



**WASTEWATER 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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EXPIRES 06-30-25

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## 1.0 EXECUTIVE SUMMARY

The 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 at the Fairmont Scottsdale Princess, in the City of Scottsdale (APN#215-08-003C). The proposed development will consist of one (1) visitor 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 potable 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 design criteria utilized:

Average Day Wastewater Demand, Commercial/Retail: .....0.5 gpd / sf  
Peak Factor, Commercial/Retail: ..... 3.0  
Minimum Mean Full Flow Velocity: .....2.50 fps  
Minimum Peak Full Flow Velocity: .....10.0 fps  
Minimum Peak Flow d/D Ratio (12-inch diameter or less sewers): .....d/D = 0.65

Abbreviations: gpd = gallons per day; fps = feet per second; P = population/1,000

## 2.0 INTRODUCTION

### 2.1 General Background

Privado Welcome Building and Parking Modifications (Site) is a proposed hotel visitor center and parking lot development on an approximate 6-acre parcel 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.

### 2.2 Project Location

The Site is located approximately 1,300 feet to the east of the 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.

### **2.3 Purpose of Report**

This Wastewater Collection System Basis of Design Report has been prepared in WOODPATEL's understanding of the City of Scottsdale Wastewater Collection System Design requirements, as applicable for the Site. The purpose of this Report is to address the following wastewater design consideration for the Site:

- Average-day and Peak Wastewater flows determination
- Capacity analysis of the proposed wastewater collection system

## **3.0 EXISTING WASTEWATER INFRASTRUCTURE**

### **3.1 Existing Utility System Conditions**

The existing wastewater infrastructure adjacent to the Site, includes a public 18-inch sewer line on the west side of the Site that extends south from Princess Boulevard to the south end of the property. The public 18-inch sewer line then continues east along the south side of the adjacent property. Please refer to Exhibit 2 – *Wastewater Exhibit* for a depiction of the existing wastewater infrastructure surrounding the Site.

## **4.0 PROPOSED WASTEWATER INFRASTRUCTURE**

### **4.1 Proposed Utility System Conditions**

As a part of the project, one sewer service will be removed from an existing building and added for the proposed Welcome Building. The proposed sewer service will require a manhole on the existing 18-inch sewer line. According to our calculations, the existing wastewater infrastructure can handle the wastewater flows and demands for the proposed project since sewer flows into the existing 18-inch sewer line will not be increased.

### **4.2 Modeling and Results**

Based on the current City of Scottsdale design criteria, the projected average-day flow for the proposed Site is calculated to be 1,374 gallons per day (gpd), or 1.0 gallon per minute (gpm). The peak flow is projected to be 4,121 gpd, or 2.9 gpm. Refer to Appendix A – *Hydraulic Modeling Results* for calculations. The proposed sewer slopes, projected flow velocities, and pipe flow capacities with the current flows are summarized on the attached spreadsheet and indicate that the wastewater system is adequate for the Site.

## **5.0 CONCLUSIONS**

Based on our wastewater collection system analysis for the proposed Site, the following conclusions are made:

1. The design criteria used to estimate wastewater flows and evaluate system hydraulics are based on WOODPATEL's understanding of the published City of Scottsdale Design Standards and Policies Manual, 2018.

2. The projected average-day flow for the proposed Site is calculated to be 1,374 gallons per day (gpd), or 1.0 gallon per minute (gpm). The peak flow is projected to be 4,121 gpd, or 2.9 gpm.

## **6.0 REFERENCES**

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

## **APPENDIX A – HYDRAULIC MODELING RESULTS**

**TABLE 1  
WASTEWATER DESIGN CRITERIA**

**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 Standards and Policies Manual (2018)

<b>WASTEWATER DEMANDS</b>			
<b>LAND USE</b>	<b>AVERAGE DAILY DEMAND (ADD)</b>		<b>POPULATION<sup>1</sup></b>
	<b>VALUE</b>	<b>UNITS</b>	
Commercial/Retail	0.50	gpd/sf	0.005 Persons per sf
Office	0.40	gpd/sf	0.004 Persons per sf
Restaurant	1.20	gpd/sf	0.012 Persons per sf
High Density Condominiums	140	gpd/DU	1.4 Persons per DU
School: without Cafeteria	30	gpd/Student	0.3 Persons per Student
School: with Cafeteria	50	gpd/Student	0.5 Persons per Student
Resort Hotel	380	gpd/Room	3.8 Persons per Room
Cultural	0.1	gpd/sf	0.001 Persons per sf
Fitness Center/Spa/ Health Club	0.8	gpd/sf	0.008 Persons per sf

