



FINAL Basis of Design Report ☐ APPROVED ☐ APPROVED AS NOTED ☒ REVISE AND RESUBMIT	 9379 E San Salvador Dr. Scottsdale, AZ 85258
Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance. For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.	
BY apritchard	DATE 5/10/2024

**WATER DISTRIBUTION SYSTEM
BASIS OF DESIGN REPORT
FOR
ATAVIA - ONE SCOTTSDALE**

March 5, 2024
WP# 235518

Provide hydraulic modeling for the water system for the four scenarios identified in DSPM 6-1.202. Include hydrant test data in Water BOD report per DSPM 6-1.202.

Prepared by
Andrew Sanchez



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Y:\WP\Reports\Commercial\235518 Atavia - One Scottsdale Water BOD.docx



1.0 INTRODUCTION

Atavia – One Scottsdale (Site) is an approximately 4.58-acre parcel located within the One Scottsdale community development. The Site is a proposed multifamily development located approximately 600-feet east of Scottsdale Road and 700-feet south of Legacy Boulevard in Scottsdale, Arizona. The Site is located in Section 26, Township 4 North, Range 4 East of the Gila and Salt River Meridian. Refer to Exhibit 1 – *Vicinity Map* for project location. Proposed development for the Atavia – One Scottsdale parcel consists of 88 multifamily units and a 4,275-square foot Clubhouse with associated parking, landscape, hardscape, and utility services.

Prior to the submittal of this Report, a Master Report titled *One Scottsdale (Stacked 40s) Master Onsite Water Plan (20-ZN-2002#3)* (ref. 1). was approved by the City of Scottsdale. The proposed site improvements analyzed in this Report are included within the Planning Unit II portion of the Master Report. Specifically, the Site is proposed to align with sub-areas 2B and 2D as denoted within the Master Report. Refer to Exhibit 2 – *Modeled On-Site Land Use Plan (From Master Report)* for a depiction of the phase areas.

The design criteria used to estimate potable water demands are based on the design criteria used in the *One Scottsdale (Stacked 40s) Master Onsite Water Plan*. The design criteria used to estimate fire flow demands are based on the International Fire Code, 2018 (ref 2). The following is a summary of the primary design criteria utilized:

Average Day Water Demand, Residential (12-22 DU/ac):	228 gpd/DU
Average Day Water Demand, Commercial/Retail:	0.8 gpd/sf
Maximum Day Demand:	2.0 x ADD
Peak Hour Demand:.....	3.5 x ADD
Fire Flow Demand:.....	1,500 gpm (3,000 gpm * 50% reduction)
Minimum Residual Pressure, Peak Hour:	50 psi
Minimum Residual Pressure, Maximum Day + Fire Flow:.....	30 psi
Maximum System Pressure:	120 psi
Maximum Pipe Head Loss, Maximum Day Demand:	8 ft / 1000 ft
Maximum Pipe Head Loss, Peak Hour Demand:	10 ft / 1000 ft
<u>Minimum Pipe Diameter, Public Water line:</u>	<u>8 inches</u>

Abbreviations: ADD = average day demand; DU = dwelling unit; gpd = gallons per day; gpm = gallons per minute; ft = feet; psi = pounds per square inch; sf = square foot

2.0 EXISTING WATER INFRASTRUCTURE

Existing water infrastructure adjacent to Planning Unit II includes existing 16-inch public water lines within Legacy Boulevard and Scottsdale Road. Two (2) existing 12-inch water stubs extend from the public water line within Legacy Boulevard to the northern property boundary of Planning Unit II. One (1) existing 8-inch water stub extends from the public water line in Scottsdale Road to the western property boundary of Planning Unit II. Two (2) existing fire hydrants extend from the public water line in Legacy Boulevard and are located along the northern

property boundary of Planning Unit II. There is also a 20-inch non-potable main in Legacy Boulevard that downsizes to a 12-inch pipe in Scottsdale Road.

