Drainage Reports

Abbreveated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application

Preliminary Water & Sewer Basis of Design Report

Storage at Shea

SEC 116th Street & Shea Boulevard

Scottsdale, Arizona

COS

Case No.

Plan Check No. : 9-ZN-2017

Prepared for:

George H. Bell

Land Research and Development, Inc.

18061 N. 99th St.

Scottsdale, Arizona 85255

For submittal to:

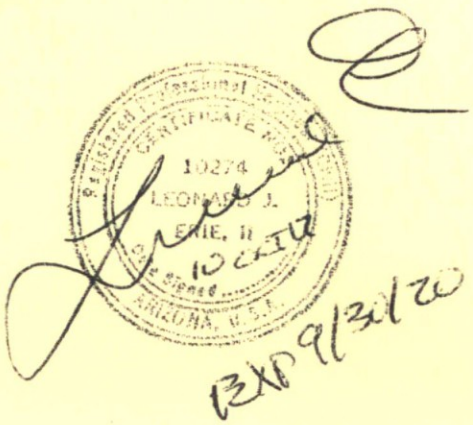
City of Scottsdale

Prepared by:

Erie & Associates, Inc.

3120 North 24th Street

Phoenix, Arizona 85016



EA #2259.01

August 10, 2017
Revised: October 10, 2017

9 ZN 2017 comments 9/7/17 P1/1

1. Revise flow calculation to include demands for break room sink and mop sink.
2. Per DSPM, Chapter 6-1.406, the system shall be designed to maintain 30 psi minimum pressure under fire flow requirements.
3. The fire hydrant flow test data appears to be off compared to City model and operational data. Additional flow test is recommended following DSPM Chapter 6-1.405 to confirm available field pressure and flow.
4. A site plan was furnished with this submittal showing the location of water and sewer lines only. No details for constructions, materials and appurtenances have been shown. All new water and sewer constructions, materials and appurtenances shall be per COS's DS&PM, Chapters 6 &7; COS's Standard Detail Series 2300 and 2400; and MAG as applicable.
5. The fire hydrant flow test data appears to be off compared to City model and operational data. Additional flow test is recommended following DSPM Chapter 6-1.405 to confirm available field pressure and flow.
6. Add node elevations, pipe diameter and lengths to the hydraulic model tables.
7. Network Table – Max Day + Fire: There is approximately 15' of HGL difference between Nodes J8 & J9. Please check model for accuracy.
8. Network Table – Max Day + Fire: the minimum pressure requirement of 30 psi does not meet for the proposed fire hydrants. Revise hydraulic modeling by setting up the pump at "static residual hydrant" and using the pump curve generated from fire hydrant flow test. If this does not improve the pressure requirements, extension of the existing 8" water line along 116th St may be necessary to connect to Zone 3E pipe on Shea Blvd to improve pressure and flow to the proposed site.
9. Coordinate with fire department for the location of the proposed new fire hydrants.

Reply —

1. Done
2. It does with the raw data
3. Additional flow test conducted with similar results.
4. The consultant plans with this info will be submitted on city council approval of the use
5. see # 3 reply
6. The info is on the network Table for links and nodes.
7. See new runs on HGL's
8. Modeling revised w/ raw data · gives 30 psi ±. Test results are consistant between the two tests so raw data is consistant and a 10% reduction is not necessary
9. F.D. is OK with the F.H. locations.

1.0 Table of Contents

2.0 List of Plates and Tables

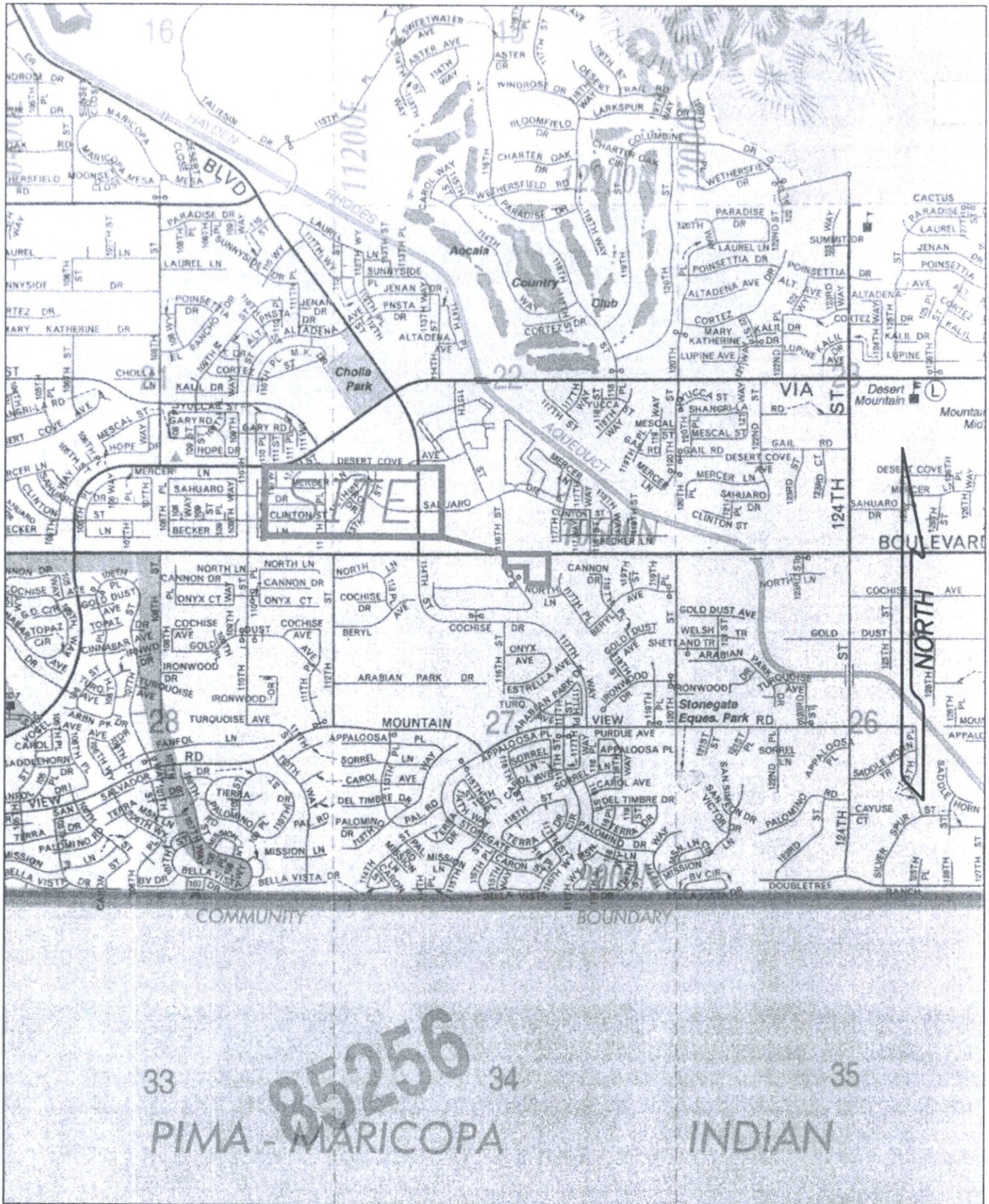
3.0 Location/Description

The proposed 3.8± acre site is located at the southeast corner of 116th Street and Shea Boulevard, and is a portion of the northeast Quarter of Section 27, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian in Scottsdale, Arizona. The site is bordered along the west side by an office development and along the east side by the Montana Ranch Subdivision. See *Plate 1 – Location Map.*

The proposed building will serve as an internalized community storage facility. The proposed building will be two stories with a basement and the area of each floor is approximately 35,300 SF for a total of 105,864 SF.

The site is located within COS Q.S. 28-56, City of Scottsdale Water Service Area, Pressure Zone 3. There is an existing 12" ACP water main that runs in Shea Boulevard and an 8"DIP water main in 116th Street. The closest fire hydrant is located on the west side of the 116th Street cul-de-sac approximately 325 feet to the west.

There is an existing 15" VCP sewer line in Shea Boulevard and a manhole north of the site. The sewer is accessible with a manhole in Shea Boulevard at a grade below the proposed finish floor.



JOB NO. 2259.01 DATE: 10/10/2017 SCALE: 1"=2000'	ERIE & ASSOCIATES, INC. 3120 NORTH 24th STREET PHOENIX, ARIZONA 85016 (602) 954-6399	STORAGE AT SHEA PLATE 1 – LOCATION MAP

4.0 Sanitary Sewer System

The building will be serviced by a 6" building connection that will tap into the existing sewer manhole in Shea Boulevard. The 6" service will be designed at a minimum slope of 1.09%. See *Plate 2 – Water and Sewer Master Plan* for the sewer location.

The sewer demand was calculated using ADEQ unit design flows. The sewer demand for this project is relatively small. The site will have two restrooms, a break room with a sink, and a mop sink. The average daily flow was estimated to be 800 GPD and the peak day flow was estimated to be 3200 GPD (2.2 GPM). The full flow capacity of the proposed 6" sewer was calculated using Manning's equation and found to be 305 GPM. The sanitary sewer calculations are included in *Appendix A*.

5.0 Water Distribution System

A new 12" water line is proposed to connect to the existing 8" stub out in 116th Street and at a second point in the cul-de-sac to create a loop. The building will be served by a 4" fire line and a 1" potable water line. Two fire hydrants are proposed, one north of the driveway, and one in the middle of the parking lot.

A water model was produced using EPANET Version 2.0. Two flow tests were completed by EJ Flow Tests, LLC on August 10, 2017 and October 4, 2017 and the results are included in *Appendix A*. Nodes have been placed at the test hydrants and proposed hydrant. Elevations for each node are based on the topography as shown on *Plate 2*.

Model criteria are as follows:

- Average day demand shall be a total of 800 gpd.
- Maximum day demand shall be 2.0 times the average day demand. 1600 gpd = 1.1 gpm
- Peak hour demand shall be 4.0 times the average day demand. 3200 gpd = 2.2 gpm
- Fire flow shall be 6,750 gpm. With a 75% reduction for sprinklers the required fire flow is 1,687.5 gpm. The fire flow is split between the two on-site hydrants.
- Minimum and maximum system pressures under average day, maximum day, and peak hour flows shall be no less than 50 psi and no more than 80 psi.
- The residual pressure for the max day plus fire flow shall be 30 psi.
- Maximum head loss for every 1,000 feet shall not exceed 10 feet for the 1,500 gpm fire hydrant criteria.

A 12" looped water line is required to meet the criteria. The required fire flow is split between the two proposed hydrants in the model. The EPANET input/output is included in *Appendix B*. The results are summarized in *Table 1-Residual Pressure Summary*.

Table 1 – Residual Pressure Summary

	Flow Test #1		Flow Test #2	
EPANET Node I.D.	Residual Pressure (raw data)	Residual Pressure (10% S.F.)	Residual Pressure (raw data)	Residual Pressure (10% S.F.)
NEW-FH	30.39 psi	22.46 psi	29.33 psi	19.67 psi
NEW-FH2	29.68 psi	21.75 psi	28.62 psi	18.96 psi

After modeling the results from Flow Test #1, it was determined that the proposed system would meet the City of Scottsdale's criteria of 30 psi residual using the raw data, but would not meet the criteria using the 10% Safety Factor data. An agreement was reached with City of Scottsdale staff (Rezaur Rahman) that the raw data would be acceptable if a second flow test confirmed the first flow test. The second test was conducted and the results are similar to the first test (see table 1). Based on these results we propose to use the raw data from Flow Test #1 for our modeling.

6.0 References

"Design Standards and Policies Manual", prepared by City of Scottsdale, dated January 2010.

