

Drainage Reports

Abbreviated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application

**WATER/SEWER SERVICE
LOTS 2 AND 4**

101 Mega Raintree

**8688 E. Raintree Drive
Scottsdale, AZ 85260**

Prepared For:

101 MEGA RAINTREE, LLC

Prepared by:



Sustainability Engineering Group

**8280 E. Gelding Drive, Suite 101
Scottsdale, AZ 85260
480.588.7226 www.azSEG.com**



Project Number: 180816

**Submittal Date: January 22, 2018
Revised Submittal: March 25, 2019**

Case No.: 612-PA-2018 Plan Check No.: TBD

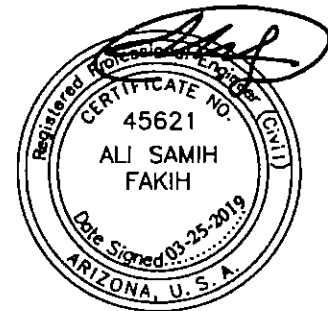
**4-DR-2019
04/05/2019**

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1. INTRODUCTION

This report presents the service requirements for the existing 29,246 sf retail building and a new 3,608 sf restaurant proposed on two lots along the North 87th Street 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 are 215-52-034L and 215-52-034 M. Refer to **FIGURE 1 - Vicinity Map** 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 vacant "big box" commercial building (formerly Sam's Club).
- West: The west side is bound by Scottsdale Shops and Northsight Blvd.
- South: The south is Kohls/Scottsdale.
- East: 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 202,144.7 square feet, 4.64 +/- acres (net) of commercially zoned land. City of Scottsdale zoning maps designate this parcel as C-2.

The two proposed lots consist of an existing retail building and a drainage basin. 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 four lots. This phase includes development of Lots 2 and 4. Future development includes a self-storage facility within an existing structure on the northwest Lot 1 and a new residential development on the southwest Lot 3. Refer to **FIGURE 4** for the **Preliminary Minor Land Division Plat** and **FIGURE 5** for the **Preliminary Utility Plan**.

3. EXISTING INFRASTRUCTURE

See **FIGURE 3** for the existing **Water/Sewer Quarter Section Maps**.

3.1 WATER:

An 8" water line exists in the 87th Street public access way adjacent to Lots 2 and 4 and a private drive located south of the existing retail building. Existing domestic, fire and landscape service lines are tapped to the latter line.

Fire hydrants exist at the northeast corner of Lot 2 and southeast corner of Lot 4. Another hydrant is located just west of Lot 2.

3.2 SEWER:

An 8" sewer line is located within the 87th Street public access way adjacent to Lots 2 and 4. Lot 2 presently is connected to this line. Another 8" sewer line located along an access drive adjacent to the south line of Lot 4.

4. DEMANDS
4.1 WATER:
TABLE 1 - AVERAGE DAILY DEMANDS

Land Use	Inside Use (gpm)	Outside Use (gpm)	Total Use (gpm)	Units
Restaurant	1.67E-03	1.39E-04	1.81E-03	per sf
Commercial/ Retail	9.73E-04	1.39E-04	1.11E-03	per sf

Peaking factors: MD 2.0, PH 3.5

Table 2 - CALCULATED INSTANTANEOUS DEMANDS

Lot	Land Use	Sq. Ft.	Total Use (gpm) *	ADD (gpm)	MDD (gpm)	PHD (gpm)	Meter Size
4	Restaurant	3,608	1.18E-03	4.3	8.5	14.9	1"
2	Commercial Retail	29,246	1.11E-03	32.5	64.9	113.6	2"
			Totals	36.7	73.4	128.5	

* Reference DS+PM Figure 6-1.2 (in gallons per minute)

4.2 SEWER:
TABLE 3 - AVERAGE DAILY DEMANDS

Land Use	Demand (gpd)	Peaking Factor	Units
Restaurant	1.2	6	per sf
Commercial/ Retail	0.5	3	per sf

Peaking factors: MD 2.0, PH 3.5

Table 4 - CALCULATED DEMANDS

Lot	Land Use	Sq. Ft.	ADD (gpd)	ADD (gpm)	PD (gpm)
4	Restaurant	3,608	4329.6	3.0	18.0
2	Commercial	29,246	14623.0	10.2	30.5
		Totals	18952.6	13.2	48.5

Reference DS+PM Figure 6-1.2

4.3 FIRE:

In accordance with City of Scottsdale DS & PM Section 6-1.501, a 1500 gpm fire flow will be provided and verified by certified hydrant flow testing accompanying the improvement plans. See **FIGURE 6** for results of the **Fire Flow Test**.

5. UTILITY CONNECTIONS

5.1 WATER:

Lots 1 and 3 will retain existing connections.

Lot 2: Use existing connections for domestic, fire and landscape service.

Lot 4: Provide new taps for domestic, fire and landscape service off the 8" water line in the 87th Street public access way.

5.2 SEWER:

Lots 1 and 3 will retain existing connections.

Lot 2: Use existing connection for sewer service.

Lot 4: Provide new sewer service tap off the 8" sewer in the 87th Street public access way. Install grease interceptor as needed.

6. CONCLUSIONS

Water and sewer service exists or is available for both lots. The needed fire flow is consistent with the present needs of the existing commercial area.

7. REFERENCES

1. *Design Standards & Policies Manual, City of Scottsdale – 2018*

FIGURE 1 – VICINITY MAP

FIGURE 2 – AERIAL

FIGURE 5 – PRELIMINARY UTILITY PLAN

FIGURE 6 – FIRE FLOW TEST

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name: 101 Mega Raintree
Project Address: 87th Street and Raintree, Scottsdale, Arizona, 85260
Client Project No.: 180816
Arizona Flow Testing Project No.: 19019
Flow Test Permit No.: C57100
Date and time flow test conducted: January 15, 2019 at 8:45 AM
Data is current and reliable until: July 15, 2019
Conducted by: Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by: Jared Berry – City of Scottsdale-Inspector (602-541-4942)

Raw Test Data

Static Pressure: **88.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **76.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **21.0 PSI**
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One 4-inch Hose Monster
(Measured in inches)

Coefficient of Diffuser: 0.7875

Flowing GPM: **1,723 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **4,396 GPM**

Data with 16 PSI Safety Factor

Static Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **60.0 PSI**
(Measured in pounds per square inch)

Distance between hydrants: Approx. 500 Feet

Main size: Not Provided

Flowing GPM: **1,723 GPM**

GPM @ 20 PSI: **3,803 GPM**

Flow Test Location

North ↑



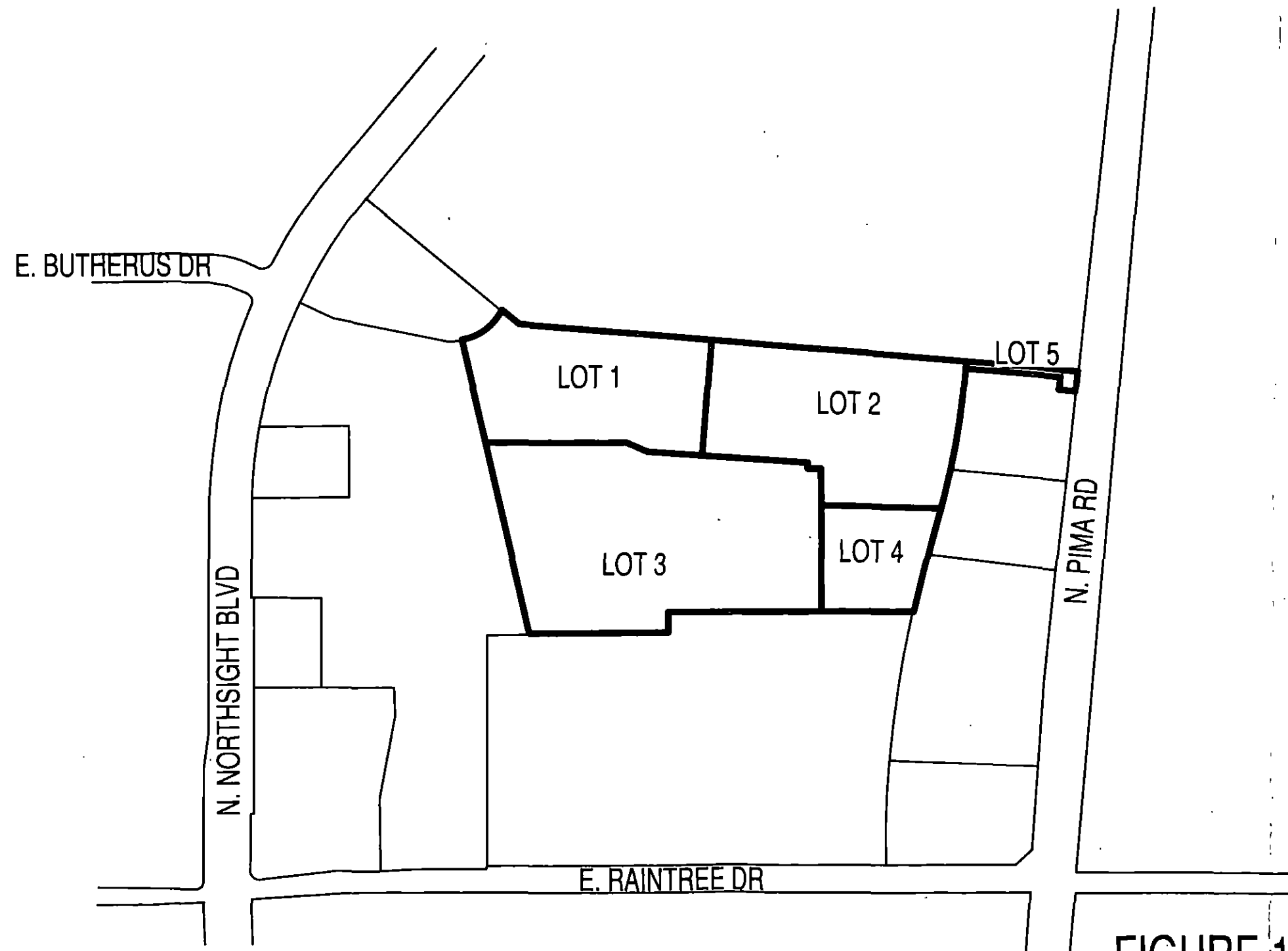
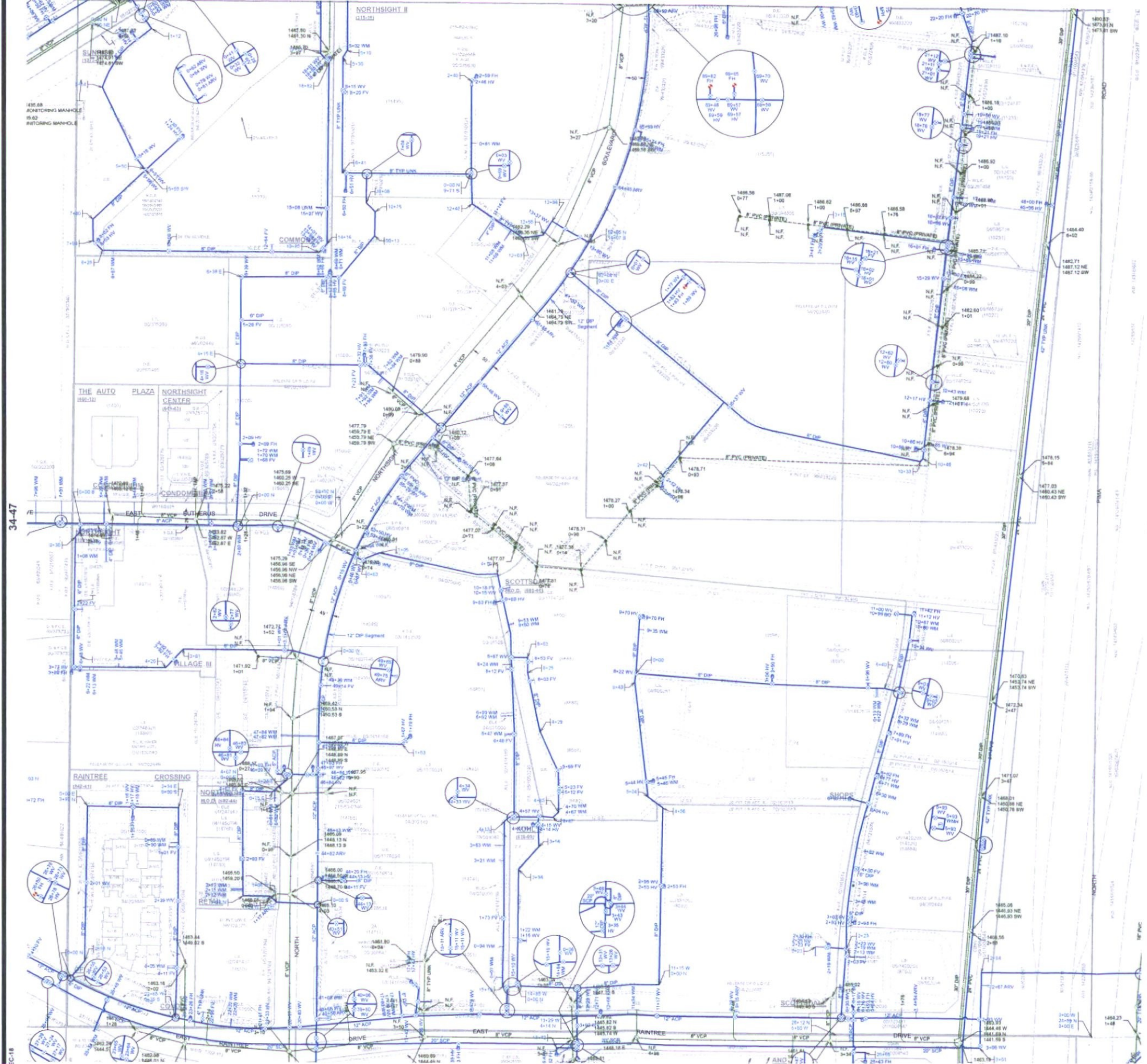
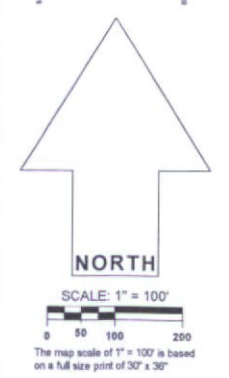


FIGURE 1
VICINITY MAP



N O T I C E
THIS MAP IS PROVIDED FOR GENERAL INFORMATION PURPOSES ONLY. THE CITY OF SCOTTSDALE DOES NOT WARRANT ITS ACCURACY, COMPLETENESS OR SUITABILITY FOR ANY PURPOSE. IT SHOULD NOT BE RELIED UPON WITHOUT FIELD VERIFICATION.
THE CITY OF SCOTTSDALE

- LEGEND:**
- Water Valve
 - Non-potable Water Valve
 - Fire Hydrant
 - Water Blowoff
 - Water Main Reducer
 - Water Sample Station
 - Water Air Release Valve
 - Non-potable Water Air Release Valve
 - Water Pressure Reducing Valve
 - Water Vault
 - Water Manhole
 - Non-Potable Water Manhole
 - Water Pump
 - Water Main
 - Non-Potable Water Main
 - Fire Line
 - Water Service
 - Non-Scottsdale Water Main
 - Sewer Manhole
 - Sewer Cleanout
 - Sewer Lift Station
 - Sewer Treatment Plant
 - Sewer Main - Gravity
 - Sewer Main - Force
 - Non-Scottsdale Sewer Main
 - Sewer Service



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

MINOR LAND DIVISION PLAT NORTHSIGHT CROSSING PROPERTY AMENDED

OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
ADRIAN FORTES
20190151729 03/05/2019 02:40
BOOK 1443 PAGE 45
ELECTRONIC RECORDING

33102-3-1-1-M-
sareblam

DEDICATION

STATE OF ARIZONA }
COUNTY OF MARICOPA } SS

KNOW ALL MEN BY THESE PRESENTS:

101 MEGA RAIN TREE, LLC AND 101 ENVY RAIN TREE LLC, OWNERS, HEREBY SUBDIVIDES LOTS 1 AND 6, NORTHSIGHT CROSSING PROPERTY, AS RECORDED IN BOOK 688, PAGE 12, MARICOPA COUNTY RECORDS, CITY OF SCOTTSDALE, MARICOPA COUNTY, ARIZONA, UNDER THE NAME "NORTHSIGHT CROSSING PROPERTY AMENDED", AS SHOWN ON THIS PLAT. THIS PLAT SETS FORTH THE LOCATION AND GIVES THE DIMENSIONS OF THE LOTS AND EASEMENTS CONSTITUTING THE SUBDIVISION. EACH LOT AND EASEMENT SHALL BE KNOWN BY THE NUMBER OR DESCRIPTION GIVEN EACH RESPECTIVELY ON THIS PLAT. THE EASEMENTS ARE DEDICATED FOR THE PURPOSES, AND SUBJECT TO THE CONDITIONS, STATED.

EASEMENTS:

101 MEGA RAIN TREE, LLC AND 101 ENVY RAIN TREE LLC, OWNERS, GRANTOR, DEDICATES TO THE CITY OF SCOTTSDALE, AN ARIZONA MUNICIPAL CORPORATION, GRANTEE:

PUBLIC MOTORIZED ACCESS (PMA):

A PERPETUAL, NON-EXCLUSIVE EASEMENT SHOWN HEREON UPON, OVER, UNDER AND ACROSS THE PROPERTY ON THIS PLAT, FOR ALL MANNER OF PEDESTRIAN AND MOTORIZED AND NON-MOTORIZED VEHICULAR ACCESS, AND FOR CONSTRUCTION, OPERATION, USE, MAINTENANCE, REPAIR, MODIFICATION AND REPLACEMENT FROM TIME TO TIME OF IMPROVEMENTS RELATED THERETO.