<b>HYDRAULIC MODELING CRITERIA</b>	
<b>DESCRIPTION</b>	<b>VALUE<sup>2</sup></b>
<b>PEAK FLOW</b>	
Peak Flow = Peaking Factor (PF) x ADD	
Commercial/Retail	3.0
Fitness Center/Spa/Health Club	3.5
High Density Condominium	4.5
Restaurant	6.0
<b>HYDRAULICS</b>	
Minimum Pipe Diameter (in)	8
Manning's "n" value	0.013
Maximum d/D ratio at peak flow	0.65

<b>PIPE SIZE</b>	<b>MEAN VELOCITY<sup>2</sup></b>		<b>DESIGN SLOPE<sup>2</sup></b>	
	<b>(in)</b>	<b>Minimum (ft/sec)</b>	<b>Maximum (ft/sec)</b>	<b>Minimum (%)</b>
8	2.5	10.0	0.380	6.980
10	2.5	10.0	0.306	5.121
12	2.5	10.0	0.256	3.919

**Notes**

1. Based on Arizona Administrative Code, Title 18, Chapter 9 value of 100 gallons per capita per day.
2. Per City of Scottsdale Design Standards and Policies Manual (2018)

**WASTEWATER MODEL, FULL  
BUILD-OUT CONDITION**

**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 Standards and Policies Manual (2018)  
 Arizona Administrative Code, Title 18, Chapter 9

<b>FROM NODE</b>	<b>Commercial/ Retail (SF)</b>	<b>Commercial/ Retail (GPD/SF)</b>	<b>SEWER NODE ADD (GPD)</b>	<b>SEWER NODE ADD (GPM)</b>	<b>PEAK FLOW <sup>1</sup> (GPD)</b>	<b>PEAK FLOW <sup>1</sup> (GPM)</b>
<b>Outfall</b>						
Welcome Center	2747	0.5	1,374	1.0	4,121	2.9
<b>Total Outfall</b>	<b>2,747</b>		<b>1,374</b>	<b>1.0</b>	<b>4,121</b>	<b>2.9</b>

<sup>1</sup> Peaking Factor per the City of Scottsdale Design Standards & Policies Manual are as follows:  
 Commercial/Retail: 3