Appendix A – Calculation Worksheets

STORAGE AT SHEA | EAH 2259 | BY: JAL | DATE: 6-16-17 Δ 9-7-17

SEWER DEMAND CALCULATIONS:

UNIT FLOW

ASSUME: 1. 2 PUBLIC RESTROOMS = 200 GPD
2. 2 EMPLOYEES (USE 2 R.R.) = 200 GPD

AVERAGE DAILY FLOW

$Q = 2(200) + 2(200) = 800$ GPD

PEAK DAY

$Q = 800 \times 4 = \underline{3200 \text{ GPD}}$

MAX DAY

$Q = 800 \times 2 = 1600$ GPD
$Q_{min} = 1.11$ gpm

$$Q = 3200 \frac{\text{gal}}{\text{day}} \times \frac{1 \text{ day}}{24(60) \text{ min}}$$

$Q = \underline{2.22 \text{ gpm}}$

CAPACITY OF 6"

Assume 1. $n = 0.012$
2. $S = 0.0109$

$Q = 305$ gpm ✓ $\quad Q_{6"} > Q_{PEAK\ DAY}$

E·J | Flow Test Summary

Project Name:	EJFT 17164
Project Address:	10105 N 116th St, Scottsdale, AZ 85259
Date of Flow Test:	2017-08-10
Time of Flow Test:	7:32 AM
Data Reliable Until:	2018-02-10
Conducted By:	Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed By:	Larry Frandle (City of Scottsdale) 602.541.4942
City Forces Contacted:	City of Scottsdale (602.541.4942)
Permit Number:	C53611

Raw Flow Test Data

Static Pressure:	78.0 PSI
Residual Pressure:	40.0 PSI
Flowing GPM:	1,595
GPM @ 20 PSI:	2,004

Data with a 10 % Safety Factor

Static Pressure:	70.2 PSI
Residual Pressure:	32.2 PSI
Flowing GPM:	1,595
GPM @ 20 PSI:	1,854

Hydrant F_1

Pitot Pressure (1):	20	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	4	inches

Additional Coefficient 0.83 on orifice #1

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
286 ft (measured linearly)

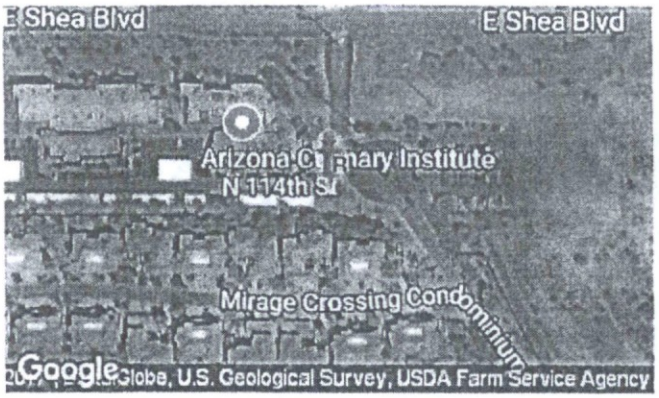
Static-Residual Elevation
1461 ft (above sea level)

Flow Hydrant (F_1) Elevation
1458 ft (above sea level)

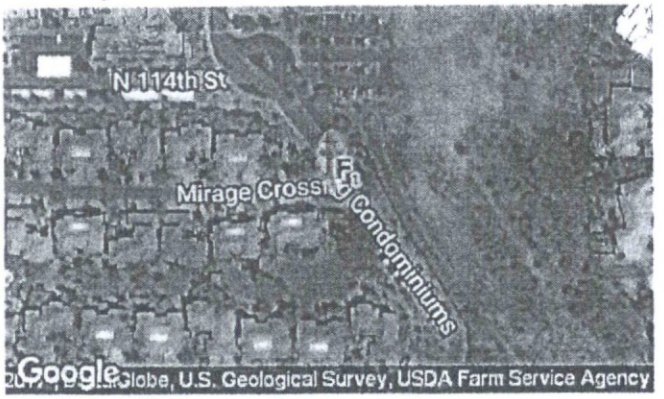
Elevation & distance values are approximate

E·J | Flow Test Summary

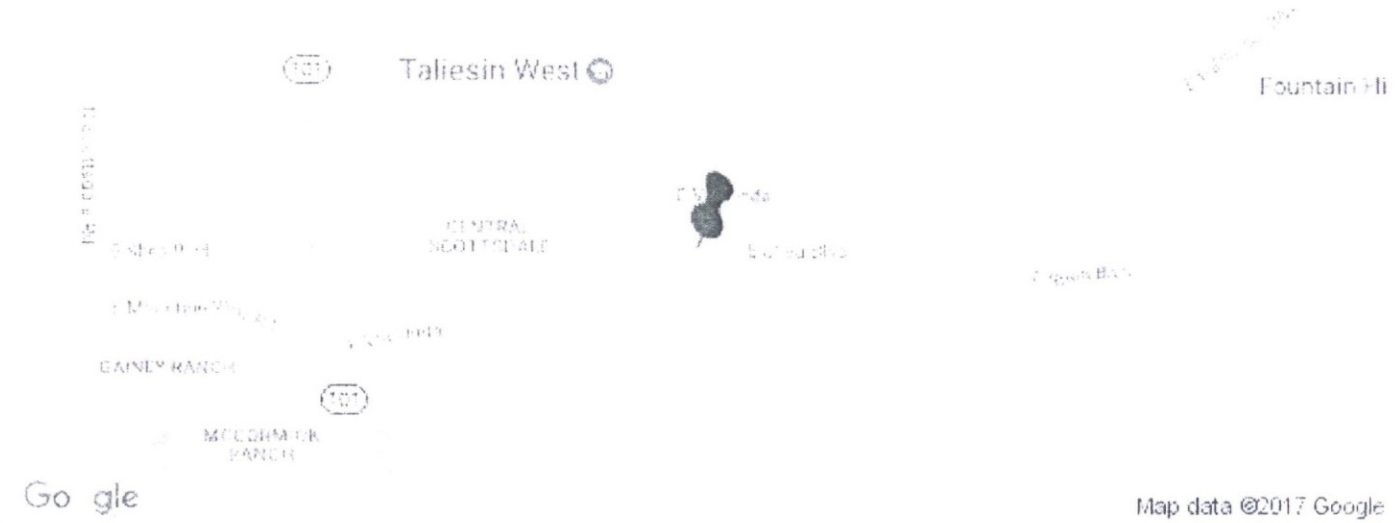
Static-Residual Hydrant



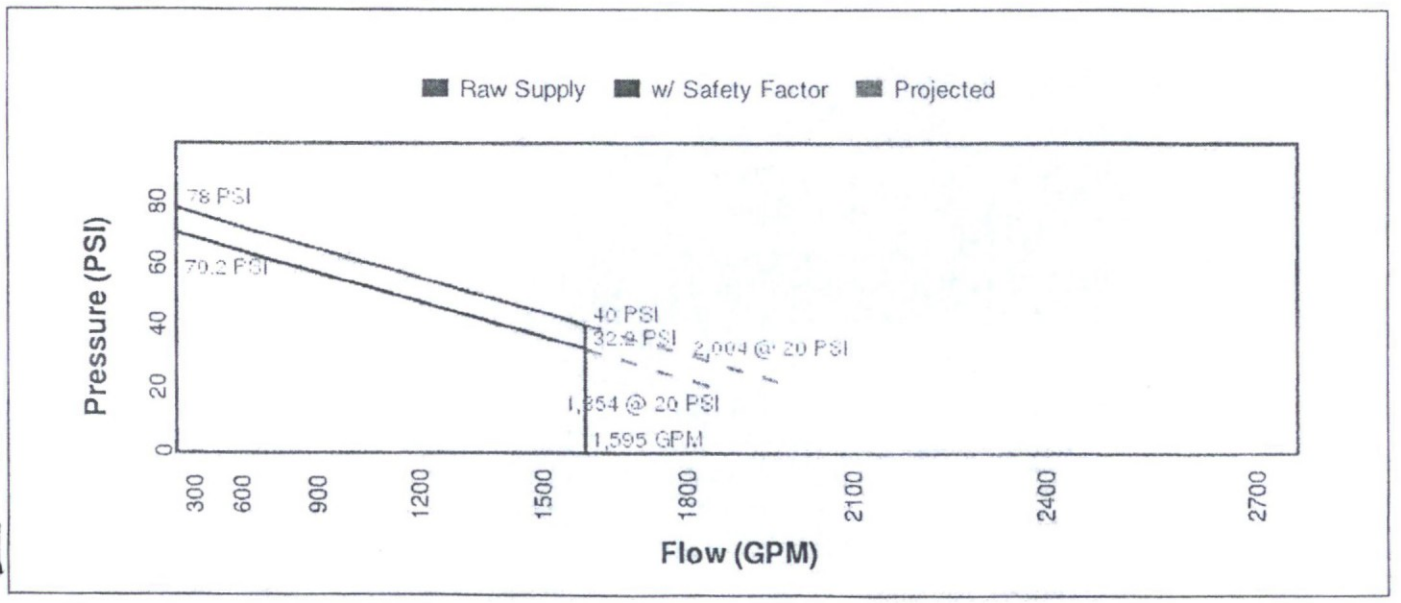
Flow Hydrant (only hydrant F1 shown for clarity)



Approximate Project Site



Water Supply Curve $N^{1.85}$ Graph



6" SEWER
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	6" SEWER
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coefficient	0.012	
Channel Slope	0.010900	ft/ft
Depth	0.50	ft
Diameter	6.00	in

Results		
Discharge	240	gal(Imp)/min
Flow Area	0.20	ft²
Wetted Perimeter	1.57	ft
Top Width	0.00	ft
Critical Depth	0.40	ft
Percent Full	100.00	
Critical Slope	0.011173	ft/ft
Velocity	3.23	ft/s
Velocity Head	0.16	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	0.68	cfs
Full Flow Capacity	0.63	cfs
Full Flow Slope	0.010900	ft/ft

= 305 g.p.m.

TABLE B105.1(2) REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-	166,501-	106,501-	77,001-	47,401-	6,000	

Greater	Greater	115,800	83,700	51,500	
–	–	115,801-125,500	83,701-90,600	51,501-55,700	6,250
–	–	125,501-135,500	90,601-97,900	55,701-60,200	6,500
–	–	135,501-145,800	97,901-106,800	60,201-64,800	6,750
–	–	145,801-156,700	106,801-113,200	64,801-69,600	7,000
–	–	156,701-167,900	113,201-121,300	69,601-74,600	7,250
–	–	167,901-179,400	121,301-129,600	74,601-79,800	7,500
–	–	179,401-191,400	129,601-138,300	79,801-85,100	7,750
–	–	191,401-Greater	138,301-Greater	85,101-Greater	8,000

12, 2005 (05-3).

Table 1. Unit Design Flows

Wastewater Source	Applicable Unit	Sewage Design Flow per Applicable Unit, Gallons Per Day
Airport	Passenger (average daily number) Employee	4 15
Auto Wash	Facility	Per manufacturer, if consistent with this Chapter
Bar/Lounge	Seat	30
Barber Shop	Chair	35
Beauty Parlor	Chair	100
Bowling Alley (snack bar only)	Lane	75
Camp Day camp, no cooking facilities Campground, overnight, flush toilets Campground, overnight, flush toilets and shower Campground, luxury Camp, youth, summer, or seasonal	 Camping unit Camping unit Camping unit Person Person	 30 75 150 100-150 50
Church Without kitchen With kitchen	 Person (maximum attendance) Person (maximum attendance)	 5 7
Country Club	Resident Member Nonresident Member	100 10
Dance Hall	Patron	5
Dental Office	Chair	500
Dog Kennel	Animal, maximum occupancy	15
Dwelling For determining design flow for sewage treatment facilities under R18-9-B202(A)(9)(a) and sewage collection systems under R18-9-E301(D) and R18-9-B301(K), excluding peaking factor.	Person	80
Dwelling For on-site wastewater treatment facilities per R18-9-E302 through R18-9-E323: Apartment Building 1 bedroom 2 bedroom 3 bedroom 4 bedroom Seasonal or Summer Dwelling (with recorded seasonal occupancy restriction) Single Family Dwellings Other than Single Family Dwelling, the greater flow value based on: Bedroom count 1-2 bedrooms Each bedroom over 2 Fixture count	 Apartment Apartment Apartment Apartment Resident see R18-9-A314(D)(1) Bedroom Bedroom Fixture unit	 200 300 400 500 100 see R18-9-A314(D)(1) 300 150 25
Fire Station	Employee	45
Hospital All flows Kitchen waste only Laundry waste only	 Bed Bed Bed	 250 25 40

Hotel/motel		
Without kitchen	Bed (2 person)	50
With kitchen	Bed (2 person)	60
Industrial facility		
Without showers	Employee	25
With showers	Employee	35
Cafeteria, add	Employee	5
Institutions		
Resident	Person	75
Nursing home	Person	125
Rest home	Person	125
Laundry		
Self service	Wash cycle	50
Commercial	Washing machine	Per manufacturer, if consistent with this Chapter
Office Building	Employee	20
Park (temporary use)		
Picnic, with showers, flush toilets	Parking space	40
Picnic, with flush toilets only	Parking space	20
Recreational vehicle, no water or sewer connections	Vehicle space	75
Recreational vehicle, with water and sewer connections	Vehicle space	100
Mobile home/Trailer	Space	250
Restaurant/Cafeteria	Employee	20
With toilet, add	Customer	7
Kitchen waste, add	Meal	6
Garbage disposal, add	Meal	1
Cocktail lounge, add	Customer	2
Kitchen waste disposal service, add	Meal	2
Restroom, public	Toilet	200
School		
Staff and office	Person	20
Elementary, add	Student	15
Middle and High, add	Student	20
with gym & showers, add	Student	5
with cafeteria, add	Student	3
Boarding, total flow	Person	100
Service Station with toilets	First bay	1000
	Each additional bay	500
Shopping Center, no food or laundry	Square foot of retail space	0.1
Store	Employee	20
Public restroom, add	Square foot of retail space	0.1
Swimming Pool, Public	Person	10
Theater		
Indoor	Seat	5
Drive-in	Car space	10

Note: Unit flow rates published in standard texts, literature sources, or relevant area or regional studies are considered by the Department, if appropriate to the project.

