ALLEN

CONSULTING ENGINEERS, INC.

APN# 304-91-045J & 304-91-045K

(A.C.E. Job # 97839)

June 17, 2024

Prepared by: Allen Consulting Engineers, Inc.
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INTRODUCTION

This drainage report for 26026 S. Ellsworth Road will outline the hydrology and hydraulic calculations and procedures for the further development of this site. This report will be submitted per the requirements outlined in the current version of the Town of Queen Creek Subdivision Ordinance as well as the current version of the Maricopa County Drainage Policies and Standards, Drainage Design Manuals for Maricopa County, Volume 1 – Hydrology and Volume 2 – Hydraulics, and Section 1205 of the Maricopa County Zoning Ordinance per form 712A Drainage Report #10. The results of this study will be used to ensure the site structures are free from flooding for the 100 year storm event. All designs in this report will be developed in accordance with the current Maricopa County regulations, standards and policies.

LOCATION

The development is located within a portion in the southeast quarter of Section 33, Township 2 South, Ranch 7 East at the intersection of Ellsworth Road and San Tan Boulevard in Queen Creek on 4.19 acres. Refer to Figure 1 for a location map.

SITE DESCRIPTION

The site consists of vacant lots with existing retention basins along the eastern property line for offsite retention purposes. The site slopes from south to north at approximately 0.008'/'.

PROPOSED DEVELOPMENT

Four apartment buildings are proposed for the site with onsite retention provided. The retention basin system for the project will be divided between onsite and offsite flows. The onsite retention basins can be found along the western and southern property lines with onsite grading and valley gutters directing the flow to these areas. Offsite flows from Ellsworth Road enter the site via existing scuppers which some will remain and others will be relocated or proposed.

FEMA FLOODPLAIN CLASSIFICATION

This site lies in flood zone "X" per FIRM Panel 04013C3135L dated 10-16-2013. Therefore, there is not any portion of this site that will lie within any designated floodplain and no flood insurance will be required. Please refer to Figure 3 for a FIRM map.

OFFSITE DRAINAGE DESCRIPTION

The site accepts and retains offsite flow from Ellsworth Road via existing scuppers. The required retention volume of the half street was calculated and the new development will continue providing onsite retention for the offsite flows.

ONSITE DRAINAGE CONVEYANCE

Drainage runoff generated from the proposed development will be directed to the western and southern retention basins via valley gutters and onsite grading.

Weighted runoff “C” coefficients were calculated and used to determine the peak flows. Refer to Appendix A for weighted “C” coefficient calculations. Finished floors shall be set at the higher elevation of either 14-inches above the low lot outfall, or 12-inches above the 100-year water surface elevation.

RETENTION BASIN DESIGN

The proposed retention basin systems for this development will be designed to accommodate the volume of runoff generated by the 100-year 2-hour duration storm event. Any retention basins adjacent to local streets will be designed with a maximum ponding depth of 1.0 foot with 6:1 side slopes. The retention volume required has been divided between onsite and offsite drainage areas and weighted coefficients. On lot retention basins may be designed with a maximum of 4:1 side slopes. The basins along the western and southern property lines are 2.5 feet deep with Maxwell Plus drywells installed to drain the basins within 36 hours. Refer to the G&D plan for the location of the Maxwell Plus drywells. Storm water retention for the development adjacent to Ellsworth Road will be retained via above ground retention basins 1 foot deep. Refer to Appendix A for retention calculations.

RETENTION BASIN DRAIN TIME

All retention basins will be required to drain within 36 hours per Section 3.11.6 of the Maricopa County Drainage Policies and Standards Manual. Drywells are proposed in retention basins deeper than 1-ft. Basins 2 and 3 are connected via a bleed off pipe and therefore only require 1 drywells between the 2 basins. An assumed rate of 0.1 CFS is used to determine the # of drywells required. Basins 1-ft deep and shallower will drain via natural percolation with no drywells required. Refer to Appendix B for drain time calculations.

