

**VILLAGE CAMP DURANGO
DOMESTIC WATER DEMAND MEMO**

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Building a Better World
for All of Us®

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Background

This Water Demand Report, prepared by SEH, Inc., demonstrates the sufficiency of proposed water design for the development of the Village Camp Durango project. The project includes the development of 277 RV sites located off County Road 252 in unincorporated La Plata County, CO.

The project will tie into the existing Animas Water Company (AWC) System along CR 252. The AWC system is fed by two tanks located near Rimrock Dr and Hermosa Acres Dr with an elevation of 6861 feet. From the two tanks, the water flows through various 10-inch lines including one that passes the project site on CR 252. See Appendix A for a Network preview.

The proposed water demand was determined by using the International Plumbing Code, and a model of the system was run using WaterGEMS modeling software. The results are summarized below.

Water Supply and Circulation

The proposed water system will tie into an existing 10-inch watermain along CR 252 with two 2-inch service lines, one at each of the site access roads. Two pressure reducing valves (PRVs) are proposed; one for each connection. After the PRVs, 2-inch water mains will deliver water to each of the 277 RV sites. Along with the 2-inch lines, un-metered 6-inch lines will be installed in a shared trench with the domestic service lines to provide for fire flow and be connected to seven fire hydrants in the system. These lines will not be connected to the domestic service system.

The worst case demand for the entire site was determined in accordance with the International Plumbing Code (IPC), Appendix E. First, the water supply fixture unit (WSFU) for the entire site was calculated using Table E103.3(2) from the IPC, which provides WSFU values for various fixtures and appliances. These calculated values are shown in Table 1. The WSFU value was then applied to Table E103.3(3) from the IPC, to determine the overall demand in gallons per minute (gpm).

Table 1: Fixture Count Demand

Fixture	WSFU	RV sites	Clubhouse	Bathhouse	WSFU
Lavatory	2.0		4	6	20
Bathroom Group	3.6	277			997.2
Kitchen Sink	1.4	277	2		390.6
Washing Machine (8lb)	3.0			4	12
Utility Sink	1.5		1	1	3
Wet Bar / Hand sink	1.0		2		2
Hose bib	2.5		1	1	5
				Total WSFU:	1429.8

International Plumbing Code, Appendix E, Table E103.3(2) and (4)

The project will also include a public hot tub. It was not included in the calculations with the assumption that water turnover for the facility can be scheduled during off-peak hours. The total WSFU was rounded up to 1,500 to determine the demand from Table E103.3(3) in the IPC. This resulted in a demand of 269 gpm for the entire site.