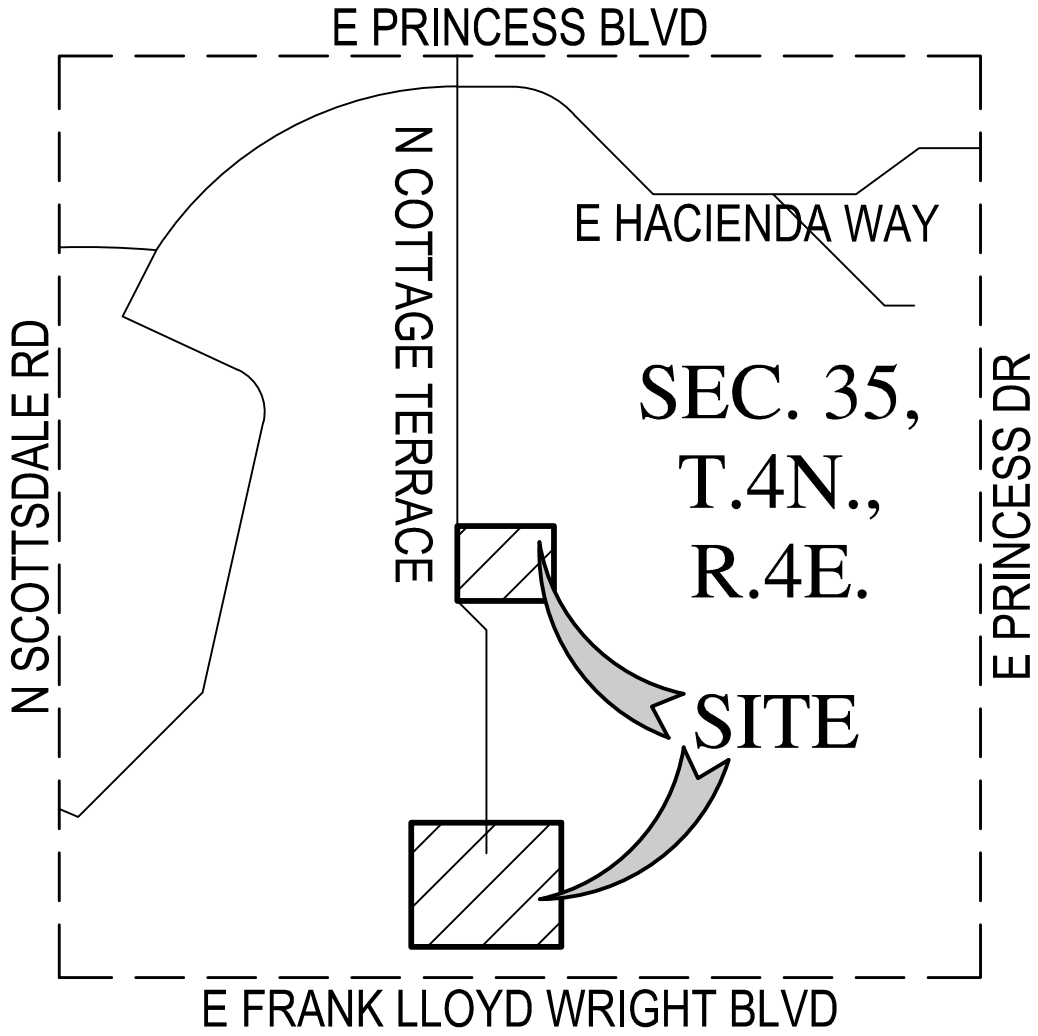


CALCULATED PIPE CAPACITIES, FULL BUILD-OUT CONDITION

**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 Standards and Policies Manual (2018)  
 ADEQ Bulletin No. 11

FROM NODE	PIPE SIZE	MODELED PIPE SLOPE	PIPE CAPACITY (FULL)		PEAK FLOW RESULTS					
					PEAK FLOW	PEAK FLOW	d/D	MEAN VELOCITY (at d/D=0.75)	SURPLUS CAPACITY	PERCENT OF CAPACITY
					(gpd)	(gpm)		(ft/sec)		
(in)	(ft/ft)	(gpd)	(gpm)	(gpd)	(gpm)		(ft/sec)	(gpd)	(%)	
<b>Outfall</b>										
Welcome Center	6	0.0226	546,689	380	4,121	2.9	0.07	4.7	542,569	0.8%

