WATER DISTRIBUTION SYSTEM
PRELIMINARY BASIS OF DESIGN REPORT
FOR
FAIRMONT SCOTTSDALE PRINCESS
PRIVADO WELCOME BUILDING AND PARKING MODIFICATIONS

October 12, 2022
WP# 215319

EXPIRES 06-30-25

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1.0 INTRODUCTION

Fairmont Scottsdale Princess Privado Welcome Building and Parking Modifications (Site) is a proposed hotel welcome building and parking lot development on an approximate 6-acre parcel of the Fairmont Scottsdale Princess in the City of Scottsdale (APN#215-08-003C). The proposed development will consist of one (1) welcome building and new parking lot expansion. The project will include parking, hardscape, landscape, and utility improvements to support the development. The Site is located approximately 1,300 feet to the east of Scottsdale Road and Princess Boulevard, on the south side of Princess Boulevard within Section 35, Township 4 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Refer to Exhibit 1 – *Vicinity Map* for the project location. The existing property, currently zoned C-2, is primarily developed with buildings, parking lots, pools, sidewalks, and a variety of landscaping (desert and grass).

The design criteria used to estimate water demands and evaluate system hydraulics are based on Wood, Patel & Associates, Inc.'s (WOODPATEL's) understanding of the requirements listed in the *City of Scottsdale Design Standards and Policies Manual, 2018*.

The following is a summary of the primary design criteria utilized:

Average Day Water Demand, Commercial/Retail: ..... 0.8 gpd/ sf
Maximum Flow Factor:.....2 x ADD
Peak Hour Factor: .....3.5 x ADD
Abbreviations: gpd = gallons per day; sf = square feet; ADD = average day demand
*Includes both inside and outside use, per Figure 6-1.2, City of Scottsdale *Design Standards and Policies Manual*

2.0 EXISTING WATER INFRASTRUCTURE

Existing water infrastructure adjacent to the Site includes an existing 12-inch public water line within Cottage Terrace. One (1) existing 6-inch water stub extends from the public water line within Cottage Terrace to serve the Site. One (1) existing fire hydrant extends from the public water line within Cottage Terrace and is located along the northern portion of the parking lot. A second fire hydrant is located on the west side of Cottage Terrace as a part of the Maravilla Senior Living Community. Please refer to Exhibit 2 – *Water Exhibit* for a depiction of existing infrastructure.

3.0 PROPOSED WATER INFRASTRUCTURE

3.1 Onsite Water Infrastructure

The proposed welcome building will be served by a proposed 2-inch domestic service, a fire hydrant , and a proposed 6-inch fireline connecting to the existing 6-inch waterline throughout the Site. This water service will replace an existing service that will be removed as a part of this project. The water demand of the proposed Site will not impede on the current water demand, therefore the system performance will not change.

3.2 Water Demand Calculations

The average day water demand for the proposed Site is projected to be approximately 3.1 gallons per minute (gpm). The maximum day demand is approximately 6.2 gpm. Peak hour demands are projected to be 10.9 gpm (Refer to Appendix A - *Water Demand Calculations*). Fire flow modelling was done as a part of this Report (Refer to Appendix B – *Hydraulic Modeling Results*), however the received hydrant flow test results show a calculated flow at 20psi of 5,936 gpm (Refer to Appendix C – *Hydrant Flow Test*). City of Scottsdale standards require the hydrant flow be calculated at 30 psi making the flow 5,448 gpm. It is assumed that the proposed demand will equal the existing demand from the existing building. See Exhibit 2 – *Water Exhibit* for the layout of existing water infrastructure.

4.0 CONCLUSIONS

Based on our analysis of the Site, the following conclusions can be made:

1. The design criteria used to estimate potable water demands and evaluate system hydraulics are based on the design criteria listed in the *City of Scottsdale Design Standards and Policies Manual, 2018*.

2. The proposed water infrastructure described is adequate to serve the domestic and fire flow requirements for the Site since the calculated demand for the site improvements is equal to the current water demand.

