Drainage Reports

Abbreviated Water and Sewer Needs

Water Study

Wastewater Study

Stormwater Waiver Application

Preliminary Drainage Report

For

Self Storage

Loop 101 Northbound N of Raintree

Scottsdale, AZ

Scottsdale Case:
Job: 416
May 2019
35-DR-2019

Prepared by:

Steve Bowser, PE
Helix Engineering, LLC
3240 E. Union Hills Dr #112
Phoenix, AZ 85050
602-788-2616
sb@hxeng.com

EXP 9-30-20

PRELIMINARY DRAINAGE REPORT
FOR
Self Storage
Loop 101 Northbound N of Raintree
Scottsdale, Arizona

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1.0 INTRODUCTION

The proposed site is located along the east side of Loop 101 North of Raintree within the City of Scottsdale, Arizona. The site is situated within the Northwest Quarter of Section 7, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is currently vacant with office developments north and south and vacant property to the east. This project will develop a self storage building on the site.

2.0 OBJECTIVES – PROJECT DEVELOPMENT AND BACKGROUND

The purpose of this report is to verify the site compliance with the drainage requirements set forth in the *Drainage Design Manual for Maricopa County, Volume II "Hydraulics,* prepared by the Maricopa County Flood Control District; and the City of Scottsdale Design Standards and Procedures Manual dated 2018.

3.0 EXISTING SITE CONDITIONS

Currently, the site is a vacant site. Loop 101 Northbound frontage road abuts the west side of site, Fully developed office buildings abut the north and south side of the site. The east side of the site is vacant between this site and 90th street. Sites to the north and south contain retention systems. Loop 101 frontage road contains storm drain to intercept street runoff.

Site east of this site is undeveloped.

4.0 FLOOD PLAIN DESIGNATION

The west side of the site lies within zone X Shaded per (FEMA) Flood Insurance Rate Map (FIRM), Map Numbers 1760L, dated October 16, 2013. Finish floor of the new building is set at elevation LF_{88}=1478.0.

See Figure 3 for a copy of the FEMA map.

5.0 PROPOSED STORMWATER SITE RETENTION

STORMWATER RETENTION

Project will be developed providing the 100 year 2 hour retention (2.3"). Retention will be located on surface basins supplemented with underground retention.

The site will have two main retention basins. The main area will be retained by two basins equalized by a pipe along the south side of the site. A 2' basin on the west side will equalize to a 3' deep basin along the east side of the site. Upon filling, this basin will overtop to the 101 right of way and flows proceed south.

The south side of the site will be retained in a section of 8' diameter underground retention. This area is limited due to the low corner of the site at elevation 73.0. The underground retention will allow this area to be retained onsite in a deeper system to crate the 100 year 2 hour volume. Pipes equalizing the surface basins and pipes conveying from the low corner to the underground storage will stacked in a single trench due to the narrow corridor between the bundling and the APS underground power easement. This easement contains buried 69 kV power which greatly limits what can be done in that easement.

Underground pipe must meet DSPM 4-1.202. Pipe shall have a 75 year life, smooth floor per COP Std Det 2554, two access points, signage, O&M plan, and a notarized "Ownership responsibility statement" acknowledging ownership responsibility and recordation of this statement.

C FACTORS

A C factor of 0.45 is used for landscape areas and 0.95 for paved and roof areas.

ULTIMATE OUTFALLS

This project ultimate outfall will remain at the southwest corner of the site at elevation 73.0. The finish floor is in excess of 2’ above this elevation. This outfall is unchanged from historical.

DISPOSAL

Surface basins and Underground retention will be disposed by drywell. No city storm drains are available in this area.

404 AND CONSTRUCTION STORMWATER

This project is not located in a 404 wash. Project exceeds 1 acre and will have a Stormwater Management Plan prepared and an NOI filed with ADEQ prior to improvement plan approval.

6.0 SUMMARY

- This project is the development of a single self storage building.
- The site will provide retention for the 100 year 2 hour event.
- The Project Site is located within FEMA designated X Shaded.
- Site will outfall to the southwest corner of the site.

7.0 REFERENCES

1. Federal Emergency Management Agency, Flood Insurance Rate Map, Maricopa County, Arizona and Incorporated Areas, Map Number 04013C1760L, Oct 16, 2013.
2. City of Scottsdale, Design Standards and Procedures Manual Chapter 4, 2018.

