



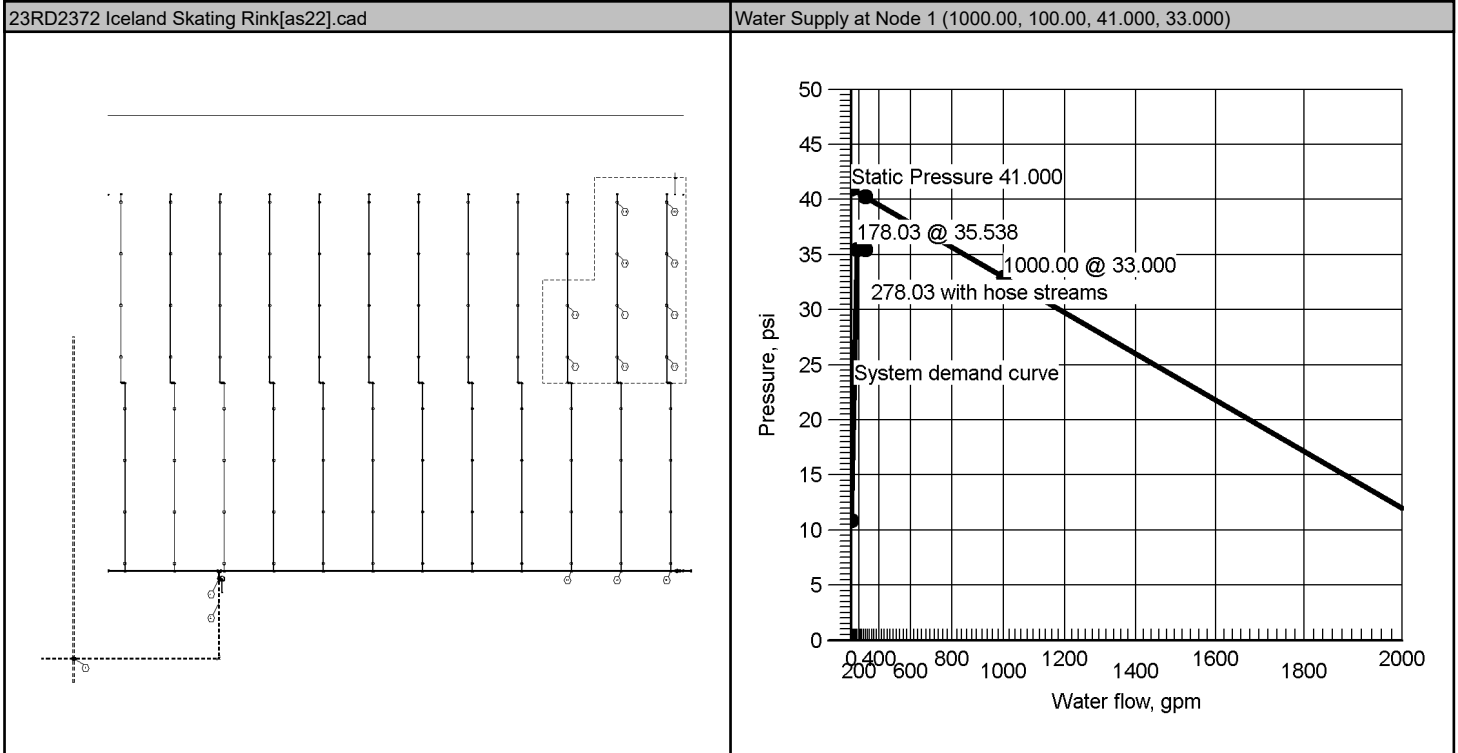
Hydraulic Overview

Job Number: 23RD2372
Report Description: Light Hazard (1)

Job		
Job Number 23RD2372	Design Engineer Byron Gonzales	
Job Name: Iceland Skating Rink	Phone 916-652-1306	FAX 916-652-1307
Address 1 1430 Del Paso Blvd.	State Certification/License Number 577921	
Address 2 Sacramento, CA 95815	AHJ City of Sacramento	
Address 3	Job Site/Building Dry Pipe System	