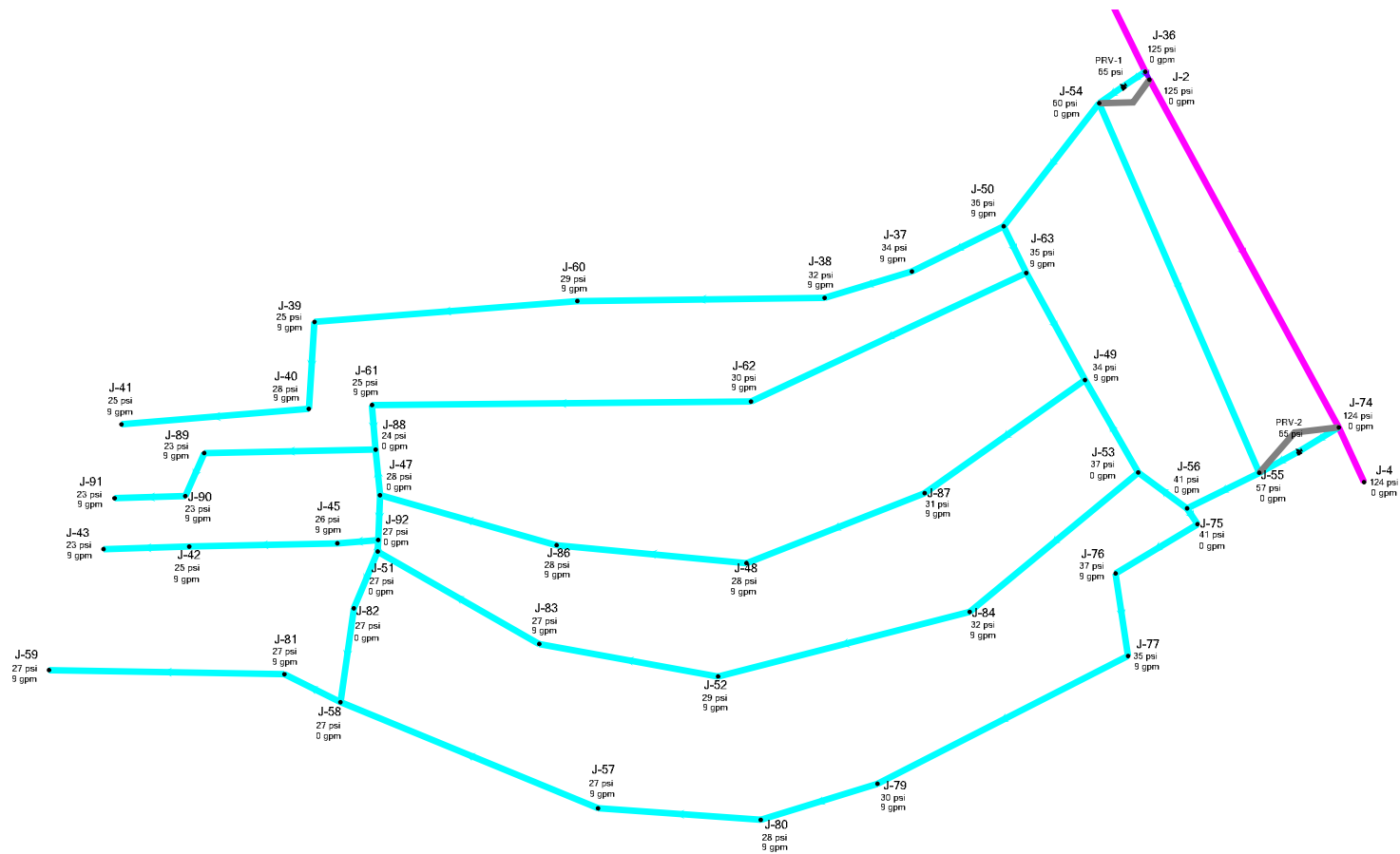
Summary

With the proposed PRVs set at 65 psi, the minimum residual pressure is estimated to be 20 psi at full capacity demand for the fixtures as tabulated. We have attached a manufacturer's data sheet for a 2-inch magnetic flow meter rated to 378 gpm. This is well over the maximum flow for the site, which will be divided among two meters. The WaterGEMs software results can be found in Appendix B.