Within Planning Unit II, there is an existing public 12-inch water line loop located under Henkel Way that connects to the 16-inch public water main in Scottsdale Road at two (2) locations. This private loop serves six (6) existing fire hydrants located along Henkel Way. This water line loop was constructed per the *One Scottsdale – Planning Unit II South End Improvements Water Plan* (C.O.S. #3030-06-1) (ref. 3). Additionally, a proposed 12-inch public water line that extends from the existing 12-inch stub at the Legacy Boulevard & 73rd Way intersection to the existing 12-inch onsite water line loop is under construction. Please refer to the approved One Scottsdale Private Drive Plan (C.O.S. #2328-22), (ref. 4) 8-PP2021. Construction of this 12-inch water line will include an additional two (2) fire hydrants within Planning Unit II located along 73rd Way. Refer to Exhibit 3 – *On-Site Water Distribution System Exhibit (From Master Report)* for a depiction of the existing infrastructure.

3.0 PROPOSED WATER INFRASTRUCTURE

3.1 Onsite Water Infrastructure

The Master Report (ref. 1) analyzed the overall water infrastructure needed to serve the One Scottsdale development, including this Site. The Master Report proposed the installation of a 12-inch water line along the north boundary of this Site, connecting to the existing 12-inch water stub within Legacy Boulevard. This 12-inch water line will be constructed concurrently with this Site, but as a separate project. Please refer to Exhibit 3 - *On-Site Water Distribution System Exhibit (From Master Report)* for a depiction of the proposed infrastructure.

The proposed potable water for the Site will be provided by three (3) 2-inch water services and one (1) 4-inch water service with meters and backflows matching their respective pipe sizes. The 2-inch services will serve the northern three (3) buildings and will connect to the proposed 12-inch waterline north of the Site. The 4-inch service will serve the remaining twelve (12) buildings and will connect to the existing 12-inch water line south of the Site. Fire protection for the Site will be provided by an 8-inch fire loop routing onsite connecting to the proposed 12 inch line to the north and the existing 12-inch line to the south. Fifteen (15) 6-inch fire services will be provided for the Site, with one service extending from the proposed 8-inch fire loop to each building. Please refer to Exhibit 4 – *One Scottsdale Water Exhibit* for a depiction of the proposed water infrastructure for the Site.

3.2 Water Demand Calculations

As noted in Section 1.0 of this Report, a Master Report for the One Scottsdale development was previously approved by the City of Scottsdale *titled One Scottsdale (Stacked 40s) Master Onsite Water Plan* (ref. 1). That report analyzed the overall water demands for the One Scottsdale project, including the proposed Site. The proposed Site aligns with sub-areas 2B and 2D from that Master Report.

Based on the design criteria utilized within the Master Report, the projected average-day water demand for the Site is calculated to be 24,336 gallons per day (gpd), or 33.8 gallons per minute (gpm). The

projected maximum day demand is 67.6 gpm and the projected peak demand is 118.3 gpm. The proposed fire flow to the Site is 1,500 gpm for the largest building on Site. (Refer to Appendix A – *Water Demand Calculations*) The previously approved *One Scottsdale (Stacked 40s) Master Onsite Water Plan* calculated the peak hour demand for sub-area 2B and 2D to be 406 gpm and the fire flow to be 2,500 gpm. (Refer to Appendix B - *Excerpt from Master Report Calculations Relevant to the Atavia - One Scottsdale Improvements*) Per these numbers, the calculated domestic and fire flow demands for the proposed Site improvements are less than anticipated in the Master Report analysis. Therefore, it is our understanding that the overall One Scottsdale system will have sufficient capacity to provide domestic and fire flow requirements to the Site.

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 used in the *One Scottsdale (Stacked 40s) Master Onsite Water Plan*. The design criteria used to estimate fire flow demands are based on the International Fire Code, 2018.
2. The water infrastructure described in the *One Scottsdale (Stacked 40s) Master Water Plan* is adequate to serve the domestic and fire flow requirements for the Site since the calculated demand for the Site improvements is less than the flows anticipated in the Master Report.

