

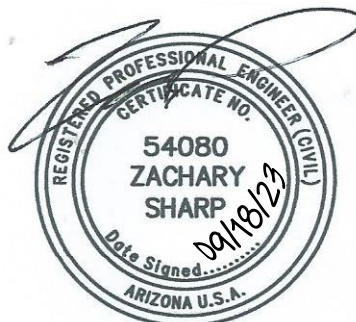


PRELIMINARY WATER REPORT
FOR
PHOENIX COUNTRY DAY SCHOOL
PERFORMING ARTS CENTER

PARADISE VALLEY, ARIZONA

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KIVA: XX-XXXX

September 2023
HW Project No. 1648.02

Prepared For:

9/18/23

ADM Group, Inc.
2100 West 15th Street
Tempe, AZ 85281

Date

Prepared and Submitted By:

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9/18/23

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Date

City of Phoenix Approvals:

Planning and Development Director

Date

Water Services Director

Date

**PRELIMINARY WATER REPORT
FOR
PHOENIX COUNTRY DAY SCHOOL PERFORMING ARTS CENTER**

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1.0 INTRODUCTION

1.1 Background and Project Location

Phoenix Country Day School Performing Arts Center (the Project) is a proposed performing arts school building within the overall existing Phoenix Country Day School (PCDS) campus, located south of Stanford Drive and west of 40th Street in the Town of Paradise Valley (the Town), Arizona. The Project occupies approximately 20.4 acres in a portion of Section 13, Township 2 North, Range 3 East of the Gila and Salt River Meridian. Figure 1 in Appendix A provides a vicinity map for the Project and the overall PCDS campus. It is estimated that approximately 800 students are enrolled at the PCDS campus.

1.2 General Description

The Project will consist of a single performing arts school building with a footprint of approximately 18,250 square feet, parking areas, and landscaped areas. The performing arts building will replace an existing parking lot, adding to the 13 existing buildings within the PCDS campus. The PCDS campus and surrounding area generally drain south and east at approximately 1.3 percent towards the Echo Canyon Wash. The Project is located within the City of Phoenix water service area, in Pressure Zone 3B. The water infrastructure for the Project will be owned and operated by the City of Phoenix.

1.3 Purpose of Report

The purpose of this Preliminary Water Report (Report) is to identify and evaluate the proposed water system infrastructure required for serving the Project in accordance with the *Design Standards Manual for Water and Wastewater Systems* (City of Phoenix, 2021). This Report discusses the existing water infrastructure within the Project vicinity and identifies anticipated demands for average day, peak day, and peak day plus fire flow conditions, and identifies anticipated water line sizes and alignments.

2.0 DESIGN CRITERIA

2.1 City of Phoenix Design Criteria

The proposed water system infrastructure for the Project has been prepared and evaluated consistent with the City's current design criteria as identified in the *Design Standards Manual for Water and Wastewater Systems* (City of Phoenix, 2021). These criteria are summarized in Table 1 below.

TABLE 1 WATER SYSTEM DESIGN CRITERIA ¹			
Category		Value	Unit
Average Day Water Demand			
	Schools	25	gpd/Student
	General Landscaping	4,374	gpd/ac
Peaking Factors ²			
	Peak Day Demand	1.7	x Average Day
Average Day System Performance			
	Minimum Pressure	50	psi
	Maximum Pressure ³	100	psi
Peak Day System Performance			
	Minimum Pressure	50	psi
	Maximum Pressure ³	100	psi
	Maximum Velocity	5	fps
	Maximum Head loss	10	ft/1,000 ft
Peak Day + Fire Flow System Performance			
	Minimum Pressure	25	psi
	Maximum Velocity	10	fps
	Fire Flow – Performing Arts Building - Type VB (23,301-26,300 square feet) ⁴	2,125	gpm for 4 hours
Minimum Pipe Diameter		8	inches
Hazen Williams 'C' Factor		130	
Notes: 1. Design criteria based on the City of Phoenix 2021 <i>Design Standards Manual for Water and Wastewater Systems</i> (City of Phoenix 2021). 2. Peaking factors not applied to General Landscaping as watering cycles are anticipated to remain constant. 3. Any structure experiencing pressures greater than 80 psi shall have an individual PRV. 4. The performing arts building area is the largest under roof area and includes proposed footprint from the ground level and balcony/mezzanine level. Fire flow assumes fire sprinklers will be provided. Building type will be confirmed and could reduce fire flow requirements.			

