FINAL WATER BASIS OF DESIGN REPORT
PASEO AT PINNACLE PEAK

NEC Pinnacle Peak Rd. & Miller Rd.
Scottsdale, AZ

Prepared For:

LENNAR

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Gilbert, AZ 852233
Ph: 480.476.8441

Prepared by:

FINAL Basis of Design Report
☑ APPROVED
☐ APPROVED AS NOTED
☐ REVISE AND RESUBMIT

CITY OF SCOTTSDALE
SCOTTSDALE WATER
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 scan DATE 8/29/2018

Sustainability Engineering Group
8280 E. Gelding Drive, Suite 101
Scottsdale, AZ 85260
480.588.7226 www.azSEG.com

Project Number: 170566

Submittal Date: April 6, 2018 (PP/DRB)
Revised Submittal: June 29, 2018
Revision Date: August 23, 2018

Case No.: 362-PA-2017; 4-PP-2018 **Plan Check No.: TBD**

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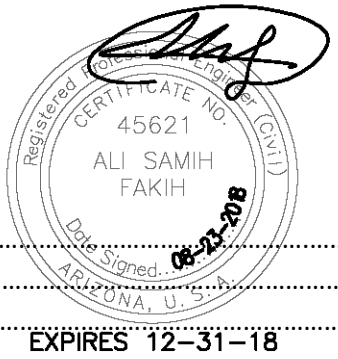

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1. EXECUTIVE SUMMARY

The subject project is the proposed redevelopment of the existing P.F. Chang's office complex located at the NEC of North Miller Road and East Pinnacle Peak Road into a residential development. The parcel is zoned R1-10 PRD ESL through approved zoning case 11-ZN-2017 for the subject project and will be developed with a maximum of fifty-five (55) residences fronting on a proposed internal 46' wide tract with 28' wide private cul-de-sacs.

Water service for the development is to be provided by the City of Scottsdale. Two connections will be from an existing 16" DIP main that runs north and south in North Miller Road.

There will be no off-site improvements required of public mains to serve the domestic service, irrigation, and fire protection to the proposed residential lots.

Certified fire hydrant flow testing was performed on May 22, 2017 at 7:00 AM by Arizona Flow Testing, LLC at locations as shown on the provided reports. The results are as follows:

	Raw Test Data	Data w/58 PSI Safety Factor
• Static Pressure	130.0 PSI	72.0 PSI
• Residual Pressure:	108.0 PSI	50.0 PSI
• Flow:	3,087 GPM	3,087 GPM
• GPM @ 20 PSI:	7,361 GPM	4,912 GPM

The actual flow test documentation is included in **Appendix I**.

2. INTRODUCTION

2.1 PLAN OBJECTIVE:

The purpose of this report is to provide discussions and calculations defining the water system concepts necessary to comply with the requirements outlined in the City of Scottsdale Design Standards & Policy Manual. Preparation of this report has been done in accordance with the requirements of the City's Design Standards & Policy Manual.

2.2 SITE LOCATION

The project property consists of four (4) parcels of land located at the NEC of North Miller Road and East Pinnacle Peak Road. The total project area contains approximately 855,802.3 SF (19.647 AC) gross; 749,876.2 SF (17.215 AC) net. It is further defined as follows:

- Parcel Description: The west half of Section 11, Township 4 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Scottsdale, Arizona
- Parcel ID numbers: APN: 212-04-001B, 212-04-001C, 212-04-001D and 212-04 001E.
- Parcel Address: 7676 E. Pinnacle Peak Road

The site is bounded by North Miller Road on the west, East Pinnacle Peak Road on the south, a portion of North 77th Street on the east near the SEC and the La Vista single family subdivision to the east and north.

Refer to **FIGURE 1** - **Vicinity Map** for the project's location with respect to major cross streets

2.3 PROPOSED DEVELOPMENT

2.3.1 Existing Site Description:

Land ownership includes 17.22 +/- net acres over four (4) parcels of developed and undeveloped land zoned R1-10 PRD ESL. There are existing designated and recorded N.A.O.S. areas along the south, west and north portions of the proposed project site area.

The site is both undeveloped natural desert in the northerly portion and a developed office component roughly in the south 2/3 of the project site. Contour elevations range from approximately 1916 in the northeast corner to 1879 in the southwest corner, with a slope at approximately 2.5% from northeast to southwest.

FIRM Map Number 04013C1310L dated October 16, 2013 indicates this site is designated as Zone "AO", however there has been a Letter of Map Revision (LOMR) 15-09-1857P with an effective date of June 10, 2016 which removed the project site from the Rawhide Wash Floodplain area and re-designated as **Zone "X",** having a 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile.

Refer to **FIGURE 2** for an aerial of the overall project existing conditions.

EXISTING WATER (COS QS45-46)

- **Miller Road**: Two existing 16" and one 36" water main run north and south in North Miller Road. A non-potable 16" pipe is located approximately 3' east of the roadway centerline and a 36" transmission pipe is located approximately 10' east of the roadway centerline. A 16" potable distribution line is located approximately 39' east of the North Miller Road centerline and presently serves one point of connection to the existing office complex system and will serve as one connection point for this project. A new tap to this 16" line is proposed for the onsite water line extension. PRVs will be necessary to reduce pressures to the 80-psi range. An existing inline valve between the two new taps will assure second sourcing.
- **E. Pinnacle Peak Road**: Two 12" water mains run east and west in East Pinnacle Peak Road. One 12" non-potable pipe connected to a well site is located approximately 44' north of the roadway centerline and the other, a potable 12" pipe, is located approximately 42' south of the roadway centerline. No existing service taps to the site off this potable line are indicated on the quarter-section maps and none are proposed.

- **77th Street**: An 8" ACP potable water main is located near the easterly ROW line of 77th Street. The existing on-site water loop ties into this main and is proposed to be abandoned as it will be obstructed by a significant wall.
- **On-site**: There is an 8" diameter water line, per city mapping records, in a 12' public water easement that bisects the project site from North Miller Road to North 77th Street. The entire line will need to be abandoned.

Refer to **Figure 3** for the COS Water Quarter Section Map (QS 45-46).

2.3.2 Proposed Site Development:

Proposed development consists of a maximum of fifty-five (55) residences fronting on a proposed internal 46' wide tract with 28' wide private cul-de-sac. Main access is provided near the center of the parcel off North Miller Road which connects to East Pinnacle Peak Road to the south.

An 8" main is proposed to tie into the existing 16" City of Scottsdale main in Miller Road at two locations and loop through the site. Domestic and irrigation services to the units will be tapped off this new 8" water main.

Refer to **FIGURE 4** for the proposed site layout.

3. DESIGN CRITERIA

3.1 UTILITY DEVELOPER GUIDE CRITERIA

This project is designed using 55 du / 19.65 gross acres = 2.89 du/ac. Refer to **Table 1** below for applicable "Design Criteria for Water Systems" based on Figure 6.1-2 (2-2.9 du/ac) in accordance with the City of Scottsdale DS&PM.

Table 1 - COS Design Criteria by demand type

Land Use	Average Day Demand (gal/day/unit)	Max Day Peaking Factor	Peak Hour Peaking Factor
Residential (2-2.9 DU/ac)	470.4	2.0	3.5

The system pressures, velocities, head losses and fire flow are in accordance with the COS DS&PM as follows:

Minimum Pressures:

Final water modeling will demonstrate a minimum of 50 psi residual pressure is available at the highest delivery point within a structure based on data within the 2015 IPC Appendix "B" under maximum system demand AND a minimum 30 psi is available at all fire hydrants with 15 psi available at the highest delivery point within a structure.

Maximum Pressures:

Maximum Pressure =120 psi

The City of Scottsdale operates its system from wells and pumps that commonly have pressures exceeding 80 psi. Therefore, the city requires all metered services to have a pressure-regulating valve installed on the private service line per DS&PM 6-1.402.

Velocity & Head loss:

- *10 ft. head loss maximum per 1,000 linear feet of pipe for pipes less than 16 inches in diameter with a*
- *Hazen-Williams Coefficient = 130*

Fire Flows:

This site is under the jurisdiction of the City of Scottsdale Fire Department. Fire flows must be in accordance with the 2015 International Fire Code which, for one- and two-family dwellings, is determined as follows:

- Dwellings having a fire-flow calculation area that does not exceed 3,600 s.f. that have automatic sprinklers shall be 500 gpm for 1/2 hour.

4. DEMANDS

4.1 PROJECT USE DESCRIPTION

Proposed demands for this project are based on a Residential Demand per Dwelling Unit for a density 2-2.9 DU/ac. Refer to **Table 2** below for the proposed water demand calculations based on the design criteria established in *Section 3.1* above

Table 2: Water Demand Calculations

	Units	Avg. Day Flow (gpd/unit)	Avg. Day Flow (gpm/unit)	Max Day Peaking Factor	Peak Hour Peaking Factor	Avg. Day Demand (GPM)	Max. Day Demand (GPM)	Peak Hour Demand (GPM)
Res. (2-2.9 DU/ac)	55	470.4		2	3.5	18	36	63
Res. (2-2.9 DU/ac)*	55		0.66	2	3.5	36	73	127

* used as a basis for water modeling per DS+PM Figure 6.1-2

4.2 WATER PRESSURE ZONE

This site is in Zone 7/6 according to Figure 6.1-3 Pressure Zone Map in DS&PM. Pressure indicates it to be in the lower end of Zone 7.

4.3 PHASING OF DEMANDS

This residential project may be phased as dictated by unit demand. The infrastructure will be built in a single phase.

4.4 SUMMARY NARRATIVE OF DEMANDS

The demand scenario that governs the design is max day + fire flow.

5. EXISTING FACILITIES / CONDITIONS

5.1 PREVIOUS MASTER PLANS

No existing master plan or water report is available from COS for this site.

6. PROPOSED FACILITIES

6.1 DISTRIBUTION SYSTEM PIPING

6.1.1 Onsite:

The proposed water supply will consist of new 8" public water line, two (2) 8" PRV's, and new fire hydrants. The proposed 8" water main will be DIP in accordance with COS requirements. Domestic service will be provided by 1"copper service connections to each lot, including meter and backflow prevention and PRV. Irrigation will be tapped from the domestic service after the BFP and require a separate/second BFP.

Irrigation for common areas will be provided by a separate system tapped from the 8" water main and maintained by the Home Owners Association.

