

PRELIMINARY WATER CAPACITY REPORT

for

The Parque

16001 N. Scottsdale Road
Scottsdale, AZ

Prepared For:

Nelsen Partners

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PRELIMINARY Basis of Design Report

- ACCEPTED
- ACCEPTED AS NOTED
- REVISE AND RESUBMIT



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 rsacks DATE 2/16/2023

Prepared by:



Sustainability Engineering Group

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Project Number: 211005

Submittal Date: February 06, 2023 (REZONING)

Case No.: 13-ZN-2022

Plan Check No.: TBD

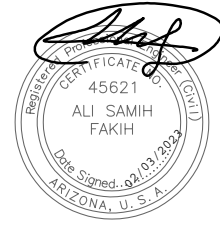


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1. INTRODUCTION

1.1 SUMMARY OF PROPOSED DEVELOPMENT:

This project is a redevelopment of the land occupied by the Cracker Jax Family Fun and Sports Park in Scottsdale, AZ. Proposed development is conceptualized to be a mixed use consisting of office/retail, hotel, condominium, multi-family residential, restaurant and open space/park uses. The purpose of this water capacity design report is to provide an analysis of the impact that this development will have on the City's local water system.

1.2 LEGAL DESCRIPTION:

The project property consists of two parcels of land located in a portion of Section 2, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona; Parcel ID numbers are APN: 215-44-002D and 215-44-002F. The property address is 16001 N. Scottsdale Road.

The project is located at the NEC of East Tierra Buena Lane and North Scottsdale Road in Scottsdale, AZ. The site is bound by East Paradise Lane to the north and North 73rd Street to the east. Refer to **FIGURE 1 - Vicinity Map** for the project's location with respect to major cross streets.

1.3 EXISTING AND PROPOSED SITE ZONING AND LAND USES:

The parcel is zoned C-4 and is currently occupied with an amusement park consisting of one main building, an existing parking lot, a driving range and amusement attractions. The requested zoning is PCP. A Non-Major General Plan Amendment for the site was approved by Council on October 18, 2011, amending the Airpark Land Use Map to Airpark Mixed Use-Residential (AMU-R).

1.4 REFERENCES:

The project is located in the Scottsdale Airpark area and falls within Mixed-Use Neighborhoods conceptual land use district of the City's General Plan.

2. DESIGN DOCUMENTATION

2.1 DESIGN COMPLIANCE:

The proposed water system is designed to meet the criteria of the City of Scottsdale ("the City") Water Resources Department, the Arizona Department of Environmental Quality ("ADEQ"), and Maricopa County Environmental Services Department ("MCESD").

2.2 PROCEDURES, POLICIES AND METHODOLOGIES:

The general methodology used to design this public water infrastructure will consist of modeling a network of water distribution mains to meet the City's pressure, head loss, and water demand requirements during daily demands and fire events. The connection to the water system is modeled as a reservoir and pump. The pump will simulate the pressure drop and the available flow from the existing water system as depicted by the respective fire flow tests.

2.3 SOFTWARE ACKNOWLEDGEMENT:

Bentley WaterCAD® Version 8i is the computer modeling tool that will be used in this final design report.

3. EXISTING CONDITIONS

3.1 EXISTING ZONING & LAND USE:

Land ownership, as defined by ALTA/NSPS Land Title Survey prepared by Superior Surveying Services, Inc, includes 1,207,435Sq. Ft. (27.72 acres) of Amusement Facility commercially developed land. City of Scottsdale zoning map designates this parcel as C-4.

3.2 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

The north parcel of the site has never been fully developed but has been maintained as a driving range and tee structure. The south parcel of the site has been fully developed with the amusement park and parking lot. Both parcels are currently still in operation. The topography slopes from the north-northeast to the southwest corner at approximately one percent with a change in elevation of approximately twenty (20) feet. Refer to **FIGURE 2** for an aerial of the overall project existing conditions.

FIRM Map Number 04013C1320L dated October 16, 2013, indicates this site is designated as **Zone "X" shaded**. As such, it is determined to be outside the 100-year flood hazard zone. Zone "X" shaded is defined as areas of 0.2-percent-annual-chance flood; areas of 1-percent-annual-chance-flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1-percent-annual-chance-flood. Refer to **FIGURE 3** for the FIRM.

3.3 EXISTING WATER MAINS:

Refer to **FIGURE 4** for the City quarter section map (**QS 35-45**)

- An existing 20" ACP non-potable water main is located in North Scottsdale Road east of the road centerline running north-south along the entire frontage.
- A 12" ACP main is located east of the centerline of Dial Blvd. and runs the entire length of the frontage.
- An 8" C-900 water main is located south of the centerline in East Paradise Lane and begins approximately 250' east of the center line of North Scottsdale Road and runs east along the frontage of the site.
- An 8" water main is located both north and south of the centerline of East Tierra Buena Lane. Both begin about 270 feet east of the center line of North Scottsdale Road. The north line ends approximately 640 feet east of the centerline of North Scottsdale Road and turns into the subject site. The south line continues through the frontage of the site. Both lines are interconnected at the west end of the project entrance.
- There are ten fire hydrants located on the adjacent streets around the site and one located on site adjacent to the existing building.
- A 6" main loops through the site from Tierra Buena Lane to Dial Blvd.

- A 16" water main connects to a PRV along Scottsdale Road just south of Frank Lloyd Blvd. A 12" DIP connects the PRV to the distribution system within the Promenade.

Refer to **FIGURE 4** for COS existing QS 35-45 for water and fire hydrant locations.

3.4 CERTIFIED FLOW TEST RESULTS OF THE EXISTING WATER SYSTEM:

The fire hydrant flow test was updated on December 2, 2022, by Arizona Flow Testing LLC at 7:00 a.m. using hydrants along Dial Boulevard around Monte Cristo Avenue. The test recorded a static pressure of 76.0 psi and a residual pressure of 63.0 psi flowing 2,392 gpm. The calculated flow at 20 psi is 5,264 gpm. Scottsdale requires the reduced data for NFES Design to be used for modeling purposes. That static pressure is 68.4 psi, with a residual pressure of 55.4 psi flowing 2,392 gpm. That extrapolated flow at 20 psi is 4,866 gpm.

The flow test documentation is included in **APPENDIX I**.

4. PROPOSED CONDITIONS

4.1 SITE PLAN:

The property is proposed to be re-developed with new use configurations conceptualized to be mixed uses consisting of 200 hotel rooms, 120,000 SF of office space, 120,000 SF of restaurant/retail space, 120 luxury hotel units, 135 condominiums, 899 multifamily residential units and 21 residential units.

Refer to **FIGURE 5** for proposed site layout.

4.2 PROPOSED WATER SYSTEM:

Phased development will connect to existing water system along the boundary of the site and be looped as needed for redundancy and fire protection. This report presents a preliminary water layout reports. Interior piping will be a looped 12" DIP configuration connecting to the existing 12" pipe at Dial Blvd and the existing 8" pipes at Paradise and Tierra Buena Lanes.

4.3 PHASING OF DEVELOPMENT:

APPENDIX VI illustrates potential phasing of construction. The water system can be constructed in a looped configuration for Phase 1 by extending the Line from Paradise Lane south to Tierra Buena Lane. Future Phases will provide connections to Dial Boulevard. Reference **APPENDIX II** for the modeled pipe layout.

4.4 SECOND SOURCE:

The public system provides service to the site from multiple directions.

4.5 WATER REQUIREMENTS:

Per the City's design standards, the demand analysis includes evaluation of average day, maximum day, peak hour and maximum day plus fire flow demands. All new water lines will be polyethylene

wrapped ductile iron pipe with restrained joints. All buildings will have separate domestic meters and individual fire lines. Fire hydrants will provide 300 foot overlapping coverage.

4.6 MAINTENANCE RESPONSIBILITIES:

The on-site water main for the proposed development will be public and located within easements dedicated to the City of Scottsdale. Therefore, the City will maintain the on-site and off-site water system.

5. WATER SYSTEM COMPUTATIONS

5.1 WATER DEMANDS:

The proposed development at the site consists of office, retail, hotel and residential uses. Average day water demands are described in Section 6-1.205, Figure 6.1-2 of the City of Scottsdale’s Design Standards & Policies Manual (“DS&PM”), dated January 2017. A summary of the total water demands for the site are presented below in Table 1.

Table 1: DAILY WATER DEMAND CALCULATIONS

Block - Use	Square Feet	Dwelling Units	ADD (gpd/sq.ft.) (gpd/unit)	Avg. Day Demand (gpd)	Max. Day Demand (gpd)	Peak Hour (gpd)
A - Hotel		200	446.3	89,260	178,520	312,410
B - Condominium		120	185.3	22,236	44,472	77,826
C - Multi-Family		340	185.3	63,002	126,004	220,507
D - Restaurant	20,000		1.3	26,000	52,000	91,000
E - Restaurant	20,000		1.3	26,000	52,000	91,000
F - Restaurant	20,000		1.3	26,000	52,000	91,000
G - Open Space*	87,120		0.04	3,572	7,144	12,502
H - Restaurant	20,000		1.3	26,000	52,000	91,000
J - Condominium		135	185.3	25,016	50,031	87,554
K - Restaurant	20,000		1.3	26,000	52,000	91,000
L - Restaurant	20,000		1.3	26,000	52,000	91,000
M - Multi-Family		276	185.3	51,143	102,286	179,000
N - Multi-Family		283	185.3	52,440	104,880	183,540
P - Office/Retail	120,000		0.6	72,000	144,000	252,000
Q - Residential		21	227.6	4,780	9,559	16,729
TOTALS	327,120	1375.0		539,448	1,078,896	1,888,067
			TOTALS (gpm)	374.6	749.2	1,311.2

* demand is 1786 gpd/acre

Peaking Factors; Max Day 2.0; Peak Hour 3.5

Fire flow demand will be a minimum of 2500 gpm as the site proposes clusters of high rise structures. Fire flow analysis will be presented in accordance with NFPA 1. The 2500 gpm plus max day will be analyzed among three nodes along the west side of the development (J-28, J-30 and J-31) and again among three nodes along the east side of the development (J-29, J-34 and J-33).

5.2 SOFTWARE MODELING:

Bentley WaterCAD® Version 8i will be the computer modeling tool used for preparation of the final design report. The model layout and reports are included in **APPENDIX II**.

Network analysis input parameters will include the following:

1. Pipe diameters (inches)
2. Pipe lengths (feet)
3. Pipes invert elevations (feet – MSL)
4. A reservoir and a pump to model the fire flow test performed
5. System demands (gpm)
6. Fire flows (gpm)
7. Model piping is ductile iron pipe using Hazen-Williams frictional losses (C = 130)

Output parameters included but were not limited to:

1. Pressure (psi)
2. Flow rates (gpm)
3. Velocities (fps)
4. Head loss (feet)

5.3 PRESSURE REQUIREMENTS:

The following system pressure requirements are in accordance with the City's design standards:

- Average day, maximum day and peak hour flow demands:
 - Minimum pressure = 50 psi at street level.
 - Maximum pressure = 120 psi at street level.
- Maximum day plus coincident fire flow demand:
 - Minimum pressure = 30 psi +/- at street level.
 - Maximum pressure = 120 psi at street level.
- Daily scenario head loss shall not exceed 10 feet per 1,000 feet length of pipe.

5.4 WATER SYSTEM ANALYSIS:

Providing domestic and fire service to the clusters of high-rise buildings will require individual building pumps for fire and domestic service. Modeling demonstrated the available flows and pressures at street level. Results of the model are presented in Table 2.

Table 2: RESULTS OF WATER MODELING

Demand Scenario	Water Demand (gpm)	Pressure (psi)				Velocity (ft/s)	Pipe ID
		Min.	Node	Max.	Node		
Average Day	375	65	J-29	70	J-26	0.6	P-20
Maximum Day	749	63	J-22	69	J-26	1.1	P-24
Peak Hour	1,311	61	J-23	66	J-26	1.9	P-24
MD + West Split FF	3,249	28	J-22	34	J-26	4.7	P-24
MD + East FF	3,249	29	J-22	34	J-26	4.8	P-24

6. WATER MANAGEMENT PRINCIPLES

Refer to **APPENDIX IV** for a memo outlining potential water management and efficiency concepts that Park Village intends to pursue. **APPENDIX V** is the Water Demand Exhibit as required by the City for projects requesting rezoning and having an average day water use exceeding 100,000 gallons.

7. SUMMARY

7.1 SUMMARY OF PROPOSED WATER IMPROVEMENTS:

- All proposed water mains will be designed in accordance with City of Scottsdale’s Design Standards and Policies Manual².
- Pressure regulators and backflow prevention devices will be provided on the domestic service supply for all structures. Fire systems within the building will be designed as to utilize the backflow valve installed on the building riser.
- Any needed domestic pressure and/or fire pumps will need to be designed by the buildings mechanical engineer.

7.2 PROJECT SCHEDULE:

Initial construction and any related phases will be determined with the final design report.