Historical Note

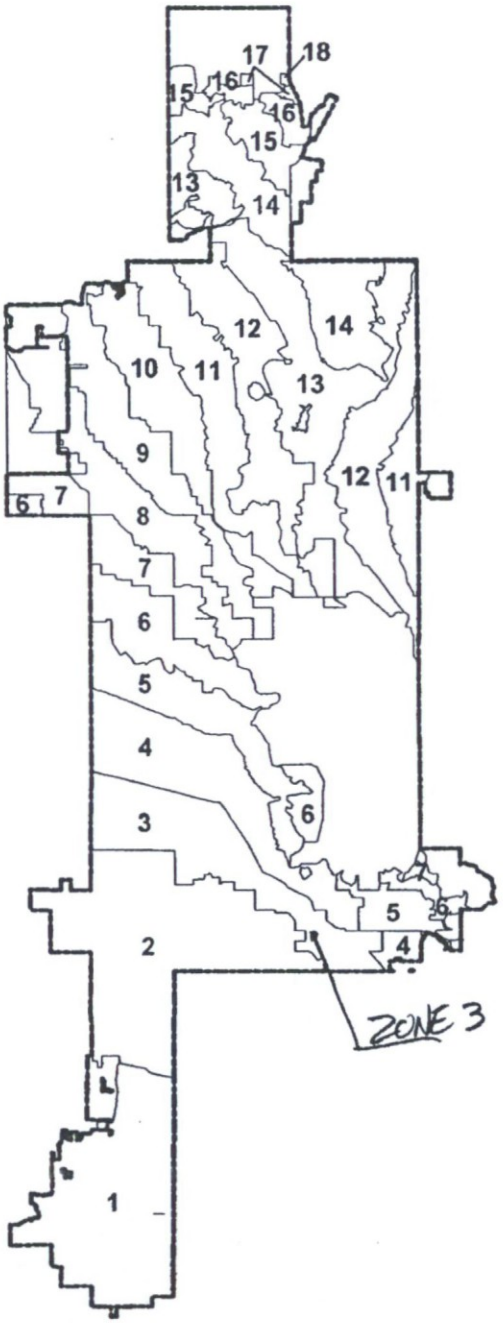
New Section adopted by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4). Amended by final rulemaking at 11 A.A.R. 4544, effective November 12, 2005 (05-3).

ARTICLE 4. NITROGEN MANAGEMENT GENERAL PERMITS

R18-9-401. Definitions

In addition to the definitions established in A.R.S. §§ 49-101 and 49-201 and A.A.C. R18-9-101, the following terms apply to this Article:

1. "Application of nitrogen fertilizer" means any use of a substance containing nitrogen for the commercial production of a crop or plant. The commercial production of a crop or plant includes commercial sod farms and nurseries.
2. "Contact stormwater" means stormwater that comes in contact with animals or animal wastes within a concentrated animal feeding operation.
3. "Crop or plant needs" means the amount of water and nitrogen required to meet the physiological demands of a crop or plant to achieve a defined yield.
4. "Crop or plant uptake" means the amount of water and nitrogen that can be physiologically absorbed by the roots



Zone	Ground Elevation Range (Ft.)
1	1180-1280
1A	1250-1330
2A	1280-1330
2	1330-1440
3	1440-1550
4	1510-1650
4E	1550-1650
5	1650-1790
5E	1650-1750
6	1790-1920
6E	1750-1934
7	1920-2050
7E	1934-2065
8	2050-2180
8E	2065-2200
9	2180-2310
10	2310-2440
11,11E	2440-2570
12,12E	2570-2700
13	2700-2830
14	2830-2960
15	2960-3090

FIGURE 6.1-3 PRESSURE ZONE MAP

6-1.300 WATER FACILITIES

Water facilities (wells, reservoirs and booster pump stations) are typically designed and constructed by the city through its capital improvement program. Developers needing to construct water facilities should contact the Water Resources Department and request a meeting. The developer should be prepared to address how the proposed system will conform to the Integrated Water Master Plan. The city will address design issues, the review process for facilities and any potential city cost participation.

Subject **RE: STORAGE AT SHEA**
From Robert Kubicek <rkubicek@rkaa.com>
To Josh Lessard <josh@waterwiz.net>
Date 2017-06-16 09:35

Josh- water / sewer from 116th street/ we will have 2 restrooms, a break room with sink and a mop sink.
Bob

Robert W. Kubicek, A.I.A.
Senior Principal

RKAA Architects, Inc.

Arizona Office
2233 East Thomas Road - Phoenix, AZ 85016
Office: (602) 955-3900

California Office
26591 La Roda - Mission Viejo, CA 92691
Office: (949) 954-8785

rkaa.com

-----Original Message-----
From: Josh Lessard [mailto:josh@waterwiz.net]
Sent: Friday, June 16, 2017 8:23 AM
To: Robert Kubicek
Subject: RE: STORAGE AT SHEA

Bob,

Do you know where the water and sewer will enter the building? What facilities will the building have? I need to calculate a water usage.

Thanks,

Josh Lessard, PE

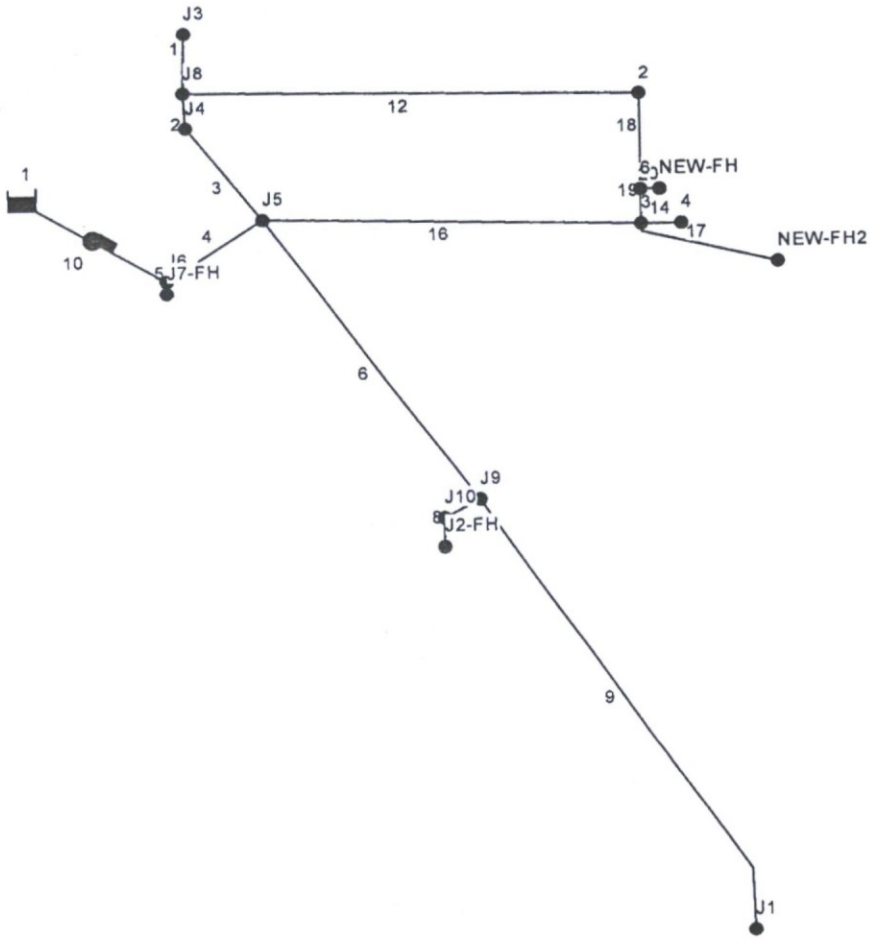
Erie & Associates, Inc.
3120 N 24th Street
Phoenix, AZ 85016
602-954-6399 Office
602-954-6601 Fax

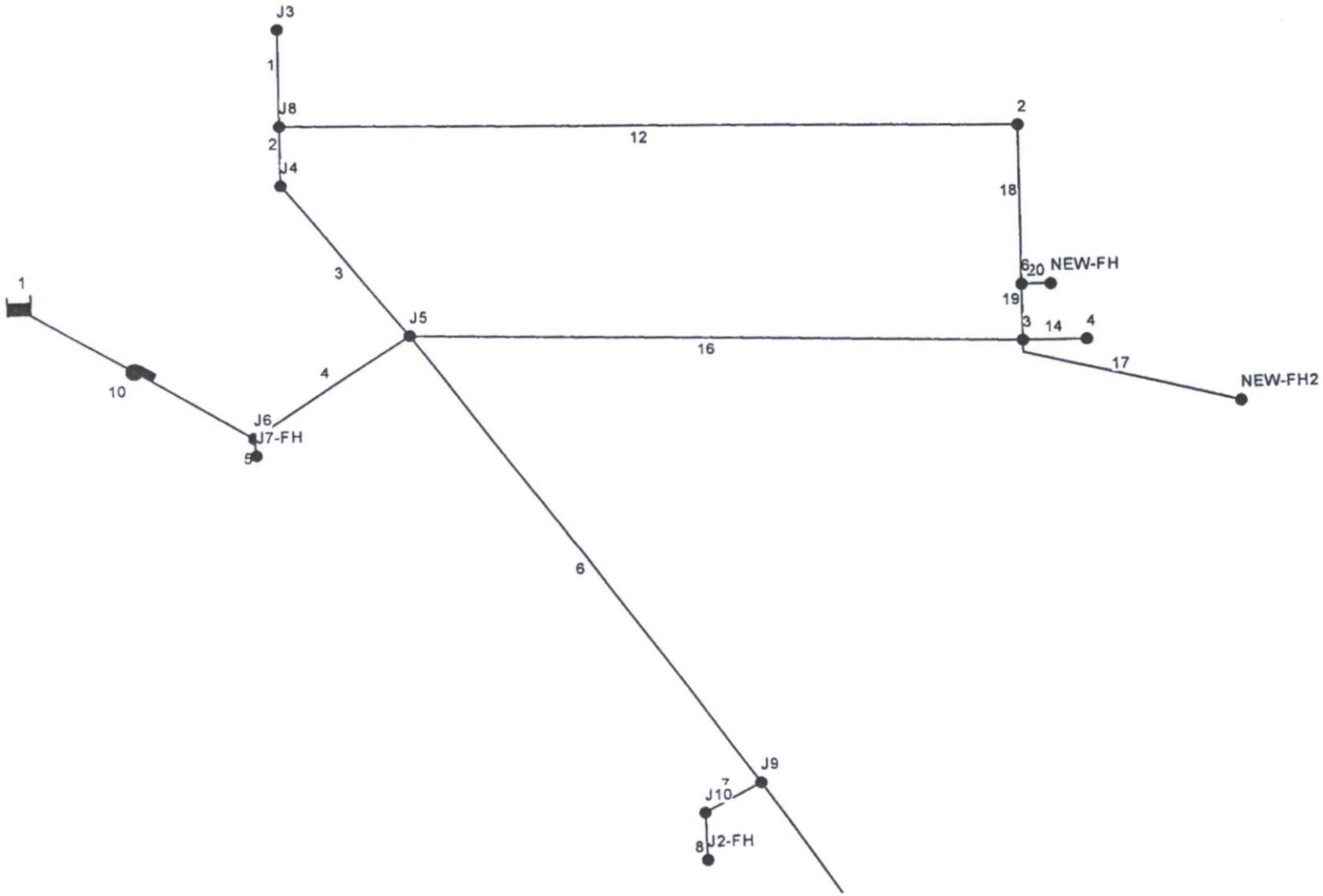
1 N Calle Cesar Chavez, #102
Santa Barbara, CA 93103
805-963-3692