EMERGENCY AND SERVICE ACCESS (ESA):

A PERPETUAL, NON-EXCLUSIVE EASEMENT SHOWN HEREON UPON, OVER, UNDER AND ACROSS THE PROPERTY ON THIS PLAT, FOR ACCESS FOR EMERGENCY, PUBLIC SAFETY, REFUSE COLLECTION, UTILITY, AND OTHER SERVICE PERSONNEL AND VEHICLES AND FOR THE RIGHT TO CONSTRUCT, OPERATE, USE, MAINTAIN, REPAIR AND REPLACE IMPROVEMENTS RELATED TO ACCESS AS CITY DEEMS NECESSARY FOR ACCESS PURPOSES.

GRANTOR WARRANTS AND COVENANTS TO GRANTEE AND ITS SUCCESSORS AND ASSIGNS THAT GRANTOR IS LAWFULLY SEIZED AND POSSESSED OF THE PROPERTY; THAT GRANTOR HAS A GOOD AND LAWFUL RIGHT TO MAKE THE CONVEYANCE DESCRIBED HEREIN; AND THAT GRANTEE SHALL HAVE TITLE AND QUIET POSSESSION AGAINST THE CLAIMS OF ALL PERSONS.

THE PERSON EXECUTING THIS DOCUMENT ON BEHALF OF A CORPORATION, TRUST OR OTHER ORGANIZATION WARRANTS HIS OR HER AUTHORITY TO DO SO AND THAT ALL PERSONS NECESSARY TO BIND GRANTOR HAVE JOINED IN THIS DOCUMENT. THIS DOCUMENT RUNS WITH THE LAND IN FAVOR OF GRANTEE'S SUCCESSORS AND ASSIGNS.

DATED THIS 14 DAY OF February, 2019.

GRANTOR: 101 MEGA RAIN TREE, LLC

BY: Jim Riggs

ITS: Manager

DATED THIS 14 DAY OF February, 2019.

GRANTOR: 101 ENVY RAIN TREE LLC

BY: Jim Riggs

ITS: Manager

ACKNOWLEDGEMENT

STATE OF Arizona }
COUNTY OF Maricopa } SS

THIS DOCUMENT WAS ACKNOWLEDGED BEFORE ME THIS 14 DAY OF February, 2019.

BY Jim Riggs FOR AND ON BEHALF OF 101 Mega Rain Tree LLC

NOTARY PUBLIC John H. Hays

MY COMMISSION EXPIRES: July 31, 2020

ACKNOWLEDGEMENT

STATE OF Arizona }
COUNTY OF Maricopa } SS

THIS DOCUMENT WAS ACKNOWLEDGED BEFORE ME THIS 14 DAY OF February, 2019.

BY Jim Riggs FOR AND ON BEHALF OF 101 Envy Rain Tree LLC

NOTARY PUBLIC John H. Hays

MY COMMISSION EXPIRES: July 31, 2020

BEING A REPLAT OF LOT 1 AND LOT 6,
NORTHSIGHT CROSSING PROPERTY,
AS RECORDED IN BOOK 688, PAGE 12, MARICOPA COUNTY RECORDS,
CITY OF SCOTTSDALE, COUNTY OF MARICOPA, STATE OF ARIZONA

OWNERS:

101 MEGA RAIN TREE, LLC AND
101 ENVY RAIN TREE LLC
9363 N 90TH STREET, STE. 102-258
SCOTTSDALE, AZ 85258
CONTACT: JIM RIGGS

CITY OF SCOTTSDALE APPROVAL

THIS PLAT HAS BEEN REVIEWED FOR COMPLIANCE WITH THE CITY OF SCOTTSDALE'S DESIGN STANDARDS AND POLICY MANUAL SPECIFICATION.

BY: William H. Clark 3/5/2019
CHIEF DEVELOPMENT OFFICER DATE

THIS SUBDIVISION HAS BEEN REVIEWED FOR COMPLIANCE WITH THE DEVELOPMENT STANDARDS OF THE CITY OF SCOTTSDALE'S DEVELOPMENT REVIEW BOARD (DRB) CASE NO. 12-143-2018, AND ALL CASE RELATED STIPULATIONS.

BY: Jim Riggs 02/05/2019
DEVELOPMENT ENGINEERING MANAGER DATE

RATIFICATION

AS BENEFICIARY UNDER THAT CERTAIN DEED OF TRUST RECORDED IN THE COUNTY RECORDER'S OFFICE, MARICOPA COUNTY, ARIZONA, IN RECORDER'S NUMBER 2018-0881188, MCR, THE UNDERSIGNED HEREBY RATIFIES, APPROVES AND CONFIRMATION IS GIVEN TO SAID DEDICATIONS AS STATED IN THIS PLAT AS TO THE INTEREST OF THE UNDERSIGNED. THE PERSON SIGNING FOR BENEFICIARY WARRANTS AND REPRESENTS THEY HAVE POWER AND AUTHORITY TO DO SO.

BY: David L. Smith
STEARN'S NATIONAL BANK
Vice President
TITLE 2/14/19
DATE

ACKNOWLEDGEMENT

STATE OF Arizona }
COUNTY OF Maricopa } SS

THIS DOCUMENT WAS ACKNOWLEDGED BEFORE ME THIS 14th DAY OF FEB, 2019.

BY David L. Smith FOR AND ON BEHALF OF Stearns Bank N.A.

NOTARY PUBLIC John H. Hays

MY COMMISSION EXPIRES: Sept 26, 2022

RATIFICATION

AS BENEFICIARY UNDER THAT CERTAIN DEED OF TRUST RECORDED IN THE COUNTY RECORDER'S OFFICE, MARICOPA COUNTY, ARIZONA, IN RECORDER'S NUMBER 2018-0882253, MCR, THE UNDERSIGNED HEREBY RATIFIES, APPROVES AND CONFIRMATION IS GIVEN TO SAID DEDICATIONS AS STATED IN THIS PLAT AS TO THE INTEREST OF THE UNDERSIGNED. THE PERSON SIGNING FOR BENEFICIARY WARRANTS AND REPRESENTS THEY HAVE POWER AND AUTHORITY TO DO SO.

BY: David L. Smith
CORBANK
Said Vice President
TITLE 2-28-2019
DATE

ACKNOWLEDGEMENT

STATE OF Arizona }
COUNTY OF Maricopa } SS

THIS DOCUMENT WAS ACKNOWLEDGED BEFORE ME THIS 28th DAY OF February, 2019.

BY David L. Smith FOR AND ON BEHALF OF CORBANK

NOTARY PUBLIC John H. Hays

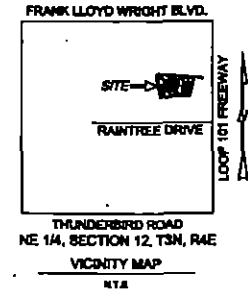
MY COMMISSION EXPIRES: 11/18/2020

LOT AREA TABLE

LOT	SQUARE FEET	ACRES
1	121,111	2.78
2	158,867	3.60
3	242,067	5.55
4	49,789	1.14

SHEET INDEX

SHEET	DESCRIPTION
1	COVER SHEET
2	LOTTING AND EASEMENT DEDICATION
3	EXISTING EASEMENTS



NOTES

- THIS DEVELOPMENT IS LOCATED WITHIN THE CITY OF SCOTTSDALE WATER SERVICE AND HAS BEEN DESIGNATED AS HAVING AN ASSURED WATER SUPPLY.
- ALL NEW OR RELOCATED UTILITIES WILL BE CONSTRUCTED UNDERGROUND AS REQUIRED BY THE ARIZONA CORPORATION COMMISSION.
- CONSTRUCTION WITHIN PUBLIC UTILITY EASEMENTS, EXCEPT BY PUBLIC AGENCIES AND UTILITY COMPANIES, SHALL BE LIMITED TO WOOD, WIRE OR REMOVABLE SECTION-TYPE FENCING AND MUST BE IN CONFORMANCE WITH THE APPLICABLE CC&R.
- AFFIDAVITS OF CORRECTION OR AMENDMENT TYPE LETTERS CONCERNING THIS PLAT ARE NOT VALID. THERE WILL BE NO REVISIONS TO THIS PLAT WITHOUT THE DEVELOPMENT ENGINEERING MANAGER'S APPROVAL.
- THE MAINTENANCE OF LANDSCAPING WITHIN THE PUBLIC RIGHT-OF-WAY TO BACK OF CURB SHALL BE THE RESPONSIBILITY OF THE COMMUNITY ASSOCIATION OR ADJUTING PROPERTY OWNER.
- THE ORIGINAL PARCELS WHICH COMPOSE THIS PLAT INCLUDE STORMWATER STORAGE EASEMENTS AND STRUCTURES THAT TOGETHER FULFILLED THE STORMWATER STORAGE REQUIREMENTS FOR THE DEVELOPMENT OF THE ENTIRE PROPERTY. OWNERS OF CURRENT AND FUTURE PARCELS ACKNOWLEDGE THE HISTORICAL AND SHARED NATURE OF THIS DRAINAGE PLAN, BUT UNDERSTAND AND AGREE, THAT UPON REDEVELOPMENT OF ANY PARCEL, EACH PARCEL AS PLATTED HEREON MUST COLLECT AND RETAIN STORMWATER WITHIN ITS OWN BOUNDARIES AND MAY NOT DRAIN ONTO ADJACENT PARCELS WITHOUT THE WRITTEN CONSENT AND AGREEMENT OF THE ADJACENT PARCEL OWNER. BY ACQUIRING ANY PROPERTY PLATTED HEREON, A BUYER ACCEPTS AND ASSUMES ANY AND ALL RISKS, BURDENS AND INCONVENIENCES CAUSED BY OR ASSOCIATED WITH THIS PROVISION.

PERTINENT DOCUMENTS

- NORTHSIGHT CROSSING PROPERTY BOOK 688, PAGE 12, MARICOPA COUNTY RECORDS
- RECORD OF SURVEY LOT 6 BOOK 1090, PAGE 20, MARICOPA COUNTY RECORDS
- RECORD OF SURVEY BOOK 1400, PAGE 36, MARICOPA COUNTY RECORDS
- RECORD OF SURVEY BOOK 1345, PAGE 14, MARICOPA COUNTY RECORDS
- MINOR LAND DIVISION PLAT BOOK 1401, PAGE 18, MARICOPA COUNTY RECORDS

BASIS OF BEARING

THE BASIS OF BEARING AND ALL MONUMENTATION SHOWN HEREON IS BASED ON THE NORTH LINE OF LOT 1 OF NORTHSIGHT CROSSING PROPERTY USING A BEARING OF SOUTH 85 DEGREES 00 MINUTES 35 SECONDS EAST, AS SHOWN ON THE FINAL PLAT RECORDED IN BOOK 688, PAGE 12, MARICOPA COUNTY RECORDS.

LAND SURVEYOR'S CERTIFICATION

- This is to certify that:
- I am a land surveyor registered to practice in Arizona.
 - This plat was made under my direction.
 - This plat meets the "Minimum Standards for Arizona Land Boundary Surveys".
 - The survey and division of the subject property described and platted herein were made during the month of July 2018.
 - The survey is true and complete as shown.
 - All monuments as shown exist and their positions are correctly shown. Said monuments are sufficient to enable the survey to be retraced.

DANIEL D. ARMUJO
RLS 45377
AW LAND SURVEYING, LLC
PO BOX 2170
CHANDLER, AZ 85244
(480) 244-7630



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

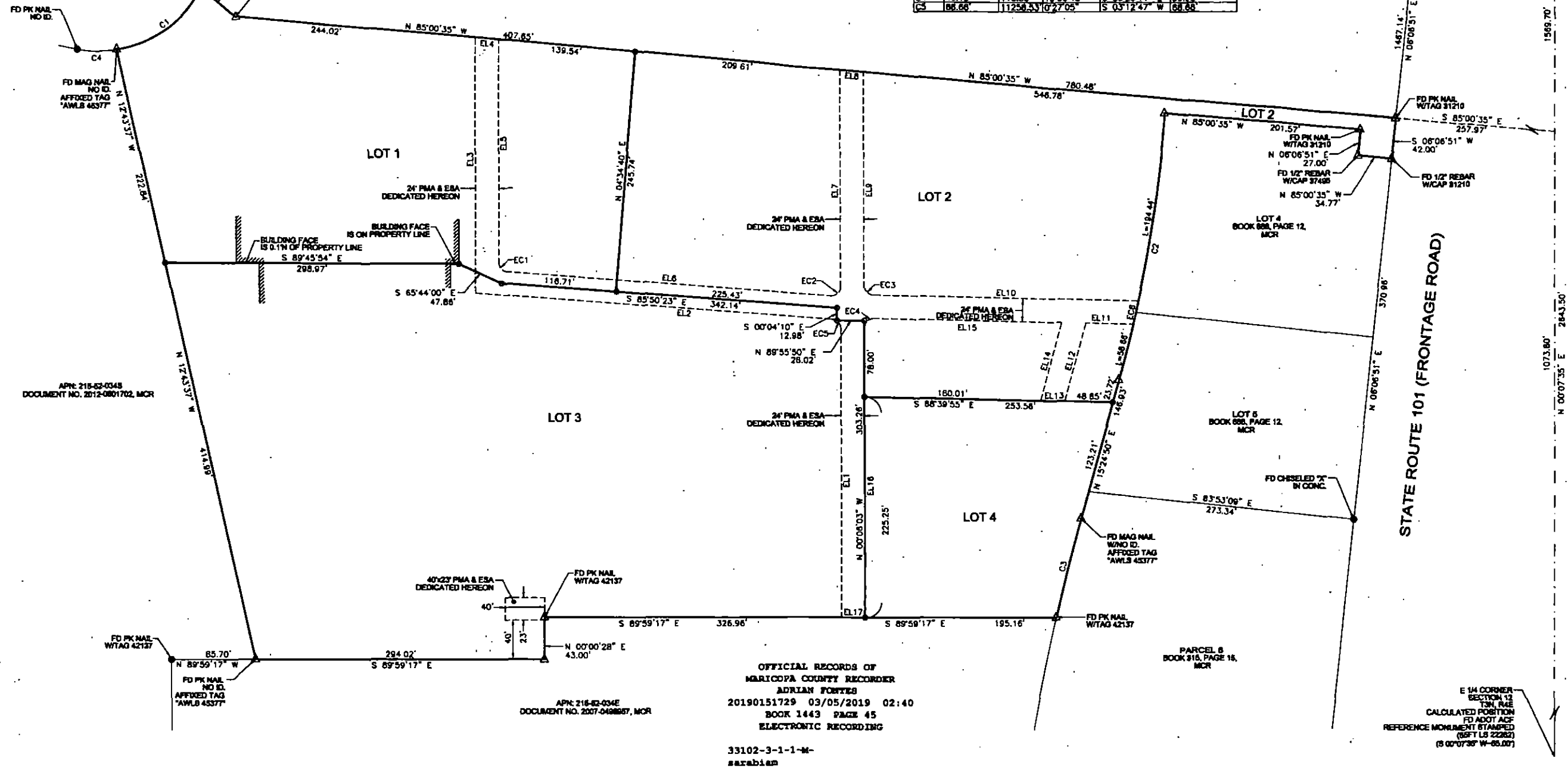
AW LAND SURVEYING, LLC
P.O. BOX 2170, CHANDLER, AZ 85244
(480) 244-7630 (480) 243-4287

COVER SHEET
DRAWN BY: SSA CHECKED BY: SSA DATE: 02/11/19
JOB NO.: 18-073 SHEET NO.: 1 OF 3

APR: 215-82-0374
DOCUMENT NO. 1808-013243, MCR

LINE	BEARING	DISTANCE
L1	N 89°57'13" W	99.22

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	110.87	118.00	84°45'38"	S 43°48'38" W	108.70
C2	277.58	1422.50	111°10'47"	N 09°48'27" E	277.12
C3	103.72	2277.50	2°38'34"	S 14°03'12" W	103.71
C4	40.18	116.00	18°50'48"	S 85°53'11" E	38.98
C5	88.60	11258.53	0°27'05"	S 03°12'47" W	88.60

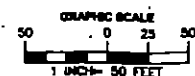


LINE	BEARING	DISTANCE
EL1	N 00°06'03" W	294.64
EL2	N 85°50'23" W	363.97
EL3	N 00°00'00" E	280.79
EL4	S 85°00'35" E	24.08
EL5	N 00°00'00" E	227.08
EL6	S 85°50'23" E	329.08
EL7	N 00°06'03" W	220.56
EL8	S 85°00'35" E	24.10
EL9	N 00°00'00" E	217.77
EL10	S 85°37'13" E	270.06
EL11	N 85°37'13" W	48.33
EL12	S 14°55'20" W	82.52
EL13	N 85°39'45" W	24.89
EL14	N 14°53'20" E	82.54
EL15	N 85°37'13" W	191.18
EL16	S 00°06'03" E	299.41
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	13.82
EC2	16.45	10.00	94°15'40"	S 47°01'47" W	14.88
EC3	15.43	10.00	85°31'10"	S 44°31'38" E	13.86
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°58'12" E	13.81
EC6	24.48	1422.50	0°59'07"	N 12°33'31" E	24.48

LEGEND

MCR	MARICOPA COUNTY RECORDS	PROPERTY LINE	△	SUBDIVISION CORNER
APN	ASSESSOR PARCEL NUMBER	LOT LINE	○	SET 1/2" REBAR W/ CAP
DOC.	DOCUMENT NUMBER	EASEMENT LINE AS NOTED	●	"AWLS 45377" UNLESS OTHERWISE NOTED
NO.	FOUND			
FD.	IDENTIFICATION			
ID.	CITY OF SCOTTSDALE			
COS	BRASS CAP IN HANDHOLE			
BCH	ARIZONA DEPARTMENT OF TRANSPORTATION			
ADOT	ALUMINUM CAP FLUSH			
ACF	MARICOPA COUNTY			
MC	PUBLIC MOTORIZED ACCESS EASEMENT			
PMA	EMERGENCY SERVICE ACCESS EASEMENT			
ESA				