5.0 REFERENCES

1. *One Scottsdale (Stacked 40s) Master Onsite Water Plan*, Wood, Patel & Associates, Inc. Revised January 28, 2016
2. *International Fire Code*, 2018
3. *One Scottsdale - Planning Unit II South End Improvements Water Plan*, Wood, Patel & Associates, Inc. Submitted December 12, 2007
4. *One Scottsdale Private Drive Plan*, Wood, Patel & Associates, Inc. Submitted August 18, 2022

APPENDIX A – WATER DEMAND CALCULATIONS

Provide total floor area of all floor levels for each building in development, building construction type, and the resultant required fire flow per DSPM 6-1.202 and 6-1.501.

WATER DEMAND CALCULATIONS

Project Atavia - One Scottsdale
Location Scottsdale
Project Number 235518
Project Engineer Zachary Radovich, PE
References One Scottsdale (Stacked 40s) Master On-Site Water Plan

PROPOSED SITE IMPROVEMENTS

Node	LAND USE		AVERAGE DAILY DEMAND		MAX DAY DEMAND		PEAK HOUR DEMAND		FIRE FLOW
	Residential - 12-22 DU/ac (DU)	Commercial/Retail (sf)							(gpm)
			(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)	
Atavia	88	4,275	24,480	34	48,960	68	85,680	119	1,500

MASTER PLAN DEMAND CALCULATIONS - SUB AREA 3D

Node	LAND USE		AVERAGE DAILY DEMAND		MAX DAY DEMAND		PEAK HOUR DEMAND		FIRE FLOW
	Residential - 12-22 DU/ac (DU)	Retail (sf)							(gpm)
			(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)	
2B	266	28,831	83,713	58	167,426	116	292,996	203	2,500
2D	266	28,831	83,979	58	167,958	116	293,927	203	2,500
Total	532	57,662	167,692	116	335,384	232	586,923	406	

**APPENDIX B – MASTER REPORT CALCULATIONS RELEVANT TO ATAVIA – ONE
SCOTTSDALE IMPROVEMENTS**

WOOD/PATEL

MODELED LAND USE CALCULATIONS

CIVIL ENGINEERS • HYDROLOGISTS • LAND SURVEYORS

Project: Master On-Site Water/Wastewater Plan
for One Scottsdale (Stacked 40s)
Location: Scottsdale, Arizona
Date: December 3, 2015

Proj. Number: 154391
Proj. Engineer: JGR

PLANNING UNIT II

PHASE 1						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL				HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)	TOTAL COMMERCIAL AREA (SF)	
1 (Henkel Building)	---	325,156	---	---	325,156	---
SUBTOTAL	---	325,156	---	---	325,156	---

PHASE 2						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL				HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)	TOTAL COMMERCIAL AREA (SF)	
2a	133	---	57,500	26,000	83,500	---
2b	266	---	28,831	---	28,831	---
2c	133	---	57,500	26,000	83,500	---
2d	266	---	28,831	---	28,831	---
SUBTOTAL	798	---	172,662	52,000	224,662	---

PHASE 3						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL				HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)	TOTAL COMMERCIAL AREA (SF)	
3a	---	246,800	2,500	5,000	254,300	140
3b	---	246,800	2,500	---	249,300	---
3c	---	190,100	2,500	---	192,600	---
3d	---	116,300	2,500	---	118,800	---
SUBTOTAL	---	800,000	10,000	5,000	815,000	140

PHASE 4						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL				HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)	TOTAL COMMERCIAL AREA (SF)	
4a	279	---	---	---	---	260
4b	267	---	---	8,000	8,000	---
4c	372	---	---	---	---	---
SUBTOTAL	918	---	---	8,000	8,000	260