6.1.2 Offsite Infrastructure:

No offsite infrastructure is anticipated. Two connections to the existing potable 16" pipe in Miller Road will be made.

7. WATER MODEL

7.1 DESCRIPTION OF MODEL

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

Bentley WaterCAD® Version 8i is the computer modeling tool used in this study.

Network analysis input parameters included the following:

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

Output parameters included but were not limited to:

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

7.2 ASSUMPTIONS

Please refer to *Section 3.1* for the design criteria.

The general methodology used to design this public water infrastructure consists of modeling a network of water distribution mains to meet COS 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 fire flow test. Refer to **Appendix I** for a copy of the fire flow test results.

7.3 SUMMARY OF RESULTS

A summary of the modeling results is presented below in **Table 3**. Detailed WaterCAD® results are presented in **Appendix II**.

Table 3: WaterCAD® Analysis Results

Demand Scenario	Water Demand (GPM)	Pressure (PSIG)				Velocity (ft/s)	Pipe ID
		Min.	Node	Max.	Node		
Average Day	36.3	82	J-7	89	J-4	0.23	P-21
Maximum Day	72.6	82	J-7	89	J-4	0.46	P-21
Peak Hour	127.1	82	J-7	89	J-4	0.81	P-21
Max. + Fire Flow	1000 + Max day	77	J-8	80	J-7	6.6	P-21

8. SUMMARY / CONCLUSIONS

8.1 CONFORMANCE TO DESIGN GOALS

- The proposed water main is designed in accordance with COS design standards and policies[1]. The following summary is based on the above analysis summary.
  - Minimum 50 psi residual @ highest delivery point required, 82 psi minimum provided.
  - Minimum 30 psi @ max+ fire flow required, 81 psi provided.
  - 10 fps maximum velocity is not exceeded.
  - The system supports the minimum 500 gpm (and 1000 gpm) fire flow requirements.
- The results shown in the modeling summary (refer to Section 7.3) indicate that the proposed water system meets the COS criteria for Daily water usage and fire flow events as described in Section 3.1.
- Pressure regulating valves at each building are required per COS design criteria.

8.2 REQUIRED FACILITIES AND PHASING

- Proposed facility improvements for this project are limited to a new 8" water main including two (2) PRV's, new fire hydrants, and 1" domestic service connections for each lot.
- This project will be constructed in a single phase.
- The final plans will show water and sewer vertical clearances compliant with City and State separation or protection provisions.

REFERENCES

1. *City of Scottsdale Design Standards & Policies Manual-Chapter 6, Water*

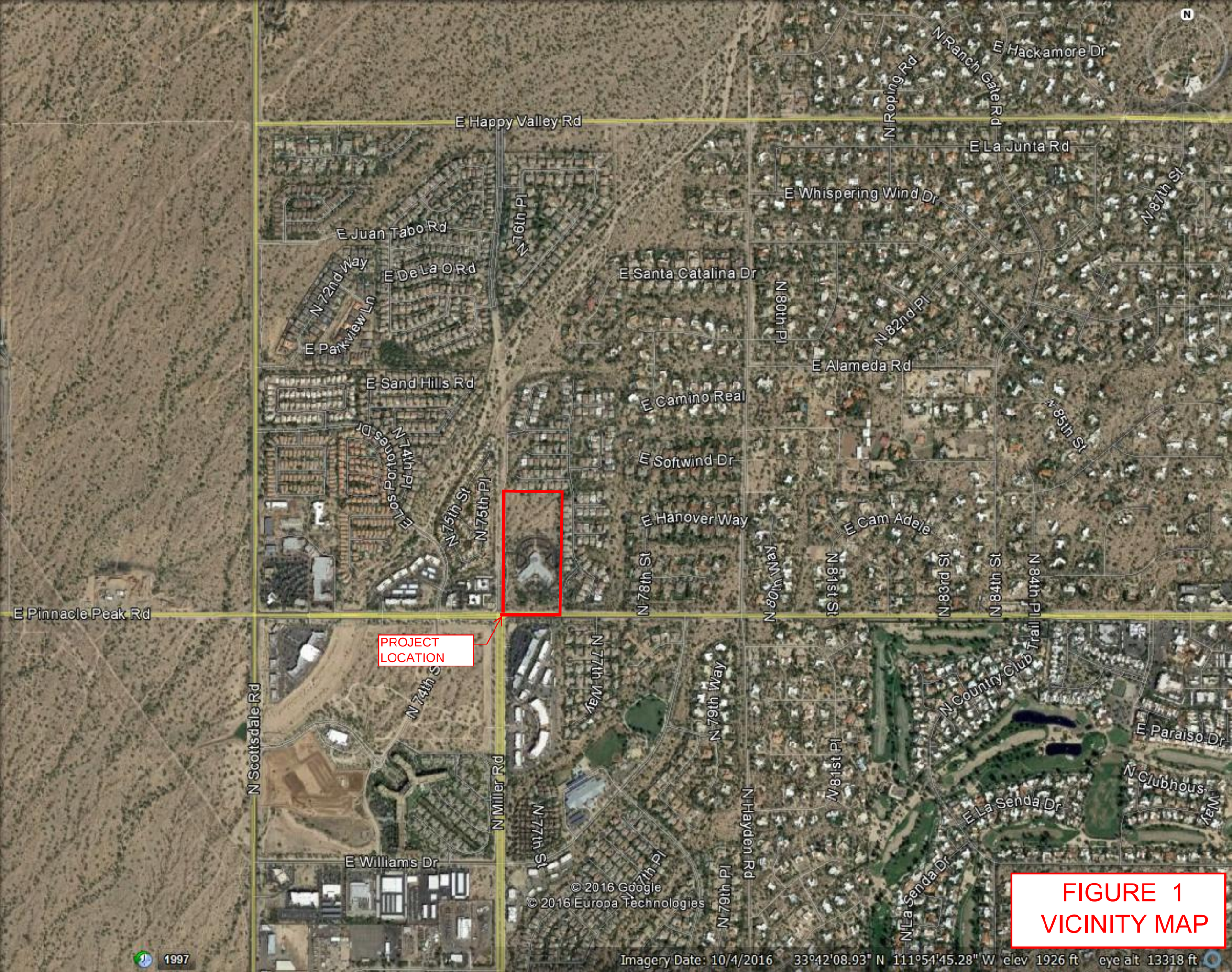


FIGURE 1
VICINITY MAP

SUBJECT PARCEL

E Pinnacle Peak Rd & 76th St

1997

Imagery Date: 10/4/2016 33°42'02.34" N 111°54'55.09" W elev 1898 ft eye alt 3978 ft

FIGURE 2
AERIAL

PROJECT LOCATION

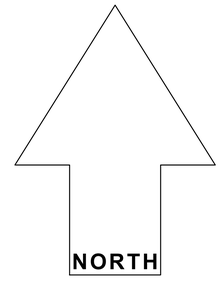
GENERAL NOTES:

- 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 (ARV)
- Non-potable Air Release Valve (NPARV)
- Blowoff
- Cap (CAP)
- Cathodic Protection (CPT)
- Fill Drain (F&D)
- Fire Hydrant
- Non-GPS Point
- Pressure Reducing Valve (PRV)
- Pump (WP)
- Reducer
- Sample Station (SS)
- Water Manhole (WMH)
- Non-Potable Manhole (NPMH)
- Well (WELL)
- Valve
- Non-potable Valve (NPV)
- Vault (WVT)
- Water Main
- Non-Potable Main (NP)
- Fire / Private Main
- Non-Scottsdale Main

VICINITY MAP



The map scale of 1" = 100' is based on a full size print of 30" x 36"

WATER

QUARTER SECTION MAP

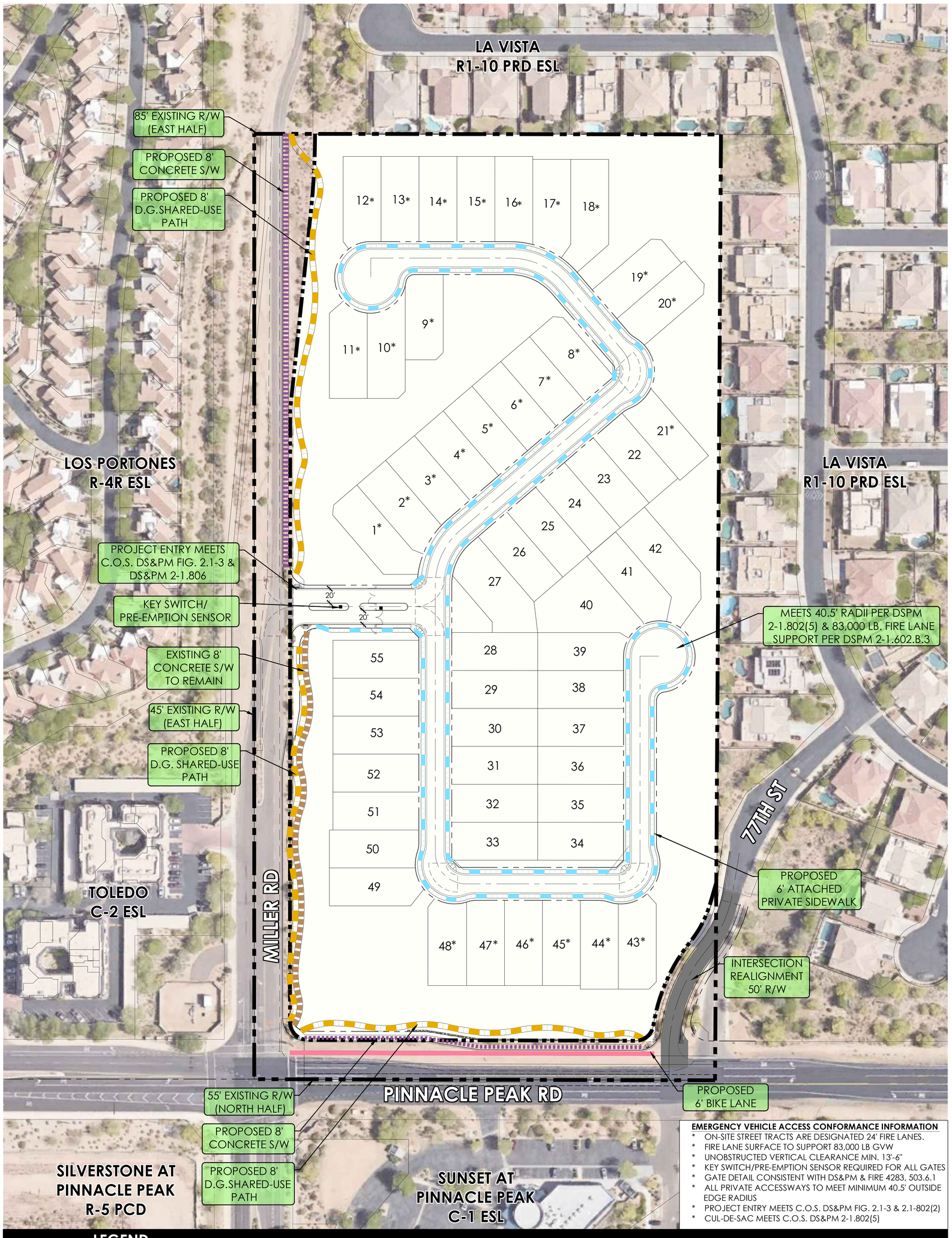
46-46

SE 1/4 SEC. 11 T4N R4E

FIGURE 3

CITY OF SCOTTSDALE
SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS
3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