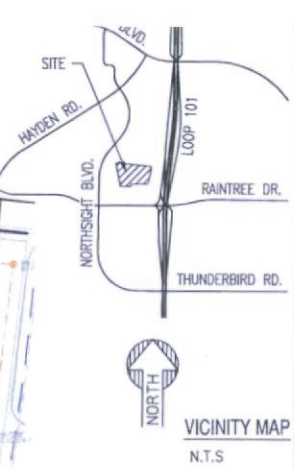
MINOR LAND DIVISION PLAT
NORTHSIGHT CROSSING PROPERTY
AMENDED
SECTION 12
TOWNSHIP 3 NORTH
RANGE 4 EAST
OF THE G.S.R.B. & M.
MARICOPA COUNTY, ARIZONA

AW LAND SURVEYING, INC.
P.O. BOX 2170, CHANDLER, AZ 85244
(480) 244-7830 (480) 243-4287

PRELIMINARY GRADING PLAN
8698 E. RAIN TREE DRIVE, SCOTTSDALE, AZ 85260

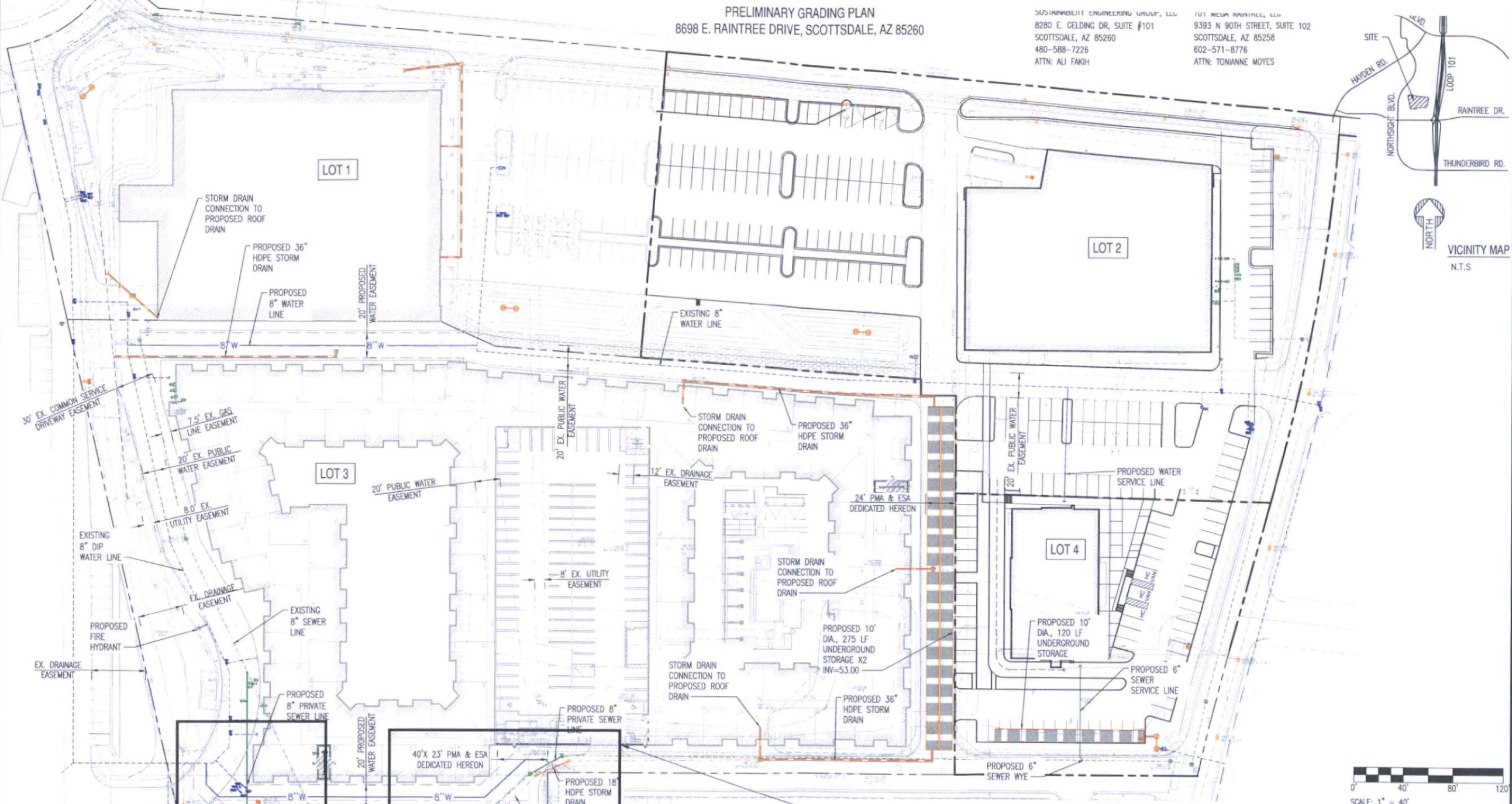
SUSTAINABILITY ENGINEERING GROUP, LLC
8280 E. GELDING DR., SUITE #101
SCOTTSDALE, AZ 85260
480-588-7226
ATTN: ALI FAKIH

LOT 101 MEGA RAIN TREE, LLC
9393 N 90TH STREET, SUITE 102
SCOTTSDALE, AZ 85258
602-571-8776
ATTN: TONIANNE MOYES

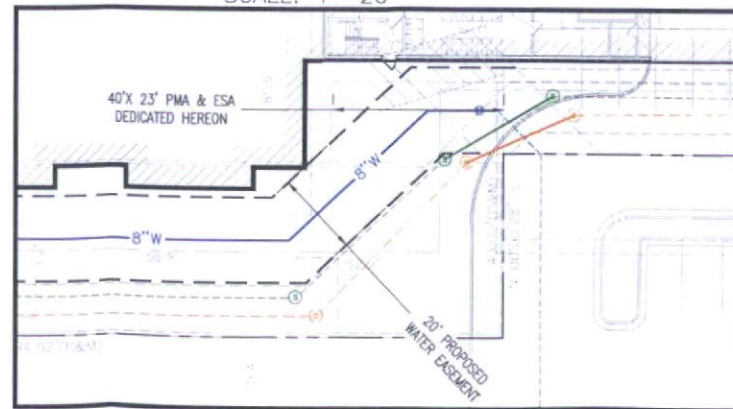


PRELIMINARY
NOT FOR
CONSTRUCTION

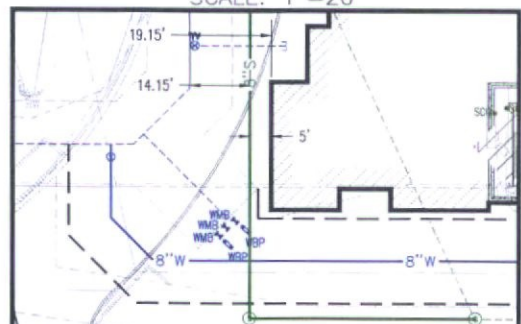
8280 E. GELDING DR. #101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL. 480.588.7226



DETAIL 2
SCALE: 1"=20'



DETAIL 1
SCALE: 1"=20'



BENCHMARK:
BENCHMARK IS A CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE BEING THE SOUTH 1/4 CORNER OF SECTION 21, T3N, R4E.

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

PROJECT
101 MEGA RAIN TREE LOT 2 & 4

LOCATION
PIMA ROAD & RAIN TREE DRIVE
SCOTTSDALE, AZ

DRAWN	AVINA
DESIGNED	AVINA
CHECKED	COUNSELL
PROJ. MGR.	GERSTER
DATE:	03-26-2019
ISSUED FOR:	PRELIMINARY DESIGN
REVISION NO.	DATE:
JOB NO.	180816
SHEET TITLE:	LOT 2 & 4 UTILITY EXHIBIT
SHEET NO.	



THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

PRELIMINARY DRAINAGE REPORT

101 Mega Raintree

(Lots 2 & 4)

8698 E. Raintree Drive

Scottsdale, AZ 85260

Prepared For:

101 MEGA RAINTREE, LLC

Plan # _____

Case # 4-DR-2019

Q-S # _____

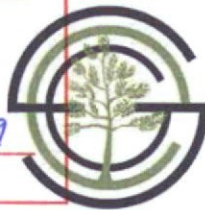
☒ Accepted

☐ Corrections

N. Baronas 4-25-19

Reviewed By Date

Prepared by:



SEG



Sustainability Engineering Group

8280 E. Gelding Drive, Suite 101

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Project Number: 180816

Submittal Date: January 22, 2019

Revision Date: April 4, 2019

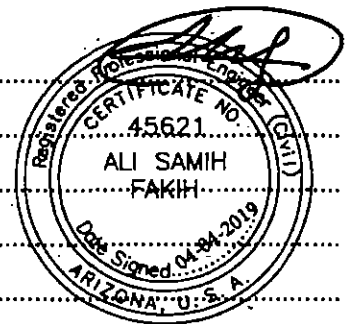
Case No.: 612-PA-2018 Plan Check No.: TBD

4-DR-2019

04/05/2019

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1. INTRODUCTION

This Preliminary Drainage Report represents the storm water analysis for the Shea Commercial 101 Mega Raintree commercial development for Parcels 2 and 4 proposed in Scottsdale, Arizona. The purpose of this report is to provide the hydrologic and hydraulic analyses, required by the City of Scottsdale, to support the proposed site plan for said development. This report includes discussions and calculations defining the storm water management concepts for the collection and conveyance necessary to comply with the drainage requirements of the City of Scottsdale and Maricopa County. Preparation of this report has been done in accordance with the requirements of the City of Scottsdale Design Standards & Policies Manual (DS&PM) 2018¹, and the Drainage Design Manuals for Maricopa County, Arizona, Volumes I² and Volume II³.

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The subject property consists of land fronting on private roads. It is further defined as follows:

- A portion of the Northeast quarter of Section 12, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Scottsdale, Arizona.
- Parcel ID: Portion of APN: 215-52-034L & 215-52-034M
- Address: 8698 E. Raintree Drive, Scottsdale, AZ

Refer to **FIGURE 1 - Vicinity Map** for the project's location with respect to major cross streets

2.2 EXISTING AND PROPOSED DEVELOPMENTS SURROUNDING THE SITE:

The site is bound as follows:

- South: Parcel 215-52-034E; M.O.D. KOHLS subdivision; Zoning is C-2
- West: Parcel 215-52-034M; one two-story self-storage facility and three one-story shops; Zoning is C-2
- North: Parcel 215-52-037H; owned by Sam's Club; Zoning is C-3
- East: Parcel 215-52-039E and 215-52-039D; Property subdivision; Zoning is C-2.

2.3 EXISTING SITE DESCRIPTION:

The project area includes approximately 202,145 sq. ft. (4.65 acres) of land designated as C-2 per COS Zoning Map 19. The site is currently developed as: one 1-store retail shop, associate parking spots and a retention basin.

Refer to **FIGURE 2** attached for an aerial of the site.

2.4 PROPOSED SITE DEVELOPMENT:

Site development includes the demolition of the existing store and the existing onsite retention basin, and construction of two new retail buildings with associate parking spots. The proposed development will include three proposed accesses. Refer to Appendix III - Preliminary Grading and Drainage Plan for site layout.

2.5 FLOOD HAZARD ZONE:

FIRM Map Number 04013C1760L dated October 16, 2013 indicates the site is designated as Zone "X". As such, it is defined as areas determined to be outside the 0.2% annual chance floodplain but is still considered as an area containing a 1% annual chance flood with average depths of less than 1 square mile. The project site is considered to be within the area protected by levees of the 1% annual chance flood.

Refer to **FIGURE 3** for the FIRM.

3. EXISTING DRAINAGE CONDITIONS

3.1 OFF-SITE DRAINAGE PATTERNS:

The site is minimally affected by any offsite overland flow adjacent to the property. However, easements and drainage structures were created across and adjacent to the Subject Property as part of an overall stormwater conveyance for the surrounding properties.

- A portion of the Sam's Club/Northsight stormwater is conveyed through a 48" storm drain that runs in an east-west drainage easement, parallel to the drive on the north side of the Subject Property, to 87th Street.
- A 48" storm drain runs south down 87th Street just off the property's eastern border.

Per previous report, Master Drainage report for Northsight Commercial Development dated January 17, 2002, the existing storm drain along 87th Street can accept a maximum discharge rate of 14 cfs, if approximately 12,000 cubic feet of detention storage is provided within the IPRT Basin.

3.2 ON-SITE DRAINAGE:

The existing onsite drainage system was designed based on the whole parcel 215-52-034M and 215-52-034L areas. According to the previous report, the site is separated to 5 sub-areas. Three interconnected retention basins are provided for sub-area A, and single detached basins are provided for sub-areas B and C. Area D flows offsite and sub-area E discharges directly into the proposed 87th Street storm drain through an onsite collection system. Per the Grading, Drainage and Utility Plans for Scottsdale Shops (39-DR-2003), dated re-approved on 9/28/2004, the existing retention sub basins provide the following retention volume:

- Sub Basin A1 = 592 cf
- Sub Basin A2 = 24,856 cf
- Sub Basin A3 = 38,434 cf
- Sub Basin B = 12,387 cf
- Sub Basin C = 7,106 cf
- Sub Basin D = 3,234 cf

The total of the three sub basins A1 thru A3 is **63,882 cf** provided volume.

Refer to the **Existing Conditions Drainage Area Map** in **Appendix II**, and **Preliminary Drainage Report Northsight and Raintree** in **Appendix IV**.

Per previous report, Master Drainage report for Northsight Commercial Development dated January 17, 2002, the existing storm drain along 87th Avenue

4. PROPOSED STORM WATER MANAGEMENT

4.1 DESIGN INTENT:

Parcels 215-52-034M and 215-52-034L are to be divided into four parcels: Lot 1, 2, 3, and 4. Each of the parcels will be redeveloped in a manner as to provide stormwater storage in accordance with the City of Scottsdale's Design Standards and Policies Manual. The purpose of this preliminary drainage report is to present storm water analysis for Lots 2 and 4 under proposed conditions and provide an overview of the proposed drainage for Lots 1 and 3 under interim and ultimate conditions.

Lots 2&4 will accommodate the 14 cfs allowable discharge along 87th street and will provide full retention for the remainder. Stormwater in drainage area DA-1 will be collected into on-site open retention basin which provides volume for 100-year 2-hour storm event and has total discharge of the storm water within thirty-six hours. For drainage area DA-4, stormwater would be collected into an on-site underground storage pipe which provides volume for 100-year 2-hour storm event and has total discharge of the storm water within thirty-six hours. On-site drainage will be handled within paved areas through catch basins, open retention area and underground storm systems where necessary. Lots 1 and 3 will be self-retained under future development.

Refer to Section 5 below for a discussion on proposed finished floor elevations. Refer to **Interim Proposed Conditions Drainage Area Map** and **Ultimate Proposed Conditions Drainage Area Map**.

4.2 DESIGN STORM REQUIREMENTS:

The storm water system will be designed in accordance with current City of Scottsdale Design Standards and Policies Manual. Under proposed conditions, drainage areas DA-2 and DA-3 were designed to discharge to offsite to the existing drainage systems along 87th Street, while matching existing conditions or less. Drainage areas DA-1 and DA-4 were designed to retain stormwater runoff onsite, based on the 100-year, 2-hour storm event, and providing an overall storage volume greater than existing conditions.

4.3 LAND CHARACTERISTICS:

In accordance with the COS request to provide retention and the Northsight Master Drainage Report (maximum of 14 cfs discharge to the existing storm drain pipe), drainage areas (DA-2, and DA-3) will discharge directly to the existing 48" storm drain running south down 87th Street at or below existing flow rate.

For drainage areas DA-1 and DA-4, stormwater will be directed to onsite underground storage pipes. Stormwater runoff for drainage areas DA-2 and DA-3 will be directed to the existing offsite stormwater system. Based on the DS&PM, runoff coefficients for the 100-year storm event used are as follows:

- C=0.95 for roof areas
 - C=0.95 for paved surface
-

- $C=0.45$ for undisturbed natural desert or desert landscape

HYDROLOGIC ANALYSIS: The hydrologic analysis is determined using the procedures in the City of Scottsdale Design Standards & Policies Manual and the Drainage Design Manual for Maricopa County, Arizona, Volume I. The Rational Method was utilized to compute the on-site peak discharges. The Rational Method equation is displayed as shown below:

$$Q=C_wIA$$

Where: C_w = The runoff coefficient relating runoff to rainfall

I = Average rainfall intensity in inches/hour, lasting for T_c

T_c = The time of concentration (Using Five minutes for the developed areas)

A = The contributing drainage area in acres

Offsite Discharge:

- **Drainage Area 2 (DA-2)**

$$Q_{100} = (0.83) * (7.72 \text{ in/hr}) * (1.65 \text{ ac.}) = 10.52 \text{ cfs proposed}$$

- **Drainage Area 3 (DA-3)**

$$Q_{100} = (0.85) * (7.72 \text{ in/hr}) * (0.44 \text{ ac.}) = 3.25 \text{ cfs proposed}$$

Total onsite runoff discharging into offsite stormwater system= $Q_{100} = 13.77 \text{ cfs proposed}$

The total post development discharge of 13.77 cfs to the existing stormwater system is under the 14 cfs maximum allowable discharge.

Refer to the **Interim Proposed Conditions Drainage Area Map and Weighted Run-Coefficient – Calculations (C_w) in Appendix II.**

4.4 STORMWATER RETENTION:

The 100-year 2-hour retention for drainage area DA-1 and DA-4 are calculated in this preliminary report to determine potential impact on the site. Onsite retention for DA-1 is proposed using open retention basin with a 4:1 side slope, and DA-4 is proposed using underground storage pipes which comply with the City of Scottsdale underground storage policy.

REQUIRED STORAGE:

Stormwater storage required for the 100-year, 2-hour event is calculated in accordance with the COS – DS&PM. Required Retention (Acre-Feet) = $(P/12) * A * (C)$

Where: P = 100 Yr. 2 Hr. Precipitation in Inches (Ref: Isopluvial from DS&PM, Appendix 4-1D, pg. 11 and NOAA Atlas 14 table). Refer to **Appendix I** for rainfall data.

