



Abbreviated Water and Sewer Needs

FINAL SEWER CAPACITY REPORT

ALTA Raintree Scottsdale

8688 E. Raintree Drive
Scottsdale, AZ 85260

FINAL Basis of Design Report

- APPROVED
 APPROVED AS NOTED
 REVISE AND RESUBMIT



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 10/9/2019

Prepared For:



Prepared by:



Sustainability Engineering Group

8280 E. Gelding Drive, Suite 101
Scottsdale, AZ 85260
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Project Number: 180961

Submittal Date: September 27, 2019

Case No.: 2-GP-2019 3-ZN-2019

Plan Check No.: TBD

48-DR-2019
10/04/2019

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1. INTRODUCTION

This report presents the service requirements for a new multi-family apartment with 330 units and a pool proposed on one lot (Lot 3) surrounded by three private roads frontage of the site. Preparation of this report has been done in accordance with the requirements of the City of Scottsdale Design Standards & Policies Manual (DS&PM) 2018 ¹.

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The project property consists of a parcel of land located in Northsight II, a portion of the SE ¼ of Section 1 and the NE ¼ of Section 12, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The current parcel ID numbers is 215-52-034 M. Refer to **FIGURE 1** for the project's location with respect to major cross streets.

2.2 EXISTING AND PROPOSED DEVELOPMENTS SURROUNDING THE SITE:

Existing site context related to surrounding developments is as follows:

- North: To the north is a proposed self-storage building.
- West: The west side is bound by Scottsdale Shops and Northsight Blvd.
- South: The south is Kohls/Scottsdale.
- East: two new proposed retail buildings, North 87th Street public access way, a Chick-fil-A, Jimmy John's, and North Pima Road frontage to State Route 101.

2.3 EXISTING SITE DESCRIPTION:

Land ownership, as defined on the Final Plat by AW Land Surveying, LLC includes 242,067 square feet, 5.56 +/- acres (net) of commercially zoned land. City of Scottsdale zoning maps designate this parcel as C-2.

The proposed lot consist of an existing one-story retail building, two drainage basins, and associate parking. The topography generally slopes from the north to the south at approximately 1%. Refer to **FIGURE 2** for an aerial of the overall project existing conditions.

2.4 PROPOSED SITE DEVELOPMENT:

The site will be replatted into five lots. This phase includes development of Lot 3. Lots 2 and 4 to the east are described in a separate report and include an existing retail building and a new restaurant. Lot 1 is proposed as a future self-storage facility and will be developed under separate permit. Lot 5 supports a site sign along the Pima Road frontage. Refer to **FIGURE 4** for the Preliminary Plat.

3. EXISTING INFRASTRUCTURE

3.1 SEWER

Per **FIGURE 3**, Lot 3 presently has private sewers that run from north to south along the west line then east along the south lines of Lots 3 and 4 where it connects to an existing private 8" sewer in the 87th Street public accessway. This line then flows south to a public 8" pipe in Raintree Drive and east to the 24" trunk line along the Pima Frontage Road. All on-lot sewers are private.

4. DEMANDS

4.1 SEWER:

TABLE 1 - AVERAGE DAILY DEMANDS

Land Use	Demand (gpd)	Units
High Density Residential	140	per unit

Peaking factor: Peak 4.5
Pool backwash rate: 100 gpm

TABLE 2 - CALCULATED DEMANDS

Lot	Land Use	Total Unit Count	ADD (gpd)	ADD (gpm)	PD (gpm)
3	High Density Residential	330	46,200	32.1	144.4
3	Pool Backwash		N/A	100.0	100.0
	Total	330		132.1	244.4

Reference DS+PM Figure 6-1.2

5. UTILITY CONNECTIONS

5.1 PROPOSED SEWER SYSTEM:

Refer to **APPENDIX II** for the Utility Exhibit. The private sewers along the west and south sides of Lot 3 will be modified as needed to accommodate the new building footprint.

5.2 PROPOSED SEWER SERVICE CONNECTIONS:

Sewer services to the proposed residential buildings will be made to the existing 8" pipe along the south line of Lot 3. Two service connections are anticipated.

5.3 MAINTENANCE RESPONSIBILITIES:

The on-site sewer line for the proposed development will remain private, thereby owned and maintained by a property management association. The off-site sewer in Raintree Drive is a public system owned and maintained by the City.

5.4 ONSITE SEWER CAPACITY CALCULATIONS

Sewer pipe capacities have been calculated using FlowMaster V8i. The minimum slope along the existing 8" line is approximately 0.0052 ft/ft. Calculation output for the following pipe flows can be found in **Appendix I** and are summarized in the following table.

TABLE 3 - ONSITE SEWER HYDRAULICS

Flow Scenario	Flow (gpm)	Depth (in)	Velocity (fps)	d/D
ADD	32.1	1.6	1.5	0.20
ADD + Pool	132.1	3.1	2.3	0.39
PD	144.4	3.4	2.3	0.43
PD + Pool	244.4	4.6	2.6	0.58
Allowable	295.8	5.2	2.7	0.65

5.5 SEWER FLOW MONITORING AND DOWNSTREAM CAPACITIES

Monitored flow results are not being required by the City based on recent water meter reads. The downstream 8" line in Raintree Drive has a 2% slope per City records. Capacity of this pipe at a d/D of 0.65 is 580.2 gpm at 5.4 fps. The shops presently sitting on Lot 3 are presently vacant therefore no flow credit is given to the monitored results. The proposed peak day plus pool backwash flow for Lot 3 is 244.4 gpm. No deficiency is anticipated in the onsite sewer system.

The reach of sewer in Raintree Drive between the private access drive (87th Street alignment) and the 24" trunk line along Pima Road has a slope of 0.0052'/' per City quarter section maps. The capacity of this line at d/D = 0.65 is 296 gpm at 2.7 fps.

6. SUMMARY

6.1 SUMMARY OF PROPOSED IMPROVEMENTS:

- The proposed wastewater improvement was designed based on the current City of Scottsdale's design standards and policies.
- The existing onsite private and offsite public infrastructure has enough capacity for the proposed development.