14-MAY-17



EMERGENCY VEHICLE ACCESS CONFORMANCE INFORMATION

* ON-SITE STREET TRACTS ARE DESIGNATED 24' FIRE LANES.
* FIRE LANE SURFACE TO SUPPORT 83,000 LB GVW
* UNOBSTRUCTED VERTICAL CLEARANCE MIN. 13'-6"
* KEY SWITCH/PRE-EMPTION SENSOR REQUIRED FOR ALL GATES
* GATE DETAIL CONSISTENT WITH DS&PM & FIRE 4283, 503.6.1
* ALL PRIVATE ACCESSWAYS TO MEET MINIMUM 40.5' OUTSIDE EDGE RADIUS
* PROJECT ENTRY MEETS C.O.S. DS&PM FIG. 2.1-3 & 2.1-802(2)
* CUL-DE-SAC MEETS C.O.S. DS&PM 2-1.802(5)

LEGEND

- GROSS BOUNDARY
- NET BOUNDARY
- PROPOSED 8' SIDEWALK
- EXISTING 8' DETACHED PUBLIC SIDEWALK
- PROPOSED 8' SHARED-USE PATH
- PROPOSED 6' ATTACHED PRIVATE SIDEWALK
- PROPOSED 6' BIKE LANE

FIGURE 5.3-4 MINOR ARTERIAL - RURAL/ESL CHARACTER (LOOKING WEST)

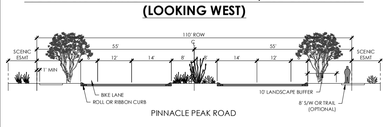
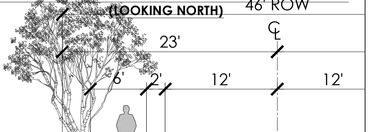


FIGURE 5.3-5 MINOR ARTERIAL - SUBURBAN CHARACTER (LOOKING NORTH)

FIGURE 5.3-20 LOCAL RESIDENTIL - SUBURBAN CHARACTER (LOOKING NORTH)



PER SECTION 6.211.A
PARKING REQUIRED: DWELLING UNITS WITH 3 OR MORE BEDROOMS SHALL PROVIDE A MIN. OF 2 ON-SITE SPACES & 2 OFF-STREET GUEST SPACES
PARKING PROVIDED: 2 SPACES/UNIT TO BE PROVIDED IN GARAGE & 2 EXCESS GUEST PARKING TO BE PROVIDED IN DRIVEWAYS

LVA an RVi Company
land planning
development entitlements
landscape architecture
120 south ash avenue
tempe, arizona 85281
480.994.0994

LENNAR

PASEO AT PINNACLE PEAK
CIRCULATION PLAN

FIGURE 4

RELATED CASE #'S: 362-PA-2017, 11-ZN-2017, 3-GP-2017
PASEO AT PINNACLE PEAK - PRELIMINARY PLAT
CIRCULATION PLAN SHEET 1 OF 1

NORTH
GRAPHIC SCALE 1" = 60'
60 30 0 60 120

1786 DRAWN BY: AV 4/2/18

APPENDIX I

Flow Test Data

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Not Provided
Project Address:	Miller and Pinnacle Peak, Scottsdale, Arizona 85255
Client Project No.:	Not Provided
Arizona Flow Testing Project No.:	17110
Flow Test Permit No.:	C53126
Date and time flow test conducted:	May 22, 2017 at 7:00 AM
Data is current and reliable until:	November 12, 2017
Conducted by:	Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Larry Frandle –City of Scottsdale-Inspector (602-828-0847)

Raw Test Data

Static Pressure: **130.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **108.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **24.0 PSI (4 inch H.M.)**
55.0 PSI (2 ½ inch)
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One (4 inch)
(Measured in inches)

Coefficient of Diffuser: Big Boy Hose Monster

Flowing GPM: **3,087 GPM**
(Measured in gallons per minute)
1,842 GPM + 1,245 GPM = 3,087 GPM

GPM @ 20 PSI: **7,361 GPM**

Data with 58 PSI Safety Factor

Static Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

Residual Pressure: **50.0 PSI**
(Measured in pounds per square inch)

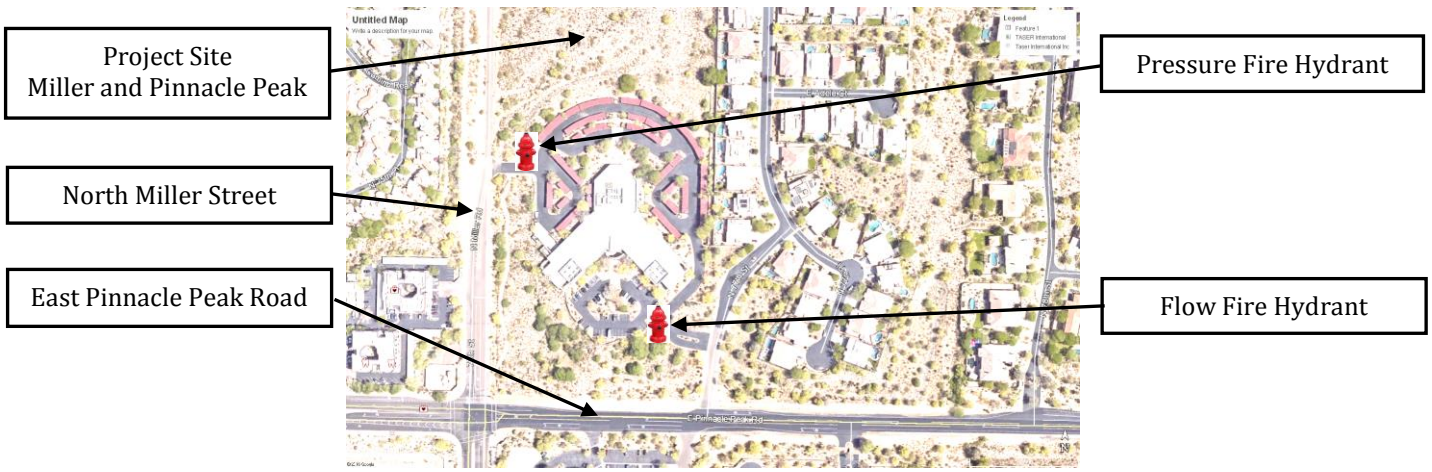
Distance between hydrants: Approx. 1150 Feet

Main size: Not Provided

Flowing GPM: **3,087 GPM**

GPM @ 20 PSI**:** **4,912 GPM**

Flow Test Location **North**



APPENDIX II

Water Model Results

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Average Day

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	1,895.00	7.920	2,092.53	85
J-4	1,886.00	7.920	2,092.52	89
J-5	1,891.50	3.960	2,092.52	87
J-6	1,897.50	3.300	2,092.52	84
J-7	1,903.50	6.600	2,092.52	82
J-8	1,902.00	6.600	2,092.52	82
J-9	1,894.00	0.000	2,192.72	129
J-10	1,892.50	0.000	2,192.72	130

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Average Day

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-3	397	8.0	Ductile Iron	130.0	15.180	0.10
P-4	270	8.0	Ductile Iron	130.0	7.260	0.05
P-5	318	8.0	Ductile Iron	130.0	3.300	0.02
P-6	444	8.0	Ductile Iron	130.0	13.200	0.08
P-7	451	8.0	Ductile Iron	130.0	6.600	0.04
P-10	115	24.0	Ductile Iron	130.0	36.298	0.03
P-11	472	16.0	Ductile Iron	130.0	-0.002	0.00
P-13	130	24.0	Ductile Iron	130.0	36.298	0.03
P-18	57	8.0	Ductile Iron	130.0	0.000	0.00
P-19	86	8.0	Ductile Iron	130.0	0.000	0.00
P-20	73	8.0	Ductile Iron	130.0	36.300	0.23
P-21	170	8.0	Ductile Iron	130.0	36.300	0.23

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Average Day

FlexTable: PRV Table

Label	Elevation (ft)	Diameter (Valve) (in)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-4	1,896.00	6.0	2,080.84	80	0.000	2,192.72	2,092.52	0.00
PRV-5	1,896.00	6.0	2,092.39	85	36.300	2,192.71	2,092.53	100.18

2018-6-28 Paseo at Pinnacle Peak.wtg
Active Scenario: Average Day
FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-2	1,892.50	On	1,892.50	2,192.72	36.298	300.22

2018-6-28 Paseo at Pinnacle Peak.wtg
Active Scenario: Average Day
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,892.50	36.298	1,892.50

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Max Day

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	1,895.00	15.840	2,092.51	85
J-4	1,886.00	15.840	2,092.50	89
J-5	1,891.50	7.920	2,092.50	87
J-6	1,897.50	6.600	2,092.50	84
J-7	1,903.50	13.200	2,092.50	82
J-8	1,902.00	13.200	2,092.50	82
J-9	1,894.00	0.000	2,192.68	129
J-10	1,892.50	0.000	2,192.68	130