A = Area (Acres)

C = C_{Proposed}

Based on the C -value identified in Section 4.3 above, the following retention is required for each drainage area:

Basin-1: DA-1: 1.20 Ac @ $C_{wt} = 0.76$

- 100-yr, 2-hr.:

$$V_r = 2.27/12 * 1.20 \text{ ac} * 0.76 = 0.17 \text{ ac.ft. (7,490 c.f.) REQUIRED STORAGE}$$

Basin-2(Underground Storage): DA-4: 1.32 Ac @ $C_{wt} = 0.82$

- 100-yr, 2-hr.:

$$V_r = 2.27/12 * 1.34 \text{ ac} * 0.82 = 0.21 \text{ ac.ft. (9,089 c.f.) REQUIRED STORAGE}$$

Refer to the **Weighted Run-Coefficient – Calculations (C_w)** in Appendix II.

STORAGE PROVIDED:

BASIN 1 (Open Retention):

In accordance with COS design requirements, an open basin is limited to three (3) feet maximum depth with maximum side slopes of 4:1 (6:1 near streets) with one (1) foot freeboard and include an emergency overflow outlet.

- The volume for open basins is calculated using the area-sum volume method based on design contours.

Table 1 summarizes the available storage in Basin 1.

Table 1

LOT 2 BASIN 1					
ELEV.	AREA	DEPTH	AVG V	SUM V	COMMENT
(FT)	(SF)	(FT)	(CF)	(CF)	
69.5	3,052			0.00	Pond Bottom
		1.00	3,906.90		
70.5	4,762			3,906.90	
		1.00	5,667.87		
71.5	6,573			9,574.77	Top of Weir

The above summary indicates there is approximately **9,575 c.f.** of storage volume available. The provided volume of 9,575 c.f. is larger than 7,490 c.f. required. The available storage facilities provide flexibility in sizing and/or layout in subsequent submittals.

BASIN 2 (Underground Storage Pipes):

Storage volume of underground piping is calculated using $V = \pi r^2 L$.

- One proposed 10' Dia. CMP storage pipe, 120 lf = $3.1416 * 5^2 * 120' = 9,425 \text{ c.f.} > 9,089 \text{ required}$

Total provided storage for Basin 1 and Basin 2 = 7,997 cf + 9,425 cf = **17,422 cf.**

OFFSITE RETENTION:

The remainder Lots 1 and 3 will be future developments. These lots will be self-retained for the 100-year, 2- hour storm event.

Lot 1 and 3:

- 100-yr, 2-hr.:

$$V_r = \text{Lot 1 (17,103 cf)} + \text{Lot 3 (36,088 cf)} = \mathbf{53,190 \text{ cf REQUIRED STORAGE}}$$

Under interim conditions, the remainder of drainage area requires a storage volume of 35,751 cf, see Interim Proposed Conditions Drainage Area Map.

Remainder A: A: 4.91 Ac @ $C_{wt} = 0.88$

- 100-yr, 2-hr.:

$$V_r = 2.27/12 * 4.91 \text{ ac} * 0.88 = \mathbf{0.82 \text{ ac.ft. (35,751 c.f.) REQUIRED STORAGE}}$$

The remainder of Basin A will be retained in the future development of Lots 1 and 3 under ultimate proposed conditions, see Ultimate Proposed Conditions Drainage Area Map. However, in the case that Lots 1 and 3 do not undergo development, additional storage will be provided to cover the retention of the remaining.

The cumulative volume provided for the proposed retention basins in Lots 2&4 is:

$$\text{Basin 1 (9,574 cf)} + \text{Basin 2(9,425 cf)} = \mathbf{18,999 \text{ cf Provided Storage}}$$

The remainder volume to be retained under interim conditions is

$$35,751 \text{ cf} - 18,999 \text{ cf} = \mathbf{16,752 \text{ cf Additional Storage}}$$

Refer to the **Interim Proposed Conditions Drainage Area Map** and **Ultimate Proposed Conditions Drainage Area Map** in **Appendix II**.

STORMWATER DISCHARGE:

In case of overflow, DA-1 overflows into the parking lot and towards drainage area DA-4. Drainage area DA-4 will overflow towards the ultimate outfall at the southeast corner of the site and along 87th Avenue. See **Preliminary Grading Plan** in **Appendix III** for ultimate outfall location.

For Basins with no direct bleed-off available, Drywells are proposed in the on-site storage facilities to dispose of the stormwater within thirty-six (36) hours. The calculation is as follows:

- Minimum percolating rate of a drywell (for planning purposes) = 0.1 cfs
- Volume to be drained in 36 hours = 0.1 cfs * 36 hours * 3600 sec/hour = 12,960 cf = 0.298 acre-feet.
- The number of drywells will be reduced if geotechnical testing for percolation rates determine adequate infiltration is available in the native soils at lower depths. If the percolation rate of the drywells is less than 0.1 cfs the number of drywells may have to be increased.

Open retention basin provided storage = 8,498 c.f.
7,997 cf/12,960 cf per drywell = 0.62 = 1 drywell required.
1 Drywell Provided

Underground Storage Pipes provide storage = 9,425 c.f.
9,425 cf/12,960 cf per drywell = 0.73 = 1 drywell required.
1 Drywell Provided

4.5 PIPE CAPACITY CALCULATIONS:

The calculations will be provided in the Final Drainage Report.

4.6 STORM DRAIN INLET CALCULATIONS

These calculations will be provided in the Final Drainage Report.

5. FLOOD SAFETY FOR DWELLINGS

5.1 FINISHED FLOOR ELEVATIONS

This project lies in an "X" Flood Zone. Proposed building finished floor elevations will be set a minimum of 12 inches above the 100-year high-water elevation of any adjacent streets and drainage paths and a minimum of 14" above the ultimate outfall elevation. This will ensure that each building will be well above the 100-year water level.

6. CONCLUSIONS

6.1 OVERALL PROJECT:

1. The finish floor elevations will be designed a minimum 12 inches above the 100-year water surface in adjacent streets and drainage paths and a minimum of 14 inches above the low top of curb of the lot. Finish floor elevations are 1474.03' and 1472.75' for the developments in Lots 2 and 4, respectively. The ultimate outfall elevation is 1468.22'.
2. On-site storm water storage will be provided for the 100-yr, 2-hr storm event and discharge within 36 hours.

6.2 PROJECT PHASING:

This project will be constructed in a single phase.

7. WARNING AND DISCLAIMER OF LIABILITY

RE: following page.

8. REFERENCES

1. *Design Standards & Policies Manual, City of Scottsdale – January 2018*
2. *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology, Flood Control District of Maricopa County, Fourth Edition, December 14, 2018*
3. *Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics, Flood Control District of Maricopa County, December 14, 2018*
4. *Preliminary Drainage Report Northsight and Raintree Retail Development prepared by JMA Engineering Corporation. dated May 15, 2003.*
5. *NorthSight Master Drainage Report prepared by Gilbertson Associates, Inc. Date January 17, 2002.*

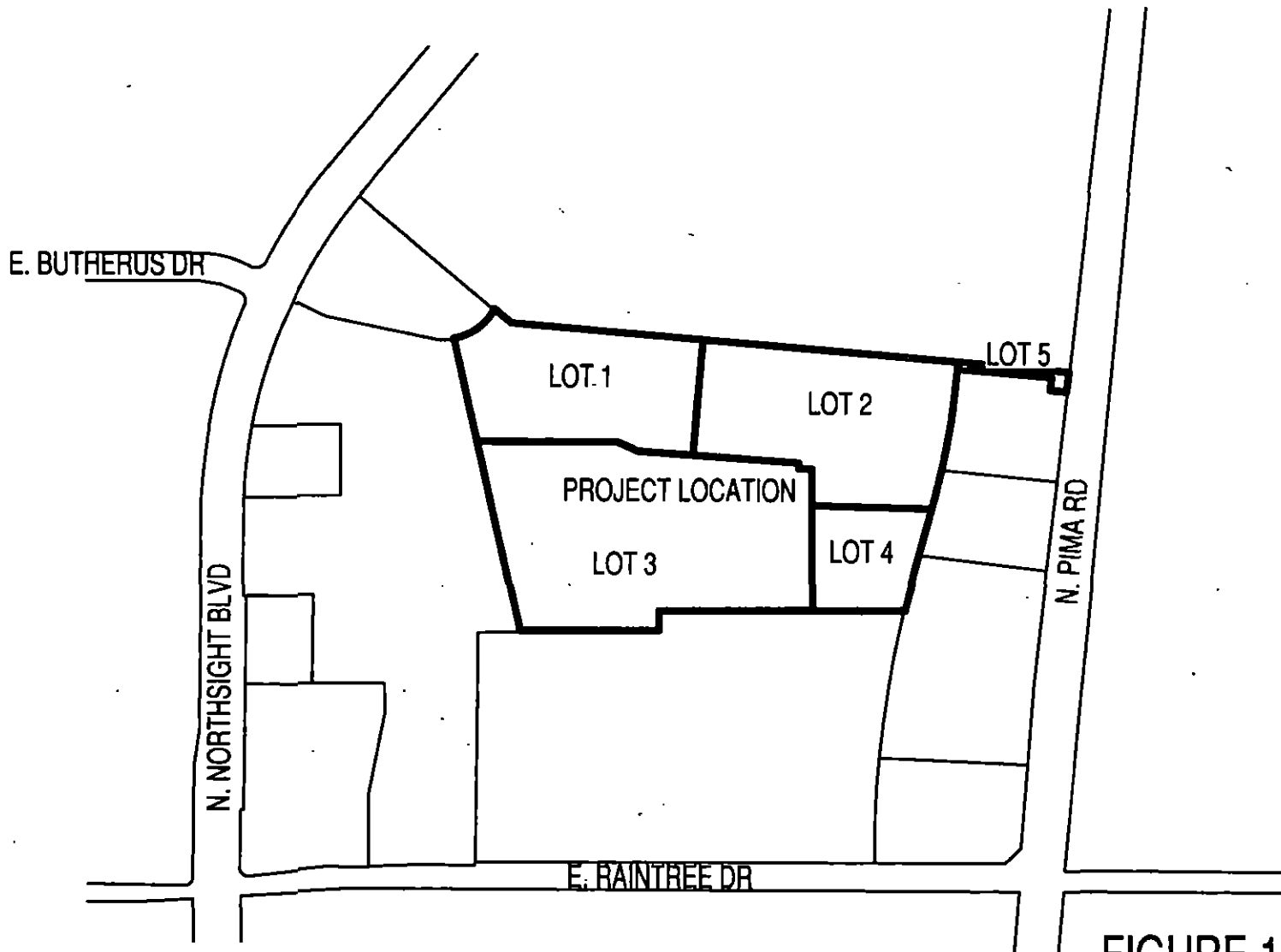
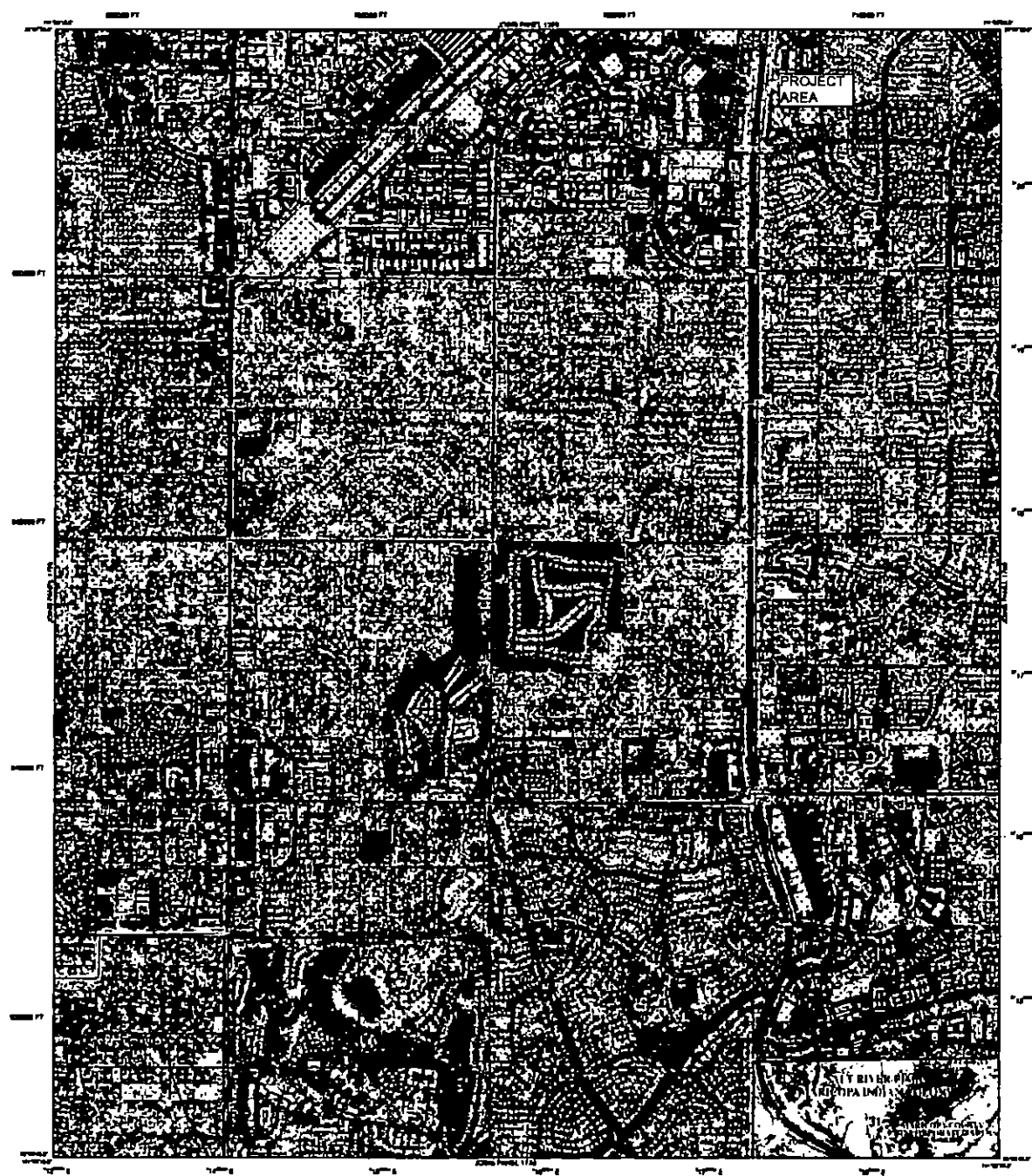


FIGURE 1
VICINITY MAP



NATIONAL

Federal Emergency M

APPENDIX I

Rainfall Data



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Helm, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishant Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