PHASE 5						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL				HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)	TOTAL COMMERCIAL AREA (SF)	
5a	---	127,834	21,074	2,500	151,408	---
5b	---	204,533	15,332	2,500	222,365	---
5c	---	204,533	15,332	---	219,865	---
SUBTOTAL	---	536,900	51,738	5,000	593,638	---

PHASE 6						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL				HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)	TOTAL COMMERCIAL AREA (SF)	
6	---	197,089	---	---	197,089	---
SUBTOTAL	---	197,089	---	---	197,089	---

PLANNING UNIT II TOTAL 1,716 1,859,145 234,400 70,000 2,163,545 400

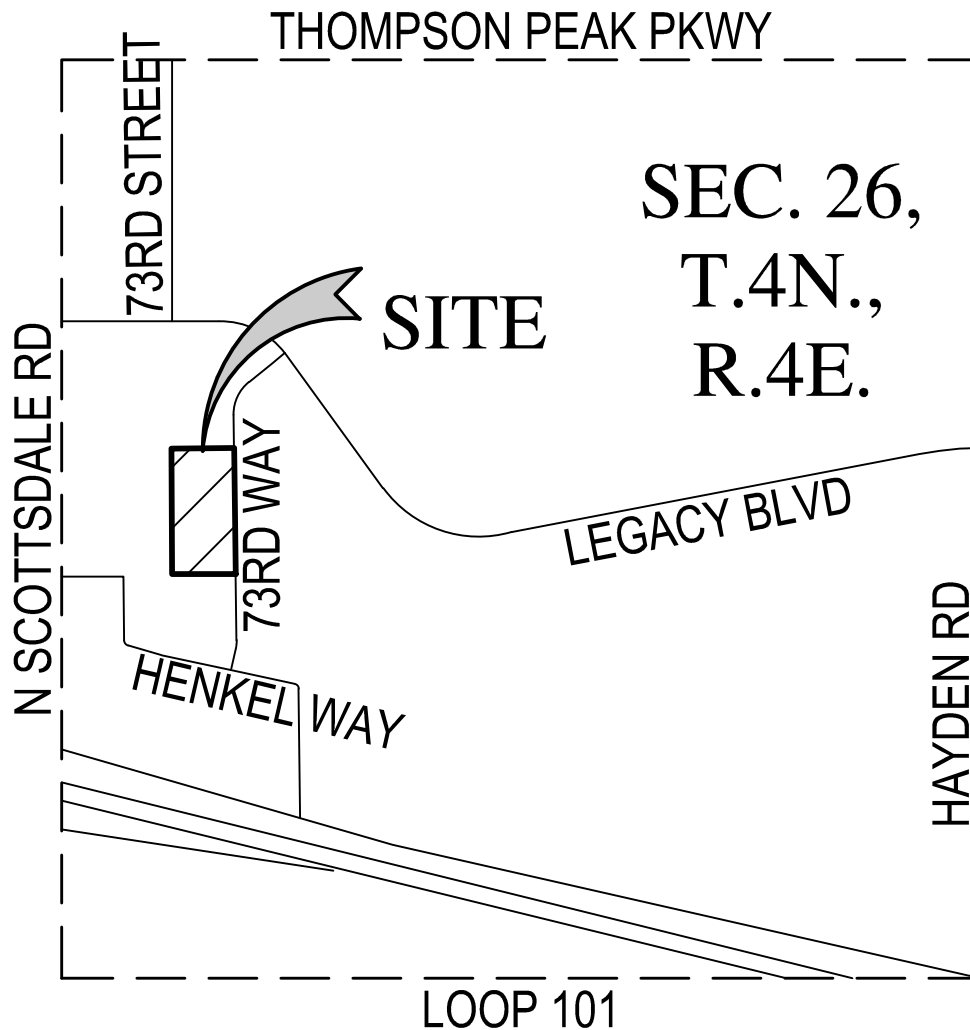
Project: Master On-Site Water/Wastewater Plan for One Scottsdale (Stacked 40s)
Location: Scottsdale, Arizona
Date: December 3, 2015

