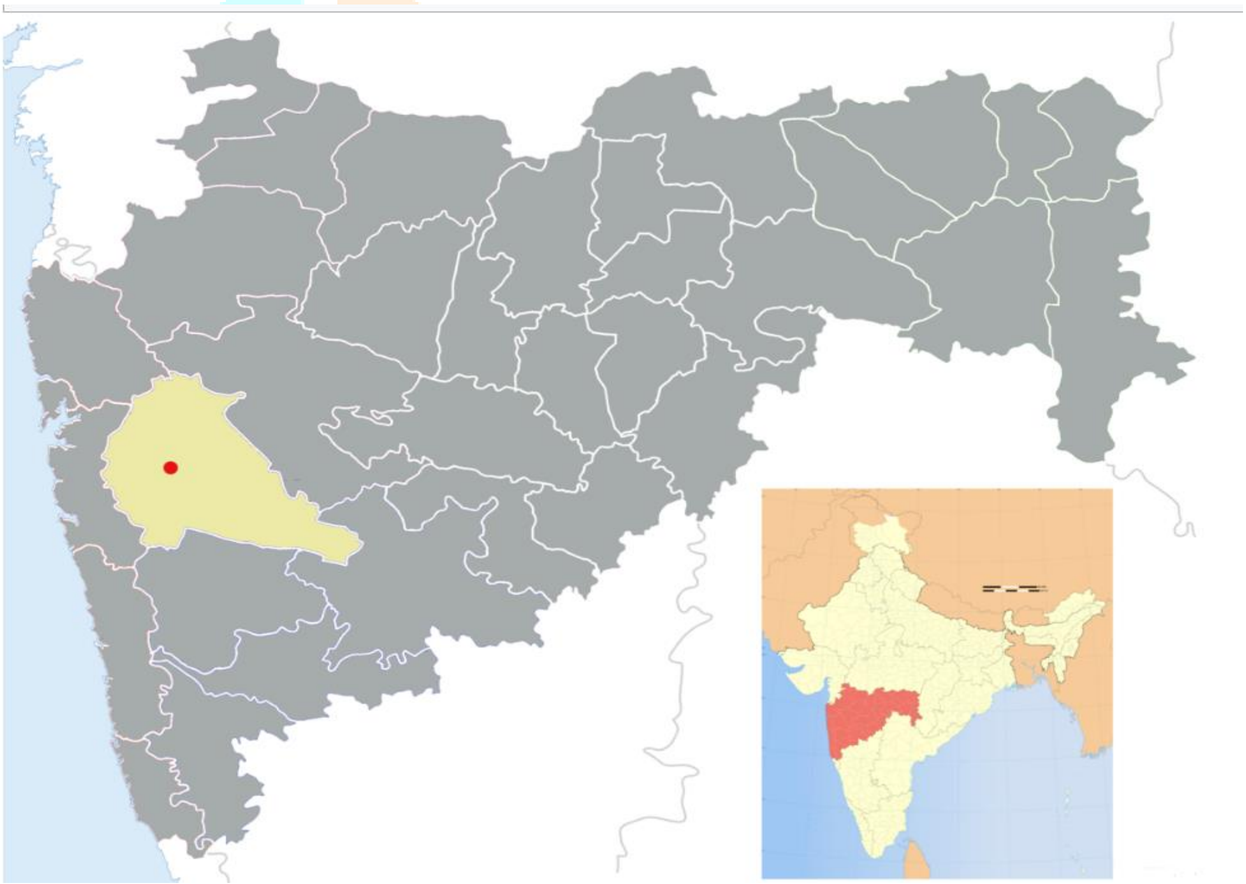
V. OBJECTIVES

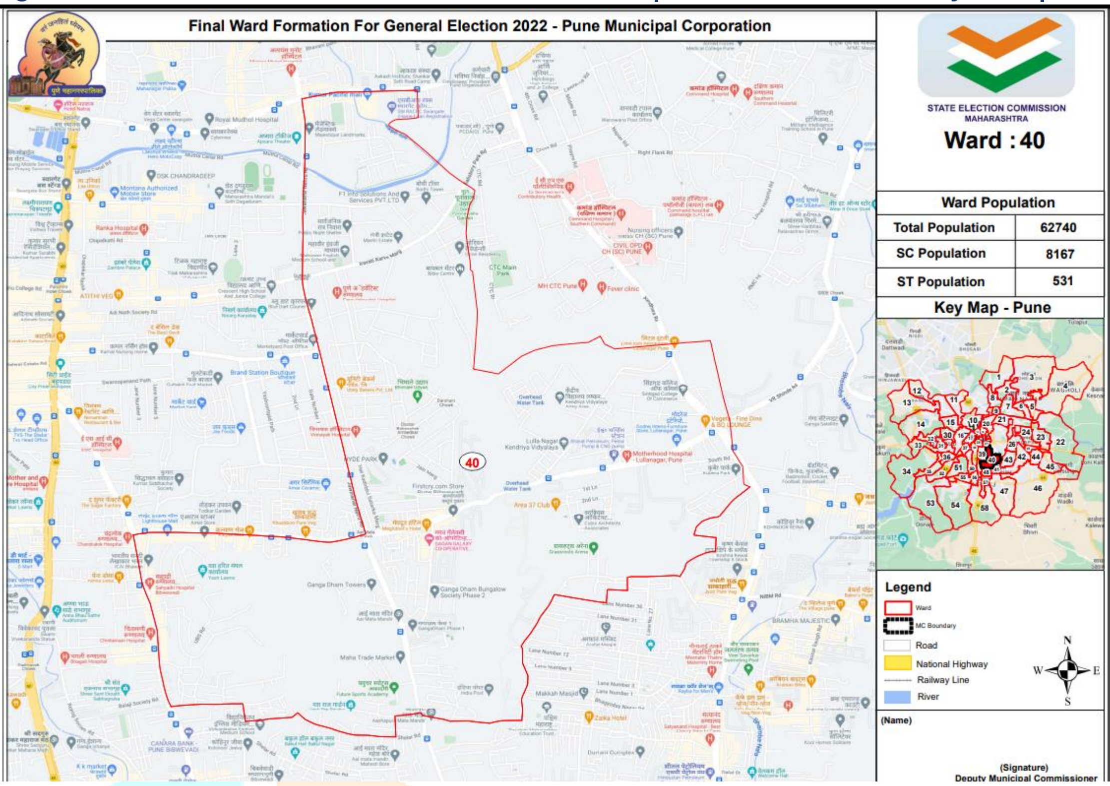
- To Analyze Existing Water Distribution Network of selected study area.
- To Design Water Distribution Network of selected study area.
- To check all parameters in Results which is required in designing of water distribution network.

CHAPTER 2: METHODOLOGY

1. Take Survey map of the study area from Google earth software.
2. Analyze the existing network.
3. Designing of water distribution network in WaterGEMS software.
4. Specify population based nodal demand.
5. Validate and compute the network.
6. Check all parameters. For eg. flow, major and minor losses, velocity.

I. SELECTION OF STUDY AREA





- Place: Ward No 40, Bibwewadi, Pune City, Maharashtra, India.
- Coordinate : 18.4690° N, 73.8641° E
- Population: 24791
- Pin Code: 411037

II. DESCRIPTION OF STUDY AREA

- Administration area of PMC: 243.95 Sq.Km.
- Area of PMC divided into 76 Prabhag.
- Study area: 40th Prabhag number
- Ward Population: 71924, Network Population: 24791
- Over head Tank capacity: 78 Lakh liters
- Location of Overhead Tank:-- Bibawewadi Gaothan Overhead Tank G9+549 Pune, Maharashtra
- Transmission of water: Khadakwasala dam to WTP and from WTP to Overhead Tank

Ward No. 40 is a ward in Pune Municipal Corporation, Maharashtra state, India. The main reason for the selection of above study area is uneven pressure and tremendous fluctuations observed in the flow rate. A water distribution network is an essential hydraulic infrastructure which is part of water supply system composed of different set of pipe, hydraulic devices and storage devices. Water distribution system connects to source of water using hydraulic components.

III. WORK FLOW

- Data Collection:

1. Population
2. Elevation point of study area

- To work:

1. Population Forecasting
2. Demand
3. Survey Base Line
4. Designing of network on WaterGems
5. Validate
6. Compute

CHAPTER 4

THEORY

- **WATERGEMS**

BentleyWaterGems is effective software with a comprehensive yet easy to use decision support tool for water distribution network. In watergems we can do analysis and designing of hydraulic model, water quality analysis, PDD simulation, Leakage detection, etc. In Maharashtra state for water supply in urban areas municipal corporation works. In this water distribution network is designed in watergems software.

- **HYDRAULIC REVIEW**

Velocity = Flow / Area
Flow=Volume / Time
Pressure Force / Area
Energy = $\{H = (p/y)+z+(v^2/2g)\}$
Head loss

Darcy Weisbach - $h = flv^2/2gd$
Hazen Williams - h = (KL/D116) x (V/C)1.85
Mannings-V = $(1/n) \times R^{2/3} \times S^{1/2}$

- **POPULATION FORECASTING**

The knowledge about the past populations and assumptions about the future are fundamental to planning decisions& the projections are estimates of the population for future years. They illustrate the plausible courses of future population and are developed using normative procedures comprised of mathematical models and analysis of growth rates based on historical data. The projected numbers are best assessed population estimated based on published government/institutional data comprising of the most recent decennial census and pune city development plan ,the design population is estimated considering the future growth patterns of the area under consideration.

The design population is estimated with due regard to all the factors governing the future growth and development of the project area in industrial, commercial, educational, social and administration spheres. Special factors causing sudden immigration or influx of population growth and can also be graphically interpreted wherever necessary.

For estimation of the design population ,various methods have been prescribed in the manual on water supply and treatment published central public health and environmental organization under ministry of urban development ,which are applicable to similar habitats . The fact is that none of the method guarantees the exact precision of population projection, as the cities are dynamic entities and their development changes from time to time depending upon the master planning .city administration, policies, infrastructure creation and socio-economic conditions.

- **POPULATION FORECASTING METHODS:**
  - Arithmetical Increase Method

Rate of change of population with time is assumed to be constant. Applicable to old and large cities with no industrial growth and reached a saturation or maximum development. This method yields lower result for rapidly growing cities.

$P_n = (P_\circ + n.x)$
Where $p_\circ$ = Latest known population;
P_n = prospective population after n decades.
X = Average increases in population per decade.

  - Geometrical Increase Method

Percentage increase in population from decade to decade is assumed to be constant. It gives good result for young cities and expanding rapidly.

$P_n = P_\circ [1 + (r/100)] ^ n$,
r = Geometrical mean percentage increase.

  - Incremental Increase Method

This method is modification of arithmetical increase method and it is suitable for an average size town under normal condition where the growth rate is found to be in increasing order While adopting this method the increase in increment is considered for calculating future population. The incremental increase is determined for each decade from the past population and the average value is added to the present population along with the average rate of increase.

Average of increase in population is found by arithmetical increase method and is to this is added the average of net incremental increase.

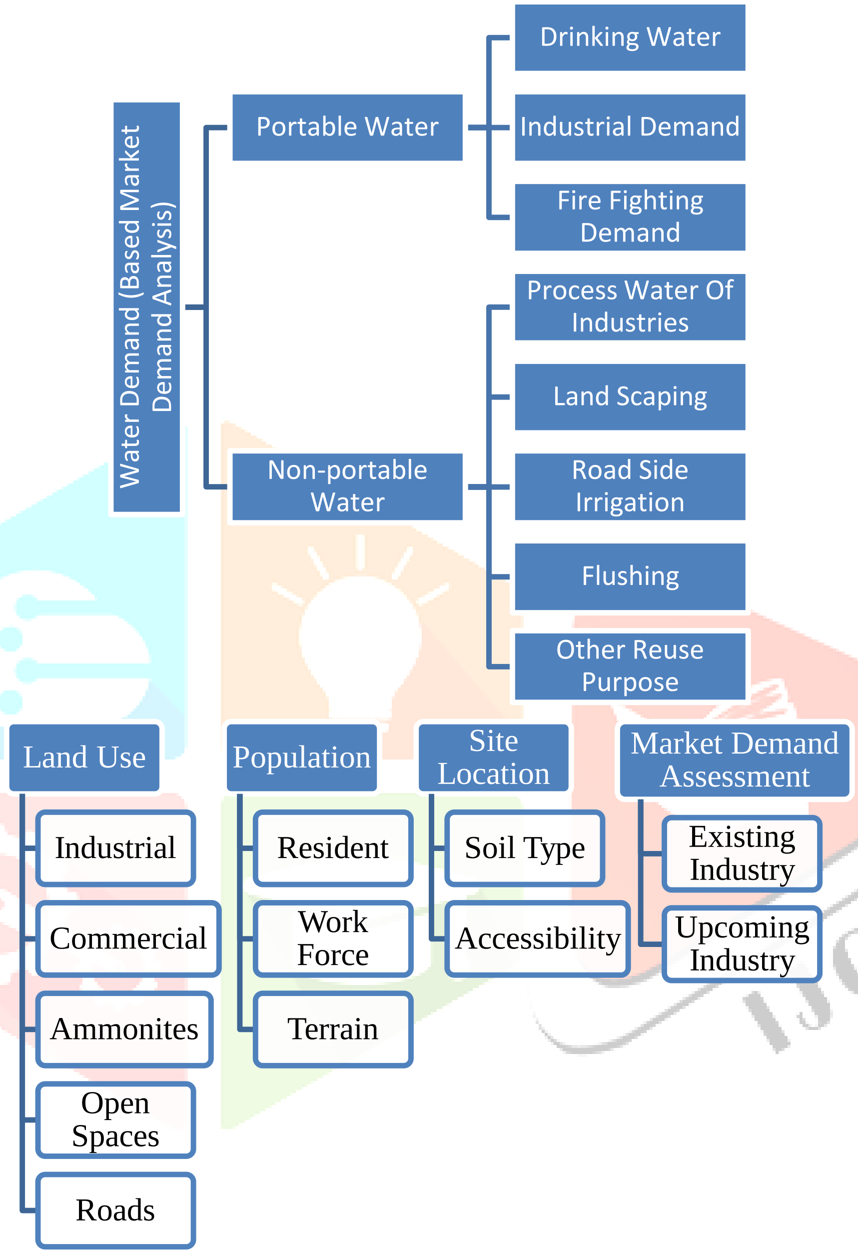
$P_n = P_\circ + n.x + n (n+1) /2 X Y$
Where, Pn increase. Population after nth decade, X = Average increase and Y = Incremental

- **DESIGN PERIOD**

  The design period of thirty years is considered, as per the standard norm of the CPHEEO. The pumps are designed for first stage of the design period, i.e. 15 years. The design years for various stages are as below

  BASE YEAR 2021
  DESIGN YEAR 2023
  ULTIMATE STAGE 2053

- **DEMAND AND ITS FACTORS**



CHAPTER 5

RESULT

- POPULATION FORECASTING

BIBWEWADI WATER SUPPLY SCHEME

POPULATION FORECAST

Sr. No.	Year	Population	Increase in decade	Incremental increase in decade	Rate of growth for decade
1	1971				
1	1981	10860			
			1312		0.121
2	1991	12172		2336	
			3648		0.300
3	2001	15820		5323	
			8971		0.567
4	2011	24791			
	Average		4644.00	3830.00	0.274

