ENGINEERING REPORT & TECHNICAL SPECIFICATIONS

FOR A

WATER SYSTEM

TO SERVE

SHEFFIELD GARDENS

NYS ROUTE 17K

TOWN OF MONTGOMERY
ORANGE COUNTY, NEW YORK

PREPARED BY

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

71 Clinton Street
Montgomery, NY 12549

January 2024
Revised December 2025

W.O. 103.0301

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APPENDICES

1.0 PROJECT DESCRIPTION

Engineering & Surveying Properties, P.C. is pleased to submit this Engineer's Report for a water system to serve the project known as Sheffield Gardens. The Project Sponsor proposes three residential buildings with a total of 261 apartment units, a future area for a 16,400 square-foot retail space and a future area for a 3,375 square-foot bank space. Each use will be on its own newly subdivided lot. Water supply will be provided from existing on-site private wells a water treatment building and a water storage tank. Sewer service will be provided by a proposed on-site, private wastewater treatment plant.

2.0 SITE DESCRIPTION

The project site is located on tax parcels Section 29, Block 1, Lots 5.1, 5.2, 5.3, 5.4 & 5.5 in the Town of Montgomery, New York and is approximately 52.42± acres in size. The site is currently vacant land. No structures or uses currently exist on the Site. A location map is included in Appendix 1 as Figure 1.

3.0 EXISTING WATER SUPPLY

Although there are three existing wells located on-site, there is currently no operating water system. These wells were drilled for potential development several years ago. The applicant considered the potential to connect to existing water systems in the Town of Montgomery. Currently the Town operates four small public water districts but none of these systems are located near the Project Site or have the capacity to serve the Project. The Village of Montgomery also operates a public water system for land within the Village and various outside users approved on a site by site basis but that is also a significant distance from the site. In addition, the Village is currently experience water supply shortfalls and has a moratorium on water service connections.

4.0 PROPOSED WATER SYSTEM

4.1 PROPOSED WATER SUPPLY

The water demand estimate is calculated for 261 residential units, including 225 two bedroom units and 36 one bedroom units; 31,000 square foot retail building with 35 employees and landscaping irrigation is estimated to be 61,360 gallons per day or 42.61 GPM as summarized in Table 1.

Table 1 – Estimated Water Demand			
Type of Use	**# of Units**	**Demand Rate (gpd)**	**Average Daily Demand (gpd)**
1 – Bedroom Apartment	36 Units	110	3,960
2 – Bedroom Apartment	225 Units	220	49,500
Commercial Space	31,000 SF	0.10	3,100
	35 Employees	15	525
	(20% Reduction for Water Saving Fixtures)	(725)	(725)
Landscaping Irrigation	1 Lump Sum	5,000	5,000
		Total Demand:	**61,360**

The proposed community water supply is being designed to meet maximum daily demand which is estimated as two times the average daily demand of the residential plus the demand of the irrigation system and commercial spaces or an estimated 79.74 GPM. It is proposed that this demand be met by the three onsite wells. Based on preliminary testing performed in July of 2023 well number 1 is projected to supply over 80 gpm and wells 2 and 3 over 40 gpm each. With the largest well out of service (well 1) the system will be capable of supplying over 80 gpm which will meet or exceed the maximum daily demand.

4.2 PROPOSED PROJECT DISTRIBUTION SYSTEM

Potable water and fire protection water that is supplied by three existing on-site wells will be delivered via raw water mains to a treatment building where the water will be treated and pumped into an on-site water tank and then to the water distribution system. In total, the Project Sponsor proposes to construct +/- 4,699 LF of 8” ductile iron pipe water main, +/- 292 LF of 6” ductile iron pipe water main, +/- 2,511 LF of 4” ductile iron pipe water supply line, and an elevated water storage tank to serve the Site. The proposed mains will have hydrants and valves spaced

as required. The water tank will be 31-feet nominal diameter (actual diameter is 30.77 feet) and 106 - feet tall (actual height is 106.34 feet). The tank will be capable of storing 5,563 gallons per foot, for a total storage capacity of approximately 591,000 gallons according to the tank data included in Appendix 2. The tank, as well as all proposed water mains, will be designed and constructed in accordance with the Technical Specifications found in Appendix 3 and the Town of Montgomery and Orange County Health Department requirements. All improvements will be constructed on property controlled by the project sponsor. The layout of the water system is attached in Appendix 1 as Figure 2.

4.3 WATER QUALITY TREATMENT

Potable water samples were obtained by Sterling Environmental Engineering, P.C. in March of 2024 as part of the 72-hour pump test of the wells. Potable water samples were obtained from each of the well discharges near the end of the constant rate tests and analyzed for selected parameters required by Subpart 5-1 of the New York State Sanitary Code. No parameters exceeded the Subpart 5-1 standards in the water sample obtained from Well 2. The presence of total coliform was detected in the sample obtained from Well 3, though no other exceedances of Subpart 5-1 standards were reported. Disinfection of wells before being put into operation is expected to address any coliform present in Well 3.

Total iron at a concentration of 1.12 mg/L exceeded the Subpart 5-1 standard of 0.3 mg/L at Well 1 and subsequently the sum of total iron and manganese (1.219 mg/L) exceeded the Subpart 5-1 combined standard of 0.5 mg/l. Iron and manganese are common constituents in bedrock-derived groundwater and can be addressed with standard water treatment methods if concentrations remain elevated after well development and use.

4.4 PROPOSED SYSTEM PRESSURES

The proposed pressure and flow calculations indicate that the normal operating pressure would range from a high pressure of 61.42 psi at the lowest point of the distribution system (elevation 400.02) at a highwater level, pump-off condition in the tank (elevation 541.98), to a low pressure of 45.24 psi at the high

point (elevation 424.41) at the low water level pump on condition in the tank (elevation 528.98) and this will comply with New York State Building Code, which requires a minimum and maximum system pressure of 45 psi and 100 psi, respectively. The proposed well pumps will be capable of producing the flows and pressure necessary to transport the raw well water to the treatment building, route the water through the various treatment processes and eventually to the tank. The tank will supply domestic and fire flows to the proposed project. Pressure calculation worksheets are included in Appendix 4.

4.5 FIRE FLOW

The Insurance Service Office (ISO) does not have recommendations for Needed Fire Flow (NFF) for buildings rated and coded as protected by an automatic sprinkler system meeting applicable NFPA standards. However, a fire flow of 500 GPM was assumed for pressure calculations for the proposed hydrants, which will aid in fire suppression and can be utilized in the design of the building's sprinkler systems.

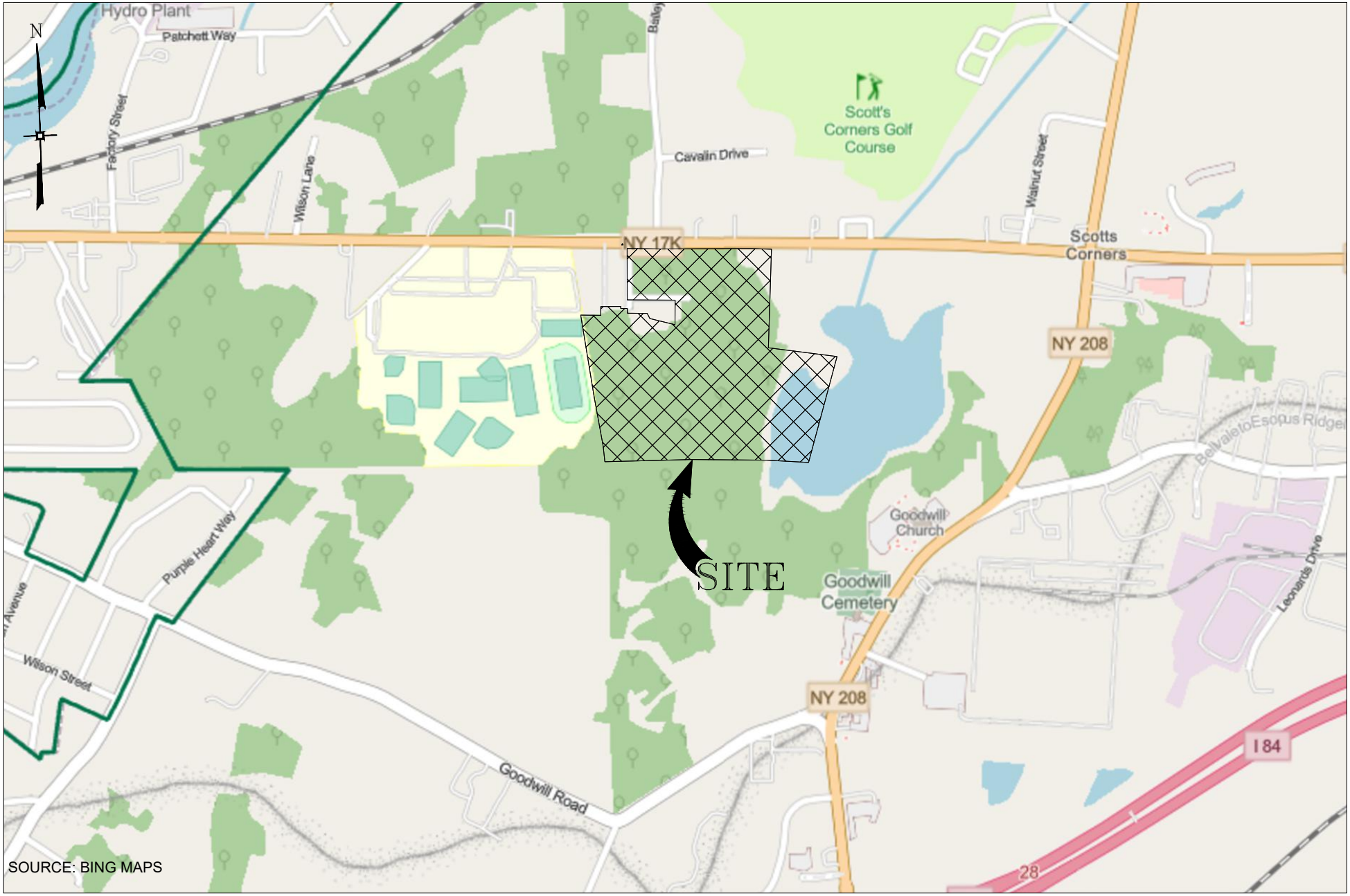
The Fire Flow calculations included in Appendix 4 indicate that the Fire Flow Available (FFA), at the proposed fire hydrants, will provide between 1,972.8 GPM (Hydrant H-12) and 4,000 GPM (Hydrant H-1) while maintaining a minimum residual pressure in the system of at least 20 psi. The water storage tank has been designed to provide minimum of 327,104.40 gallons for firefighting purposes, beginning at "low water" elevation of 529.00 to elevation 470.20 or 20 psi minimum pressure for fire fighting. This 327,104.40 gallons would provide approximately 10.9 hours of fire suppression service to the Site.