3.0 WATER DEMANDS

3.1 Land Use

The Project will consist of a single additional school building and open space uses. Table 2 shows the anticipated land use and density for the Project.

TABLE 2 LAND USE AND DENSITY				
Phase	Land Use	Gross Area (ac)	Students	Open Space (ac)
Performing Arts Building	Schools	0.6	800	0.1
Grand Total		0.6	800	0.1

3.2 Water Demand Calculations

Anticipated water demands for the Project have been calculated in accordance with the design criteria listed in Table 1 and the land use listed in Table 2. Table 3 summarizes the projected water demands for the Project. Detailed water demand calculations are provided in Table B.1 in Appendix B.

TABLE 3 TOTAL WATER DEMAND SUMMARY						
Phase	Average Day Demand				Peak Day Demand	
	Open Space (gpd)	Land Use (gpd)	Total			
			gpd	gpm	gpd	gpm
Performing Arts Building	602	20,000	20,602	14.3	34,602	24.0
Grand Total	602	20,000	20,602	14.3	34,602	24.0

4.0 WATER SYSTEM INFRASTRUCTURE

4.1 Existing Water System Infrastructure

Excerpts of the plans included in Appendix C show the existing water infrastructure within the Project vicinity. Existing water infrastructure immediately adjacent to the Project includes 8-inch water mains along Stanford Drive, and a number of connections from the PCDS campus to the existing infrastructure within Stanford Drive. This infrastructure is within Pressure Zone 3B of the City's water system.

4.2 Proposed Water System Improvements

The Project is proposed to be served water from the existing 8-inch water main within Stanford Drive, as shown on the plans included in Appendix C. Final design of the Project will reassess the preliminary assumptions and design described in this report, and the final site plan and water facilities shall comply with all applicable standards and regulations.

5.0 CONCLUSIONS

The proposed water system discussed in this report will adequately serve the Project. This report has determined that:

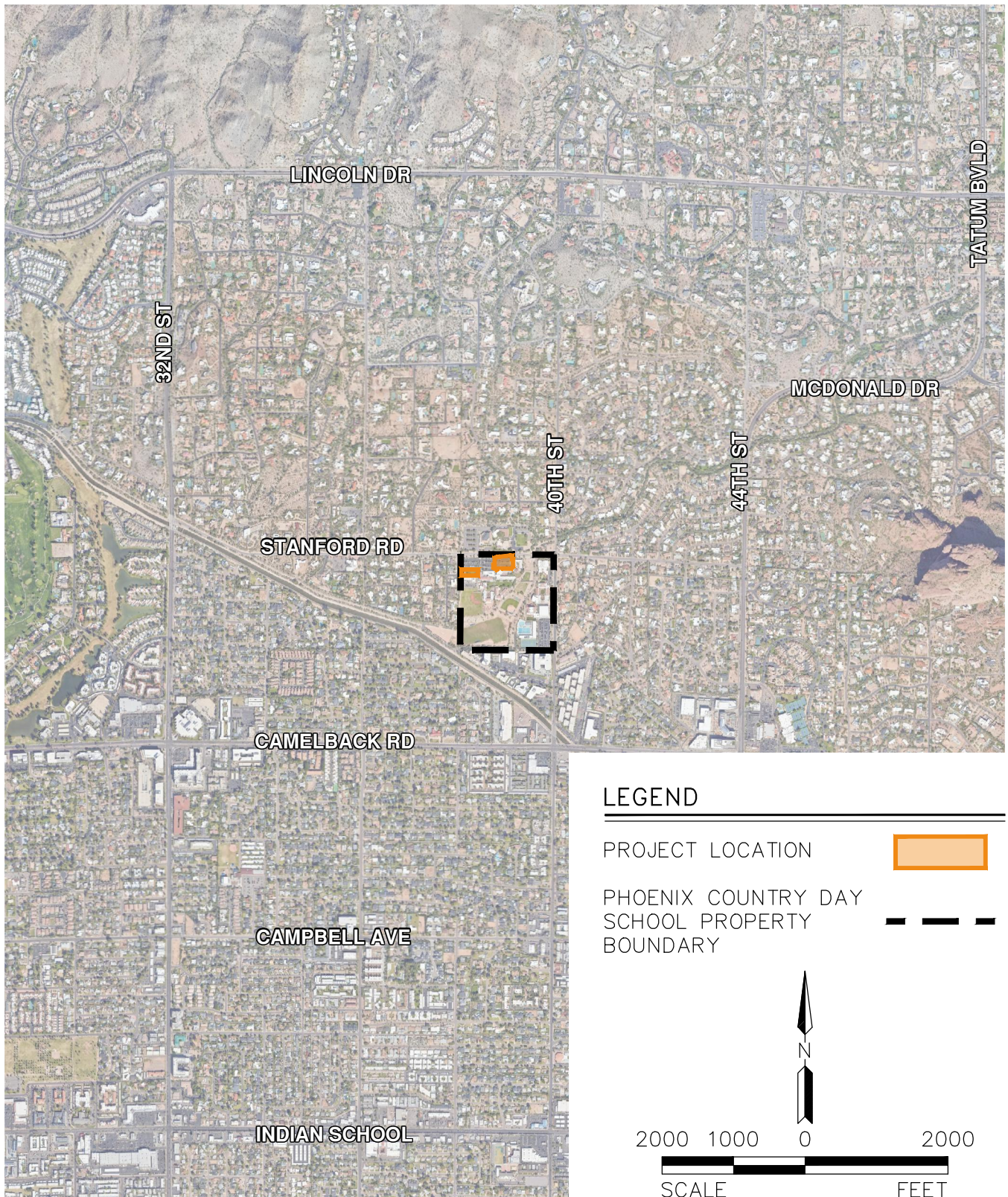
- The average day and peak day demands for the Project are 20,602 gpd (14.3 gpm) and 34,602 gpd (24.0 gpm), respectively.
- The proposed system can provide the required Type IIA fire flows while maintaining the minimum required residual pressure of 25 psi.

