WOOD PATEL

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

October 12, 2022
WP# 215319

**PRELIMINARY Basis of Design Report**

- ☐ **ACCEPTED**
- ☑ **ACCEPTED AS NOTED**
- ☐ **REVISE AND RESUBMIT**

CITY OF SCOTTSDALE
SCOTTSDALE WATER
9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

**BY** apritchard **DATE** 10/28/2022




EXPIRES 06-30-25

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## APPENDICES



## EXHIBITS




EXPIRES 06-30-25

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Y:\WP\Reports\Commercial\215319 FSP Privado Welcome Building and Parking Mods Preliminary Water BOD.docx

## 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)

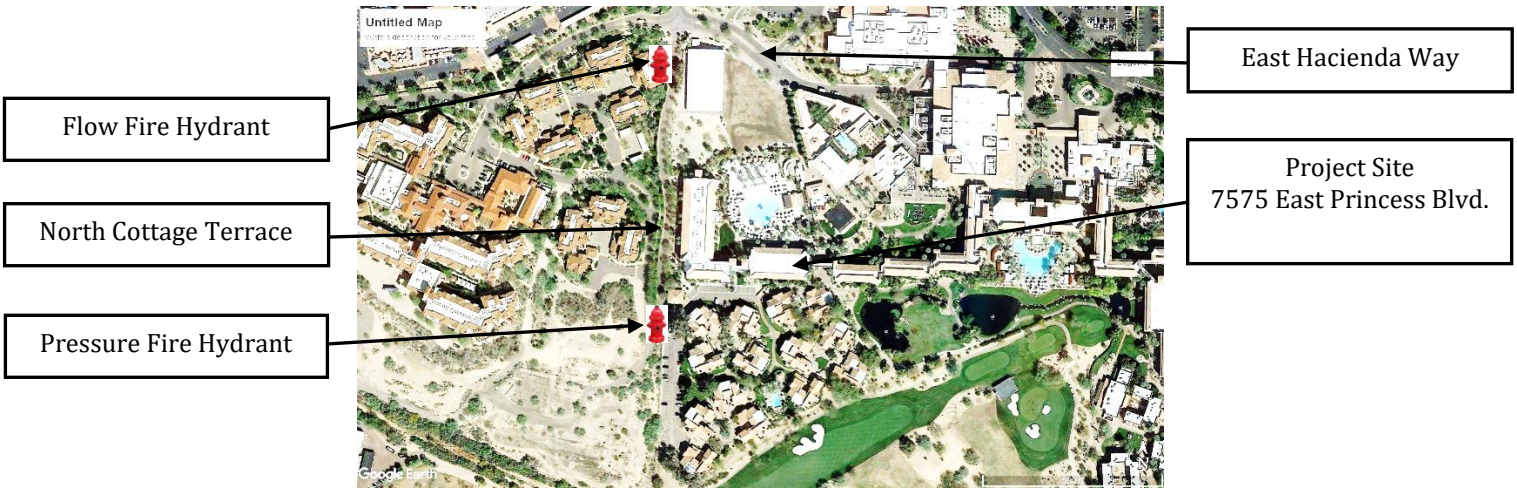
Distance between hydrants: Approx. 810 Feet