SUMMARY AND CONCLUSIONS

1.) Finished floor elevations will be set at the higher elevation of either 12” above the 100-year water surface elevation and 14” above the low lot outfall.
2.) Offsite flows are retained onsite along Ellsworth Road.
3.) Storm water runoff from the site will be retained within onsite above ground retention basins. These retention basins will provide retention for the 100-year 2-hour storm event in accordance with Flood Control District of Maricopa County Drainage Design Manual.
4.) This grading and drainage plan and drainage report are based on the standards and policies of the Maricopa County Flood Control Department.

REFERENCES:

Flood Control District of Maricopa County, Drainage Design Manual for Maricopa County – Volume II, Hydraulics, August 2013.

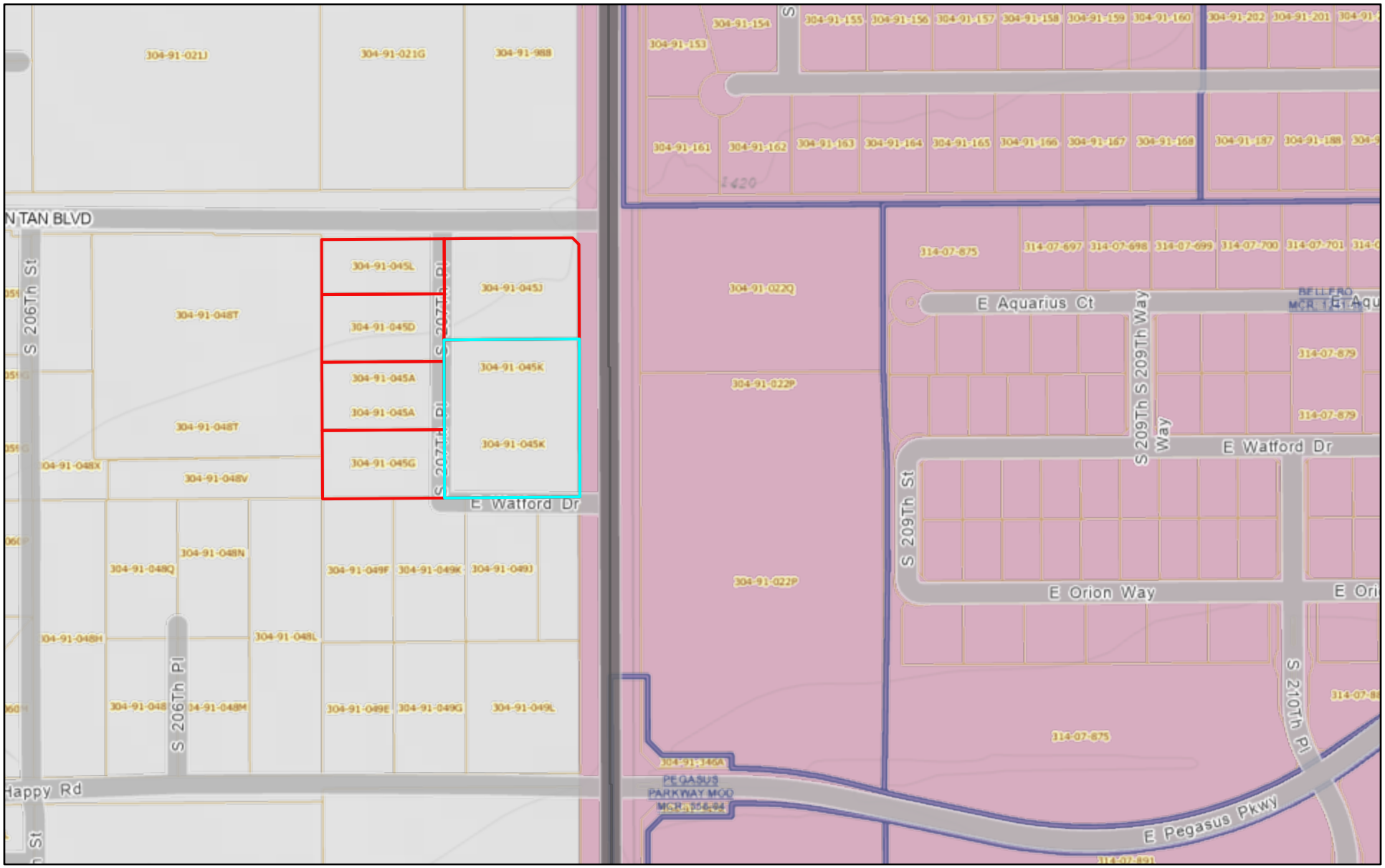
Flood Control District of Maricopa County, Drainage Design Manual for Maricopa County – Volume I, Hydrology, August 2013.