APPENDIX A: NETWORK PREVIEW

WaterGEMs Model Layout

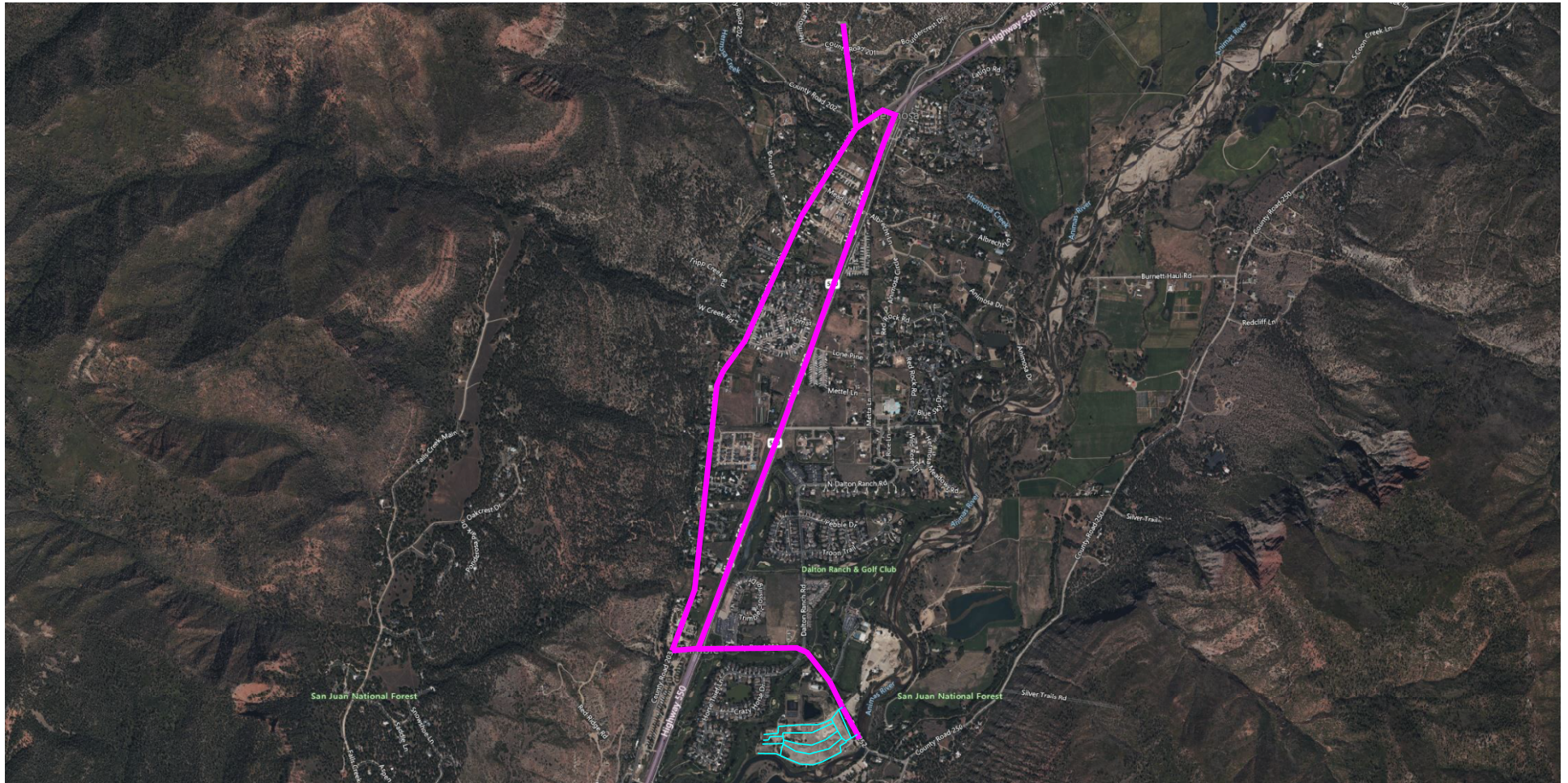
Scenario: Fixture count demand



Scenario: Fixture count demand



Scenario: Fixture count demand



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APPENDIX B: WATERGEMS RESULTS