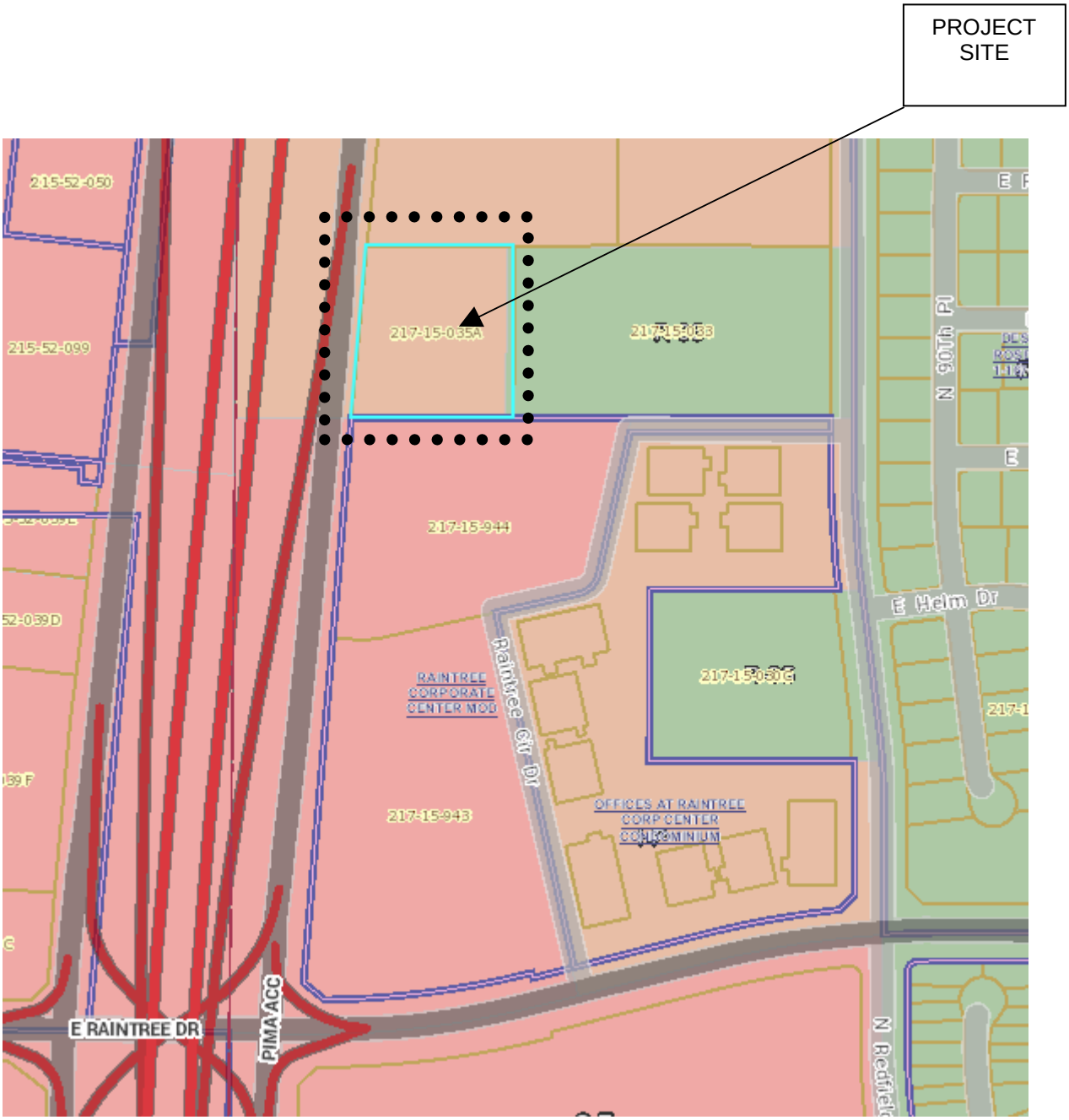


Figure 1-VICINITY MAP

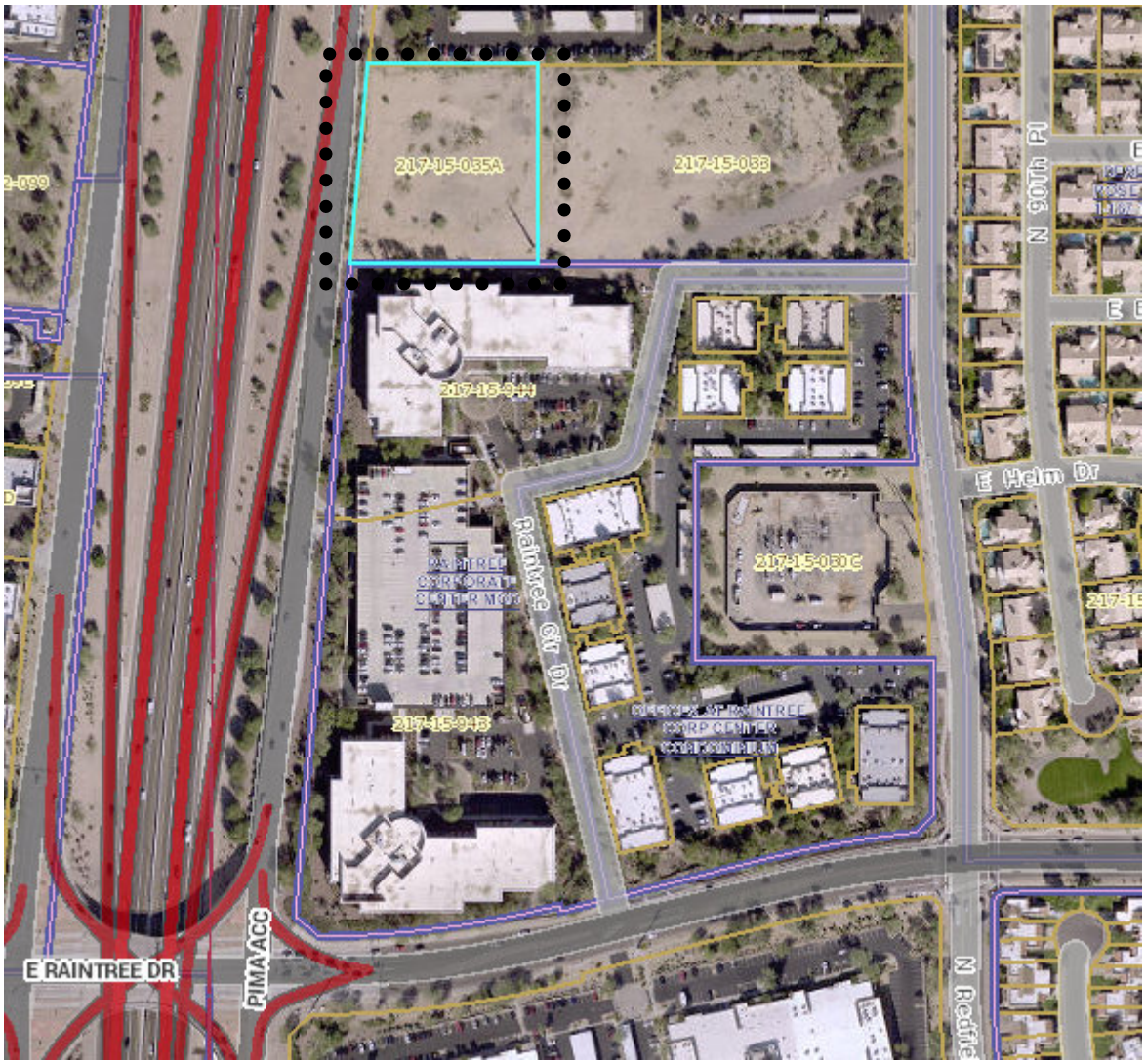


Figure 2-AERIAL MAP

Figure 3-FEMA MAP

National Flood Hazard Layer FIRMette

FEMA

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 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 *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/18/2019 at 12:52:29 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and
unmapped and unmode
regulatory purposes.

35-DR-2019
10/29/2019

Figure 4-Retention Calculations

NAME	SF AREA	100 Year 2 hr depth EVENT	C FACTOR	0.1917 DEPTH Ft	CxDxA REQUIRE CU FT	PROVIDE CU FT	excess CU FT	Notes
Basin 1	80,992	100-2	0.90	0.1917	13,971	11,608		basin 1 east
						3,261		basin 1 west
					13,971	14,869	898	Total Area 1
Basin 2	16,611	100-2	0.90	0.1917	2,865	3,016	151	All UG retnetion
						60 lf ug retention		

35-DR-2019
10/29/2019

Figure 5-Drainage Exhibit

WARNING AND DISCLAIMER OF LIABILITY The flood protection provided by the Stormwater and Floodplain Management Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Floods larger than the base flood can and will occur on rare occasions. Floodwater heights may be increased by constructed or natural causes. The Stormwater and Floodplain Management Ordinance does not create liability on the part of the city, any officer or employee thereof, or the federal, state or county government for any flood damages that result from reliance on the Ordinance or any administrative decision lawfully made thereunder. Compliance with the Stormwater and Floodplain Management Ordinance does not ensure complete protection from flooding. Flood-related problems such as natural erosion, streambed meander, or constructed obstructions and diversions may occur and have an adverse effect in the event of a flood. You are advised to consult your own engineer or other expert regarding these considerations. I have read and understand the above.

35-DR-2019

Plan Check # Owner Signature Date

Figure 6-Drainage Exhibit

ADOT RIGHT OF WAY (TO REMAIN UNCHANGED)

ZONED I-1
INDUSTRIAL PARK

— UNSUBDIVIDED —

— UNSUBDIVIDED —

1184.18'
1088.98'

N 89°39'33" E
280.78'

25.4' SS

15.3' W

S 05°44'10" W
95.20'

FREEWAY

30' APS ESMT 08-521180

FOUND ADOT ALUMINUM CAP

E. RIGHT OF WAY LINE S.R. 101 LOOP, A STATE HIGHWAY WITH ACCESS CONTROL

ACCESS ROAD

AREA 1

330.27'

— UNSUBDIVIDED

BASIN 1
EAST

ZONED R1-35
SINGLE-FAMILY
RESIDENTIAL

BASIN 1
WEST

160.34'

S 00°24'28" E

UNDERGROUND
BASIN 2

PIMA

R25.00'

15.5'

75'

1327.95'

AREA 2

30' APS ESMT

ACCESS ESMT PER AGREEMENT

N 89°45'21" E
310.99'

2.00'

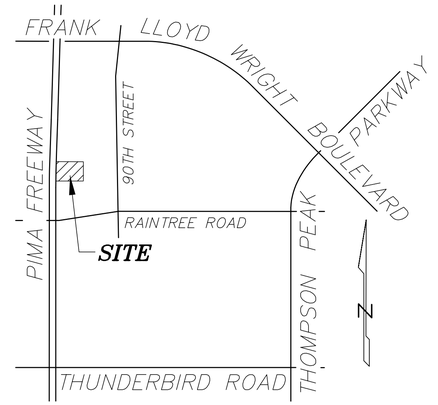
12.00'

R25.00'

N 04°52'07" E (M)
N 04°27'39" E
1092.04'

ZONED C-2

PARCEL 3
RAINTREE CORPORATE CENTER
BK. 506, PG. 23, M.C.R.



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CLIENT:
RKAA Architects, Inc.

2233 East Thomas Rd
Phoenix, AZ 85016
(602) 955-3900

PRELIMINARY

Registered Professional Engineer (Civil)
CERTIFICATE NO.
30489
STEVEN R. BOWSER
5-20-19
ARIZONA U.S.A.
Expires 09/30/2020

Helix Engineering, LLC
Engineering / Surveying / Consulting
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Phoenix AZ 85050
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www.hxeng.com

TWO WORKING DAYS BEFORE YOU DIG.
CALL FOR THE BLUE STAKES
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BLUE STAKE CENTER

RELEASE	
DATE	
5-18-19	PRELIM ENGR
9-10-19	REV SITE PLAN
9-20-19	REV SITE PLAN

REVISIONS		
NO.	DATE	
1		
2	.	.
3	.	.

PROJECT NAME
SELF STORAGE

PROJECT ADDRESS
Raintree / 101
SCOTTSDALE, ARIZONA
85260

PROJECT AREA

HELIX JOB NUMBER
416

IN HOUSE
DRAWN BY: MT
CHECKED BY: SB

SHEET TITLE
DRAINAGE EXHIBIT

SHEET
FIGURE 6

PAGE
1 OF 1

PLOT SCALE: 1:1 @ 24"x36"; 1:2.2 @ 11"x17"