System	
Density 0.10 gpm/ft ²	Area of Application 1500 ft ² (Actual 1535 ft ²)
Most Demanding Sprinkler Data 5.6 K-Factor 16.30 at 8.474	Hose Streams 100.00
Coverage Per Sprinkler 163 ft ²	Number Of Sprinklers Calculated 10 0
System Pressure Demand 35.538	System Flow Demand 178.03
Total Demand 278.03 @ 35.538	Pressure Result +4.712 (11.7%)

Supplies					
Node	Name	Flow(gpm)	Hose Flow(gpm)	Static(psi)	Residual(psi)
1	Water Supply	1000.00	100.00	41.000	33.000





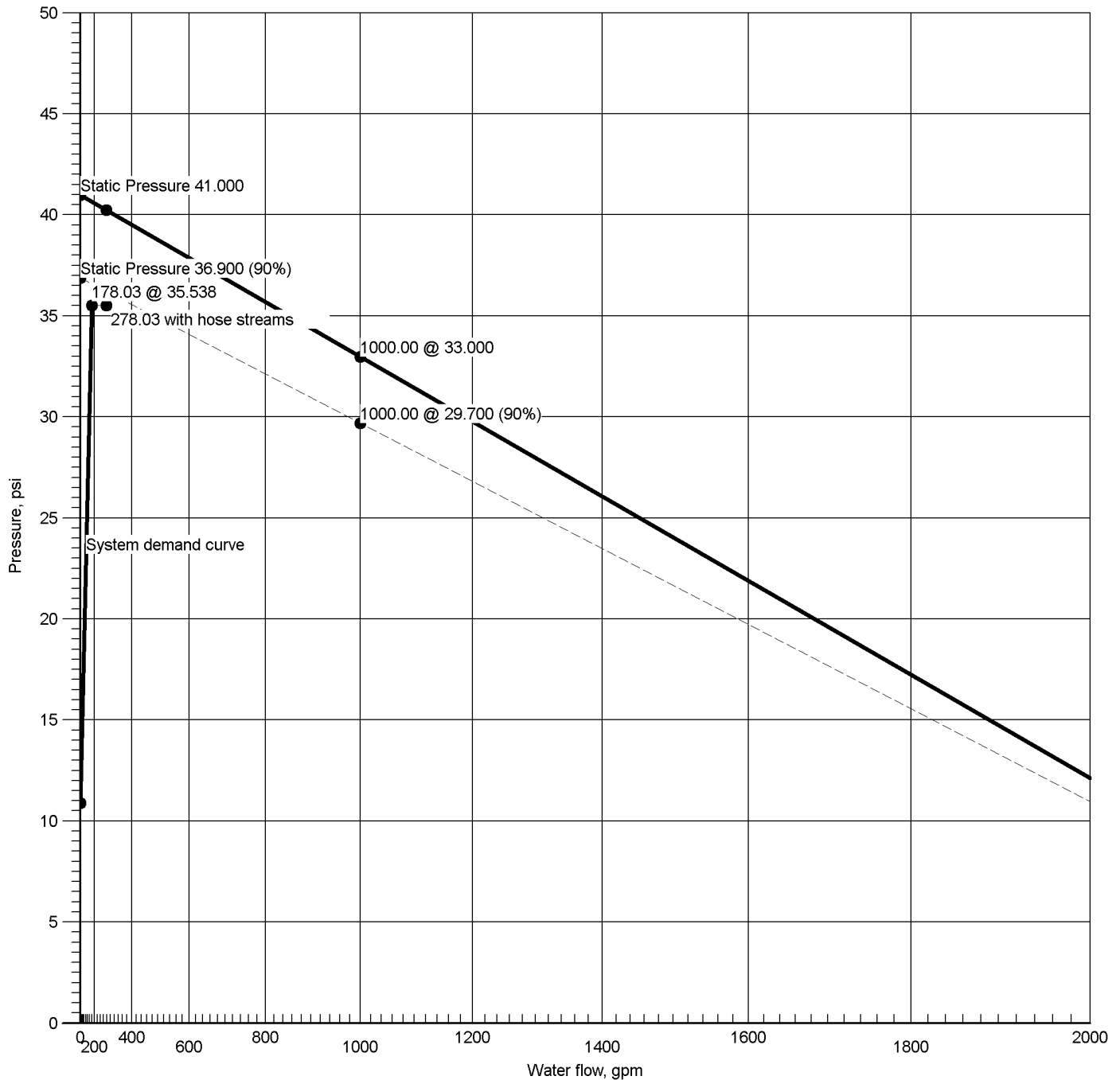
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Address 2 Sacramento, CA 95815				Job Site/Building Dry Pipe System							
Address 3				Drawing Name 23RD2372 Iceland Skating Rink[as22].cad							
System				Remote Area(s)							
Most Demanding Sprinkler Data 5.6 K-Factor 16.30 at 8.474				Occupancy Light Hazard			Job Suffix				
Hose Allowance At Source 100.00				Density 0.10 gpm/ft²			Area of Application 1500 ft² (Actual 1535 ft²)				
Additional Hose Supplies <u>Node</u> <u>Flow(gpm)</u>				Number Of Sprinklers Calculated 10		Number Of Nozzles Calculated 0		Coverage Per Sprinkler 163 ft²			
				AutoPeak Results: Pressure For Remote Area(s) Adjacent To Most Remote Area Right: 33.555							
Total Hose Streams 100.00											
System Flow Demand 178.03		Total Water Required (Including Hose Allowance) 278.03									
Maximum Pressure Unbalance In Loops 0.000											
Maximum Velocity Above Ground 9.61 between nodes 20 and 103											
Maximum Velocity Under Ground 4.20 between nodes 2 and 3											
Volume capacity of Wet Pipes 208.18 gal		Volume capacity of Dry Pipes 267.70 gal									
Supplies											
Node	Name	Hose Flow (gpm)	Static (psi)	Residual (psi)	@	Flow (gpm)	Available (psi)	@	Total Demand (gpm)	Required (psi)	Safety Margin (psi)
1	Water Supply	100.00	41.000	33.000		1000.00	40.251		278.03	35.538	4.712
Contractor											
Contractor Number 577621		Contact Name Byron Gonzales					Contact Title Designer				
Name of Contractor: Cosco Fire Protection		Phone 916-652-1306					Extension 11613				
Address 1 3850 Atherton Road		FAX 916-652-1307									
Address 2 Rocklin, CA 95765		E-mail bgonzales@coscofire.com									
Address 3		Web-Site www.coscofire.com									