A) **Incremental Increase Method**

Pn=P+nx+n(n+1)y/2

P=Population in 2001
X=Av. Increase Per decade
y=Av.Increamental increase Per decade
n=No. of decade

Year	P	X	y	n	Population
2023	24791	4644.00	3830	1.20	35419
2038	24791	4644.00	3830	2.70	56461
2053	24791	4644.00	3830	4.20	86119

B) **Geometrical Method**

Pn=P(1+Rg)n

Rg=Rate of growth for decade

Year	P	Rg	n	Population
2023	24791	0.274	1.20	33151
2038	24791	0.274	2.70	47671
2053	24791	0.274	4.20	68550

C) **Arithmatic Increase Method**

Pn=P+nx

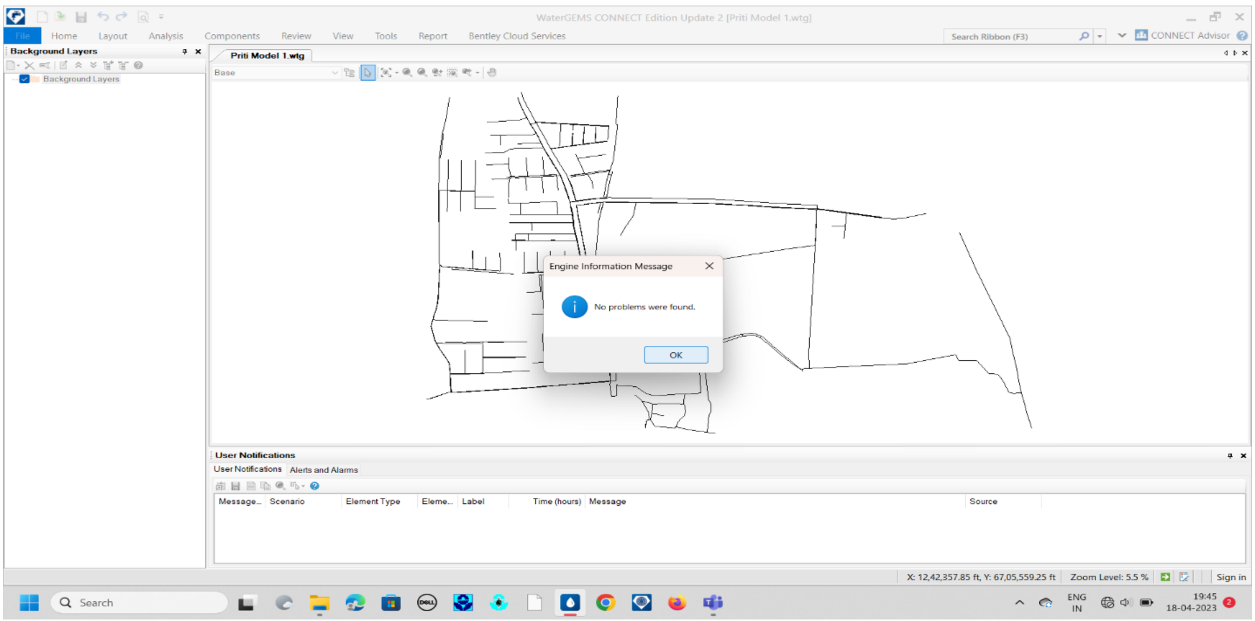
P = Population in 2011
x = Av. Increase Per decade
n = No. of decade

Year	P	X	n	Population
2023	24791	4644	1.20	30364
2038	24791	4644	2.70	37330
2053	24791	4644	4.20	44296

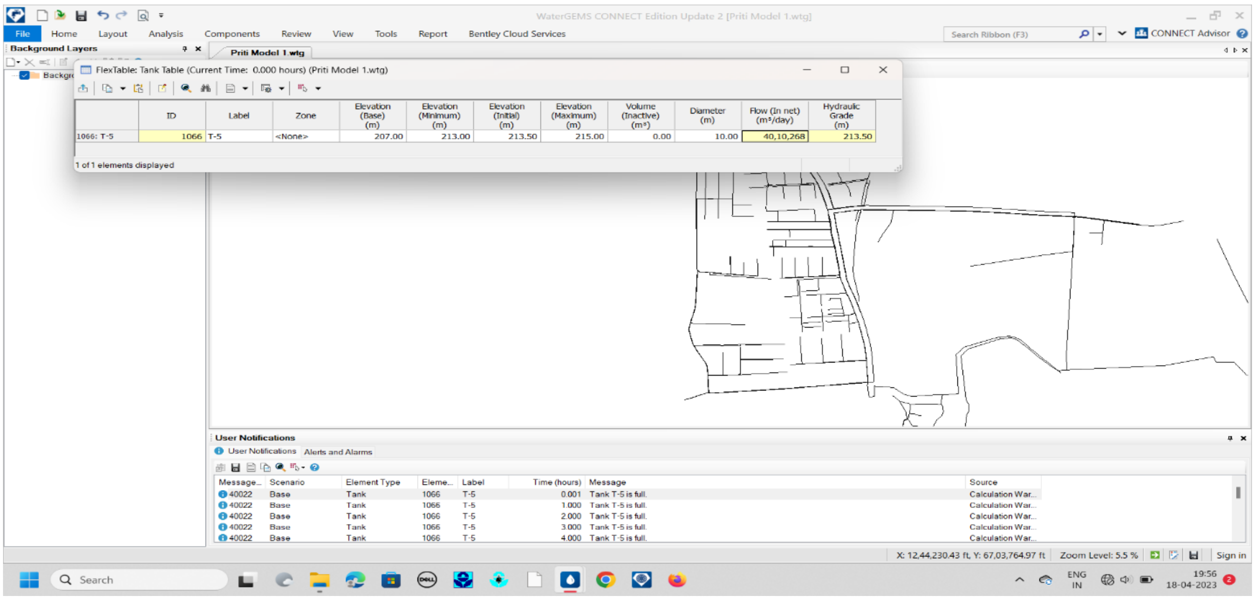
Average Population

Year	Incremental Increase Method	Geometrical Method	Arithmatic Increase Method	Average Population	Remarks
2023	35419	33151	30364	32978	Present
2038	56461	47671	37330	47154	Intermediate
2053	86119	68550	44296	66322	Future Stage

- NETWORK VALIDATION



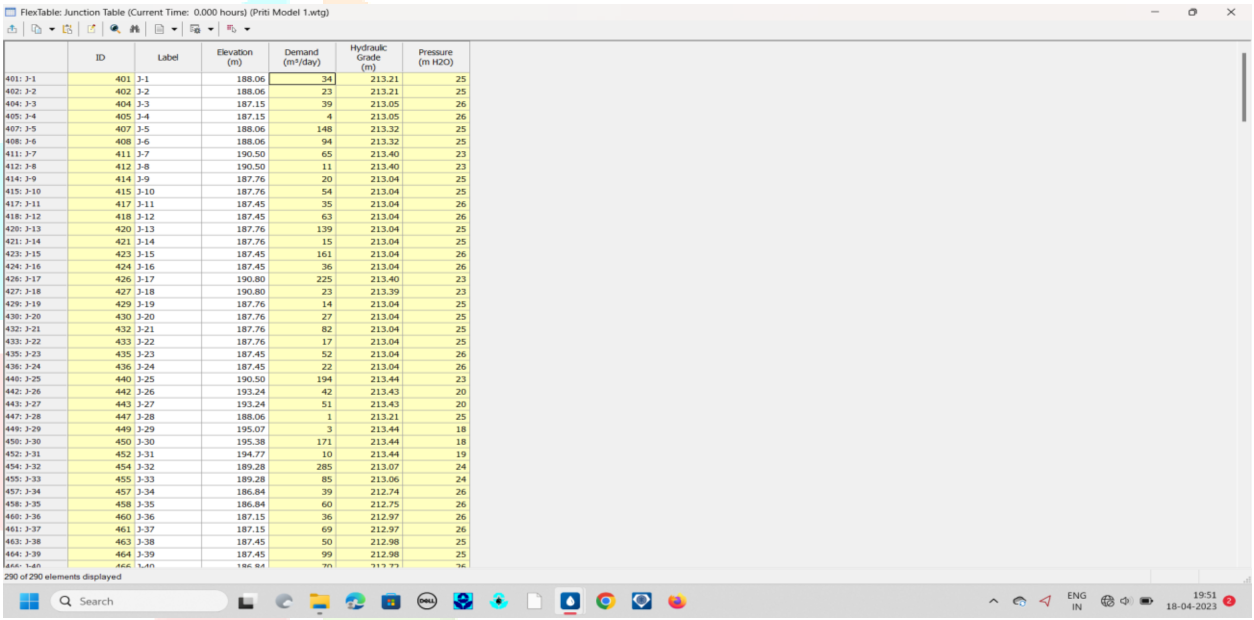
- TANK REPORT



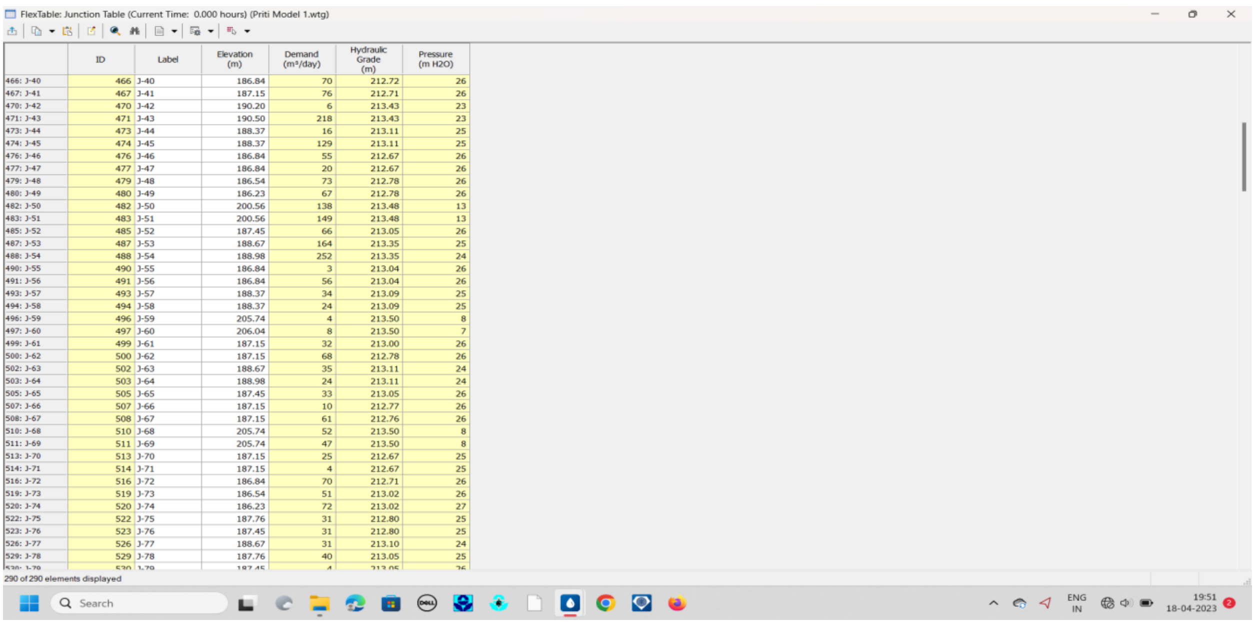
	ID	Label	Zone	Elevation (Base) (m)	Elevation (Minimum) (m)	Elevation (Initial) (m)	Elevation (Maximum) (m)	Volume (Inactive) (m³)	Diameter (m)	Flow (In net) (m³/day)	Hydraulic Grade (m)
1066: T-5	1066	T-5	<None>	207.00	213.00	213.50	215.00	0.00	10.00	40,10,268	213.50

Message...	Scenario	Element Type	Eleme...	Label	Time (hours)	Message	Source
40022	Base	Tank	1066	T-5	0.001	Tank T-5 is full.	Calculation War...
40022	Base	Tank	1066	T-5	1.000	Tank T-5 is full.	Calculation War...
40022	Base	Tank	1066	T-5	2.000	Tank T-5 is full.	Calculation War...
40022	Base	Tank	1066	T-5	3.000	Tank T-5 is full.	Calculation War...
40022	Base	Tank	1066	T-5	4.000	Tank T-5 is full.	Calculation War...

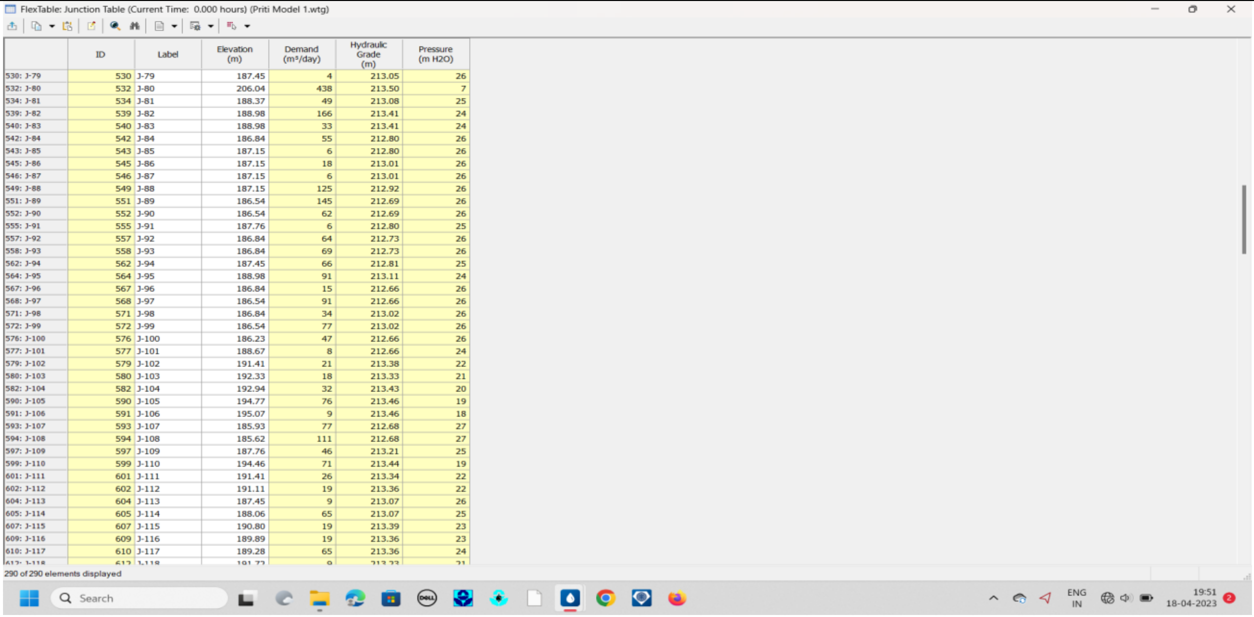
- FLEX TABLE – JUNCTION



	ID	Label	Elevation (m)	Demand (m³/day)	Hydraulic Grade (m)	Pressure (m H2O)
401: J-1	401	J-1	188.06	34	213.21	25
402: J-2	402	J-2	188.06	23	213.21	25
404: J-3	404	J-3	187.15	39	213.05	26
405: J-4	405	J-4	187.15	4	213.05	26
407: J-5	407	J-5	188.06	148	213.32	25
408: J-6	408	J-6	188.06	94	213.32	25
411: J-7	411	J-7	190.50	65	213.40	23
412: J-8	412	J-8	190.50	11	213.40	23
414: J-9	414	J-9	187.76	20	213.04	25
415: J-10	415	J-10	187.76	54	213.04	25
417: J-11	417	J-11	187.45	35	213.04	26
418: J-12	418	J-12	187.45	63	213.04	26
420: J-13	420	J-13	187.76	139	213.04	25
421: J-14	421	J-14	187.76	15	213.04	25
423: J-15	423	J-15	187.45	161	213.04	26
424: J-16	424	J-16	187.45	36	213.04	26
426: J-17	426	J-17	190.80	225	213.40	23
427: J-18	427	J-18	190.80	23	213.39	23
429: J-19	429	J-19	187.76	14	213.04	25
430: J-20	430	J-20	187.76	27	213.04	25
432: J-21	432	J-21	187.76	82	213.04	25
433: J-22	433	J-22	187.76	17	213.04	25
435: J-23	435	J-23	187.45	52	213.04	26
436: J-24	436	J-24	187.45	22	213.04	26
440: J-25	440	J-25	190.50	194	213.44	23
442: J-26	442	J-26	193.24	42	213.43	20
443: J-27	443	J-27	193.24	51	213.43	20
447: J-28	447	J-28	188.06	1	213.21	25
449: J-29	449	J-29	195.07	3	213.44	18
450: J-30	450	J-30	195.38	171	213.44	18
452: J-31	452	J-31	194.77	10	213.44	19
454: J-32	454	J-32	189.28	285	213.07	24
455: J-33	455	J-33	189.28	85	213.06	24
457: J-34	457	J-34	186.84	39	212.74	26
458: J-35	458	J-35	186.84	60	212.75	26
460: J-36	460	J-36	187.15	36	212.97	26
461: J-37	461	J-37	187.15	69	212.97	26
463: J-38	463	J-38	187.45	50	212.98	25
464: J-39	464	J-39	187.45	99	212.98	25