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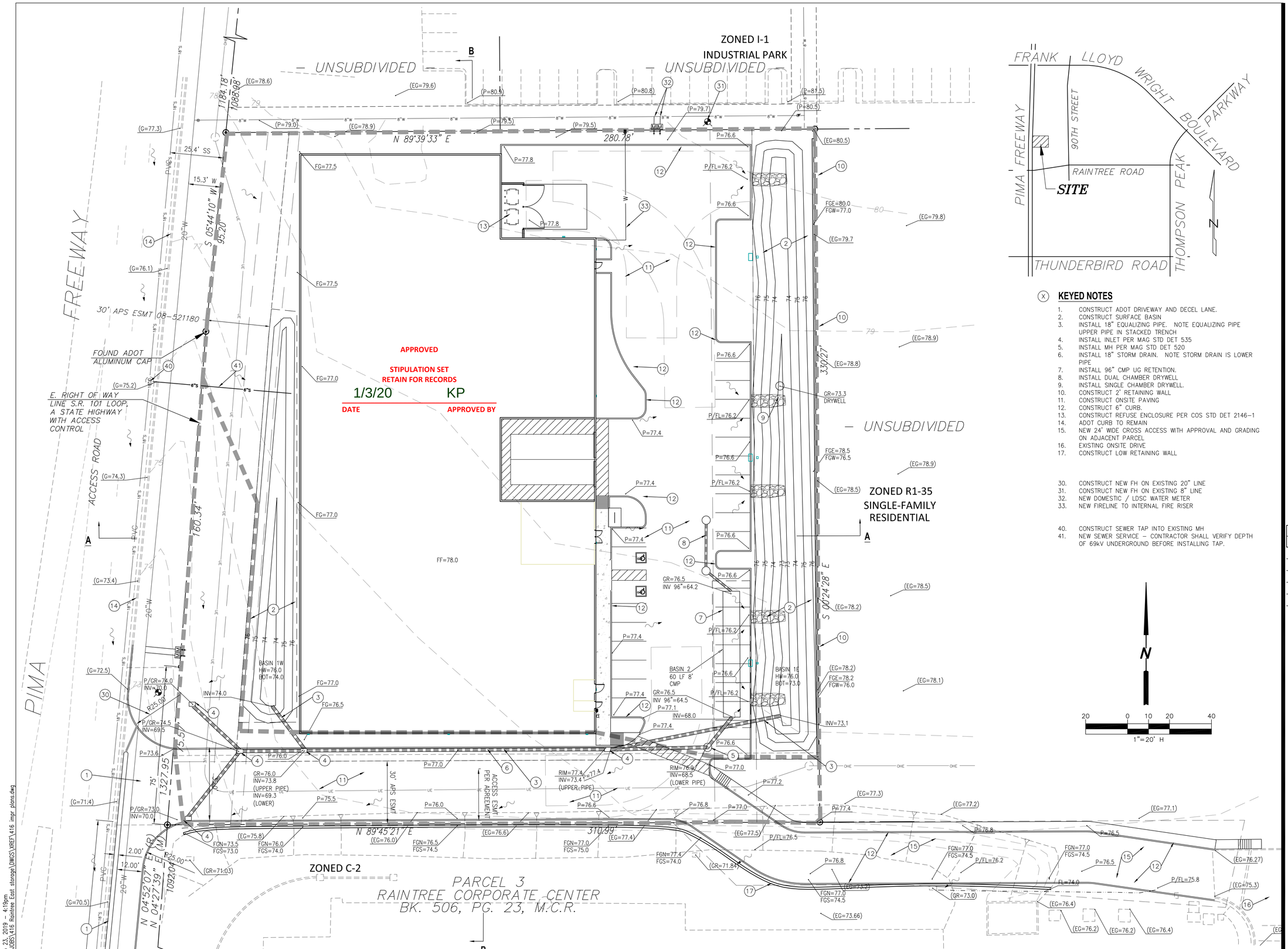
35-DR-2019
10/29/2019



KEYED NOTES

1. CONSTRUCT ADOT DRIVEWAY AND DECEL LANE.
2. CONSTRUCT SURFACE BASIN
3. INSTALL 18" EQUALIZING PIPE. NOTE EQUALIZING PIPE UPPER PIPE IN STACKED TRENCH
4. INSTALL INLET PER MAG STD DET 535
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33. NEW FIRELINE TO INTERNAL FIRE RISER

40. CONSTRUCT SEWER TAP INTO EXISTING MH
41. NEW SEWER SERVICE – CONTRACTOR SHALL VERIFY DEPTH OF 69kV UNDERGROUND BEFORE INSTALLING TAP.

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1	.	.
2	.	.
3	.	.

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SCOTTSDALE, ARIZONA
85260

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HELIX JOB NUMBER
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IN HOUSE
DRAWN BY: MT
CHECKED BY: SB

SHEET TITLE

G / D PLAN

SHEET
GD-1

PAGE
1 OF 2

PLOT SCALE: 1:1 @ 24"x36"; 1:2.2 @ 11"x17"

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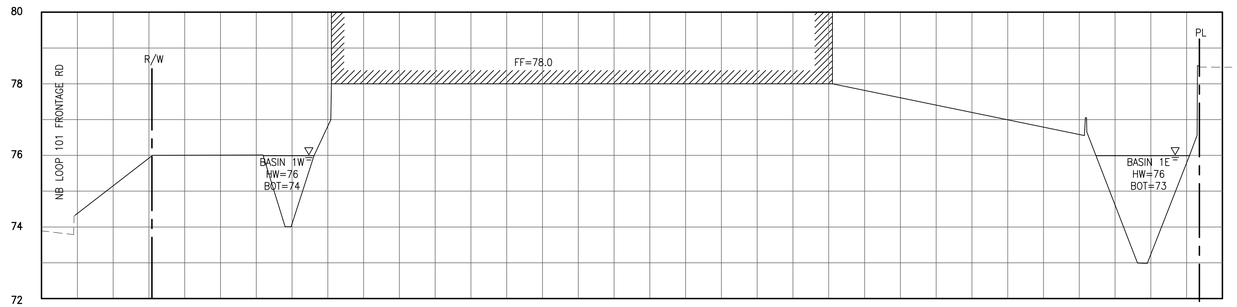
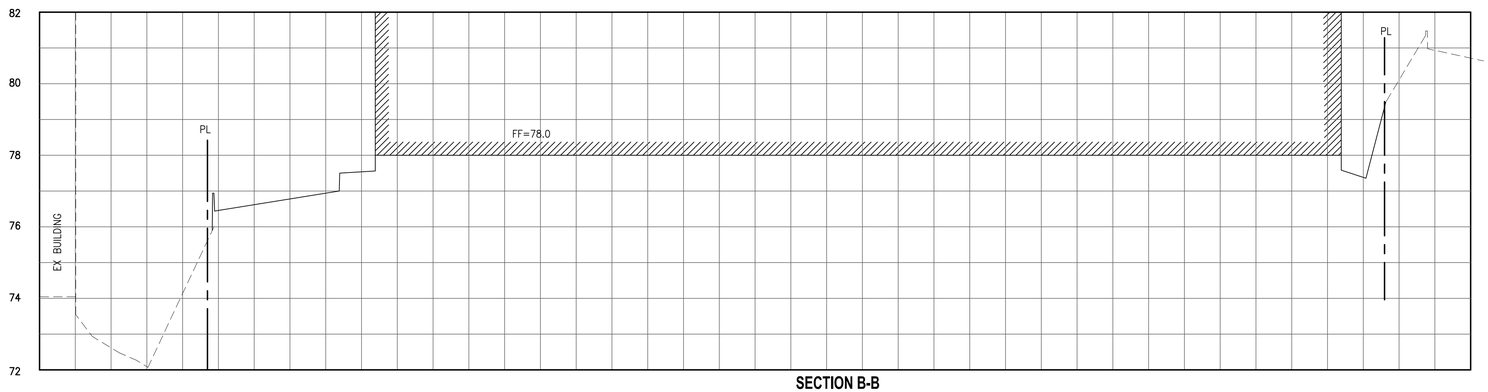
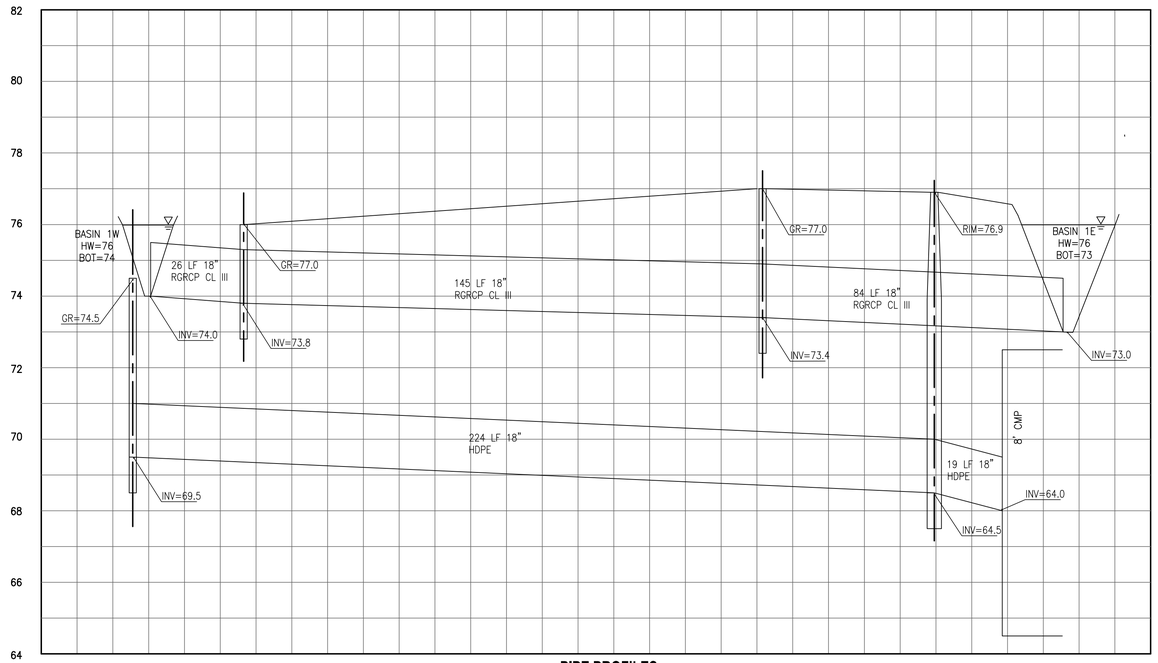


SECTION A-A
H: 1"=20'
V: 1"=2'



SECTION B-B
H: 1"=20'
V: 1"=2'



PIPE PROFILES
H: 1"=20'
V: 1"=2'

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SHEET TITLE

DETAILS

SHEET
GD-2

PAGE
2 OF 2

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COS 35-DR-2019

35-DR-2019
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Sewer Basis of Design

For

Self Storage

Loop 101 Northbound N of Raintree

Scottsdale, AZ

Scottsdale Case: 35-DR-2019
Job: 416
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Prepared by:

Steve Bowser, PE
Helix Engineering, LLC
3240 E. Union Hills Dr #112
Phoenix, AZ 85050
602-788-2616
sb@hxeng.com

30-17

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 rsacks **DATE** 11/5/2019

11/05/2019

See comment on site plan, page 7.