6.2 PROJECT SCHEDULE:

The infrastructure is proposed to be constructed in a single phase.

6 SUPPORTING MAPS

- **FIGURE 3** – quarter section map
- **FIGURE 4** – preliminary plat
- **APPENDIX II** - Utility Exhibit.

7 REFERENCES

1. *COS QS Sewer Plan number 39-49*
2. *City of Scottsdale Design Standards & Policies Manual, 2018 (Chapter 7 – Wastewater)*



FIGURE 1
VICINITY MAP

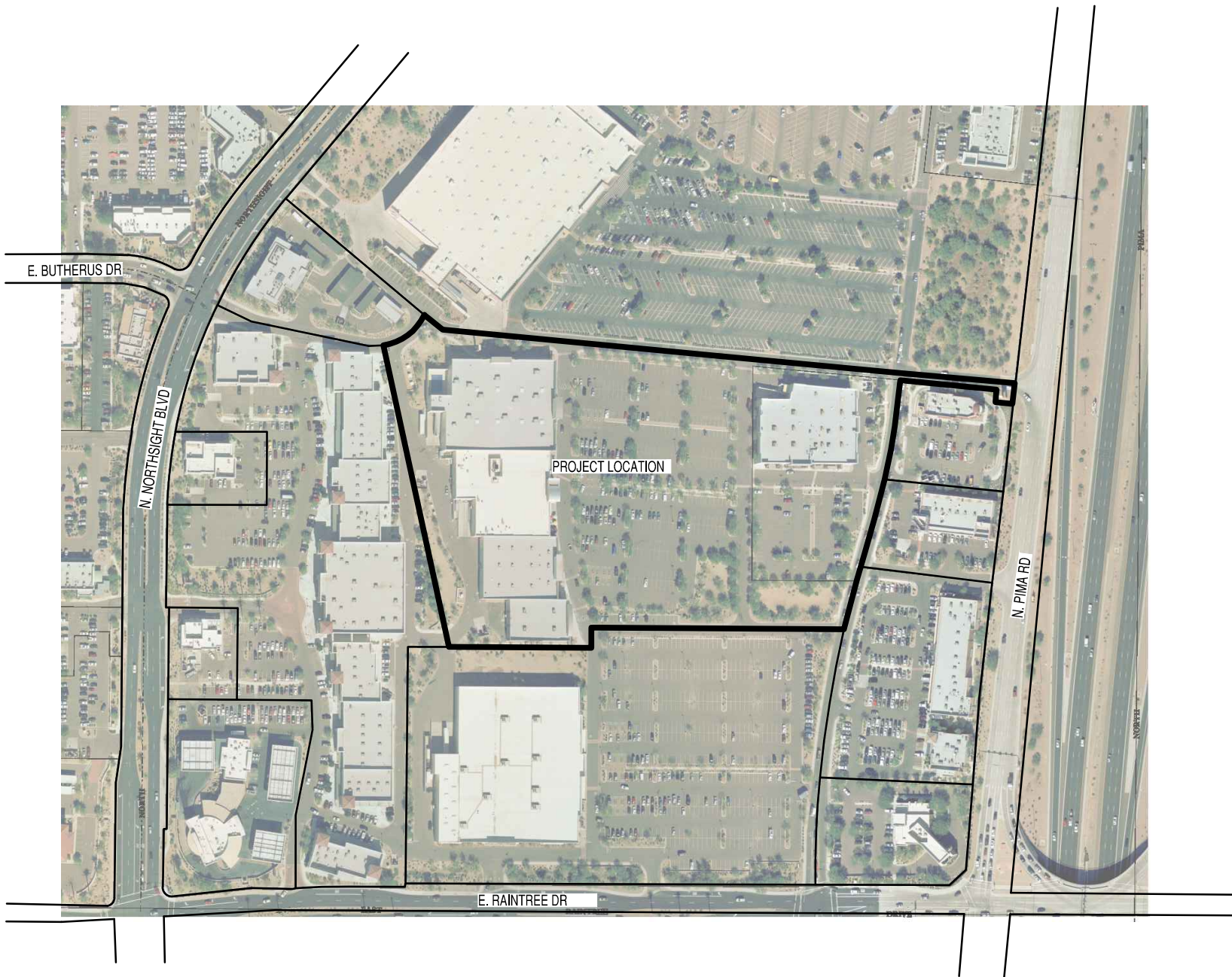
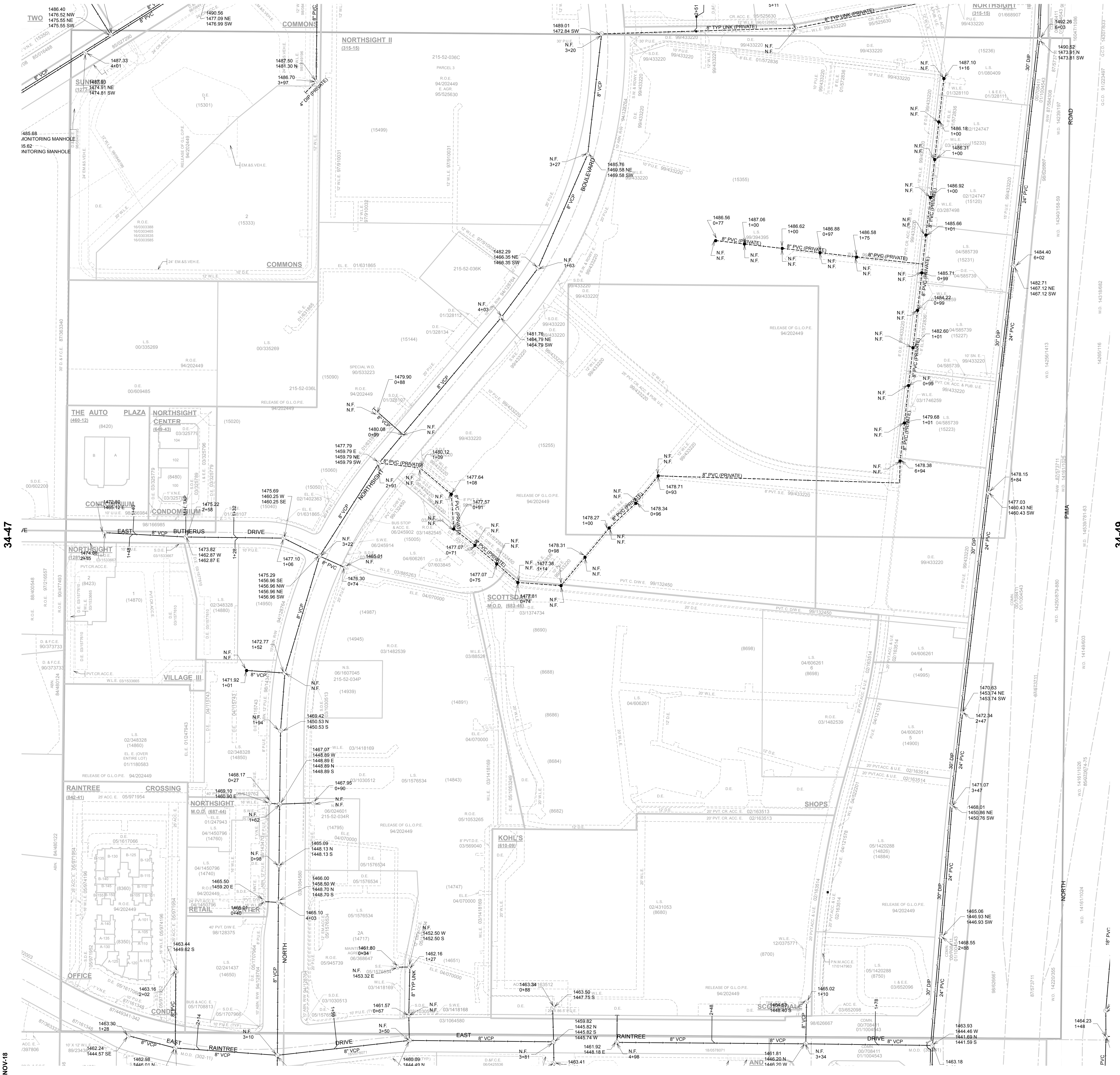