8. SUPPORTING MAPS

9.1 SITE UTILITY PLAN

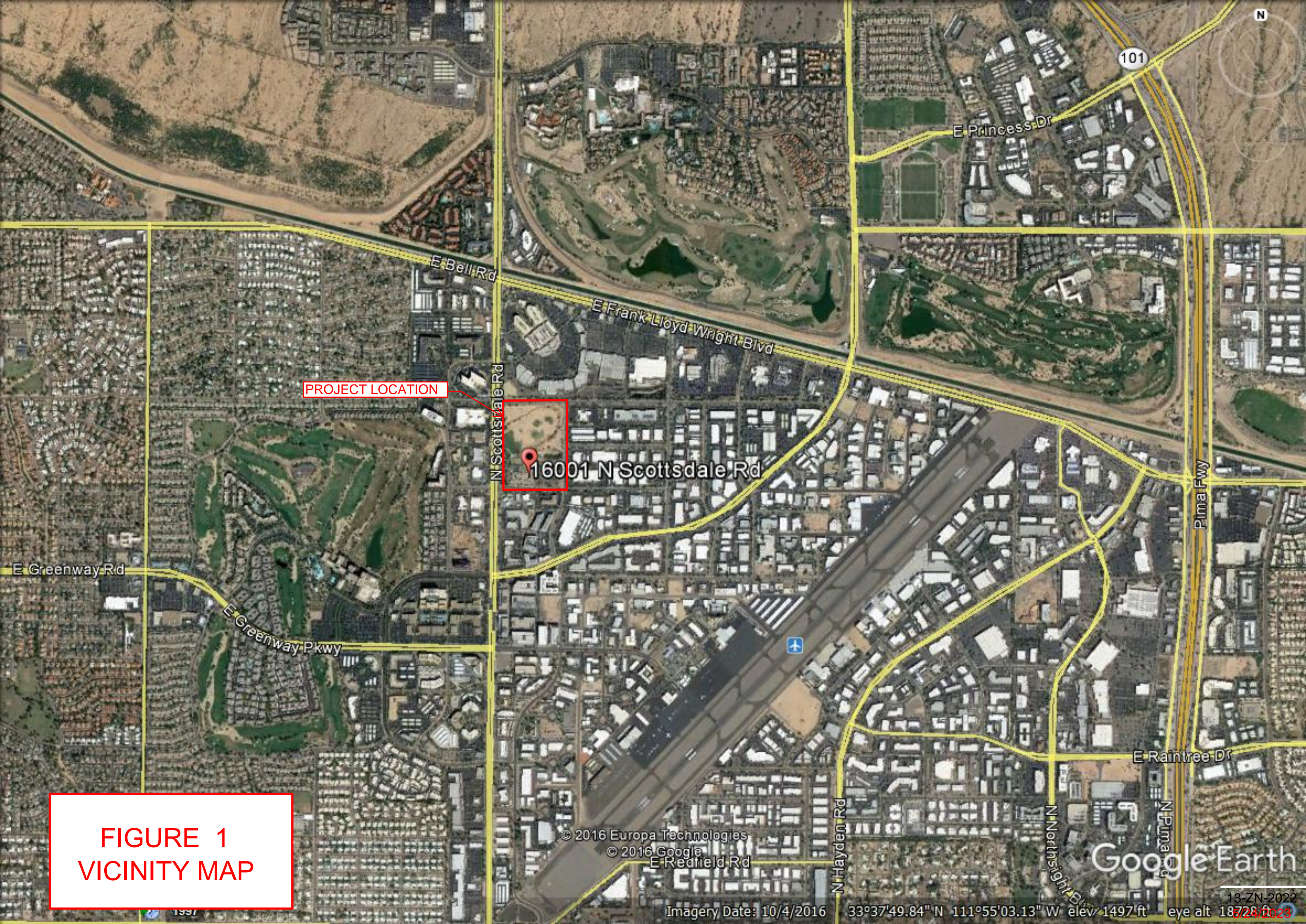
Refer to Preliminary Utility Plan in **APPENDIX III**.

10 REFERENCES

1. *COS Water and Sewer Plan number 35-45*
2. *City of Scottsdale Design Standards & Policies Manual, 2017 (Chapter 6 – Water)*

FIGURES

- 1 - Vicinity Map*
- 2 - Aerial*
- 3 - FIRM*
- 4 - Water Q-S Map*
- 5 - Site Plan*



PROJECT LOCATION

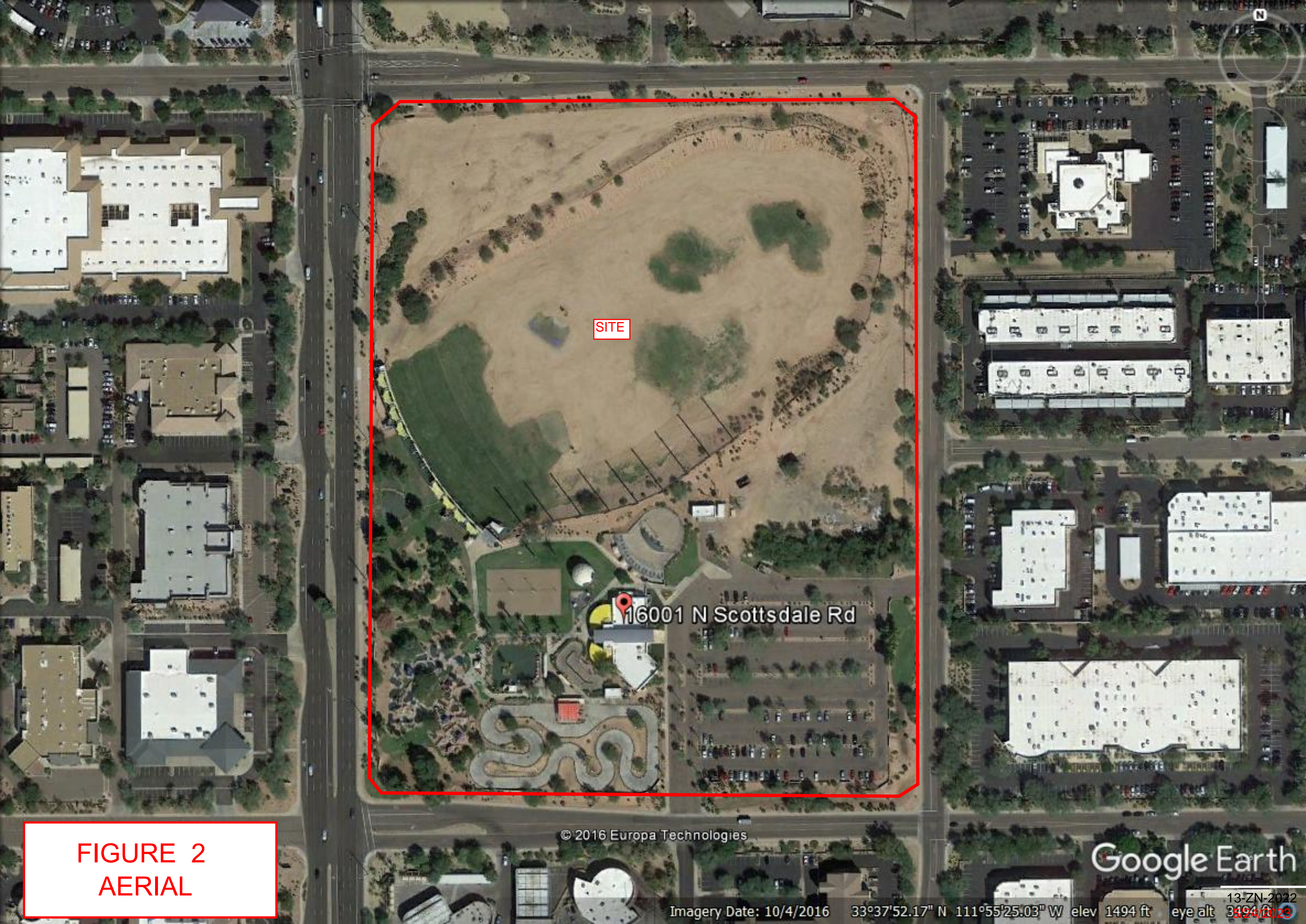


16001 N Scottsdale Rd

**FIGURE 1
VICINITY MAP**

© 2016 Europa Technologies
© 2016 Google

Google Earth



SITE

16001 N Scottsdale Rd

**FIGURE 2
AERIAL**

© 2016 Europa Technologies

Google Earth

Imagery Date: 10/4/2016 33°37'52.17" N 111°55'25.03" W elev 1494 ft eye alt 3494 ft

13-ZN-2022
3/24/2023

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **Floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arizona State Plane Central zone (FIPSZONE 0002). The **horizontal datum** was NAD 83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Map users wishing to obtain flood elevations referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29) may use the following Maricopa County website application: <http://www.fcd.maricopa.gov/Maps/gismaps/aps/aps/aps/application/index.cfm>

This web tool allows users to obtain point-specific datum conversion values by zooming in and hovering over a VERTCON checkbox on the layers menu on the left side of the screen. The VERTCON grid referenced in this web application was also used to convert existing flood elevations from NGVD 29 to NAVD 88.

To obtain current elevation, description, and/or location information for National Geodetic Survey bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>. To obtain information about Geodetic Densification and Cadastral Survey bench marks produced by the Maricopa County Department of Transportation, please visit the Flood Control District of Maricopa County website at <http://www.fcd.maricopa.gov/Maps/gismaps/aps/aps/aps/application/index.cfm>.

Base map information shown on this FIRM was derived from multiple sources. Aerial imagery was provided in digital format by the Maricopa County Department of Public Works, Flood Control District. The imagery is dated October 2009 to November 2009. Additional National Aerial Imagery Program (NAIP) imagery was provided by the Arizona State Land Department (ALRS) and is dated 2007. The coordinate system used for the production of the digital FIRM is State Plane Arizona Central NAD83 HARN, International Feet.

The **profile base line** depicted on this map represents the hydraulic modeling baselines that match flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

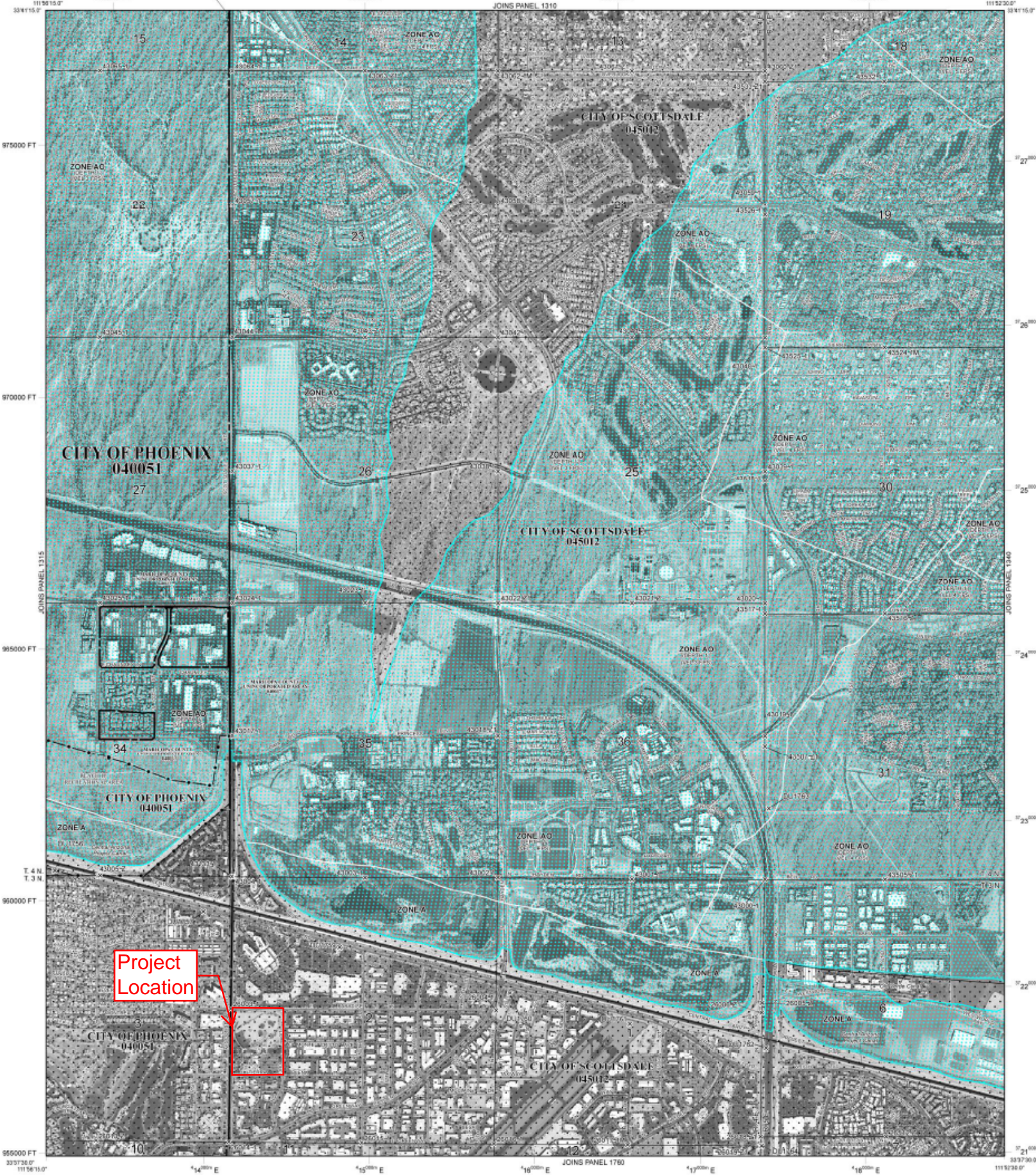
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community, as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM, visit the **FEMA Map Service Center (MSC)** website at <http://mfc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov>.