Sewer Basis of Design
FOR
Self Storage
Loop 101 Northbound N of Raintree
Scottsdale, Arizona

A. INTRODUCTION

B. DESIGN DOCUMENTATION

C. EXISTING CONDITIONS

D. PROPOSED CONDITIONS

E. COMPUTATIONS

F. SUMMARY

G. SUPPORTING MAPS / REFERENCES

Figure 1 - Vicinity Map ***5***
Figure 2 - Water/Sewer Map ***6***

C. Introduction

The proposed site is located along the east side of Loop 101 North of Raintree within the City of Scottsdale, Arizona. The site is situated within the Northwest Quarter of Section 7, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is currently vacant with office developments north and south and vacant property to the east. This project will develop a self storage building on the site.

D. Design Documentation

Project will be analyzed using the design criteria from the DSPM. Sewer demand of 0.4 gal per sf per day for office uses for the approx 3600 SF office. The only area within the project that generates sewer is the office area. Peak factor of 3.0 will be used. Project does not involve high peak uses (such as restaurants, hotels or condos).

C. Existing Conditions

Currently, the site is a vacant site with an 18" public sewer along the west boundary. This public line flows south as part of the network of the city's sewer system.

D. Proposed Conditions

The building will be placed centrally in the site with the office in the southeast corner of the first floor. A single 6" private sewer service will exit the building and flow to the west to connect the existing public line at the existing manhole. A tap in the existing manhole will be installed.

All onsite sewer lines shall be private.

E. Computations

Office Areas: 3600 SF

Average Day Sewer Demand: 0.4 gallons per SF= 1440 gal per day
Peak Factor: 3x
Peak Day Demand: 3x Average Day Sewer Demand = 3 x 1440= 4320 gal per day
(Peak Demand based on conservative 10 hour operational day) = **7 gpm**

Proposed 6” private main at 1.04% slope capacity=**256 GPM** (0.57 CFS)

35-DR-2019
10/29/2019

F. Summary

- This project is the construction of single commercial storage building with a 3600 SF office.

- Office area is the only wastewater generator on the site.

- The project will install a new 6" commercial sewer service connecting to the 18" public main on the west side of the site.