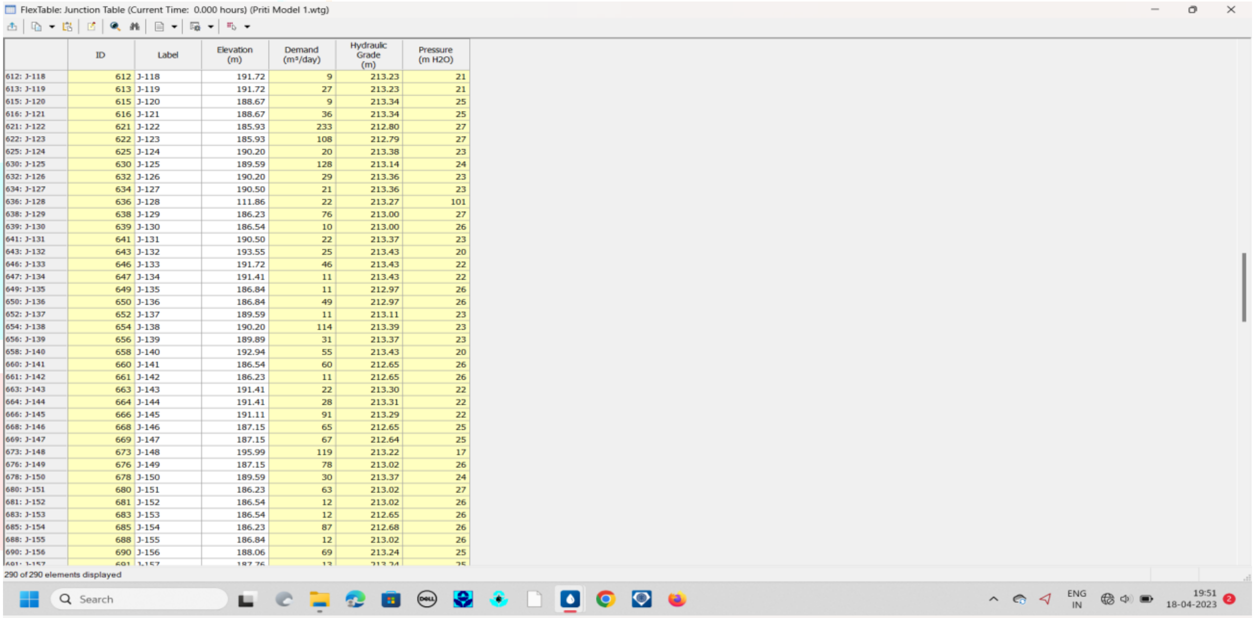
	ID	Label	Elevation (m)	Demand (m³/day)	Hydraulic Grade (m)	Pressure (m H2O)
466: J-40	466	J-40	186.84	70	212.72	26
467: J-41	467	J-41	187.15	76	212.71	26
470: J-42	470	J-42	190.20	6	213.43	23
471: J-43	471	J-43	190.50	218	213.43	23
473: J-44	473	J-44	188.37	16	213.11	25
474: J-45	474	J-45	188.37	129	213.11	25
476: J-46	476	J-46	186.84	55	212.67	26
477: J-47	477	J-47	186.84	20	212.67	26
479: J-48	479	J-48	186.54	73	212.78	26
480: J-49	480	J-49	186.23	67	212.78	26
482: J-50	482	J-50	200.56	138	213.48	13
483: J-51	483	J-51	200.56	149	213.48	13
485: J-52	485	J-52	187.45	66	213.05	26
487: J-53	487	J-53	188.67	164	213.35	25
488: J-54	488	J-54	188.98	252	213.35	24
490: J-55	490	J-55	186.84	3	213.04	26
491: J-56	491	J-56	186.84	56	213.04	26
493: J-57	493	J-57	188.37	34	213.09	25
494: J-58	494	J-58	188.37	24	213.09	25
496: J-59	496	J-59	205.74	4	213.50	8
497: J-60	497	J-60	206.04	8	213.50	7
499: J-61	499	J-61	187.15	32	213.00	26
500: J-62	500	J-62	187.15	68	212.78	26
502: J-63	502	J-63	188.67	35	213.11	24
503: J-64	503	J-64	188.98	24	213.11	24
505: J-65	505	J-65	187.45	33	213.05	26
507: J-66	507	J-66	187.15	10	212.77	26
508: J-67	508	J-67	187.15	61	212.76	26
510: J-68	510	J-68	205.74	52	213.50	8
511: J-69	511	J-69	205.74	47	213.50	8
513: J-70	513	J-70	187.15	25	212.67	25
514: J-71	514	J-71	187.15	4	212.67	25
516: J-72	516	J-72	186.84	70	212.71	26
519: J-73	519	J-73	186.54	51	213.02	26
520: J-74	520	J-74	186.23	72	213.02	27
522: J-75	522	J-75	187.76	31	212.80	25
523: J-76	523	J-76	187.45	31	212.80	25
526: J-77	526	J-77	188.67	31	213.10	24
529: J-78	529	J-78	187.76	40	213.05	25



FlexTable: Junction Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Elevation (m)	Demand (m³/day)	Hydraulic Grade (m)	Pressure (m H2O)
530: J-79	530	J-79	187.45	4	213.05	26
532: J-80	532	J-80	206.04	438	213.50	7
534: J-81	534	J-81	188.37	49	213.08	25
539: J-82	539	J-82	188.98	166	213.41	24
540: J-83	540	J-83	188.98	33	213.41	24
542: J-84	542	J-84	186.84	55	212.80	26
543: J-85	543	J-85	187.15	6	212.80	26
545: J-86	545	J-86	187.15	18	213.01	26
546: J-87	546	J-87	187.15	6	213.01	26
549: J-88	549	J-88	187.15	125	212.92	26
551: J-89	551	J-89	186.54	145	212.69	26
552: J-90	552	J-90	186.54	62	212.69	26
555: J-91	555	J-91	187.76	6	212.80	25
557: J-92	557	J-92	186.84	64	212.73	26
558: J-93	558	J-93	186.84	69	212.73	26
562: J-94	562	J-94	187.45	66	212.81	25
564: J-95	564	J-95	188.98	91	213.11	24
567: J-96	567	J-96	186.84	15	212.66	26
568: J-97	568	J-97	186.54	91	212.66	26
571: J-98	571	J-98	186.84	34	213.02	26
572: J-99	572	J-99	186.54	77	213.02	26
576: J-100	576	J-100	186.23	47	212.66	26
577: J-101	577	J-101	188.67	8	212.66	24
579: J-102	579	J-102	191.41	21	213.38	22
580: J-103	580	J-103	192.33	18	213.33	21
582: J-104	582	J-104	192.94	32	213.43	20
590: J-105	590	J-105	194.77	76	213.46	19
591: J-106	591	J-106	195.07	9	213.46	18
593: J-107	593	J-107	185.93	77	212.68	27
594: J-108	594	J-108	185.62	111	212.68	27
597: J-109	597	J-109	187.76	46	213.21	25
599: J-110	599	J-110	194.46	71	213.44	19
601: J-111	601	J-111	191.41	26	213.34	22
602: J-112	602	J-112	191.11	19	213.36	22
604: J-113	604	J-113	187.45	9	213.07	26
605: J-114	605	J-114	188.06	65	213.07	25
607: J-115	607	J-115	190.80	19	213.39	23
609: J-116	609	J-116	189.89	19	213.36	23
610: J-117	610	J-117	189.28	65	213.36	24

290 of 290 elements displayed



FlexTable: Junction Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

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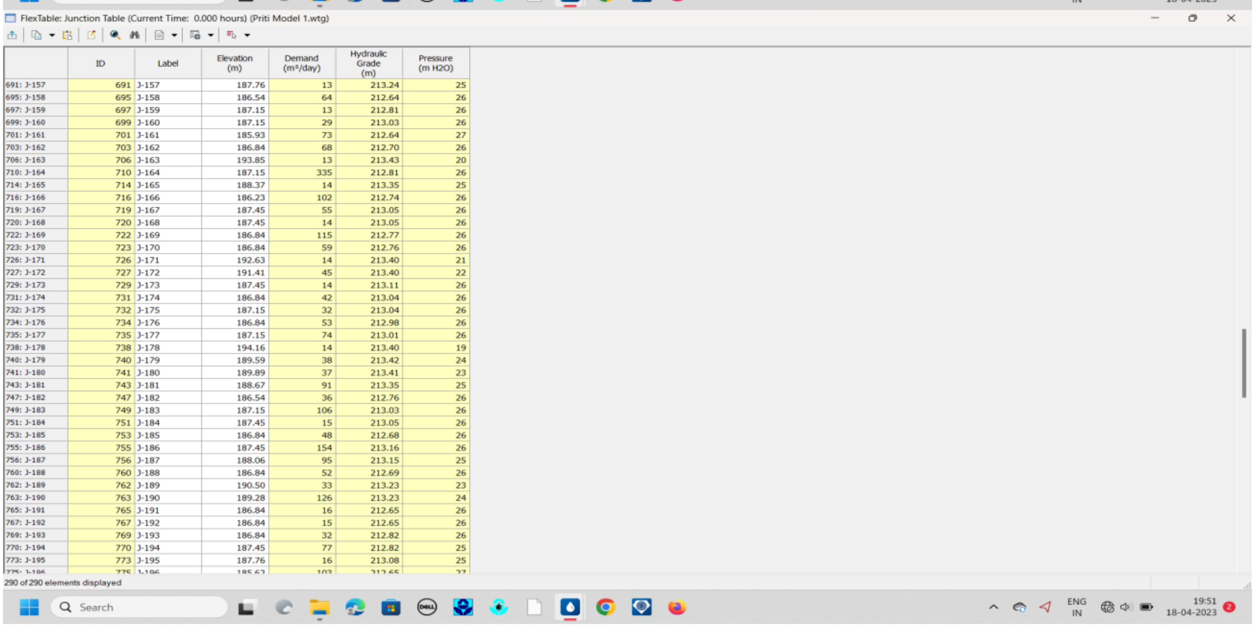
612: J-118	612	J-118	191.72	9	213.23	21
613: J-119	613	J-119	191.72	27	213.23	21
615: J-120	615	J-120	188.67	9	213.34	25
616: J-121	616	J-121	188.67	36	213.34	25
621: J-122	621	J-122	185.93	233	212.80	27
622: J-123	622	J-123	185.93	108	212.79	27
625: J-124	625	J-124	190.20	20	213.38	23
630: J-125	630	J-125	189.59	128	213.14	24
632: J-126	632	J-126	190.20	29	213.36	23
634: J-127	634	J-127	190.50	21	213.36	23
636: J-128	636	J-128	111.86	22	213.27	101
638: J-129	638	J-129	186.23	76	213.00	27
639: J-130	639	J-130	186.54	10	213.00	26
641: J-131	641	J-131	190.50	22	213.37	23
643: J-132	643	J-132	193.55	25	213.43	20
646: J-133	646	J-133	191.72	46	213.43	22
647: J-134	647	J-134	191.41	11	213.43	22
649: J-135	649	J-135	186.84	11	212.97	26
650: J-136	650	J-136	186.84	49	212.97	26
652: J-137	652	J-137	189.59	11	213.11	23
654: J-138	654	J-138	190.20	114	213.39	23
656: J-139	656	J-139	189.89	31	213.37	23
658: J-140	658	J-140	192.94	55	213.43	20
660: J-141	660	J-141	186.54	60	212.65	26
661: J-142	661	J-142	186.23	11	212.65	26
663: J-143	663	J-143	191.41	22	213.30	22
664: J-144	664	J-144	191.41	28	213.31	22
666: J-145	666	J-145	191.11	91	213.29	22
668: J-146	668	J-146	187.15	65	212.65	25
669: J-147	669	J-147	187.15	67	212.64	25
673: J-148	673	J-148	195.99	119	213.22	17
676: J-149	676	J-149	187.15	78	213.02	26
678: J-150	678	J-150	189.59	30	213.37	24
680: J-151	680	J-151	186.23	63	213.02	27
681: J-152	681	J-152	186.54	12	213.02	26
683: J-153	683	J-153	186.54	12	212.65	26
685: J-154	685	J-154	186.23	87	212.68	26
688: J-155	688	J-155	186.84	12	213.02	26
690: J-156	690	J-156	188.06	69	213.24	25