5.0 CONCLUSION

As proposed, the water system designed to service the project will meet or exceed all local and state design requirements.

APPENDIX 1

FIGURES



SITE LOCATION MAP	SHEFFIELD APARTMENTS ROUTE 17K TOWN OF MONTGOMERY ORANGE COUNTY, NEW YORK	DATE: 12/15/2023	JOB # 103.0301
		SCALE: 1"=1000'	SHEET # 2.2A

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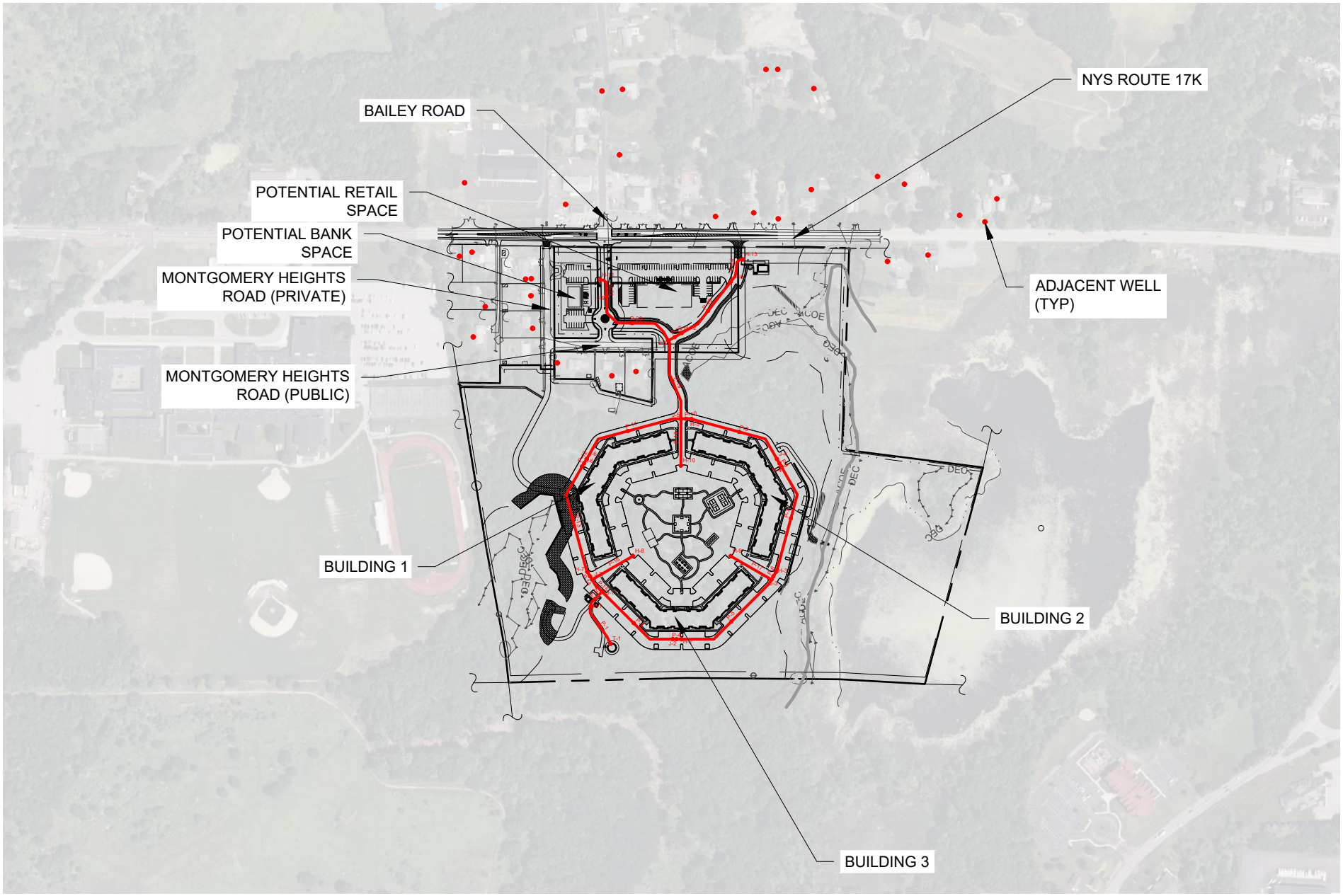

PROPOSED WATER SYSTEM	SHEFFIELD GARDENS NYS ROUTE 17K TOWN OF MONTGOMERY ORANGE COUNTY, NEW YORK	DATE: 01/22/2024 REV 12/18/2025	JOB # 103.0301	ENGINEERING & SURVEYING PROPERTIES Achieving Successful Results with Innovative Designs
		SCALE: 1" = 500'	SHEET # 3.3A	

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APPENDIX 2

WATER TANK STORAGE DATA

AQUASTORE® TANK CAPACITY CHART
WATER TANKS WITH CONCRETE FLOORS (US Gallons x 1000)