G. Supporting Maps / References

1. City of Scottsdale, Design Standards and Procedures Manual, 2018.
2. QS map 34-49

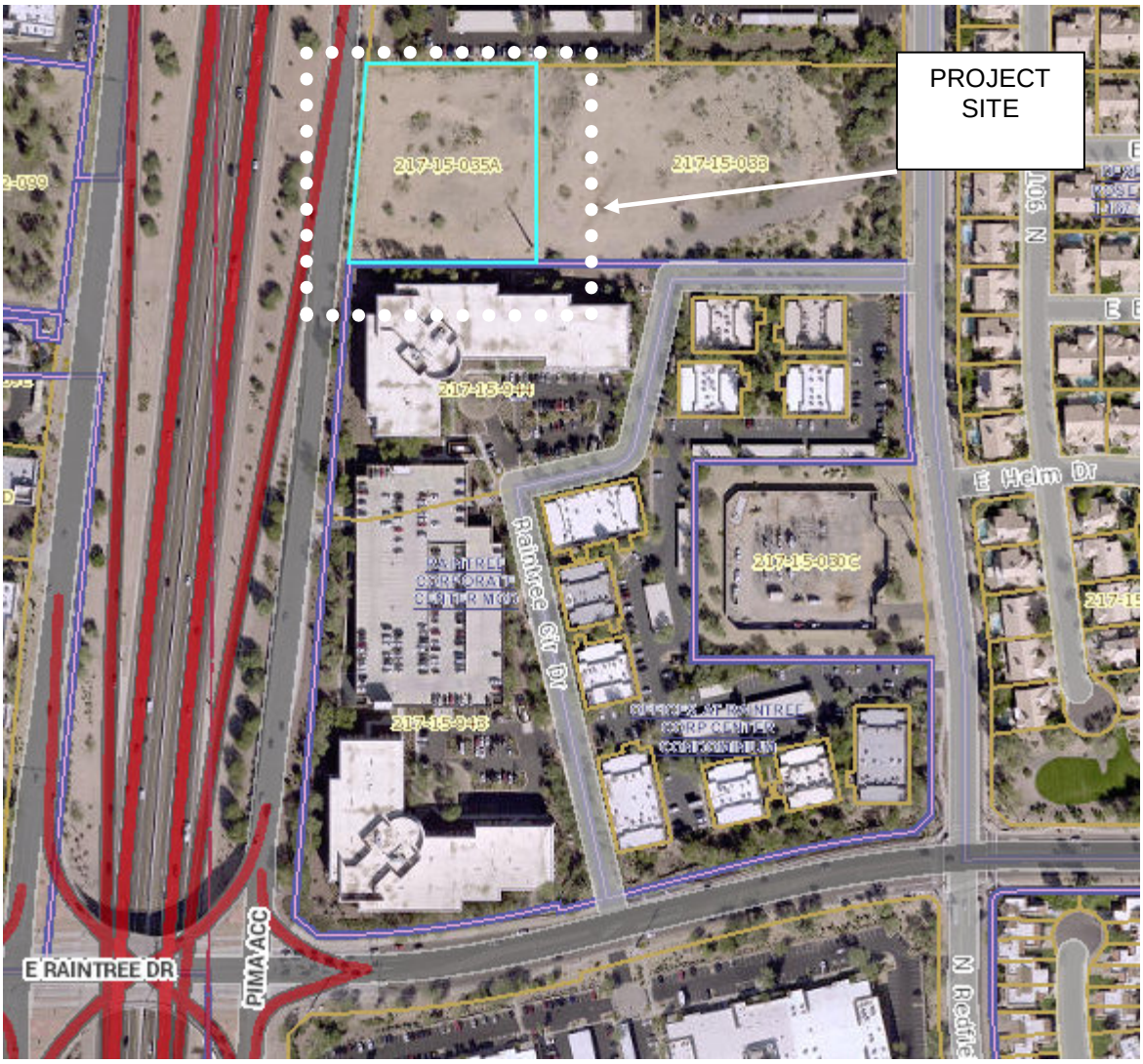


Figure 1-VICINITY MAP

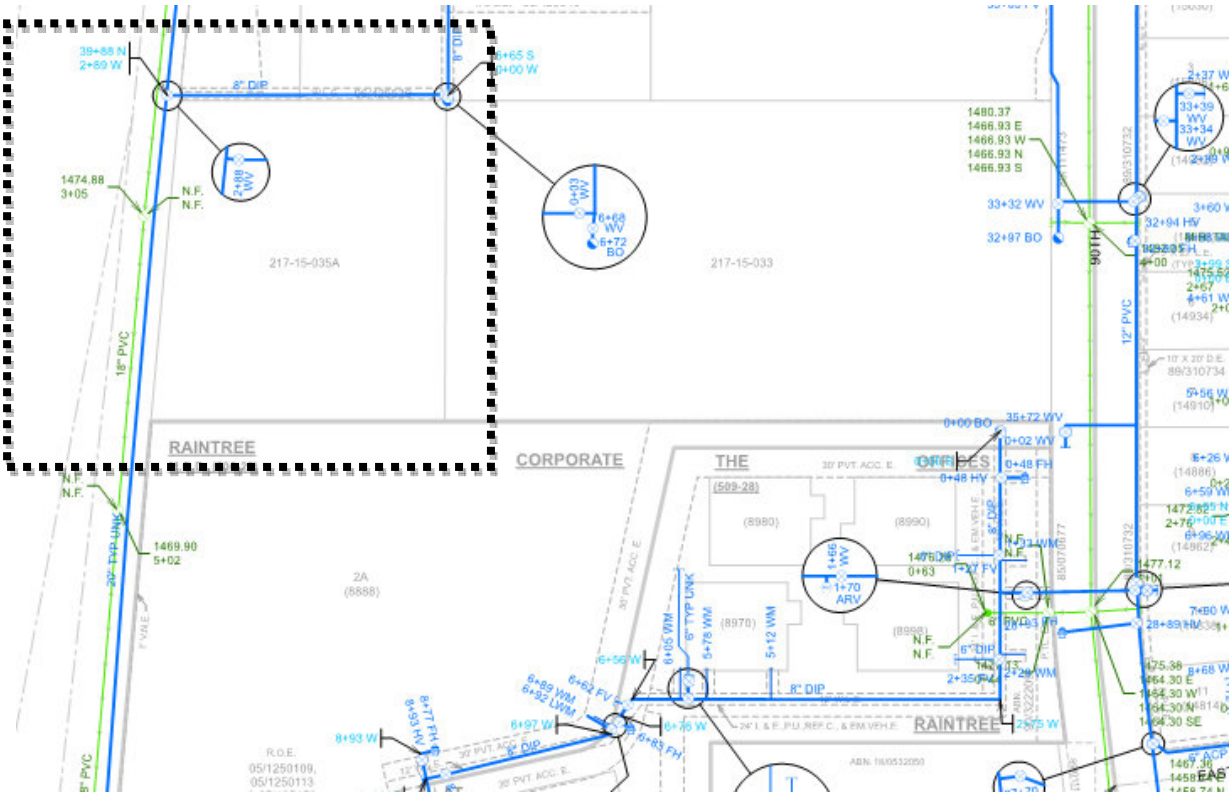
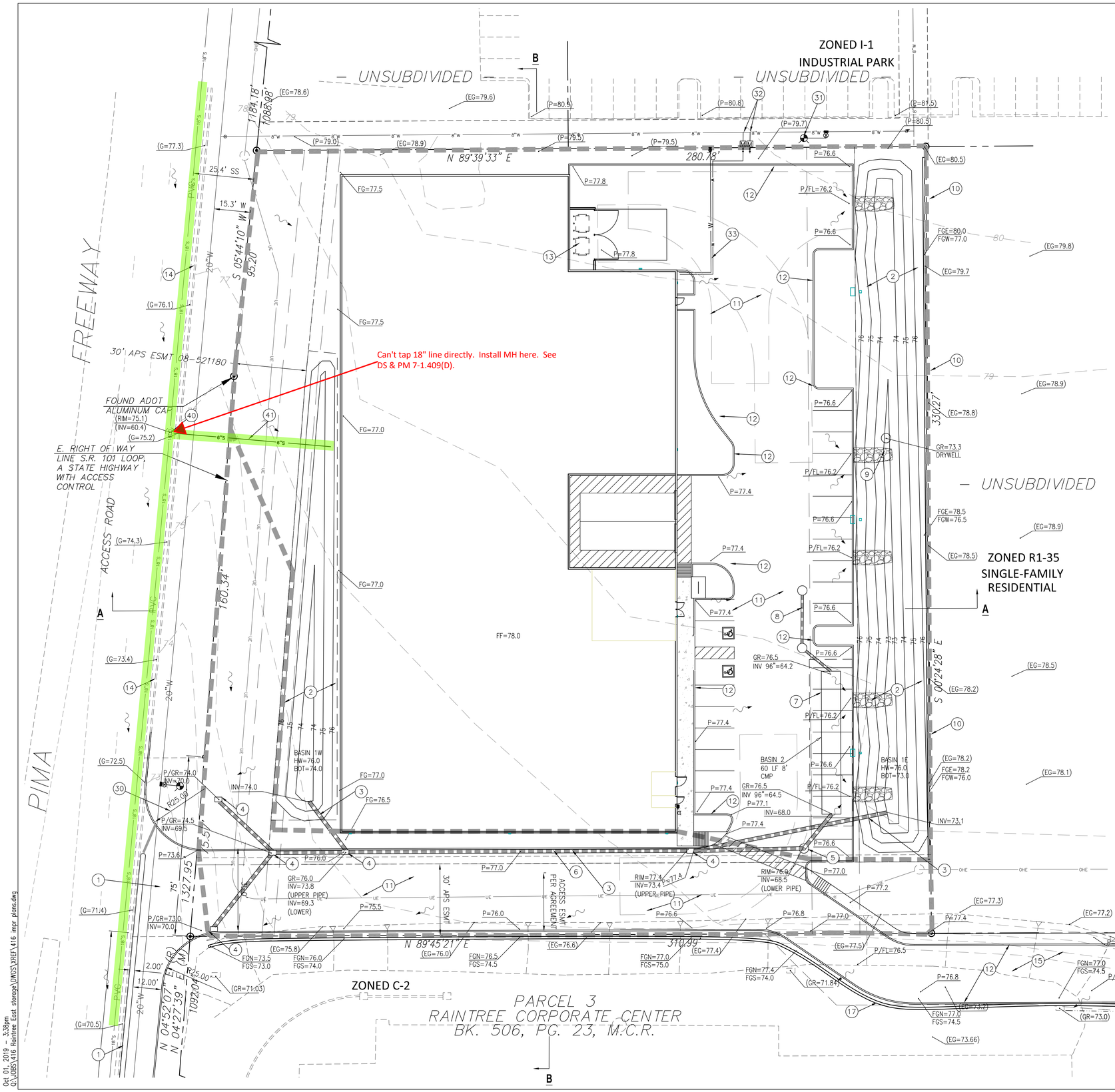


Figure 2-WATER-SEWER QS MAP



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9-20-19	REV SITE PLAN

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SELF STORAGE

PROJECT ADDRESS

Raintree / 101
SCOTTSDALE, ARIZONA
85260

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HELIX JOB NUMBER	IN HOUSE
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G / D PLAN

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GD-1	1 OF 2

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EXPIRES 9-30-17

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 rsacks **DATE** 11/5/2019

Both hydrants need to be located within waterline easements.

Water Basis of Design
FOR
Self Storage
Loop 101 Northbound N of Raintree
Scottsdale, Arizona

A. INTRODUCTION

B. DESIGN DOCUMENTATION

C. EXISTING CONDITIONS

D. PROPOSED CONDITIONS

E. COMPUTATIONS

F. SUMMARY

G. SUPPORTING MAPS / REFERENCES

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Figure 2-Water/Sewer Map ***6***
Figure 3 - Network Analysis and Flow Test ***7***

A. Introduction

The proposed site is located along the east side of Loop 101 North of Raintree within the City of Scottsdale, Arizona. The site is situated within the Northwest Quarter of Section 7, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is currently vacant with office developments north and south and vacant property to the east. This project will develop a self storage building on the site.

B. Design Documentation

Project will be analyzed using the design criteria from the DSPM. Water demand of 0.6 gal per sf per day for office uses for the approx 3600 SF office. The only area within the project that generates water demand is the office area. Peak factor per the DSPM of 2x for the Max Day Demand and 3.5x for the Peak Hr Demand will be used.

Based on 111,000 SF and type IIB construction, fire flow per IFC will be 7000 gpm, with a 75% reduction, a fire flow of 1750 gpm will be required.

An EPANET analysis was performed based on a May 2019 flow test on the 8" line north of the site. 1500 gpm was modeled on the more remote hydrant and 250 gpm in the riser at 40' above grade. Results show 52 gpm at the hydrant and 36 gpm at the riser at 40' above grade.

C. Existing Conditions

There is an existing 20" main in the Loop 101 frontage road and an 8" line along the north side of the site.

D. Proposed Conditions

A new fire hydrant is proposed at the main entrance on Loop 101. This hydrant will be installed directly on the 20" main. A second hydrant will be constructed off the 8" main along the north side of the site. This line will also serve the fire riser on the building. Two hydrants and riser (each hydrant will directly connected to an existing main) should provide the 1750 gpm fire flow as required per code.

This project is in is in city water zone 3 and the property does not abut city water zone 2 or 4.

A 1" domestic meter and 1" landscape (100% drip landscape) meter will be placed side by side tapping the existing 8" main along the north side of the site.

E. Computations

Office: Average Day Demand: 0.6 gallons per SF= 2160 gal per day
Max Day Demand: 2x Average Day Demand = 2 x 2160= 4320 gal per day
Peak Hour Demand: 3.5x Average Day Demand (use a conservative 10 operational day) = (3.5 x 2160) / 10 hours = 756 gal per hour (13 gpm)

F. SUMMARY

- This project is the construction of one storage building with one office area.
- Site currently has water mains abutting the west and north side of the site
- Project will construct two new hydrants at the Southwest and Northeast corners of the site.
- Fire flow (using the 75% reduction) will be 1750 gpm
- Current flow test and network analysis shows 52 gpm at the hydrant and 36 gpm at the riser at 40' above grade.