6.0 REFERENCES

City of Phoenix Water Services Department (2021). *Design Standards Manual for Water and Wastewater Systems 2021*. Phoenix, AZ.

APPENDIX A

FIGURES



PROJ.NO.: 1648
 DATE: SEP 2023
 SCALE: 1" = 2,000'
 DRAWN BY: DM
 CHECKED BY: BB

PHOENIX COUNTRY DAY SCHOOL
 PERFORMING ARTS CENTER
 TOWN OF PARADISE VALLEY
FIG 1: VICINITY MAP


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APPENDIX B

TABLES

Table B.1 - Water Demand Calculations

Phoenix Country Day School Performing Arts Center

Phoenix, AZ
September 2023



Land Use	Gross Area	Students	Open Space	Average Day Demand				Peak Day Demand	
				Open Space	Land Use	Total		(gpd)	(gpm)
	(ac)	(du)	(ac)	(gpd)	(gpd)	(gpd)	(gpm)		
Schools	0.6	800	0.1	602	20,000	20,602	14.3	34,602	24.0
GRAND TOTAL	0.6	800	0.1	602	20,000	20,602	14.3	34,602	24.0

Notes:

1. Design standards based on City of Phoenix 2021 *Design Standards Manual for Water and Wastewater Systems*.
2. Landscaped area based on preliminary site plan.
3. Landscaping demands are not peaked as these demands are anticipated to remain constant.

Demand Factors:

Schools: 25 gpd/student
General Landscaping: 4,374 gpd/ac

Peaking Factors:

Peak Day Demand: 1.7 x Average Day Demand

Fire Flow Demand:

Type VB (23,301-26,300 sf): 4,250 gpm for 4 hours

APPENDIX C

EXCERPTS

PRELIMINARY UTILITY PLAN
PHOENIX COUNTRY DAY SCHOOL
PARADISE VALLEY, ARIZONA

A PORTION OF THE SOUTHEAST QUARTER OF SECTION 13, TOWNSHIP 2 NORTH, RANGE 3 EAST
OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA

ENGINEER

HILGARTWILSON
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ARCHITECT

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TEMPE ARIZONA 85281
CONTACT: BEN BARCON
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BASIS OF BEARING