MARICOPA COUNTY UNINCORPORATED AREAS 04007



LEGEND

- SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
- The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AV, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponds); Base Flood Elevation determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined; for areas of elevated land flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently abandoned. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AV** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; the Base Flood Elevation determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevation determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with average areas less than 3 square miles; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities
- 513 Base Flood Elevation line and value; elevation in feet
- EL 997 Base Flood Elevation value where different within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988 (NAVD 88)
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid ticks, zone 12
- 500-foot grid ticks; Arizona State Plane coordinate system, central zone (FIPSZONE 0002); Transverse Mercator
- BM 510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- MI 5 River Mile
- MAP REPOSITORIES**
- Refer to Map Repositories list on Map Index
- EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**
- April 15, 1988
- EFFECTIVE DATES OF REVISIONS TO THIS PANEL**
- December 3, 1993 September 26, 1995 July 16, 2001 September 26, 2005
- October 16, 2013 - to add base flood elevation, to add special flood hazard areas, to incorporate previously issued letters of map change, to add roads and road names, to update corporate limits, to change floodway, to advance to 1% to change base flood elevations, and to add floodway.
- For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
- To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-438-6428.

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1320L

FIRM FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1320 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	04007	1320	L
PHOENIX, CITY OF	040051	1320	L
SCOTTSDALE, CITY OF	045012	1320	L

FIGURE 3

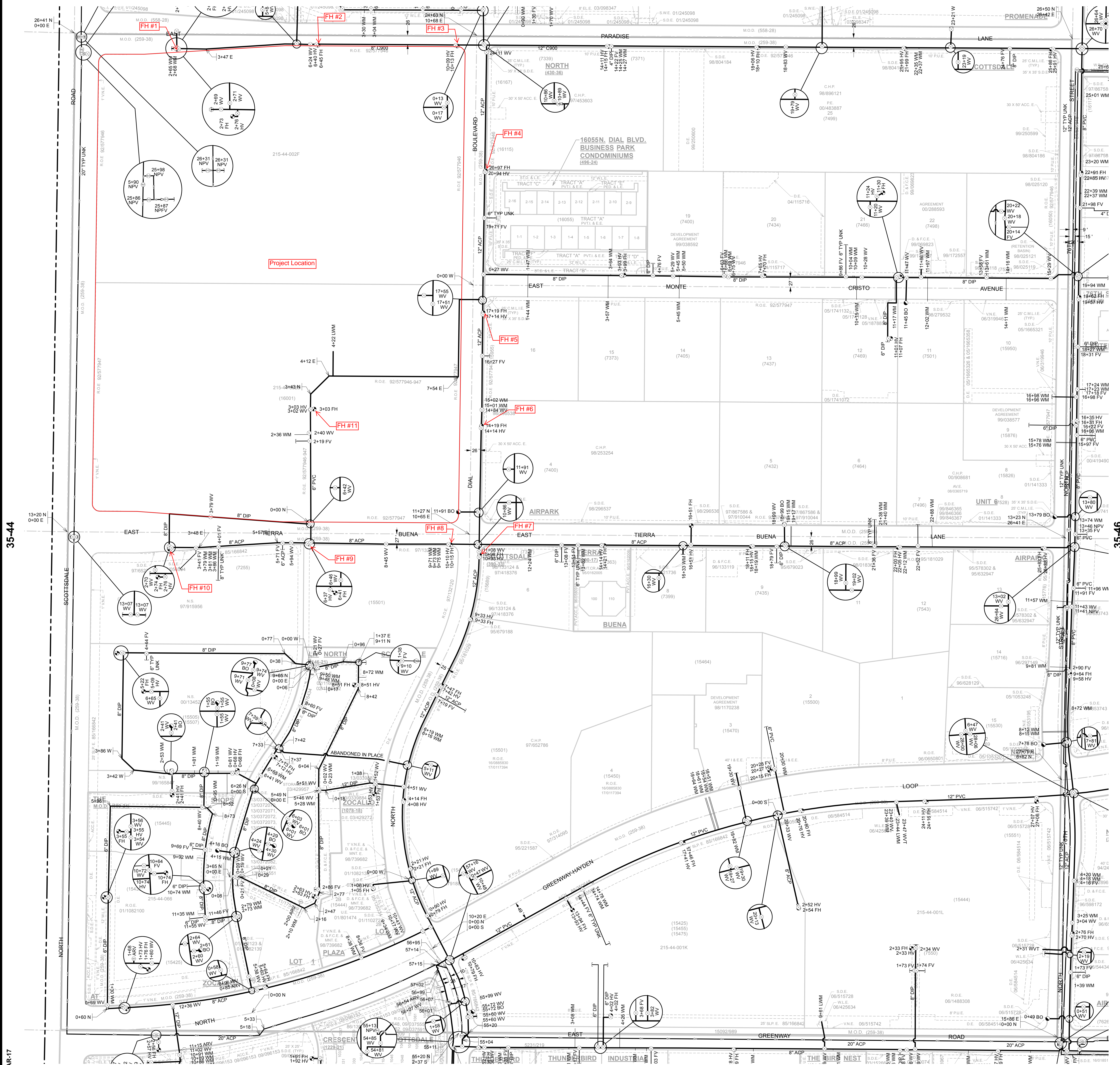
Notes to User: The Map Number above should be used when placing map orders. The Community Number above should be used on insurance applications for the subject community.

MAP NUMBER 04013C1320L

MAP REVISED OCTOBER 16, 2013

Federal Emergency Management Agency

Project Location

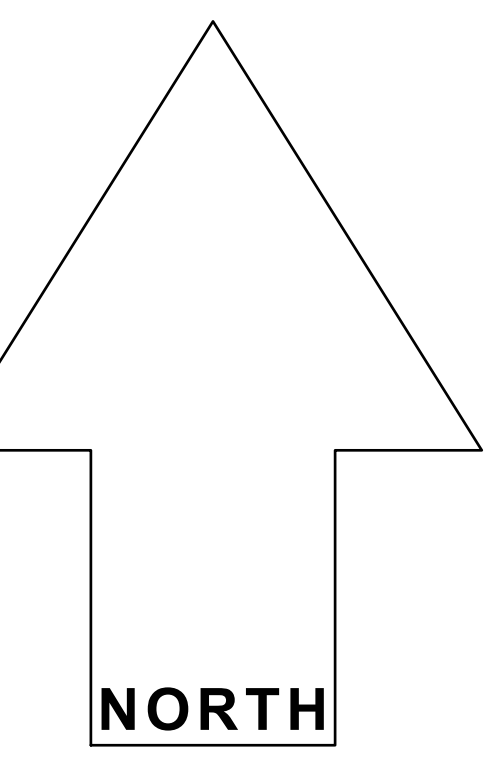
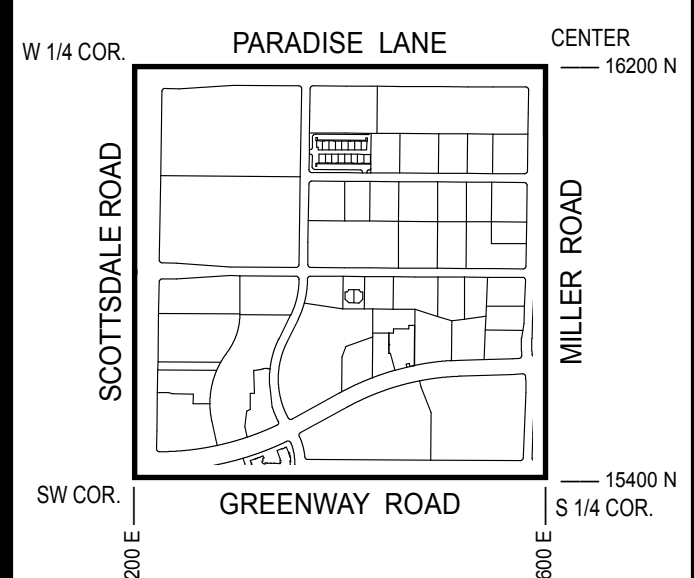


GENERAL NOTES:
 THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
 THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS 'CALCULATED' ON THE MAP.

LEGEND:

- Air Release Valve
- Non-potable Air Release Valve
- Blowoff
- Cap
- Cathodic Protection
- Fill Drain
- Fire Hydrant
- Non-GPS Point
- Pressure Reducing Valve
- Pump
- Reducer
- Sample Station
- Water Manhole
- Non-Potable Manhole
- Well
- Valve
- Non-potable Valve
- Vault
- Water Main
- Non-Potable Main
- Fire / Private Main
- Non-Scottsdale Main

VICINITY MAP



SCALE: 1" = 100'
 0 50 100 200
 The map scale of 1" = 100' is based on a full size print of 30" x 36"

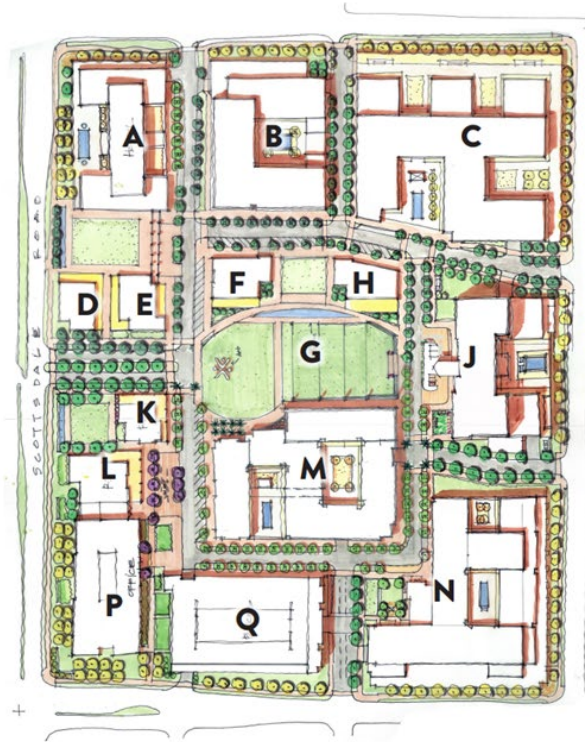
WATER
 QUARTER SECTION MAP

35-45

SW 1/4 SEC. 2 T3N R4E

FIGURE 4

NOTICE
 THIS DOCUMENT IS PROVIDED FOR GENERAL INFORMATION PURPOSES ONLY. THE CITY OF SCOTTSDALE DOES NOT WARRANT ITS ACCURACY, COMPLETENESS OR SUITABILITY FOR ANY PARTICULAR PURPOSE. IT SHOULD NOT BE RELIED UPON WITHOUT FIELD VERIFICATION.
 THE CITY OF SCOTTSDALE



OPTION 2

TOTAL UNITS COUNT - 1,175 UNITS

BLOCK	PROGRAM	UNIT COUNT	HEIGHTS
BLOCK A	HOTEL RETAIL	200 keys	78 FT
BLOCK B	LUXURY-BRANDED CONDOMINIUM RETAIL	120 UNITS	120 FT
BLOCK C	MULTI-FAMILY RETAIL	340 UNITS	96 FT
BLOCK D	RESTAURANT		30 FT
BLOCK E	RESTAURANT		30 FT
BLOCK F	RESTAURANT		30 FT
BLOCK G	PUBLIC PARK		
BLOCK H	RESTAURANT		30 FT
BLOCK J	CONDOMINIUM RETAIL	135 UNITS	120 FT
BLOCK K	RESTAURANT		30 FT
BLOCK L	RESTAURANT		30 FT
BLOCK M	MULTI-FAMILY RETAIL	276 UNITS	96 FT
BLOCK N	MULTI-FAMILY RETAIL	283 UNITS	96 FT
BLOCK P	OFFICE RETAIL	120,000 sf	78 FT
BLOCK Q	PARKING STRUCTURE RESIDENTIAL	21 UNITS	58 FT

**FIGURE 5 –
Site Plan - Densities**

APPENDICIES

I- FH Flow Test

II- Model Reports

III- Utility Plan

IV- Water Management Principles

V- Water Demand Exhibit

VI- Phasing Plan

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name: Cracker Jacks
Project Address: Scottsdale Road & Paradise Lane (SEC), Scottsdale, Arizona, 85260
Client Project No.: Not Provided
Arizona Flow Testing Project No.: 22853
Flow Test Permit No.: C70806
Date and time flow test conducted: December 2, 2022 at 7:00 AM
Data is current and reliable until: June 2, 2023
Conducted by: Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by: Chris Mendez – City of Scottsdale-Inspector (602-9028-9046)