PF tabular

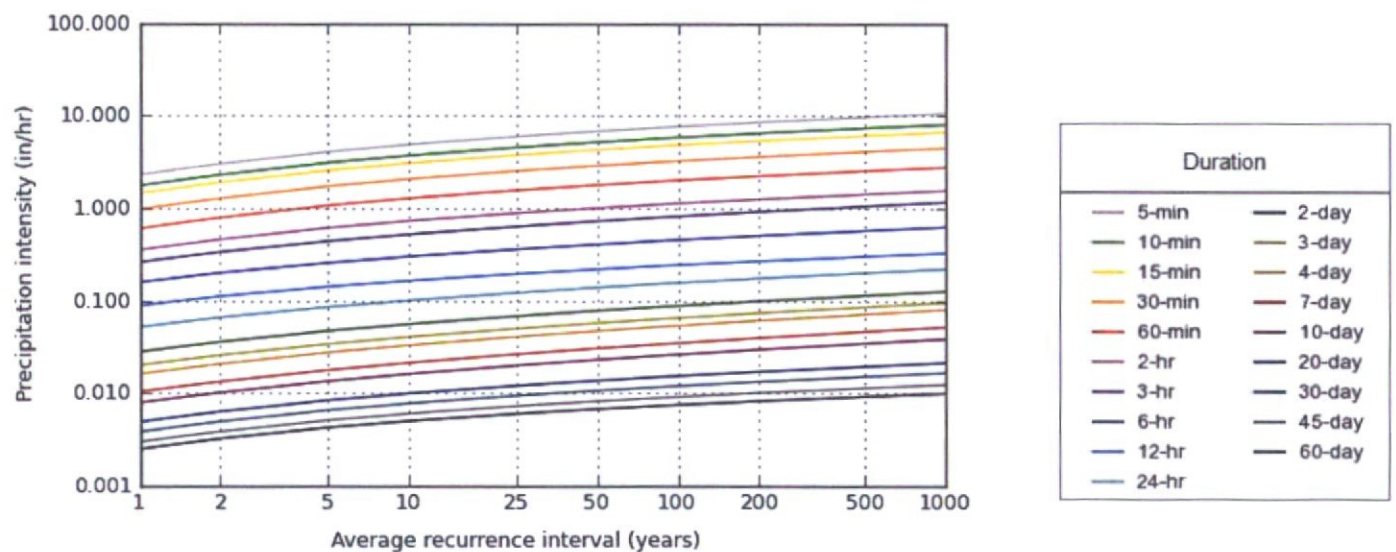
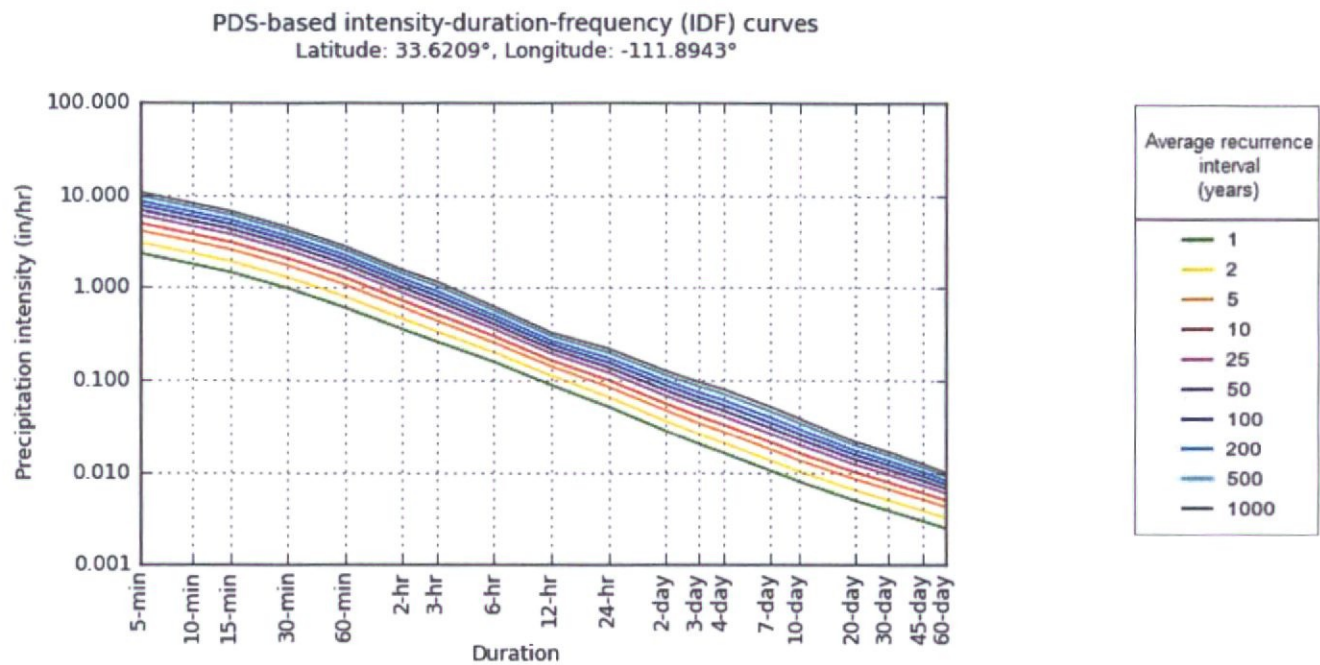
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	2.33 (1.93-2.86)	3.04 (2.54-3.72)	4.09 (3.40-5.00)	4.92 (4.08-5.98)	6.01 (4.87-7.28)	6.85 (5.50-8.23)	7.72 (6.07-9.26)	8.57 (6.65-10.3)	9.73 (7.36-11.7)	10.6 (7.86-12.8)
10-min	1.77 (1.47-2.17)	2.31 (1.93-2.83)	3.12 (2.59-3.80)	3.74 (3.08-4.55)	4.57 (3.71-5.54)	5.21 (4.18-6.27)	5.87 (4.63-7.05)	6.52 (5.05-7.82)	7.41 (5.60-8.90)	8.08 (5.98-9.72)
15-min	1.46 (1.22-1.79)	1.91 (1.60-2.34)	2.58 (2.13-3.14)	3.09 (2.55-3.76)	3.78 (3.06-4.58)	4.30 (3.45-5.18)	4.85 (3.82-5.83)	5.39 (4.18-6.46)	6.12 (4.62-7.35)	6.68 (4.94-8.03)
30-min	0.984 (0.818-1.21)	1.29 (1.08-1.58)	1.74 (1.44-2.12)	2.08 (1.72-2.53)	2.54 (2.08-3.09)	2.90 (2.33-3.49)	3.27 (2.57-3.92)	3.63 (2.81-4.35)	4.12 (3.11-4.95)	4.50 (3.33-5.41)
60-min	0.609 (0.506-0.746)	0.796 (0.665-0.976)	1.07 (0.888-1.31)	1.29 (1.08-1.57)	1.57 (1.28-1.91)	1.79 (1.44-2.16)	2.02 (1.59-2.43)	2.25 (1.74-2.69)	2.55 (1.93-3.06)	2.78 (2.06-3.35)
2-hr	0.356 (0.300-0.426)	0.462 (0.390-0.553)	0.614 (0.516-0.732)	0.730 (0.607-0.870)	0.890 (0.733-1.05)	1.01 (0.820-1.19)	1.14 (0.908-1.34)	1.26 (0.990-1.48)	1.43 (1.10-1.68)	1.56 (1.17-1.84)
3-hr	0.263 (0.222-0.323)	0.337 (0.285-0.415)	0.440 (0.370-0.539)	0.522 (0.434-0.635)	0.636 (0.521-0.769)	0.728 (0.588-0.874)	0.822 (0.652-0.987)	0.921 (0.718-1.10)	1.06 (0.799-1.26)	1.17 (0.861-1.40)
6-hr	0.159 (0.137-0.189)	0.201 (0.172-0.239)	0.256 (0.218-0.303)	0.300 (0.254-0.354)	0.361 (0.301-0.423)	0.407 (0.334-0.476)	0.456 (0.369-0.532)	0.506 (0.402-0.592)	0.573 (0.444-0.669)	0.627 (0.474-0.733)
12-hr	0.089 (0.077-0.105)	0.112 (0.096-0.132)	0.141 (0.121-0.166)	0.164 (0.140-0.192)	0.195 (0.164-0.228)	0.219 (0.182-0.255)	0.244 (0.200-0.283)	0.269 (0.217-0.312)	0.302 (0.238-0.352)	0.327 (0.254-0.385)
24-hr	0.052 (0.046-0.060)	0.066 (0.058-0.076)	0.085 (0.075-0.099)	0.101 (0.088-0.118)	0.122 (0.106-0.140)	0.139 (0.119-0.159)	0.156 (0.133-0.180)	0.175 (0.147-0.201)	0.200 (0.166-0.230)	0.220 (0.180-0.254)
2-day	0.028 (0.025-0.032)	0.036 (0.031-0.041)	0.047 (0.041-0.054)	0.056 (0.048-0.064)	0.068 (0.059-0.078)	0.078 (0.066-0.089)	0.088 (0.075-0.101)	0.099 (0.083-0.114)	0.114 (0.094-0.132)	0.126 (0.102-0.148)
3-day	0.020 (0.018-0.023)	0.026 (0.023-0.030)	0.034 (0.030-0.039)	0.041 (0.035-0.046)	0.050 (0.043-0.057)	0.057 (0.049-0.065)	0.065 (0.056-0.075)	0.074 (0.062-0.085)	0.086 (0.071-0.098)	0.095 (0.078-0.110)
4-day	0.016 (0.014-0.019)	0.021 (0.018-0.024)	0.028 (0.024-0.031)	0.033 (0.028-0.037)	0.041 (0.036-0.046)	0.047 (0.041-0.054)	0.054 (0.046-0.061)	0.061 (0.052-0.070)	0.071 (0.060-0.082)	0.080 (0.066-0.082)
7-day	0.010 (0.009-0.012)	0.013 (0.012-0.015)	0.018 (0.016-0.020)	0.021 (0.019-0.024)	0.026 (0.023-0.030)	0.030 (0.026-0.035)	0.035 (0.030-0.040)	0.040 (0.033-0.045)	0.048 (0.039-0.053)	0.052 (0.043-0.060)
10-day	0.008 (0.007-0.009)	0.010 (0.009-0.012)	0.013 (0.012-0.015)	0.016 (0.014-0.018)	0.020 (0.017-0.023)	0.023 (0.020-0.026)	0.026 (0.022-0.030)	0.030 (0.025-0.034)	0.035 (0.029-0.040)	0.039 (0.032-0.044)
20-day	0.005 (0.004-0.008)	0.006 (0.006-0.007)	0.008 (0.007-0.010)	0.010 (0.009-0.011)	0.012 (0.011-0.014)	0.014 (0.012-0.016)	0.015 (0.013-0.018)	0.017 (0.015-0.020)	0.019 (0.017-0.022)	0.021 (0.018-0.024)
30-day	0.004 (0.003-0.004)	0.005 (0.004-0.006)	0.007 (0.006-0.007)	0.008 (0.007-0.009)	0.009 (0.008-0.011)	0.011 (0.009-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.015)	0.015 (0.013-0.017)	0.017 (0.014-0.019)
45-day	0.003 (0.003-0.003)	0.004 (0.003-0.004)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.008-0.012)	0.011 (0.010-0.013)	0.012 (0.011-0.014)
60-day	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.004-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.007 (0.007-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.008-0.011)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maltaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zheo, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.194 (0.181-0.238)	0.253 (0.212-0.310)	0.341 (0.283-0.417)	0.410 (0.338-0.498)	0.501 (0.406-0.607)	0.571 (0.458-0.688)	0.643 (0.506-0.772)	0.714 (0.554-0.856)	0.811 (0.613-0.974)	0.885 (0.655-1.06)
10-min	0.295 (0.245-0.362)	0.385 (0.322-0.472)	0.520 (0.431-0.634)	0.623 (0.514-0.758)	0.762 (0.618-0.924)	0.868 (0.696-1.05)	0.978 (0.771-1.18)	1.09 (0.842-1.30)	1.24 (0.933-1.48)	1.35 (0.997-1.62)
15-min	0.366 (0.304-0.448)	0.478 (0.399-0.585)	0.644 (0.533-0.786)	0.772 (0.637-0.940)	0.945 (0.766-1.15)	1.08 (0.863-1.30)	1.21 (0.955-1.46)	1.35 (1.04-1.62)	1.53 (1.16-1.84)	1.67 (1.24-2.01)
30-min	0.492 (0.409-0.603)	0.643 (0.538-0.788)	0.868 (0.718-1.06)	1.04 (0.858-1.27)	1.27 (1.03-1.54)	1.45 (1.16-1.74)	1.63 (1.29-1.98)	1.81 (1.41-2.18)	2.06 (1.56-2.48)	2.25 (1.67-2.70)
60-min	0.609 (0.506-0.746)	0.796 (0.665-0.976)	1.07 (0.889-1.31)	1.29 (1.06-1.57)	1.57 (1.28-1.91)	1.79 (1.44-2.16)	2.02 (1.59-2.43)	2.25 (1.74-2.69)	2.55 (1.93-3.06)	2.78 (2.06-3.35)
2-hr	0.713 (0.600-0.853)	0.923 (0.780-1.11)	1.23 (1.03-1.46)	1.46 (1.21-1.74)	1.78 (1.47-2.11)	2.02 (1.64-2.39)	2.27 (1.81-2.67)	2.52 (1.98-2.97)	2.86 (2.19-3.36)	3.12 (2.34-3.69)
3-hr	0.790 (0.666-0.969)	1.01 (0.855-1.25)	1.32 (1.11-1.62)	1.57 (1.30-1.91)	1.91 (1.58-2.31)	2.19 (1.77-2.63)	2.47 (1.96-2.96)	2.77 (2.16-3.31)	3.17 (2.40-3.80)	3.50 (2.59-4.20)
6-hr	0.953 (0.818-1.13)	1.20 (1.03-1.43)	1.53 (1.31-1.82)	1.80 (1.52-2.12)	2.16 (1.80-2.54)	2.44 (2.00-2.85)	2.73 (2.21-3.18)	3.03 (2.41-3.54)	3.43 (2.66-4.01)	3.75 (2.84-4.38)
12-hr	1.07 (0.922-1.26)	1.35 (1.16-1.59)	1.70 (1.46-2.00)	1.98 (1.68-2.32)	2.35 (1.98-2.75)	2.64 (2.20-3.07)	2.94 (2.41-3.41)	3.24 (2.62-3.76)	3.63 (2.87-4.24)	3.94 (3.06-4.63)
24-hr	1.25 (1.10-1.44)	1.59 (1.40-1.83)	2.05 (1.79-2.36)	2.41 (2.11-2.78)	2.93 (2.54-3.36)	3.33 (2.86-3.82)	3.76 (3.19-4.31)	4.19 (3.53-4.81)	4.80 (3.97-5.52)	5.29 (4.31-6.10)
2-day	1.35 (1.18-1.56)	1.72 (1.50-1.99)	2.26 (1.98-2.60)	2.68 (2.33-3.08)	3.27 (2.82-3.76)	3.74 (3.19-4.29)	4.23 (3.58-4.87)	4.75 (3.98-5.47)	5.46 (4.51-6.31)	6.04 (4.91-7.01)
3-day	1.45 (1.28-1.67)	1.86 (1.63-2.13)	2.45 (2.14-2.80)	2.92 (2.55-3.34)	3.59 (3.11-4.10)	4.13 (3.55-4.71)	4.70 (4.01-5.38)	5.31 (4.48-6.09)	6.16 (5.12-7.08)	6.85 (5.63-7.91)
4-day	1.56 (1.38-1.78)	1.99 (1.76-2.27)	2.64 (2.32-3.00)	3.17 (2.78-3.60)	3.91 (3.41-4.45)	4.52 (3.92-5.14)	5.17 (4.44-5.89)	5.87 (4.99-6.70)	6.85 (5.74-7.84)	7.66 (6.34-8.81)
7-day	1.76 (1.54-2.02)	2.25 (1.97-2.58)	2.98 (2.61-3.41)	3.58 (3.12-4.09)	4.43 (3.84-5.06)	5.12 (4.41-5.85)	5.86 (5.01-6.71)	6.66 (5.63-7.64)	7.78 (6.48-8.96)	8.70 (7.16-10.1)
10-day	1.91 (1.68-2.18)	2.45 (2.15-2.79)	3.24 (2.84-3.69)	3.88 (3.39-4.41)	4.79 (4.16-5.44)	5.52 (4.76-6.27)	6.30 (5.40-7.17)	7.13 (6.05-8.13)	8.30 (6.94-9.50)	9.25 (7.64-10.8)
20-day	2.36 (2.09-2.69)	3.05 (2.69-3.48)	4.03 (3.55-4.57)	4.78 (4.19-5.42)	5.79 (5.06-6.57)	6.58 (5.72-7.47)	7.39 (6.39-8.41)	8.22 (7.06-9.38)	9.34 (7.94-10.7)	10.2 (8.61-11.8)
30-day	2.78 (2.44-3.15)	3.57 (3.15-4.06)	4.72 (4.16-5.35)	5.60 (4.92-6.33)	6.78 (5.93-7.67)	7.70 (6.70-8.71)	8.64 (7.48-9.78)	9.61 (8.28-10.9)	10.9 (9.29-12.4)	11.9 (10.1-13.6)
45-day	3.24 (2.87-3.67)	4.18 (3.70-4.73)	5.52 (4.88-6.24)	6.52 (5.75-7.37)	7.85 (6.89-8.87)	8.86 (7.75-10.0)	9.90 (8.60-11.2)	10.9 (9.45-12.4)	12.3 (10.5-14.1)	13.4 (11.4-15.4)
60-day	3.60 (3.20-4.07)	4.66 (4.13-5.25)	6.14 (5.44-6.91)	7.22 (6.38-8.14)	8.64 (7.61-9.74)	9.71 (8.51-11.0)	10.8 (9.40-12.2)	11.9 (10.3-13.4)	13.3 (11.4-15.1)	14.3 (12.2-16.4)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

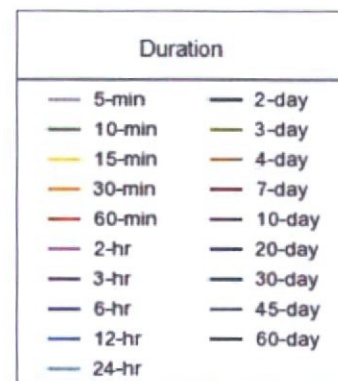
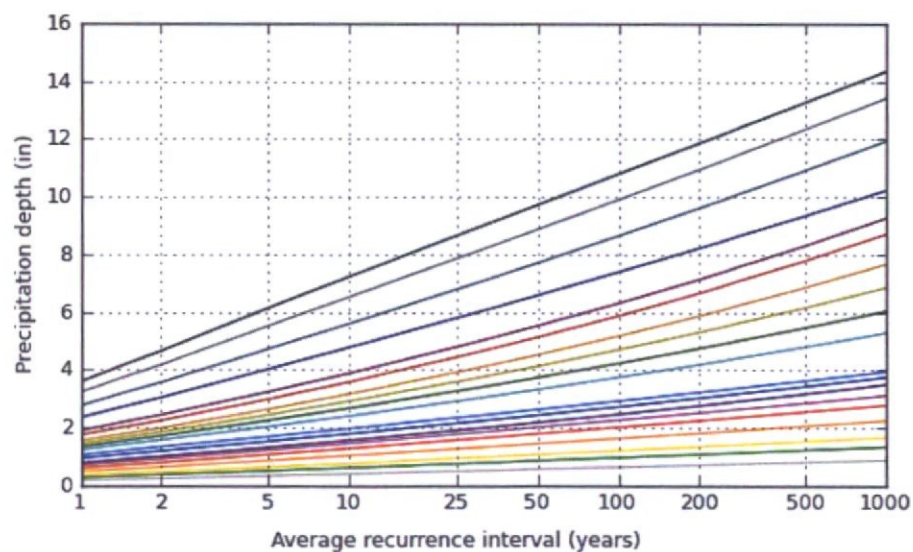
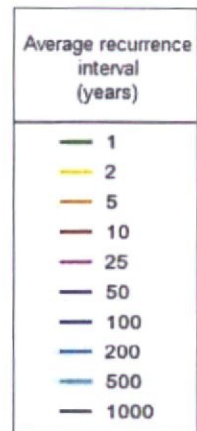
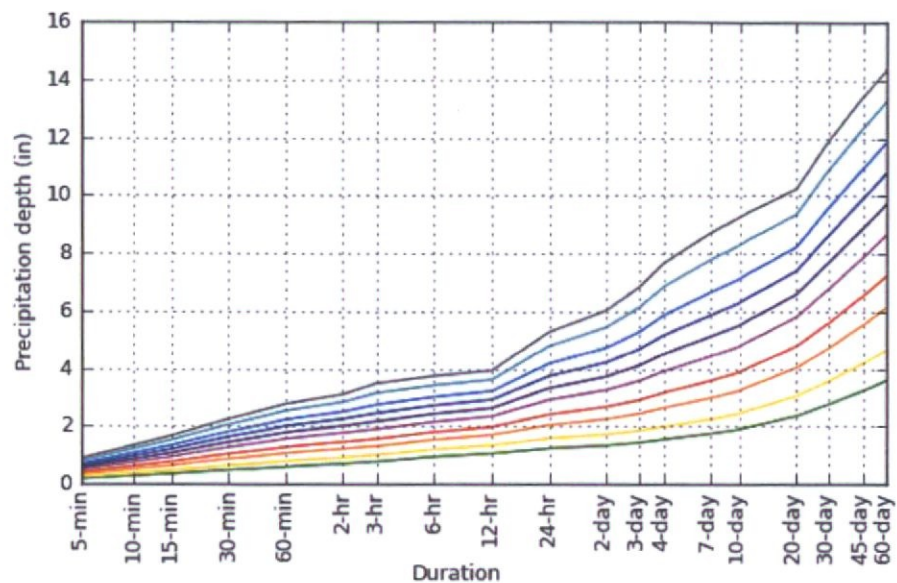
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Please refer to NOAA Atlas 14 document for more information.

PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 33.6209°, Longitude: -111.8943°



Maps & aerials

Small scale terrain

APPENDIX II

Calculations

Weighted Runoff Coefficient-Calculations (Cw)

PROPOSED OVERALL SITE C_w				
	BUILDING or CONCRETE or ASPHALT	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	3.33	1.30	4.63	0.81
DA-1	0.74	0.46	1.20	0.76
DA-2	1.24	0.41	1.65	0.83
DA-3	0.35	0.09	0.44	0.85
DA-4	1.00	0.34	1.34	0.82

Required Storage Volume Calculations

						$V_r = 1 * (P/12) * C_w * A$
						P=100-yr, 2-hr=2.27 in.
Drainage	Area	C _w	intensity	Q	Volume Req.	Volume Req.
<u>Area ID</u>	<u>(acres)</u>	<u>(-)</u>	<u>(in/hr)</u>	<u>(cfs)</u>	<u>(acre-ft)</u>	<u>(CF)</u>
RETENTION BASIN 1						
DA-1	1.20	0.76	7.72	7.03	0.172	7,498.49
Basin 1 Totals:	1.20	0.76		7.03	0.172	7,498.49
RETENTION BASIN 2						
DA-4	1.34	0.82	7.72	8.52	0.209	9,088.83
Basin 2 Totals:	1.34	0.82		8.52	0.209	9,088.83
DIRECT DISCHARGE						
DA-2	1.65	0.83	7.72	10.52	0.258	11,227.14
DA-3	0.44	0.85	8.72	3.25	0.071	3,073.56
Total:				13.77		

APPENDIX III

Preliminary Grading & Drainage Plan

APPENDIX V

Northsight Master Drainage Report

APPENDIX IV

Preliminary Drainage Report Northsight and Raintree

PRELIMINARY DRAINAGE REPORT

NORTHSIGHT AND RAINTREE

39-DR-2003

5-19-2003

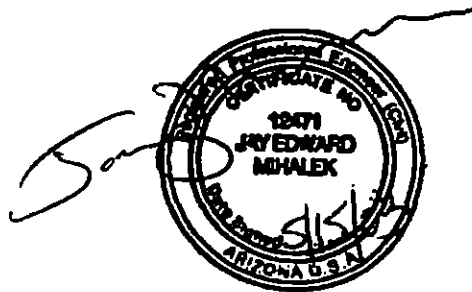
**A Proposed Retail Development
Near the NWC Raintree Drive & Loop 101
Scottsdale, Arizona**

Prepared for:

**Continental Properties
Continental 138 Funds, LLC**

and

**City of Scottsdale
Development Services Department**



October 11, 2002

Revised May 15, 2003

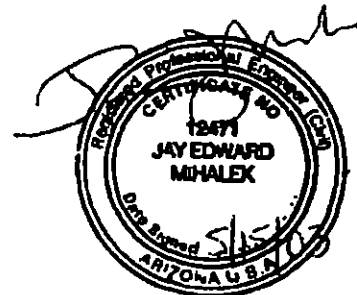
Prepared by:

**JMA Engineering Corporation
531 East Bethany Home Road, Garden Suite
Phoenix, Arizona 85012
(602) 248-0286
Contact: Jay Mihalek, PE**

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PROJECT LOCATION AND DESCRIPTION

This project consists of a new 129,800-sf retail center with associated drives and parking constructed on a 13.07 gross acre parcel of land. The site is located west of 87th Street, south of existing Sam's Club, approximately 500 feet east of Northsight Boulevard, and north of proposed 87th Street. See enclosed Exhibit A. The site is described as a portion of Parcel 6 of Map of Dedication for Northsight recorded Book 315, Page 15, Maricopa County Records. Presently, the site is undeveloped desert.

The east 20 feet of the site has been dedicated as right-of-way for the recent extension of 87th Street to a private street. The 87th Street improvements include curb and gutter, paving, stormdrain, and water and sewer lines. These improvements were installed as a part of the Kohl's project (see enclosed Exhibit C, Group, Inc. city project number 83-DR-01).

FLOOD PLAIN CLASSIFICATION

The site is located within Zone X as shown on FEMA Flood Insurance Rate Map (FIRM) No. 04-03-001 Panel 1685, Suffix G, dated July 19, 2001. Zone X is defined as areas outside the 500-year flood limits.

EXISTING TOPOGRAPHY AND HYDROLOGY

The site is undeveloped natural desert sloping at about a 1.3% grade from north to south. An existing graded channel crosses the west side of the property. This channel is for temporary pre-development discharge from the Sam's Club project to the north. The discharges will be collected and piped into the future 87th Street stormdrain as part of this and the Kohl's development. The site slopes from north to south at approximately one-percent, see enclosed Exhibit B and Exhibit C.

PROPOSED ONSITE STORMWATER MANAGEMENT

MASTER DRAINAGE REPORT FOR NORTHSIGHT

A master drainage report for the 330-acre Northsight region was prepared by Gilbertson and Associates Inc. dated January 17, 2002 and revised January 28, 2002. "Northsight" is a masterplanned commercial development bounded by Thunderbird Road to the south, Frank Lloyd Wright Boulevard to the north, Pima Freeway to the east, and a line west of Northsight Boulevard. This latest issue amends the master drainage report prepared in 1986. The amended report was approved by the Stormwater Management Division, City of Scottsdale, on July 23, 2002. The subject "Northsight and Related" development is completely within the report's study area and utilizes the amended report as its master drainage design.

The site is divided into two drainage areas in the report; "JPRT" on the west two-thirds and "IPRT" east third. There are unusual retention requirements for the area due to the development sequ the area with the construction of the new Pima Freeway to the east. The result is that some poi the Northsight region's properties already have retention provided by a regional basin.

The west area, named JPRT, has two possibilities to its stormwater retention. The first is the nor of Scottsdale retention requirements of a 100-year, 2-hour storm. The second alternative is to ap waiver, which would allow design for the pre versus post stormwater runoff. This option will pursued as it would result in only about 10 to 15 percent reduction of the normal city of Sc retention ordinance requirements. The Northsight Boulevard 36-inch stormdrain system is sized bleed-off to empty the required basins within 36 hours.

The east area, named IPRT, can discharge into the proposed 87th Street stormdrain system with stormwater retention. The existing 48-inch 87th Street stormdrain system will convey approximat cfs which includes the 70-cfs discharge from Sam's Club plus the fully developed IPRT area run east portion of this site and the remainder out-parcels east of 87th Street have this direct di privilege and do not require stormwater retention. The waiver process will be required becaus pre-versus post approach and the IPRT direct discharge.

PROPOSED SITE GRADING

The proposed grading for separating the JPRT-IPRT tributary areas of this development does n the delineation of the Master Drainage Report. The JPRT-IPRT area sizes within the site, and t the runoff amounts, have been preserved. Considering the above, we have computed the tota stormwater retention for the site to be 88,116 cubic feet. This amount is based on the JPI (416,622-sf) of the site, a soil Group B, and the pre-post concept. The JPRT area has been divi four sub-areas named A, B, C and D. See enclosed Exhibit D and Exhibit E.

Retention has been accommodated with three interconnected retention basins for sub-area A, an detached basins for sub-areas B and C. Area D flows offsite due to grades established by the development. A 12-inch gravity stormdrain will meter discharge from the basins to the storm Northsight Boulevard via Raintree Drive. The remaining IPRT area named "E" (149,773-sf) will di directly into the proposed 87th Street stormdrain through an onsite collection system. See e Exhibit E.

STORMWATER RETENTION

Stormwater retention is provided for the JPRT area in accordance with city of Scottsdale requirements follows.

$$V_R = P/12(CA)$$

Where:

P = rainfall 2.82 inches
A = area
C = runoff coefficient 0.9

A summary of the site's stormwater retention accommodation is as follows in Table 1.

TABLE 1
Stormwater Retention Summary

Tributary Area Name	JPRT Area, sf	Volume Required, cf	Basin Name	Volume Provided, cf
A	317,437	67,138		
		-	A ₁ 1	1,000
		-	A ₁ 2	22,500
		-	A ₁ 3	43,638
		-		
B	40,038	8,468	B	8,468
C	43,855	9,275	C	9,275
D	15,292	3,234	Offsite	3,234
Totals:	416,622	88,115		89,115

Source: JMA Engineering Corporation

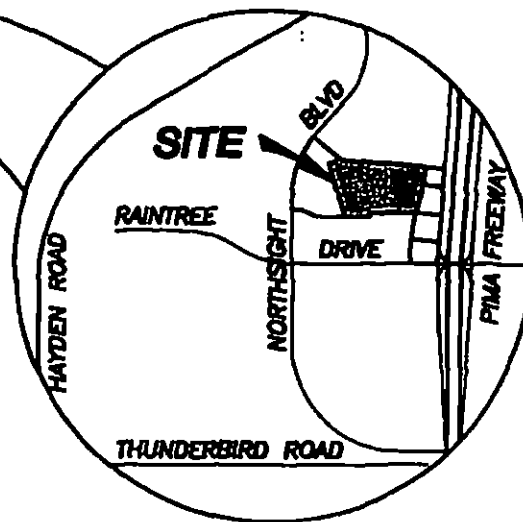
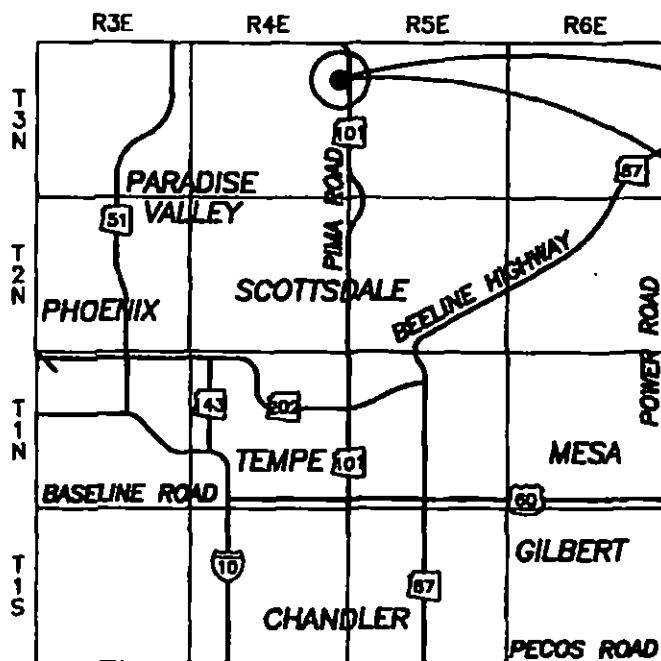
OFFSITE DRAINAGE

Offsite drainage is eliminated from the site by the existing Sam's Club stormwater detention system new construction of adjacent private streets and their associated stormdrain piping system. The construction of 87th street and its stormdrain is a separate project, (see CMX Group, Inc. city number 83-DR-01).

FINISH FLOOR

The finish floor elevations are at various heights and generally more than a foot above the ponded water heights.