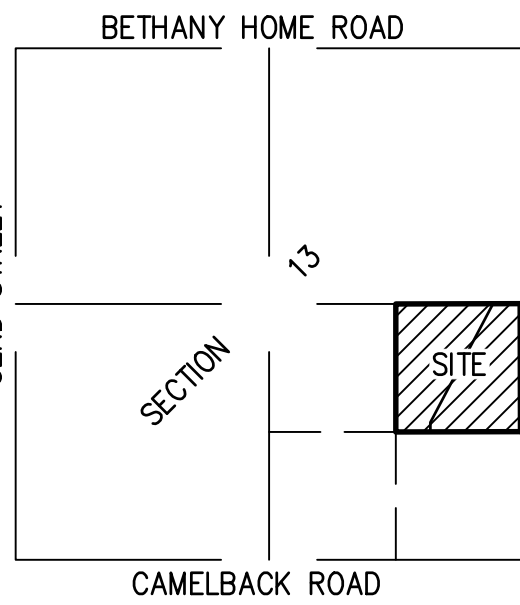
BASIS OF BEARING IS S00°15'38"W ALONG THE EAST LINE OF THE
SOUTHEAST QUARTER OF SECTION 13, TOWNSHIP 2 NORTH, RANGE 3 EAST
OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA,
BETWEEN THE MONUMENTS AS SHOWN HEREON.

OWNER

PHOENIX COUNTRY DAY SCHOOL
3901 E STANFORD DR
PARADISE VALLEY, ARIZONA 85253

SITE PLAN

APN: 170-09-001B
EXISTING ZONING: SUP
NET AREA: 108,010 SF
GROSS AREA: 108,010 SF
DISTURBED AREA:



VICINITY MAP
NOT TO SCALE

HILGARTWILSON
HAS JOINED COLLIER'S ENGINEERING & DESIGN
2141 E. HIGHLAND AVE., STE. 250 | P: 602.490.0535 / F: 602.368.2436
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PHOENIX COUNTRY DAY SCHOOL
3901 E STANFORD DRIVE
PARADISE VALLEY, ARIZONA

