



## Drainage Reports

# Preliminary Basis of Design

## Preliminary Drainage

FOR

### Acoya Shea & Scottsdale Senior Living

**APN# 175-33-093H**

7373 E Shea Boulevard

Scottsdale, AZ 85260

Submittal - April 27, 2020

Prepared for:

**Ryan A+E, Inc.**

3900 E. Camelback Road, Suite 100

Phoenix, AZ 85018

Prepared by:

**Mike Jackson, P.E.**



1600 N Desert Drive, Suite 230

Tempe, AZ 85281

Phone: (480) 951-0517 Fax: (480) 951-2353

*April 27, 2020*



A handwritten signature in black ink, appearing to be 'Mike Jackson'.

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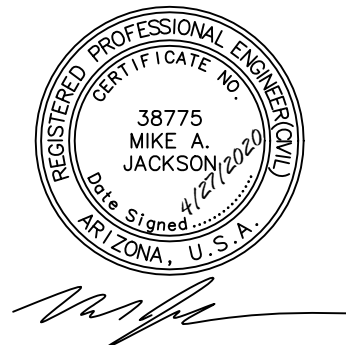
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- Appendix 1: Preliminary Grading/Utility Plan
- Appendix 2: Warning and Disclaimer of Liability Form (To be provided)



## **INTRODUCTION**

The purpose of this report is to indicate the methods used and to provide discussion of the proposed stormwater drainage for a new 4 story 4 story senior living building at the southwest corner of Shea Boulevard and N. 74<sup>th</sup> Street, serving the City of Scottsdale. The development is a 2.57 acre site that will consist of 160 units with shared areas to be used for dining and entertainment. The site proposes a total of 137 parking spaces which will be provided in an underground garage and supplemented with minimal surface parking

The proposed improvements include construction of a parking lot, open space areas, a new building, driveways, pedestrian access ramps, sidewalks, utilities, and stormwater drainage structures. This report will indicate how the storm water generated on the subject property is addressed and how it complies with the City of Scottsdale drainage requirements.

## **EXISTING CONDITIONS**

The site is bounded by Shea Boulevard to the north, 74<sup>th</sup> street to the east and commercial office buildings to the west and south. The total property area is approximately 2.57 acres and the existing development consists of an existing car wash facility and supporting site improvements. Refer to Vicinity Map (Figure 1) below for a general graphical representation of the Site location.

## **EXISTING DRAINAGE**

The Site is currently completely developed as a carwash and auto service facility. The site generally slopes towards the south. There are two catch basins located along the southern most parking curb line. Our site observations show evidence that a pipe drains the eastern catch basin to the western catch basin. The site outlets to the south to a regional storm drain.

Based on field observation and available topographic data there is no evidence of on-site ponding or stormwater storage. All storm water from this site appears to discharge through the existing storm drain network and the site ultimately overflows to the south onto the private street.

## **FEMA FLOOD ZONE / FIRM MAP**

This is to certify that the above subject property lies within unshaded zone 'x' as designated on the FIRM flood insurance rate map, map number 04013C1760L, dated October 16, 2013. Unshaded zone 'x' is designated as being areas outside of the 0.2% annual chance flood.

## **PROPOSED CONDITIONS**

To mitigate the drainage flows we propose to retain the first flush volume within a combination of above ground and underground storage on-site.

A rational method analysis was performed for the first flush storage volumes for this project. Due to the site being completely developed and lacking any apparent existing retention volume, the first flush volume is greater than the pre vs post volume. See Table 1 below for the required storage volumes.

The site has been divided into four Drainage areas for analysis, these areas are referred to as DA-1 through DA-4. Area DA-1 encompasses the northeastern portion of the site, DA-2 is to the west, DA-3 to the south, and DA-4 to the east. The drainage areas consist of roof and open space while DA-1 also includes the small surface parking lot north of the building.

The required storage volume for areas DA-1,2, & 4 will be provided in underground storage pipes. The required storage for area DA-3 will be provided in a shallow (1-foot deep) retention basin. See Table 2 for pipe IDs and details

It is proposed both the existing catch basins be removed and the existing pipe allowing on-site discharge to the south remain. The proposed on-site retention pipes will be routed in 18" HDPE storm drainpipe and ultimately discharge via the existing pipe to the south.

### **FINISHED FLOOR ELEVATION**

Building Finished Floor elevation 1355.90 is set a minimum of 6 inches above the high adjacent top of curb, which is well above one foot above the site outfall. The ultimate outfall is located at the south end of the site at an elevation of 1351.21.

### **DATA ANALYSIS**

The computations included in this report are based on the procedure described in the City of Scottsdale Design Standards and Policies Manual and the design standards and methodologies developed by the Flood Control District of Maricopa County. The first flush was used to calculate the retention volume required across the site.

Table 1-Retention Volume Requirements

Drainage Basin ID	Area (sf)	Area (ac)	C <sub>w</sub> *	Precipitation** (in)	Retention Volume Required (cf)
DA-1	42,203	0.97	1	0.5	1,758
DA-2	22,339	0.51	1	0.5	931
DA-3	26,127	0.60	1	0.5	1,089
DA-4	21,524	0.49	1	0.5	897

Table 2- Retention Volume Provided

Drainage Basin ID	Retention Type	Pipe Dia (ft)	Pipe area (sf)	Length (ft)	Volume (cf)
DA-1	UG pipe	3	7.07	260	1,838
DA-2	UG pipe	3	7.07	135	954
DA-3	Basin	na	na	na	1,011
DA-4	UG pipe	3	7.07	130	919

**WARNING AND DISCLAIMER OF LIABILITY**

Refer to **Appendix 2** for a copy of the Warning & Disclaimer of Liability form. (Pending)

**CONCLUSIONS**

This project has been designed to conform to the City of Scottsdale storm drainage design requirements. Proposed drainage improvements will include an above ground basin and an underground retention system sized to retain the first flush retention volume. Proposed storm drain inlets and storm drain pipes will be adequately sized to convey the expected peak flows to the underground storage system which will ultimately discharge to an existing network south. Excess flows generated onsite will overflow to the existing street to the south, which generally match the historic overflow pattern. No adverse impacts to the offsite downstream properties are anticipated as a result of the proposed improvements.