5.0 REFERENCES

1. City of Scottsdale Design Standards and Policies Manual, 2018

APPENDIX A – WATER DEMAND CALCULATIONS

WOOD PATEL

WATER DEMAND DESIGN FLOWS

Project Fairmont Scottsdale Princess Privado Welcome Center and Parking Expansion
Location Scottsdale AZ
Project Number 215319
Project Engineer Darin Moore, P.E.
References City of Scottsdale Design and Policies Manual (2018)

LAND USE AND DWELLING UNIT BREAKDOWN BY JUNCTION

HYDRAULIC MODEL NODE	LAND USE	DWELLING UNITS	AREA (SF)	DEMAND VALUE	UNITS	AVERAGE DAILY DEMAND		MAX FLOW		PEAK FLOW	
						(gpm)	(gpd)	(gpm)	(gpd)	(gpm)	(gpd)
Welcome Center	Commercial/Retail	--	2,747	0.8	gpd/sf	3.1	2,198	6.2	4,396	10.9	7,693
Total		**0**	**2747**			**3.1**	**2,198**	**6.2**	**4,396**	**10.9**	**7,693**

APPENDIX B – HYDRAULIC MODELING REPORTS

5319-Provado Welcome Building WaterCAD

FlexTable: Junction Table

Active Scenario: Calibration-Static

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)	Pressure Head (ft)
EX FH-1 (TEST)	1,551.30	0	88	1,754.63	203.33
EX FH-2 (FLOW)	1,547.00	0	90	1,754.63	207.63
EX J-1	1,547.11	0	90	1,754.63	207.52
EX J-2	1,547.11	0	90	1,754.63	207.52
FH-1	1,539.52	0	93	1,754.63	215.11
J-1	1,539.50	6	93	1,754.63	215.13

5319-Provado Welcome Building WaterCAD

FlexTable: Junction Table

Active Scenario: Calibration-Residual

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)	Pressure Head (ft)
EX FH-1 (TEST)	1,551.30	0	72	1,717.67	166.37
EX FH-2 (FLOW)	1,547.00	2,718	46	1,654.40	107.40
EX J-1	1,547.11	0	68	1,704.74	157.63
EX J-2	1,547.11	0	54	1,672.70	125.59
FH-1	1,539.52	0	50	1,654.40	114.88
J-1	1,539.50	0	50	1,654.40	114.90

5319-Provado Welcome Building WaterCAD

FlexTable: Junction Table

Active Scenario: Calibration-Flow@20

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)	Pressure Head (ft)
EX FH-1 (TEST)	1,551.30	0	20	1,597.50	46.20
EX FH-2 (FLOW)	1,547.00	5,937	-94	1,328.58	-218.42
EX J-1	1,547.11	0	-2	1,542.53	-4.58
EX J-2	1,547.11	0	-61	1,406.37	-140.74
FH-1	1,539.52	0	-91	1,328.58	-210.94
J-1	1,539.50	0	-91	1,328.58	-210.92

5319-Provado Welcome Building WaterCAD

FlexTable: Junction Table

Active Scenario: Average Day Demand

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)	Pressure Head (ft)
EX FH-1 (TEST)	1,551.30	0	88	1,754.63	203.33
EX FH-2 (FLOW)	1,547.00	0	90	1,754.63	207.63
EX J-1	1,547.11	0	90	1,754.63	207.52
EX J-2	1,547.11	0	90	1,754.63	207.52
FH-1	1,539.52	0	93	1,754.63	215.11
J-1	1,539.50	3	93	1,754.63	215.13

5319-Provado Welcome Building WaterCAD

FlexTable: Pipe Table

Active Scenario: Average Day Demand

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
EX P-10	EX FH-1 (TEST)	EX J-1	801	12.0	130.0	3	0.01
EX P-20	EX J-1	EX J-2	68	6.0	130.0	3	0.04
EX P-30	EX J-2	EX FH-2 (FLOW)	39	6.0	130.0	3	0.04
EX P-40	EX FH-2 (FLOW)	FH-1	246	6.0	130.0	3	0.04
EX P-50	FH-1	J-1	67	6.0	130.0	3	0.04
PMP-1 TO TEST HYDRANT	PM-1	EX FH-1 (TEST)	9	48.0	130.0	3	0.00
RES-1 TO PMP-1	RES-1	PM-1	10	48.0	130.0	3	0.00