On 2017-06-15 17:11, Robert Kubicek wrote:

> thanks Josh
>
> Robert W. Kubicek, A.I.A.
> Senior Principal
>
> RKAA Architects, Inc.
>
> Arizona Office
> 2233 East Thomas Road - Phoenix, AZ 85016
> Office: (602) 955-3900
>
> California Office

Appendix B – EPANET input/output


J3
1
J8
2
J4
12
2
18
6
NEW-FH
19
3
14
4
1
3
J5
4
16
17
NEW-FH2
10
5
J7-FH
6
J9
J10
8
J2-FH
9
J1


J3
1
J8
2
12
2
J4
18
3
6
20
NEW-FH
1
19
J5
3
14
4
16
4
17
NEW-FH2
10
J6
J7-FH
5
6
J9
7
J10
8
J2-FH

EPANET 2

Network Table - Links

Link ID	Length ft	Diameter in	Roughness	Flow GPM	Velocity fps	Unit Headloss ft/Kft
Pipe 1	47.73	8	135	0.00	0.00	0.00
Pipe 2	27.92	8	135	-503.55	3.21	8.80
Pipe 3	91.60	8	135	-503.55	3.21	6.01
Pipe 4	86.27	8	135	-1688.61	10.78	103.48
Pipe 5	8.91	6	135	0.00	0.00	0.00
Pipe 6	270.29	8	135	0.00	0.00	0.00
Pipe 7	29.48	8	135	0.00	0.00	0.00
Pipe 8	22.25	6	135	0.00	0.00	0.00
Pipe 9	401.42	8	135	0.00	0.00	0.00
Pipe 12	338.05	12	140	503.55	1.43	0.75
Pipe 14	28.89	12	140	1.11	0.00	0.00
Pipe 16	281.90	12	140	1185.06	3.36	3.90
Pipe 17	108.05	12	140	-843.75	2.39	3.26
Pipe 18	75.14	12	140	503.55	1.43	0.87
Pipe 19	27.10	12	140	-340.20	0.97	0.62
Pipe 20	13.74	12	140	843.75	2.39	14.56
Pump 10	#N/A	#N/A	#N/A	1688.61	0.00	-86.88

RAW DATA
TEST #4

Network Table - Nodes

Node ID	Elevation ft	Demand GPM	Head ft	Pressure psi
Junc J3	63	0.00	140.16	33.43
Junc J4	60.5	0.00	140.40	34.62
Junc J5	60	0.00	140.95	35.08
Junc J6	60	0.00	149.88	38.95
Junc J7-FH	67	0.00	149.88	35.91
Junc J8	61	0.00	140.16	34.30
Junc J9	55	0.00	140.95	37.24
Junc J10	56	0.00	140.95	36.81
Junc J2-FH	63	0.00	140.95	33.78
Junc J1	55	0.00	140.95	37.24
Junc 2	63.5	0.00	139.90	33.11
Junc 3	62.5	0.00	139.85	33.52
Junc 4	62.5	1.11	139.85	33.52
Junc NEW-FH	69.5	843.75	139.64	30.39
Junc NEW-FH2	71	843.75	139.50	29.68
Junc 6	63	0.00	139.84	33.29
Resvr 1	63	-1688.61	63.00	0.00

RAW DATA TEST #1

Network Table - Links

Link ID	Length ft	Diameter in	Roughness	Flow GPM	Velocity fps	Unit Headloss ft/Kft
Pipe 1	47.73	8	135	0.00	0.00	0.00
Pipe 2	27.92	8	135	-503.55	3.21	8.80
Pipe 3	91.60	8	135	-503.55	3.21	6.01
Pipe 4	86.27	8	135	-1688.61	10.78	103.48
Pipe 5	8.91	6	135	0.00	0.00	0.00
Pipe 6	270.29	8	135	0.00	0.00	0.00
Pipe 7	29.48	8	135	0.00	0.00	0.00
Pipe 8	22.25	6	135	0.00	0.00	0.00
Pipe 9	401.42	8	135	0.00	0.00	0.00
Pipe 12	338.05	12	140	503.55	1.43	0.75
Pipe 14	28.89	12	140	1.11	0.00	0.00
Pipe 16	281.90	12	140	1185.06	3.36	3.90
Pipe 17	108.05	12	140	-843.75	2.39	3.26
Pipe 18	75.14	12	140	503.55	1.43	0.87
Pipe 19	27.10	12	140	-340.20	0.97	0.62
Pipe 20	13.74	12	140	843.75	2.39	14.56
Pump 10	#N/A	#N/A	#N/A	1688.61	0.00	-68.57

Network Table - Nodes

Node ID	Elevation ft	Demand GPM	Head ft	Pressure psi
Junc J3	63	0.00	121.84	25.50
Junc J4	60.5	0.00	122.09	26.69
Junc J5	60	0.00	122.64	27.14
Junc J6	60	0.00	131.57	31.01
Junc J7-FH	67	0.00	131.57	27.98
Junc J8	61	0.00	121.84	26.36
Junc J9	55	0.00	122.64	29.31
Junc J10	56	0.00	122.64	28.88
Junc J2-FH	63	0.00	122.64	25.84
Junc J1	55	0.00	122.64	29.31
Junc 2	63.5	0.00	121.59	25.17
Junc 3	62.5	0.00	121.54	25.58
Junc 4	62.5	1.11	121.54	25.58
Junc NEW-FH	69.5	843.75	121.32	22.46
Junc NEW-FH2	71	843.75	121.19	21.75
Junc 6	63	0.00	121.52	25.36
Resvr 1	63	-1688.61	63.00	0.00

Network Table - Links

Link ID	Length ft	Diameter in	Roughness	Flow GPM	Velocity fps	Unit Headloss ft/Kft
Pipe 1	47.73	8	135	0.00	0.00	0.00
Pipe 2	27.92	8	135	-503.55	3.21	8.80
Pipe 3	91.60	8	135	-503.55	3.21	6.01
Pipe 4	86.27	8	135	-1688.61	10.78	103.48
Pipe 5	8.91	6	135	0.00	0.00	0.00
Pipe 6	270.29	8	135	0.00	0.00	0.00
Pipe 7	29.48	8	135	0.00	0.00	0.00
Pipe 8	22.25	6	135	0.00	0.00	0.00
Pipe 9	401.42	8	135	0.00	0.00	0.00
Pipe 12	338.05	12	140	503.55	1.43	0.75
Pipe 14	28.89	12	140	1.11	0.00	0.00
Pipe 16	281.90	12	140	1185.06	3.36	3.90
Pipe 17	108.05	12	140	-843.75	2.39	3.26
Pipe 18	75.14	12	140	503.55	1.43	0.87
Pipe 19	27.10	12	140	-340.20	0.97	0.62
Pipe 20	13.74	12	140	843.75	2.39	14.56
Pump 10	#N/A	#N/A	#N/A	1688.61	0.00	-84.43

PLAC DATA
TEST #2

Network Table - Nodes

Node ID	Elevation ft	Demand GPM	Head ft	Pressure psi
Junc J3	63	0.00	137.70	32.37
Junc J4	60.5	0.00	137.95	33.56
Junc J5	60	0.00	138.50	34.01
Junc J6	60	0.00	147.43	37.88
Junc J7-FH	67	0.00	147.43	34.85
Junc J8	61	0.00	137.70	33.24
Junc J9	55	0.00	138.50	36.18
Junc J10	56	0.00	138.50	35.75
Junc J2-FH	63	0.00	138.50	32.71
Junc J1	55	0.00	138.50	36.18
Junc 2	63.5	0.00	137.45	32.04
Junc 3	62.5	0.00	137.40	32.45
Junc 4	62.5	1.11	137.40	32.45
Junc NEW-FH	69.5	843.75	137.18	29.33
Junc NEW-FH2	71	843.75	137.05	28.62
Junc 6	63	0.00	137.38	32.23
Resvr 1	63	-1688.61	63.00	0.00

RAW DATA TEST #2

Network Table - Links

Link ID	Length ft	Diameter in	Roughness	Flow GPM	Velocity fps	Unit Headloss ft/Kft
Pipe 1	47.73	8	135	0.00	0.00	0.00
Pipe 2	27.92	8	135	-503.55	3.21	8.80
Pipe 3	91.60	8	135	-503.55	3.21	6.01
Pipe 4	86.27	8	135	-1688.61	10.78	103.48
Pipe 5	8.91	6	135	0.00	0.00	0.00
Pipe 6	270.29	8	135	0.00	0.00	0.00
Pipe 7	29.48	8	135	0.00	0.00	0.00
Pipe 8	22.25	6	135	0.00	0.00	0.00
Pipe 9	401.42	8	135	0.00	0.00	0.00
Pipe 12	338.05	12	140	503.55	1.43	0.75
Pipe 14	28.89	12	140	1.11	0.00	0.00
Pipe 16	281.90	12	140	1185.06	3.36	3.90
Pipe 17	108.05	12	140	-843.75	2.39	3.26
Pipe 18	75.14	12	140	503.55	1.43	0.87
Pipe 19	27.10	12	140	-340.20	0.97	0.62
Pipe 20	13.74	12	140	843.75	2.39	14.56
Pump 10	#N/A	#N/A	#N/A	1688.61	0.00	-62.14

Test #2
10 of 21

Network Table - Nodes

Node ID	Elevation ft	Demand GPM	Head ft	Pressure psi
Junc J3	63	0.00	115.42	22.71
Junc J4	60.5	0.00	115.67	23.90
Junc J5	60	0.00	116.22	24.36
Junc J6	60	0.00	125.14	28.23
Junc J7-FH	67	0.00	125.14	25.19
Junc J8	61	0.00	115.42	23.58
Junc J9	55	0.00	116.22	26.53
Junc J10	56	0.00	116.22	26.09
Junc J2-FH	63	0.00	116.22	23.06
Junc J1	55	0.00	116.22	26.53
Junc 2	63.5	0.00	115.17	22.39
Junc 3	62.5	0.00	115.12	22.80
Junc 4	62.5	1.11	115.12	22.80
Junc NEW-FH	69.5	843.75	114.90	19.67
Junc NEW-FH2	71	843.75	114.77	18.96
Junc 6	63	0.00	115.10	22.58
Resvr 1	63	-1688.61	63.00	0.00

Test #2

STORAGE AT SHEA
WATER AND SEWER MASTER PLAN
NORTH
SCALE:1"=30'
EX 12" ACP WATER
NORTH QUARTER CORNER SECTION 27, NOTHING FOUND CALCULATED PER GDAC 752-33 MCR
FOUND 1/2" REBAR 6.61' EAST & 0.12' NORTH OF LINE ACCEPTED PER GDAC 752-33 MCR HELD FOR CL 116TH STREET
NW. COR. 290-08 MCR. NOTHING FOUND
NE. CORNER SECTION 27 FOUND 3" SCOTTSDALE BRASS CAP IN HAND HOLE 0.5' DOWN NO STAMPING
N 89°50'08" W 2643.18' (C)
661.50' (C)
CONCRETE VERTICAL CURB & GUTTER
SHEA BOULEVARD
EXISTING SEWER MANHOLE
EXISTING SEWER MANHOLE
EX 15" VCP SEWER
CONCRETE SIDEWALK
603.20' (M) 602.51' (R1 & R2)
291.32' (C) 290.63' (R2)
317.88' (R2)
6" SEWER
S.C.E., P.A.E. & P.T. EASEMENT
APN 217-33-004C SUBJECT
24' A.E. & P.U.E.
EXISTING WATER TAP
12" DIP WATER
N 89°38'41" W 293.38' (M)
N 89°59'36" W (R2)
CONCRETE VERTICAL CURB
LOT 1 1045-08 MCR APN 217-33-985 SUBJECT
40' B.S.L.
40' P.T. EASEMENT
0.7' TO WEST FACE OF WALL
FALEN LOT 3, 290-08 MCR APN 217-33-118
116TH STREET
MIRAGE CROSSING OFFICE LLC APN 217-56-871
NEW WATERLINE CONNECTION
24' A.E. PER 585-15 MCR
PROPOSED FIRE HYDRANT
4" FIRELINE
1" WATER
8" W
12" DIP WATER
PROPOSED FIRE HYDRANT
24' A.E. & P.U.E.
EXISTING FIRE HYDRANT
8" DIP WATER
MAGARELLI LOT 2, 290-08 MCR APN 217-33-117
N 00°00'38" E (R1)
N 00°03'53" E 1319.44' (C)
365.00' (R1 & R2)
N 00°01'34" E 2968.24' (M) (R1) BASIS OF BEARING
0.5' TO WEST FACE OF WALL
WEST QUARTER CORNER SECTION 27 FOUND 2.5" GLO BRASS CAP IN HAND HOLE 0.4' DOWN STAMPED "1/4 S27 S26 1914"
240' APS RIGHT OF WAY EASEMENT
89' **SRP EASEMENT PER DOCUMENT 1988-073483 MCR
240' RIGHT OF WAY EASEMENT WIDTH UN-SPECIFIED
N 89°49'11" W 330.36' (R1)
N 89°53'32" W 330.62' (C)
100' D.O.E. EASEMENT
125' D.O.E. EASEMENT
MIRAGE HOME CONSTRUCTION INC APN 217-56-849
N 00°00'06" E 2639.31' (C)
CENTER SECTION 27 FOUND 2.5" GLO BRASS CAP FLUSH STAMPED " C1/4 S27 1914"
N 89°51'35" W 2641.07' (M) (R1)
1981-2016 35 YEARS OF EXCELLENCE ERIE & ASSOCIATES
EXP. 09/30/20
ERIE & ASSOCIATES, INC.
JOB NO. 2259.01
DATE: 10/10/2017
SCALE: 1"=30'
DRAWN: J.A.L.
DESIGN: L.J.E.
CHECKED: L.J.E.
SHEET NO.
PLATE 2

Preliminary Drainage Report

Storage at Shea

SEC 116th Street & Shea Boulevard

Scottsdale, Arizona

COS

Case No.