Water Supply at Node 1



Hydraulic Graph

Water Supply at Node 1

Static: Pressure
41.000

Residual: Pressure
33.000 @ 1000.00

Available Pressure at System Demand
40.251 @ 278.03

Required Pressure at System Demand
35.538 @ 178.03

Required Pressure at System Demand (Including Hose Allowance at Source)
35.538 @ 278.03

Test Conducted By

City of Sacramento Community Development

Date of Test
2/29/2024

Hydrant Numbers
701

Test Witnessed By

Mario Robinson

Time of Test
10:30 AM

Location

1430 Del Paso Blvd. Sacramento, CA 9



Node Analysis

Job Number: 23RD2372

Report Description: Light Hazard (1)

Node	Elevation(Foot)	Fittings	Pressure(psi)	Discharge(gpm)
1	-3-0	S, C(46-0½)	35.538	178.03
101	22-2	Spr(-16.075)	16.075	22.45
102	21-1	Spr(-16.245)	16.245	22.57
103	22-2	Spr(-9.412)	9.412	17.18
104	21-1	Spr(-8.613)	8.613	16.44
105	20-0	Spr(-8.483)	8.483	16.31
106	18-11	Spr(-8.783)	8.783	16.60
107	22-2	Spr(-9.402)	9.402	17.17
108	21-1	Spr(-8.604)	8.604	16.43
109	20-0	Spr(-8.474)	8.474	16.30
110	18-11	Spr(-8.775)	8.775	16.59
2	-3-0		34.985	
3	0-6		33.297	
10	16-0	PO(7-0½)	24.960	
20	16-0	PO(7-0½)	24.878	



Hydraulic Analysis

Job Number: 23RD2372
Report Description: Light Hazard (1)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Eq. Length	Summary
Upstream					Fittings	Total Length	
Route 1							
BL	1.6820	32.89	4.75	100	0.045915	13-0½	Pf 0.599
109	20-0	16.30	5.6	8.474	Sprinkler		Pe -0.469
108	21-1			8.604		13-0½	Pv
BL	1.6820	49.32	7.12	100	0.097142	13-0½	Pf 1.267
108	21-1	16.43	5.6	8.604	Sprinkler		Pe -0.469
107	22-2			9.402		13-0½	Pv
BL	1.6820	66.49	9.60	100	0.168827	58-0½	Pf 12.781
107	22-2	17.17	5.6	9.402	Sprinkler,	17-8	Pe 2.672
30	16-0			24.855	3E(3-6½), PO(7-0½)	75-8½	Pv
CM	4.2600	66.49	1.50	100	0.001828	12-6	Pf 0.023
30	16-0			24.855			Pe
20	16-0			24.878		12-6	Pv
CM	4.2600	133.01	2.99	100	0.006593	12-6	Pf 0.082
20	16-0	66.52		24.878	Flow (q) from Route 2		Pe
10	16-0			24.960		12-6	Pv
CM	4.2600	178.03	4.01	100	0.011307	104-8	Pf 1.621
10	16-0	45.02		24.960	Flow (q) from Route 5	39-5	Pe 6.715
3	0-6			33.297	T(18-9½), E(9-4½), DPV, BV(11-3)	144-1	Pv
UG	4.1600	178.03	4.20	140	0.006812	9-6	Pf 0.171
3	0-6			33.297		15-7	Pe 1.517
2	-3-0			34.985	E(15-7)	25-1	Pv
UG	4.3900	178.03	3.77	150	0.004613	50-9½	Pf 0.553
2	-3-0			34.985		69-0½	Pe
1	-3-0			35.538	E(23-0), S, C(46-0½)	119-10	Pv
		100.00			Hose Allowance At Source		
1		278.03					
Route 2							
BL	1.6820	32.91	4.75	100	0.045957	13-0½	Pf 0.600
105	20-0	16.31	5.6	8.483	Sprinkler		Pe -0.469
104	21-1			8.613		13-0½	Pv
BL	1.6820	49.34	7.12	100	0.097235	13-0½	Pf 1.268
104	21-1	16.44	5.6	8.613	Sprinkler		Pe -0.469
103	22-2			9.412		13-0½	Pv
BL	1.6820	66.52	9.61	100	0.168991	58-0½	Pf 12.793
103	22-2	17.18	5.6	9.412	Sprinkler,	17-8	Pe 2.672
20	16-0			24.878	3E(3-6½), PO(7-0½)	75-8½	Pv
Route 3							
BL	1.6820	16.59	2.40	100	0.012942	13-0½	Pf 0.169
110	18-11	16.59	5.6	8.775	Sprinkler		Pe -0.469
109	20-0			8.474		13-0½	Pv
Route 4							
BL	1.6820	16.60	2.40	100	0.012954	13-0½	Pf 0.169
106	18-11	16.60	5.6	8.783	Sprinkler		Pe -0.469
105	20-0			8.483		13-0½	Pv
Route 5							
BL	1.6820	45.02	6.50	100	0.082077	58-0½	Pf 6.214
101	22-2	22.57	5.6	16.075	Sprinkler,, Flow (q) from Route 6	17-8	Pe 2.672
10	16-0			24.960	3E(3-6½), PO(7-0½)	75-8½	Pv
Route 6							
BL	1.6820	22.57	3.26	100	0.022879	13-0½	Pf 0.298
102	21-1	22.57	5.6	16.245	Sprinkler		Pe -0.469
101	22-2			16.075		13-0½	Pv