5319-Provado Welcome Building WaterCAD

FlexTable: Junction Table

Active Scenario: Max Day Demand

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)	Pressure Head (ft)
EX FH-1 (TEST)	1,551.30	0	88	1,754.63	203.33
EX FH-2 (FLOW)	1,547.00	0	90	1,754.63	207.63
EX J-1	1,547.11	0	90	1,754.63	207.52
EX J-2	1,547.11	0	90	1,754.63	207.52
FH-1	1,539.52	0	93	1,754.63	215.11
J-1	1,539.50	6	93	1,754.63	215.13

5319-Provado Welcome Building WaterCAD

FlexTable: Pipe Table

Active Scenario: Max Day Demand

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
EX P-10	EX FH-1 (TEST)	EX J-1	801	12.0	130.0	6	0.02
EX P-20	EX J-1	EX J-2	68	6.0	130.0	6	0.07
EX P-30	EX J-2	EX FH-2 (FLOW)	39	6.0	130.0	6	0.07
EX P-40	EX FH-2 (FLOW)	FH-1	246	6.0	130.0	6	0.07
EX P-50	FH-1	J-1	67	6.0	130.0	6	0.07
PMP-1 TO TEST HYDRANT	PM-1	EX FH-1 (TEST)	9	48.0	130.0	6	0.00
RES-1 TO PMP-1	RES-1	PM-1	10	48.0	130.0	6	0.00

5319-Provado Welcome Building WaterCAD

FlexTable: Junction Table

Active Scenario: Peak Hour Demand

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)	Pressure Head (ft)
EX FH-1 (TEST)	1,551.30	0	88	1,754.63	203.33
EX FH-2 (FLOW)	1,547.00	0	90	1,754.63	207.63
EX J-1	1,547.11	0	90	1,754.63	207.52
EX J-2	1,547.11	0	90	1,754.63	207.52
FH-1	1,539.52	0	93	1,754.63	215.11
J-1	1,539.50	6	93	1,754.63	215.13

5319-Provado Welcome Building WaterCAD

FlexTable: Pipe Table

Active Scenario: Peak Hour Demand

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
EX P-10	EX FH-1 (TEST)	EX J-1	801	12.0	130.0	6	0.02
EX P-20	EX J-1	EX J-2	68	6.0	130.0	6	0.07
EX P-30	EX J-2	EX FH-2 (FLOW)	39	6.0	130.0	6	0.07
EX P-40	EX FH-2 (FLOW)	FH-1	246	6.0	130.0	6	0.07
EX P-50	FH-1	J-1	67	6.0	130.0	6	0.07
PMP-1 TO TEST HYDRANT	PM-1	EX FH-1 (TEST)	9	48.0	130.0	6	0.00
RES-1 TO PMP-1	RES-1	PM-1	10	48.0	130.0	6	0.00

5319-Provado Welcome Building WaterCAD

Fire Flow Node FlexTable: Fire Flow Results Table

Active Scenario: Max Day + Fire Flow

Label	Elevation (ft)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Hydraulic Grade (ft)
J-1	1,539.50	1,506	2,040	30	30	1,754.63
FH-1	1,539.52	1,500	2,190	30	30	1,754.63
EX J-2	1,547.11	1,500	3,598	30	30	1,754.63
EX J-1	1,547.11	1,500	4,705	30	30	1,754.63
EX FH-2 (FLOW)	1,547.00	1,500	3,228	30	30	1,754.63
EX FH-1 (TEST)	1,551.30	1,500	5,442	30	30	1,754.63

APPENDIX C – HYDRANT FLOW TEST AND CALCULATIONS

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Fairmont Scottsdale Princess
Project Address:	7575 East Princess Blvd., Scottsdale, Arizona 85255
Client Project No.:	215319
Arizona Flow Testing Project No.:	22541
Flow Test Permit No.:	C69698
Date and time flow test conducted:	August 4, 2022 at 7:00 AM
Data is current and reliable until:	February 4, 2023
Conducted by:	Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Sonny Schreiner –City of Scottsdale-Inspector (602-819-7718)