Main size: Not Provided

Flowing GPM: **2,718 GPM**

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

**Flow Test Location** **North**



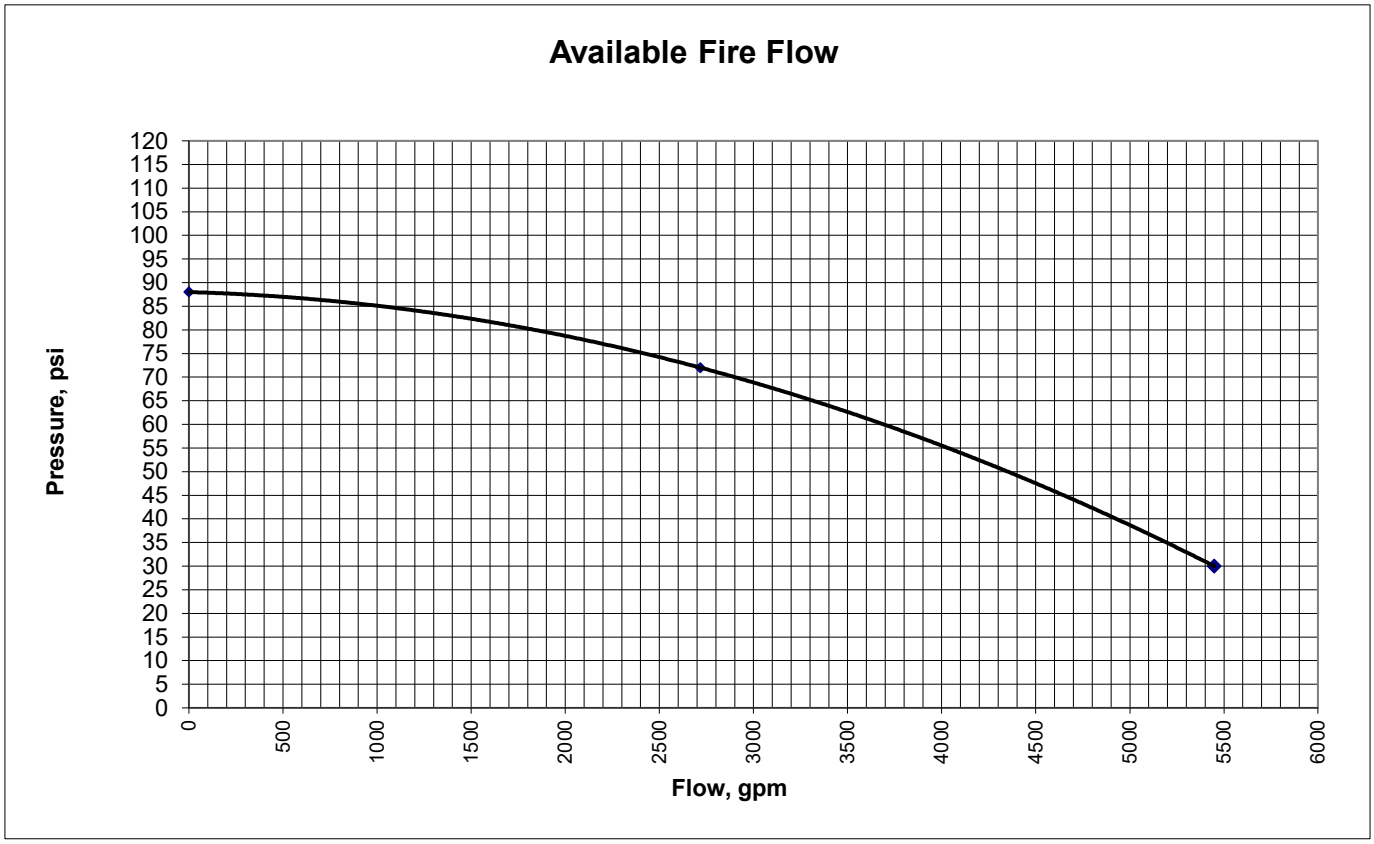
WOOD PATEL

# 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**

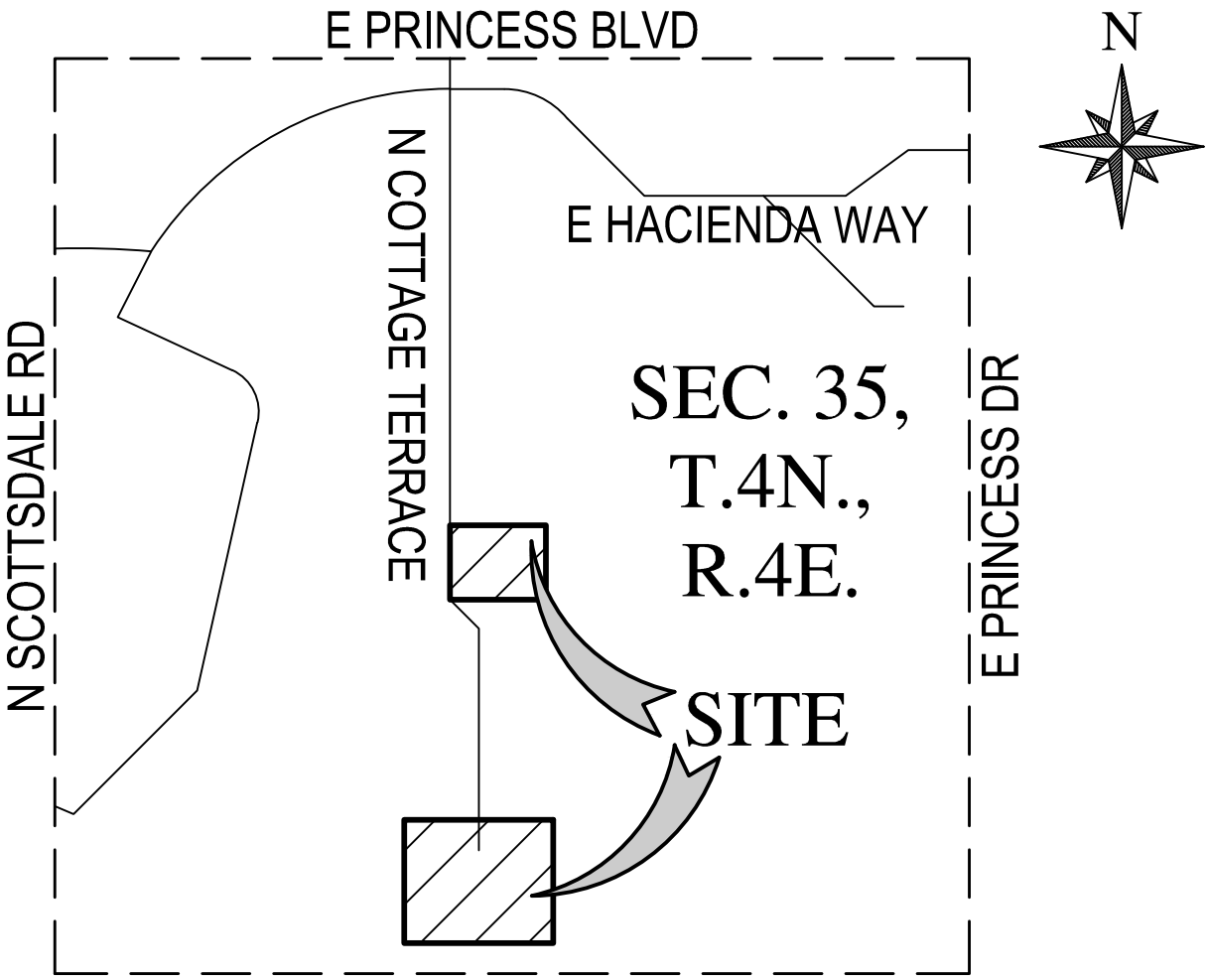
| **Pressure Hydrant** | | **Flow Hydrant** | |
|---|---|---|---|
| Static Pressure (psi) | 88.0 | | |
| Residual Pressure (psi) | 72.0 | Flow (gpm) | 2718 |
| Calculated Flow at 30 psi | 5448 gpm | Calculated Flow at | 30 psi |