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VICINITY MAP

SCOTTSDALE, ARIZONA

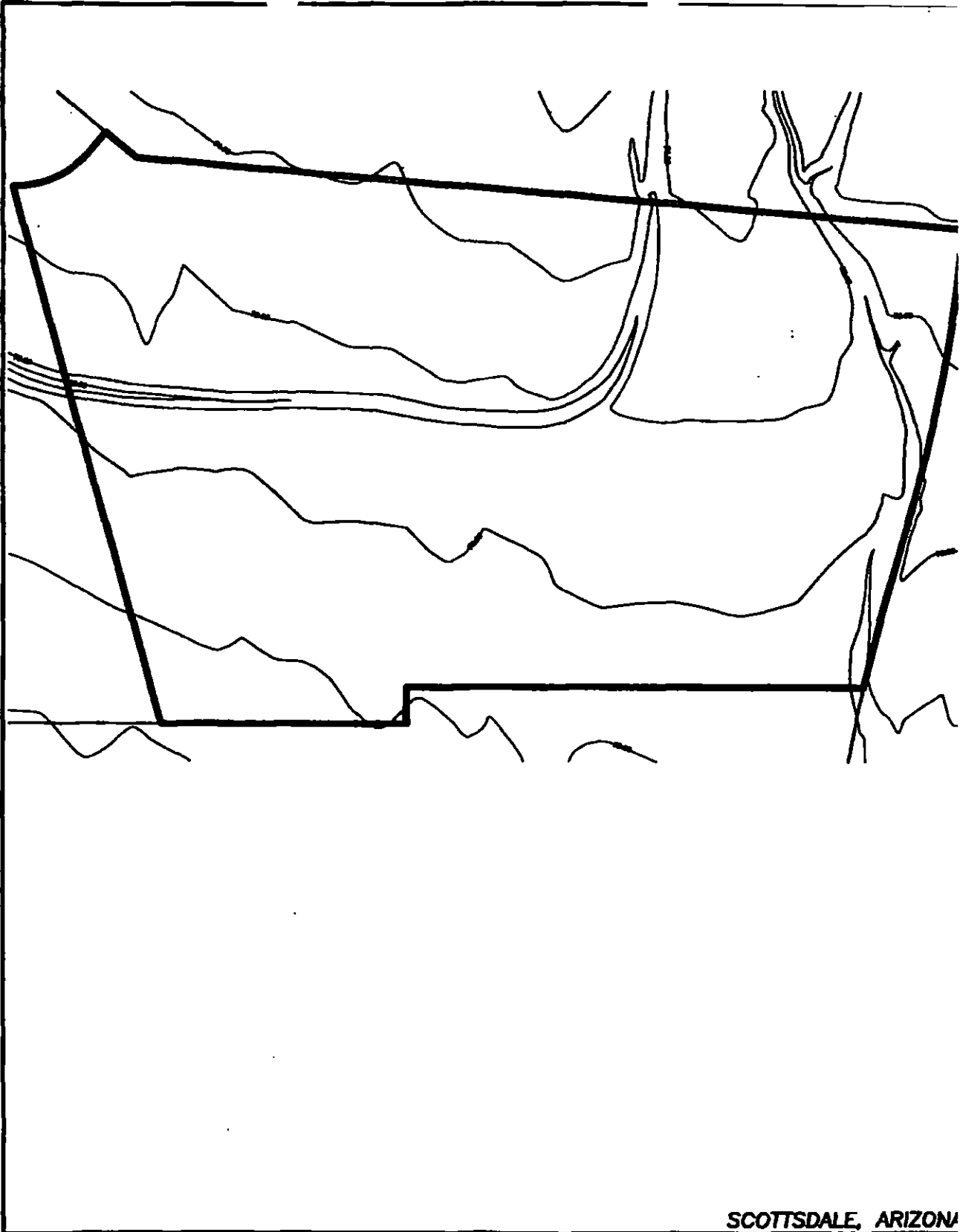
SCOTTSDALE, ARIZONA

JMA

JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

EXHIBIT A
VICINITY MAP
NORTHSIGHT AND RAINTREE



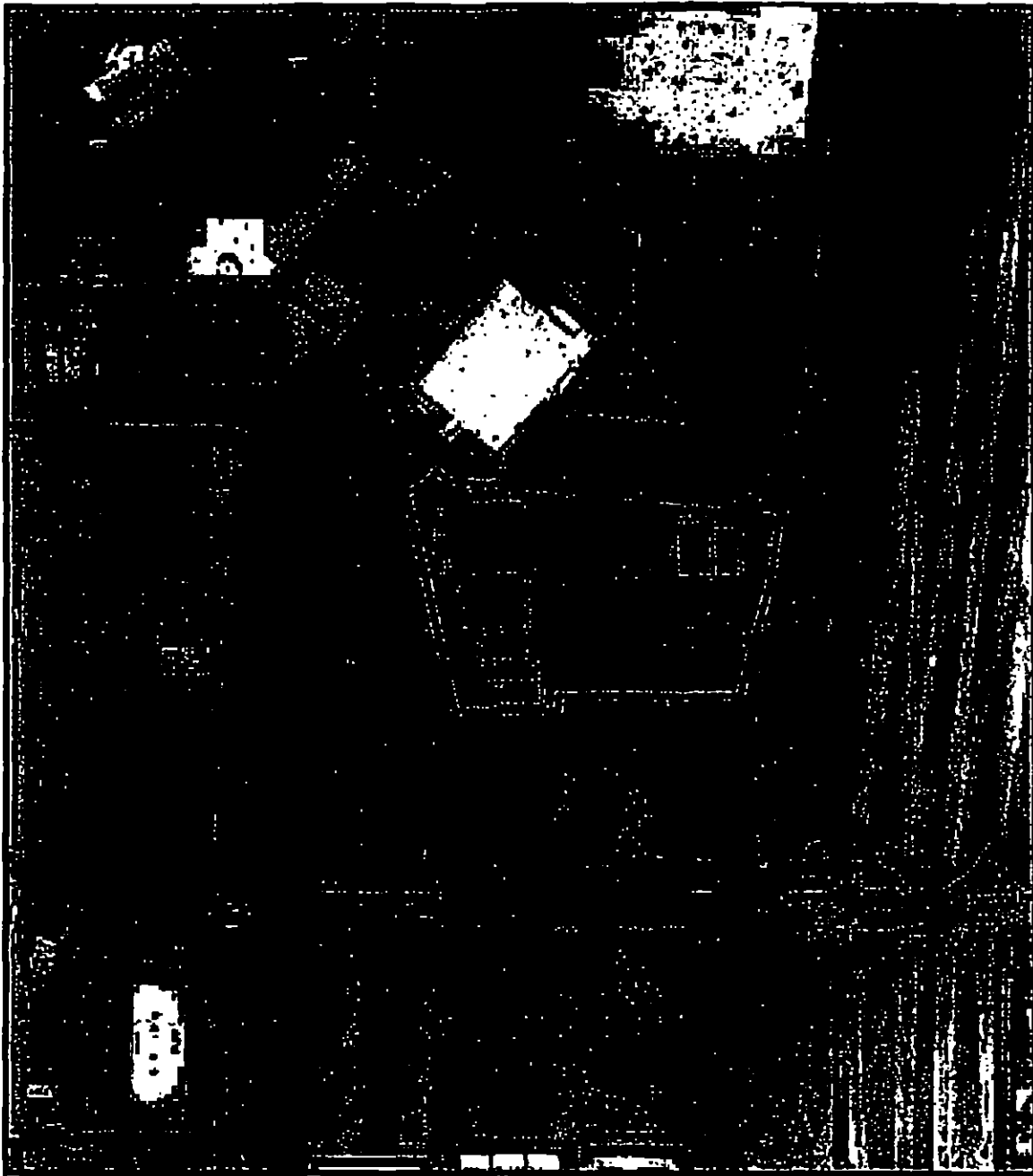
SCOTTSDALE, ARIZONA

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Phoenix, Arizona 85012

EXHIBIT B
CONTOUR MAP
NORTHSIGHT AND RAIN TREE



SCOTTSDALE, ARIZONA

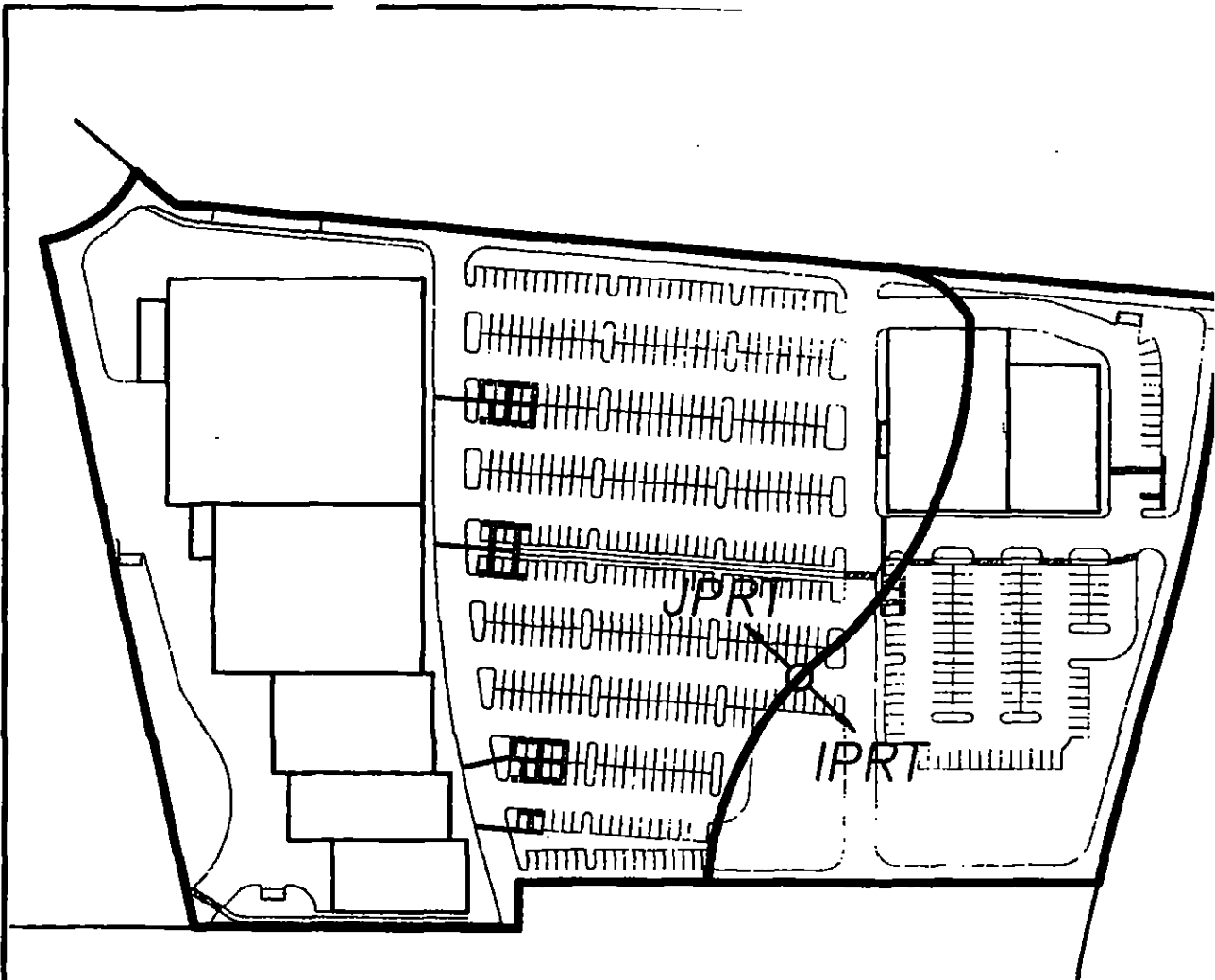
JMA

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Phoenix, Arizona 85012

**AERIAL PHOTO - EXHIBIT C
NORTHSIGHT AND RAIN TREE**

10/02



NTS

JPRT AREA, SF	IPRT AREA, SF
415,622	149,711

SCOTTSDALE, ARIZONA

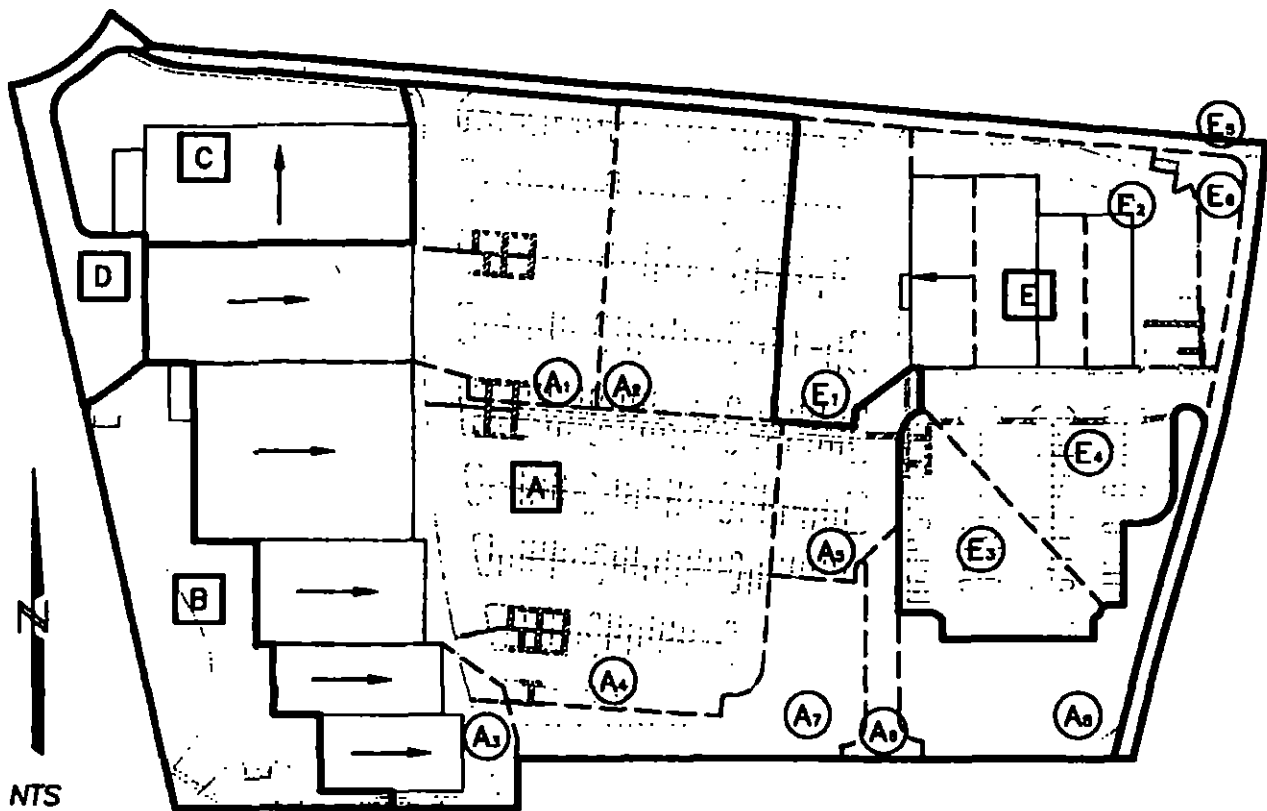
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Phoenix, Arizona 85012

EXHIBIT C **JPRT-IPRT DRAINAGE AREAS** **NORTHSIGHT AND RAINTREE**

10/02



KEY

(A ₁)	66,972 SF	1.5375 AC
(A ₂)	40,106 SF	0.9207 AC
(A ₃)	23,595 SF	0.5417 AC
(A ₄)	118,091 SF	2.7110 AC
(A ₅)	14,640 SF	0.3361 AC
(A ₆)	5,934 SF	0.1362 AC
(A ₇)	22,526 SF	0.5171 AC
(A ₈)	25,572 SF	0.5871 AC
(E ₁)	34,889 SF	0.8009 AC
(E ₂)	23,722 SF	0.5446 AC
(E ₃)	19,997 SF	0.4591 AC
(E ₄)	42,442 SF	0.9743 AC
(E ₅)	21,409 SF	0.4915 AC
(E ₆)	6,252 SF	0.1435 AC

(A)	BASIN TRIBUTARY AREA
(A ₃)	BASIN SUB-TRIB AREA
→	ROOF SLOPE

(A)	317,437 SF	7.2873 AC
(B)	40,038 SF	0.9192 AC
(C)	43,855 SF	1.0068 AC
(D)	15,292 SF	0.3511 AC
(E)	148,711 SF	3.4139 AC

SCOTTSDALE, ARIZONA

JMA

JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

EXHIBIT E TRIBUTARY AREAS NORTHSIGHT AND RAINTREE

EXISTING CONDITION DRAINAGE AREA MAP

101 W. RAIN TREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255

PRELIMINARY
NOT FOR
CONSTRUCTION

SEG



4200 E GILBERT DR #101, SCOTTSDALE, ARIZONA 85200
VARY AZEED CON TEL 480.888.7726

PROJECT
101 W. RAIN TREE LOT 2 & 4

LOCATION
PIMA ROAD & RAIN TREE DRIVE
SCOTTSDALE, AZ

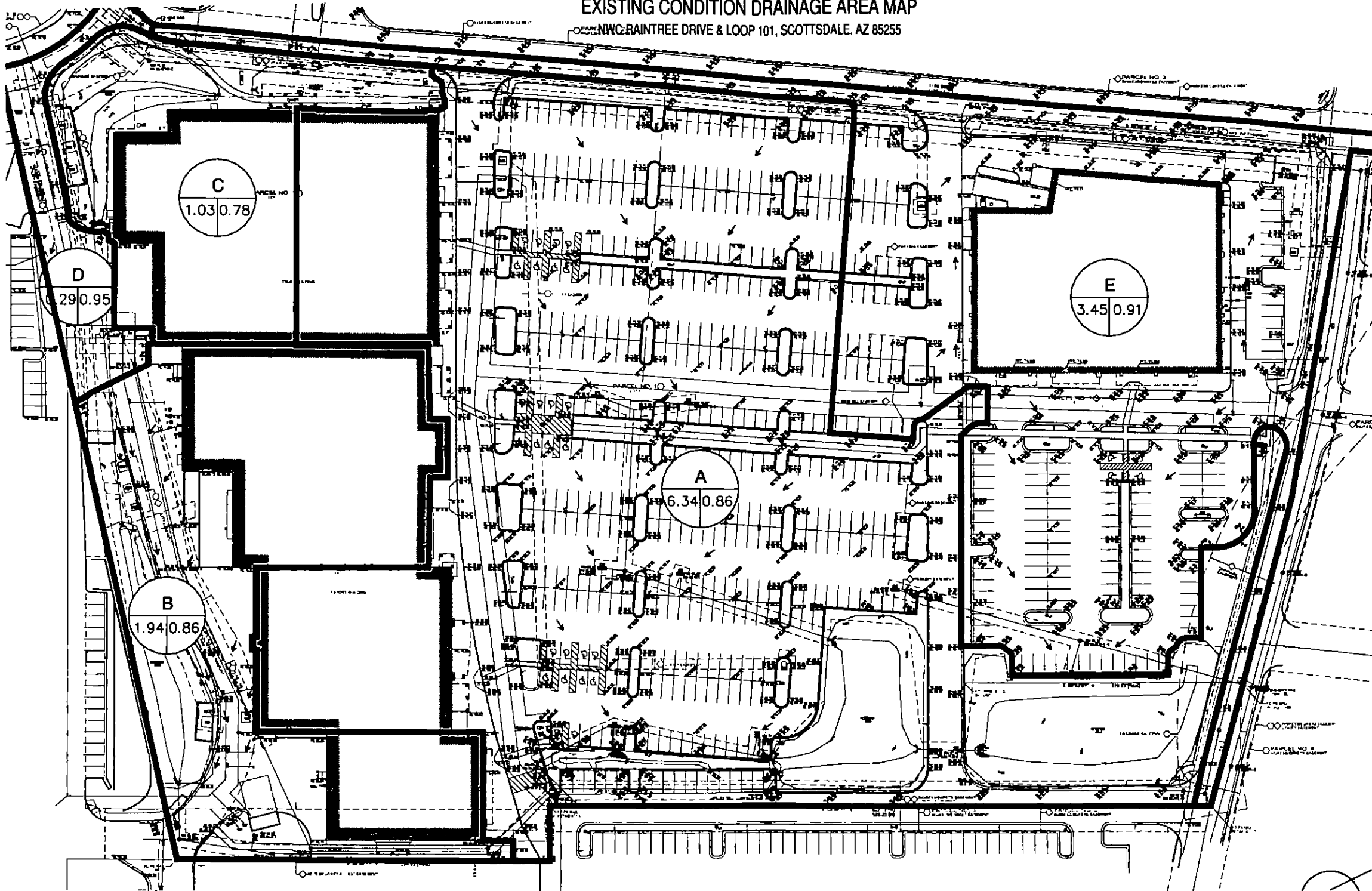
DESIGNED BY AVNA
CHECKED BY AVNA
PREPARED BY COUNSELL
GERSTER

DATE: 04-03-2018
SUBJECT FOR: PRELIMINARY DESIGN

REVISION NO. DATE

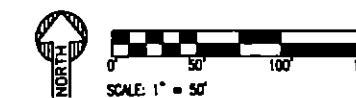
JOB NO.: 180818

SHEET TITLE
EXISTING DRAINAGE AREA
MAP



AREA IN ACRES
DRAINAGE AREA ID
RUNOFF COEFFICIENT

DRAINAGE AREA KEY



Existing Required Storage Volume Calculations						
						$V = 1.47(P/12) \cdot Cw \cdot A$
						$P = 100\text{-yr. 2-hr} = 2.42$
						in.
Drainage Area ID	Area (acres)	Cw	Intensity (in/hr)	Q (cfs)	Volume Req. (acre-ft)	Volume Req. (CF)
Existing Conditions						
A	6.34	0.86	7.72	41.91	1.027	44,733.13
B	1.94	0.86	7.72	12.89	0.316	13,753.85
C	1.03	0.78	7.72	6.19	0.152	6,603.29
D	0.29	0.95	7.72	2.12	0.052	2,267.28
E	3.45	0.91	7.72	24.25	0.594	25,886.77

NOTE:
EXISTING RETENTION VOLUMES WERE DETERMINED PER GRADING, DRAINAGE AND UTILITY PLAN FOR SCOTTSDALE SHOPS AS-BUILTS.