G. SUPPORTING MAPS / REFERENCES

1. City of Scottsdale, Design Standards and Procedures Manual, 2018.
2. QS Map 34-49

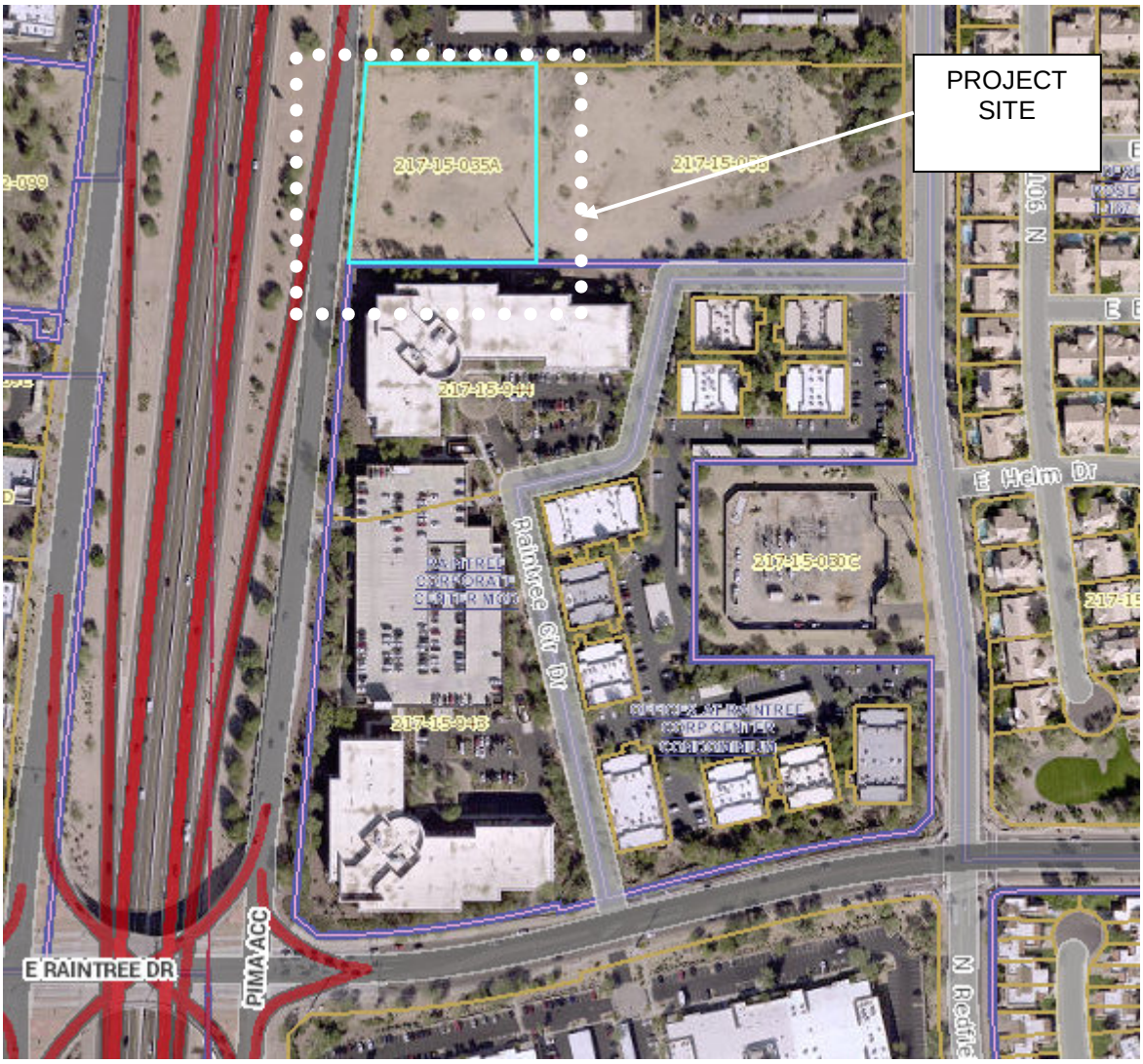


Figure 1-VICINITY MAP

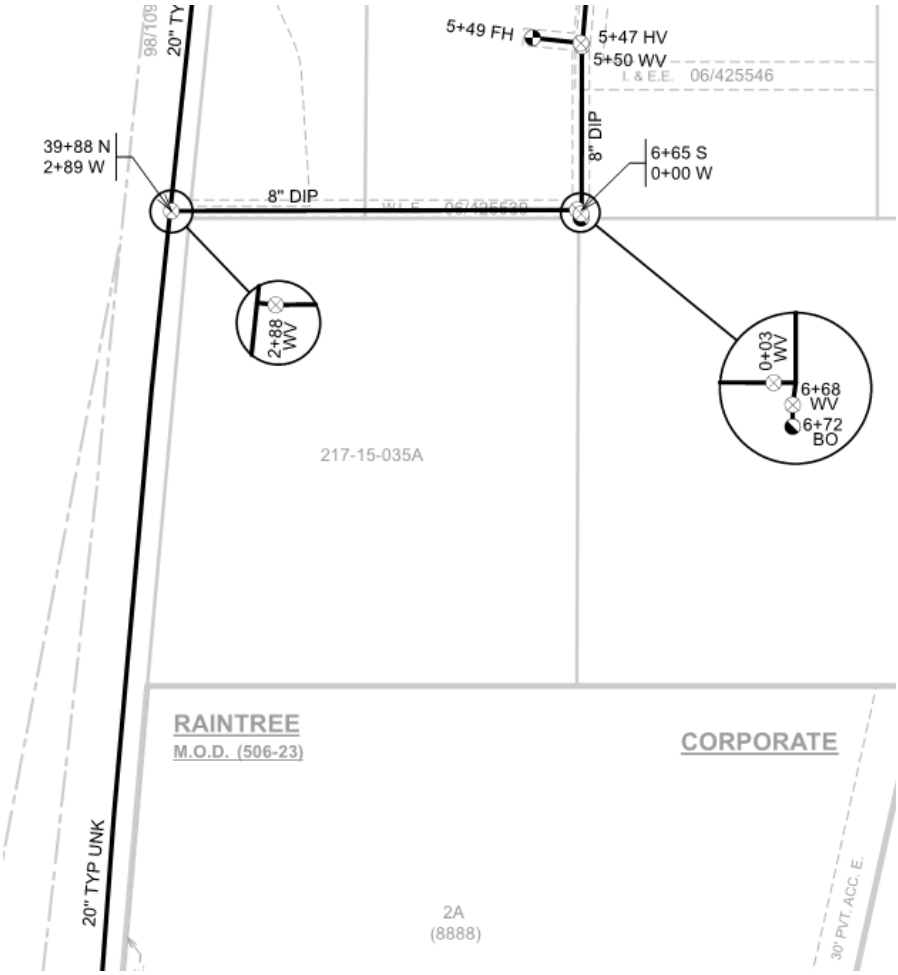
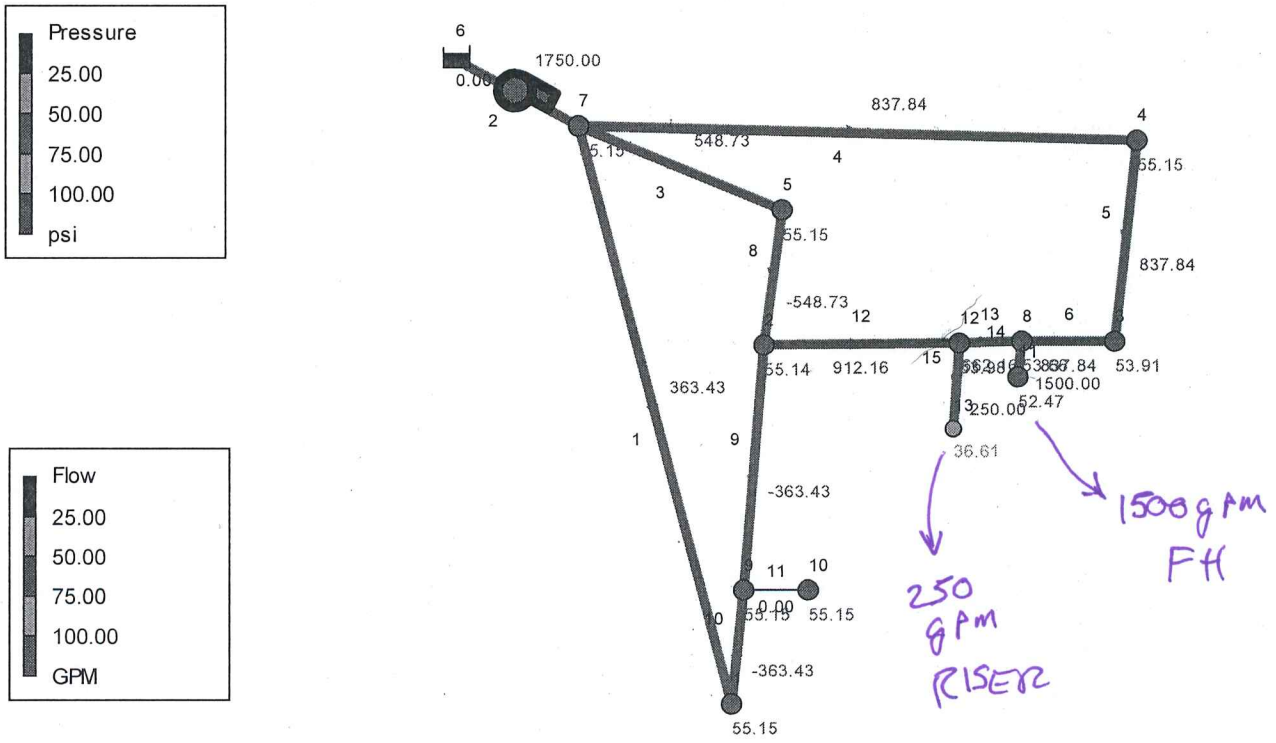


Figure 2-WATER-SEWER QS MAP

Figure 3 - Network Analysis and Flow Test

Figure 3 - Network Analysis and Flow Test


Pressure
25.00
50.00
75.00
100.00
psi
Flow
25.00
50.00
75.00
100.00
GPM
6
1750.00
0.00
2
7
837.84
4
548.73
55.15
3
5
55.15
8
837.84
-548.73
12
13
8
6
14
15
55.14
912.16
53.91
1500.00
363.43
52.47
250.00
1
9
36.61
-363.43
1500 gpm
FH
11
10
0.00
55.15
250
gpm
RISER
-363.43
55.15

Network Table - Nodes

Node ID	Elevation ft	Demand GPM	Pressure psi
Junc 1	0	0.00	55.15
Junc 2	0	0.00	55.14
Junc 3	0	0.00	53.91
Junc 4	0	0.00	55.15
Junc 5	0	0.00	55.15
Junc 7	0	0.00	55.15
Junc 8	0	0.00	53.66
Junc 9	0	0.00	55.15
Junc 10	0	0.00	55.15
Junc 11	0	1500.00	52.47
Junc 12	0	0.00	53.98
Junc 13	40	250.00	36.61
Resvr 6	0	-1750.00	0.00