Plan Check No. : 9-ZN-2017

Prepared for:

George H. Bell

Land Research and Development, Inc.

18061 N. 99th St.

Scottsdale, Arizona 85255

Plan # 9-ZN-2017
Case #
Q-S #
☑ Accepted
☐ Corrections
DG 9/12/17
Reviewed By Date

For submittal to:

City of Scottsdale

Registered Professional Engineer (Civil) CERTIFICATE NO. 10274 LEONARDO J. ERIE, II ARIZONA, U.S.A.
10 AUG 17
EXP 9/30/17

Prepared by:

Erie & Associates, Inc.
3120 North 24th Street
Phoenix, Arizona 85016

9-ZN-2017
08/28/17

EA #2259.01

August 9, 2017

1.0 Table of Contents **Page**

2.0 List of Plates and Tables

3.0 Location/Description

The proposed 3.8± acre site is located at the southeast corner of 116th Street and Shea Boulevard, and is a portion of the northeast Quarter of Section 27, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian in Scottsdale, Arizona. The site is bordered along the west side by an office development and along the east side by the Montana Ranch Subdivision. A powerline corridor runs through the site diagonally. The property consists of 2 parcels that are "L" shaped with frontage along Shea Boulevard from 116th Street east to the east boundary of the site. See *Plate 1 – Location Map.*

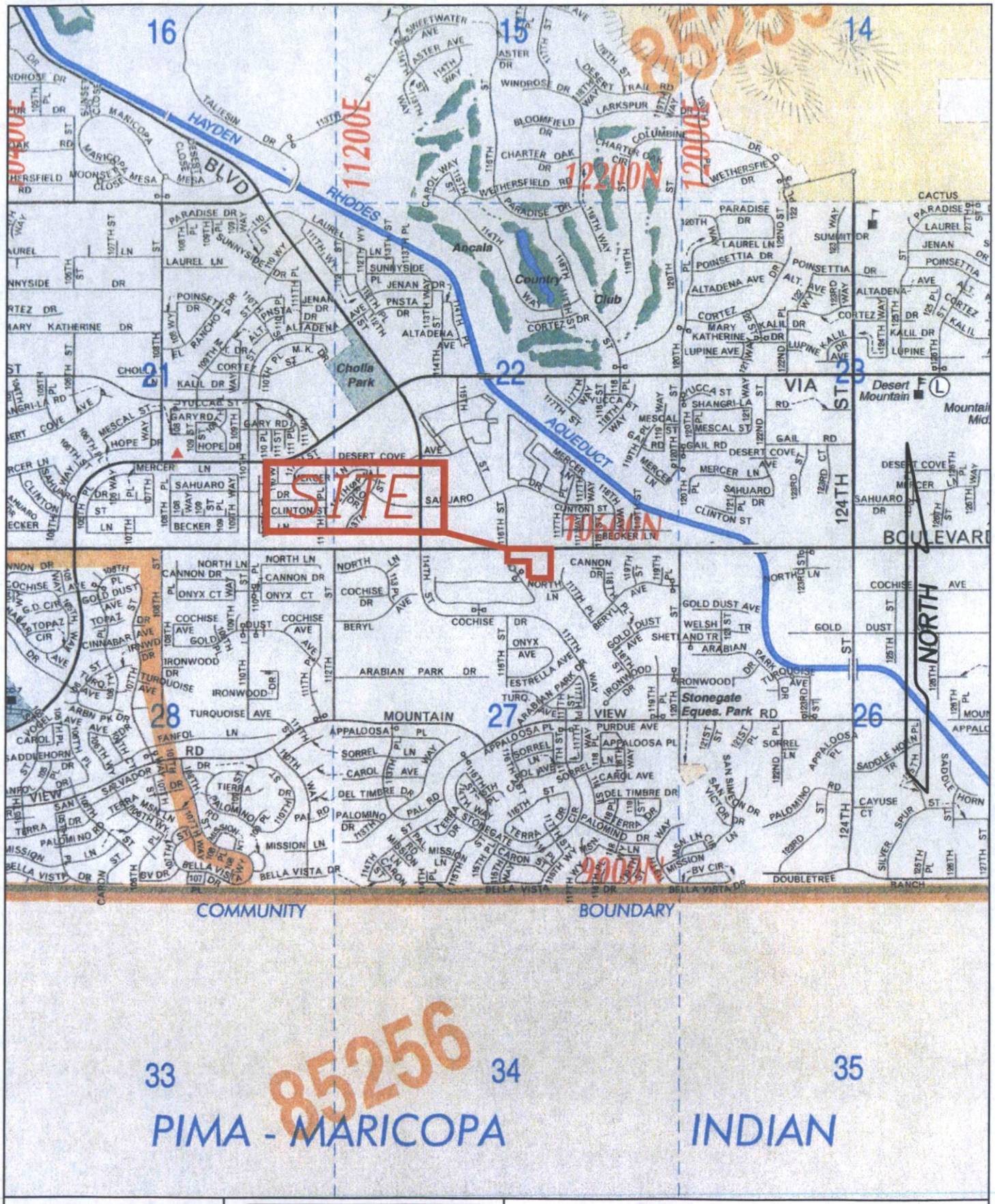
3.1 FEMA Data

The proposed site is within a "Shaded X" FEMA Zone, which is defined as "areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood". The site is located on FEMA map number 04013C1780L with an effective date of October 16, 2013. See *Plate 2 – Effective FEMA FIRM Map.*

3.2 Existing Drainage Conditions

The site generally drains from northeast to southwest. A small tributary is the only offsite area, and offsite flows currently enter at the northeast corner of the project site. The offsite flows are conveyed by overland flow to the southwest, and leave the site along the southern boundary. The offsite flows are from a tributary that is composed of the south side of Shea Boulevard and the scenic corridor that parallels the right-of-way. This tributary extends approximately 350 feet upstream to the east.

The scenic corridor along the north portion of the site drains from east to west and eventually discharges to an existing detention basin located along the north side of the existing parking lot.



JOB NO. 2259.01 DATE: 3/21/2017 SCALE: 1"=2000'	ERIE & ASSOCIATES, INC. 3120 NORTH 24th STREET PHOENIX, ARIZONA 85016 (602) 954-6399	STORAGE AT SHEA PLATE 1 – LOCATION MAP

JOB NO. 2259.01 DATE: 6/19/2017 SCALE: 1"=2000'	ERIE & ASSOCIATES, INC. 3120 NORTH 24th STREET PHOENIX, ARIZONA 85016 (602) 954-6399	STORAGE AT SHEA PLATE 2 – FEMA MAP

3.3 Drainage Concepts

- Detention basins will be provided for the 100-year, 2-hour onsite runoff volume from the developed portions of the site.

- Detention basins drain within 36 hours.

- Offsite flow will be collected in a constructed perimeter channel and routed around the east side of the development. For post-development conditions the flows will leave the site in the pre-development location. *Plate 5 – Master Drainage Plan.*

- Peak flows leaving the site during post-development conditions will not exceed predevelopment flows.

4.0 Hydrology

A hydrologic analysis was completed to determine the flows entering the site, for pre-development conditions. The peak flows for the 100-year storm event were calculated using the Rational Method. See *Appendix A* for hydrologic data and calculations. The methodology used to calculate the peak flows is consistent with requirements outlined in the City of Scottsdale's Design Standards and Policies Manual.

4.1 Existing Hydrology

The offsite tributary area was delineated using City of Scottsdale topo and field reconnaissance. The remainder of the offsite and onsite tributary was determined using a one foot contour interval topo and point elevations survey completed as part of this project and field reconnaissance. See *Plate 4 – Existing Tributary Map* for the existing tributary areas. See *Appendix A* for the hydrologic worksheets and calculations.

See *Table 1 – Existing Sub-Area Parameters*. The 100-year peak flow summary for existing conditions is included in *Table 2*.

Table 1 – Existing Sub-Area Parameters

Sub-Area	Area (acres)	i (in/hr)	C	Tc (min)
SA-1	0.65	7.8	0.7	5
SA-2	0.89	7.8	0.7	5
SA-3	1.17	7.8	0.7	5
SA-4	1.98	7.8	0.45	7

Table 2 – 100-Year Flow Summary

Sub-Area ID	Location/Description	Existing Peak Flow (cfs)
SA-1	Offsite tributary to the east	4
SA-2	Onsite tributary and street along the north side of site	5
SA-4	Onsite tributary	7
SA-3+SA-2	Onsite tributary and street along the north side of site	11

4.1 Developed Hydrology

The offsite area to the northeast runs through an undeveloped area east of the proposed building. The remaining tributary area is approximately 1.98 acres. The average runoff coefficient is 0.78 (see *Appendix A*). The peak flow into the basins is approximately 12 CFS.

5.0 Hydraulics

The offsite flow from the northeast corner is conveyed by a channel that runs along the east and a portion of the south property line. The channel is 1 foot deep with 4H:1V side slopes. The channel capacity is 13 CFS vs. the estimated 100 year flow of 4 CFS.

The velocity in the channel is 3.2 FPS with an assumed manning n-factor of 0.04 to account for native landscaping. Calculations are included in *Appendix A*.

The proposed finish floor elevation (FF=1471.0) is 3 feet higher than the highest proposed ponding elevation (WS=1468.0) as discussed in Section 6.0 Onsite Drainage/Detention.

The capacity of the proposed 12" outfall pipe is approximately 6.5 CFS at the maximum ponding elevation of 3 feet. See *Appendix A* for calculations.

6.0 Onsite Drainage/Detention

Onsite runoff will be directed to two basins as shown on *Plate 4*. The detention basins are sized for the 100-year, 2-hour volume. Approximately the north 25% of the site will be drained to detention basin DB-2 and the remainder of the site will drain to detention basin DB-1. A summary of the detention basins is provided in *Table 3*.

Table 3 – Onsite Detention Basin Summary

Sub-Area	Area (acres)	C	Vreq (ac-ft)	Vprov (ac-ft)	Ponding WS
DB-1	2.46	0.7	0.33	0.34	1467.5
DB-2	0.82	0.7	0.11	0.12	1468.0
			Total=0.44	Total=0.46	

Where V=(d/12)(A)(C) and d=2.3"

The basins are sized to take the whole eastern parcel including Shea Boulevard right-of-way, even though portions of the north and east sides of the parcel do not drain to the basins. The proposed basin volume is over sized for the area draining to it. The western parcel drains to an existing basin on the 116th Street cul-de-sac that drains west.

The basins are designed to bleed off by a 12" pipe and to drain within a 24 hour period at a flow rate below the existing outfall from the site of 7 CFS. Calculations are included in *Appendix A*.

7.0 References

"Drainage Design Manual for Maricopa County, Arizona", prepared by Flood Control District of Maricopa County, dated 2009.

