

FINAL
PRELIMINARY SEWER BASIS OF DESIGN REPORT

Hyatt Pima Renovation

7330 North Pima Road
Scottsdale, Arizona

*APPROVED AS FINAL w/ stipulation
AS NOTED*

Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona

By: *L. Dillon*
Date: *8-8-17*

Prepared for:

Zenith Asset Company, LLC
1855 Olympic Boulevard, Suite 300
Walnut Creek, CA 94596

Prepared by:

Kimley-Horn and Associates
291010001
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Kimley»»Horn

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FINAL
~~PRELIMINARY~~

SEWER BASIS OF DESIGN REPORT

HYATT PIMA RENOVATION
7330 N. PIMA ROAD
SCOTTSDALE, ARIZONA



MAY 2017

Expires 03/30/20

Prepared By:

Kimley»»Horn

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INTRODUCTION

SITE LOCATION

This Preliminary Sewer Basis of Design Report (SewerBOD) has been prepared for the proposed Hyatt Pima Renovation located at 7330 N. Pima Road in Scottsdale, Arizona (development). The development is bound to the west and south by private townhomes and private drive known as Inner Circle Drive, an existing private condominium complex to the north, and Pima Road to the east. The development is located within Section 1 of Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Refer to **Figure 1** for the Vicinity Map.