Network Table - Links

Link ID	Length ft	Diameter in	Roughness	Flow GPM	Velocity fps
Pipe 1	1	12	140	363.43	1.03
Pipe 3	1	12	140	548.73	1.56
Pipe 4	1	12	140	837.84	2.38
Pipe 5	250	8	140	837.84	5.35
Pipe 6	50	8	140	837.84	5.35
Pipe 8	250	20	140	-548.73	0.56
Pipe 9	300	20	140	-363.43	0.37
Pipe 10	250	20	140	-363.43	0.37
Pipe 11	20	6	140	0.00	0.00
Pipe 12	200	8	140	912.16	5.82
Pipe 13	100	8	140	662.16	4.23
Pipe 14	20	6	140	1500.00	17.02
Pipe 15	80	8	140	250.00	1.60
Pump 2	#N/A	#N/A	#N/A	1750.00	0.00

HYDFLOW Version 2.0
Hydrant Flow Test Calculations Template

Situation: Raintree east 416 Date: 05/22/19

HYDRANT FLOW CALCULATIONS

Supply Pressure:	72.00	
Supply Elevation:	0.00	
Test Point Static Pressure:	72.00	(No Hydrant Flow)
Test Point Elevation	0.00	
Test Point Residual Pressure:	17.00	(Hydrant Flowing)

a.	Supply HGL:	166.32
b.	Test Point Static HGL:	166.32
c.	Test Point Residual HGL:	39.27

Static Head Loss (a-b):	0
Residual Head Loss(a-c):	127.05

	Hydrant:		
	#1	#2	#3
Flow Pressure in PSI:	20.00	20.00	30.00
Nozzle Diameter in Inches:	2.50	2.50	2.50
Calculated Flow in GPM:	750.6	750.6	919.4

Total Hydrant Flows in GPM:	3340.0

System Equivalent Base Flow in GPM:	0.0

System Base Flow Peaking Factor:	1
Source Pressure:	72
Source HGL	166.32

Test Point Available Flow:

Residual Pressure	HGL	Total Flow	Equiv Base Flow	Available GPM
20	46	3240	0	3240
27	61	3015	0	3015
33	76	2774	0	2774
40	91	2513	0	2513
46	106	2228	0	2228
53	121	1907	0	1907
59	136	1532	0	1532
66	151	1053	0	1053
72	166	0	0	0

E·J | Flow Test Summary

Project Name:	EJFT 19106
Project Address:	15111 N Pima Rd, Scottsdale, AZ 85260
Date of Flow Test:	2019-05-20
Time of Flow Test:	7:10 AM
Data Reliable Until:	2019-11-20
Conducted By:	Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed By:	Jared Berry (City of Scottsdale) 602.541.4942
City Forces Contacted:	City of Scottsdale (602.541.4942)
Permit Number:	C58327
Note	Scottsdale requires a max static pressure of 72 psi for safety factor

Raw Flow Test Data

Static Pressure:	100.0 PSI
Residual Pressure:	45.0 PSI
Flowing GPM:	3,340
GPM @ 20 PSI:	4,089

Data with a 28 PSI Safety Factor

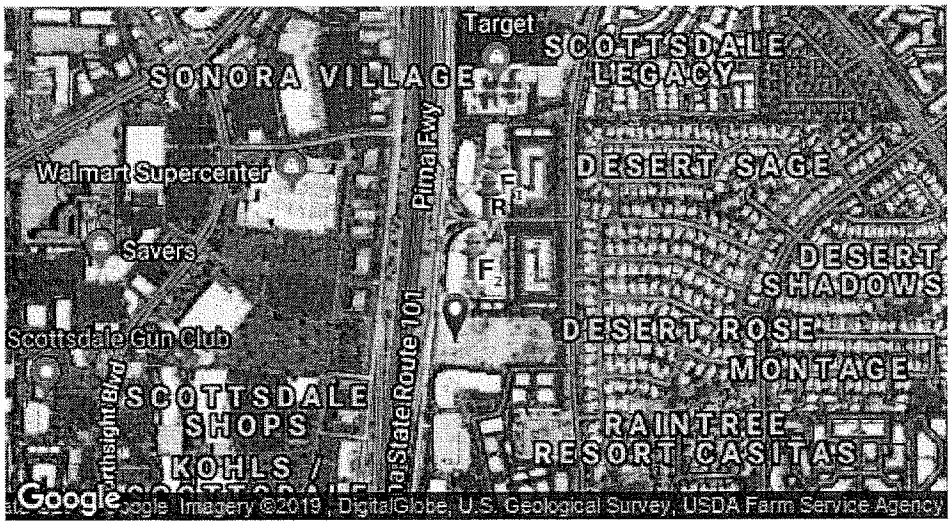
Static Pressure:	72.0 PSI
Residual Pressure:	17.0 PSI
Flowing GPM:	3,340
GPM @ 20 PSI:	3,240

Hydrant F_1

Pitot Pressure (1):	30	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	30	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches

Hydrant F_2

Pitot Pressure (1):	20	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	20	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches



Project Site

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
179 ft (measured linearly)

Static-Residual Elevation
1486 ft (above sea level)

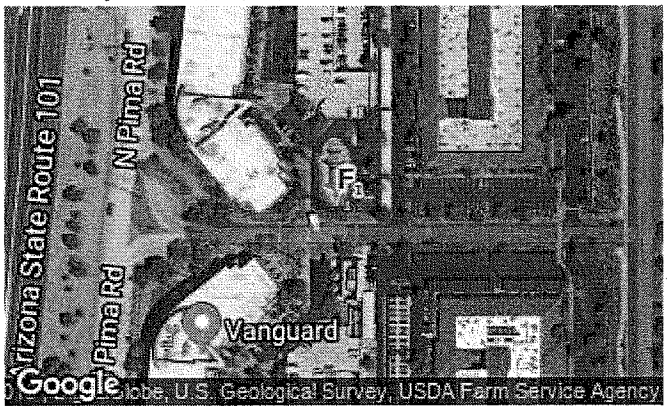
Flow Hydrant (F_1) Elevation
1489 ft (above sea level)