Equivalent Pipe Lengths of Valves and Fittings (C=120 only)

C Value Multiplier

$$\left(\frac{\text{Actual Inside Diameter}}{\text{Schedule 40 Steel Pipe Inside Diameter}} \right)^{4.87} = \text{Factor}$$

Value Of C	100	130	140	150
Multiplying Factor	0.713	1.16	1.33	1.51



Hydraulic Analysis

Job Number: 23RD2372
Report Description: Light Hazard (1)

Pipe Type	Diameter	Flow	Velocity	HWC	Friction Loss	Length	Pressure
Downstream	Elevation	Discharge	K-Factor	Pt	Pn	Eq. Length	Summary
Upstream					Fittings	Total Length	

Pipe Type Legend	Units Legend	Fittings Legend
AO Arm-Over BL Branch Line CM Cross Main DN Drain DR Drop DY Dynamic FM Feed Main FR Feed Riser MS Miscellaneous OR Outrigger RN Riser Nipple SN Swing Nipple SP Sprig ST Stand Pipe UG Underground	Diameter Inch Elevation Foot Flow gpm Discharge gpm Velocity fps Pressure psi Length Foot Friction Loss psi/Foot HWC Hazen-Williams Constant Pt Total pressure at a point in a pipe Pn Normal pressure at a point in a pipe Pf Pressure loss due to friction between points Pe Pressure due to elevation difference between indicated points Pv Velocity pressure at a point in a pipe	ALV Alarm Valve AngV Angle Valve b Bushing BalV Ball Valve BFP Backflow Preventer BV Butterfly Valve C Cross Flow Turn 90° cplg Coupling Cr Cross Run CV Check Valve DelV Deluge Valve DPV Dry Pipe Valve E 90° Elbow EE 45° Elbow Ee1 11¼° Elbow Ee2 22½° Elbow f Flow Device fd Flex Drop FDC Fire Department Connection fE 90° FireLock(TM) Elbow fEE 45° FireLock(TM) Elbow flg Flange FN Floating Node fT FireLock(TM) Tee g Gauge GloV Globe Valve GV Gate Valve Ho Hose Hose Hose HV Hose Valve Hyd Hydrant LtE Long Turn Elbow mecT Mechanical Tee Noz Nozzle P1 Pump In P2 Pump Out PIV Post Indicating Valve PO Pipe Outlet PrV Pressure Relief Valve PRV Pressure Reducing Valve red Reducer/Adapter S Supply sCV Swing Check Valve SFx Seismic Flex Spr Sprinkler St Strainer T Tee Flow Turn 90° Tr Tee Run U Union WirF Wirsbo WMV Water Meter Valve Z Cap

WATER SUPPLY TEST - DEPARTMENT OF UTILITIES

City of Sacramento Community Development Dept. 300 Richards Blvd., 3rd Floor Sacramento, CA 95811	WORK ORDER #: 597935	WST NUMBER: 2403443
	ANALYSIS FEE: \$519.00	DATE PAID: 2/16/2024
	FIELD TEST FEE: \$1,092.00	DATE PAID: 2/16/2024
	HYDRAULIC BOUNDARY CONDITION	DATE PAID:
CONTACT: Rob Kerth	FEE: \$615.00; optional see item (3) below.	TEST NUMBER: 1 of 1
COMPANY: American Iceland, LLC	PHONE NUMBER: (916) 799-3121	rob@kerth.us
ADDRESS: 539 Southgate RD Sacramento, CA 95815	Site location 1430 Del Paso Boulevard, Sacramento, CA, 95815	ASSESSOR'S PARCEL NUMBER: 275-0125-007-0000