Model Diameter	Sheets	Exact Diameter (feet)	Capacity Per Foot (gallons)	Maximum Water Depth AWWA Z = 0,1 Design (feet)	AWWA Z = 2A Design (feet)	AWWA Z = 2B Design (feet)	AWWA Z = 3 Design (feet)	AWWA Z = 4 Design (feet)	AISC Z = 0,1 Design (feet)	Model Sidewall Height / Actual Sidewall Height (feet) 6 / 5.51	10 / 10.09	15 / 14.68	19 / 19.26	24 / 23.84	28 / 28.43	33 / 33.01	38 / 37.59	42 / 42.18	47 / 46.76	51 / 51.34	56 / 55.92	61 / 60.51	65 / 65.09	70 / 69.67	74 / 74.26	79 / 78.84	83 / 83.42	88 / 88.01	93 / 92.59	97 / 97.17	102 / 101.75	106 / 106.34	111 / 110.92	116 / 115.50	120 / 120.09	125 / 124.67	129 / 129.25	134 / 133.84	138 / 138.42
11	4	11.19	735	65.1	46.4	40.2	32.8	28.4	65.1	4	7	10	14	17	20	24	27	30	34	37	41	44	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	5	13.98	1,149	138.4	113.2	97.8	80.1	69.3	138.4	6	11	16	22	27	32	37	43	48	53	58	64	69	74	80	85	90	95	101	106	111	116	122	127	132	137	143	148	153	159	
17	6	16.78	1,655	138.4	105.0	91.2	73.9	63.7	138.4	9	16	24	31	39	47	54	62	69	77	84	92	100	107	115	122	130	138	145	153	160	168	175	183	191	198	206	213	221	229	
20	7	19.58	2,252	138.4	98.4	84.7	69.3	60.5	138.4	12	22	33	43	53	64	74	84	94	105	115	125	136	146	156	167	177	187	198	208	218	229	239	249	260	270	280	291	301	311	
22	8	22.37	2,942	138.4	92.2	80.1	65.7	57.5	138.4	16	29	43	56	70	83	97	110	124	137	151	164	178	191	204	218	231	245	258	272	285	299	312	326	339	353	366	380	393	407	
25	9	25.17	3,724	123.2	88.7	76.5	62.7	54.9	138.4	20	37	54	71	88	105	122	139	157	174	191	208	225	242	259	276	293	310	327	344	361	378	395	413	430	447	464	481	498	515	
28	10	27.97	4,597	110.9	84.7	72.9	60.5	52.9	131.0	25	46	67	88	109	130	151	172	193	214	236	257	278	299	320	341	362	383	404	425	446	467	488	509	530	552	573	594	602		
31	11	30.77	5,563	100.8	81.1	70.9	58.5	50.3	119.0	30	56	81	107	132	158	183	209	234	260	285	311	336	362	387	413	438	464	489	515	540	566	591	617	642	662					
34	12	33.56	6,620	92.4	78.5	68.3	56.5	49.3	109.1	36	66	97	127	157	188	218	248	279	309	339	370	400	430	461	491	521	552	582	612	643	673	703	722							
36	13	36.36	7,770	85.3	75.5	66.3	54.9	48.3	100.7	42	78	114	149	185	220	256	292	327	363	398	434	469	505	541	576	612	648	683	719	755	782									
39	14	39.16	9,011	79.2	73.9	64.7	53.9	47.3	93.5	49	90	132	173	214	256	297	338	380	421	462	503	545	586	627	669	710	751	793	834	842										
42	15	41.96	10,345	73.9	71.9	62.7	52.9	46.8	87.3	57	104	151	199	246	294	341	388	436	483	531	578	625	673	720	768	815	863	903												
45	16	44.75	11,770	69.3	69.3	61.7	51.9	45.8	81.9	64	118	172	226	280	334	388	442	496	550	604	658	712	766	820	873	927	963													
48	17	47.55	13,287	65.2	65.2	60.5	51.3	44.8	77.0	73	134	195	255	316	377	438	499	560	621	682	743	803	864	925	986	1,023														
50	18	50.35	14,896	61.6	61.6	59.5	50.3	44.8	72.8	82	150	218	286	355	423	491	559	628	696	764	833	901	969	1,037	1,083															
53	19	53.15	16,598	58.3	58.4	58.4	49.3	43.8	68.9	91	167	243	319	395	471	547	623	700	776	852	928	1,004	1,080	1,143																
56	20	55.95	18,391	55.4	55.4	55.4	49.3	43.8	65.5	101	185	269	354	438	522	607	691	775	859	944	1,028	1,112	1,197																	
59	21	58.74	20,276	52.8	52.8	52.8	48.3	42.8	62.4	111	204	297	390	483	576	669	762	855	948	1,040	1,133	1,226	1,264																	
62	22	61.54	22,253	50.4	50.4	50.4	48.3	42.8	59.5	122	224	326	428	530	632	734	836	938	1,040	1,142	1,244	1,324																		
64	23	64.34	24,322	48.2	48.2	48.2	48.2	42.2	56.9	134	245	356	468	579	691	802	914	1,025	1,137	1,248	1,360	1,384																		
67	24	67.13	26,483	46.2	46.2	46.2	46.2	42.2	54.6	145	267	388	510	631	752	874	995	1,116	1,238	1,359	1,445																			
70	25	69.93	28,736	44.3	44.4	44.4	44.4	41.2	52.4	158	290	421	553	685	816	948	1,080	1,211	1,343	1,475	1,505																			
73	26	72.73	31,081	42.6	42.6	42.6	42.6	41.2	50.4	171	313	456	598	741	883	1,025	1,168	1,310	1,453	1,565																				
76	27	75.53	33,518	41.1	41.1	41.1	41.1	41.1	48.5	184	338	491	645	799	952	1,106	1,260	1,413	1,567	1,625																				
78	28	78.32	36,046	39.6	39.6	39.6	39.6	39.6	46.8	198	363	529	694	859	1,024	1,189	1,355	1,520	1,685																				
81	29	81.12	38,667	38.2	38.2	38.2	38.2	38.2	45.2	213	390	567	744	921	1,099	1,276	1,453	1,630	1,746																				
84	30	83.92	41,380	37.0	37.0	37.0	37.0	37.0	43.6	228	417	607	796	986	1,176	1,365	1,555	1,745	1,806																				
87	31	86.72	44,184	35.8	35.8	35.8	35.8	35.8	42.2	243	445	648	850	1,053	1,255	1,458	1,660	1,863																				
90	32	89.51	47,081	34.6	34.6	34.6	34.6	34.6	40.9	259	475	691	906	1,122	1,338	1,554	1,769	1,926																				
92	33	92.31	50,070	33.6	33.6	33.6	33.6	33.6	39.7	275	505	734	964	1,193	1,423	1,652	1,882	1,986																				
95	34	95.11	53,150	32.6	32.6	32.6	32.6	32.6	38.5	292	536	780	1,023	1,267	1,510	1,754	1,998	2,046																				
98	35	97.91	56,323	31.7	31.7	31.7	31.7	31.7	37.4	310	568	826	1,084	1,342	1,601	1,859	2,107																					
101	36	100.70	59,587	30.8	30.8	30.8	30.8	30.8	36.4	328	601	874	1,147	1,420	1,693	1,966	2,167																					
104	37	103.50	62,944	30.0	30.0	30.0	30.0	30.0	35.4	346	635	923	1,212	1,500	1,789	2,077	2,227																					
106	38	106.30	66,392	29.2	29.2	29.2	29.2	29.2	34.5	365	670	974	1,278	1,582	1,887	2,191	2,287																					
109	39	109.10	69,932	28.4	28.4	28.4	28.4	28.4	33.6	385	705	1,026	1,346	1,667	1,987	2,308	2,347																					
112	40	111.90	73,565	27.7	27.7	27.7	27.7	27.7	32.7	405	742	1,079	1,416	1,754	2,091	2,408																						
115	41	114.69	77,289	27.0	27.0	27.0	27.0	27.0	31.9	425	780	1,134	1,488	1,842	2,197	2,468																						
117	42	117.49	81,105	26.4	26.4	26.4	26.4	26.4	31.2	446	818	1,190	1,562	1,933	2,305	2,528																						
120	43	120.29	85,013	25.8	25.8	25.8	25.8	25.8	30.5	468	858	1,247	1,637	2,026	2,416	2,588																						
123	44	123.09	89,013	25.2	25.2	25.2	25.2	25.2	29.8	490	898	1,306	1,714	2,122	2,530	2,648																						
126	45	125.89	93,105	24.6	24.6	24.6	24.6	24.6	29.1	513	939	1,366	1,793	2,219	2,646	2,709																						
129	46	128.68	97,289	24.1	24.1	24.1	24.1	24.1	28.5	536	982	1,427	1,873	2,319	2,765																							
131	47	131.48	101,565	23.6	23.6	23.6	23.6	23.6	27.9	559	1,025	1,490	1,956	2,421	2,829																							
134	48	134.27	105,933	23.1	23.1	23.1	23.1	23.1	27.3	583	1,069	1,554	2,040	2,525	2,889																							
137	49	137.07	110,393	22.6	22.6	22.6	22.6	22.6	26.7	608	1,114	1,620	2,126	2,632	2,950																							
140	50	139.87	114,945	22.2	22.2	22.2	22.2	22.2	26.2	633	1,160	1,687	2,213	2,740	3,010																							
143	51	142.67	119,589	21.7	21.7	21.7	21.7	21.7	25.7	659	1,207	1,755	2,303	2,851	3,070																							
145	52	145.46	124,324	21.3	21.3	21.3	21.3	21.3	25.2	685	1,254	1,824	2,394	2,964	3,130																							
148	53	148.26	129,152	20.9	20.9	20.9	20.9	20.9	24.7	711	1,303	1,895	2,487	3,079	3,190																							
151	54	151.06	134,072	20.5	20.5	20.5	20.5	20.5	24.2	738	1,353	1,967	2,582	3,196	3,251																							
154	55	153.86	139,083	20.2	20.2	20.2	20.2	20.2	23.8	766	1,403	2,041	2,678	3,311																							
157	56	156.66	144,187	19.8	19.8	19.8	19.8	19.8	23.4	794	1,455	2,116	2,777	3,371																							
159	57	159.46	149,382	19.4	19.4	19.4	19.4	19.4	23.0	823	1,507	2,192	2,877	3,431																							
162	58	162.26	154,670	19.1	19.1	19.1	19.1	19.1	22.6	852	1,561	2,270	2,978	3,491																							
171	61	170.65	171,082	18.2	18.2	18.2	18.2	18.2	21.5	942	1,726	2,510	3,295	3,672																							
179	64	179.04	188,318	17.3	17.3	17.3	17.3	17.3	20.5	1,037	1,900	2,763	3,627	3,852																							
187	67	187.43	206,381	16.5	16.5	16.5	16.5	16.5	19.5	1,137	2,083	3,029	3,974	4,033																							
193	69	193.03	218,898	16.1	16.1	16.1	16.1	16.1	19.0	1,206	2,209	3,212	4,153																							
201	72	201.42	238,340	15.4	15.4	15.4	15.4	15.4	18.2	1,313	2,405	3,498	4,334																							
210	75	209.81	258,609	14.8	14.8	14.8	14.8	14.8	17.5	1,425	2,610	3,795	4,514																							
218	78	218.20	279,712	14.2	14.2	14.2	14.2	14.2	16.8	1,541	2,823	4,105	4,695																							
227	81	226.59	301,642	13.7	13.7	13.7	13.7	13.7	16.2	1,662	3,044	4,427	4,876																							
235	84	234.99	324,399	13.2	13.2	13.2	13.2	13.2	15.6	1,787	3,274	4,761	5,056																							
243	87	243.38	347,984	12.7	12.7	12.7	12.7	12.7	15.1	1,917	3,512	5,107	5,237																							