Elevation & distance values are approximate

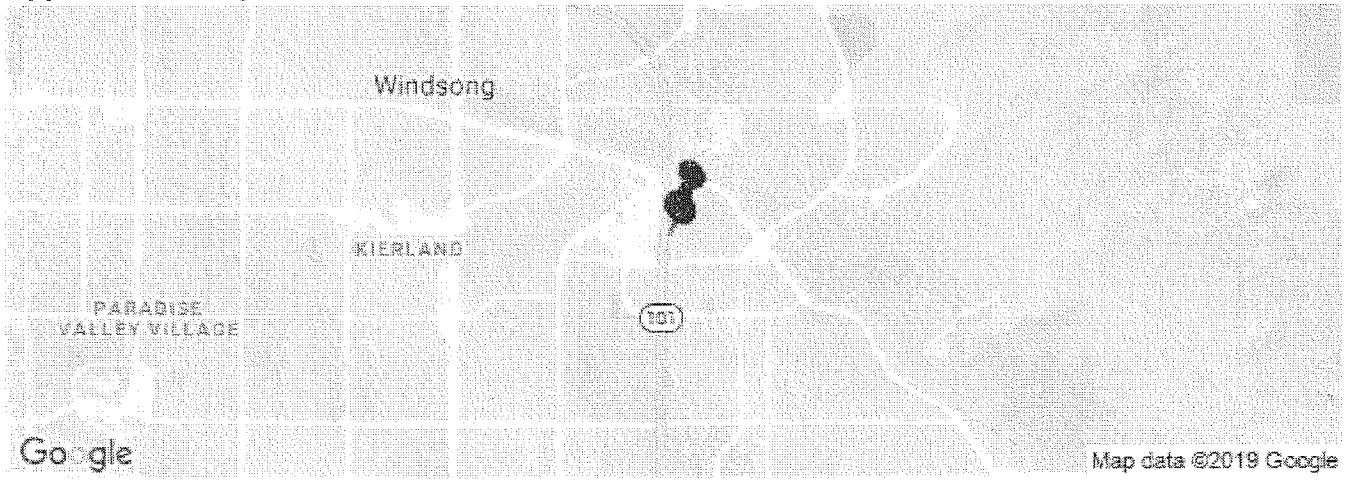
E·J | Flow Test Summary

Static-Residual Hydrant

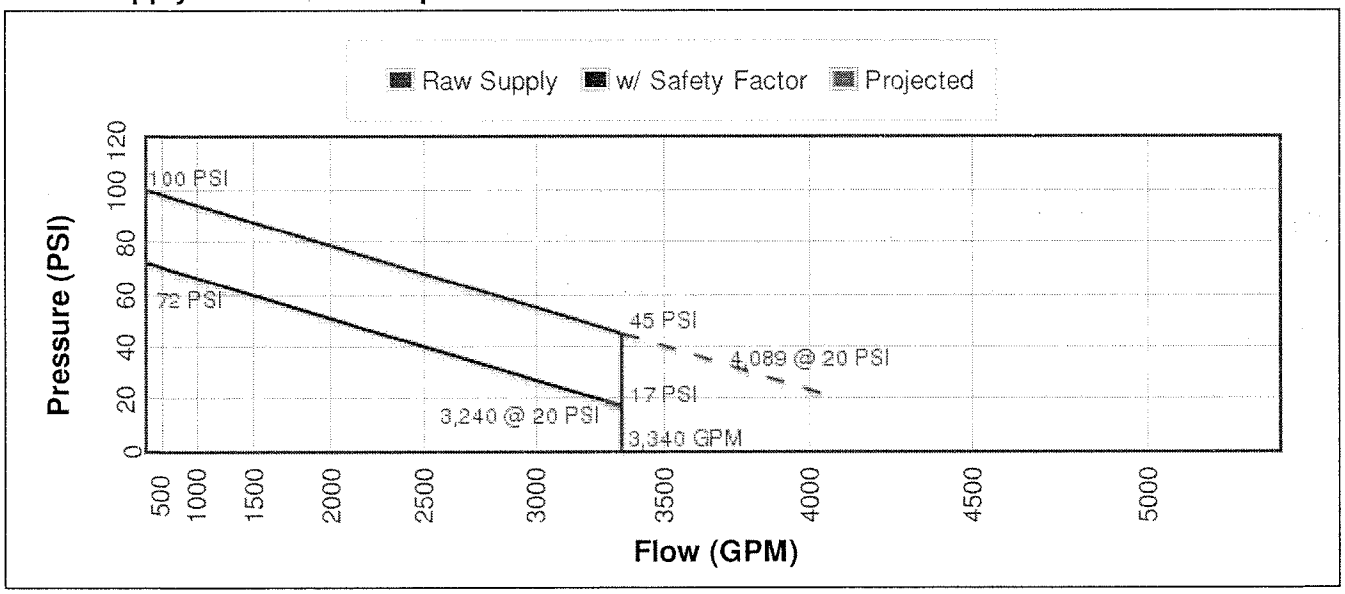
Flow Hydrant (only hydrant F1 shown for clarity)



Approximate Project Site



Water Supply Curve $N^{1.85}$ Graph



EJ Flow Tests, LLC
21505 North 78th Ave. | Suite 130 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejenginee
John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA
www.flowtestsummary.com

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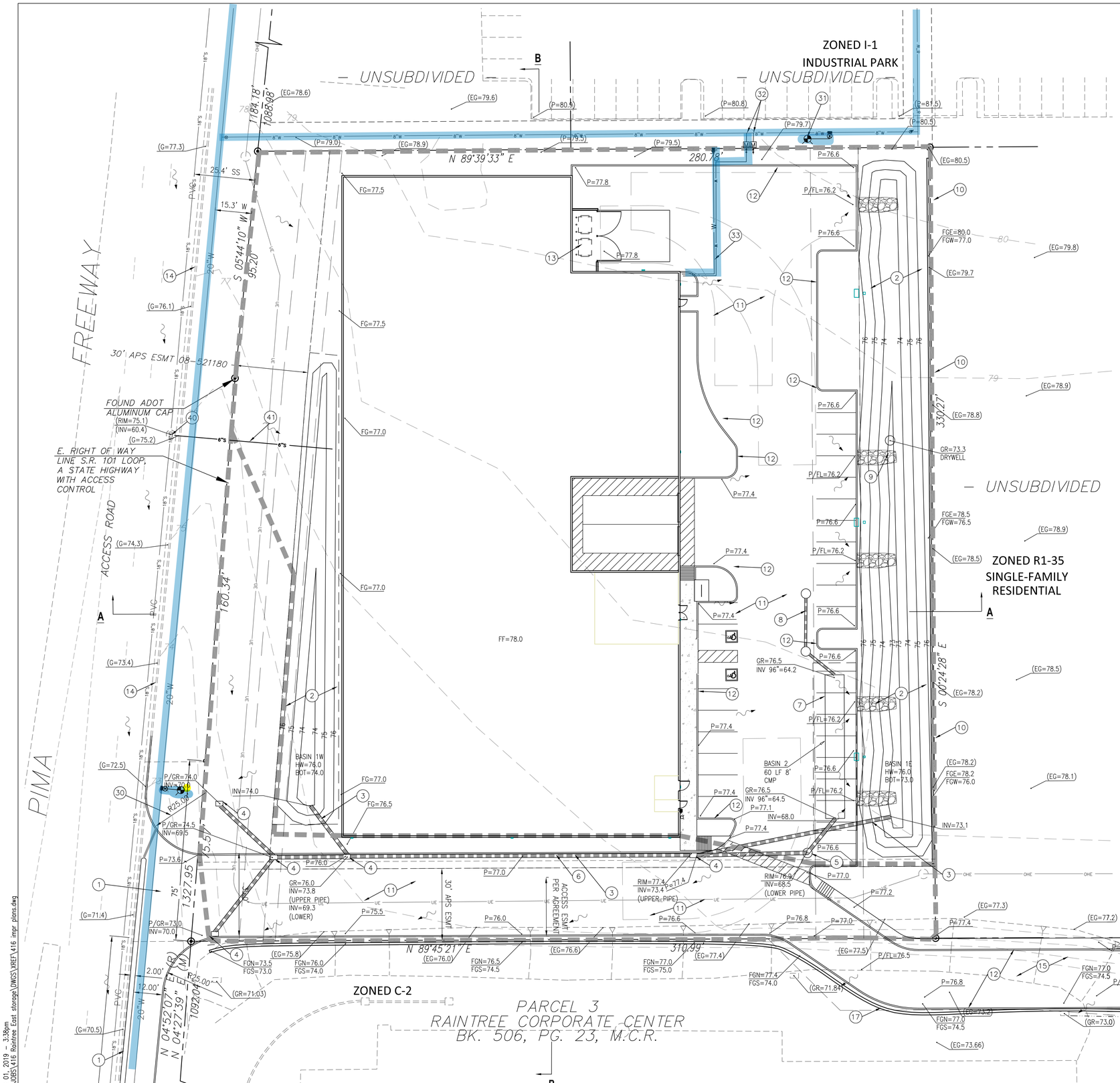
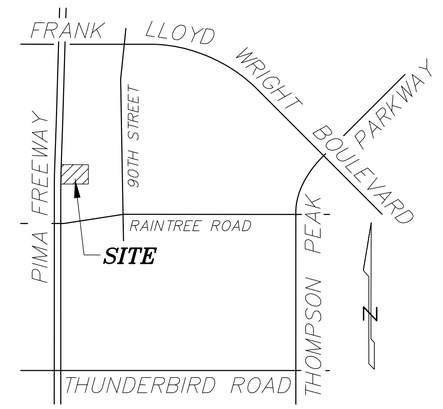


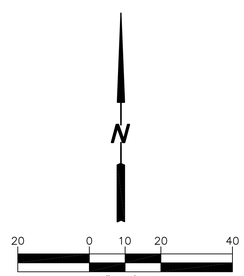


KEYED NOTES

1. CONSTRUCT ADOT DRIVEWAY AND DECEL LANE.
2. CONSTRUCT SURFACE BASIN
3. INSTALL 18" EQUALIZING PIPE. NOTE EQUALIZING PIPE UPPER PIPE IN STACKED TRENCH
4. INSTALL INLET PER MAG STD DET 535
5. INSTALL MH PER MAG STD DET 520
6. INSTALL 18" STORM DRAIN. NOTE STORM DRAIN IS LOWER PIPE
7. INSTALL 96" CMP UG RETENTION.
8. INSTALL DUAL CHAMBER DRYWELL
9. INSTALL SINGLE CHAMBER DRYWELL.
10. CONSTRUCT 2' RETAINING WALL
11. CONSTRUCT ONSITE PAVING
12. CONSTRUCT 6" CURB.
13. CONSTRUCT REFUSE ENCLOSURE PER COS STD DET 2146-1
14. ADOT CURB TO REMAIN
15. NEW 24' WIDE CROSS ACCESS WITH APPROVAL AND GRADING ON ADJACENT PARCEL
16. EXISTING ONSITE DRIVE
17. CONSTRUCT LOW RETAINING WALL

30. CONSTRUCT NEW FH ON EXISTING 20" LINE
31. CONSTRUCT NEW FH ON EXISTING 8" LINE
32. NEW DOMESTIC / LDSC WATER METER
33. NEW FIRELINE TO INTERNAL FIRE RISER

40. CONSTRUCT SEWER TAP INTO EXISTING MH
41. NEW SEWER SERVICE – CONTRACTOR SHALL VERIFY DEPTH OF 69kV UNDERGROUND BEFORE INSTALLING TAP.



CLIENT:
RKAA Architects, Inc.
2233 East Thomas Rd
Phoenix, AZ 85016
(602) 955-3900

PRELIMINARY

Registered Professional Engineer
CERTIFICATE NO.
30489
STEVEN R. BOWSER
ARIZONA U.S.A.
Expires 09/30/2020

Helix Engineering, LLC
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RELEASE	
DATE	
5-18-19	PRELIM ENGR
9-10-19	REV SITE PLAN
9-20-19	REV SITE PLAN

REVISIONS		
NO.	DATE	
1	.	.
2	.	.
3	.	.

PROJECT NAME

SELF STORAGE

PROJECT ADDRESS

Raintree / 101
SCOTTSDALE, ARIZONA
85260

PROJECT AREA

HELIX JOB NUMBER	IN HOUSE
416	DRAWN BY: MT CHECKED BY: SB

SHEET TITLE

G / D PLAN

SHEET	PAGE
GD-1	1 OF 2

PLOT SCALE: 1:1 @ 24"x36"; 1:2.2 @ 11"x17"

COS 35-DR-2019

35-DR-2019
10/29/2019

Oct 01, 2019 - 3:38pm
O:\JOBS\416 Raintree East storage\DWGS\XREFs\416 impr plans.dwg