Flood Control District of Maricopa County, Drainage Policies and Standards Manual, January 2007.

Town of Queen Creek, Subdivision Ordinance, October 2008.

FIGURES

FIGURE 1 - AREA LOCATION MAP



June 17, 2024

Override 1

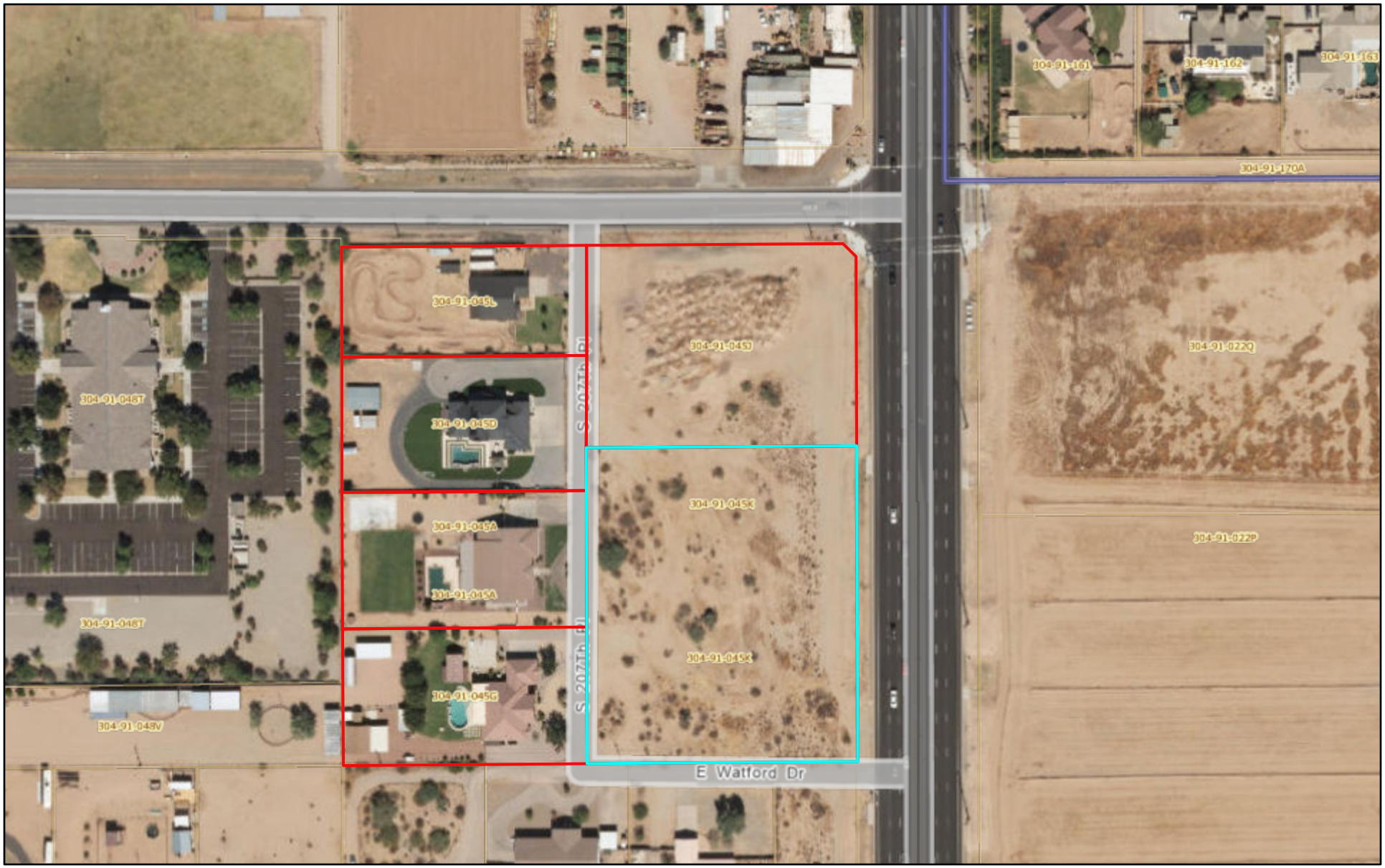
1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Maricopa County GIO, Maricopa County Assessor's Office