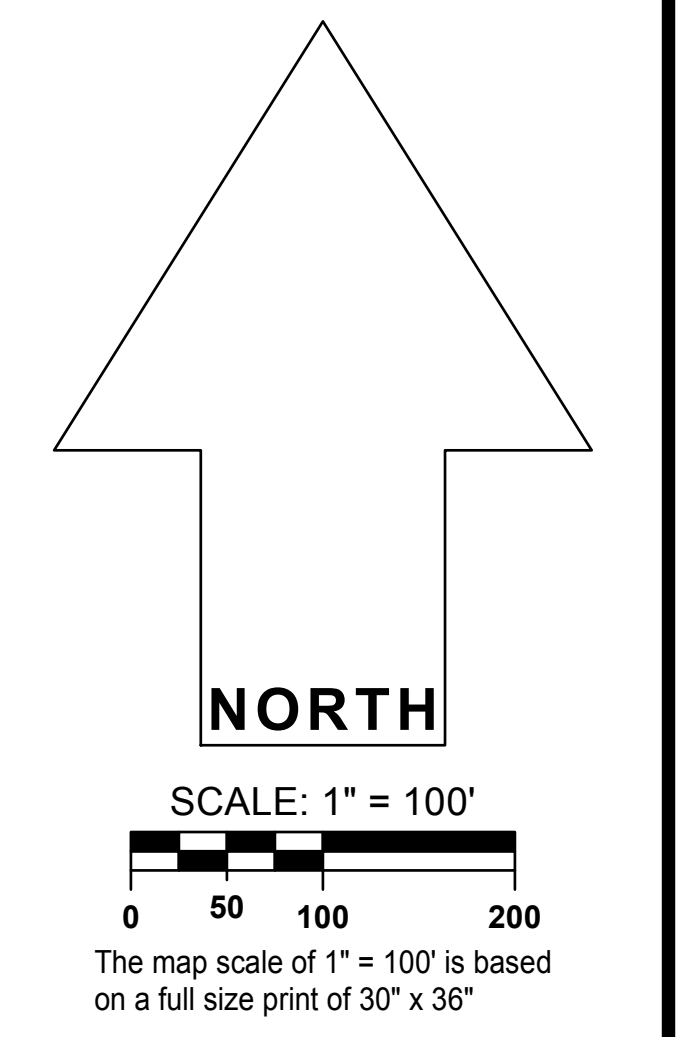
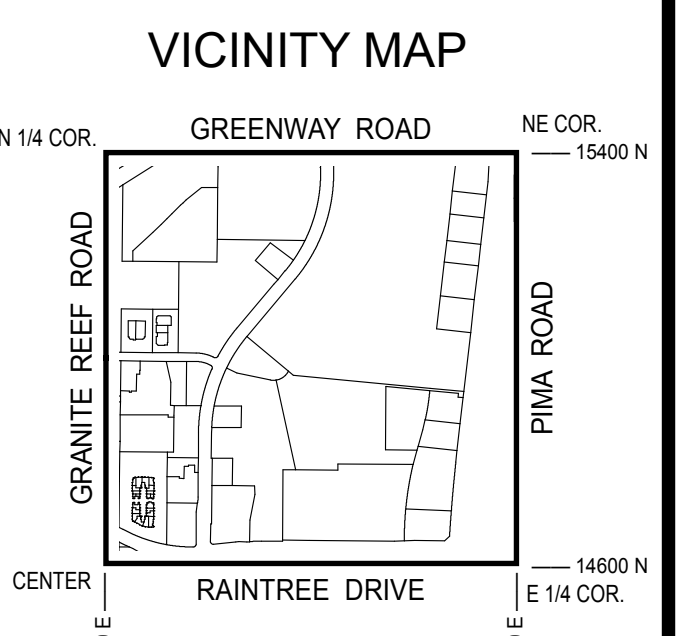
FIGURE 2
AERIAL MAP
48-DR-2019
10/04/2019



GENERAL NOTES:
 THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
 THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOTED AS "CALCULATED" ON THE MAP.