## **REFERENCES**

*City of Scottsdale*, Design Standards & Policies Manual, January 2010.

*Flood Control District of Maricopa County*. Drainage Design Manual for Maricopa County, Arizona, Volume 1. August 15, 2013.

*Flood Control District of Maricopa County*. Drainage Design Manual for Maricopa County, Arizona, Volume 2. August 15, 2013.

# Appendix 1: Preliminary Grading/Utility Plan

# 7373 E SHEA BOULEVARD SCOTTSDALE, ARIZONA

A PORTION OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 26,  
TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN,  
MARICOPA COUNTY, ARIZONA

## PRELIMINARY GRADING AND DRAINAGE PLAN

### LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF MARICOPA, STATE OF ARIZONA, AND IS DESCRIBED AS FOLLOWS:

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MARICOPA COUNTY, ARIZONA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:  
COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 26; THENCE SOUTH 89 DEGREES 58 MINUTES 07 SECONDS EAST ALONG THE NORTH LINE OF SAID SECTION, A DISTANCE OF 908.81 FEET; THENCE SOUTH 00 DEGREES 01 MINUTES 53 SECONDS WEST, A DISTANCE OF 65.00 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF SHEA BOULEVARD, MARKING THE POINT OF BEGINNING; THENCE SOUTH 89 DEGREES 58 MINUTES 07 SECONDS EAST ALONG SAID RIGHT-OF-WAY LINE, A DISTANCE OF 349.62 FEET TO THE BEGINNING OF A CURVE WITH A RADIUS OF 112.00 FEET TO THE RIGHT; THENCE SOUTHEASTERLY, ALONG THE ARC OF SAID CURVE, THROUGH A CENTRAL ANGLE OF 89 DEGREES 46 MINUTES 45 SECONDS, FOR AN ARC DISTANCE OF 18.80 FEET TO THE WESTERLY RIGHT-OF-WAY LINE OF 74TH STREET; THENCE SOUTH 00 DEGREES 11 MINUTES 22 SECONDS EAST ALONG SAID WESTERLY RIGHT-OF-WAY LINE, A DISTANCE OF 313.05 FEET; THENCE NORTH 89 DEGREES 58 MINUTES 07 SECONDS WEST, A DISTANCE OF 330.46 FEET; THENCE NORTH 00 DEGREES 05 MINUTES 41 SECONDS WEST, A DISTANCE OF 55.05 FEET TO THE BEGINNING OF A CURVE WITH A RADIUS OF 115.00 FEET TO THE LEFT; THENCE NORTHERLY, ALONG THE ARC OF SAID CURVE, THROUGH A CENTRAL ANGLE OF 08 DEGREES 20 MINUTES 12 SECONDS, FOR AN ARC DISTANCE OF 16.73 FEET; THENCE NORTH 08 DEGREES 25 MINUTES 53 SECONDS WEST, A DISTANCE OF 203.20 FEET TO THE BEGINNING OF A CURVE WITH A RADIUS OF 100.00 FEET TO THE RIGHT; THENCE NORTHERLY, ALONG THE ARC OF SAID CURVE, THROUGH A CENTRAL ANGLE OF 08 DEGREES 27 MINUTES 46 SECONDS, FOR AN ARC DISTANCE OF 14.77 FEET; THENCE NORTH 00 DEGREES 01 MINUTES 53 SECONDS EAST, A DISTANCE OF 37.57 FEET TO THE POINT OF BEGINNING.

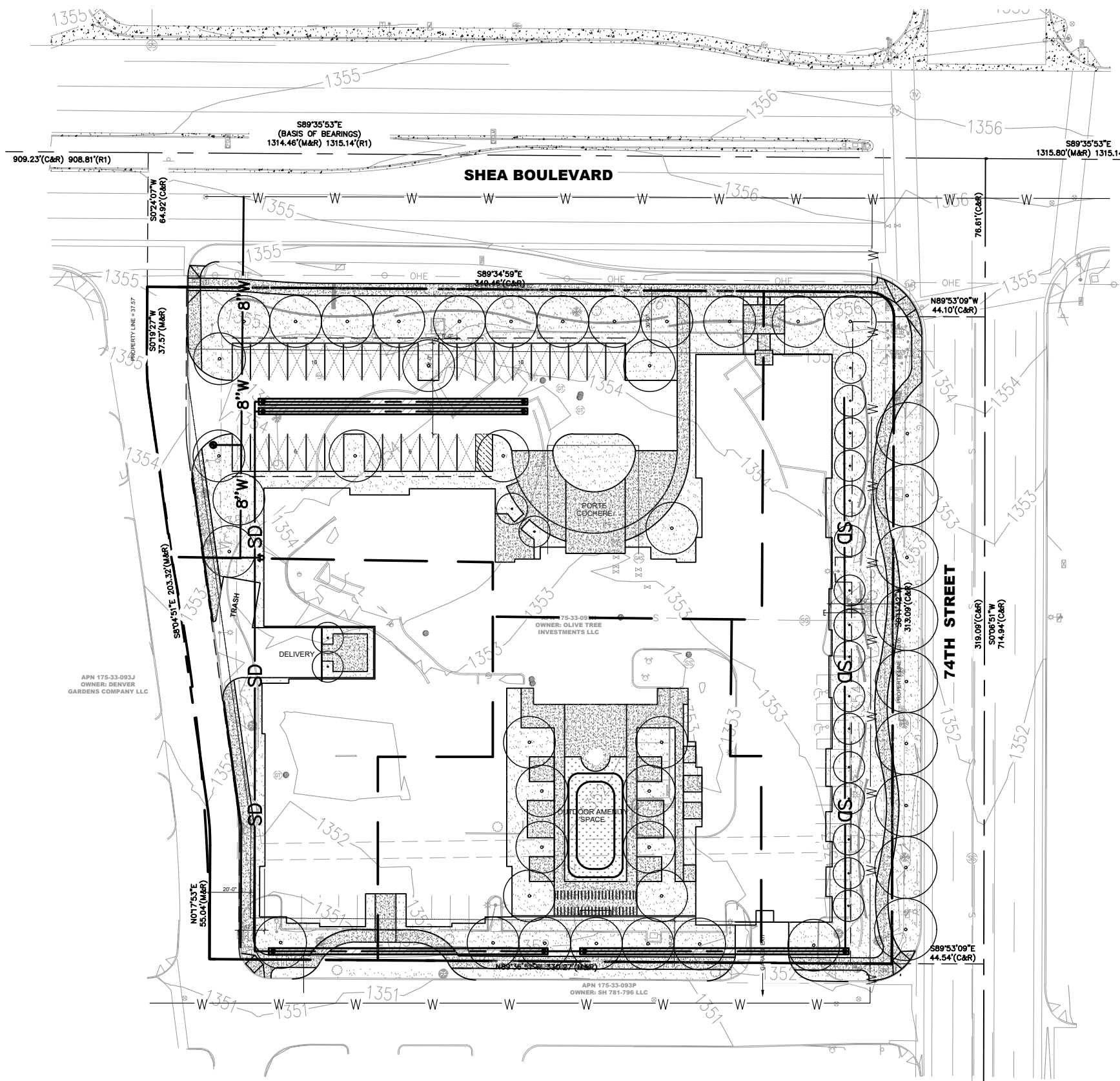
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### LEGEND