Raw Test Data

Static Pressure: **76.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **63.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **31.0 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: **2,392 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **5,264 GPM**

Data with 10% Safety Factor

Static Pressure: **68.4 PSI**
(Measured in pounds per square inch)

Residual Pressure: **55.4 PSI**
(Measured in pounds per square inch)

Distance between hydrants: Approx. 370 Feet

Main size: Not Provided

Flowing GPM: **2,392GPM**

GPM @ 20 PSI: **4,866 GPM**

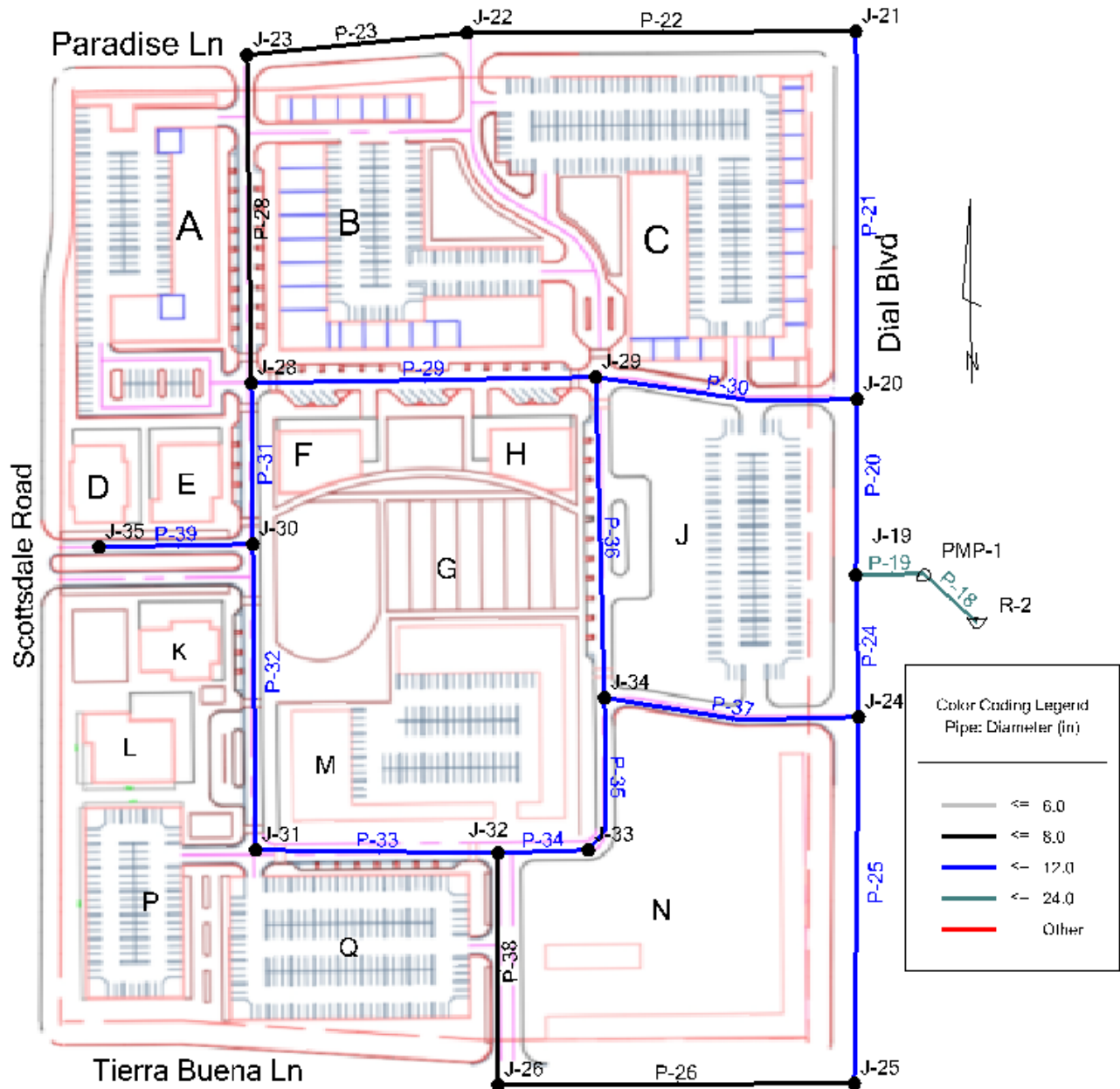
Flow Test Location

North ↑



Arizona Flow Testing LLC 480-250-8154 www.azflowtest.com floyd@azflowtest.com

13-ZN-2022
5/24/2023



Note: The fire hydrant flow test was updated on 12/02/2022 and is included at the end of this Appendix. The test shows a slight improvement in pressure and available flow. The model results herein are not updated from the original test. The final report will update the model.

APPENDIX II

Water Model and Reports

2022-03-31 Park Village Model.wtg
Active Scenario: Average Day Scenario
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
83	J-19	1,491.00	0	1,645.40	67
85	J-20	1,494.00	0	1,645.37	65
87	J-21	1,497.80	0	1,645.37	64
89	J-22	1,497.00	0	1,645.35	64
91	J-23	1,496.00	0	1,645.34	65
93	J-24	1,488.00	0	1,645.37	68
95	J-25	1,485.60	0	1,645.37	69
97	J-26	1,484.20	0	1,645.35	70
101	J-28	1,492.50	77	1,645.32	66
103	J-29	1,494.50	62	1,645.34	65
106	J-30	1,489.00	54	1,645.32	68
108	J-31	1,486.50	107	1,645.32	69
110	J-32	1,487.50	0	1,645.34	68
112	J-33	1,488.00	36	1,645.34	68
114	J-34	1,488.00	20	1,645.35	68
119	J-35	1,488.50	18	1,645.32	68

2022-03-31 Park Village Model.wtg
Active Scenario: Average Day Scenario
FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)	Pressure Loss (psi)
P-18	24.0	Ductile Iron	130.0	375	95	0.27	0.0
P-19	24.0	Ductile Iron	130.0	375	90	0.27	0.0
P-20	12.0	ACP	130.0	182	231	0.52	0.0
P-21	12.0	ACP	130.0	34	484	0.10	0.0
P-22	8.0	PVC	130.0	34	512	0.22	0.0
P-23	8.0	PVC	130.0	34	291	0.22	0.0
P-24	12.0	ACP	130.0	193	187	0.55	0.0
P-25	12.0	ACP	130.0	39	482	0.11	0.0
P-26	8.0	ACP	130.0	39	469	0.25	0.0
P-28	8.0	Ductile Iron	130.0	34	432	0.22	0.0
P-29	12.0	Ductile Iron	130.0	-112	453	0.32	0.0
P-30	12.0	Ductile Iron	130.0	-148	347	0.42	0.0
P-31	12.0	Ductile Iron	130.0	68	212	0.19	0.0
P-32	12.0	Ductile Iron	130.0	-4	403	0.01	0.0
P-33	12.0	Ductile Iron	130.0	-111	319	0.31	0.0
P-34	12.0	Ductile Iron	130.0	-72	119	0.20	0.0
P-35	12.0	Ductile Iron	130.0	-108	209	0.31	0.0
P-36	12.0	Ductile Iron	130.0	26	422	0.07	0.0
P-37	12.0	Ductile Iron	130.0	-154	337	0.44	0.0
P-38	8.0	Ductile Iron	130.0	-39	305	0.25	0.0
P-39	12.0	Ductile Iron	130.0	18	202	0.05	0.0

2022-03-31 Park Village Model.wtg
Active Scenario: Average Day Scenario
FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,491.00	On	1,492.00	1,645.40	375	153.40

2022-03-31 Park Village Model.wtg
Active Scenario: Average Day Scenario
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-2	1,492.00	375	1,492.00

2022-03-31 Park Village Model.wtg
Active Scenario: Max Day Scenario
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
83	J-19	1,491.00	0	1,643.57	66
85	J-20	1,494.00	0	1,643.48	65
87	J-21	1,497.80	0	1,643.47	63
89	J-22	1,497.00	0	1,643.40	63
91	J-23	1,496.00	0	1,643.37	64
93	J-24	1,488.00	0	1,643.49	67
95	J-25	1,485.60	0	1,643.48	68
97	J-26	1,484.20	0	1,643.40	69
101	J-28	1,492.50	155	1,643.31	65
103	J-29	1,494.50	124	1,643.39	64
106	J-30	1,489.00	108	1,643.30	67
108	J-31	1,486.50	214	1,643.30	68
110	J-32	1,487.50	0	1,643.35	67
112	J-33	1,488.00	73	1,643.36	67
114	J-34	1,488.00	40	1,643.39	67
119	J-35	1,488.50	36	1,643.30	67

2022-03-31 Park Village Model.wtg
Active Scenario: Max Day Scenario
FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)	Pressure Loss (psi)
P-18	24.0	Ductile Iron	130.0	749	95	0.53	0.0
P-19	24.0	Ductile Iron	130.0	749	90	0.53	0.0
P-20	12.0	ACP	130.0	364	231	1.03	0.0
P-21	12.0	ACP	130.0	68	484	0.19	0.0
P-22	8.0	PVC	130.0	68	512	0.43	0.0
P-23	8.0	PVC	130.0	68	291	0.43	0.0
P-24	12.0	ACP	130.0	386	187	1.09	0.0
P-25	12.0	ACP	130.0	78	482	0.22	0.0
P-26	8.0	ACP	130.0	78	469	0.50	0.0
P-28	8.0	Ductile Iron	130.0	68	432	0.43	0.0
P-29	12.0	Ductile Iron	130.0	-223	453	0.63	0.0
P-30	12.0	Ductile Iron	130.0	-296	347	0.84	0.0
P-31	12.0	Ductile Iron	130.0	137	212	0.39	0.0
P-32	12.0	Ductile Iron	130.0	-8	403	0.02	0.0
P-33	12.0	Ductile Iron	130.0	-222	319	0.63	0.0
P-34	12.0	Ductile Iron	130.0	-144	119	0.41	0.0
P-35	12.0	Ductile Iron	130.0	-217	209	0.61	0.0
P-36	12.0	Ductile Iron	130.0	51	422	0.15	0.0
P-37	12.0	Ductile Iron	130.0	-308	337	0.87	0.0
P-38	8.0	Ductile Iron	130.0	-78	305	0.50	0.0
P-39	12.0	Ductile Iron	130.0	36	202	0.10	0.0

2022-03-31 Park Village Model.wtg
Active Scenario: Max Day Scenario
FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,491.00	On	1,492.00	1,643.57	749	151.58

2022-03-31 Park Village Model.wtg
Active Scenario: Max Day Scenario
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-2	1,492.00	749	1,492.00

2022-03-31 Park Village Model.wtg
Active Scenario: Peak Hour Scenario
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
83	J-19	1,491.00	0	1,637.04	63
85	J-20	1,494.00	0	1,636.79	62
87	J-21	1,497.80	0	1,636.77	60
89	J-22	1,497.00	0	1,636.59	60
91	J-23	1,496.00	0	1,636.48	61
93	J-24	1,488.00	0	1,636.82	64
95	J-25	1,485.60	0	1,636.78	65
97	J-26	1,484.20	0	1,636.57	66
101	J-28	1,492.50	271	1,636.33	62
103	J-29	1,494.50	216	1,636.53	61
106	J-30	1,489.00	190	1,636.29	64
108	J-31	1,486.50	374	1,636.29	65
110	J-32	1,487.50	0	1,636.43	64
112	J-33	1,488.00	127	1,636.46	64
114	J-34	1,488.00	70	1,636.54	64
119	J-35	1,488.50	63	1,636.29	64

2022-03-31 Park Village Model.wtg
Active Scenario: Peak Hour Scenario
FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)	Pressure Loss (psi)
P-18	24.0	Ductile Iron	130.0	1,311	95	0.93	0.0
P-19	24.0	Ductile Iron	130.0	1,311	90	0.93	0.0
P-20	12.0	ACP	130.0	636	231	1.80	0.1
P-21	12.0	ACP	130.0	119	484	0.34	0.0
P-22	8.0	PVC	130.0	119	512	0.76	0.1
P-23	8.0	PVC	130.0	119	291	0.76	0.0
P-24	12.0	ACP	130.0	675	187	1.92	0.1
P-25	12.0	ACP	130.0	136	482	0.39	0.0
P-26	8.0	ACP	130.0	136	469	0.87	0.1
P-28	8.0	Ductile Iron	130.0	119	432	0.76	0.1
P-29	12.0	Ductile Iron	130.0	-391	453	1.11	0.1
P-30	12.0	Ductile Iron	130.0	-517	347	1.47	0.1
P-31	12.0	Ductile Iron	130.0	239	212	0.68	0.0
P-32	12.0	Ductile Iron	130.0	-14	403	0.04	0.0
P-33	12.0	Ductile Iron	130.0	-388	319	1.10	0.1
P-34	12.0	Ductile Iron	130.0	-252	119	0.71	0.0
P-35	12.0	Ductile Iron	130.0	-379	209	1.08	0.0
P-36	12.0	Ductile Iron	130.0	90	422	0.26	0.0
P-37	12.0	Ductile Iron	130.0	-539	337	1.53	0.1
P-38	8.0	Ductile Iron	130.0	-136	305	0.87	0.1
P-39	12.0	Ductile Iron	130.0	63	202	0.18	0.0