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INTERIM PROPOSED CONDITION DRAINAGE AREA MAP
NWC RAINTREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255

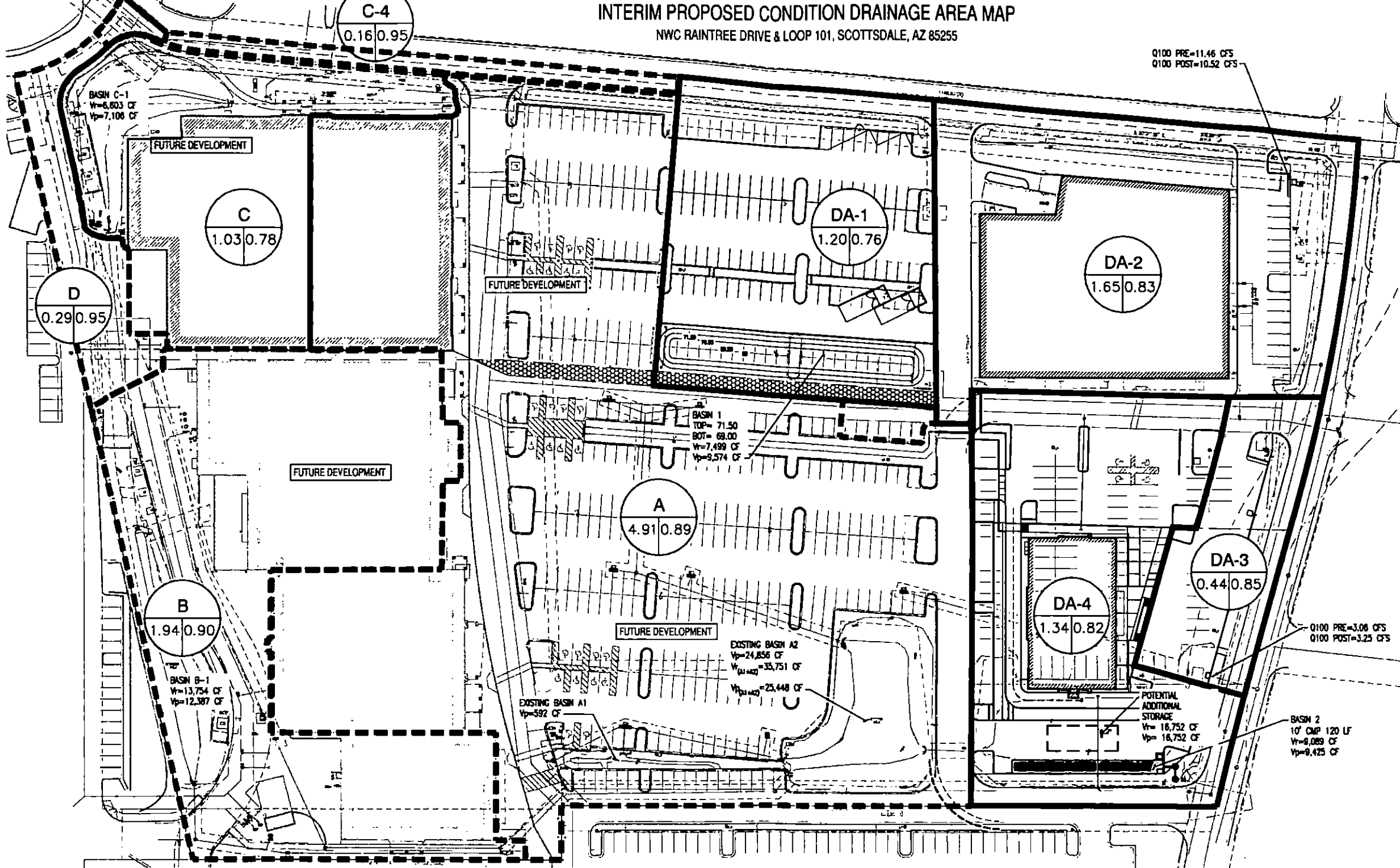
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SEG

200 E. GILBERT DR. #101, SCOTTSDALE, ARIZONA 85250
WWW.AZSEG.COM TEL: 480.988.7200



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Required Storage Volume Calculations						
						$V_{100} = 1" (P/12) * C_w * A$ P=100-yr, 2-hr=2.27 in.
Drainage	Area	C _w	Intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
DA-1	1.20	0.76	7.72	7.03	0.172	7,498.49
Basin 1 Totals:	1.20	0.76		7.03	0.172	7,498.49
RETENTION BASIN 2						
DA-4	1.34	0.82	7.72	8.52	0.209	9,088.83
Basin 2 Totals:	1.34	0.82		8.52	0.209	9,088.83
DIRECT DISCHARGE						
DA-2	1.65	0.83	7.72	10.52	0.258	11,227.14

Offsite Required Storage Volume Calculations						
						$V_{100} = 1" (P/12) * C_w * A$ P=100-yr, 2-hr=2.27 in.
Drainage	Area	C _w	Intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN C-1						
A	4.91	0.88	7.72	33.49	0.821	35,751.02
B	1.94	0.86	7.72	12.89	0.316	13,753.85
C	1.03	0.78	7.72	6.19	0.152	6,603.29
D	0.29	0.95	7.72	2.12	0.052	2,267.28
Totals	8.16			54.69	1.29	58,375.44

PROPOSED LEGEND

ON-SITE DRAINAGE AREAS
OFF-SITE DRAINAGE AREAS

AREA IN ACRES
DRAINAGE AREA ID
RUNOFF COEFFICIENT

DRAINAGE AREA KEY



PROJECT
101 NWC RAINTREE LOT 2 & 4

LOCATION
PIMA ROAD & RAINTREE DRIVE
SCOTTSDALE, AZ

DRAWN BY: AVNA
CHECKED BY: AVNA
PROJECT MANAGER: COUNSELL
GERSTER

DATE: 04-03-2019

ISSUED FOR: PRELIMINARY DESIGN

REVISION NO. DATE

180816

SHEET TITLE

INTERIM PROPOSED CONDITION
DRAINAGE AREA MAP

SHEET NO.

ULTIMATE PROPOSED CONDITION
DRAINAGE AREA MAP

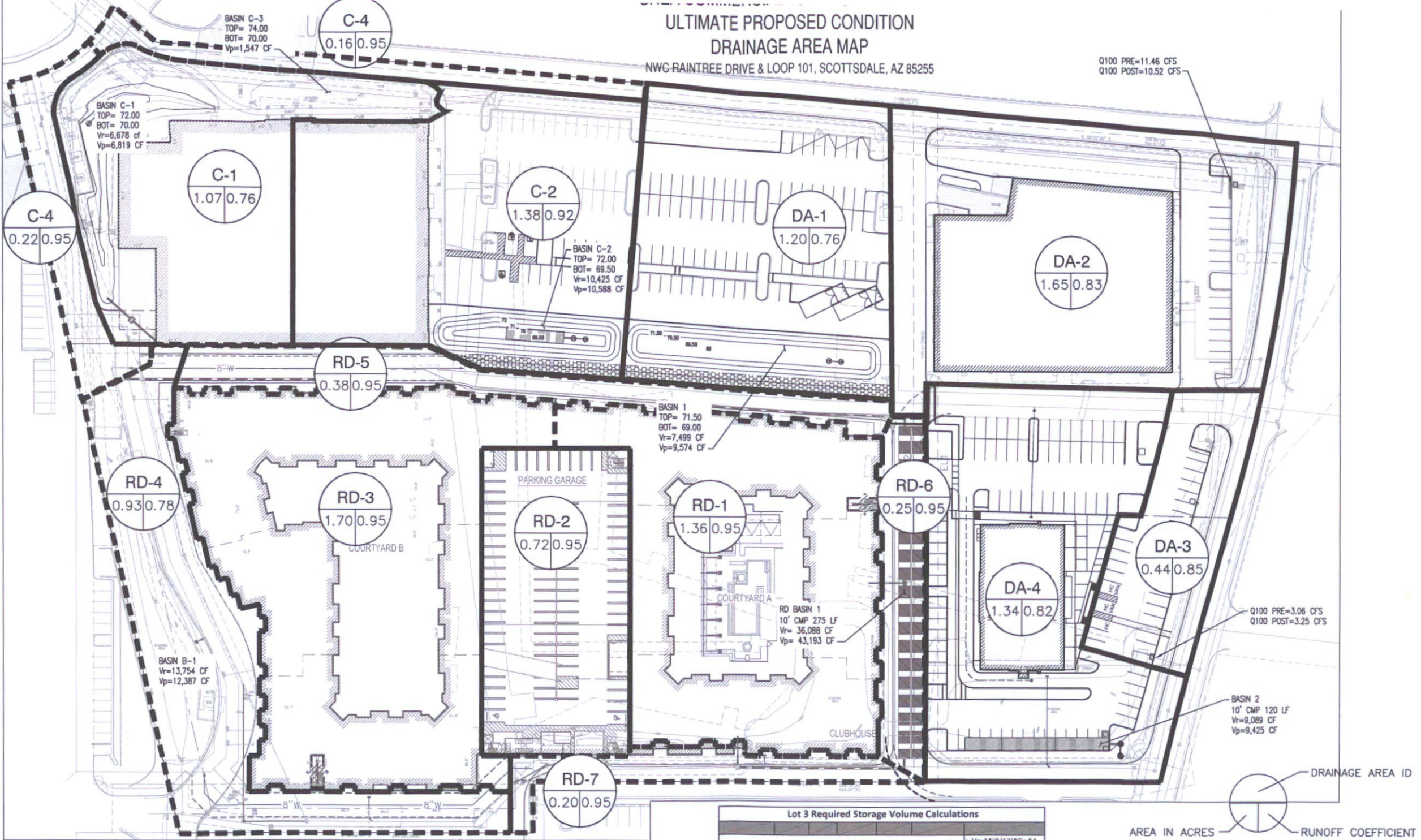
NWG RAIN TREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255

PRELIMINARY
NOT FOR
CONSTRUCTION

SEG
6200 E GELDING DR #101, SCOTTSDALE, ARIZONA 85250
WWW.AZSEG.COM TEL: 480.588.7226

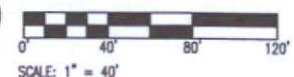


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AREA IN ACRES RUNOFF COEFFICIENT

DRAINAGE AREA KEY



PROPOSED LEGEND

- ON SITE DRAINAGE AREAS
- OFF SITE DRAINAGE AREAS

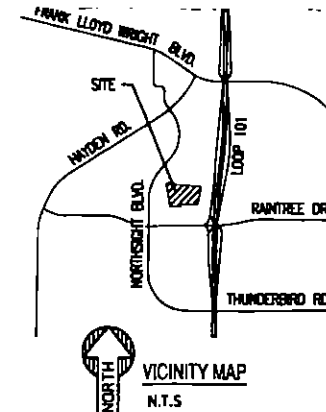
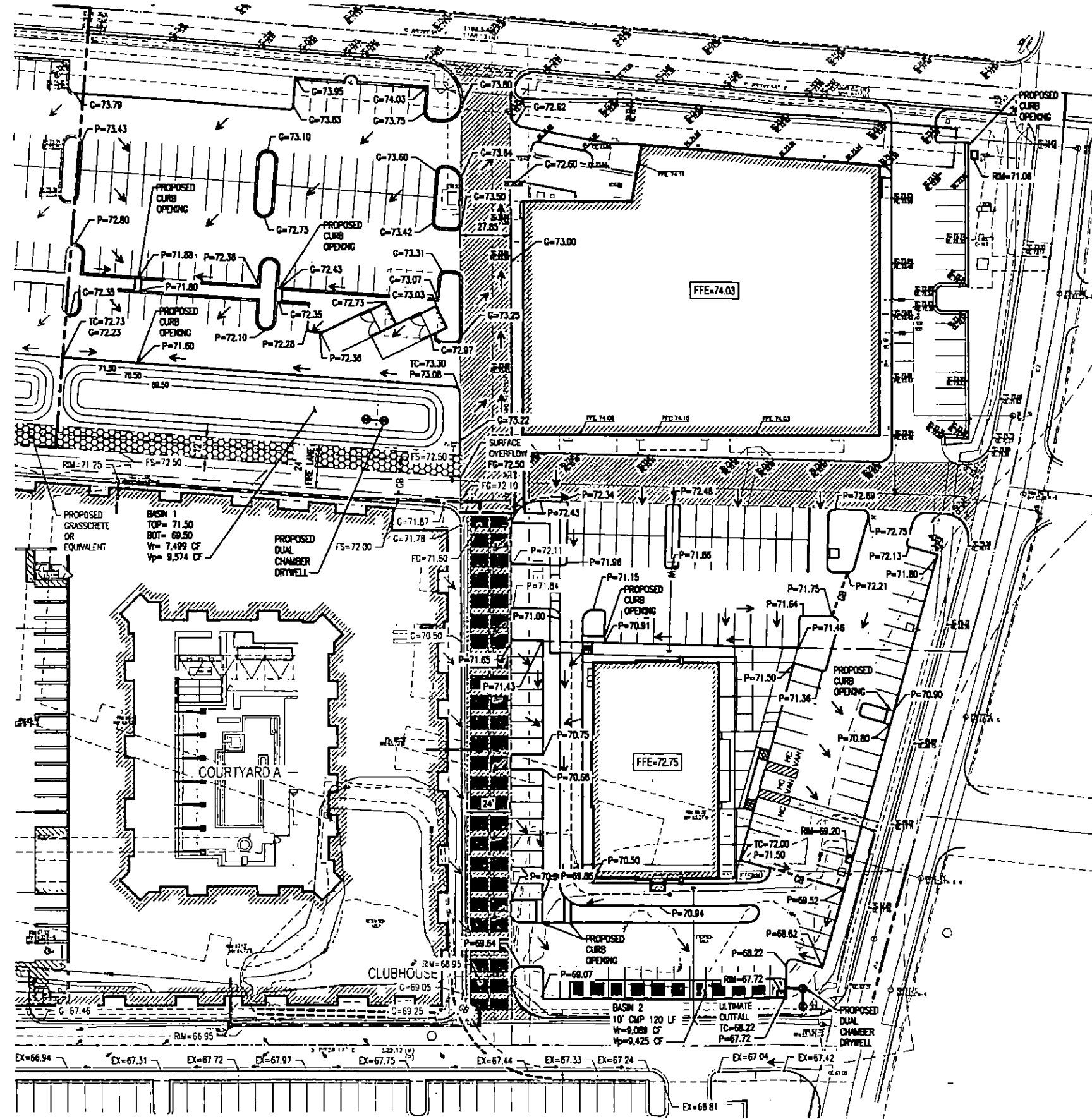
Required Storage Volume Calculations						
						$Vr=1*(P/12)*Cw*A$ P=100-yr, 2-hr=2.27 in.
Drainage	Area	Cw	Intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
DA-1	1.20	0.76	7.72	7.03	0.172	7,498.49
Basin 1 Totals:	1.20	0.76		7.03	0.172	7,498.49
RETENTION BASIN 2						
DA-4	1.34	0.82	7.72	8.52	0.209	9,088.83
Basin 2 Totals:	1.34	0.82		8.52	0.209	9,088.83
DIRECT DISCHARGE						
DA-2	1.65	0.83	7.72	10.52	0.258	11,227.14

Lot 1 Proposed Required Storage Volume Calculations						
						$Vr=1*(P/12)*Cw*A$ P=100-yr, 2-hr=2.27 in.
Drainage	Area	Cw	Intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
C-1	1.07	0.76	7.72	6.26	0.153	6,678.78
RETENTION BASIN 2						
C-2	1.38	0.92	7.72	9.77	0.239	10,425.13
Totals:	2.45	0.85		16.02	0.393	17,103.90
OFFSITE DISCHARGE						
C-3	0.22	0.95	7.72	1.62	0.040	1,728.40
C-4	0.16	0.95	7.72	1.16	0.028	1,236.23

Lot 3 Required Storage Volume Calculations						
						$Vr=1*(P/12)*Cw*A$ P=100-yr, 2-hr=2.42 in.
Drainage	Area	Cw	Intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
RD-4	0.93	0.78	7.72	5.60	0.137	5,977.37
Basin 1 Totals:	0.93	0.78		5.60	0.137	5,977.37
RETENTION BASIN 2						
RD-1	1.36	0.95	7.72	9.97	0.244	10,646.21
RD-2	0.72	0.95	7.72	5.28	0.129	5,636.23
RD-3	1.70	0.95	7.72	12.47	0.306	13,307.76
RD-5	0.38	0.95	7.72	2.79	0.068	2,974.68
RD-6	0.25	0.95	7.72	1.83	0.045	1,957.02
RD-7	0.20	0.95	7.72	1.47	0.036	1,565.62
Basin 2 Totals:	4.61	0.95		33.81	0.828	36,087.52



101 MEGA RAIN TREE
PRELIMINARY GRADING PLAN
8698 E. RAIN TREE DRIVE, SCOTTSDALE, AZ 85260



CIVIL ENGINEER:
SUSTAINABILITY ENGINEERING GROUP, LLC
8280 E. GELDING DR., SUITE #101
SCOTTSDALE, AZ 85260
480-588-7228
ATTN: ALI FARAH

DEVELOPER:
101 MEGA RAIN TREE, LLC
9383 N 90TH STREET, SUITE 102
SCOTTSDALE, AZ 85258
602-571-8778
ATTN: TOMMIE MOYES

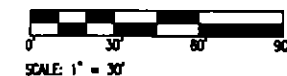
BENCHMARK:
BENCHMARK IS A CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE BEING THE
SOUTH 1/4 CORNER OF SECTION 21, T3N, R4E.

ELEVATION = 1434.36' NAVD83
(CITY OF SCOTTSDALE DATUM)

PROPOSED LEGEND

- P=XXXX PAVEMENT ELEVATION
- C=XXXX CUTTER ELEVATION
- 1470 CONTOUR
- FIRE LANE ACCESS
- STORM PIPE
- CATCH BASIN
- ← FLOW ARROW
- DRYWELL
- SAWCUT
- PROPERTY LINE
- /// ACCESS EASEMENT

LOT NUMBER	EXISTING VOLUME PROVIDED	LOT AREA (A)	PRECIPITATION (R)	T" VALUE	VOL. REQUIRED (W)	VOL. PROVIDED (W)
LOT 2 RETAIL	0.00 CF	1.20 AC	2.27 IN	0.95	7,490 C.F.	8,498 C.F.
LOT 4 RETAIL	43,638 CF	1.34 AC	2.27 IN	0.95	9,089 C.F.	9,425 C.F.



PRELIMINARY
NOT FOR
CONSTRUCTION

SEG



8280 E. GELDING DR. #101, SCOTTSDALE, ARIZONA 85260
WWW.ASEG.COM TEL. 480.588.7228

PROJECT
101 MEGA RAIN TREE LOT 2 & 4

LOCATION
PIMA ROAD & RAIN TREE DRIVE
SCOTTSDALE, AZ

DRAWN BY: AVINA
CHECKED BY: AVINA
PROJECT NO.: COUNSELL
GENSTER

DATE: 04-03-2019

DESIGNED FOR:
PRELIMINARY DESIGN

REVISION NO.: 04/19

△	
△	
△	
△	

ASR NO.: 180816

SHEET NO.:

PRELIMINARY GRADING EXHIBIT
LOT 2 & 4

SHEET NO.:

C3.10

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