---	PROPERTY BOUNDARY	S	SLOPE
---	SAWCUT LINE/LIMITS OF GRADING	FT	FOOT
---	CENTER LINE	TC	TOP OF CURB ELEVATION
---	1581 EXISTING MINOR CONTOUR	GB	GRADE BREAK
---	1580 EXISTING MAJOR CONTOUR	SW	SIDEWALK
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---	CONCEPTUAL GAS LINE	1.0%	FLOW ARROW
---	6" S PROPOSED SANITARY SEWER LINE	P=1425.00	PROPOSED SPOT ELEVATION
---		(P=1424.25)	EXISTING SPOT ELEVATION

### DRAINAGE STATEMENT

THIS PROJECT HAS BEEN DESIGNED TO CONFORM TO THE CITY OF SCOTTSDALE STORM DRAINAGE DESIGN REQUIREMENTS. DUE TO THE SITE BEING COMPLETELY DEVELOPED AND LACKING ANY APPARENT EXISTING RETENTION VOLUME, THE FIRST FLUSH VOLUME IS GREATER THAN THE PRE VS POST VOLUME. A RATIONAL METHOD ANALYSIS WAS PERFORMED FOR THE FIRST FLUSH AND THE PROPOSED DRAINAGE IMPROVEMENTS WILL INCLUDE AN ABOVE GROUND BASIN AND UNDERGROUND RETENTION SYSTEMS. PROPOSED STORM DRAIN INLETS AND STORM DRAIN PIPES WILL BE ADEQUATELY SIZED TO CONVEY THE EXPECTED PEAK FLOWS TO THE UNDERGROUND STORAGE SYSTEMS. THE UNDERGROUND STORAGE WILL DISCHARGE TO THE EXISTING STORM DRAIN NETWORK SOUTH OF THE PROPERTY. EXCESS FLOWS GENERATED ONSITE WILL OVERFLOW TO THE EXISTING STREETS AND DRAIN TO THE SOUTH, WHICH GENERALLY MATCH THE HISTORIC OVERFLOW PATTERN. NO ADVERSE IMPACTS TO THE OFFSITE DOWNSTREAM PROPERTIES ARE ANTICIPATED AS A RESULT OF THE PROPOSED IMPROVEMENTS.



### INDEX MAP

NTS

SHEET INDEX	
DRAWING NUMBER	SHEET TITLE
C1	COVER SHEET
C2	PRELIMINARY GRADING & DRAINAGE PLAN
C3	PRELIMINARY UTILITY PLAN

### ARCHITECT

**RYAN A+E, INC.**  
533 S. THIRD STREET, SUITE 100  
MINNEAPOLIS, MINNESOTA 55415  
PHONE: 612-492-4000  
CONTACT: CARY MOLASH

### CIVIL ENGINEER

**IMEG CORP**  
1600 N. DESERT DRIVE, SUITE 230  
TEMPE, AZ 85281  
PHONE: 480-378-3925  
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A.P.N.: 175-33-093H  
AREA : 112,072 SF OR 2,573 AC.  
ADDRESS: 7373 E. SHEA BOULEVARD  
SCOTTSDALE, AZ 85260

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THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 26. SAID LINE BEARS SOUTH 89 DEGREES 35 MINUTES 53 SECONDS WEST.