2022-03-31 Park Village Model.wtg
Active Scenario: Peak Hour Scenario
FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,491.00	On	1,491.99	1,637.06	1,311	145.07

2022-03-31 Park Village Model.wtg
Active Scenario: Peak Hour Scenario
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-2	1,492.00	1,311	1,492.00

2022-03-31 Park Village Model.wtg
Active Scenario: MD + West Split FF
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
83	J-19	1,491.00	0	1,565.83	32
85	J-20	1,494.00	0	1,564.41	30
87	J-21	1,497.80	0	1,564.18	29
89	J-22	1,497.00	0	1,562.39	28
91	J-23	1,496.00	0	1,561.38	28
93	J-24	1,488.00	0	1,564.65	33
95	J-25	1,485.60	0	1,564.48	34
97	J-26	1,484.20	0	1,563.28	34
101	J-28	1,492.50	1,155	1,561.17	30
103	J-29	1,494.50	124	1,563.17	30
106	J-30	1,489.00	1,108	1,560.95	31
108	J-31	1,486.50	714	1,561.28	32
110	J-32	1,487.50	0	1,562.51	32
112	J-33	1,488.00	73	1,562.76	32
114	J-34	1,488.00	40	1,563.27	33
119	J-35	1,488.50	36	1,560.95	31

2022-03-31 Park Village Model.wtg
Active Scenario: MD + West Split FF
FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)	Pressure Loss (psi)
P-18	24.0	Ductile Iron	130.0	3,250	95	2.30	0.0
P-19	24.0	Ductile Iron	130.0	3,250	90	2.30	0.0
P-20	12.0	ACP	130.0	1,611	231	4.57	0.6
P-21	12.0	ACP	130.0	409	484	1.16	0.1
P-22	8.0	PVC	130.0	409	512	2.61	0.8
P-23	8.0	PVC	130.0	409	291	2.61	0.4
P-24	12.0	ACP	130.0	1,639	187	4.65	0.5
P-25	12.0	ACP	130.0	345	482	0.98	0.1
P-26	8.0	ACP	130.0	345	469	2.20	0.5
P-28	12.0	Ductile Iron	130.0	409	432	1.16	0.1
P-29	12.0	Ductile Iron	130.0	-1,351	453	3.83	0.9
P-30	12.0	Ductile Iron	130.0	-1,202	347	3.41	0.5
P-31	12.0	Ductile Iron	130.0	606	212	1.72	0.1
P-32	12.0	Ductile Iron	130.0	-539	403	1.53	0.1
P-33	12.0	Ductile Iron	130.0	-1,253	319	3.55	0.5
P-34	12.0	Ductile Iron	130.0	-908	119	2.58	0.1
P-35	12.0	Ductile Iron	130.0	-981	209	2.78	0.2
P-36	12.0	Ductile Iron	130.0	273	422	0.77	0.0
P-37	12.0	Ductile Iron	130.0	-1,294	337	3.67	0.6
P-38	8.0	Ductile Iron	130.0	-345	305	2.20	0.3
P-39	12.0	Ductile Iron	130.0	36	202	0.10	0.0

2022-03-31 Park Village Model.wtg
Active Scenario: MD + West Split FF
FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,491.00	On	1,491.93	1,565.90	3,250	73.97

2022-03-31 Park Village Model.wtg
Active Scenario: MD + East Split FF
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
83	J-19	1,491.00	0	1,565.84	32
85	J-20	1,494.00	0	1,564.49	30
87	J-21	1,497.80	0	1,564.38	29
89	J-22	1,497.00	0	1,563.58	29
91	J-23	1,496.00	0	1,563.12	29
93	J-24	1,488.00	0	1,564.60	33
95	J-25	1,485.60	0	1,564.47	34
97	J-26	1,484.20	0	1,563.57	34
101	J-28	1,492.50	155	1,563.02	31
103	J-29	1,494.50	1,124	1,563.05	30
106	J-30	1,489.00	108	1,562.98	32
108	J-31	1,486.50	214	1,562.96	33
110	J-32	1,487.50	0	1,562.98	33
112	J-33	1,488.00	573	1,562.96	32
114	J-34	1,488.00	1,040	1,563.05	32
119	J-35	1,488.50	36	1,562.98	32

2022-03-31 Park Village Model.wtg
Active Scenario: MD + East Split FF
FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)	Pressure Loss (psi)
P-18	24.0	Ductile Iron	130.0	3,249	95	2.30	0.0
P-19	24.0	Ductile Iron	130.0	3,249	90	2.30	0.0
P-20	12.0	ACP	130.0	1,570	231	4.45	0.6
P-21	12.0	ACP	130.0	266	484	0.76	0.0
P-22	8.0	PVC	130.0	266	512	1.70	0.3
P-23	8.0	PVC	130.0	266	291	1.70	0.2
P-24	12.0	ACP	130.0	1,679	187	4.76	0.5
P-25	12.0	ACP	130.0	298	482	0.84	0.1
P-26	8.0	ACP	130.0	298	469	1.90	0.4
P-28	12.0	Ductile Iron	130.0	266	432	0.76	0.0
P-29	12.0	Ductile Iron	130.0	-141	453	0.40	0.0
P-30	12.0	Ductile Iron	130.0	-1,304	347	3.70	0.6
P-31	12.0	Ductile Iron	130.0	253	212	0.72	0.0
P-32	12.0	Ductile Iron	130.0	108	403	0.31	0.0
P-33	12.0	Ductile Iron	130.0	-105	319	0.30	0.0
P-34	12.0	Ductile Iron	130.0	192	119	0.55	0.0
P-35	12.0	Ductile Iron	130.0	-381	209	1.08	0.0
P-36	12.0	Ductile Iron	130.0	-39	422	0.11	0.0
P-37	12.0	Ductile Iron	130.0	-1,382	337	3.92	0.7
P-38	8.0	Ductile Iron	130.0	-298	305	1.90	0.3
P-39	12.0	Ductile Iron	130.0	36	202	0.10	0.0

2022-03-31 Park Village Model.wtg
Active Scenario: MD + East Split FF

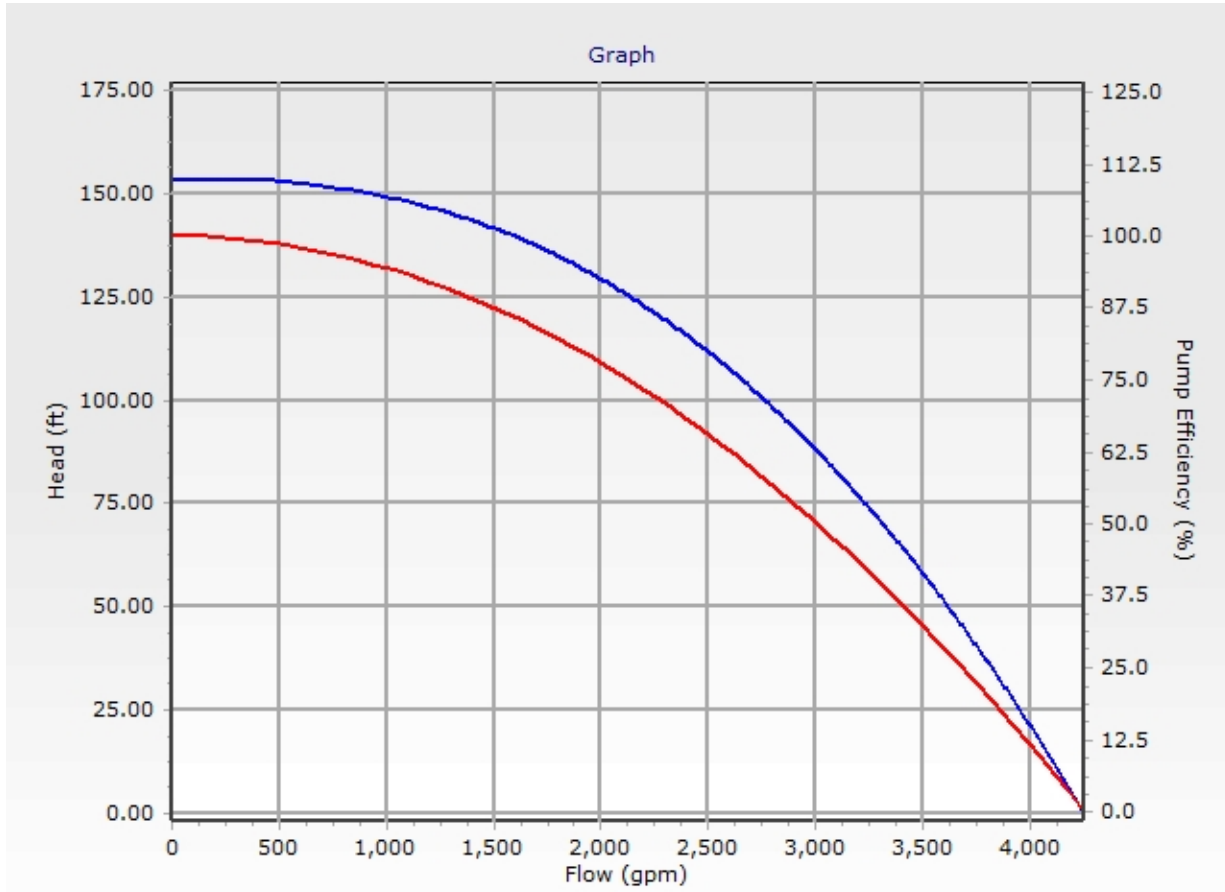
FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,491.00	On	1,491.93	1,565.91	3,249	73.98

2022-03-31 Park Village Model.wtg
Active Scenario: Max Day + Fire Flow Scenario
Pump Definition Detailed Report: PMP-1

Element Details			
ID	33	Notes	
Label	PMP-1		
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	124.71 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	3,673 gpm
Shutoff Head	153.81 ft	Maximum Operating Head	46.19 ft
Design Flow	2,148 gpm		
Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		
Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

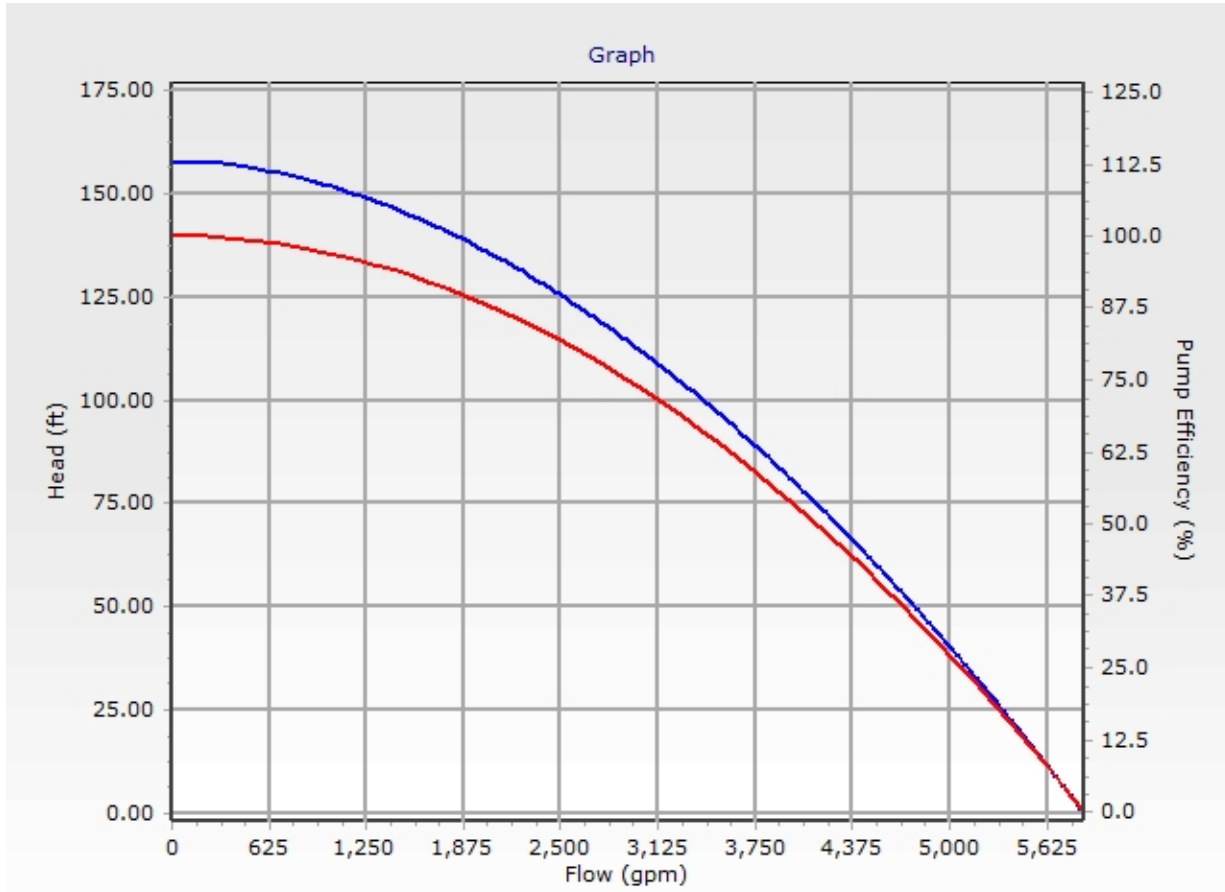
2022-03-31 Park Village Model.wtg
Active Scenario: Max Day + Fire Flow Scenario
Pump Definition Detailed Report: PMP-1