"Design Standards and Policies Manual", prepared by City of Scottsdale, dated January 2010.

Appendix A – Calculation Worksheets

STORAGE AT SHEA	EA# 2259 BY: JAL	DATE: 6-14-17

Revised Aug 8, 2017 by LE

SA-1 (RATIONAL) EXISTG

$Q = CiA$

$Q = 0.7(7.8)(0.65)$

$Q = 4$ CFS

$A = 0.65$ ac

$i = 7.8$ in/hr

$C = 0.5(0.95) + 0.5(0.45)$

$C = 0.7$

SA-2 EXISTG

$Q = 0.7(7.8)(0.89)$

$Q = 5$ CFS

$A = 0.89$ ac

$i = 7.8$ in/hr

$C = 0.7$

SA-3 EXISTG $A_{SA_3} = 1.17$ ac $+ SA_2 = 1.17 + 0.89$

$= 2.06$ ac $TC = 5$ min

$i = 7.8$ in/hr

$C = 0.7$

$Q = (0.7)(7.8)(2.06) \cong 11.$ CFS

SA-4 EXISTG

$A = 220(320) = 1.98$ ac

$T_c = 5$ min $i = 7.8$ in/hr

$C = 0.45$ undev. desert

$Q_{EX} = (0.45)(7.8)(1.98) = 6.95$ CFS

SAY 7. CFS

SA_4 Developed

$A = 270(320) = 1.98\ ac$

$T_c = 5\ min$, $i_{100} = 7.8\ in/hr$

Composite

$A_{parking\ and\ building} = 1.31\ ac$ $C = 0.95$

$A_{open} = 1.98 - 1.31 = 0.67$ $C = 0.45$

$$C_{AVG} = \frac{1.31(0.95) + 0.67(0.45)}{1.98}$$

$$C_{AVG} = 0.78$$

$$\therefore Q_{into\ Basins} = (0.78)(7.8)(1.98) = 12.cfs$$

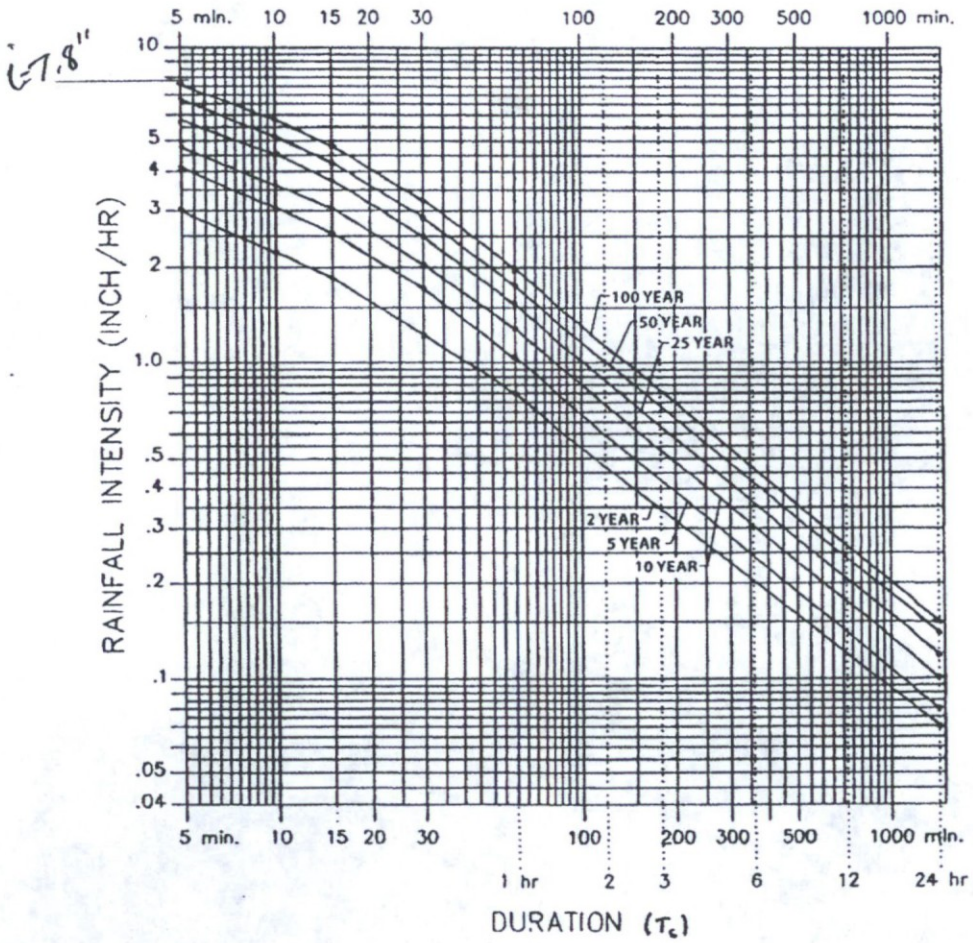
given flood event. For infrastructure design, the estimate of the actual split based on a hydraulic analysis of the current channel cross sections must include a minimum safety factor of 30 percent of the total flow. If the designer feels that there are extenuating factors affecting the stability of the split, the safety factor should be increased accordingly. The report should include a description of all assumptions made regarding watershed conditions used to calculate the peak flow rates.

C. The Rational Method

The Rational Method is limited to use on small, uniform, regularly shaped watersheds less than or equal to 160 acres in size. The methodology is provided in the Drainage Design Manual for Maricopa County, Hydrology.

1. Precipitation

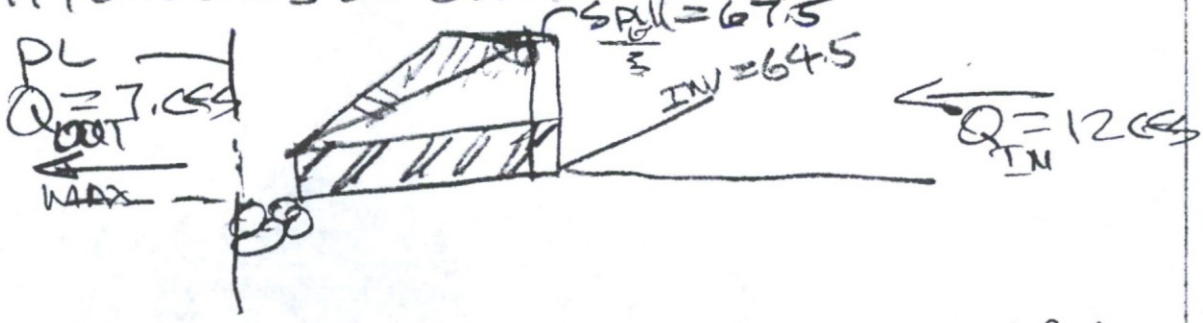
Precipitation input is rainfall intensity, "**I**," and can be obtained directly from NOAA 14 at http://hdsc.nws.noaa.gov/hdsc/pfds/sa/az_pfds.html or from Figure 4.1-3. The time of concentration, "**Tc**," is all that is required to determine "**I**" from this figure.(source: NOAA 14)



RAINFALL INTENSITY–DURATION–FREQUENCY RELATION
FOR MARICOPA COUNTY, ARIZONA

FIGURE 4.1-3 RAINFALL INTENSITY (I) VALUES FOR USE IN RATIONAL METHOD

Hydraulics of outlet at lower basin.



Assume for this short pipe that its in inlet control

Maximum $Q_{out} = 7.0$ cfs

$HW_{MAX} = 3' \pm$

Try a 12" pipe

$\therefore HW/D = 3/1 = 3$

$\therefore Q_{out} = 6.5$ cfs (Ex Q) < 7 cfs

$\therefore$ ok Use a 12" pipe at the outlet.

INLET CONTROL
NOMOGRAPH FOR CONCRETE PIPE WITH HEADWALL
(Socket Opening)
AND
CONCRETE PIPE WITH HEADWALL AND 45° WINGWALLS
(Socket Opening)

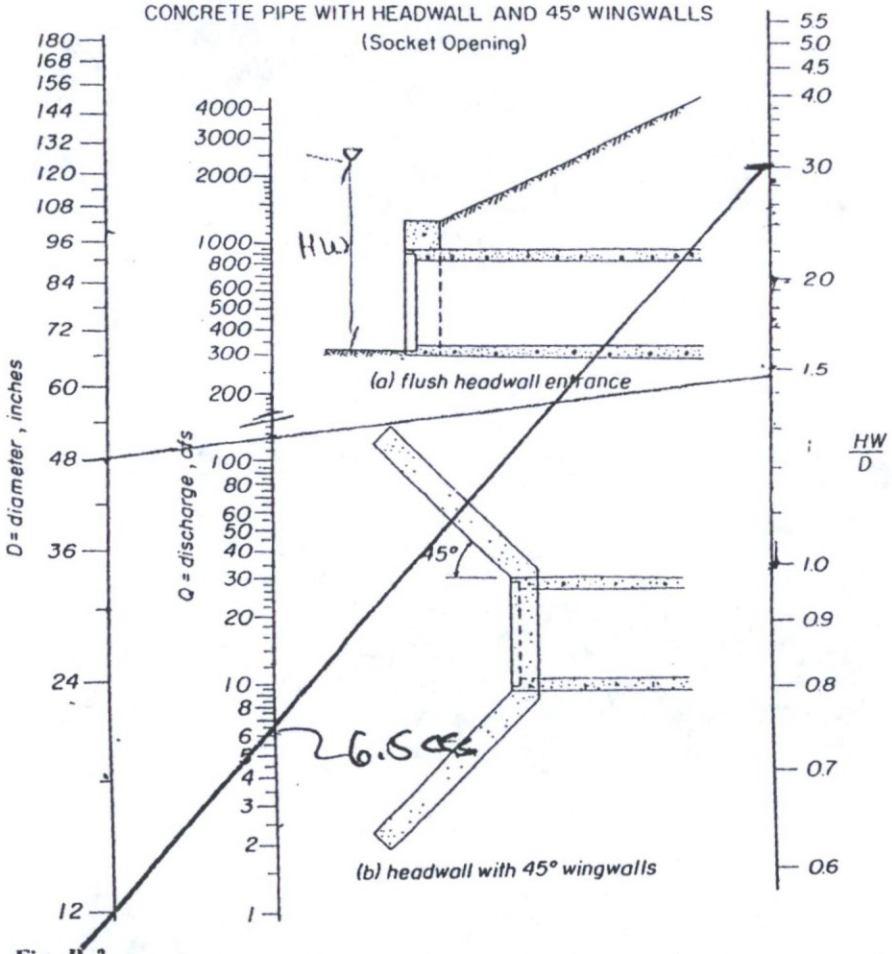


Fig. B-3

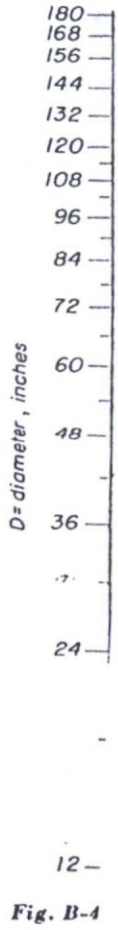


Fig. B-4

CULVERT CAPACITY CHARTS

plate 4 - SPRING Outlet NO

100-2 VOLUME CALCULATION (EAST PARCEL)

$$V_r = \frac{P}{12} A C$$

$A_T = 3.28$ ac

$A_{SITE\ A\ AC} = 0.32$ ac $C = 0.95$

$A_{PARK+BLDG} = 1.31$ ac $C = 0.95$

$A_{UNDEV} = 1.65$ ac $C = 0.45$

$\Sigma = 3.28$ ac

$$C = \frac{1.63(0.95) + 1.65(0.45)}{3.28}$$

$C = 0.70$

$$V_r = \frac{2.3}{12}(3.28)(0.70) = 0.44 \text{ ac-ft}$$

2. Time of Concentration

Time of concentration "**Tc**" is the total time of travel from the most hydraulically remote part of the watershed to the concentration point of interest. The calculation of "Tc" must follow FCDMC Hydrology Manual procedures.

***Note:** **Do not add a standard set amount of time to the estimated "Tc" for lot runoff delay (such as 5 or 10 minutes).** Natural land slopes are too variable in Scottsdale to add a set amount of time for lot runoff.

3. Runoff Coefficients

Use Figure 4.1-4 or equivalent to obtain the runoff coefficients or "**C**" values. Composite "**C**" values for the appropriate zoning category or weighted average values calculated for the specific site are both acceptable approaches.