FIGURE 2 - SITE AERIAL MAP



June 17, 2024

Override 1

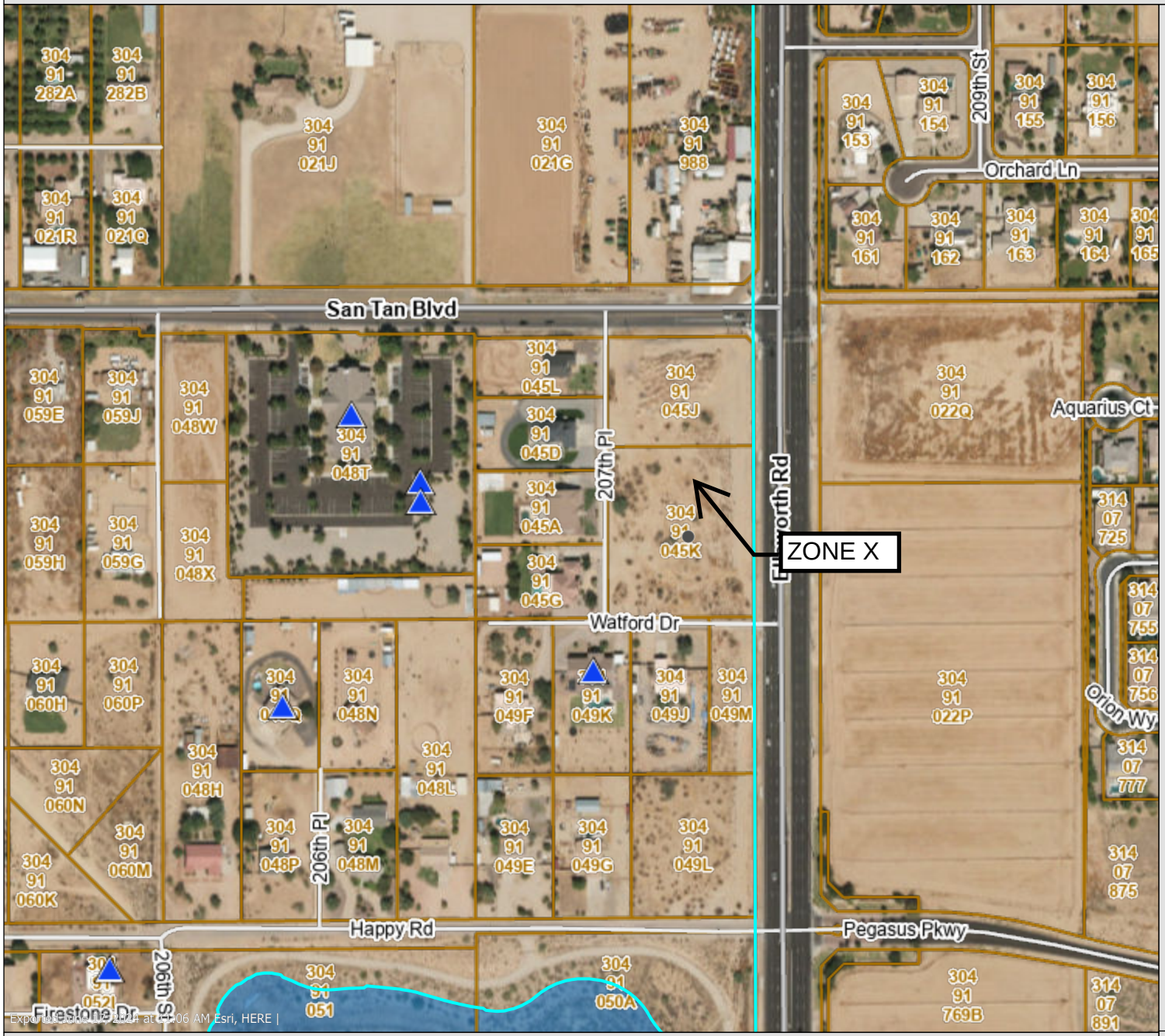
1:2,257

0 0.01 0.03 0.06 mi

0 0.03 0.05 0.1 km

Maricopa County GIO, Maricopa County Assessor's Office

FIGURE 3 - FEMA FLOODPLAIN



- Elevation Certificate
- Local
- Arterial

Highway

- Interstate Highway
- State\US\Other Highway
- Interchange\Ramp
- Parcel

Floodplain (Pending FEMA Approval)

- Floodway
- 100-Year Flood Zone

Floodplain (FEMA Effective)