LEGEND:

- Cleanout
- Lift Station
- Manhole
- Non-GPS Point
- Plug
- Sewer Service Point
- Sewer Tap Point
- Sewer Valve
- Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Sewer Main - Private



SEWER
QUARTER SECTION MAP
34-48
 NE 1/4 SEC. 12 T3N R4E

NOTICE
 THIS DOCUMENT IS PROVIDED FOR GENERAL INFORMATION PURPOSES ONLY. THE CITY OF SCOTTSDALE DOES NOT WARRANT ITS ACCURACY, COMPLETENESS OR SUITABILITY FOR ANY PARTICULAR PURPOSE. IT SHOULD NOT BE RELIED UPON WITHOUT FIELD VERIFICATION.
 THE CITY OF SCOTTSDALE

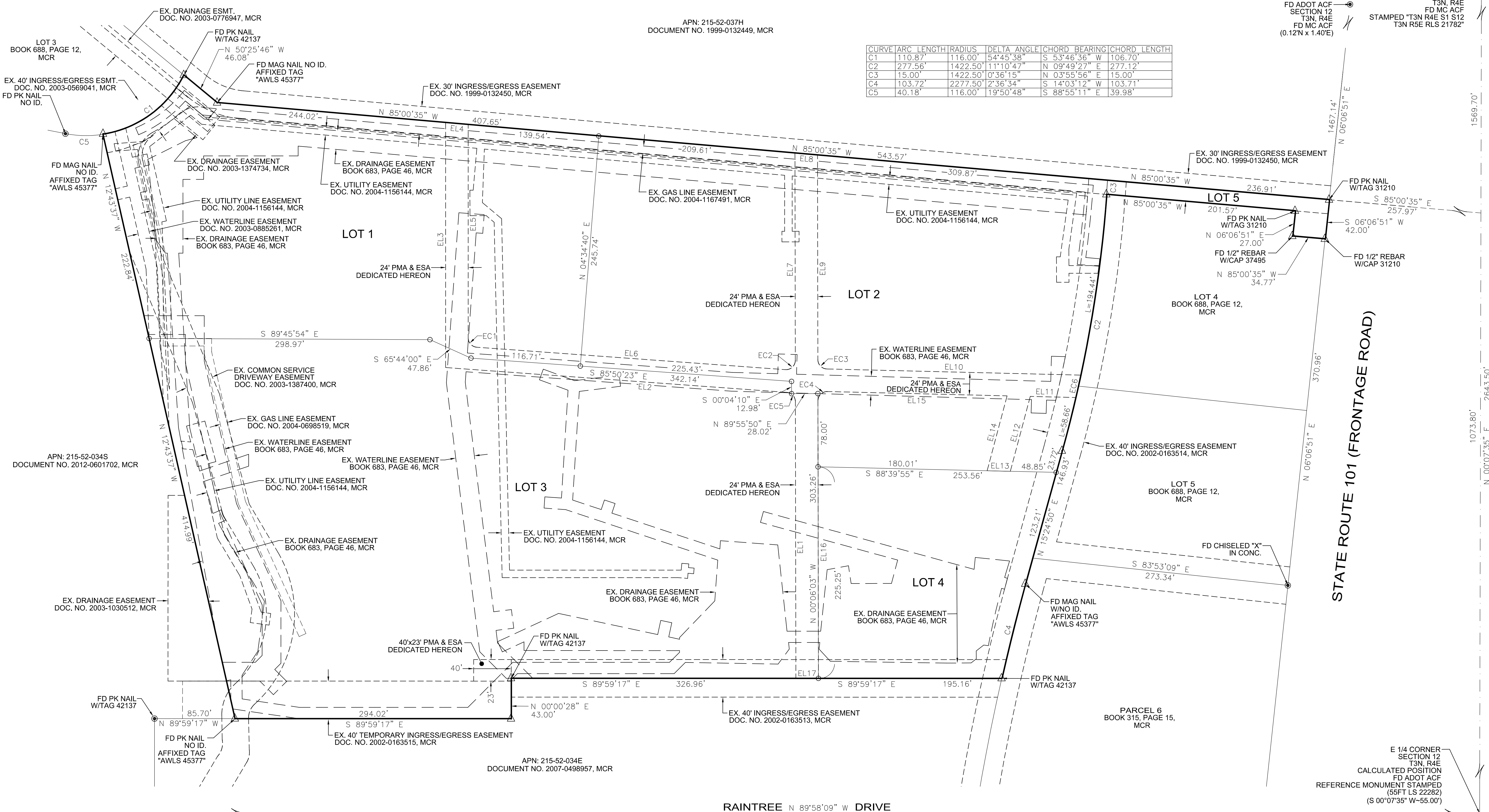
34-47

34-49

APN: 215-52-037H
DOCUMENT NO. 1999-0132449, MCR

NE CORNER SECTION 12
T3N, R4E
FD MC ACF
STAMPED "T3N R4E S1 S12
T3N R5E RLS 21782"

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	110.87'	116.00'	54°45'38"	S 53°46'36" W	106.70'
C2	277.56'	1422.50'	11°10'47"	N 09°49'27" E	277.12'
C3	15.00'	1422.50'	0°36'15"	N 03°55'56" E	15.00'
C4	103.72'	2277.50'	2°36'34"	S 14°03'12" W	103.71'
C5	40.18'	116.00'	19°50'48"	S 88°55'11" E	39.98'



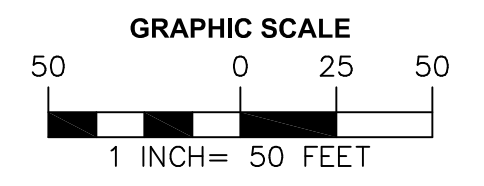
LINE	BEARING	DISTANCE
EL1	N 00°06'03" W	294.64'
EL2	N 85°50'23" W	363.97'
EL3	N 00°00'00" W	260.79'
EL4	S 85°00'35" E	24.09'
EL5	S 00°00'00" E	227.08'
EL6	S 85°50'23" E	329.08'
EL7	N 00°06'03" W	220.56'
EL8	S 85°00'35" E	24.10'
EL9	S 00°06'03" E	217.77'
EL10	S 88°37'13" E	270.06'
EL11	N 88°37'13" W	48.33'
EL12	S 14°55'20" W	82.52'
EL13	N 88°39'55" W	24.69'
EL14	S 14°55'20" E	82.54'
EL15	N 88°37'13" W	191.16'
EL16	S 00°06'03" E	295.41'
EL17	S 89°53'57" W	24.00'