| 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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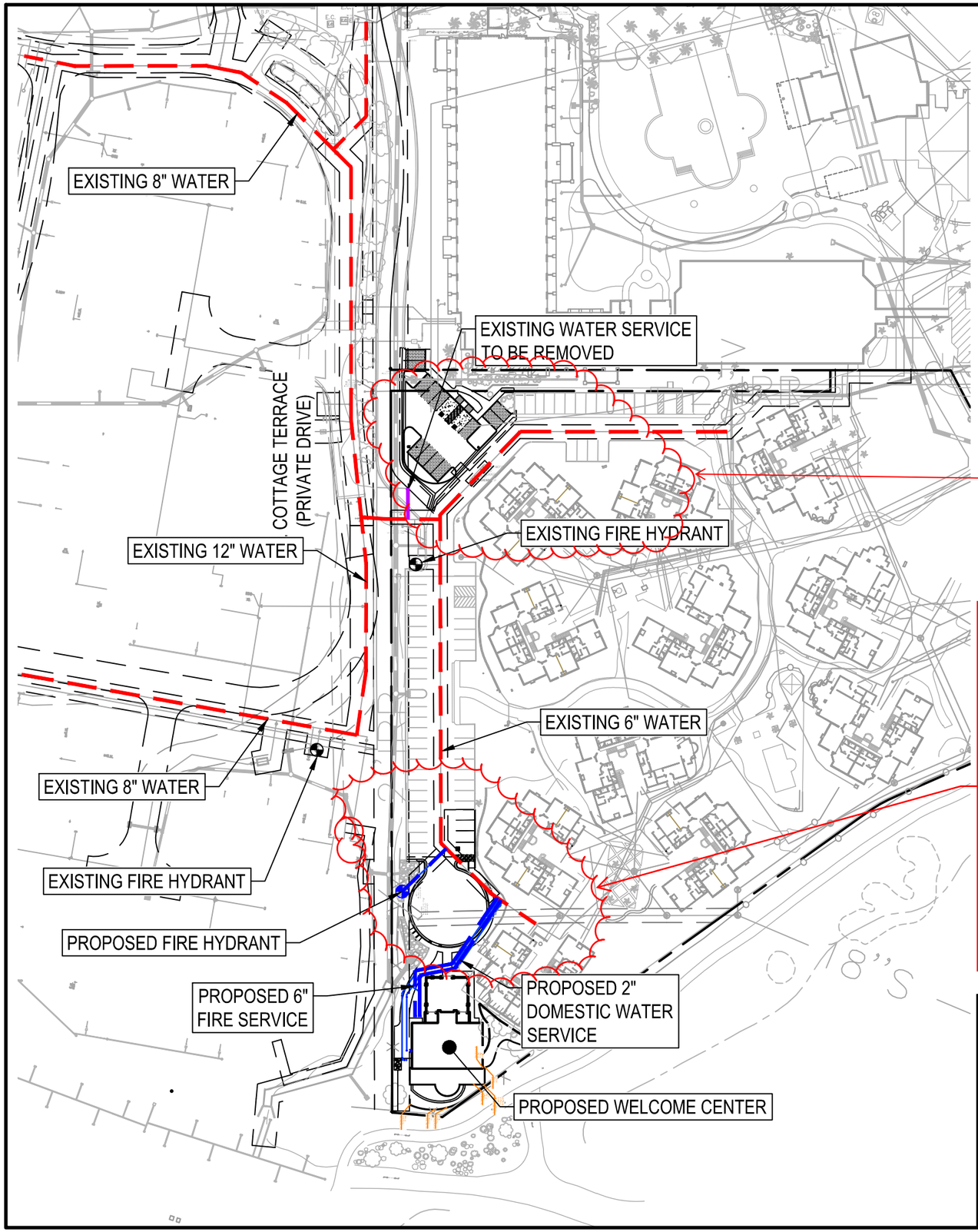
**EXHIBIT 2 – WATER EXHIBIT**




N

0 100 200

Horz. 1 in. = 200 ft.

Assure minimum depth to existing 6" water line remains at least 36" per DSPM 6-1.413 after construction of the valley gutter.

The Water Resources Department will only replace standard black asphalt and grey concrete when repairing water lines. Any water lines located under colored concrete, pavers, or other specialty paving (except at crosswalks) shall require prior approval from the Water Resources Department. In such cases a note shall be placed on the subdivision plat stating that any decorative pavement disrupted as a result of maintenance to the city's water and/or sewer system shall be the responsibility of the property owners to repair or replace. DSPM 6-1.402.A.4.

## 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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