Tank Design Code	Seismic Zone
AWWA D103-97	N/A
AWWA D103-97	1
AWWA D103-97	2A
AWWA D103-97	2B
AWWA D103-97	3
AWWA D103-97	4
AISC	N/A

Notes:
1. 100 mph wind speed
2. 25 psf live snow load
3. Seismic zone 0,1,2A, 2B, 3, 4
4. Importance Factor, I = 1.25
5. Site Amplification Factor, S = 1.5
6. Specific gravity 1.0 @ STP
7. Structure height limitations dependent upon local soil conditions and construction techniques
8. AWWA Designates AWWA D103-97
9. Assumes a maximum material thickness of .375 HSLA
10. Model Designation => Model Diameter & Model Sidewall Height
    Example: *Model Designation 4228 => 42' diameter & 28' height*
11. For steel floor option: Add .678' X Capacity Per Foot (gallons) to listed capacities
12. No freeboard allowance except in the yellow shaded areas where the freeboard is variable
13. Embedded starter design assumes short starter <=38' in height and mid starter >38' in height

Conversions:
Gallons => Cubic feet
Multiply 1000 gallons by 133.68

Gallons => Cubic Meters
Multiply 1000 gallons by 3.785

CST™
AQUASTORE®

AQUASTORE®

Glass-Fused-To-Steel Liquid Storage Tanks

CST

Steel Gives You Strength

Glass Gives You Protection

A LEGACY OF INNOVATION

CST Industries, Inc. has a long and storied history of turning raw steel into the finest storage tanks available. Our unique glass-fused-to-steel technology was introduced more than 67 years ago. Today, CST is dedicated to the design, fabrication and installation of glass-fused-to-steel storage tanks.

After more than 100,000 installations of field proven performance, Aquastore® tanks remain the markets preferred choice for potable water storage and liquid applications. With tens of thousands of satisfied customers, Aquastore tanks are engineered to be the very best.

CST has an ongoing research/product improvement program dedicated to constantly enhancing our manufacturing processes. As the leading innovator, CST ensures **Vitrium™ TiO_2** and **Edgecoat II™** technology is utilized on every tank for maximum corrosion resistance and the longest life span available. When you purchase an Aquastore, you get the best tank, EVERY TIME.

With Aquastore, you get the highest engineered quality, best service, longest product life and greatest value in liquid storage tanks.

Aquastore owners choose CST's glass-fused-to-steel technology over all other tank designs for several reasons:

- Never EVER needs painting
- Aquastore tanks are manufactured using Vitrium coating technology enhanced with TiO_2
- Edgecoat II technology, the ONLY process in the world that provides optimum glass encapsulation on all (4) four sides of the sheet
- Greater lifetime value compared to other tank designs
- Fastest construction time – Easy assembly without cranes or special equipment
- Expandable to accommodate future requirements
- Available in diameters from 11 feet (3.3 m) to 243 feet (74 m) and capacity from 20,000 gallons (75 cu m) to over 6 million gallons (22,700 cu m)
- Specific tank designs, options and accessories to meet every customers needs
- Lowest life cycle cost of all other available tank designs

All Aquastore tanks are manufactured exclusively in the USA with only USA steel and supported by the world's most experienced Local Authorized Dealer Network

» Glass Tanks with a Heart of Steel™

Vitrium™ TiO_2

ENHANCED GLASS-FUSED-TO-STEEL TECHNOLOGY

Aquastore's glass-fused-to-steel is the premium technology in the tank market. Glass coating's physical properties are specially suited to municipal and industrial storage applications. The factory-applied silica glass coating on Aquastore tanks forms a hard, inert barrier for both the interior and exterior tank surfaces to guard against weather and corrosion. Glass-fused-to-steel is impermeable to liquids and vapors, controls undercutting caused by corrosion and offers excellent impact and abrasion resistance. The color won't fade or chalk and graffiti can easily be removed. ***It never needs painting!***

A multi-step process is the heart of the glass-fused-to-steel technology system:

- Fabricated sheets are grit blasted to a uniform, near white surface
- Formulations of borosilicate, minerals, water and clays are blended into a sprayable slurry called "slip"
- After inspection, the slurry is fused to the steel sheets at temperatures above 1500° F (815° C) resulting in an ionic exchange of materials and forming a covalent bond producing the distinctive glossy Aquastore glass finish
- The molten glass reacts with the profiled steel surface to form an inert, inorganic chemical and mechanical bond

State-of-the-art porcelain enameling furnace improves quality, saves energy, increases production and speeds delivery of glass-fused-to-steel products to customers.

The interior of ALL Aquastore tanks feature Vitrium™ coating technology enhanced with titanium dioxide (TiO_2) for the toughest glass available. This coating combines the outstanding chemical and physical resistant properties of titanium-enhanced glass with a highly engineered, ultra-fine glass bubble structure essential to flexibility, quality and longevity. This process results in high performance glass-fused-to-steel technology. Vitrium features and benefits include:

- Tough TiO_2 glass formulations provides longer life
- White interior is easier to inspect than darker coatings
- Factory certified holiday-free sheets
- Designed for use in both cold and hot climates
- Designed, fabricated, shipped and supported within the USA

Guaranteeing the best quality available from our manufacturing facility to your jobsite.

Glass frit is specially formulated to produce the distinctive cobalt blue Aquastore glass coating.

ENGINEERED EDGECOAT TECHNOLOGY

Edgecoat II™ is a result of CST's commitment to an ongoing product development and improvement program. This continuous innovative *Edgecoat II technology is the ONLY process in the world that provides optimum glass encapsulation on all (4) four sides of the sheet edges.* CST took the best Edgecoat technology in the world and made it better with Edgecoat II.

Following Porcelain Enameling Institute guidelines (PEI-101), Edgecoat II sheets are mechanically rounded to specific radii that provides maximum glass adhesion to steel. The combination delivers the maximum corrosion resistance of Vitrium glass coating with the greatest protection on every sheet.

The Edgecoat II engineered approach involves stringent plant quality control procedures to ensure the Edgecoat II remains in place throughout the life of the tank.

Sheet edge corrosion on steel is aesthetically unpleasant and will significantly limit the life of your storage tank. Due to the manufacturing expense and professional engineering necessary to coat the steel edges, other glass tank providers will leave them uncoated and exposed; relying solely on the sealant fillet to prevent corrosion in this area. CST's improved process of mechanically rounding the sheet edges to exact radii ensures adherence of the glass for complete encapsulation on every sheet edge.

Aquastore glass-fused-to-steel tanks with Vitrium TiO_2 and enhanced Edgecoat II technology, offer complete encapsulation and corrosion protection. CST continues to lead innovative improvements in areas that are most susceptible to environmental attack.

The physical properties of all Aquastore tanks' glass coating are especially suited to municipal and industrial liquid storage applications. The tank designs incorporate recognized standards assuring high-quality long-lasting municipal and industrial liquid storage tanks.

Engineered Edge

Benefits of Edgecoat II include:

- 5 mils of glass encapsulation on every sheet edge
- Glass is applied on all (4) four sides of the rectangular sheet edges providing the greatest protection
- Edges are engineered to ensure optimum radii for each individual gauge of steel providing the maximum and consistent glass edge
- No sharp edges on tank sheets, eliminating safety hazards
- Highest quality finish

World-Class Value «

TANK ECONOMICS & LIFETIME VALUE

All tanks are not created equal! The glass-fused-to-steel technology in an Aquastore tank delivers greater lifetime value than any other tank provider. When you add up the tank benefits over its life cycle, the advantages of an Aquastore cannot be beat. It is simply the best quality, lowest maintenance and most flexible tank available.