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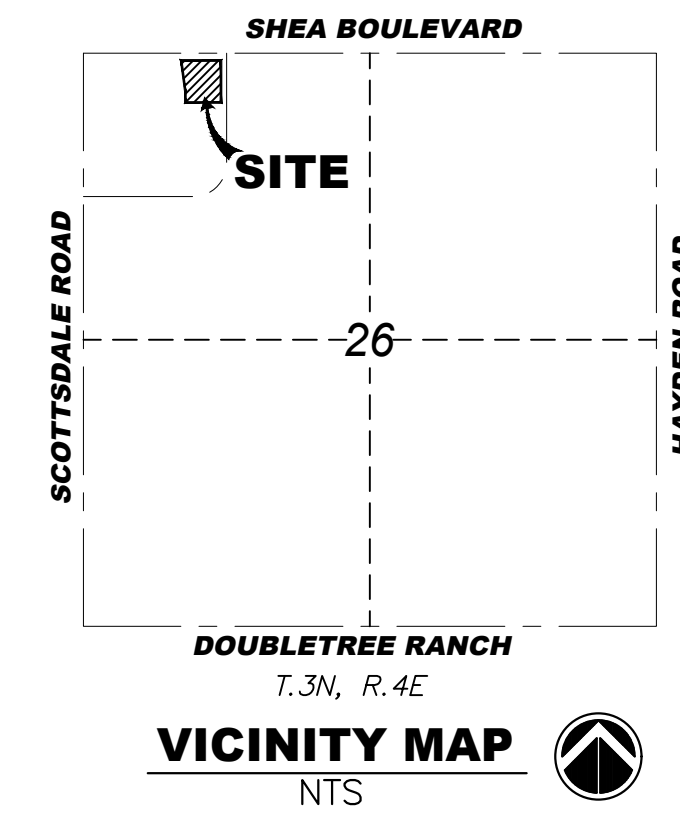
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ELEVATION = 1355.13 (NAVD'88)

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COMMUNITY NUMBER	PANEL # PANEL DATE	SUFFIX	DATE OF FIRM (INDEX DATE)	FIRM ZONE	BASE FLOOD ELEV (IN AO ZONE, USE DEPTH)
04013	1760 10/16/13	L	12.04.2015	X	N/A



### VICINITY MAP

NTS

# RYAN

RYAN A+E, INC.  
3900 E. Camelback Road, Ste 100  
Phoenix, AZ 85018  
602-322-6100 tel  
602-322-6300 fax

WWW.RYANCOMPANIES.COM

OWNER

CONSULTANTS

## IMEG

1600 N. DESERT DRIVE  
SUITE 230  
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PH: 480.951.0517  
FAX: 480.951.2353  
www.imegcorp.com



PROJECT INFORMATION

## ACOYA SHEA SENIOR LIVING

7373 E. SHEA BLVD.  
SCOTTSDALE, AZ 85260

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Architect under the laws of the State of Arizona

MIKE JACKSON

REGISTRATION NO.	DATE
38775	4/27/2020

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DRAWN BY	CHECKED BY
AM	MJ

JOB NO.	DATE
20001090.00	04.27.2020

PRELIMINARY  
NOT FOR  
CONSTRUCTION

COVER SHEET

# C1



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# C2

SCOTTSDALE ROAD

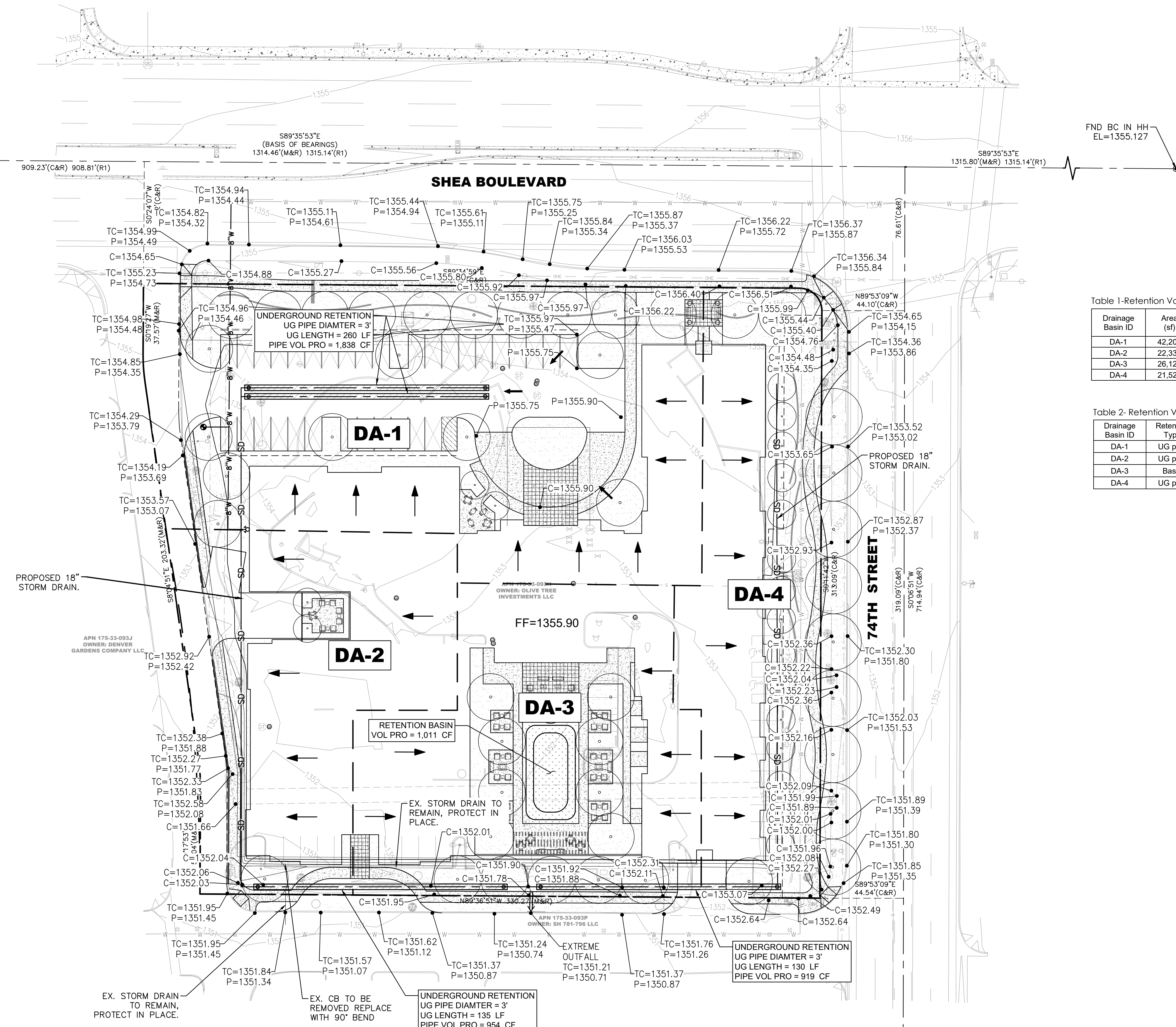
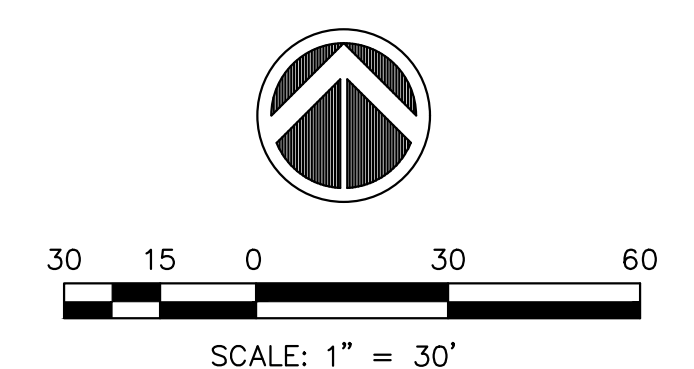