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Max Day

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-3	397	8.0	Ductile Iron	130.0	30.360	0.19
P-4	270	8.0	Ductile Iron	130.0	14.520	0.09
P-5	318	8.0	Ductile Iron	130.0	6.600	0.04
P-6	444	8.0	Ductile Iron	130.0	26.400	0.17
P-7	451	8.0	Ductile Iron	130.0	13.200	0.08
P-10	115	24.0	Ductile Iron	130.0	72.597	0.05
P-11	472	16.0	Ductile Iron	130.0	0.000	0.00
P-13	130	24.0	Ductile Iron	130.0	72.597	0.05
P-18	57	8.0	Ductile Iron	130.0	0.000	0.00
P-19	86	8.0	Ductile Iron	130.0	0.000	0.00
P-20	73	8.0	Ductile Iron	130.0	72.598	0.46
P-21	170	8.0	Ductile Iron	130.0	72.600	0.46

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Max Day

FlexTable: PRV Table

Label	Elevation (ft)	Diameter (Valve) (in)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-4	1,896.00	6.0	2,080.84	80	0.000	2,192.68	2,092.50	0.00
PRV-5	1,896.00	6.0	2,092.39	85	72.598	2,192.67	2,092.53	100.14

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Max Day

FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-2	1,892.50	On	1,892.50	2,192.68	72.597	300.18

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Max Day

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,892.50	72.597	1,892.50

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Peak Hour

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	1,895.00	27.720	2,092.47	85
J-4	1,886.00	27.720	2,092.43	89
J-5	1,891.50	13.860	2,092.43	87
J-6	1,897.50	11.550	2,092.43	84
J-7	1,903.50	23.100	2,092.44	82
J-8	1,902.00	23.100	2,092.43	82
J-9	1,894.00	0.000	2,192.59	129
J-10	1,892.50	0.000	2,192.59	130

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Peak Hour

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-3	397	8.0	Ductile Iron	130.0	53.130	0.34
P-4	270	8.0	Ductile Iron	130.0	25.410	0.16
P-5	318	8.0	Ductile Iron	130.0	11.550	0.07
P-6	444	8.0	Ductile Iron	130.0	46.200	0.29
P-7	451	8.0	Ductile Iron	130.0	23.100	0.15
P-10	115	24.0	Ductile Iron	130.0	127.048	0.09
P-11	472	16.0	Ductile Iron	130.0	-0.002	0.00
P-13	130	24.0	Ductile Iron	130.0	127.048	0.09
P-18	57	8.0	Ductile Iron	130.0	0.000	0.00
P-19	86	8.0	Ductile Iron	130.0	0.002	0.00
P-20	73	8.0	Ductile Iron	130.0	127.048	0.81
P-21	170	8.0	Ductile Iron	130.0	127.050	0.81

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Peak Hour

FlexTable: PRV Table

Label	Elevation (ft)	Diameter (Valve) (in)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-4	1,896.00	6.0	2,080.84	80	0.000	2,192.59	2,092.43	0.00
PRV-5	1,896.00	6.0	2,092.39	85	127.048	2,192.56	2,092.53	100.03

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Peak Hour

FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-2	1,892.50	On	1,892.50	2,192.59	127.048	300.09

2018-6-28 Paseo at Pinnacle Peak.wtg
Active Scenario: Peak Hour
FlexTable: Reservoir Table

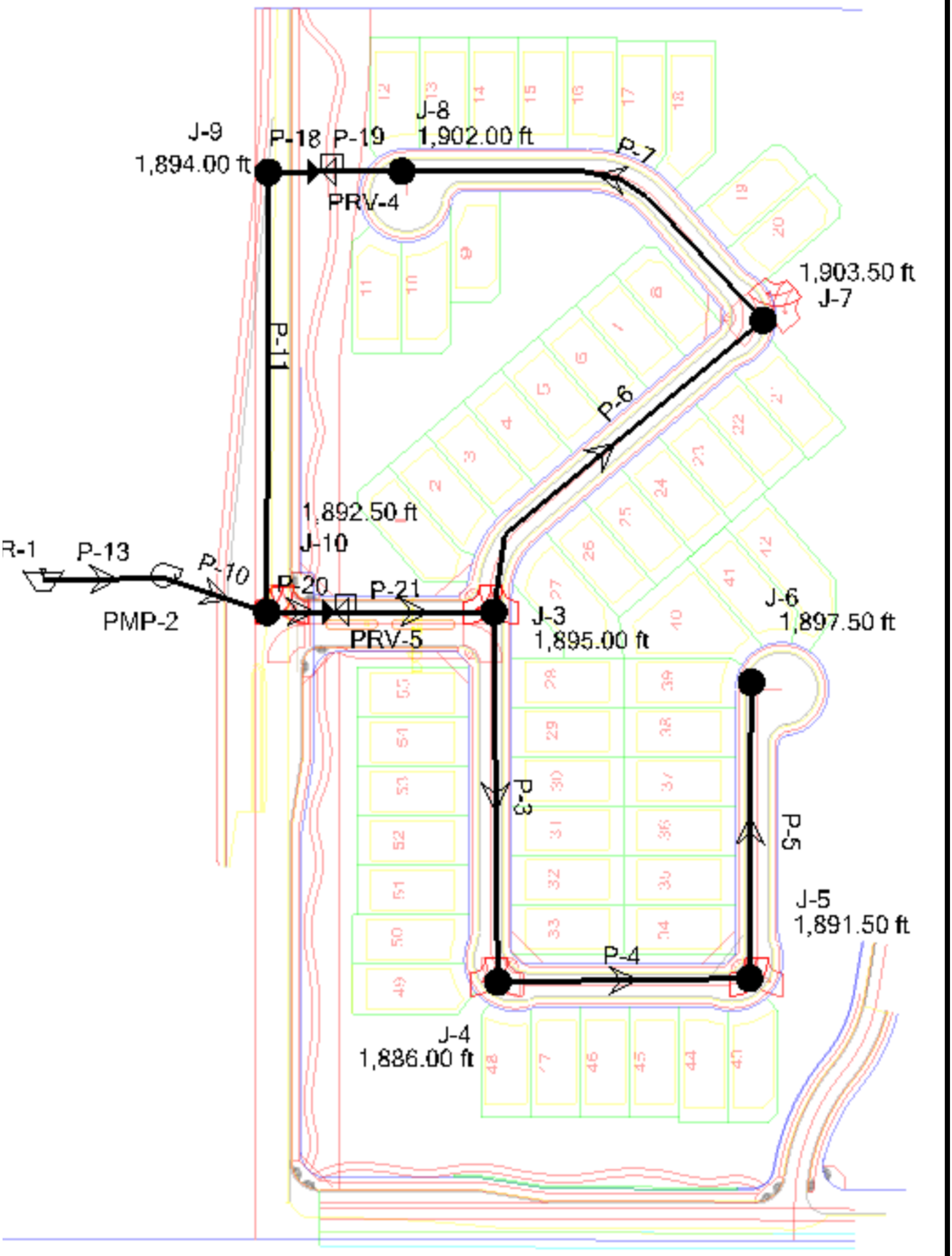
Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,892.50	127.048	1,892.50

2018-6-28 Paseo at Pinnacle Peak.wtg

Active Scenario: Max Day + FF

Fire Flow Node FlexTable: Fire Flow Report

Label	Fire Flow (Needed) (gpm)	Flow (Total Needed) (gpm)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Fire Flow (Available) (gpm)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Velocity of Maximum Pipe (ft/s)	Pipe w/ Maximum Velocity
J-3	500	508	85	1,000	80	J-7	6.61	P-21
J-4	500	508	88	1,000	80	J-6	6.61	P-21
J-5	500	504	85	1,000	78	J-6	6.61	P-21
J-6	500	503	82	1,000	80	J-5	6.61	P-21
J-7	500	507	80	1,000	77	J-8	6.59	P-21
J-8	500	507	80	1,000	79	J-7	4.99	P-21
J-9	500	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-10	500	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)



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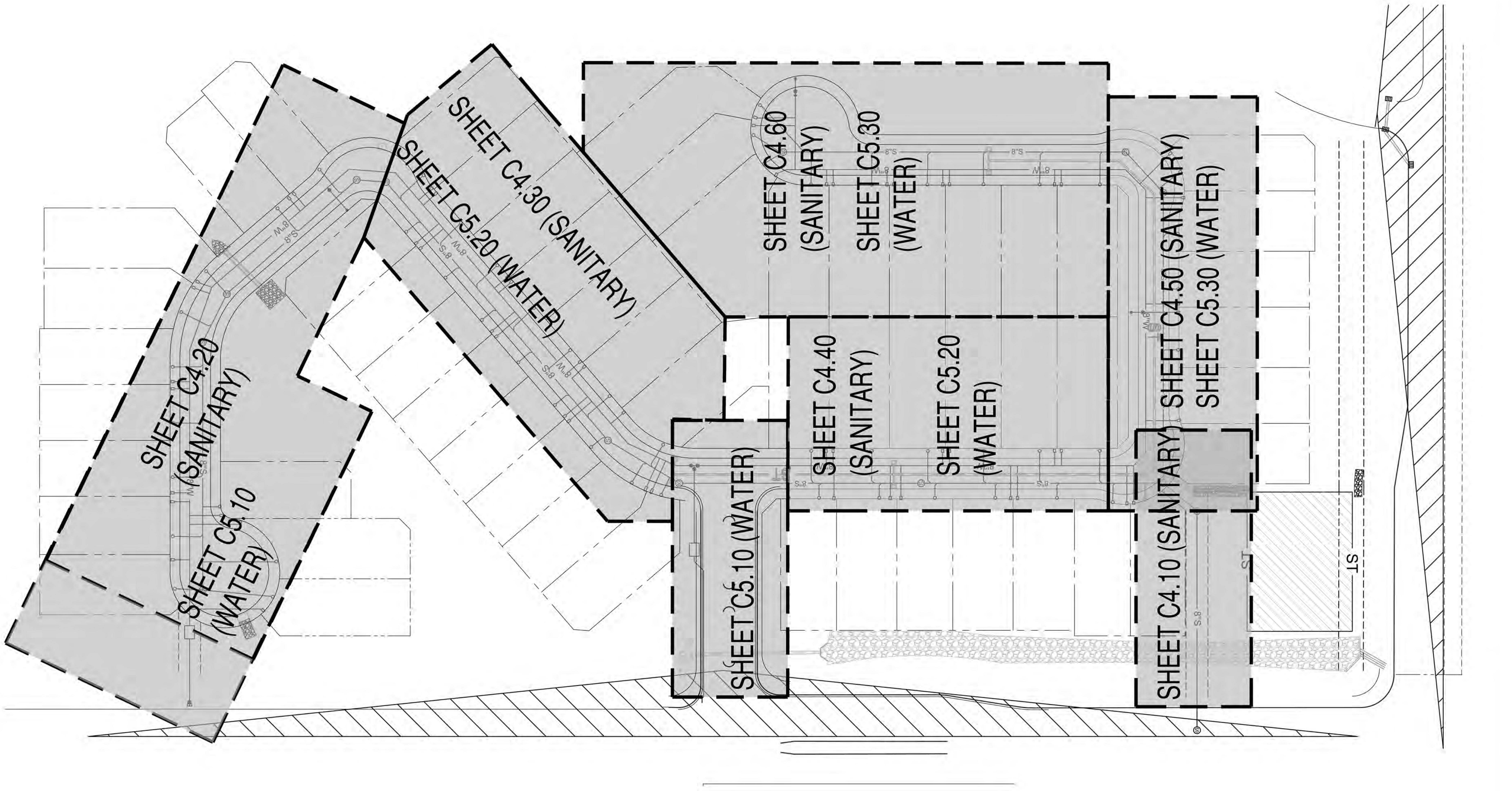
APPENDIX III