PRELIMINARY UTILITY PLAN

HILGARTWILSON
PROJ NO.: 1648
DATE: SEP 2023
SCALE: 1" = 20'
DRAWN: HW
DESIGNED: HW
APPROVED: ZH

DWG. NO.
PU01

SHT. 2 OF

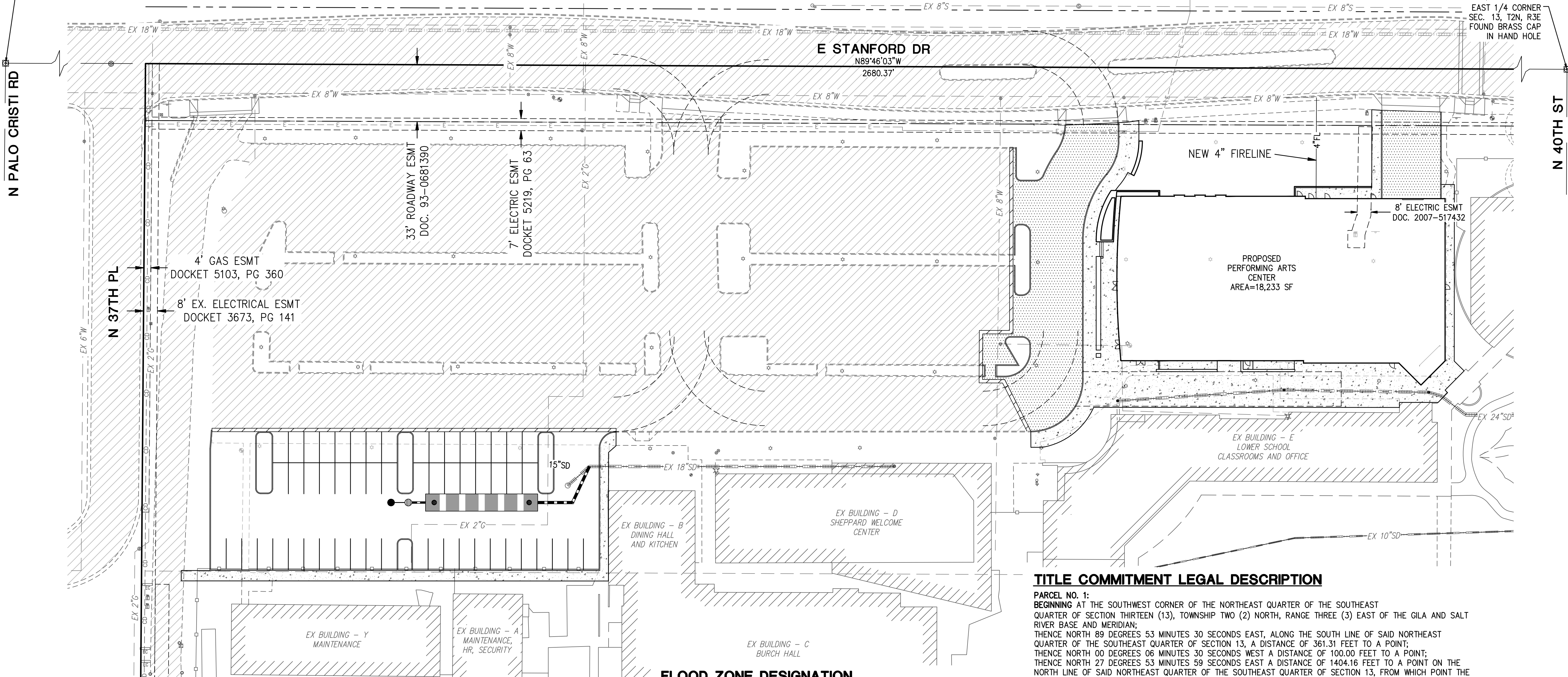


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CENTER OF
SEC. 13, T2N, R3E
FOUND TOWN OF
PARADISE VALLEY
BRASS CAP IN HAND
HOLE DOWN 0.5'

30 0 30 60
SCALE: 1" = 30'



LEGEND

- | | | | |
|----------------|------------------------------|--|--------------------------------|
| | FOUND BRASS CAP IN HAND HOLE | | EX. WROUGHT IRON FENCE |
| | FOUND BRASS CAP FLUSH | | EX. ELECTRIC METER |
| | BOUNDARY LINE | | EX. ELECTRIC JUNCTION BOX |
| | EASEMENT LINE | | EX. ELECTRIC TRANSFORMER |
| | CENTER LINE | | EX. ELECTRIC PULL BOX |
| | RIGHT OF WAY LINE | | EX. BOLLARD LIGHT |
| TC= | TOP OF CURB | | EX. LIGHT POLE |
| C= | CONCRETE | | EX. AIR CONDITIONER UNIT |
| P= | PAVEMENT | | EX. FLAG POLE |
| G= | GUTTER | | EX. TELEPHONE PEDESTAL |
| GR= | GRATE | | EX. IRRIGATION CONTROL VALVE |
| FF= | FINISHED FLOOR | | EX. FIRE DEPARTMENT CONNECTION |
| FG= | FINISHED GRADE | | EX. FIRE HYDRANT |
| PUE | PUBLIC UTILITY EASEMENT | | EX. WATER VALVE |
| CL | CENTERLINE | | EX. GAS VALVE |
| R/W | RIGHT OF WAY | | EX. SANITARY SEWER MANHOLE |
| ---(1000)--- | CONTOUR (EX.) | | EX. SEWER CLEAN OUT |
| -----1000----- | CONTOUR (PROPOSED) | | PROPOSED FLOW ARROW |

FLOOD ZONE DESIGNATION

THE FOLLOWING FLOOD PLAIN DESIGNATION AND ASSOCIATED COMMENTS ARE COPIED DIRECTLY FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) WEBSITE. HILGARTWILSON, LLC AND THE UNDERSIGNED REGISTERED PROFESSIONAL LAND SURVEYOR MAKE NO STATEMENT AS TO THE ACCURACY OR COMPLETENESS OF THE FOLLOWING FLOOD ZONE DESIGNATION STATEMENT.

A PORTION OF THE SUBJECT PROPERTY LIES WITHIN SHADED ZONE "X" WITH A DEFINITION OF: 0.2-PERCENT-ANNUAL-CHANCE FLOODPLAIN, AREAS OF 1-PERCENT-ANNUAL-CHANCE (BASE FLOOD) SHEET FLOW FLOODING WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT, AREAS OF BASE FLOOD STREAM FLOODING WITH A CONTRIBUTING DRAINAGE AREA OF LESS THAN 1 SQUARE MILE, OR AREAS PROTECTED FROM THE BASE FLOOD BY LEVEES. NO BFES OR DEPTHS ARE SHOWN IN THIS ZONE, AND INSURANCE PURCHASE IS NOT REQUIRED. DESIGNATION DETERMINED BY FEMA FLOOD ZONE MAP 04013C1765L, PANEL NUMBER 1765 OF 4425, EFFECTIVE DATE OCTOBER 16, 2013.