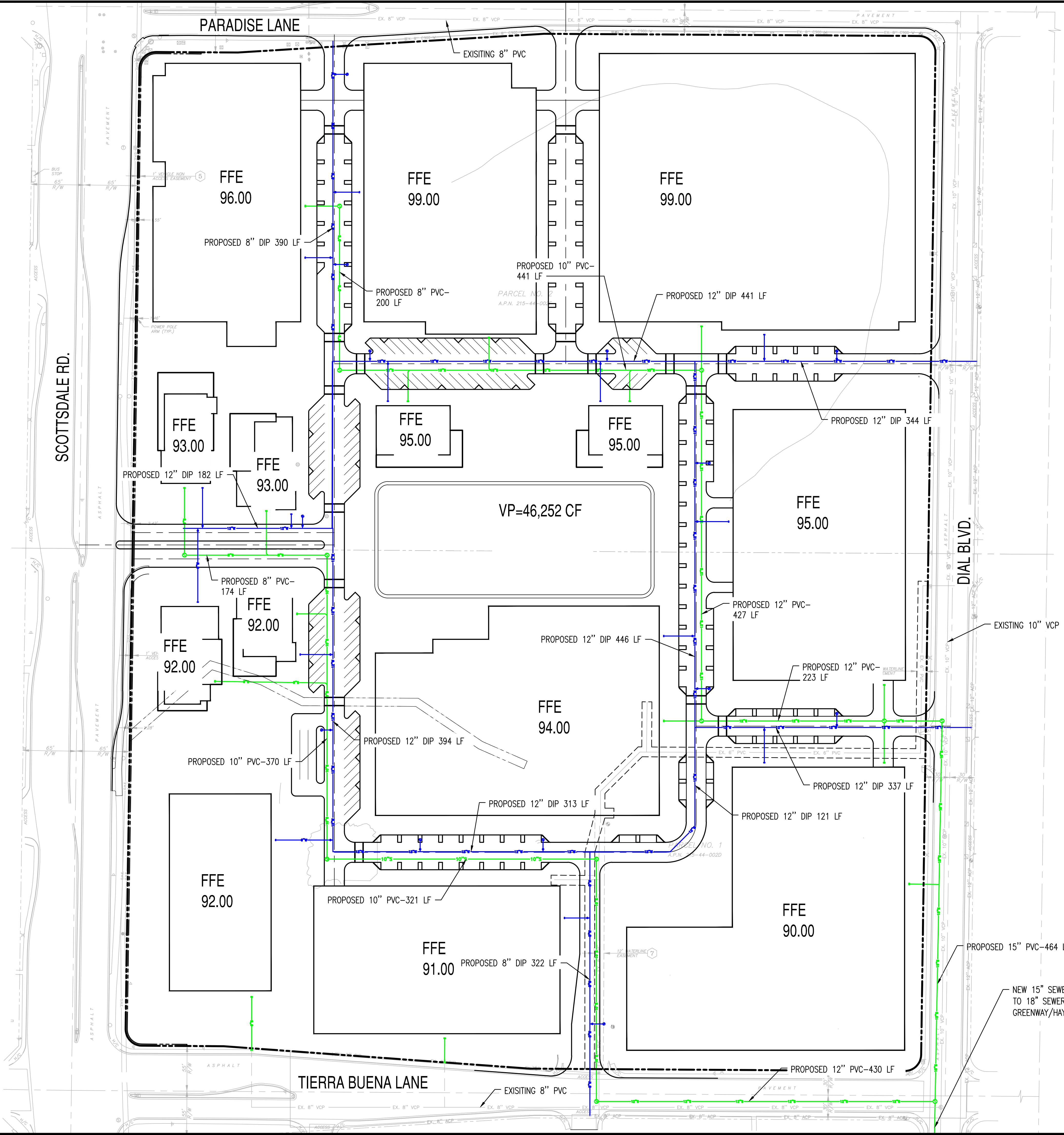


2022-03-31 Park Village Model.wtg
Active Scenario: Average Day Scenario
Pump Definition Detailed Report: Pump-12/2 Update

Element Details			
ID	129	Notes	
Label	Pump-12/2 Update		
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	128.00 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	4,866 gpm
Shutoff Head	158.00 ft	Maximum Operating Head	46.20 ft
Design Flow	2,392 gpm		
Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		
Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

2022-03-31 Park Village Model.wtg
Active Scenario: Average Day Scenario
Pump Definition Detailed Report: Pump-12/2 Update





APPENDIX III

OVERALL UTILITY EXHIBIT

SCALE: 1" = 60'

0' 60' 120' 180'

PRELIMINARY
NOT FOR
CONSTRUCTION

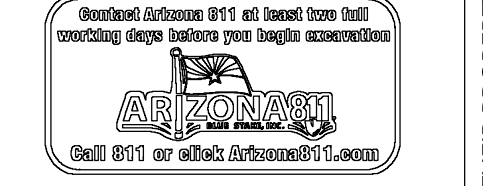
SUSTAINABILITY
ENGINEERING
GROUP

SEG

8280 E. GELDING DRIVE SUITE 101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL: 480.586.7226 FAX: 480.259.3534

**NELSEN
PARTNERS**

ARCHITECTS & PLANNERS



PROJECT:
PARK VILLAGE

LOCATION:
16001 N. SCOTTSDALE ROAD
SCOTTSDALE, ARIZONA 85254

DRAWN	JC	08/12/2022
DESIGNED	JC	08/12/2022
FINAL DC		
PROJ. MGR.	AF	08/12/2022
DATE:	08/12/2022	
ISSUED FOR:	REVIEW	

REVISION NO.:	DATE:
JOB NO.:	211005
SHEET TITLE:	OVERALL UTILITY EXHIBIT

PAGE NO.: 1 OF 1

SHEET NO.:

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

APPENDIX IV – Water Management Principles

Re: Smart Infrastructure and Sustainability Opportunities

Water/Sewer Infrastructure

- Advanced metering infrastructure combined with remote meter data management technology will provide real-time reading of usage and identification of and leakage.
- Manhole flow monitoring will permit comparison of water usage vs. sewer discharge during average day and peak demand periods.
- Centralized onsite technology equipment will permit the property management association hands-on analysis of usage from the onsite meters.
- Private submetering options are available for residential buildings.

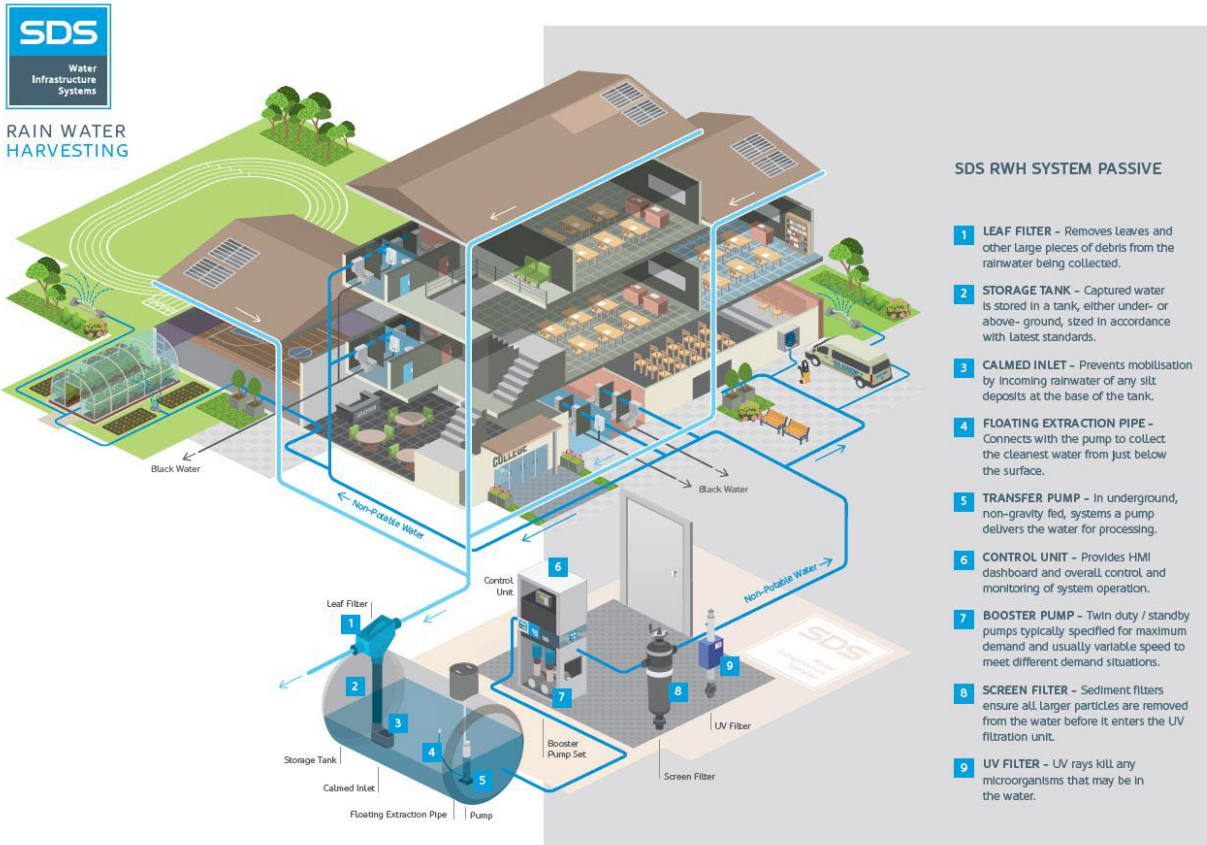
Storm Runoff - Recharge vs Retention and Recycling for Parque

- 28 acres of land that averages 10 inches of rain per year with an 85% capture rate equals approximately 20 acre-feet of runoff.
- 1 acre-foot of runoff will provide 2 single family residences with water per year, or 4 units per year for high density residential.
- Recharging 20 acre-feet would provide sufficient water for approximately 80 high density residential units.
- Permitting for recharge has many risks. No evidence of a recharge permit being filed with the State for this small amount of water.
- The City of Scottsdale has two wells within ½ mile of the Parque site. The groundwater is about 300 to 400 feet deep with the wells drilled to 1700 feet. Typical drywells will not pollute the water table and ADEQ only requires 10-foot vertical separation.
- Recommendation is to pursue green building practices through standard retention and reuse; avoid any recharge permitting processes.

Onsite green building practices can include:

- Utilize plumbing fixtures with higher efficiency than specified in the codes.
- Utilize rainwater capture from rooftops and implement roof top planting/gardens.
- Install permeable open graded pavement.
- Utilize recharge swales and basins that can utilize granular beds to improve storage and percolation. Soils testing is needed to verify percolation rates.
- Utilize dry wells for stormwater dissipation with first flush filtration chambers.

Typical Rainwater Recycle System Concept (From SDS Water Infrastructure Systems)



Summary of Water/Sewer Usage and Net Water Use

The *Scottsdale Sustainable Water Management Principles* includes a *Water and Land Use Management* section outlining the requirements of a “Water Demand Exhibit” for any property that submits a General Plan Amendment and estimates metered water uses greater than 100,000 gallons per day.

The estimated water use, wastewater use and net water use are shown in Tables 1-3 below. Calculations are based on the demands in the City’s *Design Standards and Policies Manual*. Implementing sustainable practices could potentially reduce this demand 20 to 40%. The University of Arizona Water Resources Research Center reports a study in Tucson found that greywater can account for 27% of a total residential demand.