Proj. Number: 154391
Proj. Engineer: JGR

PLANNING UNIT II

PLANNING UNIT II			LAND USE TYPE																	
			RESIDENTIAL		COMMERCIAL						HOTEL		PROJECTED WATER DEMAND							
					OFFICE		RETAIL		RESTAURANT											TOTAL COMMERCIAL AREA (SF)
HYD. MODEL NODE	ELEVATION (FT)	PLANNING UNIT SUB-AREA	NO. OF DWELLING UNITS	ADF/DU (GPD) ¹	AREA (SF)	ADF/SF (GPD)	AREA (SF)	ADF/SF (GPD)	AREA (SF)	ADF/SF (GPD)	ROOMS	ADF/ROOM (GPD)	AVE. DAY DEMAND (GPD)	AVE. DAY DEMAND (GPM)	DEMAND ASSIGNED TO JUNCTIONS	MAX. DAY DEMAND (GPD) ¹	MAX. DAY DEMAND (GPM) ¹	PEAK HOUR DEMAND (GPM) ²	FIRE FLOW (GPM)	
J-102-2	1.616	2c	133	228	---	6	57,500	8	26,000	1.3	---	447	110,124	76	76	220,248	152	266	2,500	
J-105-2	1.609	5a	---	228	127,834	6	21,074	8	2,500	1.3	---	447	96,810	67	67	193,619	134	235	2,500	
J-110-2	1.613	1	---	228	325,156	6	---	8	0	1.3	---	447	195,094	135	231	390,187	270	473	2,500	
		5b	---	228	204,533	6	15,332	8	2,500	1.3	---	447	138,235	96		276,471	192	336	2,500	
J-120-2	1.612	5c	---	288	204,533	6	15,332	8	0	1.3	---	447	134,985	94	94	269,971	188	329	2,500	
J-130-2	1.613	6	---	228	197,089	6	---	8	0	1.3	---	447	118,253	82	82	236,507	164	287	2,500	
J-160-2	1.616	4c	372	228	---	6	---	8	0	1.3	---	447	84,816	59	59	169,632	118	207	2,500	
J-170-2	1.614	2d	266	228	---	6	28,831	8	0	1.3	---	447	83,713	58	58	167,426	116	203	2,500	
J-175-2	1.622	4b	267	228	---	6	---	8	8,000	1.3	---	447	71,276	49	49	142,552	98	172	2,500	
J-180-2	1.626	4a	279	228	---	6	---	8	0	1.3	260	447	179,832	125	183	359,664	250	438	2,500	
		2b	266	229	---	6	28,831	8	0	1.3	---	447	83,979	58		167,958	116	203	2,500	
J-190-2	1.625	2a	133	228	---	6	57,500	8	26,000	1.3	---	447	110,124	76	76	220,248	152	266	2,500	
J-200-2	1.632	3a	---	228	246,800	6	2,500	8	5,000	1.3	140	447	219,160	152	233	438,320	304	532	2,500	
		3c	---	228	190,100	6	2,500	8	0	1.3	---	447	116,060	81		232,120	162	284	2,500	
J-220-2	1.631	3b	---	228	246,800	6	2,500	8	0	1.3	---	447	150,080	104	154	300,160	208	364	2,500	
		3d	---	228	116,300	6	2,500	8	0	1.3	---	447	71,780	50		143,560	100	175	2,500	
PLANNING UNIT II TOTAL			1,716		1,859,145		234,400		70,000		400		1,964,321	1,362	1,362	3,928,643	2,724	4,767		

EXHIBIT 1 – VICINITY MAP



VICINITY MAP

N.T.S.