CONSIDERING CONCRETE OR WELDED?

The biggest economic advantage is that an Aquastore tank never needs painting! The budgeted dollars that may be used to repair a concrete tank or repaint a welded tank every 8 – 15 years can be diverted to other municipal or industrial needs. The modular design allows for rapid installation and flexibility when compared to concrete and welded construction.

Concrete tanks are expensive, involve long construction periods, need a lot of room to build and are not "maintenance free". AWWA allows for leaking, and some level of cracking is expected. Concrete tanks require a lengthy construction time compared to an Aquastore tank, especially when expensive concrete roofs are involved and must be field coated to meet NSF approval.

Welded tanks have long lead and construction times. They are limited by external environmental factors when being erected and field painted. Welded tanks have high maintenance costs and must be painted multiple times over their life cycle.

Aquastore Features & Accessories

Cathodic Protection

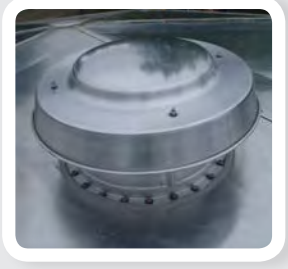
An Aquastore tank's progressive cathodic protection system uses sacrificial anodes to protect the reinforcing bars, mitigate corrosion and provide protection to internal submerged surfaces of the tank. It is incorporated into the Aquastore tank's warranty.

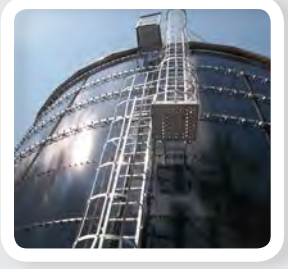
Gravity Vent

Aquastore tank gravity vents are designed to allow for air exchange during filling and emptying. They are equipped with corrosion-resistant bird and insect screens.

Ladder: Cage & Platform

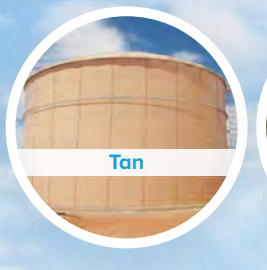
Aquastore tank ladders are constructed of aluminum rails and rungs with hot-dip galvanized cages and step off platforms. Ladders with locking safety cage doors are available.





EXTERIOR COLOR OPTIONS

Aquastore glass coatings are available in standard cobalt blue and four other exterior colors. Inquire for custom colors.



Look for the white interior as a result of the TiO_2 coating formula and technology that ensure the maximum corrosion protection for your tank. The white interior provides an added benefit of full visual exposure of your tank during inspections.

Sidewall Manways

Aquastore tank manways are designed in accordance with AWWA D103 Standards. They are 24 inches (61 cm), 30 inches (76 cm) or 36 inches (91 cm) in diameter and are manufactured with hot-dip galvanized or stainless steel. Manways are provided with a davit hinge connection for easy access.

Hardware and Sealants

The hardware and sealants are specific to each application. Chlorine resistant sealants, hardware with protective covers and heavy duty plastic bolt caps are also available for added protection.

Accessories & More

A variety of accessories are available to meet specific needs. Accessories include:

- Roof walkways, railings & staircases
- Level indicators
- Nozzles
- And many more

TANK APPLICATIONS

Aquastore storage tanks with Vitrium glass-fused-to-steel are ideal for the following designs and applications:

Composite Elevated

Standpipe

Leachate

Ground Storage Tank

Fire Protection

Anaerobic Digestion

Municipal Wastewater
Clarifier / Sludge / Storage / Mixing

FROM THE TOP DOWN - FASTER, SAFER CONSTRUCTION

Every Aquastore tank is factory engineered to customer specifications. Since all components are manufactured in the factory and easily assembled, Aquastore tanks can be installed in many types of weather conditions that field-welded steel or concrete tanks cannot. Tanks are assembled from the top down by factory-trained professional building crews using CST's Proof Load Tested and PE stamped jacking systems that safely and progressively elevate the structure without the need for expensive cranes, large staging areas or extensive scaffolding. Erection crews can stay safely on the ground. This construction method enables rapid, logical progress for timely completion.

- Small footprint
- Site work savings
- Year round construction
- Fast turnaround
- Quick erection
- Trained and certified crews

Floors

Aquastore floors can be glass-fused-to-steel or reinforced concrete. Steel floors have the same superior glass coating as the Aquastore glass-fused-to-steel sheets. When using concrete, Aquastore walls are embedded in the foundation. Authorized Aquastore Dealers can provide site preparation and foundation installation.

Sidewalls

Sidewall erection is completed using a series of specially engineered motorized jacks. Each glass-fused-to-steel panel is bolted and sealed into place. Upon completion, the motorized jacks raise the sidewall ring so subsequent rings can be erected. Erecting an Aquastore tank does not require heavy-load cranes or lifting equipment on-site. This unique installation process allows for construction in remote regions, as well as metropolitan areas.

Roofs or Domes

The flush batten OptiDome® is a next generation aluminum geodesic dome. OptiDome aluminum domes incorporate a flush batten design that effectively sheds water and reduces ponding on the panels. With a Double Web I-Beam customers get the most efficient, functional, long lasting dome solution in the industry. OptiDome is easy to install and requires less sealant than typical geodesic domes. CST's OptiDome design efficiently complies with the latest requirements that have been adopted by 2010 Aluminum Design Manual, Eurocode, and International Building Code 2012.

Every OptiDome is custom designed to meet the specific requirements of each project and can be engineered for any snow, wind or suspended load capacity, as well as span-to-rise-ratio. The all-aluminum free span OptiDome's are available for the complete range of Aquastore tanks.

Glass-fused-to-steel roofs are available up to 31' in diameter and aluminum geodesic domes are available in all sizes.

Glass-fused-to-steel roofs are manufactured with hard tooling and include radially sectioned steel panels. The roofs are assembled using the same sealant and bolting techniques as the sidewall panels.

Sealants

Aquastore tanks feature sealants specifically formulated for chemical resistance appropriate to the application. Each sealant is inspected on a batch-by-batch basis to ensure quality. The sealant is suitable for contact with potable water and is certified to meet ANSI/NSF Additives Standard 61 for indirect additives and is chlorine resistant. Sealants cure to a rubber-like consistency, have excellent adhesion to the glass coating, low shrinkage and are utilized for both interior and exterior use.

Authorized Aquastore Dealers «

Most Experienced Dealer Network

CST delivers Aquastore tanks through a network of Authorized Aquastore Dealers. These organizations and their sales representatives are available to discuss project requirements from inception to completion. Experience in your region and application knowledge are valuable during all stages, from project development to specification to erection to the completed and tested tank.

Pricing, budget estimates, foundation layouts, project scheduling, approval drawings and foundation construction are just a few of the areas where Authorized Aquastore Dealers can help. Our customers deal with one source from start to finish, including service after installation. Dealers provide excellent customer service, are local and knowledgeable of your area and building requirements.

Authorized Aquastore Dealers offer a turn-key package to customers providing service, support and expertise from start to finish. In addition to selling and erecting an Aquastore tank, dealer sales and service specialists provide the following:

- Value engineering – total cost analysis
- Tank configuration and layout data
- Budgeting
- Product engineering specifications
- Design criteria assistance
- Tank layout drawings
- Approval drawings
- Certified drawings
- Site preparation and layout
- Tank construction scheduling
- Structural calculations
- Tank testing and commissioning
- Tank inspection
- Maintenance services
- Relocation or expansion
- Concrete work
- Pipe work (inlet, outlet, overflow, decant, etc.)
- Insulation (spray foam, battens, etc.)
- Dome installations
- Turn-key tank construction
- After sale service

Turnkey package from site preparation to completed and tested tank.

» Best in Industry Warranty

For more than 67 years, CST has offered the most comprehensive manufacturer's warranty in the industry. The field-proven performance history of Aquastore tanks is one more indication that our products are built to last.

An Aquastore tank requires minimal maintenance over its life cycle and CST's Authorized Aquastore Dealers will provide complete service packages tailored to your application needs. Most importantly, the glass-fused-to-steel technology provides protection from environmental impact and never needs painting, saving hundreds of thousands of dollars over time.

Always there when you need us, just a phone call away...

*Find your nearest Aquastore Dealer in the dealer locator section at **aquastore.com** or call **815-756-1551** today!*

CST is committed to providing its customers with the highest engineered quality, best service, longest product life and greatest value for every storage solution we supply. Contact CST for all of your water, wastewater and liquid applications.