The undersigned agrees to the following items and conditions:

- (1) The street address and/or parcel number shown above is correct
- (2) Water supply data is developed from several sources of information which may include water supply test data, computer models, and pressure recording stations. The water supply data given is to be used for design purposes.
- (3) Based on hydrant locations, test results may not provide accurate flow information at the point of connection, for a fee the City can provide the hydraulic analysis necessary to transfer the results to a single point of connection.
- (4) Although the water supply data reported herein is believed to be accurate, the City makes no warranty, guaranty, certification or other representation of any kind that such data is accurate or correct, or that the pressures and/or flow rates reported herein can or will be maintained. The undersigned agrees that the City, its officers and employees shall not be liable for any damages of any kind resulting from the use of or reliance upon the water supply data reported herein by the undersigned or by any third party.
- (5) When more than one water supply test has been performed, the decision is left to the Fire Plan Checker as to which water supply test is to be used.
- (6) If the undersigned desires to witness the water supply test performed by the City, please check the box below:
☐ I want to witness this water supply test, which will be scheduled at the convenience of the Department of Utilities.
- (7) If the undersigned elects to hire a licensed engineer, at the undersigned's sole expense, to witness and certify the water supply test performed by the City, please check the box below:
☐ At my expense, I will arrange for a licensed engineer to witness and certify this water supply test, which will be scheduled at the convenience of the Department of Utilities.

PRINT NAME: Rob Kerth

SIGNATURE: 

DATE: 2/15/2024

DATE OF TEST: 2/29/2024				TIME OF TEST: 10:30 AM						
WTR. MAIN SIZE: 6				TEST CONDUCTED BY: Mario Robinson						
	Hydrant Number	Map Page	Static Pres. (PSI)	Residual Pres. (PSI)	Pitot Pres. (PSI)	Outlet Dia. (Inches)	Coefficient		Calc. Flow @ Pres. (GPM)	Flow @ 20 PSI (G.P.M.)
							C ₁	C ₂		
Residual	**	X18	46	38						
Flowed	701	X18			36	2.5	0.90	1.00	1007	1695
Flowed										
Flowed										
Flowed										