Raw Test Data

Static Pressure: **88.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **40.0 PSI**
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One 4-inch Pollard Diffuser
(Measured in inches)

Coefficient of Diffuser: 0.9

Flowing GPM: **2,718 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **5,936 GPM**

Data with 16PSI Safety Factor

Static Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **56.0 PSI**
(Measured in pounds per square inch)

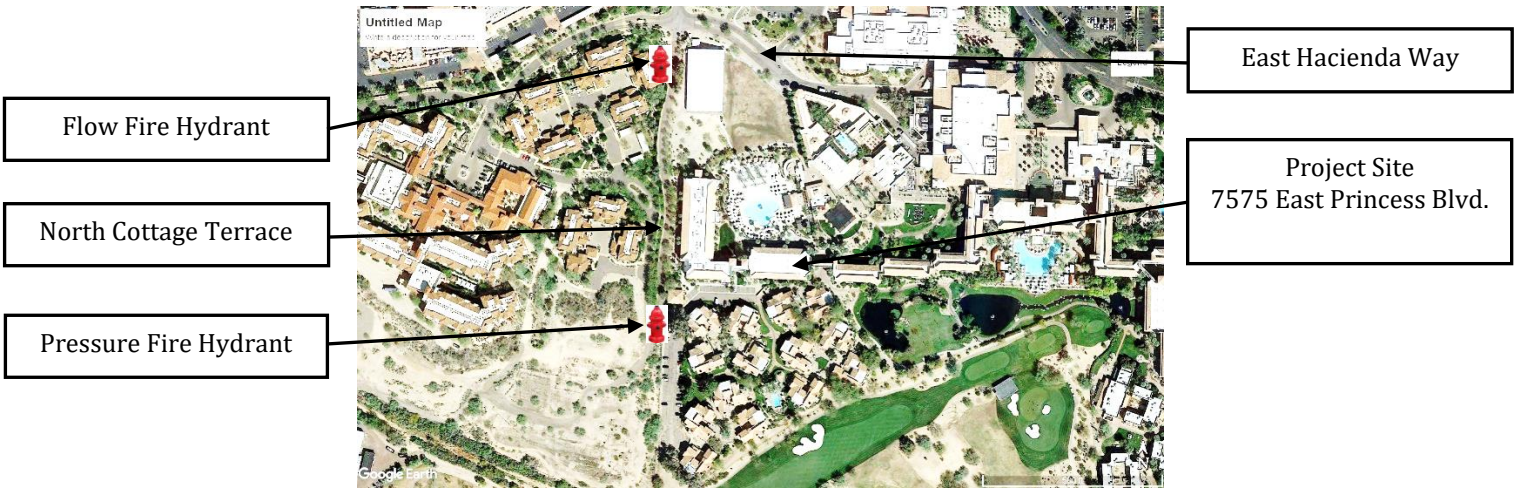
Distance between hydrants: Approx. 810 Feet