290 of 290 elements displayed



FlexTable: Junction Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Elevation (m)	Demand (m³/day)	Hydraulic Grade (m)	Pressure (m H2O)
691: J-157	691	J-157	187.76	13	213.24	25
695: J-158	695	J-158	186.54	64	212.64	26
697: J-159	697	J-159	187.15	13	212.81	26
699: J-160	699	J-160	187.15	29	213.03	26
701: J-161	701	J-161	185.93	73	212.64	27
703: J-162	703	J-162	186.84	68	212.70	26
706: J-163	706	J-163	193.85	13	213.43	20
710: J-164	710	J-164	187.15	335	212.81	26
714: J-165	714	J-165	188.37	14	213.35	25
716: J-166	716	J-166	186.23	102	212.74	26
719: J-167	719	J-167	187.45	55	213.05	26
720: J-168	720	J-168	187.45	14	213.05	26
722: J-169	722	J-169	186.84	115	212.77	26
723: J-170	723	J-170	186.84	59	212.76	26
726: J-171	726	J-171	192.63	14	213.40	21
727: J-172	727	J-172	191.41	45	213.40	22
729: J-173	729	J-173	187.45	14	213.11	26
731: J-174	731	J-174	186.84	42	213.04	26
732: J-175	732	J-175	187.15	32	213.04	26
734: J-176	734	J-176	186.84	53	212.98	26
735: J-177	735	J-177	187.15	74	213.01	26
738: J-178	738	J-178	194.16	14	213.40	19
740: J-179	740	J-179	189.59	38	213.42	24
741: J-180	741	J-180	189.89	37	213.41	23
743: J-181	743	J-181	188.67	91	213.35	25
747: J-182	747	J-182	186.54	36	212.76	26
749: J-183	749	J-183	187.15	106	213.03	26
751: J-184	751	J-184	187.45	15	213.05	26
753: J-185	753	J-185	186.84	48	212.68	26
755: J-186	755	J-186	187.45	154	213.16	26
756: J-187	756	J-187	188.06	95	213.15	25
760: J-188	760	J-188	186.84	52	212.69	26
762: J-189	762	J-189	190.50	33	213.23	23
763: J-190	763	J-190	189.28	126	213.23	24
765: J-191	765	J-191	186.84	16	212.65	26
767: J-192	767	J-192	186.84	15	212.65	26
769: J-193	769	J-193	186.84	32	212.82	26
770: J-194	770	J-194	187.45	77	212.82	25
773: J-195	773	J-195	187.76	16	213.08	25

290 of 290 elements displayed

FlexTable: Junction Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Elevation (m)	Demand (m³/day)	Hydraulic Grade (m)	Pressure (m H2O)
775: J-196	775	J-196	185.62	103	212.65	27
776: J-197	776	J-197	185.93	16	212.65	27
778: J-198	778	J-198	187.76	16	213.07	25
780: J-199	780	J-199	186.54	16	212.76	26
783: J-200	783	J-200	187.15	16	212.68	25
785: J-201	785	J-201	186.84	37	213.03	26
787: J-202	787	J-202	188.06	17	213.09	25
789: J-203	789	J-203	189.59	152	213.40	24
791: J-204	791	J-204	188.06	76	212.97	25
792: J-205	792	J-205	187.76	17	212.97	25
795: J-206	795	J-206	186.54	62	212.68	26
798: J-207	798	J-207	188.06	18	213.05	25
799: J-208	799	J-208	187.45	92	213.05	26
801: J-209	801	J-209	186.84	17	212.71	26
803: J-210	803	J-210	186.54	18	212.67	26
808: J-211	808	J-211	186.84	18	213.05	26
811: J-212	811	J-212	188.67	18	213.07	24
813: J-213	813	J-213	188.67	122	213.14	24
816: J-214	816	J-214	189.28	45	213.38	24
818: J-215	818	J-215	188.37	165	213.40	25
823: J-216	823	J-216	187.76	28	213.08	25
825: J-217	825	J-217	187.45	38	213.21	26
827: J-218	827	J-218	185.93	38	212.64	27
831: J-219	831	J-219	185.32	39	212.67	27
832: J-220	832	J-220	185.62	92	212.67	27
834: J-221	834	J-221	186.54	19	212.69	26
838: J-222	838	J-222	191.72	74	213.42	22
840: J-223	840	J-223	187.15	20	212.73	26
842: J-224	842	J-224	188.37	20	212.80	24
844: J-225	844	J-225	185.01	20	212.67	28
846: J-226	846	J-226	188.67	20	212.80	24
848: J-227	848	J-227	188.37	121	213.07	25
851: J-228	851	J-228	187.15	76	213.00	26
856: J-229	856	J-229	189.28	124	213.26	24
857: J-230	857	J-230	188.98	94	213.25	24
863: J-231	863	J-231	186.23	21	212.76	26
865: J-232	865	J-232	186.54	43	212.64	26
869: J-233	869	J-233	186.84	44	212.77	26
872: J-234	872	J-234	187.15	22	212.70	25

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FlexTable: Junction Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Elevation (m)	Demand (m³/day)	Hydraulic Grade (m)	Pressure (m H2O)
874: J-235	874	J-235	187.15	22	212.68	25
877: J-236	877	J-236	186.54	23	212.68	26
879: J-237	879	J-237	186.54	153	212.68	26
882: J-238	882	J-238	185.62	23	212.66	27
884: J-239	884	J-239	186.23	90	213.00	27
886: J-240	886	J-240	187.45	33	212.99	25
889: J-241	889	J-241	186.23	24	212.74	26
891: J-242	891	J-242	189.28	197	213.28	24
894: J-243	894	J-243	187.15	24	213.01	26
896: J-244	896	J-244	187.45	35	212.96	25
898: J-245	898	J-245	187.15	24	212.97	26
900: J-246	900	J-246	188.37	25	213.10	25
902: J-247	902	J-247	186.84	24	212.98	26
904: J-248	904	J-248	186.84	25	212.68	26
906: J-249	906	J-249	186.23	25	212.79	27
908: J-250	908	J-250	187.45	123	213.35	26
910: J-251	910	J-251	187.15	25	213.04	26
912: J-252	912	J-252	185.32	52	212.68	27
916: J-253	916	J-253	186.54	36	212.72	26
924: J-254	924	J-254	186.23	111	212.66	26
925: J-255	925	J-255	186.54	27	212.66	26
927: J-256	927	J-256	188.67	89	213.34	25
929: J-257	929	J-257	202.08	77	213.48	11
935: J-258	935	J-258	186.84	245	212.96	26
936: J-259	936	J-259	187.15	186	213.02	26
939: J-260	939	J-260	193.55	95	213.45	20
942: J-261	942	J-261	188.06	277	213.35	25
949: J-262	949	J-262	187.76	28	213.14	25
951: J-263	951	J-263	202.08	74	213.48	11
957: J-264	957	J-264	186.23	30	212.80	27
959: J-265	959	J-265	185.93	105	212.77	27
960: J-266	960	J-266	185.62	100	212.77	27
965: J-267	965	J-267	188.67	30	213.24	25
967: J-268	967	J-268	188.98	31	213.23	24
973: J-269	973	J-269	195.68	141	213.46	18
975: J-270	975	J-270	189.28	34	213.25	24
977: J-271	977	J-271	188.06	34	213.24	25
982: J-272	982	J-272	186.54	37	212.74	26
984: J-273	984	J-273	186.23	37	212.78	26

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FlexTable: Junction Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Elevation (m)	Demand (m³/day)	Hydraulic Grade (m)	Pressure (m H2O)
912: J-252	912	J-252	185.32	52	212.68	27
916: J-253	916	J-253	186.54	36	212.72	26
924: J-254	924	J-254	186.23	111	212.66	26
925: J-255	925	J-255	186.54	27	212.66	26
927: J-256	927	J-256	188.67	89	213.34	25
929: J-257	929	J-257	202.08	77	213.48	11
935: J-258	935	J-258	186.84	245	212.96	26
936: J-259	936	J-259	187.15	186	213.02	26
939: J-260	939	J-260	193.55	95	213.45	20
942: J-261	942	J-261	188.06	277	213.35	25
949: J-262	949	J-262	187.76	28	213.14	25
951: J-263	951	J-263	202.08	74	213.48	11
957: J-264	957	J-264	186.23	30	212.80	27
959: J-265	959	J-265	185.93	105	212.77	27
960: J-266	960	J-266	185.62	100	212.77	27
965: J-267	965	J-267	188.67	30	213.24	25
967: J-268	967	J-268	188.98	31	213.23	24
973: J-269	973	J-269	195.68	141	213.46	18
975: J-270	975	J-270	189.28	34	213.25	24
977: J-271	977	J-271	188.06	34	213.24	25
982: J-272	982	J-272	186.54	37	212.74	26
984: J-273	984	J-273	186.23	37	212.78	26
988: J-274	988	J-274	185.93	37	212.73	27
991: J-275	991	J-275	188.37	75	213.40	25
998: J-276	998	J-276	187.15	39	212.97	26
1003: J-277	1003	J-277	185.93	42	212.67	27
1006: J-278	1006	J-278	195.68	489	213.45	18
1007: J-279	1007	J-279	199.34	43	213.45	14
1010: J-280	1010	J-280	184.71	44	212.77	28
1012: J-281	1012	J-281	187.76	90	213.10	25
1021: J-282	1021	J-282	188.37	49	213.13	25
1025: J-283	1025	J-283	186.84	57	212.94	26
1028: J-284	1028	J-284	185.93	61	212.66	27
1031: J-285	1031	J-285	186.54	64	212.78	26
1037: J-286	1037	J-286	188.37	165	213.34	25
1041: J-287	1041	J-287	184.40	89	212.91	28
1049: J-288	1049	J-288	186.84	104	213.38	26
1051: J-289	1051	J-289	197.21	108	213.09	16
1055: J-290	1055	J-290	186.84	201	213.44	27

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- FLEX TABLE – PIPES

FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
400: 0 (Polylin	400	0 (Polyline)-338	3	J-1	J-2	150.0	Ductile Iron	257	0.17	0.000
409: 0 (Polylin	409	0 (Polyline)-302	3	J-1	J-2	150.0	Ductile Iron	234	0.15	0.000
446: 0 (Polylin	446	0 (Polyline)-297	4	J-1	J-28	150.0	Ductile Iron	1	0.00	0.000
854: 0 (Polylin	854	0 (Polyline)-301	63	J-1	J-186	300.0	Ductile Iron	2,870	0.47	0.001
403: 0 (Polylin	403	0 (Polyline)-214	1	J-3	J-4	300.0	Ductile Iron	1,140	0.19	0.000
504: 0 (Polylin	504	0 (Polyline)-215	11	J-4	J-65	300.0	Ductile Iron	1,136	0.19	0.000
406: 0 (Polylin	406	0 (Polyline)-304	1	J-5	J-6	150.0	Ductile Iron	22	0.01	0.000
438: 0 (Polylin	438	0 (Polyline)-303	3	J-5	J-1	152.4	Ductile Iron	3,479	2.21	0.032
1045: 0 (Polyli	1045	0 (Polyline)-362	277	J-6	J-286	150.0	Ductile Iron	116	0.08	0.000
410: 0 (Polylin	410	0 (Polyline)-144	2	J-7	J-8	150.0	Ductile Iron	229	0.15	0.000
962: 0 (Polylin	962	0 (Polyline)-176	90	J-7	J-203	250.0	Ductile Iron	193	0.05	0.000
963: 0 (Polylin	963	0 (Polyline)-191	91	J-7	J-203	200.0	Ductile Iron	107	0.04	0.000
653: 0 (Polylin	653	0 (Polyline)-163	31	J-8	J-138	150.0	Ductile Iron	218	0.14	0.000
413: 0 (Polylin	413	0 (Polyline)-195	3	J-9	J-10	152.4	Ductile Iron	147	0.09	0.000
617: 0 (Polylin	617	0 (Polyline)-196	28	J-9	J-14	300.0	Ductile Iron	465	0.08	0.000
619: 0 (Polylin	619	0 (Polyline)-232	28	J-10	J-13	100.0	Ductile Iron	23	0.03	0.000
627: 0 (Polylin	627	0 (Polyline)-139	28	J-10	J-65	250.0	Ductile Iron	432	0.10	0.000
748: 0 (Polylin	748	0 (Polyline)-27	44	J-10	J-183	150.0	Ductile Iron	283	0.19	0.000
416: 0 (Polylin	416	0 (Polyline)-207	1	J-11	J-12	152.4	Ductile Iron	66	0.04	0.000
574: 0 (Polylin	574	0 (Polyline)-208	23	J-11	J-23	150.0	Ductile Iron	69	0.05	0.000
933: 0 (Polylin	933	0 (Polyline)-206	81	J-12	J-15	250.0	Ductile Iron	121	0.03	0.000
419: 0 (Polylin	419	0 (Polyline)-198	1	J-13	J-14	152.4	Ductile Iron	156	0.10	0.000
535: 0 (Polylin	535	0 (Polyline)-233	15	J-13	J-20	100.0	Ductile Iron	10	0.01	0.000
618: 0 (Polylin	618	0 (Polyline)-54	28	J-13	J-10	250.0	Ductile Iron	258	0.06	0.000
1034: 0 (Polyli	1034	0 (Polyline)-249	197	J-13	J-239	100.0	Ductile Iron	78	0.11	0.000
537: 0 (Polylin	537	0 (Polyline)-197	15	J-14	J-19	300.0	Ductile Iron	294	0.05	0.000
422: 0 (Polylin	422	0 (Polyline)-204	1	J-15	J-16	152.4	Ductile Iron	145	0.09	0.000
586: 0 (Polylin	586	0 (Polyline)-119	24	J-15	J-21	250.0	Ductile Iron	123	0.03	0.000
859: 0 (Polylin	859	0 (Polyline)-129	62	J-15	J-201	150.0	Ductile Iron	199	0.13	0.000
932: 0 (Polylin	932	0 (Polyline)-236	81	J-15	J-12	100.0	Ductile Iron	11	0.02	0.000
931: 0 (Polylin	931	0 (Polyline)-203	81	J-16	J-11	250.0	Ductile Iron	100	0.02	0.000
425: 0 (Polylin	425	0 (Polyline)-142	2	J-17	J-18	152.4	Ductile Iron	822	0.52	0.002
445: 0 (Polylin	445	0 (Polyline)-143	9	J-17	J-7	400.0	Ductile Iron	594	0.05	0.000
1057: 0 (Polyli	1057	0 (Polyline)-141	653	J-17	J-54	300.0	Ductile Iron	731	0.12	0.000
707: 0 (Polylin	707	0 (Polyline)-154	39	J-18	J-102	150.0	Ductile Iron	287	0.19	0.000
428: 0 (Polylin	428	0 (Polyline)-199	2	J-19	J-20	250.0	Ductile Iron	106	0.03	0.000
588: 0 (Polylin	588	0 (Polyline)-200	24	J-19	J-22	250.0	Ductile Iron	174	0.04	0.000
536: 0 (Polylin	536	0 (Polyline)-118	15	J-20	J-13	250.0	Ductile Iron	112	0.03	0.000
584: 0 (Polylin	584	0 (Polyline)-234	24	J-20	J-21	100.0	Ductile Iron	16	0.02	0.000