- Floodway
- 100-Year Flood Zone

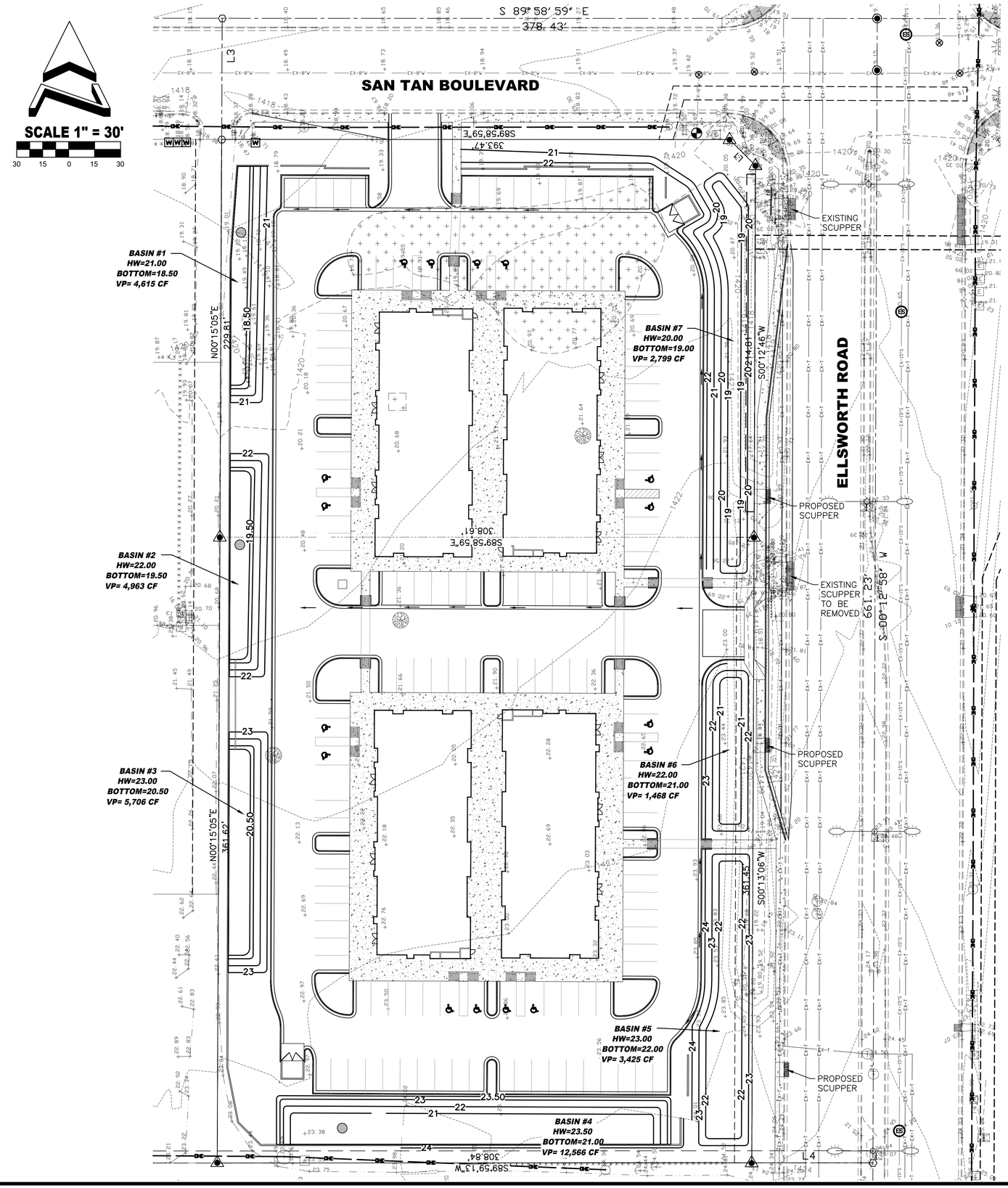
N 1:4,514 1 inch = 148 feet

0 0 0 0 mi

Flood Control District of Maricopa County
2801 W Durango St
Phoenix, AZ 85009
(602) 506-2419
http://www.fcd.maricopa.gov

Unofficial Document

This document cannot be used for floodplain determinations. Current studies, erosion setbacks and other factors may also affect the floodplain status of the property. The information shown for pending floodplains are the best technical information available at this time to determine the 1% chance flood and are subject to change.



PRELIMINARY DRAINAGE MAP

A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 7 EAST OF THE G.&S.R.B.&M., MARICOPA COUNTY, ARIZONA.