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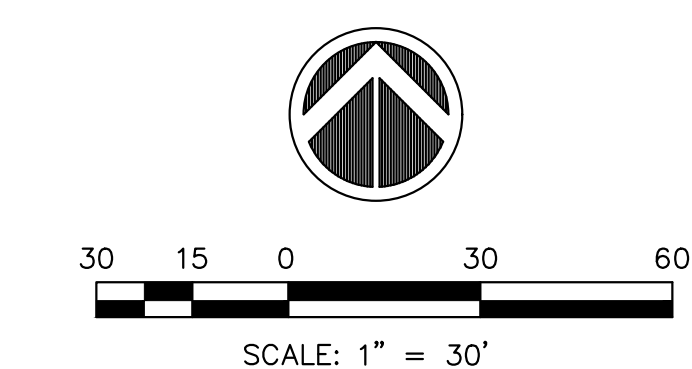
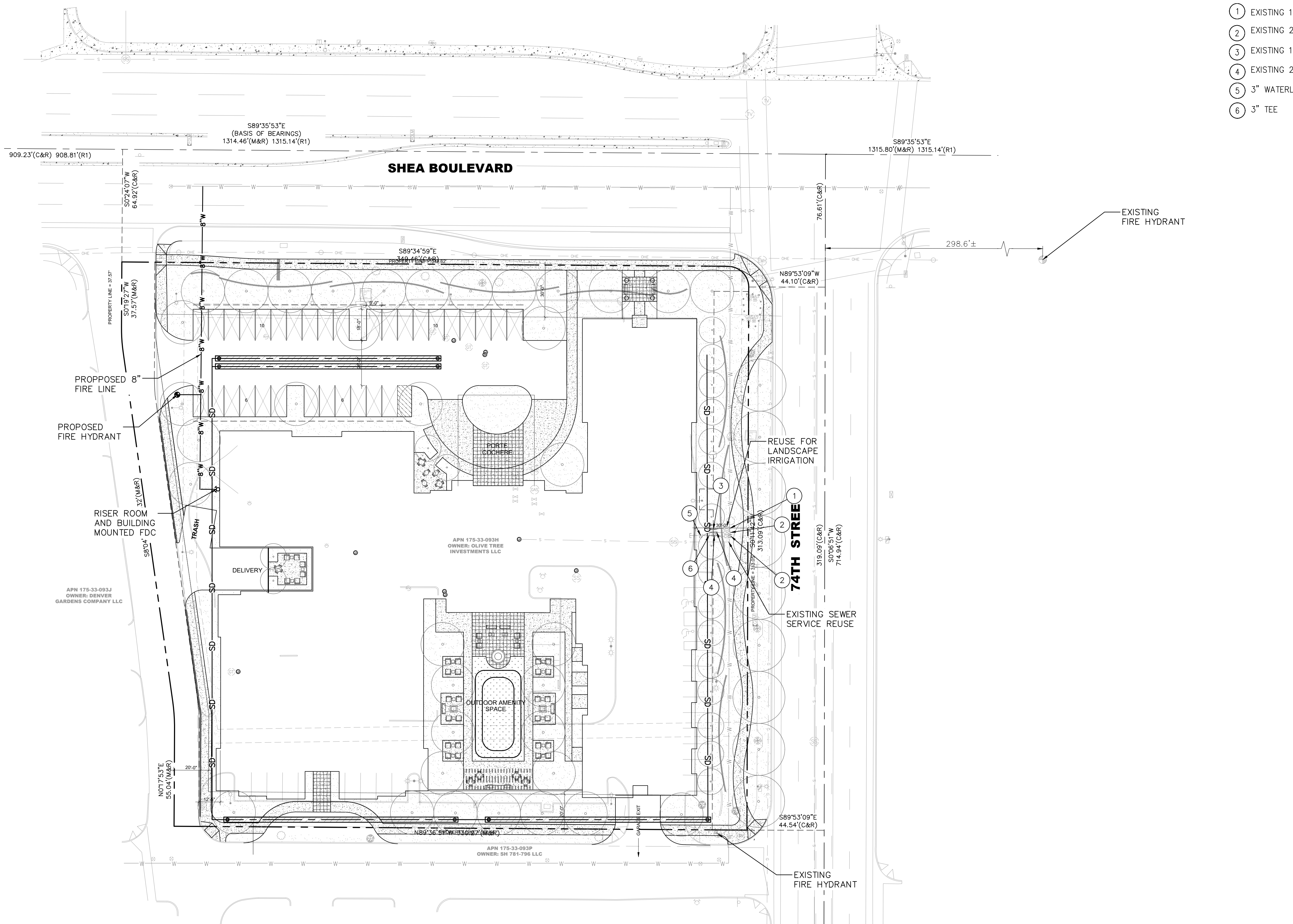
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### PRELIMINARY UTILITY PLAN