**EXHIBIT 1 – VICINITY MAP**



**VICINITY MAP**  
N.T.S.

**NOT  
FOR  
CONSTRUCTION  
OR RECORDING**



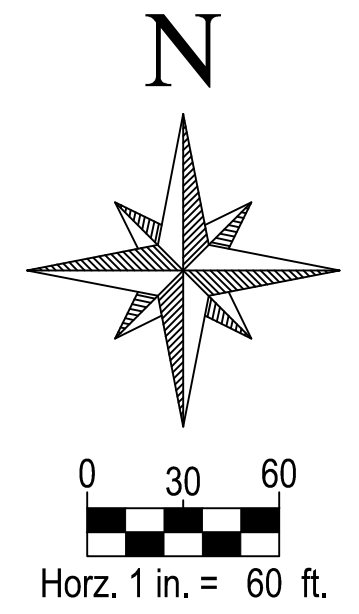
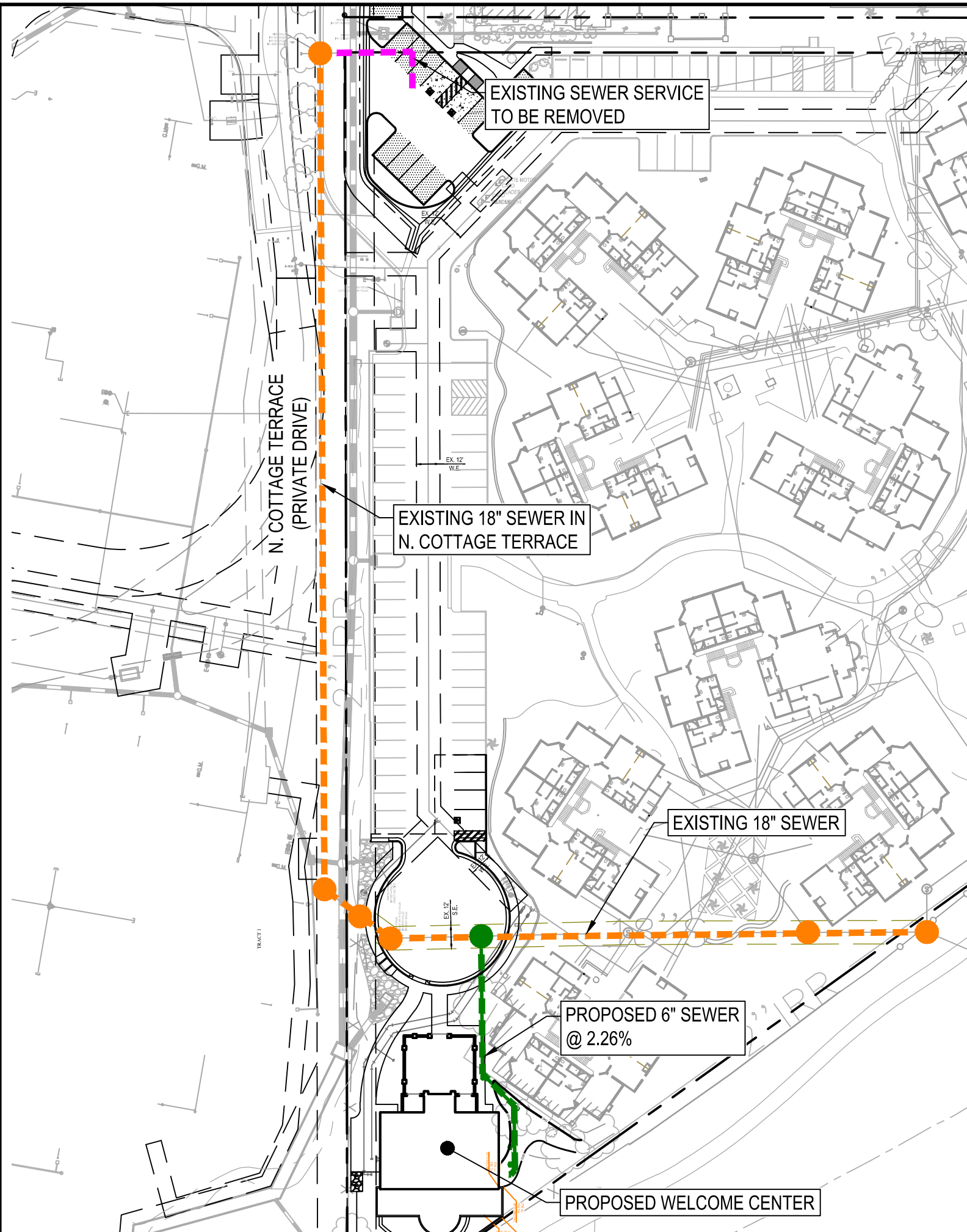
FAIRMONT SCOTTSDALE PRINCESS PRIVADO WELCOME CENTER AND PARKING MODIFICATIONS

**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 – WASTEWATER EXHIBIT**



### LEGEND

- - - - - EXISTING 18" SEWER PIPE
- - - - - EXISTING SEWER SERVICE
- - - - - PROPOSED 6" SEWER SERVICE
- PROPERTY BOUNDARY
- EXISTING SEWER MANHOLE
- PROPOSED SEWER MANHOLE

**NOT  
FOR  
CONSTRUCTION  
OR RECORDING**



FAIRMONT SCOTTSDALE PRINCESS			
PRIVADO WELCOME BUILDING AND PARKING MODIFICATION			
DATE	10/12/2022	SCALE	1" = 60'
SHEET	1 OF 1	DESIGN	RS
JOB NO.	215220	DRAWN	AM
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