Main size: Not Provided

Flowing GPM: **2,718 GPM**

GPM @ 20 PSI**:** **5,136 GPM**

Flow Test Location **North**



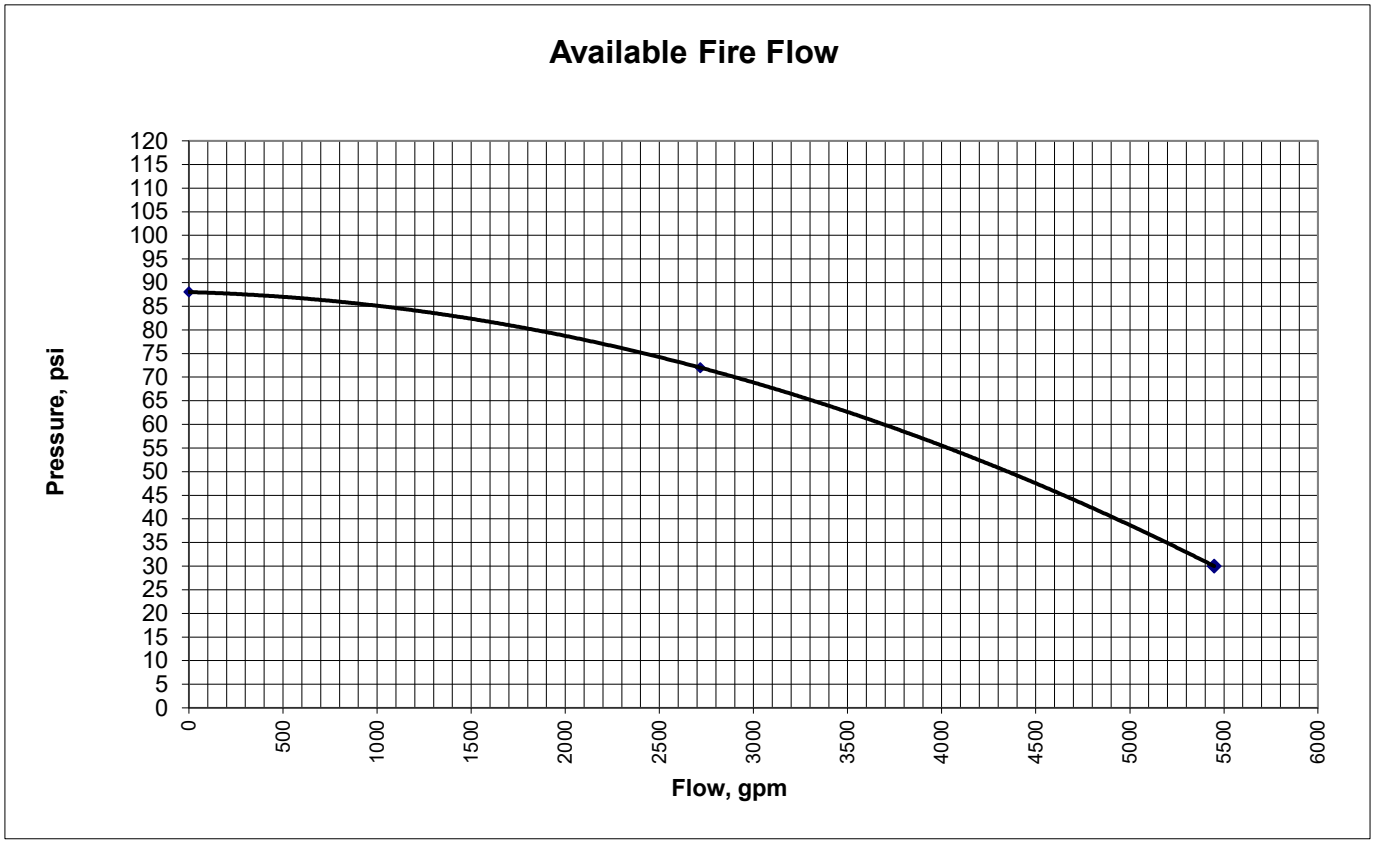
WOOD PATEL

EXISTING WATER SYSTEM PRESSURES

Project	Fairmont Scottsdale Princess Privado Welcome Center and Parking Expansion
Location	Scottsdale AZ
Project Number	215319
Project Engineer	Darin Moore, P.E.