# C3

### WATER KEYNOTES

- 1 EXISTING 1.5" WATER METER
- 2 EXISTING 2" WATER METER
- 3 EXISTING 1.3" BACKFLOW
- 4 EXISTING 2" BACKFLOW
- 5 3" WATERLINE
- 6 3" TEE

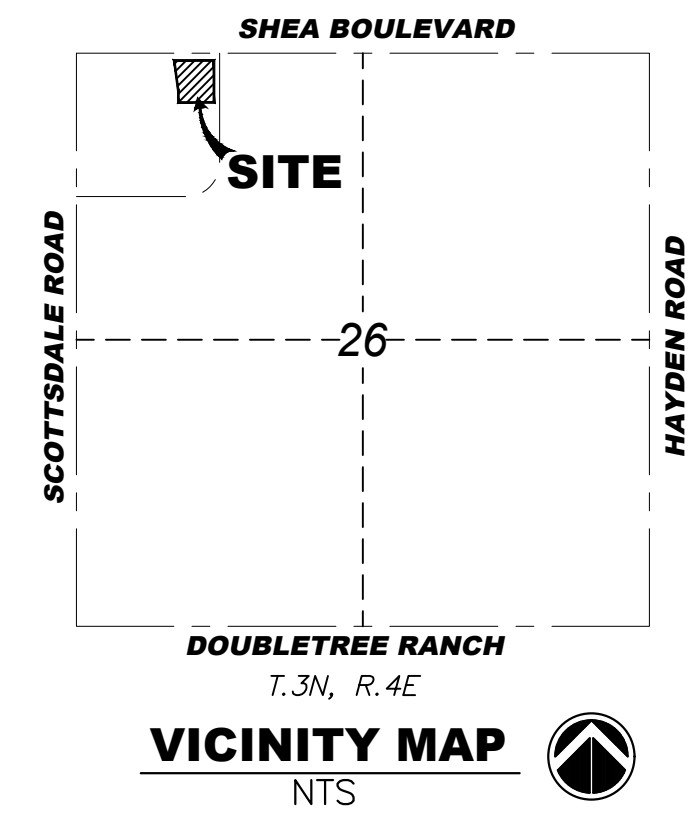


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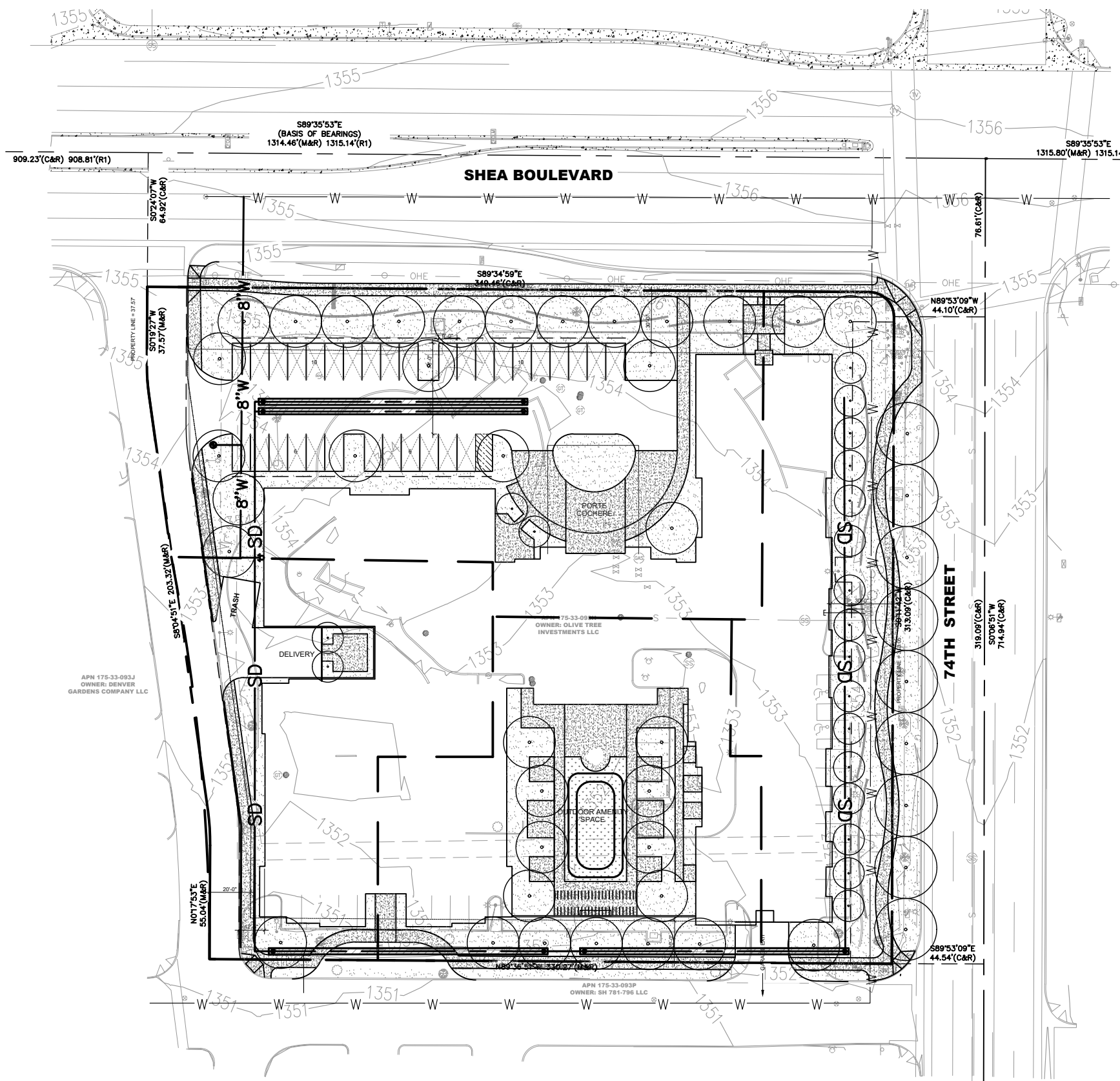
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### ACOYA SHEA SENIOR LIVING