A PORTION OF THE SUBJECT PROPERTY LIES WITHIN ZONE "AE" WITH A DEFINITION OF: 1-PERCENT-ANNUAL-CHANCE FLOODPLAINS THAT ARE DETERMINED FOR THE FIS BY DETAILED METHODS OF ANALYSIS. IN MOST INSTANCES, BFES DERIVED FROM THE DETAILED HYDRAULIC ANALYSES ARE SHOWN AT SELECTED INTERVALS IN THIS ZONE. MANDATORY FLOOD INSURANCE PURCHASE REQUIREMENTS APPLY. AE ZONES ARE AREAS OF INUNDATION BY THE 1-PERCENT-ANNUAL-CHANCE FLOOD, INCLUDING AREAS WITH THE 2-PERCENT WAVE RUNUP, ELEVATION LESS THAN 3.0 FEET ABOVE THE GROUND, AND AREAS WITH WAVE HEIGHTS LESS THAN 3.0 FEET. THESE AREAS ARE SUBDIVIDED INTO ELEVATION ZONES WITH BFES ASSIGNED. THE AE ZONE WILL GENERALLY EXTEND INLAND TO THE LIMIT OF THE 1-PERCENT-ANNUAL-CHANCE STILLWATER FLOOD LEVEL (SWEL). DESIGNATION DETERMINED BY FEMA FLOOD ZONE MAP 04013C1765L, PANEL NUMBER 1765 OF 4425, EFFECTIVE DATE OCTOBER 16, 2013.

TITLE COMMITMENT LEGAL DESCRIPTION

PARCEL NO. 1:
BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION THIRTEEN (13), TOWNSHIP TWO (2) NORTH, RANGE THREE (3) EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN;
THENCE NORTH 89 DEGREES 53 MINUTES 30 SECONDS EAST, ALONG THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 13, A DISTANCE OF 361.31 FEET TO A POINT;
THENCE NORTH 00 DEGREES 06 MINUTES 30 SECONDS WEST A DISTANCE OF 100.00 FEET TO A POINT;
THENCE NORTH 27 DEGREES 53 MINUTES 59 SECONDS EAST A DISTANCE OF 1404.16 FEET TO A POINT ON THE NORTH LINE OF SAID NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 13, FROM WHICH POINT THE EAST QUARTER CORNER OF SAID SECTION 13 BEARS NORTH 89 DEGREES 47 MINUTES 40 SECONDS EAST A DISTANCE OF 322.00 FEET;
THENCE SOUTH 89 DEGREES 47 MINUTES 40 SECONDS WEST, ALONG THE NORTH LINE OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 13, A DISTANCE OF 1018.18 FEET TO THE NORTHWEST CORNER OF SAID NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 13;
THENCE SOUTH ALONG THE WEST LINE OF THE SAID NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 13, A DISTANCE OF 1337.99 FEET TO THE POINT OF BEGINNING.

PARCEL NO. 2:
A PORTION OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION THIRTEEN (13), TOWNSHIP TWO (2) NORTH, RANGE THREE (3) EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, DESCRIBED AS FOLLOWS: BEGINNING AT THE EAST QUARTER CORNER OF SAID SECTION 13;
THENCE SOUTH 00 DEGREES 10 MINUTES 31 SECONDS EAST (ASSUMED BEARING) ALONG THE EASTERLY LINE OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 13, A DISTANCE OF 1340.30 FEET TO THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 13;
THENCE SOUTH 89 DEGREES 53 MINUTES 30 SECONDS WEST ALONG THE SOUTH LINE OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 13, A DISTANCE OF 982.97 FEET; TO THE SOUTHEAST CORNER OF PREMISES CONVEYED TO PHOENIX COUNTRY DAY SCHOOL BY DEED RECORDED IN DOCKET 3540, PAGE 18;
THENCE NORTH 00 DEGREES 06 MINUTES 30 SECONDS WEST ALONG THE SOUTHEASTERLY LINE OF SAID PHOENIX COUNTRY DAY SCHOOL PREMISES A DISTANCE OF 100 FEET TO AN ANGLE POINT;
THENCE NORTH 27 DEGREES 53 MINUTES 59 SECONDS EAST, CONTINUING ALONG THE SAID SOUTHEASTERLY LINE, A DISTANCE OF 1404.16 FEET TO A POINT ON THE NORTH LINE OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 13, TO THE NORTHEAST CORNER OF SAID PHOENIX COUNTRY DAY SCHOOL PREMISES;
THENCE NORTH 89 DEGREES 47 MINUTES 40 SECONDS EAST ALONG THE NORTH LINE OF SAID NORTHEAST QUARTER OF THE SOUTHEAST QUARTER A DISTANCE OF 322.00 FEET TO THE POINT OF BEGINNING; EXCEPT THE EAST 40 FEET THEREOF.