No Demand and Fixture Count Demand

No Demand							
ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-2	6,568.00	<None>	<Collection: 0 items>	0	6,861.00	127
35	J-4	6,571.00	<None>	<Collection: 0 items>	0	6,861.00	125
110	J-36	6,567.81	<None>	<Collection: 0 items>	0	6,861.00	127
113	J-37	6,571.00	<None>	<Collection: 0 items>	0	6,756.36	80
115	J-38	6,571.00	<None>	<Collection: 0 items>	0	6,756.36	80
117	J-39	6,573.00	<None>	<Collection: 0 items>	0	6,756.36	79
119	J-40	6,566.00	<None>	<Collection: 0 items>	0	6,756.36	82
121	J-41	6,574.00	<None>	<Collection: 0 items>	0	6,756.36	79
123	J-42	6,571.00	<None>	<Collection: 0 items>	0	6,756.36	80
125	J-43	6,576.00	<None>	<Collection: 0 items>	0	6,756.36	78
129	J-45	6,570.00	<None>	<Collection: 0 items>	0	6,756.36	81
133	J-47	6,568.00	<None>	<Collection: 0 items>	0	6,756.36	81
135	J-48	6,571.00	<None>	<Collection: 0 items>	0	6,756.36	80
137	J-49	6,573.00	<None>	<Collection: 0 items>	0	6,756.36	79
139	J-50	6,573.00	<None>	<Collection: 0 items>	0	6,756.36	79
143	J-51	6,569.00	<None>	<Collection: 0 items>	0	6,756.36	81
145	J-52	6,571.00	<None>	<Collection: 0 items>	0	6,756.36	80
147	J-53	6,571.00	<None>	<Collection: 0 items>	0	6,756.36	80
150	J-54	6,569.00	<None>	<Collection: 0 items>	0	6,756.36	81
153	J-55	6,572.00	<None>	<Collection: 0 items>	0	6,756.36	80
155	J-56	6,572.00	<None>	<Collection: 0 items>	0	6,756.36	80
158	J-57	6,570.00	<None>	<Collection: 0 items>	0	6,756.36	81
160	J-58	6,568.00	<None>	<Collection: 0 items>	0	6,756.36	81
163	J-59	6,569.00	<None>	<Collection: 0 items>	0	6,756.36	81
170	J-60	6,570.00	<None>	<Collection: 0 items>	0	6,756.36	81
173	J-61	6,575.00	<None>	<Collection: 0 items>	0	6,756.36	78
175	J-62	6,572.00	<None>	<Collection: 0 items>	0	6,756.36	80
177	J-63	6,573.00	<None>	<Collection: 0 items>	0	6,756.36	79
239	J-74	6,570.92	<None>	<Collection: 0 items>	0	6,861.00	126
246	J-75	6,571.92	<None>	<Collection: 0 items>	0	6,756.36	80
249	J-76	6,571.62	<None>	<Collection: 0 items>	0	6,756.36	80
252	J-77	6,571.22	<None>	<Collection: 0 items>	0	6,756.36	80
256	J-79	6,570.60	<None>	<Collection: 0 items>	0	6,756.36	80
259	J-80	6,570.34	<None>	<Collection: 0 items>	0	6,756.36	80
262	J-81	6,568.34	<None>	<Collection: 0 items>	0	6,756.36	81
265	J-82	6,568.44	<None>	<Collection: 0 items>	0	6,756.36	81
268	J-83	6,570.06	<None>	<Collection: 0 items>	0	6,756.36	81
271	J-84	6,571.00	<None>	<Collection: 0 items>	0	6,756.36	80
275	J-86	6,569.49	<None>	<Collection: 0 items>	0	6,756.36	81
278	J-87	6,572.00	<None>	<Collection: 0 items>	0	6,756.36	80
282	J-88	6,576.61	<None>	<Collection: 0 items>	0	6,756.36	78
285	J-89	6,576.00	<None>	<Collection: 0 items>	0	6,756.36	78
287	J-90	6,575.50	<None>	<Collection: 0 items>	0	6,756.36	78
289	J-91	6,575.00	<None>	<Collection: 0 items>	0	6,756.36	78
291	J-92	6,568.79	<None>	<Collection: 0 items>	0	6,756.36	81