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
EC1	14.98'	10.00'	85°50'23"	S 42°55'12" E	13.62'
EC2	16.45'	10.00'	94°15'40"	S 47°01'47" W	14.66'
EC3	15.45'	10.00'	88°31'10"	S 44°21'38" E	13.96'
EC4	15.97'	10.00'	91°28'50"	N 45°38'22" E	14.32'
EC5	14.96'	10.00'	85°44'20"	S 42°58'13" E	13.61'
EC6	24.46'	1422.50'	0°59'07"	N 12°33'31" E	24.46'

MCR MARICOPA COUNTY RECORDS
APN ASSESSOR PARCEL NUMBER
DOC. DOCUMENT
NO. NUMBER
FD. FOUND
ID. IDENTIFICATION
COS CITY OF SCOTTSDALE
BCHH BRASS CAP IN HANDHOLE
ADOT ARIZONA DEPARTMENT OF TRANSPORTATION
ACF ALUMINUM CAP FLUSH
MC MARICOPA COUNTY
PMA PUBLIC MOTORIZED ACCESS EASEMENT
ESA EMERGENCY SERVICE ACCESS EASEMENT

LEGEND

- PROPERTY LINE
- - - LOT LINE
- - - EASEMENT LINE AS NOTED
- △ SUBDIVISION CORNER SET 1/2" REBAR W/CAP *AWLS 45377" UNLESS OTHERWISE NOTED
- LOT/TRACT CORNER SET 1/2" REBAR W/CAP *AWLS 45377" UNLESS OTHERWISE NOTED
- FOUND MONUMENT AS NOTED



MINOR LAND DIVISION PLAT
NORTHSIGHT CROSSING PROPERTY
AMENDED
SECTION 12
TOWNSHIP 3 NORTH
RANGE 4 EAST
OF THE G.S.R.B. & M.
MARICOPA COUNTY, ARIZONA

AW LAND SURVEYING, LLC
P.O. BOX 2170, CHANDLER, AZ 85244
(480) 244-7630 (480) 243-4287

DRAWN BY: DDA CHECKED BY: DDA DATE: 12/19/18 JOB NO.: 18-073 SHEET NO. 2 OF 2



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APPENDIX I

Pipe Hydraulics

Average Day Design Flow

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00520	ft/ft
Diameter	8	in
Discharge	32.10	gal/min

Results

Normal Depth	1.55	in
Flow Area	6.85	in ²
Wetted Perimeter	7.30	in
Hydraulic Radius	0.94	in
Top Width	6.33	in
Critical Depth	1.46	in
Percent Full	19.4	%
Critical Slope	0.00669	ft/ft
Velocity	1.50	ft/s
Velocity Head	0.04	ft
Specific Energy	0.16	ft
Froude Number	0.88	
Maximum Discharge	420.70	gal/min
Discharge Full	391.09	gal/min
Slope Full	0.00004	ft/ft
Flow Type	SubCritical	

Average Day Design Flow w/ Pool Backwash

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00520	ft/ft
Diameter	8	in
Discharge	132.1	gal/min

Results

Normal Depth	3.21	in
Flow Area	0.13	ft ²
Wetted Perimeter	0.91	ft
Hydraulic Radius	1.72	in
Top Width	0.65	ft
Critical Depth	0.25	ft
Percent Full	40.1	%
Critical Slope	0.00653	ft/ft
Velocity	2.25	ft/s
Velocity Head	0.08	ft
Specific Energy	0.35	ft
Froude Number	0.89	
Maximum Discharge	420.70	gal/min
Discharge Full	391.1	gal/min
Slope Full	0.00059	ft/ft
Flow Type	SubCritical	

Peak Design Flow

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00520	ft/ft
Diameter	8	in
Discharge	144.40	gal/min

Results

Normal Depth	3.36	in
Flow Area	20.07	in ²
Wetted Perimeter	11.29	in
Hydraulic Radius	1.78	in
Top Width	7.90	in
Critical Depth	3.16	in
Percent Full	42.1	%
Critical Slope	0.00657	ft/ft
Velocity	2.31	ft/s
Velocity Head	0.08	ft
Specific Energy	0.36	ft
Froude Number	0.88	
Maximum Discharge	420.70	gal/min
Discharge Full	391.09	gal/min
Slope Full	0.00071	ft/ft
Flow Type	SubCritical	

Peak Design Flow w/ Pool Backwash

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00520	ft/ft
Diameter	8	in
Discharge	244.4	gal/min

Results

Normal Depth	4.58	in
Flow Area	0.21	ft ²
Wetted Perimeter	1.14	ft
Hydraulic Radius	2.17	in
Top Width	0.66	ft
Critical Depth	0.35	ft
Percent Full	57.3	%
Critical Slope	0.00714	ft/ft
Velocity	2.63	ft/s
Velocity Head	0.11	ft
Specific Energy	0.49	ft
Froude Number	0.83	
Maximum Discharge	420.70	gal/min
Discharge Full	391.1	gal/min
Slope Full	0.00203	ft/ft
Flow Type	SubCritical	

8" pipe with d/D = 0.65

Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

Roughness Coefficient 0.013
Channel Slope 0.00520 ft/ft
Normal Depth 5.20 in
Diameter 8 in

Results

Discharge 295.82 gal/min
Flow Area 34.59 in²
Wetted Perimeter 15.00 in
Hydraulic Radius 2.31 in
Top Width 7.63 in
Critical Depth 4.59 in
Percent Full 65.0 %
Critical Slope 0.00757 ft/ft
Velocity 2.74 ft/s
Velocity Head 0.12 ft
Specific Energy 0.55 ft
Froude Number 0.79
Maximum Discharge 420.70 gal/min
Discharge Full 391.09 gal/min
Slope Full 0.00298 ft/ft
Flow Type SubCritical