**NOT
FOR
CONSTRUCTION
OR RECORDING**



ONE SCOTTSDALE - ATAVIA

VICINITY MAP

DATE	02/23/2024	SCALE	N/A	SHEET	1 OF 1
JOB NO.	225518	DESIGN	JGR	CHECK	ZNR
		DRAWN	AJS	RFI #	

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30-DR-2021#5

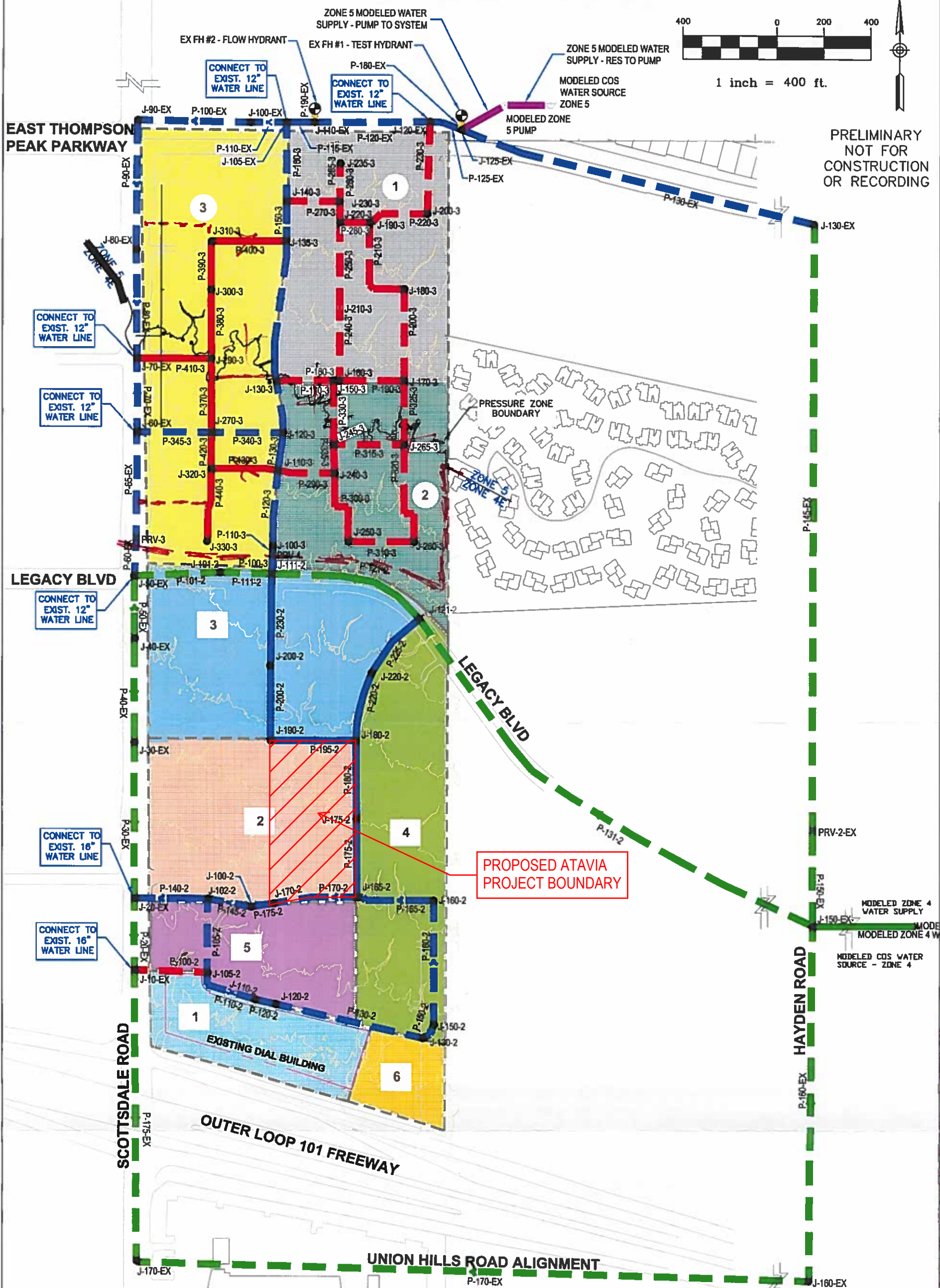
3/18/2024

EXHIBIT 2 – MODELED ON-SITE LAND USE PLAN (FROM MASTER REPORT)



1 inch = 400 ft.