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
431: 0 (Polylin	431	0 (Polyline)-201	1	J-21	J-22	152.4	Ductile Iron	76	0.05	0.000
585: 0 (Polylin	585	0 (Polyline)-120	24	J-21	J-20	250.0	Ductile Iron	184	0.04	0.000
587: 0 (Polylin	587	0 (Polyline)-235	25	J-21	J-15	100.0	Ductile Iron	11	0.02	0.000
1019: 0 (Polyli	1019	0 (Polyline)-123	143	J-21	J-99	100.0	Ductile Iron	61	0.09	0.000
583: 0 (Polylin	583	0 (Polyline)-202	24	J-22	J-16	250.0	Ductile Iron	81	0.02	0.000
434: 0 (Polylin	434	0 (Polyline)-209	2	J-23	J-24	152.4	Ductile Iron	285	0.18	0.000
573: 0 (Polylin	573	0 (Polyline)-205	23	J-23	J-12	250.0	Ductile Iron	261	0.06	0.000
804: 0 (Polylin	804	0 (Polyline)-210	53	J-23	J-177	100.0	Ductile Iron	129	0.19	0.001
437: 0 (Polylin	437	0 (Polyline)-52	1	J-24	J-23	152.4	Ductile Iron	357	0.23	0.000
439: 0 (Polylin	439	0 (Polyline)-213	3	J-25	J-17	152.4	Ductile Iron	2,372	1.51	0.016
524: 0 (Polylin	524	0 (Polyline)-70	13	J-25	J-42	400.0	Ductile Iron	5,187	0.48	0.001
441: 0 (Polylin	441	0 (Polyline)-333	5	J-26	J-27	150.0	Ductile Iron	71	0.05	0.000
444: 0 (Polylin	444	0 (Polyline)-344	3	J-26	J-27	100.0	Ductile Iron	29	0.04	0.000
642: 0 (Polylin	642	0 (Polyline)-343	36	J-27	J-132	100.0	Ductile Iron	12	0.02	0.000
644: 0 (Polylin	644	0 (Polyline)-331	37	J-27	J-132	100.0	Ductile Iron	12	0.02	0.000
448: 0 (Polylin	448	0 (Polyline)-281	4	J-29	J-30	300.0	Ductile Iron	66	0.01	0.000
1023: 0 (Polyli	1023	0 (Polyline)-307	160	J-30	J-222	675.0	Ductile Iron	7,670	0.25	0.000
451: 0 (Polylin	451	0 (Polyline)-358	4	J-31	J-29	200.0	Ductile Iron	63	0.02	0.000
453: 0 (Polylin	453	0 (Polyline)-261	4	J-32	J-33	200.0	Ductile Iron	670	0.25	0.000
945: 0 (Polylin	945	0 (Polyline)-212	84	J-32	J-61	300.0	Ductile Iron	2,828	0.46	0.001
993: 0 (Polylin	993	0 (Polyline)-211	116	J-32	J-3	300.0	Ductile Iron	1,180	0.19	0.000
914: 0 (Polylin	914	0 (Polyline)-72	78	J-33	J-78	200.0	Ductile Iron	457	0.17	0.000
971: 0 (Polylin	971	0 (Polyline)-63	169	J-33	J-208	150.0	Ductile Iron	128	0.08	0.000
456: 0 (Polylin	456	0 (Polyline)-179	5	J-34	J-35	200.0	Ductile Iron	873	0.32	0.001
952: 0 (Polylin	952	0 (Polyline)-180	86	J-35	J-62	200.0	Ductile Iron	635	0.23	0.000
459: 0 (Polylin	459	0 (Polyline)-50	5	J-36	J-37	150.0	Ductile Iron	71	0.05	0.000
850: 0 (Polylin	850	0 (Polyline)-51	60	J-37	J-228	150.0	Ductile Iron	328	0.21	0.000
462: 0 (Polylin	462	0 (Polyline)-272	6	J-38	J-39	150.0	Ductile Iron	230	0.15	0.000
1018: 0 (Polyli	1018	0 (Polyline)-316	142	J-38	J-259	150.0	Ductile Iron	280	0.18	0.000
955: 0 (Polylin	955	0 (Polyline)-325	88	J-39	J-204	100.0	Ductile Iron	46	0.07	0.000
997: 0 (Polylin	997	0 (Polyline)-275	114	J-39	J-276	100.0	Ductile Iron	39	0.06	0.000
465: 0 (Polylin	465	0 (Polyline)-182	6	J-40	J-41	152.4	Ductile Iron	535	0.34	0.001
468: 0 (Polylin	468	0 (Polyline)-217	7	J-40	J-41	152.4	Ductile Iron	499	0.32	0.001
515: 0 (Polylin	515	0 (Polyline)-184	13	J-40	J-72	150.0	Ductile Iron	308	0.20	0.000
517: 0 (Polylin	517	0 (Polyline)-48	12	J-40	J-72	150.0	Ductile Iron	312	0.20	0.000
979: 0 (Polylin	979	0 (Polyline)-218	106	J-41	J-89	100.0	Ductile Iron	79	0.12	0.000
980: 0 (Polylin	980	0 (Polyline)-183	105	J-41	J-89	250.0	Ductile Iron	880	0.21	0.000
469: 0 (Polylin	469	0 (Polyline)-368	6	J-42	J-43	400.0	Ductile Iron	5,181	0.48	0.001
1056: 0 (Polyli	1056	0 (Polyline)-369	639	J-43	J-32	400.0	Ductile Iron	4,963	0.46	0.001

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
472: 0 (Polylin	472	0 (Polyline)-284	7	J-44	J-45	100.0	Ductile Iron	30	0.04	0.000
728: 0 (Polylin	728	0 (Polyline)-310	42	J-44	J-173	100.0	Ductile Iron	14	0.02	0.000
820: 0 (Polylin	820	0 (Polyline)-296	55	J-45	J-213	100.0	Ductile Iron	125	0.18	0.001
1011: 0 (Polyli	1011	0 (Polyline)-273	132	J-45	J-281	100.0	Ductile Iron	45	0.07	0.000
1013: 0 (Polyli	1013	0 (Polyline)-326	133	J-45	J-281	100.0	Ductile Iron	45	0.07	0.000
475: 0 (Polylin	475	0 (Polyline)-49	7	J-46	J-47	150.0	Ductile Iron	38	0.02	0.000
781: 0 (Polylin	781	0 (Polyline)-75	49	J-46	J-100	100.0	Ductile Iron	78	0.12	0.000
852: 0 (Polylin	852	0 (Polyline)-59	61	J-46	J-70	152.4	Ductile Iron	29	0.02	0.000
802: 0 (Polylin	802	0 (Polyline)-9	52	J-47	J-210	100.0	Ductile Iron	18	0.03	0.000
478: 0 (Polylin	478	0 (Polyline)-341	7	J-48	J-49	100.0	Ductile Iron	131	0.19	0.001
860: 0 (Polylin	860	0 (Polyline)-323	64	J-48	J-169	150.0	Ductile Iron	216	0.14	0.000
861: 0 (Polylin	861	0 (Polyline)-279	63	J-48	J-169	100.0	Ductile Iron	75	0.11	0.000
1030: 0 (Polyli	1030	0 (Polyline)-265	190	J-49	J-285	200.0	Ductile Iron	64	0.02	0.000
481: 0 (Polylin	481	0 (Polyline)-334	7	J-50	J-51	200.0	Ductile Iron	149	0.05	0.000
928: 0 (Polylin	928	0 (Polyline)-295	86	J-50	J-257	300.0	Ductile Iron	901	0.15	0.000
1039: 0 (Polyli	1039	0 (Polyline)-274	316	J-50	J-269	300.0	Ductile Iron	614	0.10	0.000
1044: 0 (Polyli	1044	0 (Polyline)-305	342	J-51	J-30	675.0	Ductile Iron	7,907	0.26	0.000
484: 0 (Polylin	484	0 (Polyline)-55	8	J-52	J-24	250.0	Ductile Iron	821	0.19	0.000
847: 0 (Polylin	847	0 (Polyline)-226	60	J-52	J-227	100.0	Ductile Iron	109	0.16	0.000
486: 0 (Polylin	486	0 (Polyline)-53	8	J-53	J-54	400.0	Ductile Iron	253	0.02	0.000
713: 0 (Polylin	713	0 (Polyline)-19	40	J-53	J-165	152.4	Ductile Iron	14	0.01	0.000
1047: 0 (Polyli	1047	0 (Polyline)-224	365	J-53	J-261	100.0	Ductile Iron	4	0.01	0.000
742: 0 (Polylin	742	0 (Polyline)-194	43	J-54	J-181	150.0	Ductile Iron	113	0.07	0.000
489: 0 (Polylin	489	0 (Polyline)-132	8	J-55	J-56	200.0	Ductile Iron	3	0.00	0.000
909: 0 (Polylin	909	0 (Polyline)-134	75	J-56	J-251	100.0	Ductile Iron	25	0.04	0.000
940: 0 (Polylin	940	0 (Polyline)-133	82	J-56	J-174	200.0	Ductile Iron	84	0.03	0.000
492: 0 (Polylin	492	0 (Polyline)-79	8	J-57	J-58	100.0	Ductile Iron	135	0.20	0.001
875: 0 (Polylin	875	0 (Polyline)-80	66	J-57	J-114	100.0	Ductile Iron	108	0.16	0.000
533: 0 (Polylin	533	0 (Polyline)-76	15	J-58	J-81	100.0	Ductile Iron	94	0.14	0.000
786: 0 (Polylin	786	0 (Polyline)-10	49	J-58	J-202	100.0	Ductile Iron	17	0.02	0.000
495: 0 (Polylin	495	0 (Polyline)-259	10	J-59	J-60	675.0	Ductile Iron	8,933	0.29	0.000
531: 0 (Polylin	531	0 (Polyline)-260	13	J-60	J-80	675.0	Ductile Iron	8,925	0.29	0.000
498: 0 (Polylin	498	0 (Polyline)-216	10	J-61	J-62	152.4	Ductile Iron	2,796	1.77	0.022
547: 0 (Polylin	547	0 (Polyline)-34	18	J-62	J-66	300.0	Ductile Iron	1,796	0.29	0.000
953: 0 (Polylin	953	0 (Polyline)-193	86	J-62	J-35	150.0	Ductile Iron	297	0.19	0.000
501: 0 (Polylin	501	0 (Polyline)-104	11	J-63	J-64	100.0	Ductile Iron	133	0.20	0.001
899: 0 (Polylin	899	0 (Polyline)-98	73	J-63	J-246	100.0	Ductile Iron	25	0.04	0.000
651: 0 (Polylin	651	0 (Polyline)-105	32	J-64	J-137	100.0	Ductile Iron	11	0.02	0.000
626: 0 (Polylin	626	0 (Polyline)-181	29	J-65	J-9	300.0	Ductile Iron	632	0.10	0.000

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
628: 0 (Polylin	628	0 (Polyline)-231	29	J-65	J-10	100.0	Ductile Iron	39	0.06	0.000
506: 0 (Polylin	506	0 (Polyline)-150	11	J-66	J-67	250.0	Ductile Iron	1,786	0.42	0.001
946: 0 (Polylin	946	0 (Polyline)-152	85	J-67	J-40	150.0	Ductile Iron	355	0.23	0.001
947: 0 (Polylin	947	0 (Polyline)-151	84	J-67	J-40	250.0	Ductile Iron	1,370	0.32	0.001
509: 0 (Polylin	509	0 (Polyline)-359	11	J-68	J-69	675.0	Ductile Iron	8,029	0.26	0.000
1008: 0 (Polyli	1008	0 (Polyline)-360	128	J-69	J-263	675.0	Ductile Iron	7,981	0.26	0.000
512: 0 (Polylin	512	0 (Polyline)-136	12	J-70	J-71	152.4	Ductile Iron	4	0.00	0.000
702: 0 (Polylin	702	0 (Polyline)-39	43	J-72	J-162	100.0	Ductile Iron	100	0.15	0.000
704: 0 (Polylin	704	0 (Polyline)-185	44	J-72	J-162	100.0	Ductile Iron	98	0.14	0.000
759: 0 (Polylin	759	0 (Polyline)-37	45	J-72	J-188	150.0	Ductile Iron	334	0.22	0.000
800: 0 (Polylin	800	0 (Polyline)-60	52	J-72	J-209	152.4	Ductile Iron	17	0.01	0.000
518: 0 (Polylin	518	0 (Polyline)-121	13	J-73	J-74	150.0	Ductile Iron	21	0.01	0.000
687: 0 (Polylin	687	0 (Polyline)-135	36	J-73	J-155	152.4	Ductile Iron	12	0.01	0.000
1035: 0 (Polyli	1035	0 (Polyline)-250	201	J-74	J-15	100.0	Ductile Iron	52	0.08	0.000
521: 0 (Polylin	521	0 (Polyline)-111	13	J-75	J-76	100.0	Ductile Iron	58	0.08	0.000
845: 0 (Polylin	845	0 (Polyline)-112	60	J-75	J-226	100.0	Ductile Iron	20	0.03	0.000
561: 0 (Polylin	561	0 (Polyline)-108	21	J-76	J-94	100.0	Ductile Iron	109	0.16	0.000
841: 0 (Polylin	841	0 (Polyline)-109	59	J-76	J-224	100.0	Ductile Iron	20	0.03	0.000
525: 0 (Polylin	525	0 (Polyline)-96	13	J-77	J-57	100.0	Ductile Iron	139	0.21	0.001
527: 0 (Polylin	527	0 (Polyline)-188	13	J-77	J-57	100.0	Ductile Iron	137	0.20	0.001
560: 0 (Polylin	560	0 (Polyline)-97	19	J-77	J-63	100.0	Ductile Iron	73	0.11	0.000
528: 0 (Polylin	528	0 (Polyline)-73	13	J-78	J-79	200.0	Ductile Iron	4	0.00	0.000
1053: 0 (Polyli	1053	0 (Polyline)-145	558	J-80	J-25	675.0	Ductile Iron	7,753	0.25	0.000
1058: 0 (Polyli	1058	0 (Polyline)-258	726	J-80	J-278	300.0	Ductile Iron	733	0.12	0.000
822: 0 (Polylin	822	0 (Polyline)-5	84	J-81	J-216	100.0	Ductile Iron	28	0.04	0.000
538: 0 (Polylin	538	0 (Polyline)-361	17	J-82	J-83	250.0	Ductile Iron	559	0.13	0.000
817: 0 (Polylin	817	0 (Polyline)-364	54	J-82	J-215	450.0	Ductile Iron	3,769	0.27	0.000
919: 0 (Polylin	919	0 (Polyline)-146	78	J-82	J-242	250.0	Ductile Iron	2,520	0.59	0.002
541: 0 (Polylin	541	0 (Polyline)-32	18	J-84	J-85	100.0	Ductile Iron	6	0.01	0.000
544: 0 (Polylin	544	0 (Polyline)-153	18	J-86	J-87	100.0	Ductile Iron	6	0.01	0.000
675: 0 (Polylin	675	0 (Polyline)-115	35	J-86	J-149	100.0	Ductile Iron	24	0.04	0.000
548: 0 (Polylin	548	0 (Polyline)-71	27	J-88	J-78	100.0	Ductile Iron	413	0.61	0.005
1040: 0 (Polyli	1040	0 (Polyline)-74	264	J-88	J-287	152.4	Ductile Iron	89	0.06	0.000
550: 0 (Polylin	550	0 (Polyline)-219	19	J-89	J-90	100.0	Ductile Iron	61	0.09	0.000
553: 0 (Polylin	553	0 (Polyline)-87	19	J-89	J-90	250.0	Ductile Iron	691	0.16	0.000
684: 0 (Polylin	684	0 (Polyline)-220	37	J-90	J-154	100.0	Ductile Iron	54	0.08	0.000
686: 0 (Polylin	686	0 (Polyline)-88	36	J-90	J-154	250.0	Ductile Iron	611	0.14	0.000
903: 0 (Polylin	903	0 (Polyline)-89	73	J-90	J-248	100.0	Ductile Iron	25	0.04	0.000
554: 0 (Polylin	554	0 (Polyline)-110	19	J-91	J-75	100.0	Ductile Iron	6	0.01	0.000