7373 E. SHEA BLVD.  
SCOTTSDALE, AZ 85260

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Architect under the laws of the State of Arizona

MIKE JACKSON

REGISTRATION NO. DATE  
38775 4/27/2020

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DRAWN BY CHECKED BY  
AM MJ  
JOB NO. DATE  
20001090.00 04.27.2020

**PRELIMINARY**  
NOT FOR CONSTRUCTION

### PRELIMINARY GRADING & DRAINAGE PLAN

# C2

SCOTTSDALE ROAD

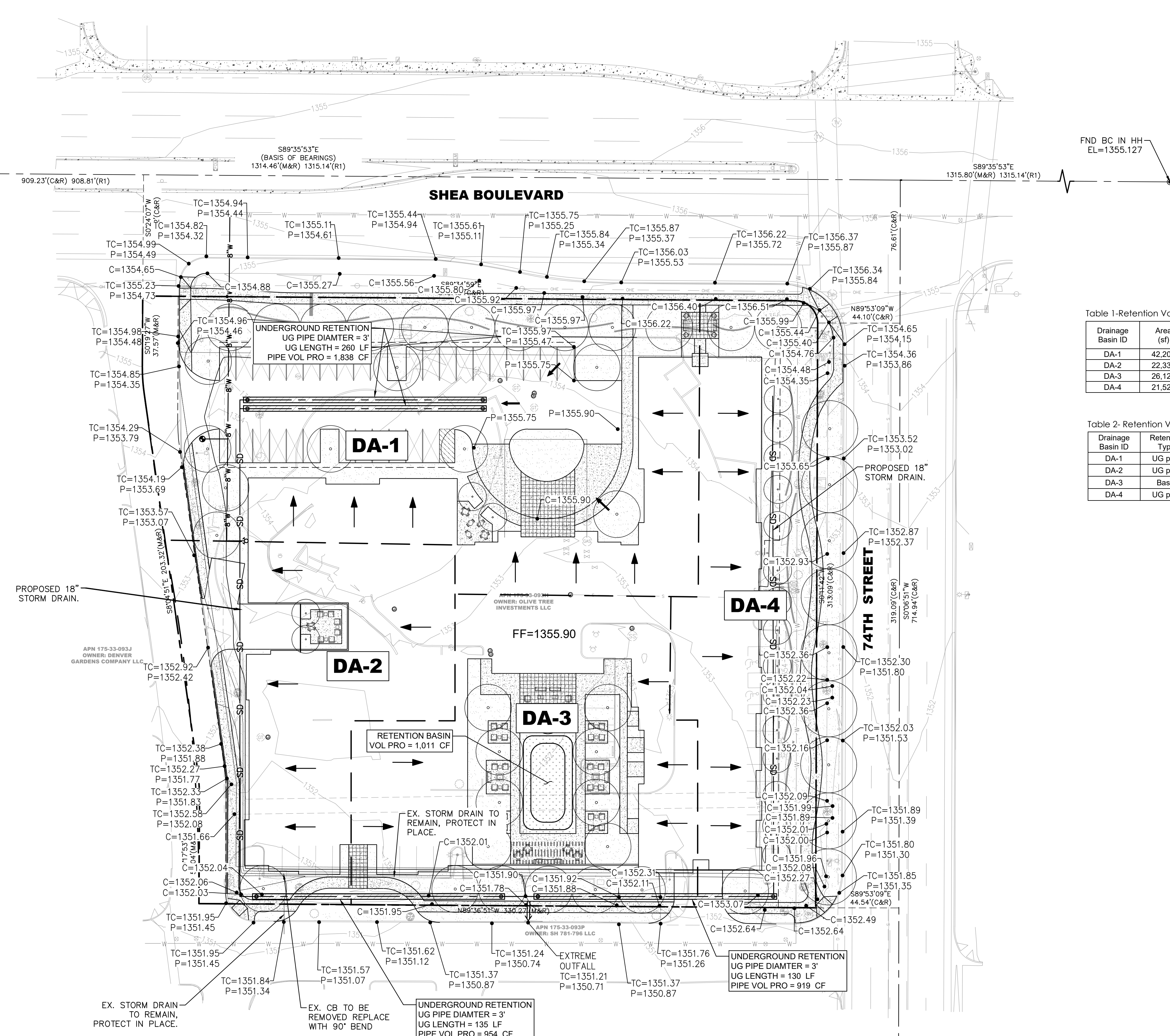
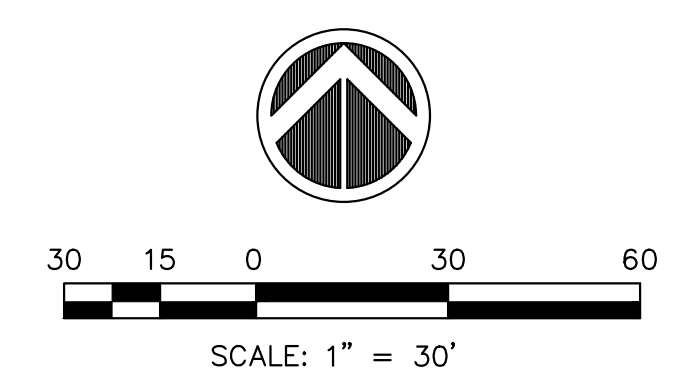