Flow Test Location
Date of Flow Test

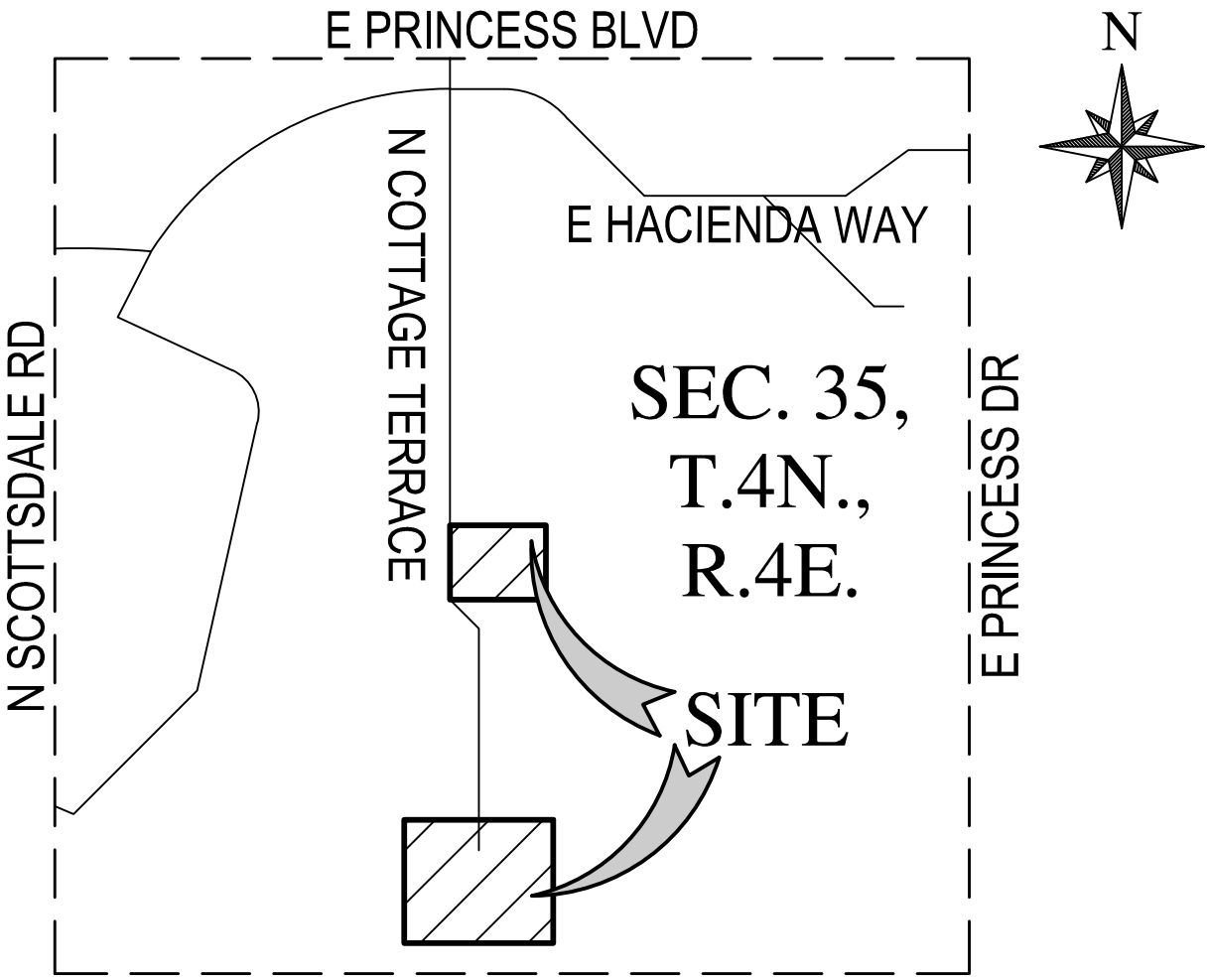
Pressure Hydrant		**Flow Hydrant**	
Static Pressure (psi)	88.0		
Residual Pressure (psi)	72.0	Flow (gpm)	2718
Calculated Flow at 30 psi	5448 gpm	Calculated Flow at	30 psi



Discharge (gpm)	Pressure (psi)	Head (ft)
0	88	203.2
2718	72	166.2
5448	30	69.3

Notes
1. Values provided from a flow test by Arizona Flow Testing LLC

EXHIBIT 1 – VICINITY MAP



VICINITY MAP

N.T.S.