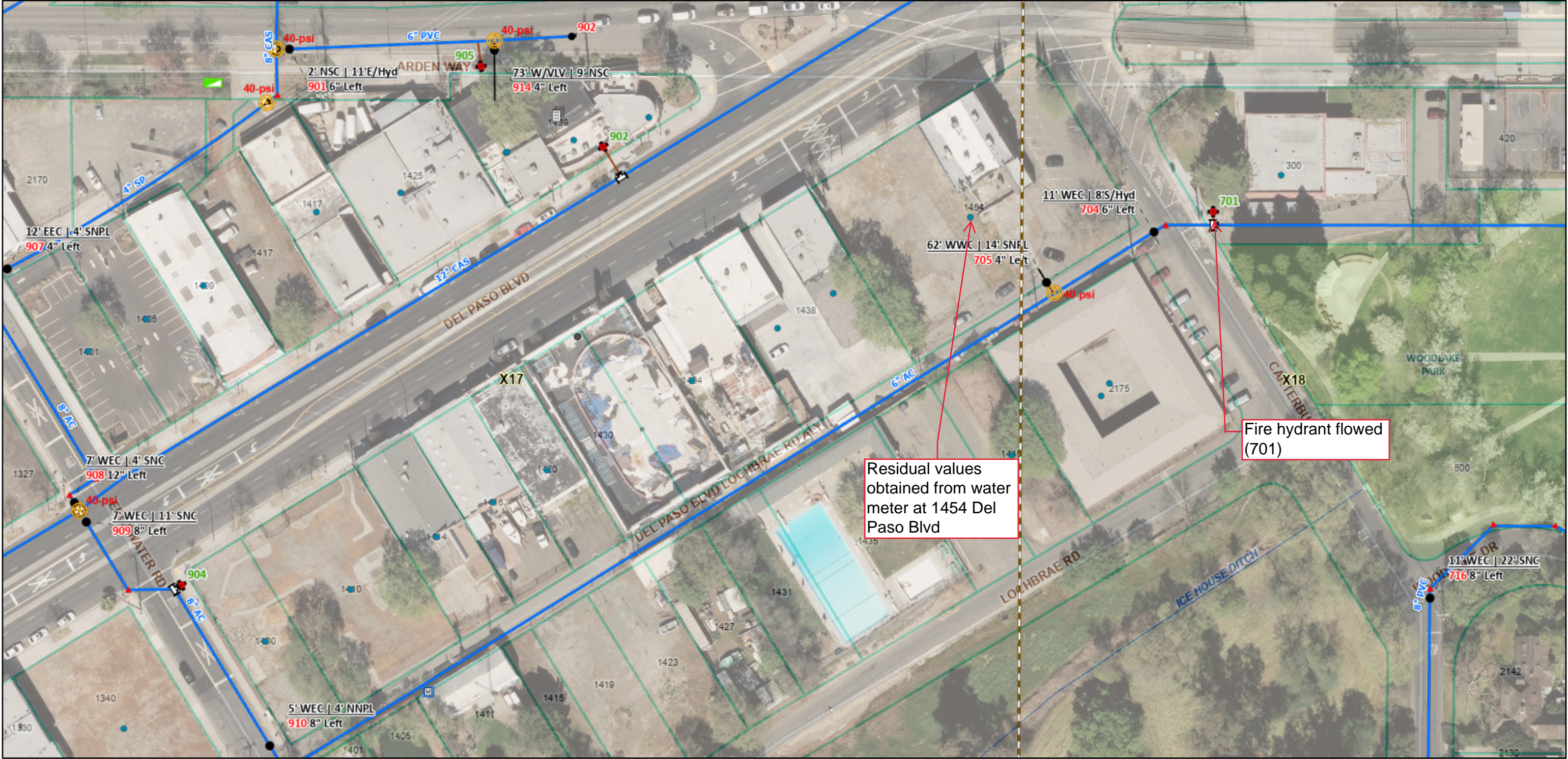
* THE WATER SUPPLY TEST DATA IS NOT TO BE USED FOR THE DESIGN OF DOMESTIC WATER SYSTEMS.
 * (STATIC PRES. - RESIDUAL PRES.) / (STATIC PRES. - 20 PSI) MUST NOT BE LESS THAN 25%. THEREFORE, THESE RESULTS ARE ONLY VALID FOR RESIDUAL PRESSURES LESS THAN 40 PSI

WATER SUPPLY DATA SUMMARY

	Design (1)
Static Pressure	41 PSI
Residual Pressure	33 PSI
Total Flow @ Residual	1000 G.P.M.
Total Flow @ 20 PSI	1700 G.P.M.

(1) The Design Water Supply Data reflects fluctuations and future demands on the water distribution system. It is to be used for design purposes. HA

UTILITY MAP




3/5/2024, 8:09:20 AM

 DOU Map Book Grid

Water Pressure

38 - 41

DOU Documents

 Hold Harmless

Water Lateral Lines (City Owned)

— Hydrant


— Unknown

Water Mains (City Owned)

Distribution

- Water Service Connections (Centroids) (City Owned)

Water Service Connections (New) (City Owned)

 Domestic

Water Hydrants (City Owned)

 Standard


Water Control Valves (City Owned)

- Blowoff

Water System Valves (City Owned)

- Gate

Water Backflow Prevention Assemblies (City Owned)

 Irrigation


Water Fittings (City Owned)

12 Cross

▲ Elbow

 Reducer

 Tee

 Parcel Boundary

Parks

 EXISTING

REFERENCES

1:1,128

0 0.01 0.02 0.04 mi

0 0.01 0.03 0.06 km

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GIS/IT
City of Sacramento GIS/IT Department