Table 1-Retention Volume Requirements

Drainage Basin ID	Area (sf)	Area (ac)	C <sub>w</sub> *	Precipitation** (in)	Retention Volume Required (cf)
DA-1	42,203	0.97	1	0.5	1,758
DA-2	22,339	0.51	1	0.5	931
DA-3	26,127	0.60	1	0.5	1,089
DA-4	21,524	0.49	1	0.5	897

Table 2- Retention Volume Provided

Drainage Basin ID	Retention Type	Pipe Dia (ft)	Pipe area (sf)	Length (ft)	Volume (cf)
DA-1	UG pipe	3	7.07	260	1,838
DA-2	UG pipe	3	7.07	135	954
DA-3	Basin	na	na	na	1,011
DA-4	UG pipe	3	7.07	130	919



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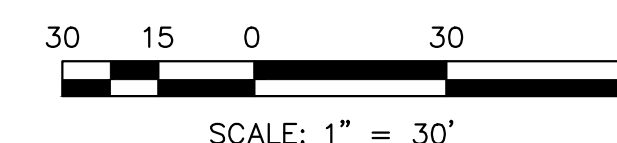
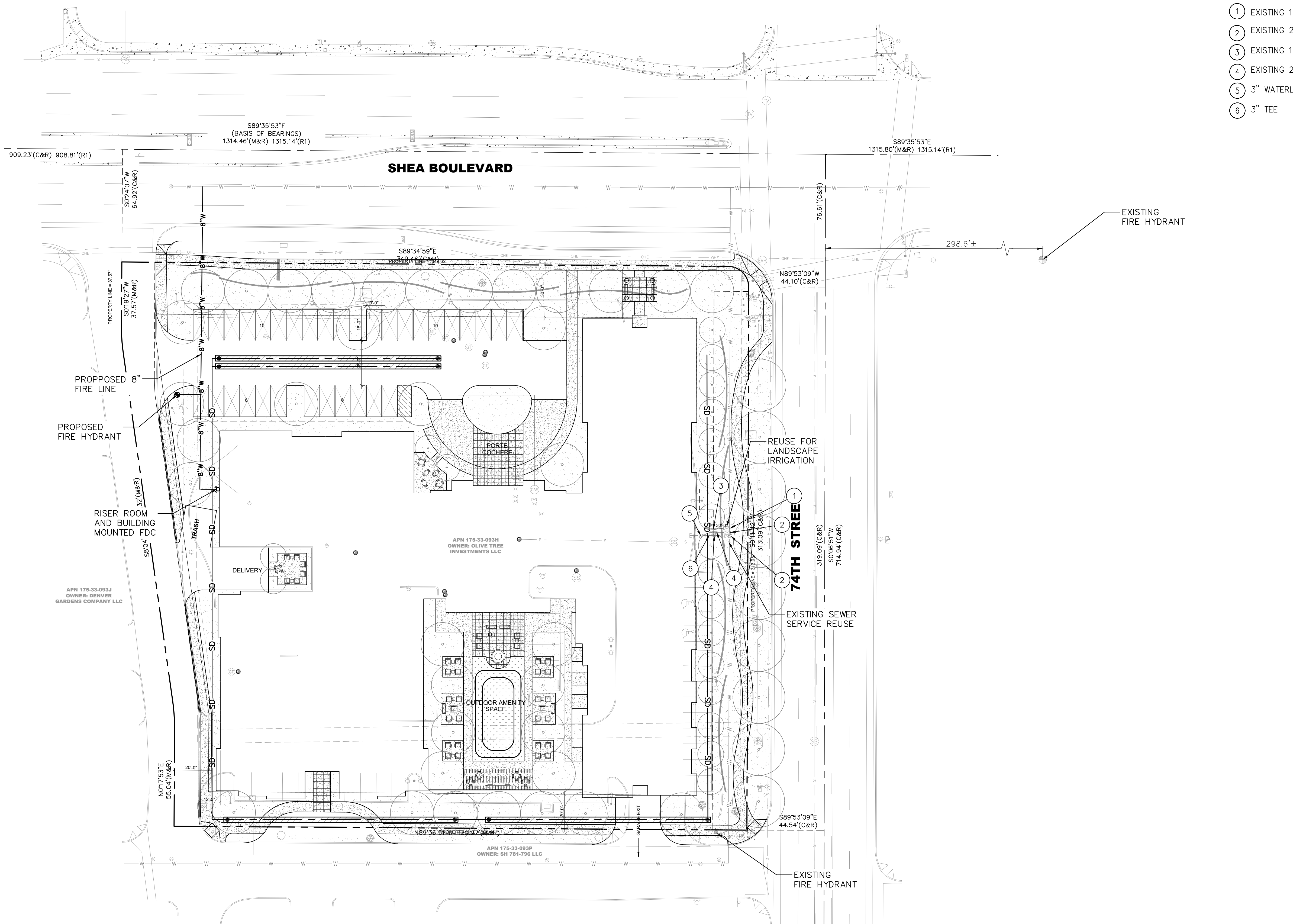
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### PRELIMINARY UTILITY PLAN

# C3

### WATER KEYNOTES

- 1 EXISTING 1.5" WATER METER
- 2 EXISTING 2" WATER METER
- 3 EXISTING 1.3" BACKFLOW
- 4 EXISTING 2" BACKFLOW
- 5 3" WATERLINE
- 6 3" TEE



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