Water Utility Plans



PROPOSED LEGEND

Symbol	Description
—— 8" W ——	WATER LINE
—— 8" S ——	SEWER LINE
— — —	STORM LINE
- - - - -	SAWCUT LINE
(symbol)	FIRE HYDRANT
(symbol)	WATER METER
(symbol)	SEWER MANHOLE/CONCRETE COLLAR
(symbol)	WATERMAIN GATE VALVE/CONCRETE COLLAR

UTILITY NOTES

1. REFER TO SHEET C0.10 FOR ADDITIONAL GENERAL NOTES.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MAG UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION, OR AS AMENDED BY LOCAL MUNICIPALITY SPECIFICATIONS, UNLESS OTHERWISE NOTED.
3. PROPER COORDINATION WITH THE RESPECTIVE UTILITY COMPANIES SHALL BE PERFORMED BY THE CONTRACTOR TO INSURE THAT ALL UTILITY COMPANY, LOCAL MUNICIPALITY, AND LOCAL COUNTY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET.
4. ALL WATER MAINS, WATER SERVICES AND SANITARY SEWER LATERALS SHALL CONFORM TO THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, APPLICABLE COUNTY AND LOCAL DEPARTMENTS, AND APPROPRIATE UTILITY COMPANY SPECIFICATIONS.
5. CONTRACTOR TO PROVIDE SLEEVES UNDER FOOTINGS OR THROUGH FOUNDATIONS FOR UTILITY CONNECTIONS.
6. CONTRACTOR SHALL PROVIDE ALL BENDS, FITTINGS, ADAPTERS, ETC. AS REQUIRED.
7. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION PRIOR TO APPROVAL FOR BACKFILL, IN ACCORDANCE WITH THE APPROPRIATE UTILITY COMPANY, LOCAL MUNICIPALITY, AND/OR LOCAL COUNTY REQUIREMENTS.
8. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY COMPANY AND LOCAL AGENCY REVIEW.
9. CAP STUBS AND PROVIDE FIELD MARKERS.
10. FOR PIPE INSTALLATION, PROVIDE TRENCH EXCAVATION, BEDDING AND BACKFILLING, AND COMPACTION PER MAG SPECIFICATION SECTION 601. REFER TO CITY OF SCOTTSDALE STANDARD DETAIL 2201 & 2202 FOR DETAIL.
11. BEDDING MATERIAL TO BE IN ACCORDANCE WITH MAG SECTION 702.2 AND TABLE 702–1.
12. FOR HDPE PIPE INSTALLATION, PROVIDE TRENCH EXCAVATION, BEDDING AND BACKFILLING, AND COMPACTION PER MAG SPECIFICATION SECTION 603.
13. PROTECT CROSSING OF OTHER UTILITIES. MAINTAIN MINIMUM SEPARATION BETWEEN UTILITIES PER CITY OF SCOTTSDALE STANDARD DETAIL 2372.
14. ALL JOINTS FOR D.I.P. WATER MAINS AND SEWER MAINS TO BE RESTRAINED WITH MEGA LUG JOINTS PER MAG STANDARD DETAIL 303–1 AND 303–2 UNLESS OTHERWISE NOTED.
15. ALL PRODUCTS USED ON THIS SITE SHALL CONFORM TO ANSI/NSF STANDARDS 60 AND 61 IN ACCORDANCE WITH REGULATORY CITATION R18–4–213.
16. PROVIDE ANCHOR BLOCKS FOR VERTICAL BENDS PER MAG STANDARD DETAIL 381.
17. PROVIDE WARNING TAPE ABOVE UTILITIES PER CITY OF SCOTTSDALE REQUIREMENTS.
18. PROVIDE 5' MINIMUM COVER FOR SANITARY LEADS AT LOT LINES.
19. PROVIDE 3' MINIMUM COVER FOR WATER SERVICE LEADS AT LOT LINES.
20. MAINTAIN SANITARY SEWER SEPARATION/PROTECTION FROM WATER AND UTILITIES PER CITY OF SCOTTSDALE STANDARD DETAIL 2401.

UTILITIES PLAN KEY MAP

0' 50' 100' 150'

SCALE: 1" = 50'

NORTH

MCESD SIGNATURE BLOCK

SIGNATURE

DATE

Call at least two full working days before you begin excavation.
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LENNAR