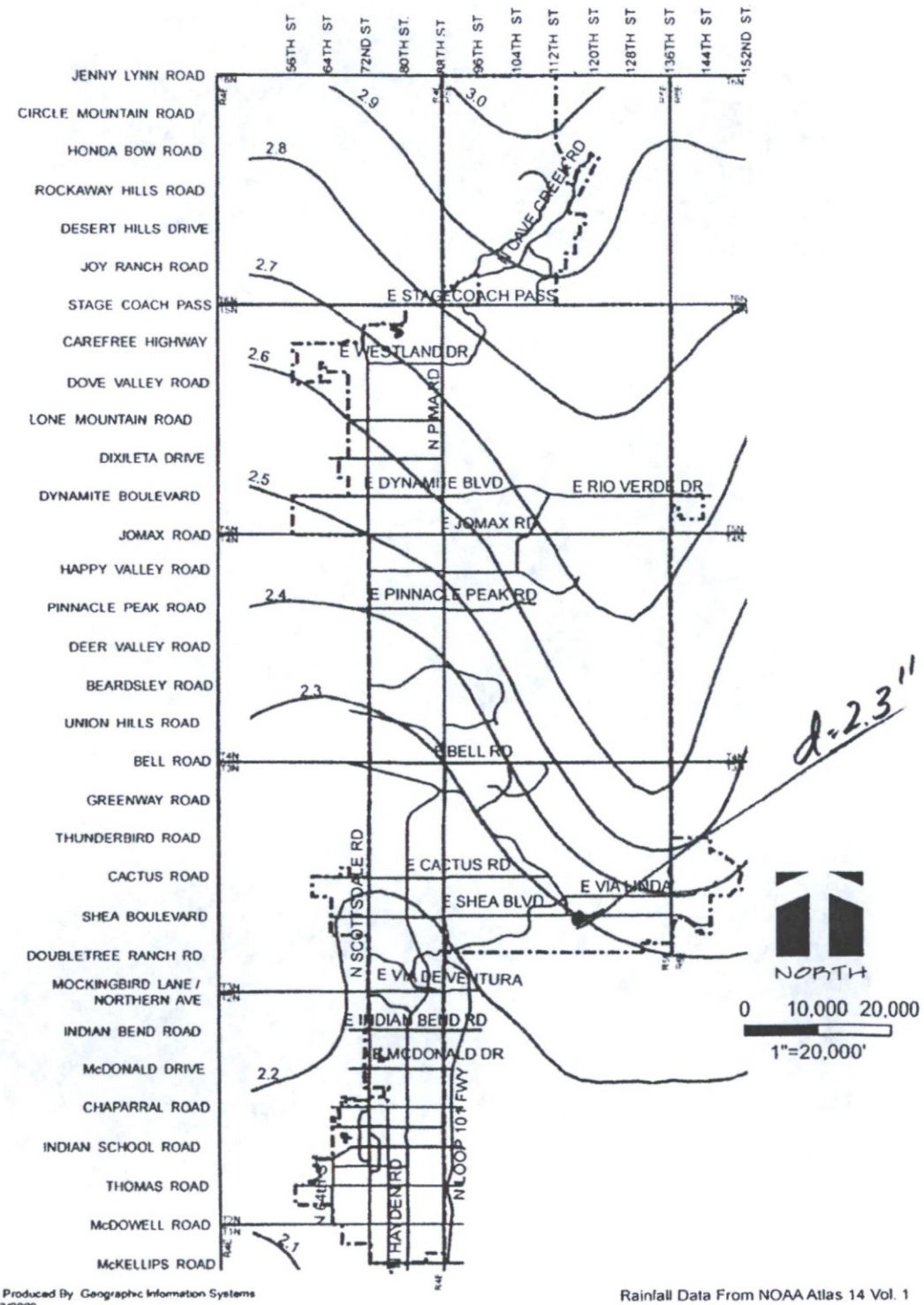
RUNOFF COEFFICIENTS - "C" VALUE

Land Use	Storm Frequency		
Composite Area-wide Values	2-25 Year	50 Year	100 Year
Commercial & Industrial Areas	0.80	0.83	0.86
Residential Areas-Single Family (average lot size)			
R1-1-1901	0.33	0.50	0.53
R1-130	0.35	0.51	0.59
R1-70	0.37	0.52	0.60
R1-43	0.38	0.55	0.61
R1-35 (35,000 square feet/lot)	0.40	0.56	0.62
R1-18 (18,000 square feet/lot)	0.43	0.58	0.64
R1-10 (10,000 square feet/lot)	0.47	0.62	0.67
R1-7 (7,000 square feet/lot)	0.51	0.64	0.94
Townhouses (R-2, R-4)	0.63	0.74	0.94
Apartments & Condominiums (R-3, R-5)	0.76	0.83	0.94
Specific Surface Type Values			
Paved streets, parking lots (concrete or asphalt), roofs, drive-ways, etc.	0.90	0.93	0.95
Lawns, golf courses, & parks (grassed areas)	0.20	0.25	0.30
Undisturbed natural desert or desert landscaping (no impervious weed barrier)	0.37	0.42	045
Desert landscaping (with impervious weed barrier)	0.63	0.73	0.83
Mountain terrain – slopes greater than 10%	0.60	0.70	0.80
Agricultural areas (flood-irrigated fields)	0.16	0.18	0.20

FIGURE 4.1-4 RUNOFF COEFFICIENTS FOR USE WITH RATIONAL METHOD

ISOPLUVIALS

100 Year 2 Hour Precipitation in Inches



Map Produced By Geographic Information Systems
04/03/2009

Rainfall Data From NOAA Atlas 14 Vol. 1

DRAINAGE SWALE
Worksheet for Triangular Channel

Project Description	
Project File	d:\flowmaster\2259.fm2
Worksheet	DRAINAGE SWALE
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coefficient	0.040	
Channel Slope	0.020000	ft/ft
Depth	1.00	ft
Left Side Slope	4.000000	H : V
Right Side Slope	4.000000	H : V

Results		
Discharge	12.97	cfs
Flow Area	4.00	ft²
Wetted Perimeter	8.25	ft
Top Width	8.00	ft
Critical Depth	0.92	ft
Critical Slope	0.031464	ft/ft
Velocity	3.24	ft/s
Velocity Head	0.16	ft
Specific Energy	1.16	ft
Froude Number	0.81	
Flow is subcritical.		

29-56

STORAGE AT SHEA

EXISTING TRIBUTARY MAP

1470 1480 1490

EAST SHEA

NORTH

0' 50' 100' 150'
SCALE:1"=50'

SA-3

SA-2

SA-1

SA-4

Q100-PRE=11 CFS
Q100-POST=11 CFS

Q100-PRE=7 CFS
Q100-POST=6.5 CFS

Q100-PRE=4 CFS
Q100-POST=4 CFS

1460

1460

1460

N. 116TH ST.

E. CANNON DR.

E. NORTH LN.

NORTH

117TH

PLAC

1981 - 2016
35 YEARS OF EXCELLENCE
ERIE & ASSOCIATES

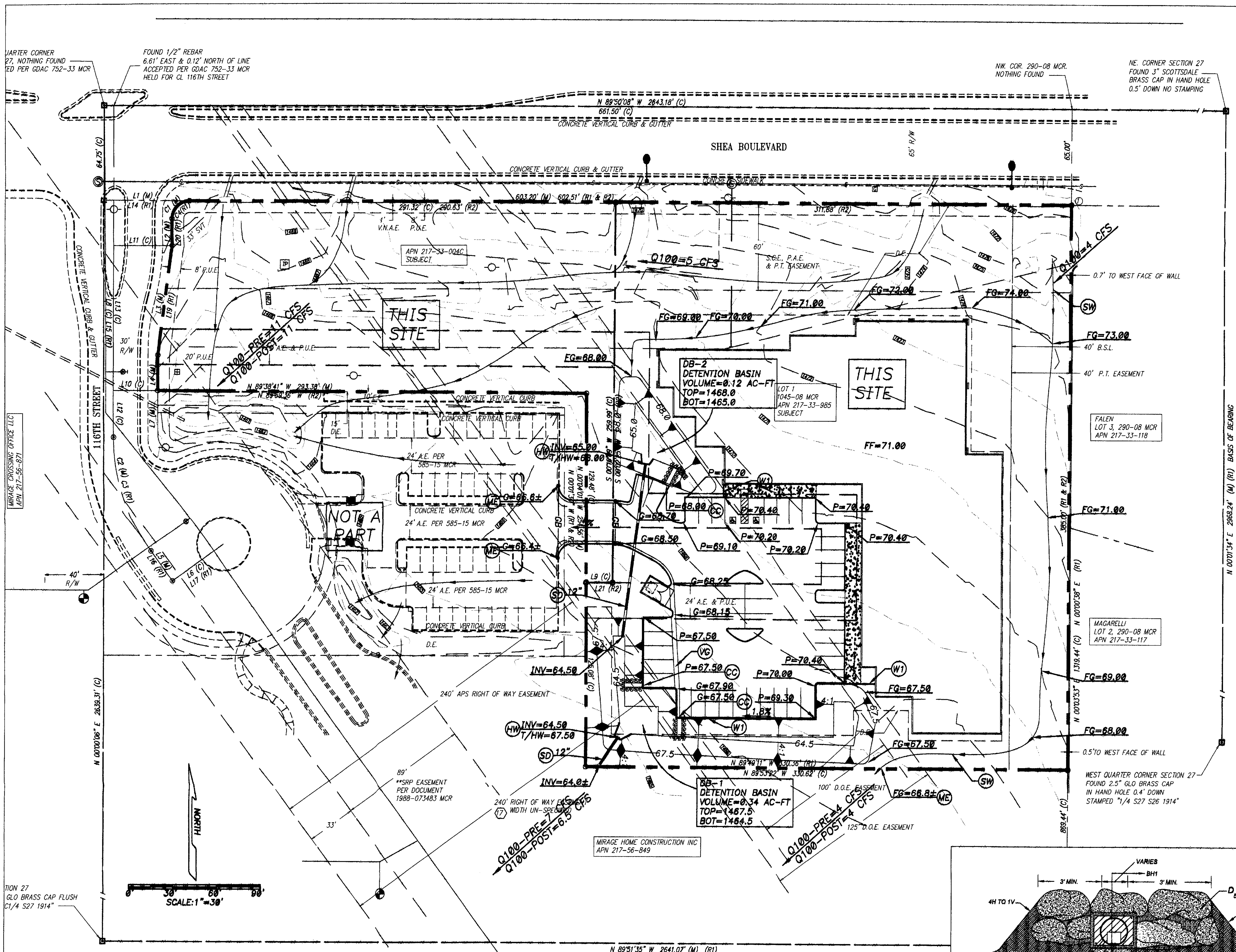
Registered Professional Engineer
CERTIFICATE
10271
LEONARD J. ERIE, II
ARIZONA, U.S.A.
EXP. 09/30/17