Worldwide Availability

CST Global Manufacturing and Offices

Certifications and Capabilities:

- ISO 9001:2015
- AISC
- IBC
- Individual State Building Codes
- ANSI/AWWA D103
- NBCC
- FM 4020/4021
- British Standard 7543:2003
- EN 15282/ISO 28765
- NFPA Standard 22
- ANSI/NSF 61

For more information, call **815-756-1551** or visit **aquastore.com** to find an Authorized Aquastore Dealer nearest you.

CST Industries, Inc. | 345 Harvestore Dr. | DeKalb, IL 60115 USA | Phone: 815-756-1551 | www.aquastore.com

APPENDIX 3

TECHNICAL SPECIFICATIONS

SECTION 02660

WATER SYSTEM

PART 1.0 - GENERAL

1.01 SUMMARY

A. The Contractor shall supply all labor, tools, materials, and equipment to construct, test and disinfect the watermains as described in these specifications and the accompanying drawings. All references to the standards, specifications, regulations, etc., are meant to be their last revisions. The contractor shall comply with the latest regulations, requirements and specifications of the New York State Department of Health, the "Recommended Standards for Water Works", 2022 publication and all appropriate AWWA Specifications, latest revision.

1.02 PROJECT RECORD DOCUMENTS

A. Accurately record the actual locations of all subsurface utilities, structures and obstructions encountered during construction. Provide an as-built survey of the water main and water service locations prior to final payment.

PART 2.0 - PRODUCTS

2.01 PIPE

All pipe shall be class 52 double cement lined ductile iron pipe with exterior bituminous coating and shall meet the requirements of AWWA C104 and AWWA C151, latest revisions. Pipe shall be supplied in the longest available lengths which will provide for required horizontal and vertical deflections, but shall not exceed 20 feet. Pipe shall be push-on or mechanical joint as required. All fittings and appurtenances shall be cast iron. Pipe lengths must be 5' at all connections to fittings and 20 feet at all crossings with storm and sanitary sewers and laterals.

Joints shall be the integral wall bell and spigot type using Elastrometric Gasket Joints meeting the requirements of ASTM F-477. All pipes shall be wiped clean and lubricated prior to insertion.

Place detectable identification tape 24” above pipe, or immediately under pavement. The detectable identification tape shall be made of polyethylene with a 1 mil metallic foil core, highly resistant to alkalis, acids or other destructive chemical compounds likely to be encountered in soils. The tape shall have black letters "CAUTION BURIED WATER LINE BELOW" printed on blue background. Tape shall be at least 3" wide, manufactured by Reef Industries, Inc. (TERRA TAPE), Linguard, Inc. or approved equal.

2.02 FITTINGS

Fittings shall be cast iron with mechanical joints. Fittings shall be pressure rated at 250 psi, and shall conform to AWWA C110, latest revision, specifications. Mechanical joint rubber gaskets shall

conform to AWWA C-111, latest revision, standards. Tie rodding should be provided with retainer glands for all fittings as necessary to restrict pipe displacement.

Fittings shall also include thrust blocks.

2.03 VALVES

Valves shall be Mueller Resilient Wedge Gate Valves Model # A-2360 as manufactured by Mueller Company. Valves shall meet all applicable requirements of ANSI/AWWA C509, latest revision, and be pressure rated to 250 psi working pressure and 500 psi static test pressure.

2.04 HYDRANT

A. All hydrants shall be dry-barrel Mueller Super Centurion Model A-423 with 5-1/4" valve nozzle configuration. Hydrants shall conform to AWWA C502, latest revision. All hydrants shall be pressure rated to 250 psi working pressure 400 psi static pressure and shall have a main valve opening of five (5) inches. All tees, valves, and fittings include restraint in the form of retainer glands, rods, and thrust blocks.

B. Hydrant drains, where allowed, must be above the seasonal groundwater table. If groundwater is encountered within two feet of the base of the hydrant, the hydrant barrel weephole must remain plugged. When the drains are plugged, the barrels must be pumped dry after use during freezing weather. Where hydrant drains are not plugged, a gravel pocket or dry well shall be provided unless the natural soils will provide adequate drainage. Hydrant drains shall not be connected to or located within 10 feet of sanitary sewers, storm sewers, or storm drains.

PART 3.0 - EXCAVATION AND PIPE INSTALLATION

3.01 BEDDING

The Contractor shall use 3/4" clean crushed stone or coarse sand for bedding of the water mains and shall be placed evenly and carefully around and over the pipe in six (6) inch maximum layers. Each layer shall be thoroughly and carefully compacted until one (1) foot of cover exists over the pipe. Each layer shall be compacted by approved mechanical tamping machines to not less than 90% of the maximum dry density as defined by ASTM D1557, latest issue for that soil.

3.02 LAYING PIPE

The Contractor shall Dial 811 to contact UDig NY or go online to www.udigny.org. Any other involved utility companies not affiliated with UDig NY, prior to any excavation. Pipes that require cutting shall be cut with a pipe saw, wheelcutter or hydraulic cutter as deemed acceptable by the engineer. All pipes shall be backfilled prior to the end of the working day in order to minimize safety hazards. All open ends of pipe shall be plugged and sealed watertight. Blocking and wedging are not permitted for pipe stabilization. Clean sand shall be used to make the bottom of trench uniform. Pipe deflections are permitted to 80% of the maximum allowable limit of 5 degrees for design purposes. All piping must have double line indicators to measure maximum deflections limits in the field. All

pipes shall be laid in accordance with AWWA C600, latest revision, for ductile iron pipe. All pipes, fittings and valves shall be carefully handled to avoid damage and, while they are suspended over the trench, before lowering, they shall be rung and inspected for defects. Before the pipe is laid, all lumps, blisters, excess coal tar, dirt, oil, grease and moisture shall be removed from inside the pipe. After pipe is laid, care shall be taken to avoid the entrance of dirt or water from the trench by use of tight bulkheads. Under no conditions may pipe be installed with standing groundwater in the trenches.

The pipe shall be laid to conform to lines and grades shown on the plans, or as directed by the engineer. The pipe shall have a minimum cover of 4'-0" unless noted otherwise on the drawings. Each bell and spigot shall be cleaned thoroughly. Each pipe and special fitting shall be firmly supported on good foundations. Mechanical and rubber gasket pipe joints shall be fabricated and used in strict accordance with manufacturer's instructions. Where bolts are used, they shall be drawn up evenly with a torque wrench.

3.03 PIPE RESTRAINTS

All pipe fittings shall be restrained to the new watermain on both sides using retainer glands in accordance with AWWA C111, latest revision. The retainer gland shall be tightly fastened to the pipeline via clamp fittings designed to break off at the required torque. The unit shall be securely fastened to the fitting using nuts and bolts as required. The gland shall be secured to the fitting first before being tightly fastened to the pipeline. Refer to the design plans for more detail.

Secured glands and fitting shall also include thrust blocks.

3.04 WATER MAIN, STORM SEWER & SANITARY SEWER CROSSING SEPARATIONS

Separate water and sewer lines at least 10' horizontally edge to edge.

At street intersections, or at other locations where water and sewer lines must cross, including sanitary sewer laterals and house connection potable water services, provide a minimum vertical distance of 18" between the outside of the water main and the outside of the sewer. One full length of water pipe shall be centered on sewer crossings so joints are equidistant and as far as possible from the sewer.

When it is impossible to obtain proper horizontal and vertical separation as stipulated above, the reviewer’s authority must specifically approve any variance from these requirements. As a minimum, concrete encasement must be provided and approved on a case-by-case basis by the engineer. Provide adequate support for both pipes to eliminate any possibility of settling.

PART 4.0 - INSPECTION AND TESTING

4.01 GENERAL

The Contractor shall supply all necessary materials, equipment and labor to test the piping as described below, including pump, piping, valves and labor. The engineer will supply the test gauge or else calibrate the contractor's gauge before and after the tests. All pressure tests must be done in

the engineer's presence under his direction. The testing of watermains shall be done in accordance with Section 5 of AWWA Standard C-600-17, latest revision.

4.02 TESTING

Two tests shall be required at the discretion of the Engineer. The first shall be a hydrostatic pressure test only. This shall be done when a section of line has been completed. The line shall be partially backfilled and braced against movement during the test. All air must be bled out of the section. A one inch (1") tap shall be provided for the required service connection. Taps may be made by means of a tapped coupling left at proper location or by cutting with an approved tapping machine, or by use of service saddles approved by the engineer. Taps shall be of the thread type to accept a standard corporation stops as specified herein.

Taps and corporation stops should be located at least 1'0" from pipe ends. Corporation stops shall be as specified on the approved plans.