Table 1: DAILY WATER DEMAND CALCULATIONS

Block - Use	Square Feet	Dwelling Units	Inside ADD (gpd/sq.ft.) (gpd/unit)	Inside ADD (gpd)	Outside ADD (gpd/sq.ft.) (gpd/unit)	Outside ADD (gpd)
A - Hotel		200	401.7	80,340	44.6	8,920
B - Condominium		120	155.3	18,636	30	3,600
C - Multi-Family		340	155.3	52,802	30	10,200
D - Restaurant	20,000		1.2	24,000	0.1	2,000
E - Restaurant	20,000		1.2	24,000	0.1	2,000
F - Restaurant	20,000		1.2	24,000	0.1	2,000
G - Open Space*	87,120		0	0	0.041	3,572
H - Restaurant	20,000		1.2	24,000	0.1	2,000
J - Condominium		135	155.3	20,966	30	4,050
K - Restaurant	20,000		1.2	24,000	0.1	2,000
L - Restaurant	20,000		1.2	24,000	0.1	2,000
M - Multi-Family		276	155.3	42,863	30	8,280
N - Multi-Family		283	155.3	43,950	30	8,490
P - Office/Retail	120,000		0.5	60,000	0.1	12,000
Q - Residential		21	155.3	3,261	72.3	1,518
TOTALS	327,120	1375.0		466,818		72,630

* demand is 1786 gpd/acre or 0.041 gpm/sq.ft.

The total average day water demand in Table 1 is 539,448 gpm. Utilizing 27% of the inside ADD from Table 1 results in a greywater capture of 126,000 gpd completely offsetting the Sion outside ADD demand.

Tables 2 estimates the total site wastewater demand at 432.500 gpd which is approximately 93% of the estimated inside water ADD shown in table 1.

Table 2: DAILY WASTEWATER DEMAND CALCULATIONS

Block - Use	Square Feet	Dwelling Units	ADD (gpd/sq.ft.) (gpd/unit)	Avg. Day Demand (gpd)
A -Hotel		200	380.0	76,000
B - Condominium		120	140.0	16,800
C - Multi-Family		340	140.0	47,600
D - Restaurant	20,000		1.2	24,000
E - Restaurant	20,000		1.2	24,000
F - Restaurant	20,000		1.2	24,000
G - Open Space	87,120		0	0
H - Restaurant	20,000		1.2	24,000
J - Condominium		135	140.0	18,900
K - Restaurant	20,000		1.2	24,000
L - Restaurant	20,000		1.2	24,000
M - Multi-Family		276	140.0	38,640
N - Multi-Family		283	140.0	39,620
P - Office/Retail	120,000		0.4	48,000
Q - Residential		21	140.0	2,940
TOTALS	327,120	1375.0		432,500

Table 3 represents the Net Water Use (NW) defined as the total water demand x (1 – (total wastewater demand / total water demand)) or

$$NW = 539,448 \times (1 - ((432,500 / 539,448))) = 106,948 \text{ gpd.}$$

Table 3: DAILY PERCENT RETURNED FLOW & NET WATER USE

Block - Use	Water Demand (gpd)	Wastewater Demand (gpd)	% Return Flow	Total Water Minus Wastewater (Lost Water)
Hotel	89,260	76,000	0.85	13,260
Condominium	47,252	35,700	0.76	11,552
Multi-Family	166,585	125,860	0.76	40,725
Restaurant	156,000	144,000	0.92	12,000
Open Space	3,572	0	0.00	3,572
Office/Retail	72,000	48,000	0.67	24,000
Residential	4,780	2,940	0.62	1,840
Totals	539,448	432,500	0.80	106,948

INSTRUCTIONS

INPUT DEVELOPMENT NAME, CASE NUMBER, AND QUANTITY VALUES TO DETERMINE TOTAL AVERAGE DAILY WATER USE PER THE 2018 DESIGN STANDARDS AND POLICY MANUAL (DS7PM) CHAPTER 6 USING GALLONS PER DAY (GPD) VALUES FROM FIGURE 6-1.2

TABLE 1: QUANTITY INPUT TABLE FOR THE DEVELOPMENT					
ENTER DEVELOPMENT NAME & CITY REVIEW CASE NUMBER HERE					
WATER USE DEVELOPMENT TYPE/CATEGORY	AVERAGE UNIT WATER USE PER DS&PM CH. 6 (GPD/UNIT)	INPUT APPLICABLE QUANTITY FOR DEVELOPMENT IN THIS COLUMN	NUMERICAL UNIT	TOTAL AVERAGE WATER USE (GPD)	NOTES
Category: Residential/ Commerical Residential/ Hotel					
< 2 DU/ac	485.6		DU	-	Community pool demands not included here. Refer to separate category.
2 – 2.9 DU/ac	470.4		DU	-	
3 – 7.9 DU/ac	248.2		DU	-	
8 – 11.9 DU/ac	227.6		DU	-	
12 – 22 DU/ac	227.6	21	DU	4,780	
High Density Condominium (condo)	185.3	1,154	DU	213,836	
Resort Hotel	446.3	200	ROOM	89,260	Includes site amenities such as 1 "standard" restaurant w/ associated dedicated kitchen, laundry service, landscaping, fountains, and 1 medium capacity pool. Large event venues/kitchens or multiple/large pools and multiple restaurants are not included.
Category: Commerical/ Other					
Restaurant	1.3	120,000	FT2	156,000	
Commercial/Retail	0.80	-	FT2	-	
Commerical High Rise	0.60	120,000	FT2	72,000	per IBC highrise is at or over 75 feet to highest finished floor
Office	0.60		FT2	-	
Institutional	1,340		ACRE	-	
Industrial	1,027		ACRE	-	
Research and Development	1,284		ACRE	-	
Category: Special Use Areas					
Natural Area Open Space	-		ACRE	-	Zero water demand
Developed Open Space - Parks	1,786	2	ACRE	3,572	
Developed Open Space- Golf Course	4,285		ACRE	-	
Category: Evaporation from Swimming Pools/Spas, Cooling, Turf Area Irrigation, Other Outdoor Consumptive Uses					
Extra large pool (60k to 100k gallons)	274		EA	-	Annual mean ETo = 74.75 in as collected by AZ Met. Kc = 1.1. Average pool size of 400 sq. ft. loses 20,490 gallons per year, or 51.23 gallons per sq ft, not including backwashing or leaks, per AMWUA calculator.
Large pool (above 30k to 60k gallons)	154	3	EA	462	
Medium pool (15k to 30k gallons)	75	3	EA	226	
Small pool or spa (under 15k gallons)	51		EA	-	
Total Bermuda Turf Area	0.10		FT2	-	1 sq ft of non-overseeded turf at 60% efficiency with increased Kc is 35 gallons per sq ft per year, per AMWUA calculator.
Total Overseeded Turf Area	0.02		FT2	-	1 sq ft of overseeded turf at 60% efficiency with increased Kc is 9 gallons per sq ft per year, per AMWUA calculator.
Evaporative Cooling/ Cooling Towers	-		TOTAL COOLING TONNAGE	-	Based on 1.50 cycles of concentration and average annual daily utilization of 68%. Water use is linear with respect to total cooling capacity tonnage. Based on US Dept of Energy Efficiency and Renewable Energy data.
Category: Filter Backwash Flows & Make-up Water from Pools & Spas (rapid sand filters)					
Extra large pool (60k to 100k gallons)	229	-	EA	-	Based on once per 7 day backwash @ 50,100, and 150gpm, respectively for each size pool category for 8 minute duration. Quantity values used from pool input values above.
Large pool (above 30k to 60k gallons)	171	3	EA	514	
Medium pool (15k to 30k gallons)	114	3	EA	343	
Small pool or spa (under 15k gallons)	57	-	EA	-	
A. TOTAL AVERAGE DAILY WATER USE FOR THIS DEVELOPMENT				540,993	GPD
NOTES:					
GPD=GALLONS PER DAY, DU=DWELLING UNITS, FT2=SQUARE FEET, AC=ACRE, EA=EACH UNIT, ETO=EVAPOTRANSPIRATION, Kc=CROP COEFFICIENT, AZMET=ARIZONA METEOROLOGICAL NETWORK, AMWUA=ARIZONA MUNICIPAL WATER USERS ASSOCIATION					
NONE OF THE VALUES OR CALCULATIONS HEREIN ARE INTENDED TO BE USED FOR INFRASTRUCTURE DESIGN, PEAK FLOW DETERMINATION, OR SYSTEM CAPACITY ANALYSIS. FOR THESE PURPOSES REFER TO CH.6 & 7 OF THE CITY'S DESIGN STANDARDS AND POLICY MANUAL FOR THE RESPECTIVE DESIGN VALUES AND PEAKING FACTORS.					
TABLE INPUT VALUES LAST UPDATED:				1/12/2023	

INSTRUCTIONS

IDENTIFY WATER CONSERVATION MEASURES ABOVE THOSE REQUIRED BY CITY CODE THAT THE DEVELOPMENT(S) PROPOSE TO IMPLEMENT. ENTER AN "X" FOR EACH PROPOSED MEASURE.

TABLE 2: APPROVED SUPPLEMENTAL WATER CONSERVATION MEASURES		
FILL IN DEVELOPMENT NAME AND CITY CASE NUMBER ON TAB 1		
PROPOSED FOR THIS DEVELOPMENT (ENTER "X")	MEASURE	DESCRIPTION
X	1. Submetering	Multi-family and mixed-use developments SUBMETER UNITS for leak detection and for occupants ability to manage their own water use
	2. No outdoor water features	Decorative water features outdoors can be a source of water use that is not functional
X	3. Indoor water features submetered	Water features have proven to be a source of leaks. Submetering that is capable of alerts to the building monitoring system greatly reduce water waste
X	4. Limitation on functional turf grass	Functional grass turf are areas used for congregation of large number of people and should be limited to up to 10% of the landscapable area
	5. Limitations on artificial turf	Artificial turf is a large source of heat especially during summer months.
X	6. Landscaped Rainwater harvesting	Earthworks, such as berms and basins, are encouraged to promote passive rainwater harvesting for planned plants and trees
X	7. Cooling tower controllers with monitoring technology	Arizona high evapotranspiration rates, cooling towers use significantly more water here than in other states. Monitory systems can optimize this water use.
X	8. Pools and splashpads submeters with monitoring technology	Pools and splashpad can be a source of leaks. Submetering that is capable of alerts to the building monitoring system greatly reduce water waste. Timers on Splash pads
<p>NOTES: Greywater systems and large areas of artificial turf are not recommended by water conservation. This list represents water conservation measures that the conservation office has approved and has shown to provide proven water savings.</p>		
TABLE INPUT VALUES LAST UPDATED:		1/12/2023

Water Demand Exhibit Summary

FILL IN DEVELOPMENT NAME AND CITY CASE NUMBER ON TAB 1

1. Total Estimated Water Use per Day on a Sustainable Basis (gallons per day, gpd)

540,993

gpd

2. Net Water (NW) / Consumptive Use (gallons per day, gpd)

118,394

gpd

3. Proposed Water Conservation Measures Above Those Required By City Code

X	1. Submetering	Multi-family and mixed-use developments SUBMETER UNITS for leak detection and for occupants ability to manage their own water use
	2. No outdoor water features	NOT PROPOSED
X	3. Indoor water features submetered	Water features have proven to be a source of leaks. Submetering that is capable of alerts to the building monitoring system greatly reduce water waste
X	4. Limitation on functional turf grass	Functional grass turf are areas used for congregation of large number of people and should be limited to up to 10% of the landscapable area
	5. Limitations on artificial turf	NOT PROPOSED
X	6. Landscaped Rainwater harvesting	Earthworks, such as berms and basins, are encouraged to promote passive rainwater harvesting for planned plants and trees
X	7. Cooling tower controllers with monitoring technology	Arizona high evapotranspiration rates, cooling towers use significantly more water here than in other states. Monitory systems can optimize this water use.
X	8. Pools and splashpads submeters with monitoring technology	Pools and splashpad can be a source of leaks. Submetering that is capable of alerts to the building monitoring system greatly reduce water waste. Timers on Splash pads

4. Annual Economic Value of the Development on a per Gallon of Use Basis (Applies to Commercial or Mixed Use, To be Completed by City)

1. Major City Revenues

\$/1,000 gallons

2. Total Annual Output Impact

\$/1,000 gallons

TABLE INPUT VALUES LAST UPDATED:

1/12/2023

TABLE 4: WATER USE SUMMARY

FILL IN DEVELOPMENT NAME AND CITY CASE NUMBER ON TAB 1

WATER USE SUMMARY FOR THE DEVELOPMENT

USE CATEGORY	AMOUNT	UNITS	% OF TOTAL USE	CALCULATION NOTES
A. TOTAL DAILY AVERAGE WATER USE	540,993	GPD	100.0%	A=B+C, C=D+E, F=B+D
B. OUTDOOR CONSUMPTIVE USE	73,319	GPD	13.6%	
C. TOTAL INDOOR USE	467,675	GPD	86.4%	
D. INDOOR CONSUMPTIVE USE	45,075	GPD	8.3%	
E. WASTEWATER TO SEWER	422,600	GPD	78.1%	
F. TOTAL CONSUMPTIVE USE (NET USE)	118,394	GPD	21.9%	

NOTES:
 GPD=GALLONS PER DAY
 ALL VALUES ARE FOR AVERAGE WATER USE ANALYSIS ONLY. THIS CALCULATION IS NOT INTENDED TO BE USED FOR INFRASTRUCTURE DESIGN, PEAK FLOW DETERMINATION, OR SYSTEM CAPACITY ANALYSIS. FOR THESE PURPOSES REFER TO CH.6 & 7 OF THE CITY'S DESIGN STANDARDS AND POLICY MANUAL FOR THE RESPECTIVE DESIGN VALUES, PEAKING FACTORS, AND DESIGN REQUIREMENTS.