RETENTION CALCULATIONS - ONSITE

VOLUME REQUIRED = C X A X (D/12)

A=182,409 SF

WEIGHTED C COEFFICIENT
CONCRETE/ASPHALT(0.95) – 131,973 SF
LANDSCAPING(0.50) – 50,436 SF

$\frac{(131{,}973 * 0.95) + (50{,}436 * 0.50)}{182{,}409 \text{ SF}} = 0.83$

C=0.83
D=2.2"
A=182,409 SF

VOLUME REQUIRED = LOT AREA X C VALUE X (2.2/12)
= 182,409 X 0.83 X (2.2/12)
= 27,757 C.F. NEEDED

BASIN 1 = $\frac{(2{,}572 + 1{,}120)}{2}$ X 2.5' = 4,615 CF

BASIN 2 = $\frac{(2{,}745 + 1{,}225)}{2}$ X 2.5' = 4,963 CF

BASIN 3 = $\frac{(3{,}104 + 1{,}461)}{2}$ X 2.5' = 5,706 CF

BASIN 4 = $\frac{(6{,}325 + 3{,}728)}{2}$ X 2.5' = 12,566 CF

VOLUME PROVIDED = 27,850 C.F. PROVIDED

RETENTION CALCULATIONS - OFFSITE

VOLUME REQUIRED = C X A X (D/12)