The contractor may elect to perform one hydrostatic pressure test at the completion of all improvements. However, the Contractor shall bear the responsibility of locating any underground leaks and making the necessary repairs. The hydrostatic test shall be of at least two hours in duration. Test pressure at the point of testing shall be as indicated by the Engineer, and in general, shall be one and a half times the actual working pressure or 150 PSI, whichever is greater applied at the lowest point of the section to be tested. A correction shall be made for the difference in elevation between this point and the test gauge. With the required pressure on the line, the entire run shall be examined for evidence of leakage. Any leaks discovered shall be corrected and the test repeated until the engineer is satisfied that the line is tight. The test pressure shall not vary by more than 5 psi for the duration of the test.

After the above work is completed and the line is completely backfilled, a leakage test of two hour duration shall be made at the same pressure as the pressure test measured at the lowest portion of the test section and corrected for test gauge height. No pipe installation will be accepted unless and until the leakage is less than the amounts allowed in AWWA Standard C-600-17, Section 5.2, and Table 6.

Allowable leakage is determined by the following formula:

* $$L = \frac{SD\ (P)^{0.5}}{148{,}000}$$

Where L is leakage in gph, S is the length of pipe tested in feet, D is the nominal diameter of the pipe in inches and P is the average test pressure during the test in psi. The hydrostatic pressure test and leakage test may be conducted simultaneously if deemed acceptable by the engineer.

4.03 DISINFECTION OF MAINS

The contractor shall disinfect all new work. Disinfection shall be performed in an approved manner in accordance with the American Water Works Association's Standard for Disinfecting Water Mains,

Designation C651 except that the “Tablet Method” described in Section 4.3 of C-651 shall not be used.

4.04 PREVENTATIVE MEASURES DURING CONSTRUCTION

Keeping Pipe Clean and Dry: Precautions shall be taken to protect pipe interiors, fittings and valves against contamination. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material. When pipelaying is not in progress, as, for example, at the close of the day's work, all openings in the pipeline shall be closed by watertight plugs. Joints of all pipes in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

If dirt that, in the opinion of the engineer or job superintendent, will not be removed by the flushing operation enters the pipe, the interior of the pipe shall be cleaned and swabbed as necessary, with a 5 percent hypochlorite disinfecting solution.

4.05 PRELIMINARY FLUSHING

The main shall be flushed prior to disinfection. The flushing velocity shall not be less than 3.0 ft/sec. The rate of flow required to produce this velocity in various diameters is shown in Table I. No site for flushing should be chosen unless it has been determined that drainage is adequate.

TABLE I
Required Openings to Flush Pipelines*
(40 psi Residual Pressure)

Pipe Size (in.)	Flow Required to Produce 3.0 fps Velocity (gpm)	Orifice Size (in.)	Hydrant Number	Outlet Nozzles (Size in.)
4	120	15/16	1	2-1/2
6	260	1-3/8	1	2-1/2
8	470	1-7/8	1	2-1/2
10	730	2-5/16	1	2-1/2
12	1,060	2-13/16	1	2-1/2

4.06 FORM OF CHLORINE DISINFECTION

The most common form of chlorine used in the disinfecting solutions are liquid chlorine (gas at atmosphere pressure), calcium hypochlorite granules, and sodium hypochlorite solutions.

A. Liquid Chlorine: shall be used only when suitable equipment is available and only under the direct supervision of a person familiar with the physiological, chemical and physical properties of this element and who is properly trained and equipped to handle any emergency that may arise. Introduction of chlorine gas directly from the supply cylinder is unsafe and shall not be permitted.

The preferred equipment consists of a solution feed chlorinator in combination with booster pump for injecting the chlorine/water mixture into the main to be disinfected. Direct feed chlorinators are not recommended because their use is limited to situations where the water pressure is lower than the chlorine cylinder pressure.

B. Calcium Hypochlorite: contains 70 percent available chlorine by weight. It is either granular or tabular in form. The tablets, 6-9 to the ounce, are designed to dissolve slowly in water.

A chlorine-water solution is prepared by dissolving the granules in water in the proportion requisite for the desired concentration.

C. Sodium hypochlorite: is supplied in strengths from 5.25 to 16 percent available chlorine. It is packaged in liquid form in glass, rubber or plastic containers ranging in size from one quart bottles to five gallon carboys. It may also be purchased in bulk for delivery by tank truck.

A chlorine-water solution is prepared by adding hypochlorite to water. Product deterioration must be considered when computing the quantity of sodium hypochlorite required for the desired concentration.

4.07 APPLICATION

The hypochlorite solutions shall be applied to the watermain with a gasoline or electrically powered chemical feed pump designed for feeding the chlorine solutions. For small applications, the solutions may be fed with a hand pump, for example, a hydraulic test pump.

The feed line shall be of such material and strength as to withstand safely the maximum pressures that may be created by the pumps. All connections shall be checked for tightness before the hypochlorite solution is applied to the main.

4.08 METHODS OF CHLORINE APPLICATION

A. Continuous Feed Method - This method is suitable for general application. Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant, measured rate into the newly-laid pipeline. The water shall receive a dose of chlorine, also fed at a constant, measured rate. The two rates shall be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 25 mg/l available chlorine. To assure that this concentration is maintained, the chlorine residual should be measured at regular intervals in accordance with the procedures described in the current edition of Standard Methods of AWWA M12 - Simplified Procedures for Water Examination.

Table II gives the amount of chlorine residual required for each 100 foot of pipe in various diameters. Solutions of one percent chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires approximately 1 lb. of calcium hypochlorite in 8.5 gallons of water. If liquid laundry bleach with 5.25% Cl is used,

then 4.25 gallons of water is to be mixed with 1 gallon of bleach to obtain 1 percent solution.

TABLE II
Chlorine Required to Produce 25 mg/1
Concentration in 100 ft. of pipe

Pipe Size (in.)	Volume of 100-ft. length (gallons)	100 Percent Chlorine (lb.)	1 Percent Chlorine Solutions (gal.)
4	65.3	.013	0.16
6	146.5	.030	0.36
8	261.0	.054	0.65
10	408.0	.085	1.02
12	588.7	.120	1.44

During the application of the chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine application shall not cease until the entire main is filled with the chlorine solution. The chlorinated water shall be retained in the main for at least 24 hours, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24 hour period, the treated water shall contain no less than 10 mg/l chlorine throughout the length of the main.

B. Tablet Method - The "tablet method" as contained in Section 4.3 of American Water Works Association (AWWA) Standard C651 is not acceptable to the New York State Department of Health and shall not be used.

4.09 FINAL FLUSHING

After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than 1 mg/l. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline. The chlorinated shall not be discharged directly into an existing watercourse (i.e. pond, lake, stream, etc.) but rather to a suitable location where the water can percolate into the ground for treatment. If such a location is not available, then the wastewater shall be taken off-site to an approved wastewater treatment plant.

4.10 BACTERIOLOGIC TESTS

After final flushing and before watermain is placed in service, a series of samples shall be collected from the main and tested for bacteriologic quantity and shall show the absence of coliform organisms. If the number and frequency of samples is not prescribed by the public health authority having jurisdiction, at least two consecutive sets of acceptable samples, taken at 24 hours apart, shall be collected from the new main which is currently under disinfection procedures in accordance with AWWA C651, latest revision, Section 5.1. At least one set of samples shall be collected from every

1,200 ft of the new watermain, plus one set from the end of the line and at least one set from each branch.

Samples for bacteriologic analysis shall be collected in sterile bottles treated with sodium thiosulfate with the analyses performed by a NYSDOH approved lab facility. No hose or fire hydrant shall be used in collection of samples. A suggested samples tap consists of a standard corporation cock installed in the main with a copper tube gooseneck assembly. After samples have been collected the gooseneck assembly may be removed and retained for future use. All testing for bacteriological quality shall be done in accordance with "Standard Methods for the Examination of Water and Wastewater".

4.11 REPETITION OF PROCEDURE

If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated at the Contractors expense until satisfactory samples have been obtained. When the samples are satisfactory, the main may be placed in service.

4.12 PROCEDURE AFTER CUTTING INTO OR REPAIRING EXISTING MAINS

The procedure outlined in this section applies primarily when mains are wholly or partially dewatered. Leaks or breaks that are repaired with clamping devices while the main remains full of water under pressure require no disinfection.

A. Trench Treatment - When an old line is opened, either by accident or by design, the excavation will likely be wet and badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from such pollution. Tablets have the advantage in such a situation because they dissolve slowly and continue to release hypochlorite as water is pumped from the excavation.

B. Main Disinfection - Swabbing with Hypochlorite Solution: The interior of all pipe and fittings used in making the repair (particularly coupling and tapping sleeves) shall be swabbed with a 1 percent hypochlorite solution before they are installed.

C. Flushing: Thorough flushing is the most practical means of removing contamination introduced during repairs. If valving and hydrant locations permit, flushing from both directions is recommended. Flushing shall be started as soon as the repairs are completed and continued until discolored water is eliminated.