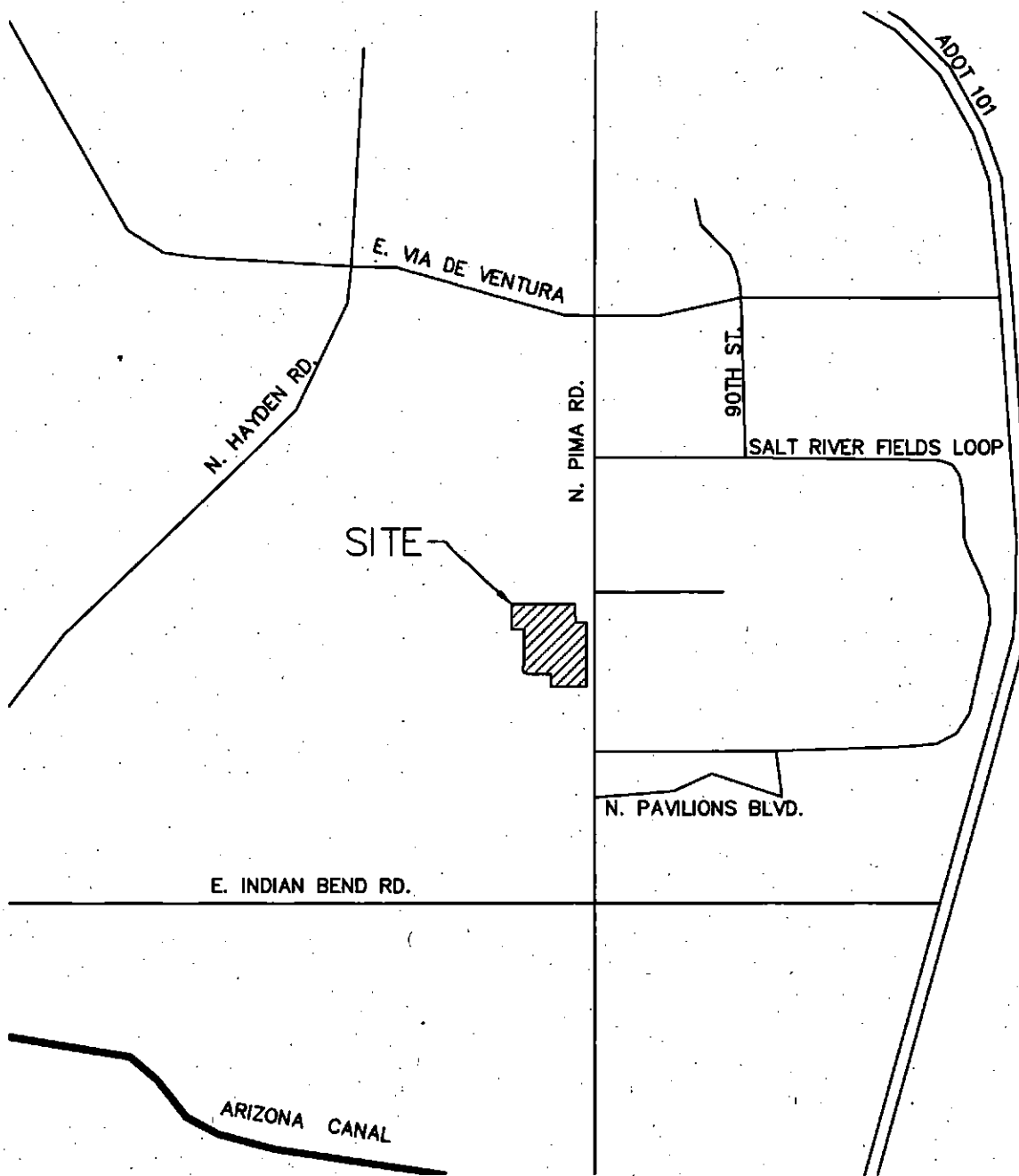
PROJECT SIZE AND TYPE

The development is a proposed three-story, 100 room hotel renovation project, including parking lot and open space improvements. The development is approximately 7.93 gross acres with a net proposed disturbance of 3.56 acres.

PURPOSE AND OBJECTIVES

This report presents the basis of design criteria that will be used for engineering design of the proposed development. This report establishes a preliminary sewer solution for the development of the site.

- Demonstrate compliance with the City's Design Standards & Polices Manual (DSPM).
- Identify a preliminary sewer system layout for the proposed development.
- Determination of the sewer demand generated by the development.
- Analysis of the capacity of the development's gravity sewer system.



K:\EAV_Civil\291010001 - Days Inn Scottsdale\Drainage\Figures\Figure 1 Vicinity Map.dwg Apr 27, 2017 Trey.Farrell

FIGURE 1
VICINITY MAP



COLLECTION SYSTEM DESCRIPTION

EXISTING COLLECTION SYSTEM

The development consists of existing condominiums, a Days Inn Hotel & Timeshare, private townhomes, a private access drive known as Inner Circle Drive, and a parking lot along the north and east end of the development. There is an existing 8-inch sewer main which serves the site, and connects to an existing sewer main located in Pima Road. The existing sewer is covered by either a utility easement, or utility rights within the Inner Circle Roadway Tract.

PROPOSED COLLECTION SYSTEM

The proposed development will include demolition of the existing Days Inn Hotel, Lobby, and Timeshare buildings. A new 3-story 100-room hotel is proposed on the site. The new hotel will be served by a single 8-inch sewer service line, which will connect to the 8-inch sewer to the south of the building with a new manhole. A proposed utility easement will cover the new water and sewer services. The existing sewer service to the east of the building will be demolished with the project. The service will be capped at the existing manhole. Refer to **Figure 2** for existing and proposed sewer layouts.

BASIS OF DESIGN

DESIGN CRITERIA

The design criteria for the development is based on the City of Scottsdale Design Standards and Policies Manual (DS&PM). Average daily demands and peaking factors for the various building uses were used to determine the existing and proposed peak flows generated on site. See **Table 1** below for a summary of the design criteria used.

Table 1. Wastewater Design Criteria

Wastewater Demands			
Land Use	Average Daily Flow (gpd)		Peaking Factor
Townhome	250	per unit	4
Condominium	140	per room	4.5
Resort Hotel & Timeshare	380	per room	4.5
Wastewater Design Criteria			
Minimum Pipe Slope			
8-inch	0.52	%	
Full Flow Velocities			
Minimum	2.5	fps	
Maximum	10	fps	
Manning's Roughness Coefficient (n)	0.013		
Design d/D	0.65		

? WHERE

The existing site, consisting of the condos, townhomes, and the hotel & timeshares generated a peak flow of approximately 151,000 gpd or 105 gpm. The proposed site, which consists of the exiting condos and townhomes, as well as the proposed hotel, pool and spa, generate a peak flow of approximately 326,250 gpd or 227 gpm. See **Table 2** below for a summary of the existing and proposed flows generated on site.