PRELIMINARY
NOT FOR
CONSTRUCTION
OR RECORDING



LEGEND

- JXXX-EX JUNCTION NODE ALONG EXIST. PIPE
- JXXX-2 JUNCTION NODE - PLANNING UNIT II
- JXXX-3 JUNCTION NODE - PLANNING UNIT III
- PXXX-EX EXISTING PIPE
- PXXX-2 PROPOSED PIPE - PLANNING UNIT II
- PXXX-3 PROPOSED PIPE - PLANNING UNIT III
- ⌵ PRESSURE REDUCING VALVE

DIAMETER
(IN)

8

12

16

EXISTING
PIPE

PROPOSED
PIPE

1

2

PHASE AREA IN
PLANNING UNIT III

PHASE AREA IN
PLANNING UNIT II

PLATE 3

January 2016

ONE SCOTTSDALE
MASTER ON-SITE
WATER PLAN EXHIBIT

WOOD/PATEL
ASSOCIATES
Civil Engineers
Hydrologists
Land Surveyors
Construction Managers
(602) 336-8600

EXHIBIT 3 – ON-SITE WATER DISTRIBUTION SYSTEM EXHIBIT (FROM MASTER REPORT)

EAST THOMPSON PEAK PARKWAY



N.T.S.

PLANNING
UNIT III

LEGACY BLVD

SCOTTSDALE ROAD

PLANNING
UNIT II

PROPOSED ATAVIA
PROJECT BOUNDARY

OUTER LOOP 101 FREEWAY

PLANNING
UNIT I
(NOT A PART)

3 PHASE AREA IN PLANNING UNIT III

1 PHASE AREA IN PLANNING UNIT II

--- PLANNING UNIT LINE

PLATE 2

JANUARY 2016

ONE SCOTTSDALE
MODELED ON-SITE
LAND USE PLAN

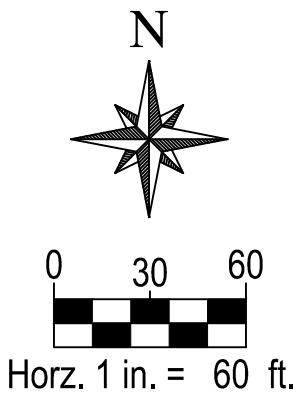
WOOD/PATEL
ASSOCIATES
Civil Engineers
Hydrologists
Land Surveyors
Construction Managers
(602) 955-9500