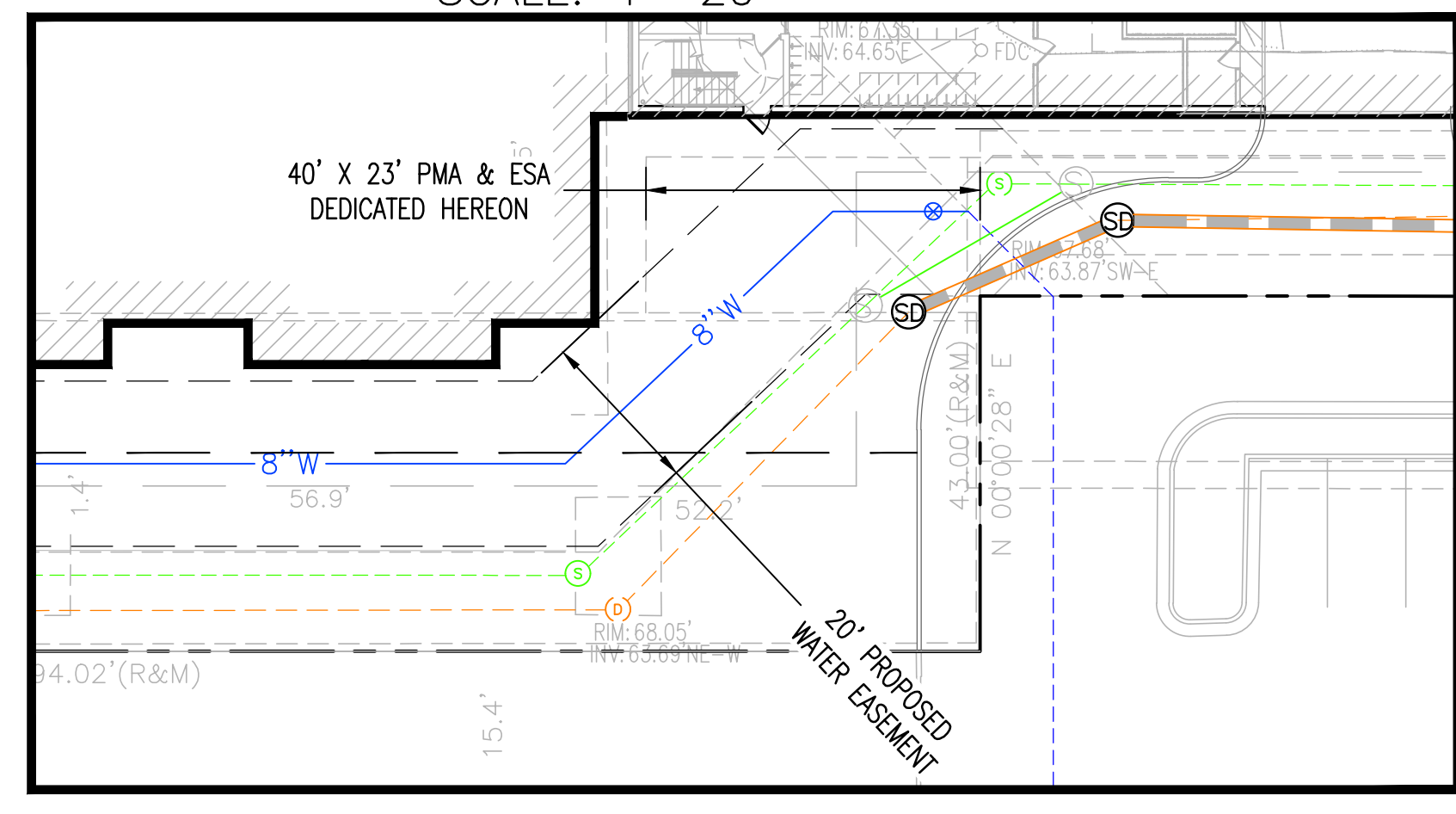
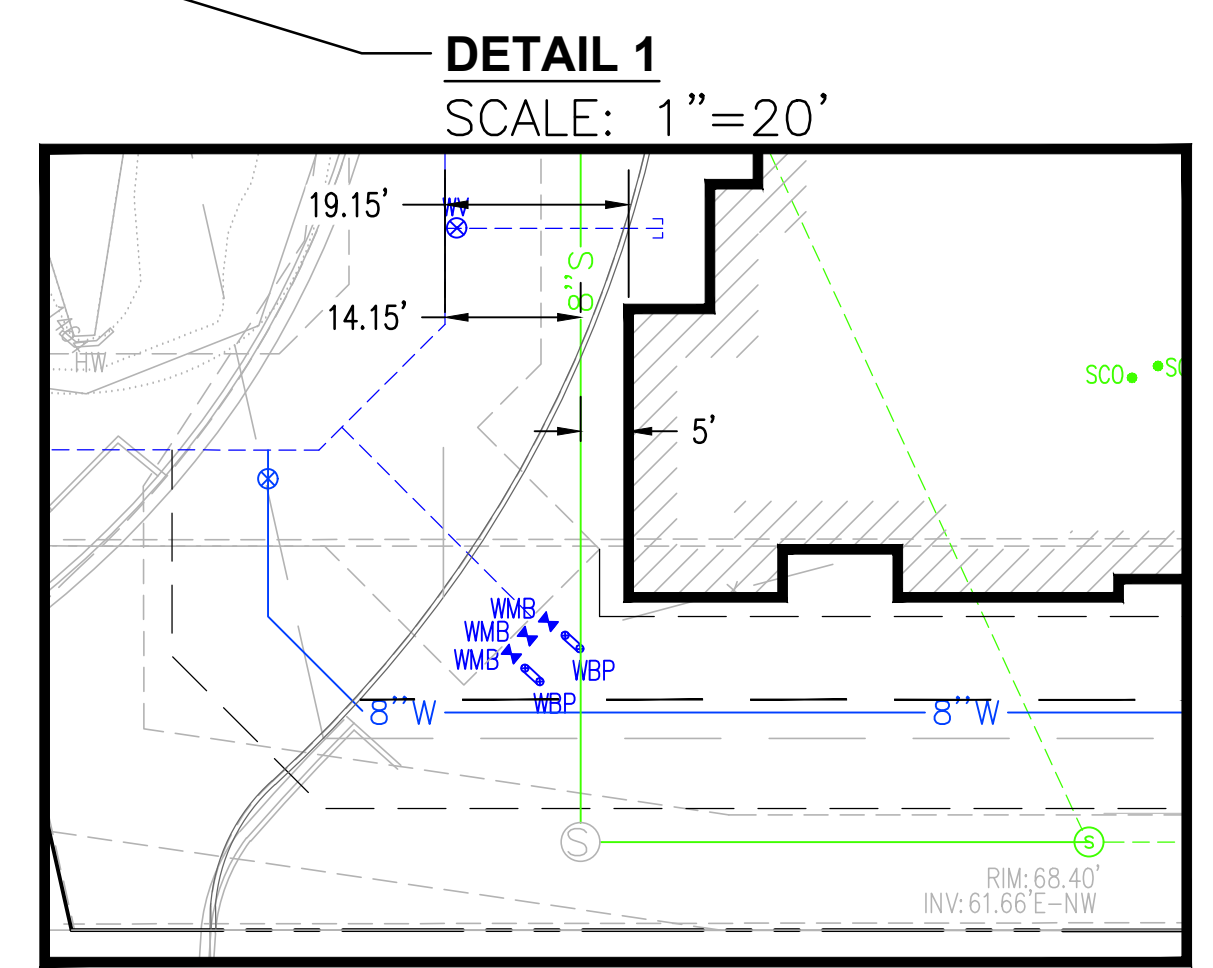
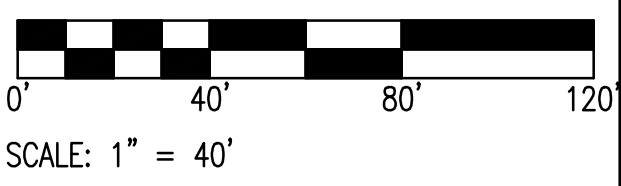