D. Sampling - Bacteriologic samples shall be taken after all repairs, in order to provide a record by which the effectiveness of the procedures used can be determined. If the direction of flow is unknown samples shall be taken on each side of the main break.

END OF SECTION

APPENDIX 4

PRESSURE AND FLOW CALCULATIONS

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATERCAD TABLE OF PIPE INFORMATION

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**1/17/2024**	**12/19/25**	**1**	**1**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

CALCULATED BY
ZS

APPROVED BY
RW

REF DRAWING(S)
FEIS

Label	Start Node	Stop Node	Diameter (inches)	Pipe Material	Hazen-Williams C	Has Check Valve?	Length (feet)
P-1	T-1	H-1	8	Ductile Iron	130	FALSE	160
P-2	H-1	J-1	8	Ductile Iron	130	FALSE	71
P-3	J-1	J-2	8	Ductile Iron	130	FALSE	332
P-4	J-2	H-2	8	Ductile Iron	130	FALSE	32
P-5	H-2	J-3	8	Ductile Iron	130	FALSE	424
P-6	J-3	H-3	8	Ductile Iron	130	FALSE	33
P-7	H-3	H-4	8	Ductile Iron	130	FALSE	414
P-8	H-4	J-4	8	Ductile Iron	130	FALSE	33
P-9	J-4	H-5	8	Ductile Iron	130	FALSE	366
P-10	H-5	J-5	8	Ductile Iron	130	FALSE	39
P-11	J-5	J-6	8	Ductile Iron	130	FALSE	399
P-12	J-6	H-6	8	Ductile Iron	130	FALSE	33
P-13	H-6	H-7	8	Ductile Iron	130	FALSE	414
P-14	H-7	J-7	8	Ductile Iron	130	FALSE	33
P-15	J-7	J-1	8	Ductile Iron	130	FALSE	58
P-16	J-7	H-8	8	Ductile Iron	130	FALSE	174
P-17	J-3	H-9	8	Ductile Iron	130	FALSE	173
P-18	J-5	H-10	8	Ductile Iron	130	FALSE	172
P-19	J-5	J-8	8	Ductile Iron	130	FALSE	298
P-20	J-8	J-9	8	Ductile Iron	130	FALSE	334
P-21	J-9	H-11	8	Ductile Iron	130	FALSE	79
P-22	J-8	H-12	8	Ductile Iron	130	FALSE	57
P-23	H-12	J-10	8	Ductile Iron	130	FALSE	262
P-24	J-10	H-13	8	Ductile Iron	130	FALSE	107

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATERCAD CALCULATED
Fire Flow Results (Tank Min.)

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**1/17/2024**	**12/19/25**	**1**	**1**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

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REF DRAWING(S)
FEIS

Node	P (psi)	FFN (gpm)	PFN (psi)	FFA (gpm)	PFA (psi)	LSP (psi)	LPN
H-1	45.3	500.0	44.8	4,000.0	28.1	28.2	H-2
H-2	45.2	500.0	44.1	2,876.0	21.2	20.0	H-9
H-3	45.7	500.0	44.2	2,543.5	20.3	20.0	H-9
H-4	45.7	500.0	44.1	2,450.0	20.4	20.0	J-4
H-5	45.8	500.0	44.3	2,497.4	20.3	20.0	H-10
H-6	45.7	500.0	44.4	2,744.8	20.1	20.0	H-10
H-7	45.4	500.0	44.5	3,527.0	21.2	20.0	H-2
H-8	45.4	500.0	44.3	2,842.4	29.5	20.0	H-2
H-9	45.4	500.0	43.6	2,199.1	26.0	20.0	J-3
H-10	45.5	500.0	43.6	2,165.4	25.8	20.0	J-5
H-11	54.1	500.0	51.0	1,896.9	22.3	20.0	H-10
H-12	52.9	500.0	50.6	2,214.5	21.7	20.0	H-10
H-13	55.7	500.0	52.6	1,936.0	22.3	20.0	H-10
J-1	45.6	500.0	44.9	4,000.0	20.5	20.9	H-2
J-2	45.4	524.8	44.3	2,931.1	20.0	20.1	H-2
J-3	45.5	500.0	44.0	2,543.2	20.0	20.1	H-9
J-4	45.7	524.8	44.1	2,448.7	20.4	20.0	H-4
J-5	45.6	500.0	44.1	2,489.2	20.0	20.1	H-10
J-6	45.7	524.8	44.3	2,710.5	20.9	20.0	H-10
J-7	45.5	500.0	44.7	3,679.2	20.0	20.1	H-2
J-8	52.6	500.0	50.4	2,279.4	20.3	20.0	H-10
J-9	54.3	503.6	51.4	1,961.7	20.0	20.3	H-10
J-10	55.1	503.6	52.2	2,008.5	20.6	20.0	H-10

P = Static Pressure of Node Analyzed (psi)
FFN = Total Fire Flow Needed (gpm)
PFN = Pressure of Node Analyzed at Fire Flow Needed (psi)
FFA = Total Fire Flow Available (gpm)
PFA = Pressure of Node Analyzed at Fire Flow Available (psi)
LSP = Lowest System Pressure at Fire Flow Available (psi)
LPN = Lowest Pressure Node at Fire Flow Available

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATERCAD CALCULATED
Hydrant Pressures (Tank Max.)

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**1/17/2024**	**12/19/25**	**1**	**2**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

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RW

REF DRAWING(S)
FEIS

Label	Elevation (feet)	Hydraulic Grade (feet)	Pressure (psi)	Demand (gpm)
H-1	424.39	541.99	50.88	0.00
H-2	424.41	541.98	50.87	0.00
H-3	423.41	541.98	51.30	0.00
H-4	423.36	541.98	51.32	0.00
H-5	423.03	541.98	51.47	0.00
H-6	423.25	541.98	51.37	0.00
H-7	424.09	541.99	51.01	0.00
H-8	424.00	541.99	51.05	0.00
H-9	424.00	541.98	51.05	0.00
H-10	423.82	541.98	51.12	0.00
H-11	403.99	541.98	59.70	0.00
H-12	406.64	541.98	58.56	0.00
H-13	400.21	541.98	61.34	0.00

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATERCAD CALCULATED
Hydrant Pressures (Tank Min.)

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**1/17/2024**	**12/19/25**	**2**	**2**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

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REF DRAWING(S)
FEIS

Label	Elevation (feet)	Hydraulic Grade (feet)	Pressure (psi)	Demand (gpm)
H-1	424.39	528.99	45.26	0.00
H-2	424.41	528.98	45.24	0.00
H-3	423.41	528.98	45.67	0.00
H-4	423.36	528.98	45.70	0.00
H-5	423.03	528.98	45.84	0.00
H-6	423.25	528.98	45.75	0.00
H-7	424.09	528.99	45.38	0.00
H-8	424.00	528.99	45.42	0.00
H-9	424.00	528.98	45.42	0.00
H-10	423.82	528.98	45.50	0.00
H-11	403.99	528.98	54.08	0.00
H-12	406.64	528.98	52.93	0.00
H-13	400.21	528.98	55.7	0.00

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATERCAD CALCULATED
Junction Pressures (Tank Max.)

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**1/17/2024**	**12/19/25**	**1**	**2**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

CALCULATED BY
ZS

APPROVED BY
RW

REF DRAWING(S)
FEIS

Label	Elevation (feet)	Hydraulic Grade (feet)	Pressure (psi)	Demand (gpm)
J-1	423.65	541.99	51.20	0.00
J-2	423.93	541.98	51.08	12.38
J-3	423.83	541.98	51.12	0.00
J-4	423.34	541.98	51.33	12.38
J-5	423.57	541.98	51.23	0.00
J-6	423.43	541.98	51.29	12.38
J-7	423.86	541.99	51.11	0.00
J-8	407.35	541.98	58.25	0.00
J-9	403.37	541.98	59.97	1.81
J-10	401.56	541.98	60.8	1.81

ENGINEERING & SURVEYING PROPERTIES
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WATERCAD CALCULATED
Junction Pressures (Tank Min.)

WO. NO.	DATE	REVISED	SHEET	OF
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REF DRAWING(S)
FEIS

Label	Elevation (feet)	Hydraulic Grade (feet)	Pressure (psi)	Demand (gpm)
J-1	423.65	528.99	45.6	0.00
J-2	423.93	528.98	45.5	12.38
J-3	423.83	528.98	45.5	0.00
J-4	423.34	528.98	45.7	12.38
J-5	423.57	528.98	45.6	0.00
J-6	423.43	528.98	45.7	12.38
J-7	423.86	528.99	45.5	0.00
J-8	407.35	528.98	52.6	0.00
J-9	403.37	528.98	54.4	1.81
J-10	401.56	528.98	55.1	1.81