



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

**PARADISE VALLEY, ARIZONA**

Prepared For:  
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KIVA: XX-XXXX

September 2023  
HW Project No. 1648.02

Prepared For:

9/18/23

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Date

Prepared and Submitted By:

Zac Sharp

9/18/23

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Date

City of Phoenix Approvals:

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Planning and Development Director

Date

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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 40<sup>th</sup> 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 <sup>1</sup>			
Category		Value	Unit
Average Day Water Demand			
	Schools	25	gpd/Student
	General Landscaping	4,374	gpd/ac
Peaking Factors <sup>2</sup>			
	Peak Day Demand	1.7	x Average Day
Average Day System Performance			
	Minimum Pressure	50	psi
	Maximum Pressure <sup>3</sup>	100	psi
Peak Day System Performance			
	Minimum Pressure	50	psi
	Maximum Pressure <sup>3</sup>	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) <sup>4</sup>	2,125	gpm for 4 hours
Minimum Pipe Diameter		8	inches
Hazen Williams 'C' Factor		130	
<b>Notes:</b> 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.

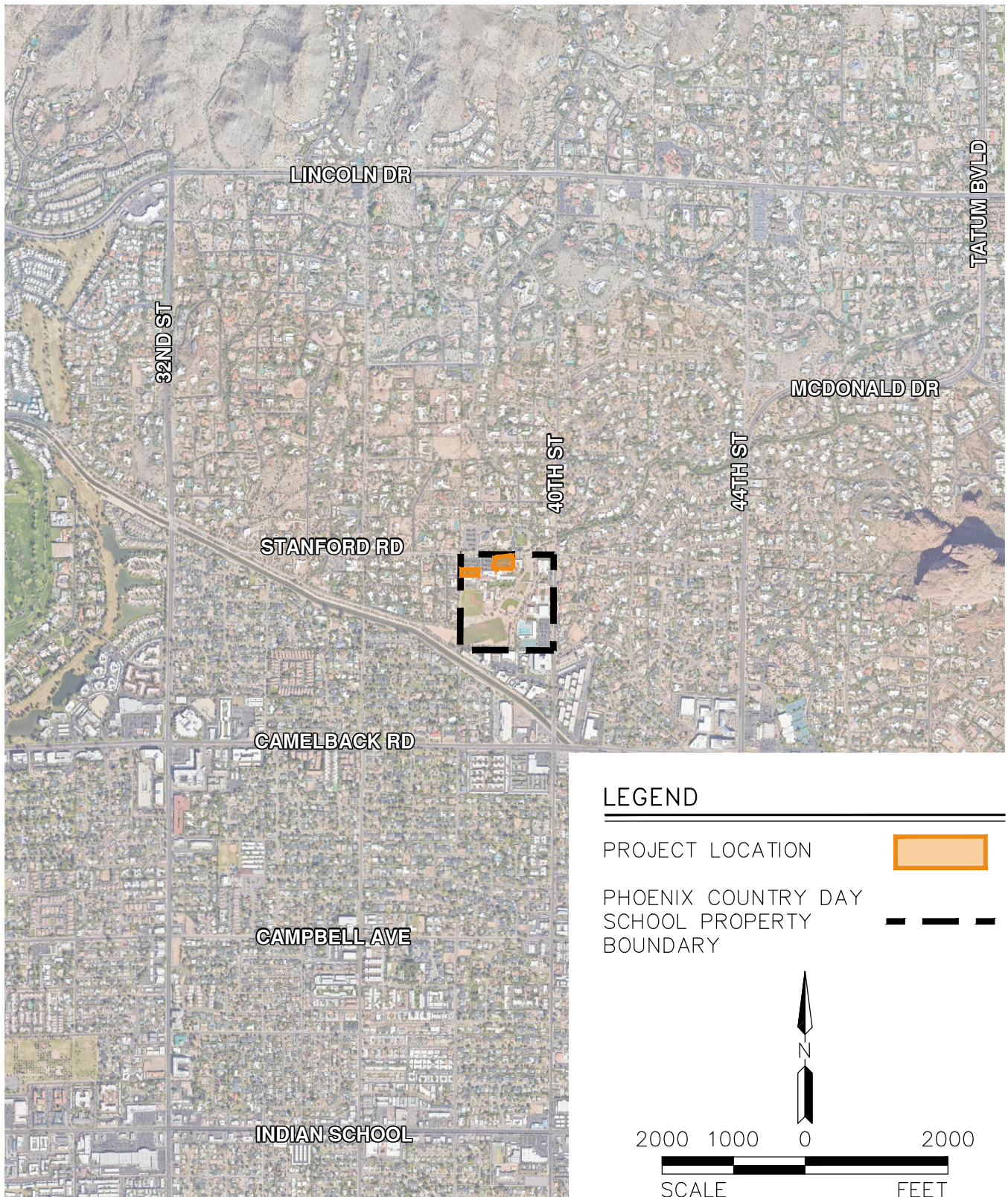
## 6.0 REFERENCES

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**

  
**HILGARTWILSON**  
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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 (ac)	Students (du)	Open Space (ac)	Average Day Demand				Peak Day Demand	
				Open Space	Land Use	Total		(gpd)	(gpm)
				(gpd)	(gpd)	(gpd)	(gpm)		
Schools	0.6	800	0.1	602	20,000	20,602	14.3	34,602	24.0
<b>GRAND TOTAL</b>	<b>0.6</b>	<b>800</b>	<b>0.1</b>	<b>602</b>	<b>20,000</b>	<b>20,602</b>	<b>14.3</b>	<b>34,602</b>	<b>24.0</b>

#### 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

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BASIS OF BEARING

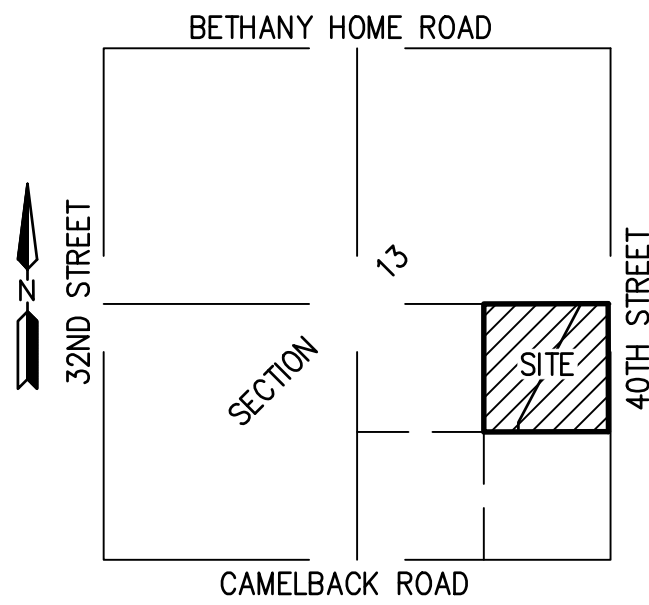
BASIS OF BEARING IS S00°15'38"W ALONG THE EAST LINE OF THE  
SOUTHEAST QUARTER OF SECTION 13, TOWNSHIP 2 NORTH, RANGE 3 EAST  
OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA,  
BETWEEN THE MONUMENTS AS SHOWN HEREON.

OWNER

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

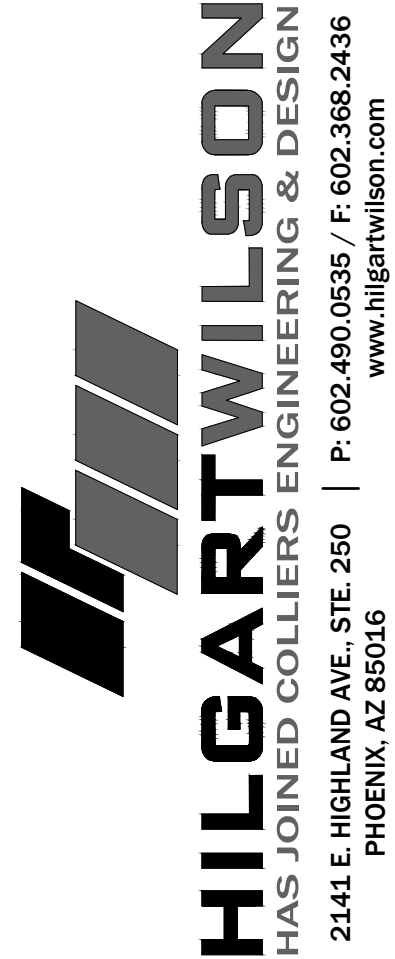
SITE PLAN

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



VICINITY MAP  
NOT TO SCALE

REV:



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

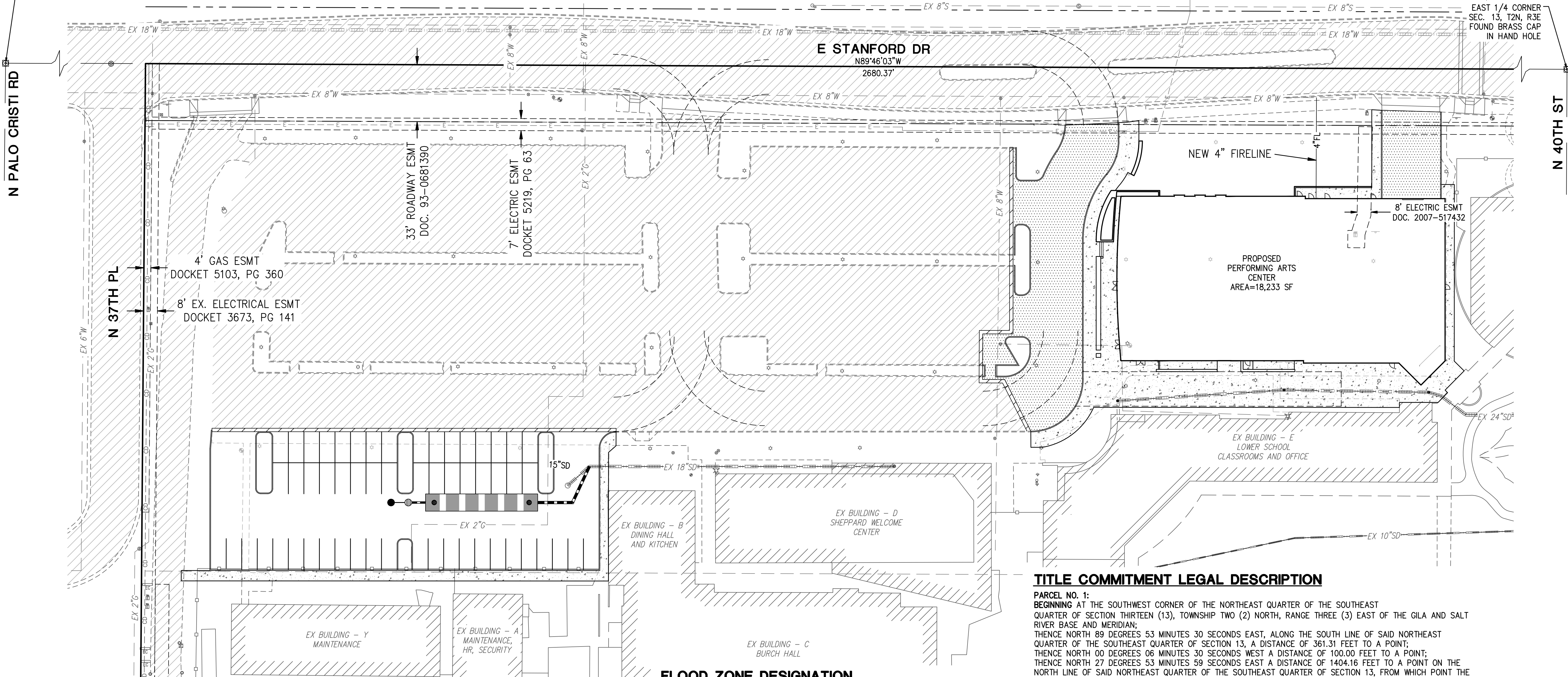


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CENTER OF  
SEC. 13, T2N, R3E  
FOUND TOWN OF  
PARADISE VALLEY  
BRASS CAP IN HAND  
HOLE DOWN 0.5'

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.