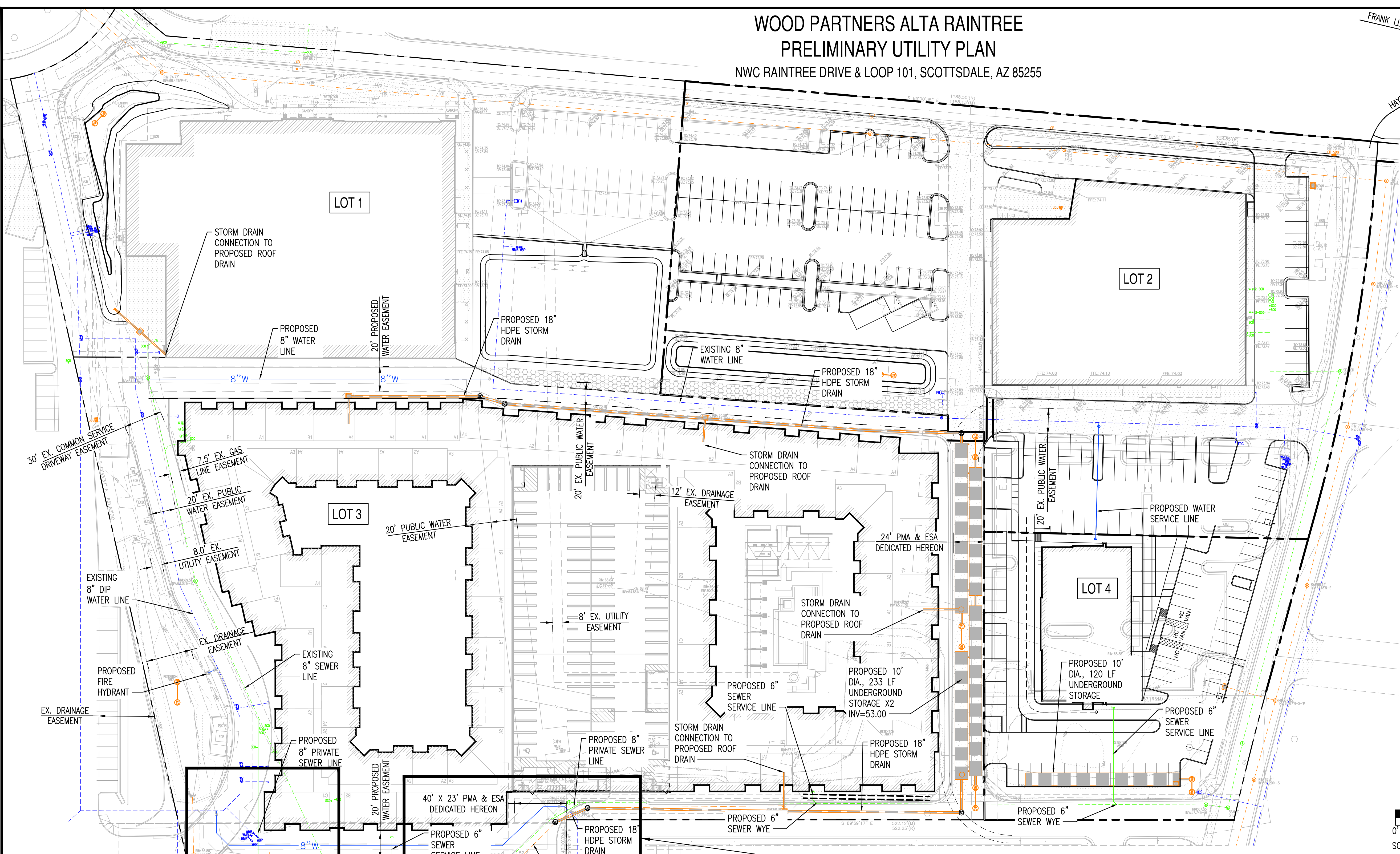
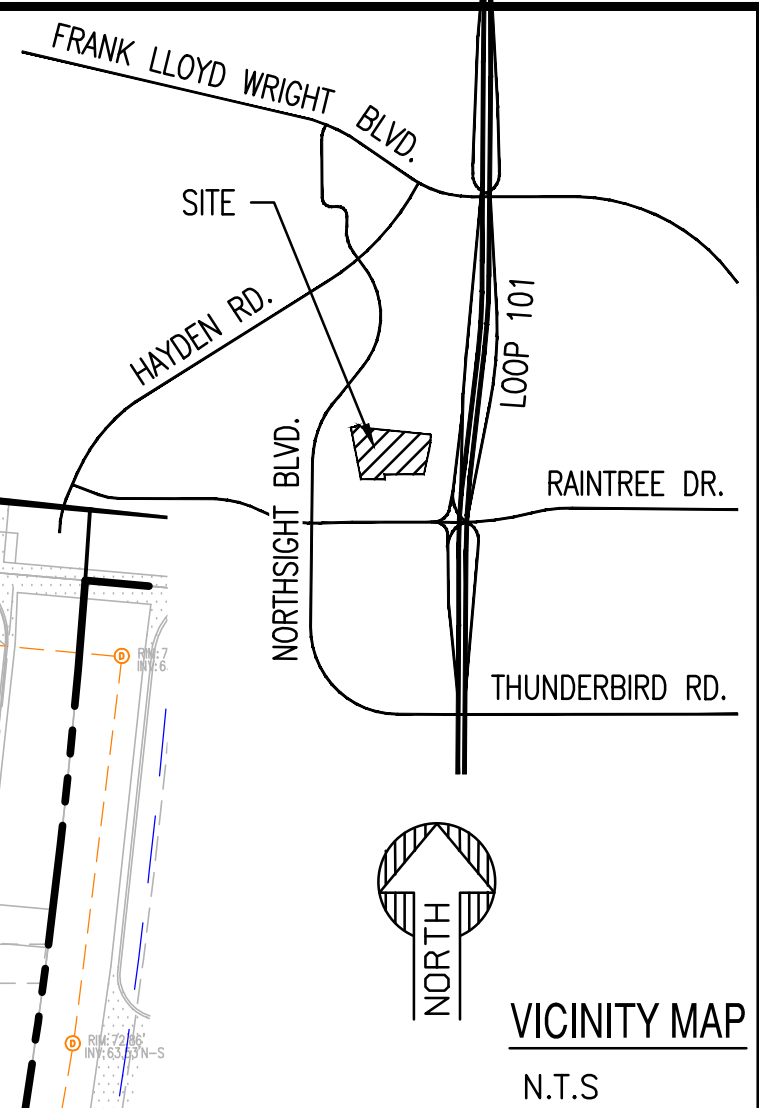