PROJECT
PASEO AT PINNACLE PEAK
RESIDENTIAL DEVELOPMENT

LOCATION
7676 E PINNACLE PEAK RD.
SCOTTSDALE, AZ 85244

DRAWN	CULVER
DESIGNED	CULVER
CHECKED	COUNSELL
PROJ. MGR.	FAKIH

DATE: 08/13/2018

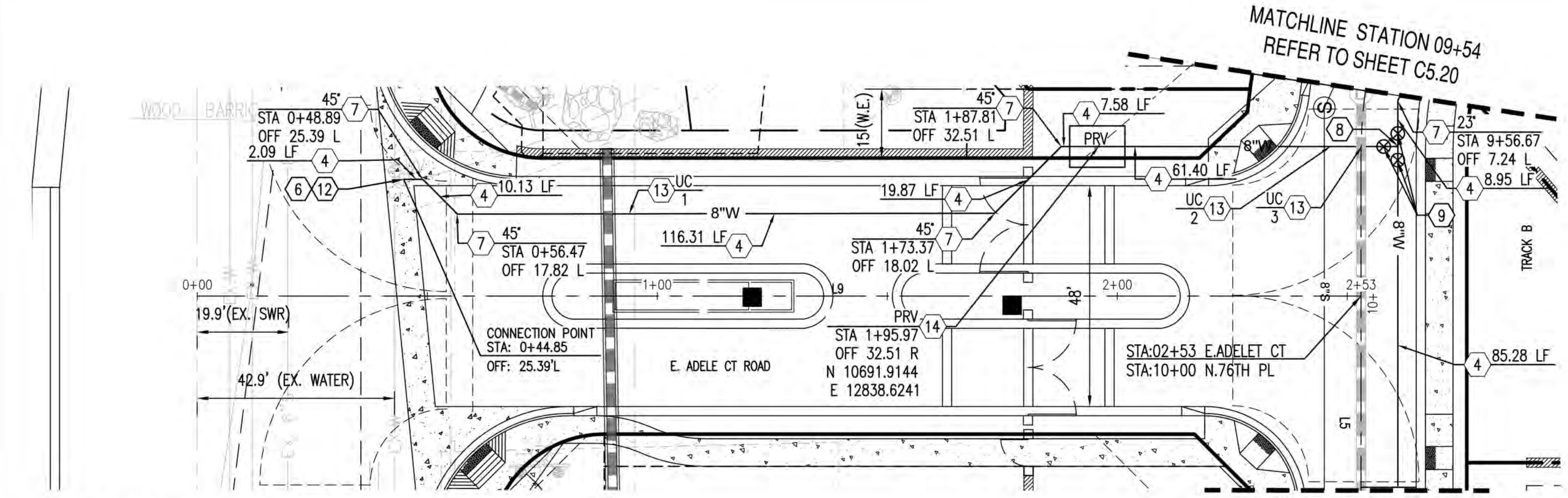
ISSUED FOR: CONSTRUCTION DOCUMENTS

REVISION NO.:		DATE:
1		
2		
3		
4		

JOB NO.: 170566

SHEET TITLE: OVERALL UTILITY PLAN KEY MAP & NOTES

SHEET NO.: C4.00



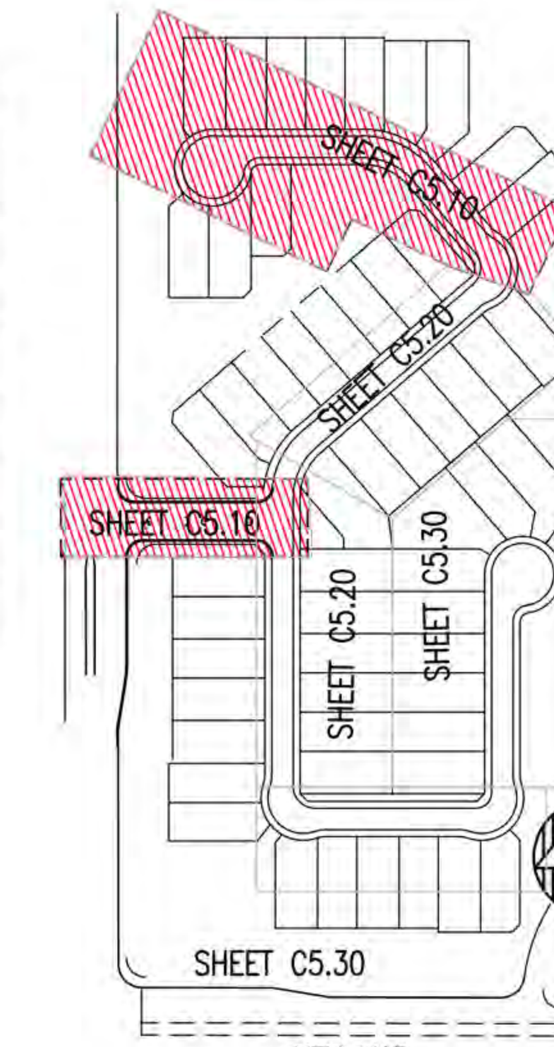
ENLARGED WATER PLAN
E. ADELE CT ROAD

SCALE: 1" = 20' HORIZONTAL

WATER CONSTRUCTION NOTES

1. FURNISH & INSTALL 1" COPPER TYPE "K" WATER SERVICE LINE CONNECTION PER COS STD DET 2330
2. FURNISH & INSTALL FIRE HYDRANT (INCLUDING 6" GATE VALVE, BOX & COVER) PER MAG STD DET 360. PROVIDE PAVEMENT (PM) MARKER PER COS STD DET 2363.
3. INSTALL METER BOX WITHIN 3 FEET OF PROPERTY LINE. (METER TO BE INSTALLED BY CITY FORCES)
4. FURNISH & INSTALL 8" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN.
5. FURNISH & INSTALL 16"X8" TAPPING SLEEVE, VALVE BOX & COVER PER MAG STD DET 340 AND 391-1 TYPE A.
6. CONTRACTOR TO VERIFY SIZE AND LOCATION OF EXISTING WATER LINE PRIOR TO CONSTRUCTION.
7. FURNISH & INSTALL 8" BEND, ANGLE PER PLAN. PROVIDE ELECTRONIC MARKER PER COS STD DET 2397.
8. FURNISH & INSTALL 8"X8" TEE.
9. FURNISH & INSTALL 8" GATE VALVE, BOX & COVER PER MAG STD DET 340, AND 391-1 WITH 40" DIAMETER CONCRETE COLLAR.
10. FURNISH & INSTALL 6" D.I.P. WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN.
12. REMOVE PLUG AND CONNECT TO EXISTING 8" STUB
13. UTILITY CROSSING PROTECTION NOTE
14. CONSTRUCT 8" PRV PER COS STD DTL
15. FURNISH & INSTALL 8"X6" TEE.

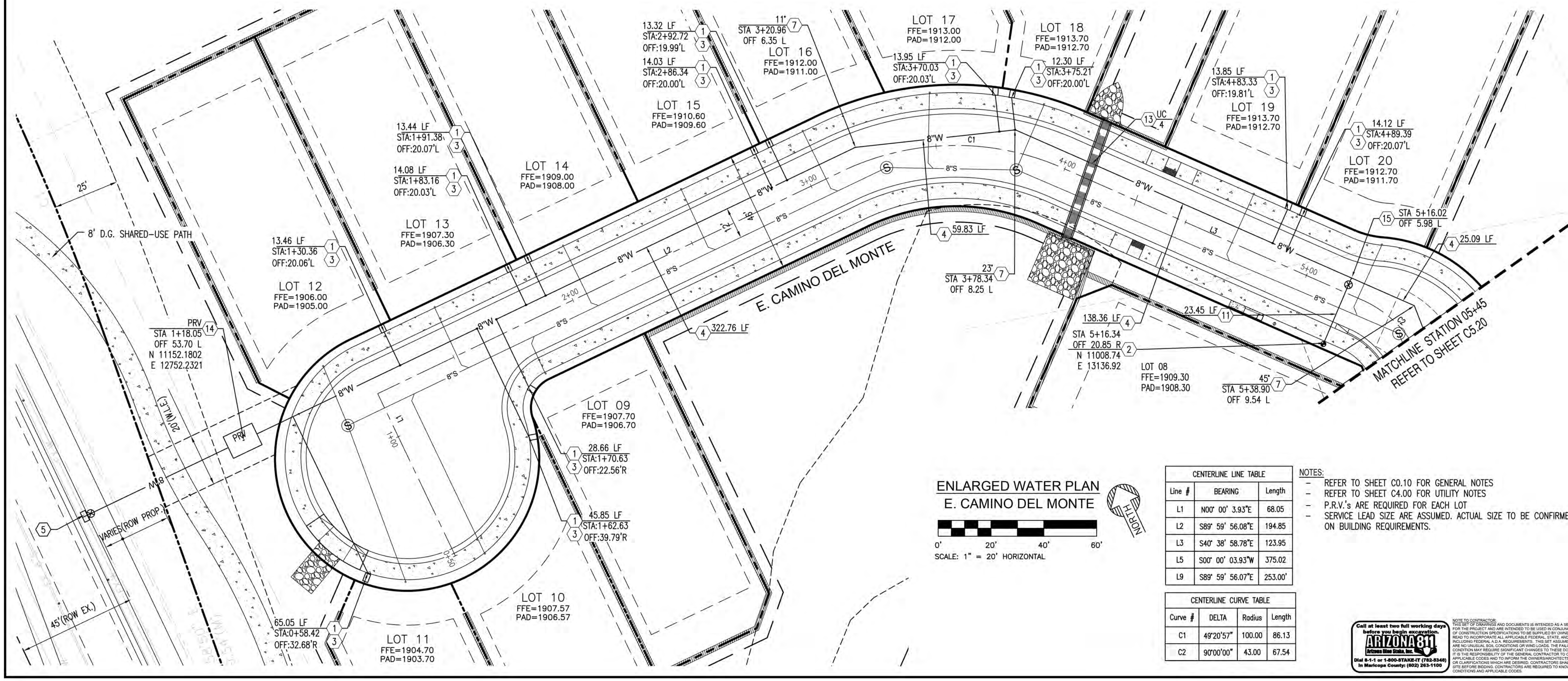
UTILITY CROSSINGS		
UC-1	STORM BOT	1889.76
	WATER TOP	1888.53
UC-2	WATER BOT	1888.50
	SEWER TOP	1886.48
UC-3	STORM BOT	1891.97
	WATER TOP	1889.27
UC-4	STORM BOT	1905.40
	WATER TOP	1904.41



KEY MAP
SCALE 1:250'

LEGEND

RIGHT-OF-WAY
EASEMENT LINE



ENLARGED WATER PLAN
E. CAMINO DEL MONTE

SCALE: 1" = 20' HORIZONTAL

CENTERLINE LINE TABLE		
Line #	BEARING	Length
L1	N00° 00' 3.93"E	68.05
L2	S89° 59' 56.08"E	194.85
L3	S40° 38' 58.78"E	123.95
L5	S00° 00' 03.93"W	375.02
L9	S89° 59' 56.07"E	253.00'

CENTERLINE CURVE TABLE			
Curve #	DELTA	Radius	Length
C1	49°20'57"	100.00	86.13
C2	90°00'00"	43.00	67.54

NOTES:
- REFER TO SHEET C0.10 FOR GENERAL NOTES
- REFER TO SHEET C4.00 FOR UTILITY NOTES
- P.R.V.'s ARE REQUIRED FOR EACH LOT
- SERVICE LEAD SIZE ARE ASSUMED. ACTUAL SIZE TO BE CONFIRMED BASED ON BUILDING REQUIREMENTS.

Call at least two full working days before you begin excavation.
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SEG SUSTAINABILITY ENGINEERING GROUP
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LENNAR

PROJECT
PASEO AT PINNACLE PEAK
RESIDENTIAL DEVELOPMENT

LOCATION
7676 E. PINNACLE PEAK RD.
SCOTTSDALE, AZ 85244

DRAWN: CULVER
DESIGNED: CULVER
CHECKED: COUNSELL
PROJ. MGR.: FAKIH

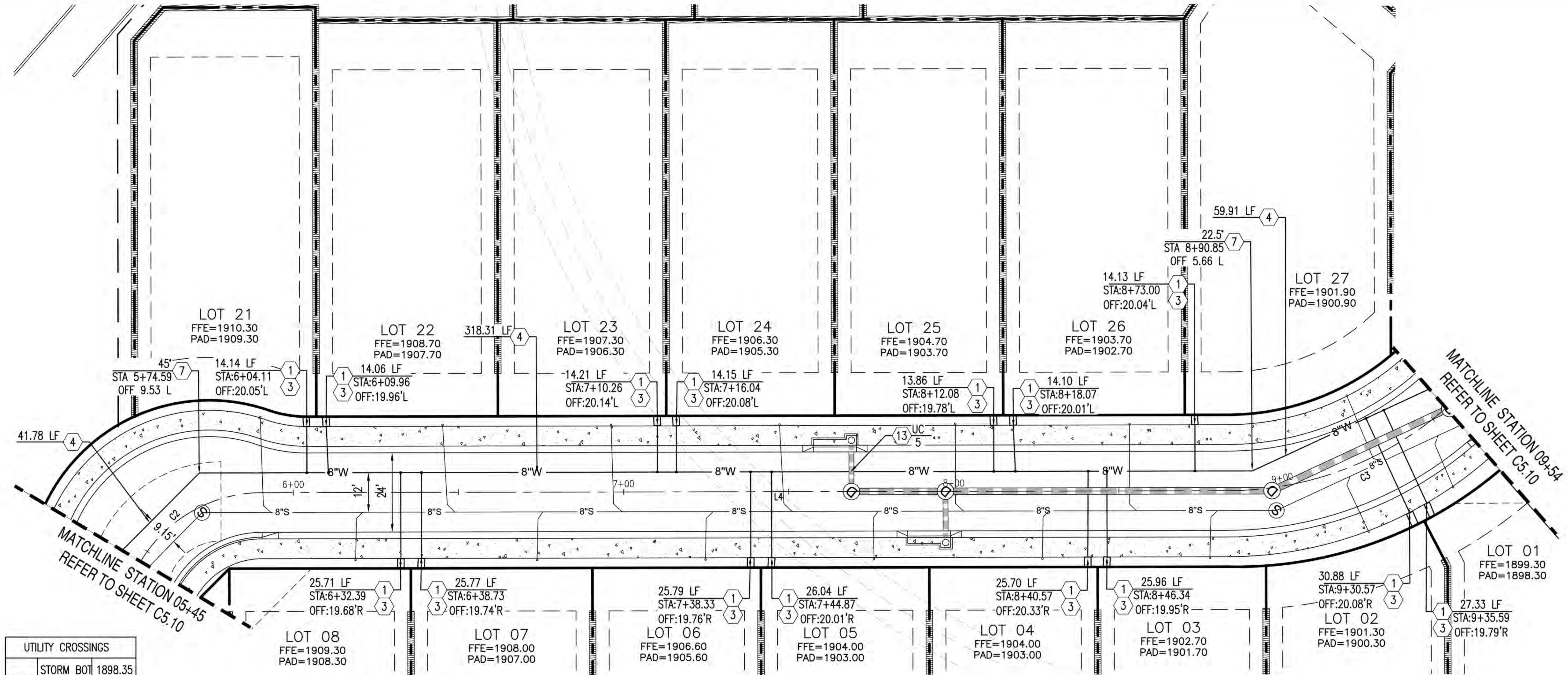
DATE: 08/13/2018
ISSUED FOR: CONSTRUCTION DOCUMENTS

REVISION NO.: DATE:

JOB NO.: 170566

SHEET TITLE: WATER PLAN

SHEET NO.: C5.10



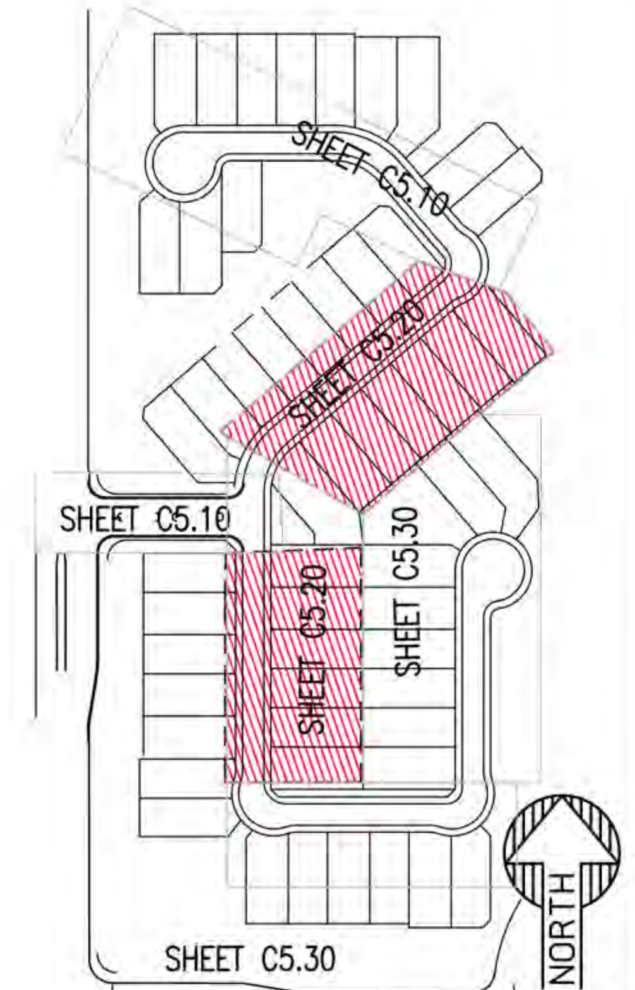
ENLARGED WATER PLAN
E. CAMINO DEL MONTE

0' 20' 40' 60'

SCALE: 1" = 20' HORIZONTAL

NORTH

UTILITY CROSSINGS		
UC-5	STORM BOT	1898.35
	WATER TOP	1896.13
UC-6	STORM BOT	1884.62
	WATER TOP	1883.62



CENTERLINE LINE TABLE		
Line #	BEARING	Length
L4	S49° 21' 01.22"W	292.53
L5	S00° 00' 03.93"W	375.02

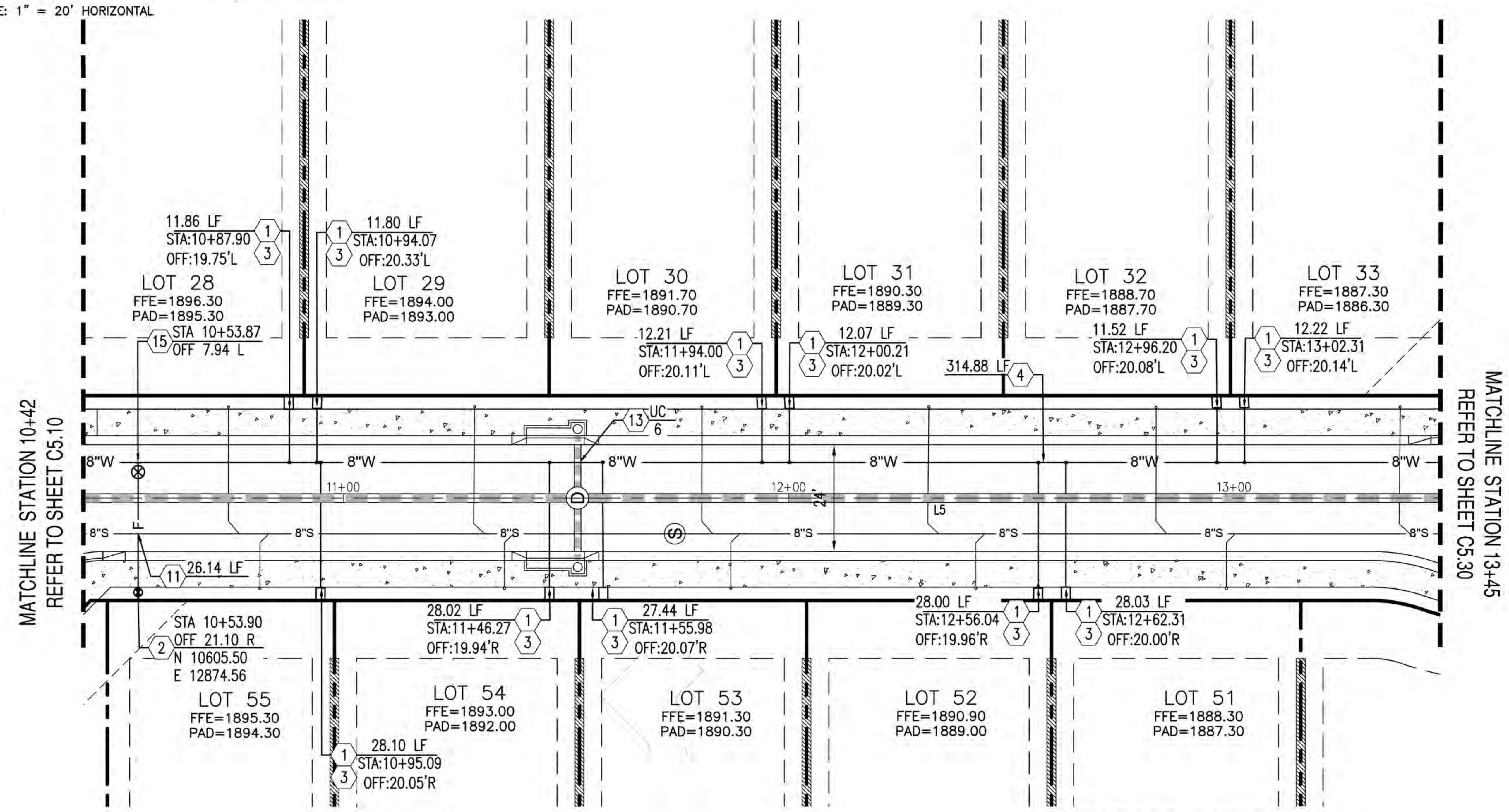
CENTERLINE CURVE TABLE			
Curve #	DELTA	Radius	Length
C2	90°00'00"	43.00	67.54
C3	49°20'57"	100.00	86.13

NOTES:
- REFER TO SHEET C0.10 FOR GENERAL NOTES
- REFER TO SHEET C4.00 FOR UTILITY NOTES
- P.R.V.'s ARE REQUIRED FOR EACH LOT
- SERVICE LEAD SIZE ARE ASSUMED. ACTUAL SIZE TO BE CONFIRMED BASED ON BUILDING REQUIREMENTS.

LEGEND

RIGHT-OF-WAY

EASEMENT LINE



ENLARGED WATER PLAN
N. 76TH PL ROAD

0' 20' 40' 60'

SCALE: 1" = 20' HORIZONTAL

NORTH

WATER CONSTRUCTION NOTES

1. FURNISH & INSTALL 1" COPPER TYPE "K" WATER SERVICE LINE CONNECTION PER COS STD DET 2330
2. FURNISH & INSTALL FIRE HYDRANT (INCLUDING 6" GATE VALVE, BOX & COVER) PER MAG STD DET 360. PROVIDE PAVEMENT (PM) MARKER PER COS STD DET 2363.
3. INSTALL METER BOX WITHIN 3 FEET OF PROPERTY LINE. (METER TO BE INSTALLED BY CITY FORCES)
4. FURNISH & INSTALL 8" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN.
7. FURNISH & INSTALL 8" BEND, ANGLE PER PLAN. PROVIDE ELECTRONIC MARKER PER COS STD DET 2397.
11. FURNISH & INSTALL 6" D.I.P. WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN.
13. UTILITY CROSSING PROTECTION NOTE
15. FURNISH & INSTALL 8"X6" TEE.