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
556: 0 (Polylin	556	0 (Polyline)-319	19	J-92	J-93	100.0	Ductile Iron	63	0.09	0.000
987: 0 (Polylin	987	0 (Polyline)-332	110	J-92	J-274	100.0	Ductile Iron	37	0.05	0.000
559: 0 (Polylin	559	0 (Polyline)-264	19	J-93	J-92	100.0	Ductile Iron	63	0.09	0.000
839: 0 (Polylin	839	0 (Polyline)-266	59	J-93	J-223	100.0	Ductile Iron	20	0.03	0.000
696: 0 (Polylin	696	0 (Polyline)-107	38	J-94	J-159	100.0	Ductile Iron	13	0.02	0.000
1014: 0 (Polyli	1014	0 (Polyline)-23	138	J-94	J-37	100.0	Ductile Iron	188	0.28	0.001
563: 0 (Polylin	563	0 (Polyline)-187	23	J-95	J-77	100.0	Ductile Iron	116	0.17	0.000
565: 0 (Polylin	565	0 (Polyline)-95	22	J-95	J-77	100.0	Ductile Iron	118	0.17	0.000
670: 0 (Polylin	670	0 (Polyline)-228	34	J-95	J-125	100.0	Ductile Iron	152	0.22	0.001
921: 0 (Polylin	921	0 (Polyline)-56	79	J-95	J-227	250.0	Ductile Iron	1,403	0.33	0.001
566: 0 (Polylin	566	0 (Polyline)-243	23	J-96	J-97	152.4	Ductile Iron	8	0.00	0.000
569: 0 (Polylin	569	0 (Polyline)-2	22	J-97	J-96	152.4	Ductile Iron	8	0.00	0.000
985: 0 (Polylin	985	0 (Polyline)-240	111	J-97	J-196	150.0	Ductile Iron	41	0.03	0.000
570: 0 (Polylin	570	0 (Polyline)-125	23	J-98	J-99	100.0	Ductile Iron	27	0.04	0.000
712: 0 (Polylin	712	0 (Polyline)-122	39	J-98	J-73	150.0	Ductile Iron	72	0.05	0.000
758: 0 (Polylin	758	0 (Polyline)-124	61	J-99	J-73	100.0	Ductile Iron	11	0.02	0.000
575: 0 (Polylin	575	0 (Polyline)-1	23	J-100	J-101	100.0	Ductile Iron	8	0.01	0.000
578: 0 (Polylin	578	0 (Polyline)-155	23	J-102	J-103	100.0	Ductile Iron	266	0.39	0.002
635: 0 (Polylin	635	0 (Polyline)-156	30	J-103	J-128	100.0	Ductile Iron	248	0.37	0.002
581: 0 (Polylin	581	0 (Polyline)-346	23	J-104	J-26	200.0	Ductile Iron	88	0.03	0.000
705: 0 (Polylin	705	0 (Polyline)-289	39	J-104	J-163	100.0	Ductile Iron	13	0.02	0.000
589: 0 (Polylin	589	0 (Polyline)-350	26	J-105	J-106	300.0	Ductile Iron	9	0.00	0.000
970: 0 (Polylin	970	0 (Polyline)-349	98	J-105	J-260	250.0	Ductile Iron	388	0.09	0.000
592: 0 (Polylin	592	0 (Polyline)-83	25	J-107	J-108	250.0	Ductile Iron	188	0.04	0.000
595: 0 (Polylin	595	0 (Polyline)-222	26	J-107	J-108	100.0	Ductile Iron	17	0.02	0.000
968: 0 (Polylin	968	0 (Polyline)-99	102	J-107	J-254	150.0	Ductile Iron	214	0.14	0.000
911: 0 (Polylin	911	0 (Polyline)-223	78	J-108	J-252	100.0	Ductile Iron	4	0.01	0.000
913: 0 (Polylin	913	0 (Polyline)-66	77	J-108	J-252	250.0	Ductile Iron	48	0.01	0.000
596: 0 (Polylin	596	0 (Polyline)-335	23	J-109	J-1	250.0	Ductile Iron	83	0.02	0.000
598: 0 (Polylin	598	0 (Polyline)-357	26	J-110	J-31	200.0	Ductile Iron	53	0.02	0.000
969: 0 (Polylin	969	0 (Polyline)-271	94	J-110	J-140	100.0	Ductile Iron	44	0.06	0.000
600: 0 (Polylin	600	0 (Polyline)-162	26	J-111	J-112	150.0	Ductile Iron	394	0.26	0.001
631: 0 (Polylin	631	0 (Polyline)-254	29	J-112	J-126	200.0	Ductile Iron	412	0.15	0.000
603: 0 (Polylin	603	0 (Polyline)-3	26	J-113	J-114	100.0	Ductile Iron	9	0.01	0.000
777: 0 (Polylin	777	0 (Polyline)-81	47	J-114	J-198	100.0	Ductile Iron	16	0.02	0.000
810: 0 (Polylin	810	0 (Polyline)-94	53	J-114	J-212	100.0	Ductile Iron	18	0.03	0.000
606: 0 (Polylin	606	0 (Polyline)-251	27	J-115	J-18	200.0	Ductile Iron	511	0.19	0.000
608: 0 (Polylin	608	0 (Polyline)-171	27	J-116	J-117	250.0	Ductile Iron	389	0.09	0.000
941: 0 (Polylin	941	0 (Polyline)-69	82	J-117	J-261	250.0	Ductile Iron	297	0.07	0.000

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
611: 0 (Polylin	611	0 (Polyline)-167	27	J-118	J-119	150.0	Ductile Iron	9	0.01	0.000
809: 0 (Polylin	809	0 (Polyline)-168	53	J-119	J-189	150.0	Ductile Iron	37	0.02	0.000
614: 0 (Polylin	614	0 (Polyline)-169	28	J-120	J-121	152.4	Ductile Iron	9	0.01	0.000
926: 0 (Polylin	926	0 (Polyline)-170	79	J-121	J-256	152.4	Ductile Iron	46	0.03	0.000
620: 0 (Polylin	620	0 (Polyline)-299	28	J-122	J-123	150.0	Ductile Iron	281	0.18	0.000
623: 0 (Polylin	623	0 (Polyline)-321	29	J-122	J-123	150.0	Ductile Iron	278	0.18	0.000
1042: 0 (Polyli	1042	0 (Polyline)-290	260	J-122	J-164	150.0	Ductile Iron	73	0.05	0.000
715: 0 (Polylin	715	0 (Polyline)-278	40	J-123	J-166	100.0	Ductile Iron	195	0.29	0.001
717: 0 (Polylin	717	0 (Polyline)-320	41	J-123	J-166	100.0	Ductile Iron	194	0.29	0.001
905: 0 (Polylin	905	0 (Polyline)-353	73	J-123	J-249	100.0	Ductile Iron	25	0.04	0.000
624: 0 (Polylin	624	0 (Polyline)-252	28	J-124	J-115	200.0	Ductile Iron	493	0.18	0.000
629: 0 (Polylin	629	0 (Polyline)-106	29	J-125	J-64	100.0	Ductile Iron	168	0.25	0.001
671: 0 (Polylin	671	0 (Polyline)-103	33	J-125	J-95	250.0	Ductile Iron	1,702	0.40	0.001
1017: 0 (Polyli	1017	0 (Polyline)-229	142	J-125	J-242	100.0	Ductile Iron	177	0.26	0.001
836: 0 (Polylin	836	0 (Polyline)-255	58	J-126	J-139	200.0	Ductile Iron	442	0.16	0.000
633: 0 (Polylin	633	0 (Polyline)-172	30	J-127	J-116	250.0	Ductile Iron	408	0.10	0.000
672: 0 (Polylin	672	0 (Polyline)-157	34	J-128	J-148	100.0	Ductile Iron	227	0.33	0.002
637: 0 (Polylin	637	0 (Polyline)-4	30	J-129	J-130	100.0	Ductile Iron	10	0.01	0.000
1004: 0 (Polyli	1004	0 (Polyline)-43	127	J-129	J-13	100.0	Ductile Iron	98	0.14	0.000
640: 0 (Polylin	640	0 (Polyline)-174	31	J-131	J-127	200.0	Ductile Iron	429	0.16	0.000
645: 0 (Polylin	645	0 (Polyline)-336	32	J-133	J-134	152.4	Ductile Iron	11	0.01	0.000
887: 0 (Polylin	887	0 (Polyline)-342	70	J-133	J-27	100.0	Ductile Iron	25	0.04	0.000
648: 0 (Polylin	648	0 (Polyline)-35	32	J-135	J-136	100.0	Ductile Iron	11	0.02	0.000
736: 0 (Polylin	736	0 (Polyline)-36	42	J-136	J-176	100.0	Ductile Iron	84	0.12	0.000
897: 0 (Polylin	897	0 (Polyline)-126	72	J-136	J-245	100.0	Ductile Iron	24	0.04	0.000
1048: 0 (Polyli	1048	0 (Polyline)-68	307	J-138	J-288	150.0	Ductile Iron	104	0.07	0.000
655: 0 (Polylin	655	0 (Polyline)-253	32	J-139	J-124	200.0	Ductile Iron	472	0.17	0.000
657: 0 (Polylin	657	0 (Polyline)-286	32	J-140	J-104	150.0	Ductile Iron	43	0.03	0.000
674: 0 (Polylin	674	0 (Polyline)-345	34	J-140	J-133	100.0	Ductile Iron	32	0.05	0.000
659: 0 (Polylin	659	0 (Polyline)-85	32	J-141	J-142	100.0	Ductile Iron	11	0.02	0.000
682: 0 (Polylin	682	0 (Polyline)-86	35	J-141	J-153	100.0	Ductile Iron	12	0.02	0.000
662: 0 (Polylin	662	0 (Polyline)-160	32	J-143	J-144	150.0	Ductile Iron	340	0.22	0.000
793: 0 (Polylin	793	0 (Polyline)-161	50	J-144	J-111	150.0	Ductile Iron	368	0.24	0.001
665: 0 (Polylin	665	0 (Polyline)-159	33	J-145	J-143	150.0	Ductile Iron	318	0.21	0.000
667: 0 (Polylin	667	0 (Polyline)-245	33	J-146	J-147	150.0	Ductile Iron	211	0.14	0.000
764: 0 (Polylin	764	0 (Polyline)-7	47	J-146	J-191	100.0	Ductile Iron	16	0.02	0.000
694: 0 (Polylin	694	0 (Polyline)-241	37	J-147	J-158	150.0	Ductile Iron	101	0.07	0.000
864: 0 (Polylin	864	0 (Polyline)-248	64	J-147	J-232	100.0	Ductile Iron	22	0.03	0.000
866: 0 (Polylin	866	0 (Polyline)-13	64	J-147	J-232	100.0	Ductile Iron	22	0.03	0.000

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
1001: 0 (Polyli	1001	0 (Polyline)-116	157	J-149	J-183	100.0	Ductile Iron	47	0.07	0.000
677: 0 (Polylin	677	0 (Polyline)-173	35	J-150	J-131	200.0	Ductile Iron	451	0.17	0.000
679: 0 (Polylin	679	0 (Polyline)-114	35	J-151	J-152	150.0	Ductile Iron	12	0.01	0.000
708: 0 (Polylin	708	0 (Polyline)-117	39	J-151	J-149	100.0	Ductile Iron	55	0.08	0.000
692: 0 (Polylin	692	0 (Polyline)-82	37	J-154	J-107	250.0	Ductile Iron	456	0.11	0.000
693: 0 (Polylin	693	0 (Polyline)-221	37	J-154	J-107	100.0	Ductile Iron	41	0.06	0.000
986: 0 (Polylin	986	0 (Polyline)-84	110	J-154	J-141	100.0	Ductile Iron	83	0.12	0.000
689: 0 (Polylin	689	0 (Polyline)-26	37	J-156	J-157	150.0	Ductile Iron	13	0.01	0.000
976: 0 (Polylin	976	0 (Polyline)-90	101	J-156	J-271	100.0	Ductile Iron	34	0.05	0.000
700: 0 (Polylin	700	0 (Polyline)-242	39	J-158	J-161	150.0	Ductile Iron	1	0.00	0.000
826: 0 (Polylin	826	0 (Polyline)-11	56	J-158	J-218	100.0	Ductile Iron	19	0.03	0.000
828: 0 (Polylin	828	0 (Polyline)-247	56	J-158	J-218	100.0	Ductile Iron	19	0.03	0.000
698: 0 (Polylin	698	0 (Polyline)-131	38	J-160	J-98	150.0	Ductile Iron	132	0.09	0.000
1026: 0 (Polyli	1026	0 (Polyline)-25	175	J-161	J-237	100.0	Ductile Iron	73	0.11	0.000
794: 0 (Polylin	794	0 (Polyline)-40	50	J-162	J-206	100.0	Ductile Iron	107	0.16	0.000
871: 0 (Polylin	871	0 (Polyline)-12	66	J-162	J-234	100.0	Ductile Iron	22	0.03	0.000
709: 0 (Polylin	709	0 (Polyline)-280	41	J-164	J-48	100.0	Ductile Iron	127	0.19	0.001
711: 0 (Polylin	711	0 (Polyline)-324	41	J-164	J-48	150.0	Ductile Iron	368	0.24	0.001
1043: 0 (Polyli	1043	0 (Polyline)-354	261	J-164	J-122	400.0	Ductile Iron	968	0.09	0.000
745: 0 (Polylin	745	0 (Polyline)-351	43	J-166	J-92	150.0	Ductile Iron	227	0.15	0.000
981: 0 (Polylin	981	0 (Polyline)-298	108	J-166	J-272	100.0	Ductile Iron	37	0.05	0.000
718: 0 (Polylin	718	0 (Polyline)-6	41	J-167	J-168	100.0	Ductile Iron	14	0.02	0.000
750: 0 (Polylin	750	0 (Polyline)-78	44	J-167	J-184	100.0	Ductile Iron	15	0.02	0.000
721: 0 (Polylin	721	0 (Polyline)-322	41	J-169	J-170	100.0	Ductile Iron	66	0.10	0.000
724: 0 (Polylin	724	0 (Polyline)-294	41	J-169	J-170	100.0	Ductile Iron	66	0.10	0.000
868: 0 (Polylin	868	0 (Polyline)-269	65	J-169	J-233	100.0	Ductile Iron	22	0.03	0.000
870: 0 (Polylin	870	0 (Polyline)-347	65	J-169	J-233	100.0	Ductile Iron	22	0.03	0.000
746: 0 (Polylin	746	0 (Polyline)-276	44	J-170	J-182	100.0	Ductile Iron	57	0.08	0.000
779: 0 (Polylin	779	0 (Polyline)-283	47	J-170	J-199	100.0	Ductile Iron	16	0.02	0.000
725: 0 (Polylin	725	0 (Polyline)-20	41	J-171	J-172	150.0	Ductile Iron	14	0.01	0.000
737: 0 (Polylin	737	0 (Polyline)-138	42	J-172	J-178	150.0	Ductile Iron	14	0.01	0.000
730: 0 (Polylin	730	0 (Polyline)-65	42	J-174	J-175	200.0	Ductile Iron	126	0.05	0.000
806: 0 (Polylin	806	0 (Polyline)-64	52	J-175	J-24	200.0	Ductile Iron	157	0.06	0.000
733: 0 (Polylin	733	0 (Polyline)-44	42	J-176	J-177	100.0	Ductile Iron	161	0.24	0.001
901: 0 (Polylin	901	0 (Polyline)-127	72	J-176	J-247	100.0	Ductile Iron	24	0.04	0.000
805: 0 (Polylin	805	0 (Polyline)-45	52	J-177	J-23	100.0	Ductile Iron	130	0.19	0.001
893: 0 (Polylin	893	0 (Polyline)-128	71	J-177	J-243	100.0	Ductile Iron	24	0.04	0.000
739: 0 (Polylin	739	0 (Polyline)-315	54	J-179	J-180	675.0	Ductile Iron	7,558	0.24	0.000
819: 0 (Polylin	819	0 (Polyline)-314	55	J-180	J-82	675.0	Ductile Iron	7,521	0.24	0.000