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APPENDIX II

Utility Plan

WOOD PARTNERS ALTA RAINTREE
PRELIMINARY UTILITY PLAN
NWC RAINTREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255



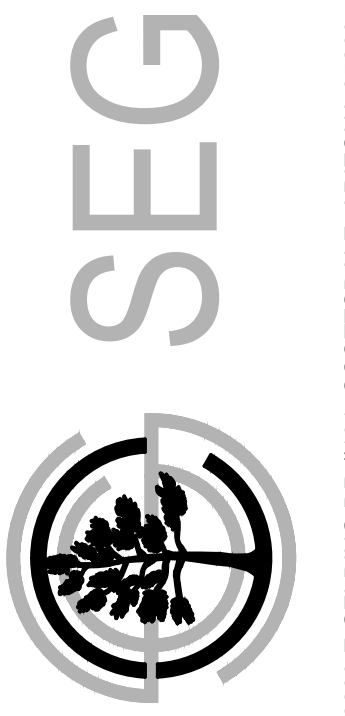
LEGEND

---	PROPERTY LINE
---	EXISTING WATER LINE
---	EXISTING SEWER DRAIN
---	EXISTING STORM LINE
---	EXISTING UTILITY EASEMENT
---	PROPOSED WATER LINE
---	PROPOSED SEWER LINE
---	PROPOSED STORM LINE
---	PROPOSED UTILITY EASEMENT

BENCHMARK:
BENCHMARK IS A CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE BEING THE SOUTH 1/4 CORNER OF SECTION 21, T3N, R4E.
ELEVATION = 1434.36' NAVD88
(CITY OF SCOTTSDALE DATUM)

Call at least two full working days before you begin excavation.
ARIZONA 311
Dial 3-1-1 or 1-800-STAKE-IT (752-8348)
In Maricopa County: (602) 263-1100

NOTE TO CONTRACTOR: THESE SET OF DRAWINGS AND DOCUMENTS IS INTENDED AS A SET OF GUIDELINES FOR THE PROJECT AND ARE INTENDED TO BE USED IN CONJUNCTION WITH A SET OF CONSTRUCTION SPECIFICATIONS TO BE SUPPLIED BY OWNER. THE USER MUST BE READ TO INCORPORATE ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES INCLUDING FEDERAL A.I.A. REQUIREMENTS. THESE SETS ADVISES THAT THERE ARE NO FEDERAL, STATE, OR LOCAL CODES THAT REQUIRE THE FAILURE OF THIS CONDITION MAY REQUIRE SIGNIFICANT CHANGES TO THESE DOCUMENTS. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO CONFORM TO ALL APPLICABLE CODES AND TO INFORM THE CHANGES/ARCHITECTS OF ANY QUESTIONS OR CLARIFICATIONS WHICH ARE DEEMED. CONTRACTORS SHALL ALSO VISIT THE SITE BEFORE BIDDING. CONTRACTORS ARE REQUIRED TO KNOW ALL OBSERVABLE CONDITIONS AND APPLICABLE CODES.



PROJECT: WOOD PARTNERS ALTA RAINTREE SCOTTSDALE
LOCATION: NWC RAINTREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA

DRAWN: AVINA
DESIGNED: JUNKER
CHECKED: JUNKER
PROJ. MGR: JUNKER

DATE: 5/15/2019
ISSUED FOR: PRELIMINARY DESIGN

REVISION NO.:	DATE:

JOB NO.: 180961
SHEET TITLE:

PRELIMINARY UTILITY EXHIBIT

SHEET NO.:

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