TOTAL AVERAGE WATER USE (GALLONS PER DAY, GPD)

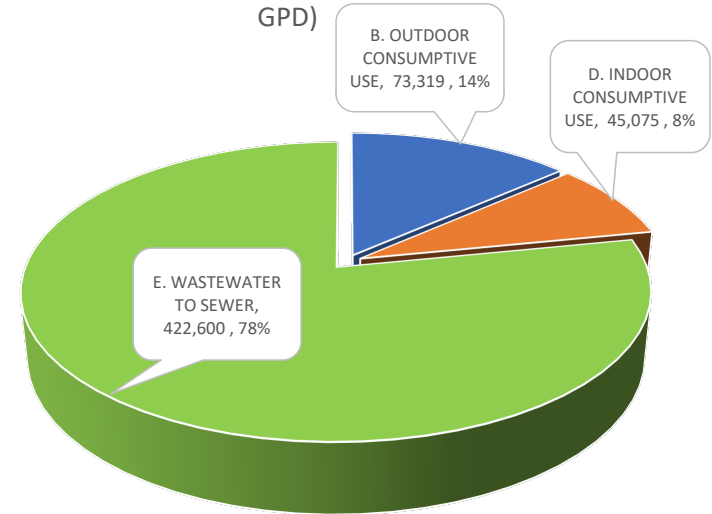


TABLE INPUT VALUES LAST UPDATED: 1/12/2023

TABLE 5: DETAILED WATER USE BREAKDOWN FOR THE DEVELOPMENT

FILL IN DEVELOPMENT NAME AND CITY CASE NUMBER ON TAB 1

TO RIGHT: WATER USE ALLOCATION --->	A. TOTAL AVERAGE WATER USE (GPD)	B. AVERAGE OUTDOOR CONSUMPTIVE WATER USE ⁽¹⁾			C. AVERAGE INDOOR TOTAL WATER USE ⁽¹⁾			D. AVERAGE INDOOR CONSUMPTIVE WATER USE ⁽²⁾			E. AVERAGE WASTEWATER FLOWS TO SEWER ⁽³⁾		
		UNIT OUTDOOR CONSUMPTIVE WATER USE (GPD/UNIT)	OUTDOOR CONSUMPTIVE USE (GPD)	OUTDOOR CONSUMPTIVE USE (% OF TOTAL USE)	UNIT TOTAL INDOOR WATER USE (GPD/UNIT)	INDOOR TOTAL USE (GPD)	INDOOR TOTAL USE (% OF TOTAL USE)	UNIT CONSUMPTIVE INDOOR WATER USE (GPD/UNIT)	INDOOR CONSUMPTIVE USE (GPD)	INDOOR CONSUMPTIVE USE (% OF TOTAL USE)	WASTEWATER FLOW (GPD/UNIT)	WASTEWATER FLOW (GPD)	WASTEWATER (% OF TOTAL USE)
Category: Residential/ Commercial Residential/ Hotel													
< 2 DU/ac	-	276.7	-	0.0%	208.9	-	0.0%	20.9	-	0.0%	188	-	0.0%
2 – 2.9 DU/ac	-	276.7	-	0.0%	193.7	-	0.0%	19.4	-	0.0%	174	-	0.0%
3 – 7.9 DU/ac	-	72.3	-	0.0%	175.9	-	0.0%	17.6	-	0.0%	158	-	0.0%
8 – 11.9 DU/ac	-	72.3	-	0.0%	155.3	-	0.0%	15.5	-	0.0%	140	-	0.0%
12 – 22 DU/ac	4,780	72.3	1,518	0.3%	155.3	3,261.3	0.6%	15.5	326.1	0.1%	140	2,935	0.5%
High Density Condominium (condo)	213,836	30.0	34,620	6.4%	155.3	179,216.2	33.1%	15.5	17,921.6	3.3%	140	161,295	29.8%
Resort Hotel	89,260	44.6	8,920	1.6%	401.7	80,340.0	14.9%	32.1	6,427.2	1.2%	370	73,913	13.7%
Category: Commercial/ Other													
Restaurant	156,000	0.10	12,000	2.2%	1.20	144,000.0	26.6%	0.12	14,400.0	2.7%	1.08	129,600	24.0%
Commercial/Retail	-	0.10	-	0.0%	0.70	-	0.0%	0.11	-	0.0%	0.60	-	0.0%
Commercial High Rise	72,000	0.10	12,000	2.2%	0.50	60,000.0	11.1%	0.05	6,000.0	1.1%	0.45	54,000	10.0%
Office	-	0.10	-	0.0%	0.50	-	0.0%	0.05	-	0.0%	0.45	-	0.0%
Institutional	-	670	-	0.0%	670.0	-	0.0%	100.50	-	0.0%	569.50	-	0.0%
Industrial	-	154	-	0.0%	873.0	-	0.0%	130.95	-	0.0%	742.05	-	0.0%
Research and Development	-	192	-	0.0%	1,092.0	-	0.0%	163.80	-	0.0%	928.20	-	0.0%
Category: Special Use Areas													
Natural Area Open Space	-	-	-	0.0%	-	-	-	-	-	-	-	-	0.0%
Developed Open Space - Parks	3,572	1,786	3,572	0.7%	-	-	-	-	-	-	-	-	0.0%
Developed Open Space- Golf Course	-	4,285	-	0.0%	-	-	-	-	-	-	-	-	0.0%
Category: Evaporation from Swimming Pools/Spas, Cooling, Turf Area Irrigation, Other Outdoor Consumptive Uses													
Extra large pool (60k to 100k gallons)	-	274	-	0.0%	-	-	-	-	-	-	-	-	0.0%
Large pool (above 30k to 60k gallons)	462	154	462	0.1%	-	-	-	-	-	-	-	-	0.0%
Medium pool (15k to 30k gallons)	226	75	226	0.0%	-	-	-	-	-	-	-	-	0.0%
Small pool or spa (under 15k gallons)	-	51	-	0.0%	-	-	-	-	-	-	-	-	0.0%
Total Bermuda Turf Area	-	0.10	-	0.0%	-	-	-	-	-	-	-	-	0.0%
Total Overseeded Turf Area	-	0.02	-	0.0%	-	-	-	-	-	-	-	-	0.0%
Evaporative Cooling/ Cooling Towers	-	-	-	0.0%	-	-	-	-	-	-	-	-	0.0%
Category: Filter Backwash Flows & Make-up Water from Pools & Spas (rapid sand filters)													
Extra large pool (60k to 100k gallons)	-	-	-	-	228.6	-	0.0%	-	-	-	229	-	0.0%
Large pool (above 30k to 60k gallons)	514	-	-	-	171.4	514.3	0.1%	-	-	-	171	514	0.1%
Medium pool (15k to 30k gallons)	343	-	-	-	114.3	342.9	0.1%	-	-	-	114	343	0.1%
Small pool or spa (under 15k gallons)	-	-	-	-	57.1	-	0.0%	-	-	-	57	-	0.0%
TOTALS	540,993		73,319	13.6%		467,675	86.4%		45,075	8.3%		422,600	78.1%

F. TOTAL CONSUMPTIVE/NET WATER USE FOR THIS DEVELOPMENT (B. + D.) 118,394 GPD 21.9% OF TOTAL USE

NOTES:
 (1) PER 2018 DS&PM CHAPTER 6, FIGURE 6-1.2
 (2) VARIES FROM 8% TO 15%, TYPICALLY 10%
 (3) WASTEWATER FLOWS TO SEWER ARE CALCULATED AS C. MINUS D.
 GPD=GALLONS PER DAY, DU=DWELLING UNIT, FT2=SQUARE FEET, AC=ACRE, EA=EACH UNIT
 NONE OF THE VALUES OR CALCULATIONS HEREIN ARE INTENDED TO BE USED FOR INFRASTRUCTURE DESIGN, PEAK FLOW DETERMINATION, OR SYSTEM CAPACITY ANALYSIS. FOR THESE PURPOSES REFER TO CH.6 & 7 OF THE CITY'S DESIGN STANDARDS AND POLICY MANUAL FOR THE RESPECTIVE DESIGN VALUES AND PEAKING FACTORS.

PRELIMINARY
NOT FOR
CONSTRUCTION
OR
RECORDING

**THE PARQUE
PCP APPLICATION**
16001 N SCOTTSDALE RD
SCOTTSDALE, AZ, 85254

PRE-APP # 620-PA-2022 ZONING # 000-00-0000 DRB # 000-00-0000

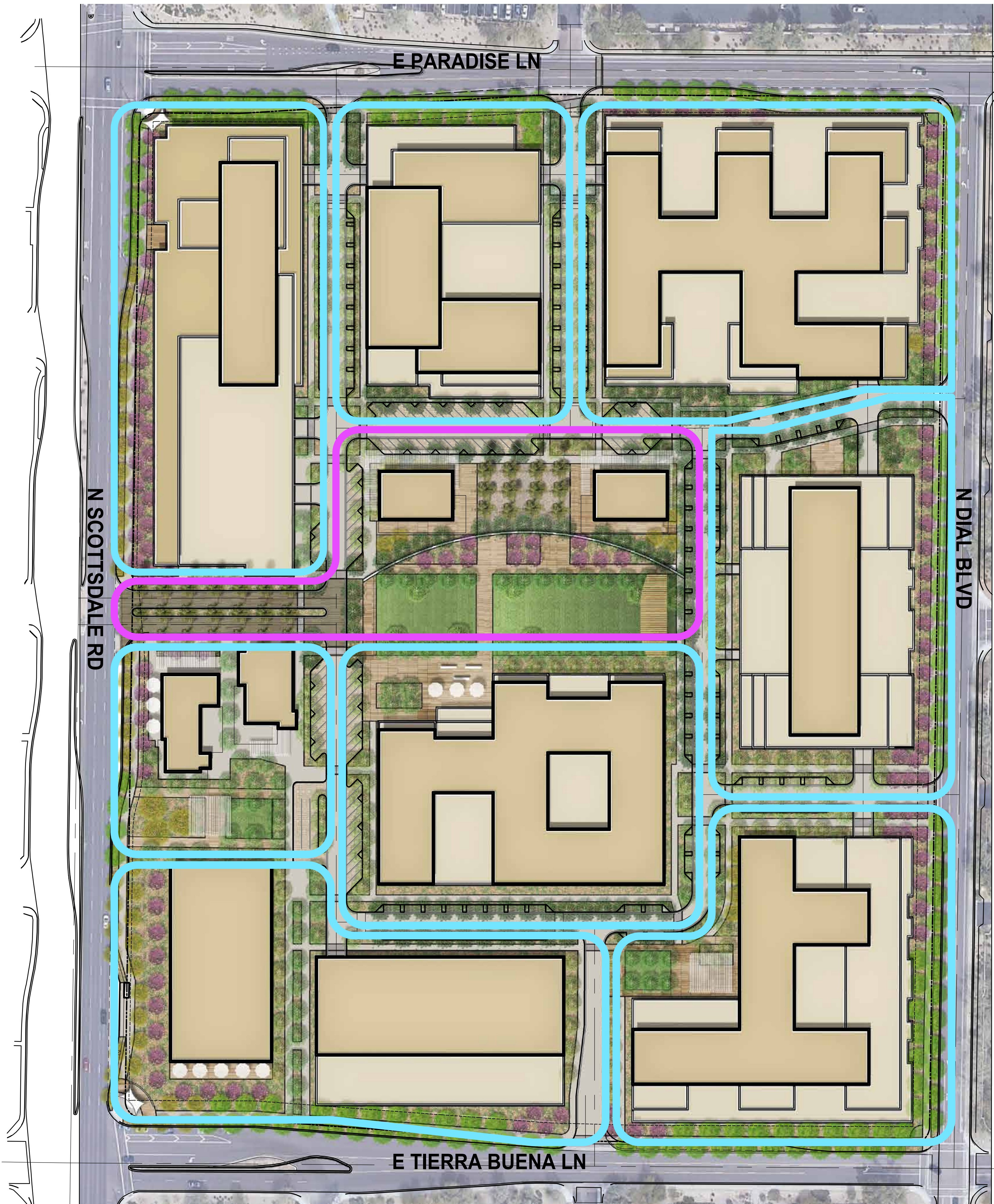
Date
01/27/2023

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Project No.
21018

A114
PHASING
PLAN



LEGEND



PHASE 1



FUTURE PHASES

NOTES:

1. PHASE 1 WILL BE BUILT IN TANDEM WITH ONE OR MORE OF THE FUTURE PHASES

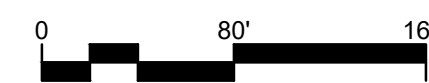


NORTH

01 PHASING PLAN

SCALE: 1"=60'

REF:



APPENDIX VI