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
744: 0 (Polylin	744	0 (Polyline)-165	43	J-181	J-54	150.0	Ductile Iron	113	0.07	0.000
995: 0 (Polylin	995	0 (Polyline)-113	113	J-183	J-151	150.0	Ductile Iron	130	0.09	0.000
752: 0 (Polylin	752	0 (Polyline)-47	45	J-185	J-46	150.0	Ductile Iron	199	0.13	0.000
782: 0 (Polylin	782	0 (Polyline)-62	48	J-185	J-200	152.4	Ductile Iron	16	0.01	0.000
754: 0 (Polylin	754	0 (Polyline)-328	46	J-186	J-187	150.0	Ductile Iron	271	0.18	0.000
853: 0 (Polylin	853	0 (Polyline)-300	61	J-186	J-2	150.0	Ductile Iron	468	0.31	0.001
999: 0 (Polylin	999	0 (Polyline)-330	121	J-186	J-259	250.0	Ductile Iron	2,092	0.49	0.001
757: 0 (Polylin	757	0 (Polyline)-267	45	J-187	J-186	150.0	Ductile Iron	274	0.18	0.000
814: 0 (Polylin	814	0 (Polyline)-327	54	J-187	J-213	150.0	Ductile Iron	210	0.14	0.000
796: 0 (Polylin	796	0 (Polyline)-46	51	J-188	J-185	150.0	Ductile Iron	264	0.17	0.000
761: 0 (Polylin	761	0 (Polyline)-166	45	J-189	J-190	150.0	Ductile Iron	70	0.05	0.000
1038: 0 (Polyli	1038	0 (Polyline)-158	235	J-190	J-145	150.0	Ductile Iron	228	0.15	0.000
766: 0 (Polylin	766	0 (Polyline)-246	46	J-192	J-146	100.0	Ductile Iron	15	0.02	0.000
768: 0 (Polylin	768	0 (Polyline)-29	46	J-193	J-194	100.0	Ductile Iron	16	0.02	0.000
771: 0 (Polylin	771	0 (Polyline)-186	47	J-193	J-194	100.0	Ductile Iron	16	0.02	0.000
835: 0 (Polylin	835	0 (Polyline)-31	57	J-194	J-84	100.0	Ductile Iron	91	0.13	0.000
920: 0 (Polylin	920	0 (Polyline)-30	78	J-194	J-88	100.0	Ductile Iron	200	0.29	0.001
772: 0 (Polylin	772	0 (Polyline)-8	47	J-195	J-81	100.0	Ductile Iron	16	0.02	0.000
774: 0 (Polylin	774	0 (Polyline)-102	47	J-196	J-197	100.0	Ductile Iron	16	0.02	0.000
784: 0 (Polylin	784	0 (Polyline)-130	48	J-201	J-160	150.0	Ductile Iron	162	0.11	0.000
788: 0 (Polylin	788	0 (Polyline)-137	49	J-203	J-172	150.0	Ductile Iron	73	0.05	0.000
990: 0 (Polylin	990	0 (Polyline)-192	111	J-203	J-275	200.0	Ductile Iron	27	0.01	0.000
992: 0 (Polylin	992	0 (Polyline)-177	110	J-203	J-275	250.0	Ductile Iron	48	0.01	0.000
790: 0 (Polylin	790	0 (Polyline)-308	49	J-204	J-205	152.4	Ductile Iron	17	0.01	0.000
954: 0 (Polylin	954	0 (Polyline)-291	87	J-204	J-39	100.0	Ductile Iron	46	0.07	0.000
873: 0 (Polylin	873	0 (Polyline)-14	66	J-206	J-235	100.0	Ductile Iron	22	0.03	0.000
876: 0 (Polylin	876	0 (Polyline)-28	67	J-206	J-236	100.0	Ductile Iron	23	0.03	0.000
797: 0 (Polylin	797	0 (Polyline)-21	52	J-207	J-208	150.0	Ductile Iron	18	0.01	0.000
807: 0 (Polylin	807	0 (Polyline)-24	52	J-208	J-211	150.0	Ductile Iron	18	0.01	0.000
812: 0 (Polylin	812	0 (Polyline)-268	53	J-213	J-187	150.0	Ductile Iron	211	0.14	0.000
821: 0 (Polylin	821	0 (Polyline)-277	55	J-213	J-45	100.0	Ductile Iron	125	0.18	0.001
815: 0 (Polylin	815	0 (Polyline)-33	54	J-214	J-150	200.0	Ductile Iron	481	0.18	0.000
930: 0 (Polylin	930	0 (Polyline)-175	80	J-214	J-83	200.0	Ductile Iron	526	0.19	0.000
1052: 0 (Polyli	1052	0 (Polyline)-365	433	J-215	J-5	450.0	Ductile Iron	3,604	0.26	0.000
824: 0 (Polylin	824	0 (Polyline)-309	56	J-217	J-109	300.0	Ductile Iron	23	0.00	0.000
829: 0 (Polylin	829	0 (Polyline)-293	56	J-217	J-109	250.0	Ductile Iron	14	0.00	0.000
830: 0 (Polylin	830	0 (Polyline)-237	56	J-219	J-220	200.0	Ductile Iron	59	0.02	0.000
978: 0 (Polylin	978	0 (Polyline)-238	101	J-220	J-237	200.0	Ductile Iron	299	0.11	0.000
996: 0 (Polylin	996	0 (Polyline)-239	114	J-220	J-97	150.0	Ductile Iron	148	0.10	0.000

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FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
833: 0 (Polylin	833	0 (Polyline)-61	57	J-221	J-188	152.4	Ductile Iron	19	0.01	0.000
837: 0 (Polylin	837	0 (Polyline)-306	59	J-222	J-179	675.0	Ductile Iron	7,596	0.25	0.000
843: 0 (Polylin	843	0 (Polyline)-58	60	J-225	J-219	200.0	Ductile Iron	20	0.01	0.000
849: 0 (Polylin	849	0 (Polyline)-57	60	J-227	J-52	250.0	Ductile Iron	1,215	0.29	0.000
917: 0 (Polylin	917	0 (Polyline)-77	78	J-227	J-167	100.0	Ductile Iron	84	0.12	0.000
922: 0 (Polylin	922	0 (Polyline)-227	79	J-227	J-95	100.0	Ductile Iron	126	0.19	0.001
880: 0 (Polylin	880	0 (Polyline)-41	68	J-228	J-52	150.0	Ductile Iron	437	0.29	0.001
885: 0 (Polylin	885	0 (Polyline)-15	97	J-228	J-240	100.0	Ductile Iron	33	0.05	0.000
855: 0 (Polylin	855	0 (Polyline)-92	62	J-229	J-230	150.0	Ductile Iron	179	0.12	0.000
858: 0 (Polylin	858	0 (Polyline)-190	63	J-229	J-230	100.0	Ductile Iron	61	0.09	0.000
974: 0 (Polylin	974	0 (Polyline)-93	101	J-229	J-270	100.0	Ductile Iron	34	0.05	0.000
867: 0 (Polylin	867	0 (Polyline)-38	65	J-230	J-156	150.0	Ductile Iron	115	0.08	0.000
964: 0 (Polylin	964	0 (Polyline)-91	90	J-230	J-267	100.0	Ductile Iron	30	0.04	0.000
862: 0 (Polylin	862	0 (Polyline)-339	63	J-231	J-182	100.0	Ductile Iron	21	0.03	0.000
878: 0 (Polylin	878	0 (Polyline)-244	68	J-237	J-146	150.0	Ductile Iron	308	0.20	0.000
989: 0 (Polylin	989	0 (Polyline)-178	110	J-237	J-34	200.0	Ductile Iron	834	0.31	0.001
881: 0 (Polylin	881	0 (Polyline)-22	68	J-238	J-100	100.0	Ductile Iron	23	0.03	0.000
883: 0 (Polylin	883	0 (Polyline)-42	69	J-239	J-129	100.0	Ductile Iron	12	0.02	0.000
888: 0 (Polylin	888	0 (Polyline)-356	70	J-241	J-166	100.0	Ductile Iron	24	0.03	0.000
890: 0 (Polylin	890	0 (Polyline)-189	72	J-242	J-229	100.0	Ductile Iron	101	0.15	0.000
892: 0 (Polylin	892	0 (Polyline)-148	71	J-242	J-229	150.0	Ductile Iron	297	0.19	0.000
918: 0 (Polylin	918	0 (Polyline)-230	78	J-242	J-82	100.0	Ductile Iron	226	0.33	0.002
1016: 0 (Polyli	1016	0 (Polyline)-147	142	J-242	J-125	250.0	Ductile Iron	1,973	0.47	0.001
895: 0 (Polylin	895	0 (Polyline)-16	103	J-244	J-36	100.0	Ductile Iron	35	0.05	0.000
907: 0 (Polylin	907	0 (Polyline)-367	74	J-250	J-53	400.0	Ductile Iron	79	0.01	0.000
915: 0 (Polylin	915	0 (Polyline)-318	108	J-253	J-93	100.0	Ductile Iron	36	0.05	0.000
923: 0 (Polylin	923	0 (Polyline)-101	79	J-254	J-255	100.0	Ductile Iron	27	0.04	0.000
1022: 0 (Polyli	1022	0 (Polyline)-100	147	J-254	J-196	150.0	Ductile Iron	77	0.05	0.000
1029: 0 (Polyli	1029	0 (Polyline)-164	184	J-256	J-181	152.4	Ductile Iron	135	0.09	0.000
1015: 0 (Polyli	1015	0 (Polyline)-311	141	J-257	J-68	300.0	Ductile Iron	977	0.16	0.000
934: 0 (Polylin	934	0 (Polyline)-263	83	J-258	J-259	150.0	Ductile Iron	452	0.30	0.001
1024: 0 (Polyli	1024	0 (Polyline)-340	169	J-258	J-283	100.0	Ductile Iron	57	0.08	0.000
1032: 0 (Polyli	1032	0 (Polyline)-313	194	J-258	J-164	100.0	Ductile Iron	154	0.23	0.001
1033: 0 (Polyli	1033	0 (Polyline)-348	194	J-258	J-164	250.0	Ductile Iron	1,717	0.40	0.001
937: 0 (Polylin	937	0 (Polyline)-329	84	J-259	J-258	250.0	Ductile Iron	1,721	0.41	0.001
1000: 0 (Polyli	1000	0 (Polyline)-282	120	J-259	J-186	150.0	Ductile Iron	547	0.36	0.001
938: 0 (Polylin	938	0 (Polyline)-270	94	J-260	J-26	152.4	Ductile Iron	231	0.15	0.000
944: 0 (Polylin	944	0 (Polyline)-355	90	J-260	J-110	100.0	Ductile Iron	62	0.09	0.000
943: 0 (Polylin	943	0 (Polyline)-225	82	J-261	J-117	100.0	Ductile Iron	27	0.04	0.000

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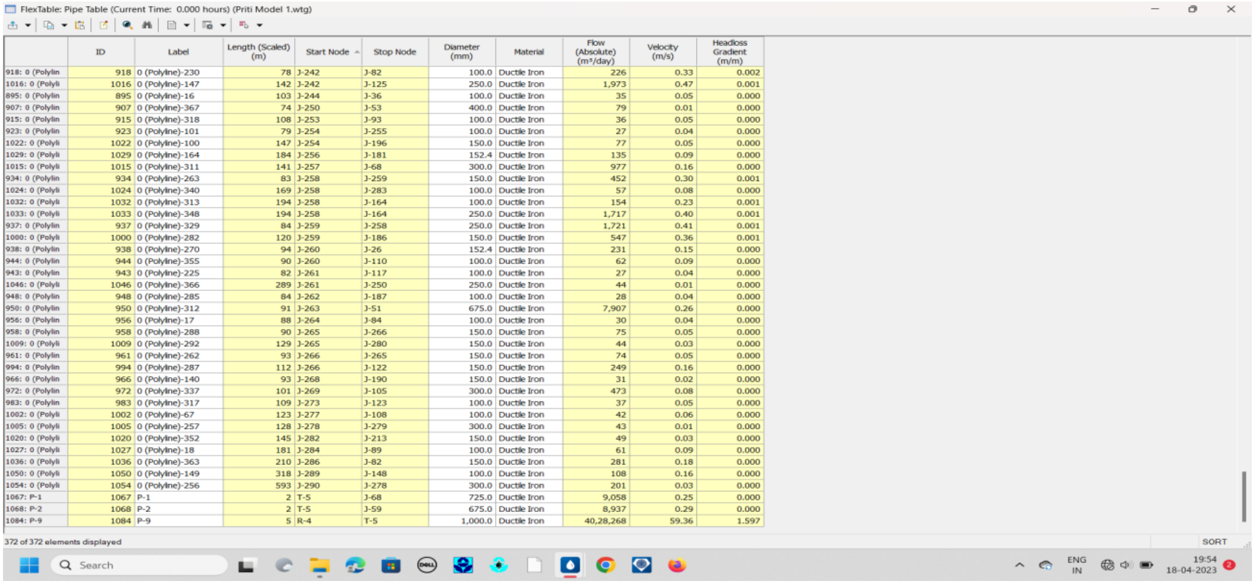

FlexTable: Pipe Table (Current Time: 0.000 hours) (Priti Model 1.wtg)

	ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Flow (Absolute) (m³/day)	Velocity (m/s)	Headloss Gradient (m/m)
918: 0 (Polylin	918	0 (Polyline)-230	78	J-242	J-82	100.0	Ductile Iron	226	0.33	0.002
1016: 0 (Polyli	1016	0 (Polyline)-147	142	J-242	J-125	250.0	Ductile Iron	1,973	0.47	0.001
895: 0 (Polylin	895	0 (Polyline)-16	103	J-244	J-36	100.0	Ductile Iron	35	0.05	0.000
907: 0 (Polylin	907	0 (Polyline)-367	74	J-250	J-53	400.0	Ductile Iron	79	0.01	0.000
915: 0 (Polylin	915	0 (Polyline)-318	108	J-253	J-93	100.0	Ductile Iron	36	0.05	0.000
923: 0 (Polylin	923	0 (Polyline)-101	79	J-254	J-255	100.0	Ductile Iron	27	0.04	0.000
1022: 0 (Polyli	1022	0 (Polyline)-100	147	J-254	J-196	150.0	Ductile Iron	77	0.05	0.000
1029: 0 (Polyli	1029	0 (Polyline)-164	184	J-256	J-181	152.4	Ductile Iron	135	0.09	0.000
1015: 0 (Polyli	1015	0 (Polyline)-311	141	J-257	J-68	300.0	Ductile Iron	977	0.16	0.000
934: 0 (Polylin	934	0 (Polyline)-263	83	J-258	J-259	150.0	Ductile Iron	452	0.30	0.001
1024: 0 (Polyli	1024	0 (Polyline)-340	169	J-258	J-283	100.0	Ductile Iron	57	0.08	0.000
1032: 0 (Polyli	1032	0 (Polyline)-313	194	J-258	J-164	100.0	Ductile Iron	154	0.23	0.001
1033: 0 (Polyli	1033	0 (Polyline)-348	194	J-258	J-164	250.0	Ductile Iron	1,717	0.40	0.001
937: 0 (Polylin	937	0 (Polyline)-329	84	J-259	J-258	250.0	Ductile Iron	1,721	0.41	0.001
1000: 0 (Polyli	1000	0 (Polyline)-282	120	J-259	J-186	150.0	Ductile Iron	547	0.36	0.001
938: 0 (Polylin	938	0 (Polyline)-270	94	J-260	J-26	152.4	Ductile Iron	231	0.15	0.000
944: 0 (Polylin	944	0 (Polyline)-355	90	J-260	J-110	100.0	Ductile Iron	62	0.09	0.000
943: 0 (Polylin	943	0 (Polyline)-225	82	J-261	J-117	100.0	Ductile Iron	27	0.04	0.000
1046: 0 (Polyli	1046	0 (Polyline)-366	289	J-261	J-250	250.0	Ductile Iron	44	0.01	0.000
948: 0 (Polylin	948	0 (Polyline)-285	84	J-262	J-187	100.0	Ductile Iron	28	0.04	0.000
950: 0 (Polylin	950	0 (Polyline)-312	91	J-263	J-51	675.0	Ductile Iron	7,907	0.26	0.000
956: 0 (Polylin	956	0 (Polyline)-17	88	J-264	J-84	100.0	Ductile Iron	30	0.04	0.000
958: 0 (Polylin	958	0 (Polyline)-288	90	J-265	J-266	150.0	Ductile Iron	75	0.05	0.000
1009: 0 (Polyli	1009	0 (Polyline)-292	129	J-265	J-280	150.0	Ductile Iron	44	0.03	0.000
961: 0 (Polylin	961	0 (Polyline)-262	93	J-266	J-265	150.0	Ductile Iron	74	0.05	0.000
994: 0 (Polylin	994	0 (Polyline)-287	112	J-266	J-122	150.0	Ductile Iron	249	0.16	0.000
966: 0 (Polylin	966	0 (Polyline)-140	93	J-268	J-190	150.0	Ductile Iron	31	0.02	0.000
972: 0 (Polylin	972	0 (Polyline)-337	101	J-269	J-105	300.0	Ductile Iron	473	0.08	0.000
983: 0 (Polylin	983	0 (Polyline)-317	109	J-273	J-123	100.0	Ductile Iron	37	0.05	0.000
1002: 0 (Polyli	1002	0 (Polyline)-67	123	J-277	J-108	100.0	Ductile Iron	42	0.06	0.000
1005: 0 (Polyli	1005	0 (Polyline)-257	128	J-278	J-279	300.0	Ductile Iron	43	0.01	0.000
1020: 0 (Polyli	1020	0 (Polyline)-352	145	J-282	J-213	150.0	Ductile Iron	49	0.03	0.000
1027: 0 (Polyli	1027	0 (Polyline)-18	181	J-284	J-89	100.0	Ductile Iron	61	0.09	0.000
1036: 0 (Polyli	1036	0 (Polyline)-363	210	J-286	J-82	150.0	Ductile Iron	281	0.18	0.000
1050: 0 (Polyli	1050	0 (Polyline)-149	318	J-289	J-148	100.0	Ductile Iron	108	0.16	0.000
1054: 0 (Polyli	1054	0 (Polyline)-256	593	J-290	J-278	300.0	Ductile Iron	201	0.03	0.000
1067: P-1	1067	P-1	2	T-5	J-68	725.0	Ductile Iron	9,058	0.25	0.000
1068: P-2	1068	P-2	2	T-5	J-59	675.0	Ductile Iron	8,937	0.29	0.000
1084: P-9	1084	P-9	5	R-4	T-5	1,000.0	Ductile Iron	40,28,268	59.36	1.597

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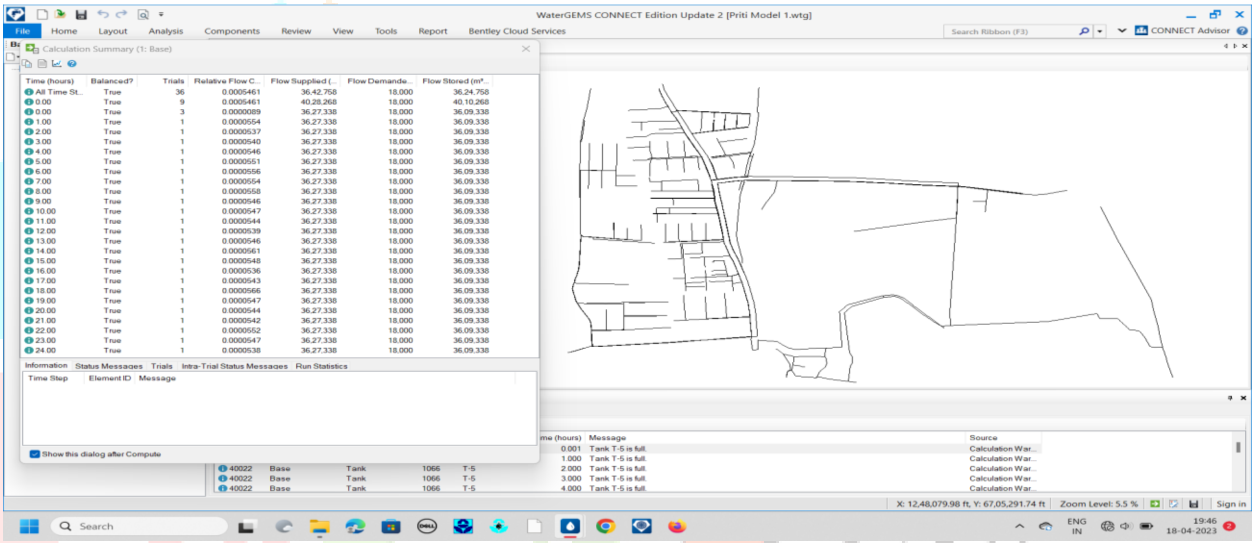
- **COMPUTATION**



Time (hours)	Balanced?	Trials	Relative Flow C...	Flow Supplied (...	Flow Demande...	Flow Stored (m³...
All Time St...	True	36	0.0005461	36,42,758	18,000	36,24,758
0.00	True	9	0.0005461	40,28,268	18,000	40,10,268
0.00	True	3	0.0000089	36,27,338	18,000	36,09,338
1.00	True	1	0.0000554	36,27,338	18,000	36,09,338
2.00	True	1	0.0000537	36,27,338	18,000	36,09,338
3.00	True	1	0.0000540	36,27,338	18,000	36,09,338
4.00	True	1	0.0000546	36,27,338	18,000	36,09,338
5.00	True	1	0.0000551	36,27,338	18,000	36,09,338
6.00	True	1	0.0000556	36,27,338	18,000	36,09,338
7.00	True	1	0.0000554	36,27,338	18,000	36,09,338
8.00	True	1	0.0000558	36,27,338	18,000	36,09,338
9.00	True	1	0.0000546	36,27,338	18,000	36,09,338
10.00	True	1	0.0000547	36,27,338	18,000	36,09,338
11.00	True	1	0.0000544	36,27,338	18,000	36,09,338
12.00	True	1	0.0000539	36,27,338	18,000	36,09,338
13.00	True	1	0.0000546	36,27,338	18,000	36,09,338
14.00	True	1	0.0000561	36,27,338	18,000	36,09,338
15.00	True	1	0.0000548	36,27,338	18,000	36,09,338
16.00	True	1	0.0000536	36,27,338	18,000	36,09,338
17.00	True	1	0.0000543	36,27,338	18,000	36,09,338
18.00	True	1	0.0000566	36,27,338	18,000	36,09,338
19.00	True	1	0.0000547	36,27,338	18,000	36,09,338
20.00	True	1	0.0000544	36,27,338	18,000	36,09,338
21.00	True	1	0.0000542	36,27,338	18,000	36,09,338
22.00	True	1	0.0000552	36,27,338	18,000	36,09,338
23.00	True	1	0.0000547	36,27,338	18,000	36,09,338
24.00	True	1	0.0000538	36,27,338	18,000	36,09,338

- HYDRAULIC MODEL INVENTORY

Hydraulic Model Inventory: Priti Model 1.wtg

Title	
Engineer	
Company	
Date	21-03-2023
Notes	

Scenario Summary

ID	1
Label	Base
Notes	
Active Topology	Base Active Topology
Physical	Base Physical
Demand	Base Demand
Initial Settings	Base Initial Settings
Operational	Base Operational
Age	Base Age
Constituent	Base Constituent
Trace	Base Trace
Fire Flow	Base Fire Flow
Energy Cost	Base Energy Cost
Transient	Base Transient
Pressure Dependent Demand	Base Pressure Dependent Demand
Failure History	Base Failure History
SCADA	Base SCADA
User Data Extensions	Base User Data Extensions
Steady State/EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	Base Calculation Options

Network Inventory

Pipes	372	Pumps	0
Laterals	0	Pump Stations	0
Junctions	290	Variable Speed Pump Batteries	0
Hydrants	0	PRV's	0
Tanks	1	PSV's	0
-Circular	1	PBV's	0
-Non-Circular	0	FCV's	0
-Variable Area	0	TCV's	0
Reservoirs	1	GPV's	0
Customer Meters	0	Isolation Valves	0
Taps	0	Spot Elevations	0
SCADA Elements	0		

Transient Network Inventory

Turbines	0	Rupture Disks	0
Periodic Head-Flows	0	Discharges to Atmosphere	0
Air Valves	0	Orifices Between Pipes	0
Hydropneumatic Tanks	0	Valves With Linear Area Change	0
Surge Valves	0	Surge Tanks	0

Priti Model 1.wtg
18-04-2023

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[10.02.03.06]
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Hydraulic Model Inventory: Priti Model 1.wtg

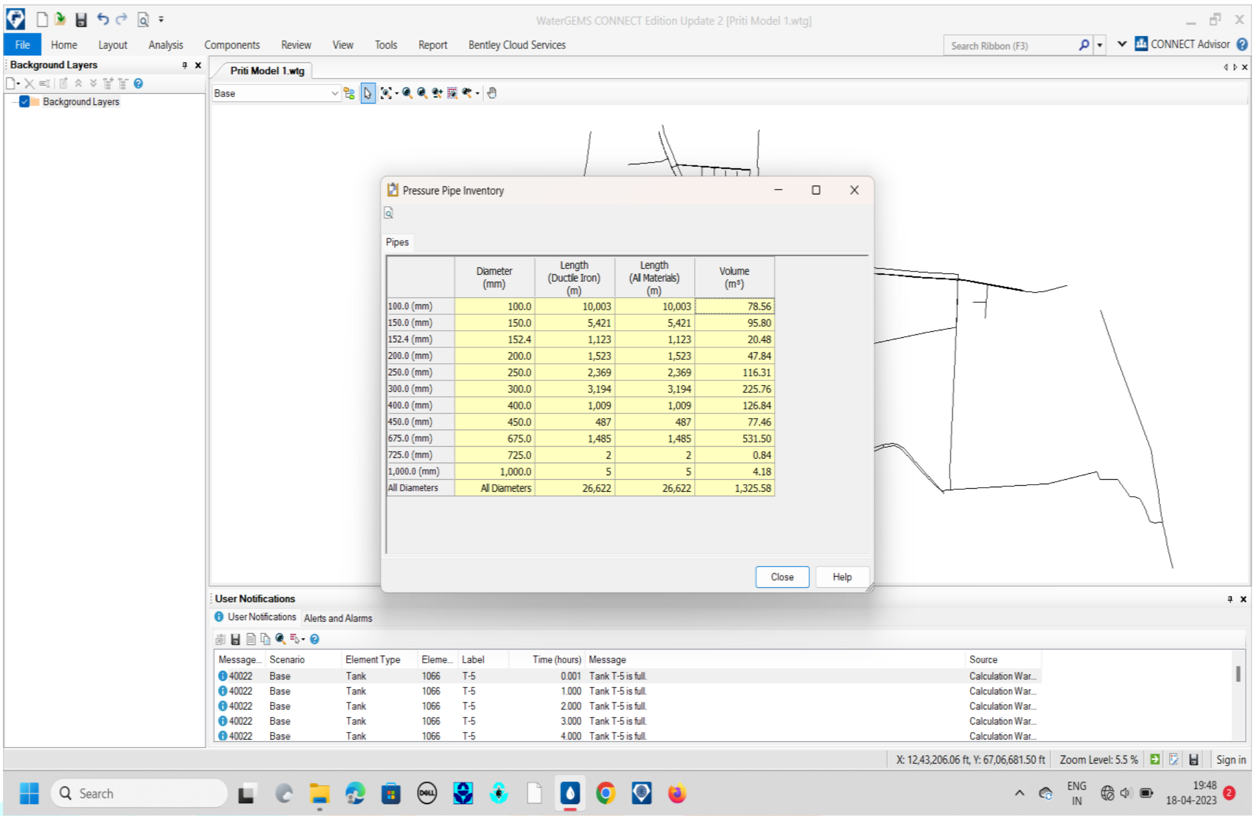
Transient Network Inventory

Check Valves	0

Pressure Pipes Inventory

100.0 (mm)	10,003 m	400.0 (mm)	1,009 m
150.0 (mm)	5,421 m	450.0 (mm)	487 m
152.4 (mm)	1,123 m	675.0 (mm)	1,485 m
200.0 (mm)	1,523 m	725.0 (mm)	2 m
250.0 (mm)	2,369 m	1,000.0 (mm)	5 m
300.0 (mm)	3,194 m	All Diameters	26,622 m

- PIPE INVENTORY



Pressure Pipe Inventory

	Diameter (mm)	Length (Ductile Iron) (m)	Length (All Materials) (m)	Volume (m^3)
100.0 (mm)	100.0	10,003	10,003	78.56
150.0 (mm)	150.0	5,421	5,421	95.80
152.4 (mm)	152.4	1,123	1,123	20.48
200.0 (mm)	200.0	1,523	1,523	47.84
250.0 (mm)	250.0	2,369	2,369	116.31
300.0 (mm)	300.0	3,194	3,194	225.76
400.0 (mm)	400.0	1,009	1,009	126.84
450.0 (mm)	450.0	487	487	77.46
675.0 (mm)	675.0	1,485	1,485	531.50
725.0 (mm)	725.0	2	2	0.84
1,000.0 (mm)	1,000.0	5	5	4.18
All Diameters	All Diameters	26,622	26,622	1,325.58

CHAPTER 6

CONCLUSION

- Water distribution network is analysed firstly and we found out that many of lines were out of age and need to design new network among the study area.
- We designed the network using survey file of PMC and we found out that we have less scope of work for new design as major part of network has not been completed 30 years of span.
- While designing network we found that elevations and undulations are unsteady and major work is to be done for pressure and flow parameters.
- Mostly all parameters are taken into consideration while designing water distribution network.
- By using hardy cross method and by doing manual calculations we studied flow in loops of our network.

We selected material, diameters and all other parameters to design actual water distribution network to be implementated.

CHAPTER 7

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