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LENNAR®

PROJECT
PASEO AT PINNACLE PEAK
RESIDENTIAL DEVELOPMENT

LOCATION
7676 E PINNACLE PEAK RD.
SCOTTSDALE, AZ 85244

DRAWN: CULVER
DESIGNED: CULVER
CHECKED: COUNSELL
PROJ. MGR.: FAKIH

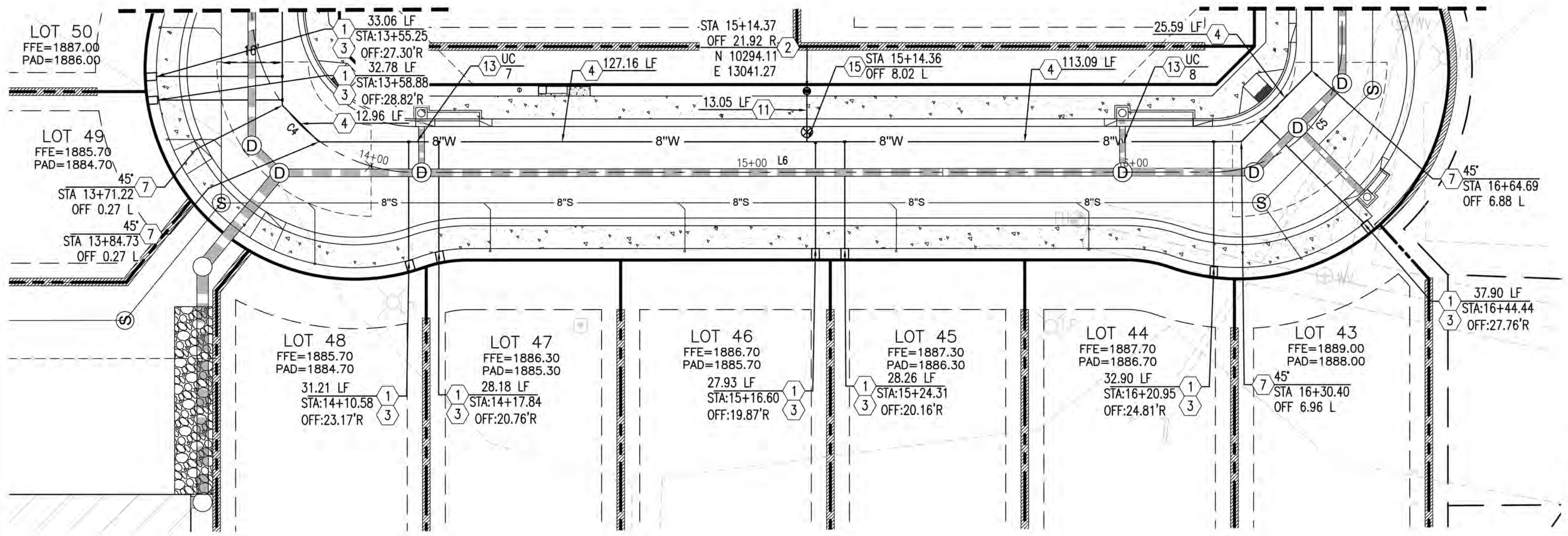
DATE: 08/13/2018
ISSUED FOR: CONSTRUCTION DOCUMENTS

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 170566

SHEET TITLE: WATER PLAN

SHEET NO.: C5.20

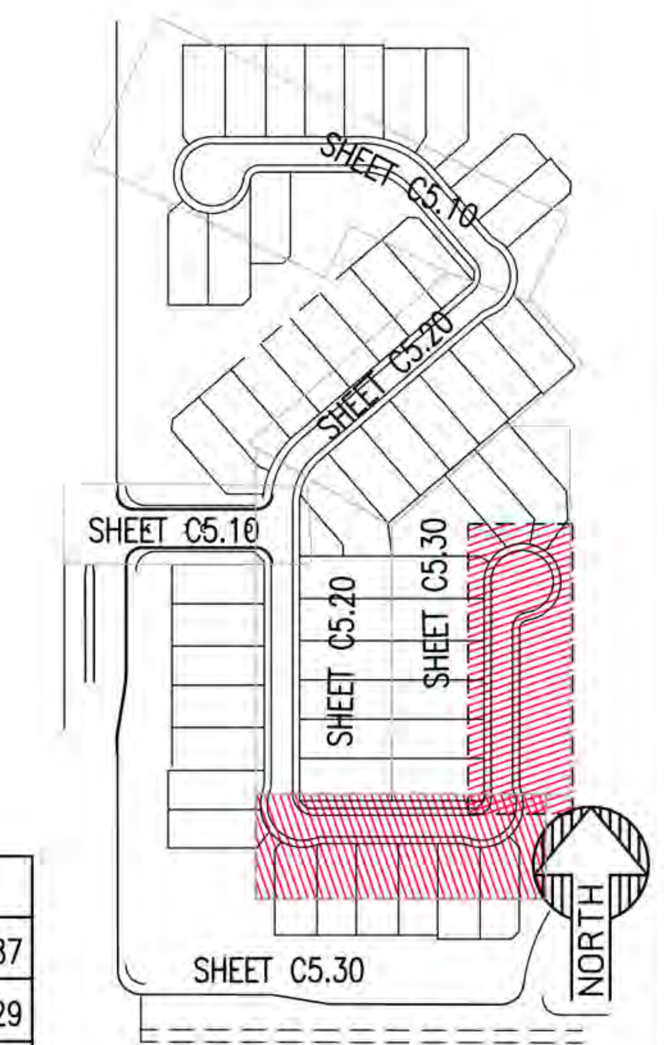


ENLARGED WATER PLAN
E. CAMINO VIVAZ

0' 20' 40' 60'
SCALE: 1" = 20' HORIZONTAL

NORTH

UTILITY CROSSINGS		
UC-7	STORM BOT	1878.87
	WATER TOP	1876.29
UC-8	STORM BOT	1880.37
	WATER TOP	1879.37
UC-9	STORM BOT	1886.87
	WATER TOP	1885.87
UC-10	SEWER BOT	1887.44
	WATER TOP	1888.69

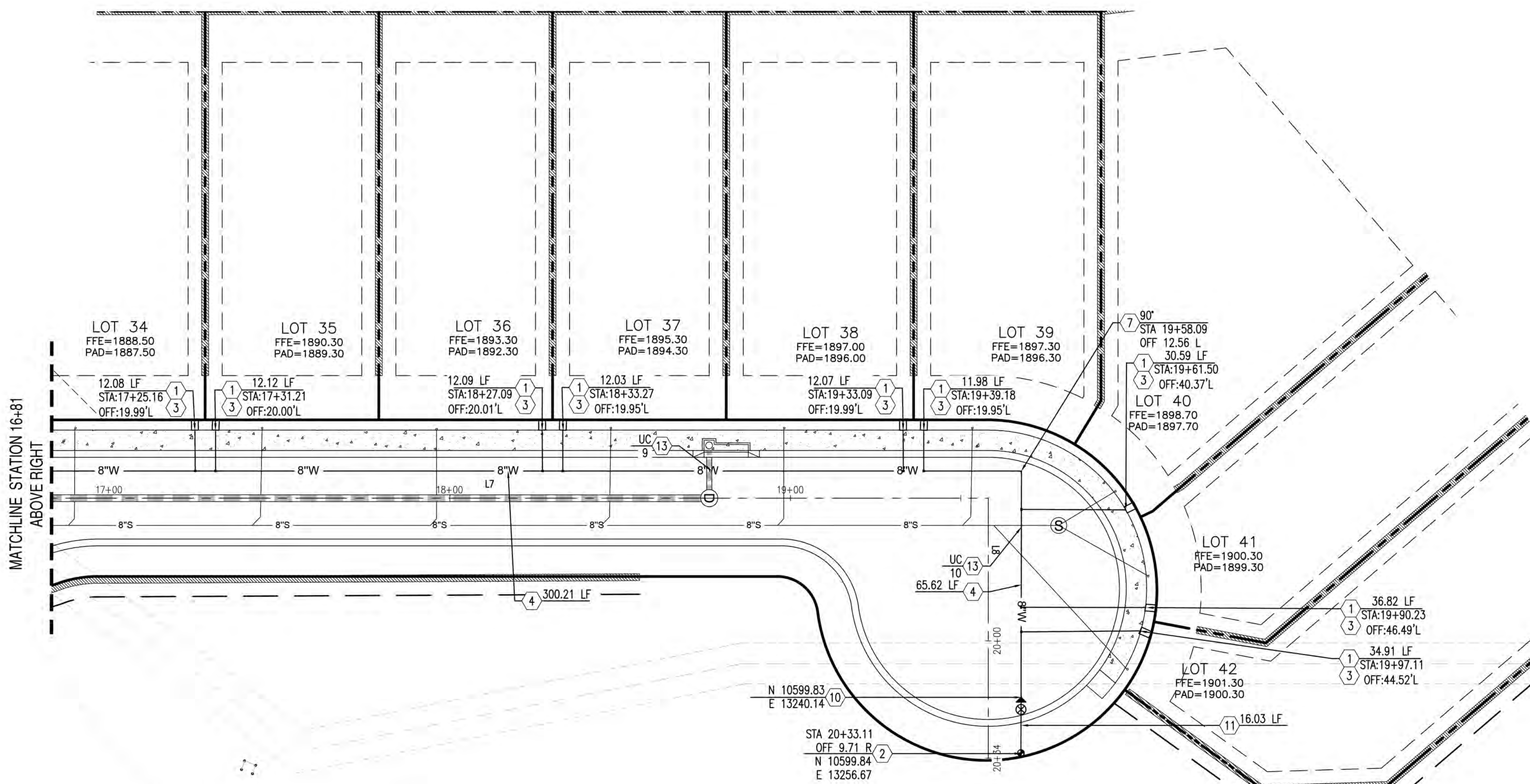


CENTERLINE LINE TABLE

Line #	BEARING	Length
L6	S89° 59' 56.07"E	209.00
L7	N00° 00' 03.93"E	283.93
L8	S89° 59' 56.07"E	77.00

CENTERLINE CURVE TABLE

Curve #	DELTA	Radius	Length
C4	90°00'00"	43.00	67.54
C5	90°00'00"	34.00	53.41



NOTES:
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- P.R.V.'s ARE REQUIRED FOR EACH LOT
- SERVICE LEAD SIZE ARE ASSUMED. ACTUAL SIZE TO BE CONFIRMED BASED ON BUILDING REQUIREMENTS.

LEGEND

RIGHT-OF-WAY
EASEMENT LINE

WATER CONSTRUCTION NOTES

1. FURNISH & INSTALL 1" COPPER TYPE "K" WATER SERVICE LINE CONNECTION PER COS STD DET 2330
2. FURNISH & INSTALL FIRE HYDRANT (INCLUDING 6" GATE VALVE, BOX & COVER) PER MAG STD DET 360. PROVIDE PAVEMENT (PM) MARKER PER COS STD DET 2363.
3. INSTALL METER BOX WITHIN 3 FEET OF PROPERTY LINE. (METER TO BE INSTALLED BY CITY FORCES)
4. FURNISH & INSTALL 8" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN.
7. FURNISH & INSTALL 8" BEND, ANGLE PER PLAN. PROVIDE ELECTRONIC MARKER PER COS STD DET 2397.
10. FURNISH & INSTALL 8"X6" REDUCER
11. FURNISH & INSTALL 6" D.I.P. WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN.
13. UTILITY CROSSING PROTECTION NOTE
15. FURNISH & INSTALL 8"X6" TEE.

ENLARGED WATER PLAN
N. 76TH WAY

0' 20' 40' 60'
SCALE: 1" = 20' HORIZONTAL

NORTH

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DESIGNED: CULVER
CHECKED: COUNSELL
PROJ. MGR.: FAKIH

DATE: 08/13/2018
ISSUED FOR: CONSTRUCTION DOCUMENTS

REVISION NO.: DATE:

JOB NO.: 170566

SHEET TITLE: WATER PLAN

SHEET NO.: C5.30