227 gpm
SEE PG. 7

Table 2. Wastewater Demand Calculations

Math ERROR

Use	Units/ Rooms (#)	Demand (gpd)	Average Daily Demand (gpd)	Peaking Factor	Peak Flow (gpd)	Peak Flow (gpm)
Ex. Townhomes	17	250	4,250	4.0	17,000	12
Ex. Condo ⁽¹⁾	80	140	11,200	4.5	50,400	35
Ex. Hotel & Timeshare	49	380	18,620	4.5	83,790	58
Proposed Hotel	100	380	38,000	4.5	171,000	119
Proposed Pool and Spa					87,840	61
Existing Total			34,070		151,190	105
Proposed Total ⁽²⁾			53,450		326,240	227

NEW add
pool drain
etc?

410,000

285

↓
105
+ 119

+ 61

285 gpm

Notes:

(1): Existing Condominium Consists of 40 - 1,365 Sq. Ft Units, assumed 2 rooms each.

(2): Proposed Total includes Ex. Townhomes, Ex. Condo, and Proposed Hotel, Pool and Spa.

WASTEWATER SYSTEM ANALYSIS

The peak flow from the entire site is conveyed into the existing 8-inch gravity sewer which then connects to an existing system within Pima Road. Based on survey of the existing sewer system, the minimum slope of the system is 0.35%. At this slope the pipe has a full flow capacity of 320 gpm. The existing pipe can convey the proposed design flow of 227 gpm at normal depth of 0.41' (d/D ratio of 0.62), with a velocity of 2.22 ft/s. See Appendix A – Flowmaster Calculations for pipe capacity calculations.

CONCLUSION

The proposed redevelopment of the Days Inn Hotel results in an increase to the generated wastewater flows onsite. The existing 8-inch sewer system has the capacity to convey the peak flow at or below the desired d/D ratio.

$d/D = 0.73 > 0.65$ limit

MUST UPSIZE 40-45 FT
SECTION of slope = 0.35% to 10"

Appendix A – Flowmaster Calculations

Worksheet for 8-Inch Full - Min

Project Description

Friction Method

Manning Formula

Solve For

Full Flow Capacity

$d/D = 1.65$ is limit

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00350	ft/ft
Normal Depth	0.67	ft
Diameter	8.00	in
Discharge	320.85	gal/min

Results

Discharge	320.85	gal/min
Normal Depth	0.67	ft
Flow Area	0.35	ft ²
Wetted Perimeter	2.09	ft
Hydraulic Radius	0.17	ft
Top Width	0.00	ft
Critical Depth	0.40	ft
Percent Full	100.0	%
Critical Slope	0.00779	ft/ft
Velocity	2.05	ft/s
Velocity Head	0.07	ft
Specific Energy	0.73	ft
Froude Number	0.00	
Maximum Discharge	0.77	ft ³ /s
Discharge Full	0.71	ft ³ /s
Slope Full	0.00350	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%

Worksheet for 8-Inch Full - Min

GVF Output Data

Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.67	ft
Critical Depth	0.40	ft
Channel Slope	0.00350	ft/ft
Critical Slope	0.00779	ft/ft

Worksheet for 8-Inch Capacity

Project Description

Friction Method Manning Formula
 Solve For Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	0.00350 ft/ft
Diameter	8.00 in
Discharge	227.00 gal/min

- 285 gpm
 PER Pg. 7

Results

Normal Depth	0.41 ft
Flow Area	0.23 ft ²
Wetted Perimeter	1.21 ft
Hydraulic Radius	0.19 ft
Top Width	0.65 ft
Critical Depth	0.33 ft
Percent Full	62.1 %
Critical Slope	0.00704 ft/ft
Velocity	2.22 ft/s
Velocity Head	0.08 ft
Specific Energy	0.49 ft
Froude Number	0.66
Maximum Discharge	0.77 ft ³ /s
Discharge Full	0.71 ft ³ /s
Slope Full	0.00175 ft/ft
Flow Type	SubCritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.00 %
Normal Depth Over Rise	62.10 %
Downstream Velocity	Infinity ft/s

$\frac{d_y}{D} = 0.73$

Worksheet for 8-Inch Capacity

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.41	ft
Critical Depth	0.33	ft
Channel Slope	0.00350	ft/ft
Critical Slope	0.00704	ft/ft