Fixture Demand							
ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-2	6,568.00	<None>	<Collection: 0 items>	0	6,856.60	125
35	J-4	6,571.00	<None>	<Collection: 0 items>	0	6,856.52	124
110	J-36	6,567.81	<None>	<Collection: 0 items>	0	6,856.60	125
113	J-37	6,571.00	<None>	<Collection: 1 item>	9	6,649.88	34
115	J-38	6,571.00	<None>	<Collection: 1 item>	9	6,645.29	32
117	J-39	6,573.00	<None>	<Collection: 1 item>	9	6,631.93	25
119	J-40	6,566.00	<None>	<Collection: 1 item>	9	6,631.13	28
121	J-41	6,574.00	<None>	<Collection: 1 item>	9	6,630.65	25
123	J-42	6,571.00	<None>	<Collection: 1 item>	9	6,629.30	25
125	J-43	6,576.00	<None>	<Collection: 1 item>	9	6,629.08	23
129	J-45	6,570.00	<None>	<Collection: 1 item>	9	6,630.66	26
133	J-47	6,568.00	<None>	<Collection: 0 items>	0	6,631.63	28
135	J-48	6,571.00	<None>	<Collection: 1 item>	9	6,636.70	28
137	J-49	6,573.00	<None>	<Collection: 1 item>	9	6,652.33	34
139	J-50	6,573.00	<None>	<Collection: 1 item>	9	6,657.07	36
143	J-51	6,569.00	<None>	<Collection: 0 items>	0	6,631.55	27
145	J-52	6,571.00	<None>	<Collection: 1 item>	9	6,637.01	29
147	J-53	6,571.00	<None>	<Collection: 0 items>	0	6,657.06	37
150	J-54	6,569.00	<None>	<Collection: 0 items>	0	6,706.59	60
153	J-55	6,572.00	<None>	<Collection: 0 items>	0	6,704.20	57
155	J-56	6,572.00	<None>	<Collection: 0 items>	0	6,667.52	41
158	J-57	6,570.00	<None>	<Collection: 1 item>	9	6,633.42	27
160	J-58	6,568.00	<None>	<Collection: 0 items>	0	6,631.51	27
163	J-59	6,569.00	<None>	<Collection: 1 item>	9	6,630.33	27
170	J-60	6,570.00	<None>	<Collection: 1 item>	9	6,637.07	29
173	J-61	6,575.00	<None>	<Collection: 1 item>	9	6,632.12	25
175	J-62	6,572.00	<None>	<Collection: 1 item>	9	6,641.09	30
177	J-63	6,573.00	<None>	<Collection: 1 item>	9	6,652.79	35
239	J-74	6,570.92	<None>	<Collection: 0 items>	0	6,856.52	124
246	J-75	6,571.92	<None>	<Collection: 0 items>	0	6,665.89	41
249	J-76	6,571.62	<None>	<Collection: 1 item>	9	6,657.60	37
252	J-77	6,571.22	<None>	<Collection: 1 item>	9	6,652.24	35
256	J-79	6,570.60	<None>	<Collection: 1 item>	9	6,639.58	30
259	J-80	6,570.34	<None>	<Collection: 1 item>	9	6,636.06	28
262	J-81	6,568.34	<None>	<Collection: 1 item>	9	6,630.93	27
265	J-82	6,568.44	<None>	<Collection: 0 items>	0	6,631.53	27
268	J-83	6,570.06	<None>	<Collection: 1 item>	9	6,633.35	27
271	J-84	6,571.00	<None>	<Collection: 1 item>	9	6,645.85	32
275	J-86	6,569.49	<None>	<Collection: 1 item>	9	6,633.18	28
278	J-87	6,572.00	<None>	<Collection: 1 item>	9	6,642.79	31
282	J-88	6,576.61	<None>	<Collection: 0 items>	0	6,631.58	24
285	J-89	6,576.00	<None>	<Collection: 1 item>	9	6,628.23	23
287	J-90	6,575.50	<None>	<Collection: 1 item>	9	6,627.80	23
289	J-91	6,575.00	<None>	<Collection: 1 item>	9	6,627.62	23
291	J-92	6,568.79	<None>	<Collection: 0 items>	0	6,631.46	27