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30-DR-2021#5

3/18/2024

EXHIBIT 4 – ATAVIA – ONE SCOTTSDALE WATER EXHIBIT



LEGEND

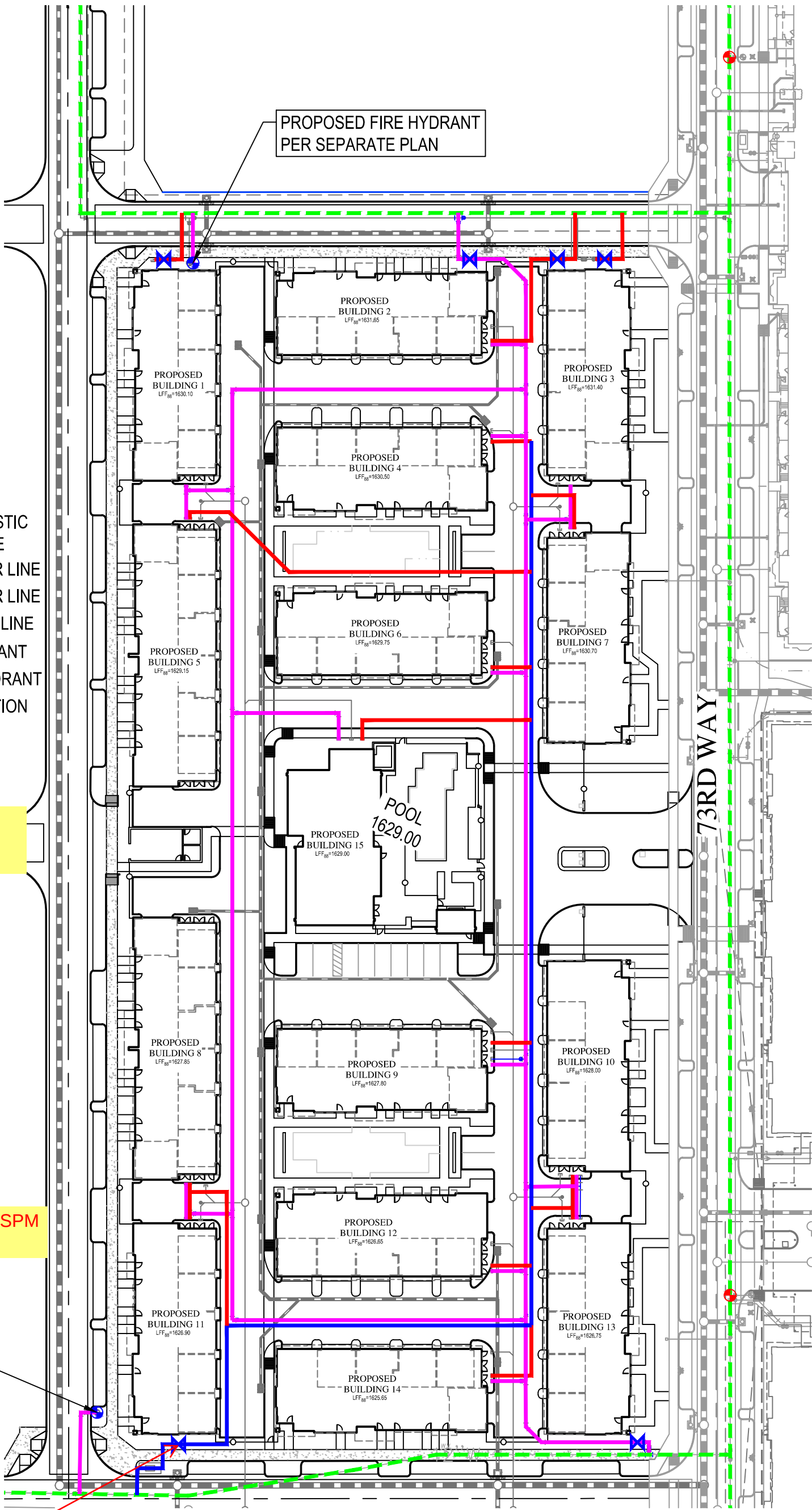
- PROPOSED 4" DOMESTIC WATER SERVICE LINE
- PROPOSED 6" WATER LINE
- PROPOSED 2" WATER LINE
- EXISTING 12" WATER LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- BACKFLOW PREVENTION DEVICE

Show any water easements per DSPM 6-1.202

Show meter location(s) per DSPM 6-1.202.

PROPOSED FIRE HYDRANT PER SEPARATE PLAN

Use Reduced Pressure Principal backflow preventers per SRC 49-62.



NOT
FOR
CONSTRUCTION
OR RECORDING



ONE SCOTTSDALE - ATAVIA

EXHIBIT 2 - WATER LAYOUT

DATE	02/23/2024	SCALE	1" = 60'	SHEET	1 OF 1
JOB NO.	235518	DESIGN	JGR	DRAWN	AJS

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