A = 40,329 SF

WEIGHTED C COEFFICIENT
CONCRETE/ASPHALT(0.95) – 35,992 SF
LANDSCAPING(0.50) – 4,337 SF

$\frac{(35{,}992 * 0.95) + (4{,}337 * 0.50)}{40{,}329 \text{ SF}} = 0.90$

C=0.90
D=2.2"
A=40,329 SF (HALF STREET ALONG ELLSWORTH)

VOLUME REQUIRED = AREA X C VALUE X (2.2/12)
= 40,329 X 0.90 X (2.2/12)
= 6,654 C.F. NEEDED

BASIN 5 = $\frac{(4{,}169 + 2{,}680)}{2}$ X 1.0' = 3,425 CF

BASIN 6 = $\frac{(1{,}882 + 1{,}053)}{2}$ X 1.0' = 1,468 CF

BASIN 7 = $\frac{(3{,}765 + 1{,}833)}{2}$ X 1.0' = 2,799 CF

VOLUME PROVIDED = 7,692 C.F. PROVIDED

Registered Professional Engineer (Civil)
CERTIFICATE NO.
80281
CUTTER A. ZAUGG
06/17/2024
ARIZONA, U.S.A.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

DATE
1
2
3
4

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APN'S 304-91-045J & 304-91-045K
26026 S. ELLSWORTH ROAD
QUEEN CREEK, AZ 85142
DRAINAGE MAP

JOB NUMBER	97839	SHEET	1	OF	1
DRAWING	G&D				
DRAFTSMAN		CHECKED BY		DATE	06/17/2024

APPENDIX A
Retention Calculations

ONSITE RETENTION REQUIRED

VR = C * A * (D/12)

A = Lot Area = 182,409 SF

Weighted C Coefficient

Concrete/Asphalt (0.95) = 131,973 SF
Landscaping (0.50) = 50,436 SF

C = ((131,973 * 0.95) + (50,436 * 0.50))/(182,409 SF) = 0.83

VR = (0.83) * (182,409) * (2.2/12)
Volume Required = 27,757 CF

ONSITE RETENTION PROVIDED

BASIN 1 = ((2,572 + 1,120)/2) * 2.5’ = 4,615 CF

BASIN 2 = ((2,745 + 1,225)/2) * 2.5’ = 4,963 CF

BASIN 3 = ((3,104 + 1,461)/2) * 2.5’ = 5,706 CF

BASIN 4 = ((6,325 + 3,728)/2) * 2.5’ = 12,566 CF

Volume Provided = 27,850 CF

OFFSITE RETENTION REQUIRED

VR = C * A * (D/12)

A = Half Street Area = 40,329 SF

Weighted C Coefficient

Concrete/Asphalt (0.95) = 35,992 SF
Landscaping (0.50) = 4,337 SF

C = ((35,992 * 0.95) + (4,337 * 0.50))/(40,329 SF) = 0.90

VR = (0.90) * (40,329) * (2.2/12)
Volume Required = 6,654 CF

OFFSITE RETENTION PROVIDED

BASIN 5 = ((4,169 + 2,680)/2) * 1.0’ = 3,425 CF

BASIN 6 = ((1,882 + 1,053)/2) * 1.0’ = 1,468 CF

BASIN 7 = ((3,765 + 1,833)/2) * 1.0’ = 2,799 CF

Volume Provided = 7,692 CF

APPENDIX B

Basin Drain Time Calculations

Drywell Percolation Rate (Assumed) = 0.1 cfs

Basin 1 Volume = 4,615 CF
Basin 1 Drain Time = (4,615 CF) / (0.1 cfs) = 46,150 seconds = **12.82 Hours**

Basin 2+3 Volume = 10,669 CF
Basin 1 Drain Time = (10,669 CF) / (0.1 cfs) = 106,690 seconds = **29.64 Hours**

Basin 4 Volume = 12,566 CF
Basin 1 Drain Time = (12,566 CF) / (0.1 cfs) = 125,560 seconds = **34.88 Hours**

Basins 5, 6 and 7 are 1 foot deep and do not require drywells.