NOT
FOR
CONSTRUCTION
OR RECORDING

WOOD PATEL

FAIRMONT SCOTTSDALE PRINCESS PRIVADO WELCOME CENTER AND PARKING MODIFICATIONS

VICINITY MAP EXHIBIT

DATE	8-22-2022	SCALE	N.T.S	SHEET	1 OF 1
JOB NO.	215319	DESIGN	RS	CHECK	
		DRAWN	LBD	RFI #	

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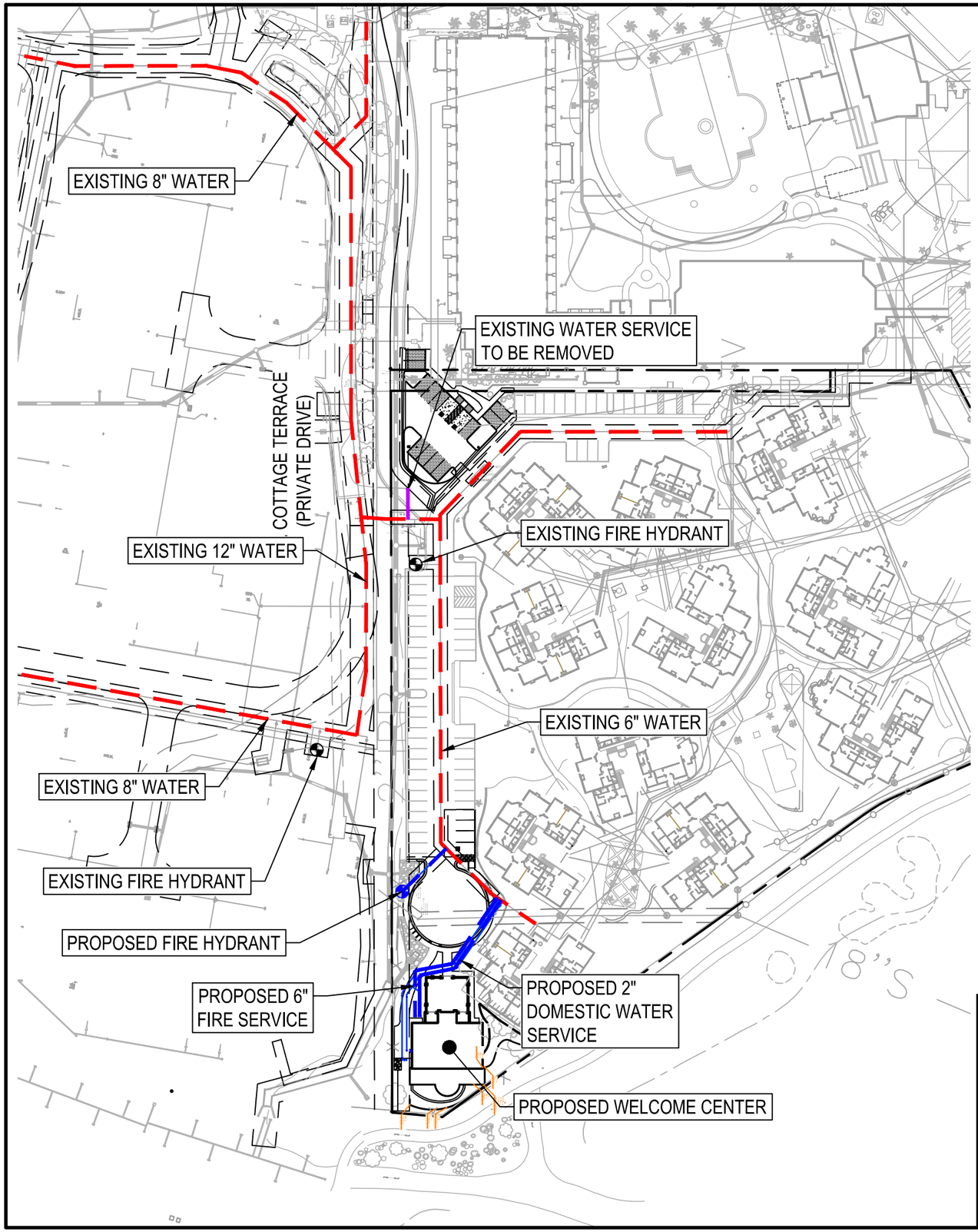
EXHIBIT 2 – WATER EXHIBIT



N

0 100 200

Horz. 1 in. = 200 ft.

LEGEND

- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- EXISTING WATER PIPE
- PROPOSED WATER PIPE
- PROPOSED WATER PIPE
- PROPERTY BOUNDARY

NOT FOR CONSTRUCTION OR RECORDING

WOOD PATEL

FAIRMONT SCOTTSDALE PRINCESS

PRIVADO WELCOME BUILDING AND PARKING MODIFICATIONS

DATE	10/12/2022	SCALE	1" = 100'	SHEET	1 OF 1
JOB NO.	215220	DESIGN	RS	DRAWN	AM

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