ERIE & ASSOCIATES, INC.
3120 N. 24th ST.
PHOENIX, ARIZONA 85016
(602) 954-5399

JOB NO. 2259.01
DATE: 08/10/2017
SCALE: 1"=50'
DRAWN: J.A.L.
DESIGN: L.J.E.
CHECKED: L.J.E.
SHEET NO.
PLATE 3

STORAGE AT SHEA

MASTER DRAINAGE PLAN/POST DEVELOPMENT DRAINAGE SITEPLAN

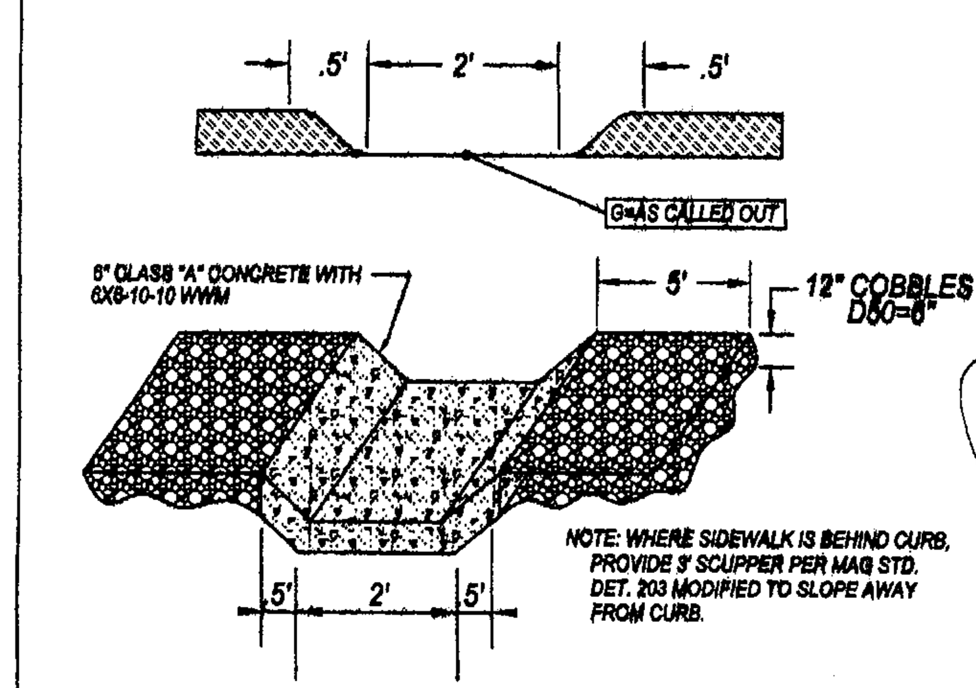


SHEA BOULEVARD
116TH STREET
THIS SITE
THIS SITE
NOT A PART
N 89°50'08" W 2643.18' (C)
661.50' (C)
CONCRETE VERTICAL CURB & GUTTER
603.20' (M) 602.51' (R1 & R2)
291.32' (C) 290.63' (R2)
311.88' (R2)
APN 217-33-004C SUBJECT
Q100=5 CFS
Q100=4 CFS
Q100-PRE=11 CFS
Q100-POST=11 CFS
FG=69.00
FG=70.00
FG=71.00
FG=72.00
FG=74.00
FG=73.00
FG=68.00
DB-2
DETENTION BASIN
VOLUME=0.12 AC-FT
TOP=1468.0
BOT=1465.0
LOT 1
1045-08 MCR
APN 217-33-985
SUBJECT
FF=71.00
INV=65.00
T/HW=68.00
P=69.70
P=68.00
P=70.40
P=70.20
P=69.10
P=70.40
G=68.50
G=68.25
G=68.15
P=67.50
P=70.00
G=67.90
G=67.50
P=69.30
P=70.40
FG=71.00
FG=69.00
FG=67.50
FG=68.00
FG=66.8±
INV=64.50
T/HW=67.50
INV=64.0±
DB-1
DETENTION BASIN
VOLUME=0.34 AC-FT
TOP=1467.5
BOT=1464.5
Q100-PRE=7 CFS
Q100-POST=6.5 CFS
Q100-PRE=4 CFS
Q100-POST=4 CFS
N 89°49'11" W 330.36' (R1)
N 89°53'02" W 330.62' (C)
FALEN
LOT 3, 290-08 MCR
APN 217-33-118
MAGARELLI
LOT 2, 290-08 MCR
APN 217-33-117
MIRAGE HOME CONSTRUCTION INC
APN 217-56-849
MIRAGE CROSSING OFFICE LLC
APN 217-56-871
240' APS RIGHT OF WAY EASEMENT
240' RIGHT OF WAY EASEMENT WIDTH UN-SPECIFIED
89' **SRP EASEMENT PER DOCUMENT 1988-073483 MCR
100' D.O.E. EASEMENT
125' D.O.E. EASEMENT
NE. CORNER SECTION 27
FOUND 3" SCOTTSDALE BRASS CAP IN HAND HOLE 0.5' DOWN NO STAMPING
NW. COR. 290-08 MCR. NOTHING FOUND
FOUND 1/2" REBAR 6.61' EAST & 0.12' NORTH OF LINE ACCEPTED PER GDAC 752-33 MCR HELD FOR CL 116TH STREET
WEST QUARTER CORNER SECTION 27 FOUND 2.5" GLO BRASS CAP IN HAND HOLE 0.4' DOWN STAMPED "1/4 S27 S26 1914"
0.7' TO WEST FACE OF WALL
0.5' TO WEST FACE OF WALL
40' B.S.L.
40' P.T. EASEMENT
N 00°01'34" E 2968.24' (M) (R1) BASIS OF BEARING
N 00°00'38" E (R1)
1319.44' (C)
N 00°03'53" E
N 00°00'36" E 2639.31' (C)
N 89°51'35" W 2641.07' (M) (R1)
N 89°38'41" W 293.38' (M)
24' A.E. PER 585-15 MCR
24' A.E. & P.U.E.
NORTH
SCALE:1"=30'

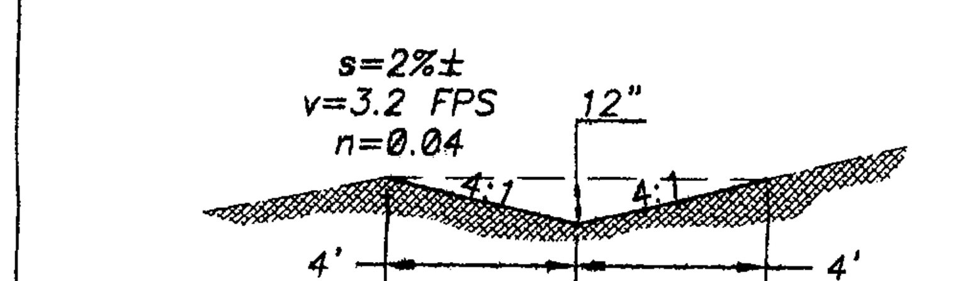
CONSTRUCTION NOTES

(ME)	MATCH EXISTING GRADE
(W1)	CONSTRUCT RETAINING WALL
(CC)	CONSTRUCT CURBCUT AND DOWNDRAIN PER DETAIL THIS SHEET
(VG)	CONSTRUCT VALLEY GUTTER
(SW)	CONSTRUCT SWALE PER DETAIL THIS SHEET
(HW)	CONSTRUCT BOULDER HEADWALL PER DETAIL THIS SHEET
(SD)	CONSTRUCT 12" CMP STORM DRAIN

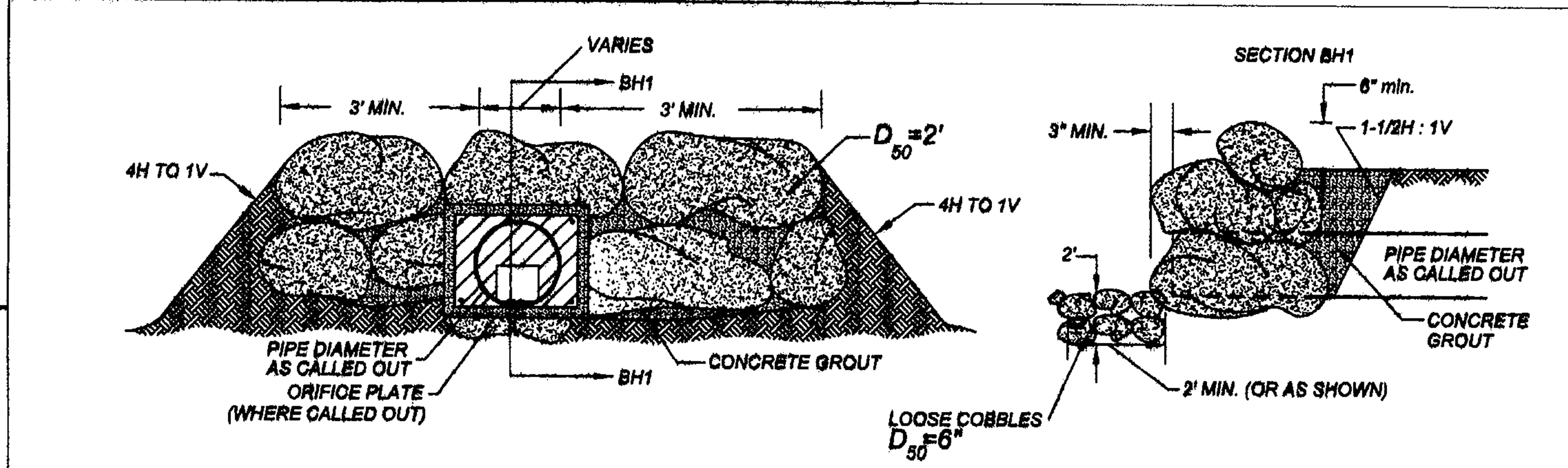
PROPERTY LINE



(CC) CURB CUT WITH DOWN DRAIN



(SW) TYPICAL EAST SWALE SECTION
SCALE:1"=4'



(BH) BOULDER HEADWALL DETAIL

1981-2016 35 YEARS OF EXCELLENCE ERIE & ASSOCIATES

EXP. 09/30/17

ERIE & ASSOCIATES, INC.
3120 N. 24th ST.
PHOENIX, ARIZONA 85016
(602) 954-6399

JOB NO.	2259.01
DATE:	08/10/2017
SCALE:	1"=30'
DRAWN:	J.A.L.
DESIGN:	L.J.E.
CHECKED:	L.J.E.
SHEET NO.	

PLATE 5


NORTH QUARTER CORNER
SECTION 27, NOTHING FOUND
CALCULATED PER GDAC 752-33 MCR
FOUND 1/2" REBAR
6.61' EAST & 0.12' NORTH OF LINE
ACCEPTED PER GDAC 752-33 MCR
HELD FOR CL 116TH STREET
NW. COR. 290-08 MCR.
NOTHING FOUND
NE. CORNER SECTION 27
FOUND 3" SCOTTSDALE
BRASS CAP IN HAND HOLE
0.5' DOWN NO STAMPING
NORTH
SCALE: 1"=30'
N 89°50'08" W 2643.18' (C)
661.50' (C)
CONCRETE VERTICAL CURB & GUTTER
SHEA BOULEVARD
65' R/W
CONCRETE SIDEWALK
603.20' (M) 602.51' (R1 & R2)
291.32' (C) 290.63' (R2)
311.88' (R2)
1' V.N.A.E.
8' P.U.E.
APN 217-33-004C
SUBJECT
60'
S.C.E., P.A.E. & P.T. EASEMENT
Qex=4 CFS
Qex=6 CFS
0.7' TO WEST FACE OF WALL
8' P.U.E.
24' A.E. & P.U.E.
20' P.U.E.
30' R/W
Qex=11 CFS
Qdev=11 CFS
40' B.S.L.
40' P.T. EASEMENT
116TH STREET
CONCRETE VERTICAL CURB & GUTTER
N 89°38'41" W 293.38' (M)
N 89°39'36" W (R2)
10' E.E.
CONCRETE VERTICAL CURB
15' D.E.
15' E.E.
24' A.E. PER 585-15 MCR
24' A.E. PER 585-15 MCR
24' A.E. PER 585-15 MCR
LOT 1
1045-08 MCR
APN 217-33-985
SUBJECT
FALEN
LOT 3, 290-08 MCR
APN 217-33-118
MIRAGE CROSSING OFFICE LLC
APN 217-56-871
S 00°01'25" W 259.99' (C) 260.22' (R2)
N 00°01'01" W 254.56' (M)
24' A.E. & P.U.E.
MAGARELLI
LOT 2, 290-08 MCR
APN 217-33-117
40' R/W
D.E.
240' APS RIGHT OF WAY EASEMENT
N 00°01'34" E 2968.24' (M) (R1) BASIS OF BEARING
N 00°03'53" E 1319.44' (C)
385.00' (M) (R1 & R2)
0.5' TO WEST FACE OF WALL
N 89°49'11" W 330.36' (R1)
N 89°53'32" W 330.62' (C)
100' D.O.E. EASEMENT
125' EASEMENT
Qex=4 CFS
Qdev=4 CFS
Qex=7 CFS
Qdev=6.5 CFS
WEST QUARTER CORNER SECTION 27
FOUND 2.5" GLO BRASS CAP
IN HAND HOLE 0.4' DOWN
STAMPED "1/4 S27 S26 1914"
89'
**SRP EASEMENT
PER DOCUMENT
1988-073483 MCR
240' RIGHT OF WAY EASEMENT
WIDTH UN-SPECIFIED
33'
MIRAGE HOME CONSTRUCTION INC
APN 217-56-849
869.44' (C)
N 00°00'06" E 2639.31' (C)
CENTER SECTION 27
FOUND 2.5" GLO BRASS CAP FLUSH
STAMPED " C1/4 S27 1914"
N 89°51'35" W 2641.07' (M) (R1)

STORAGE AT SHEA

PRE DEVELOPMENT DRAINAGE SITEPLAN

1981 - 2016
35 YEARS OF EXCELLENCE
ERIE & ASSOCIATES

ERIE & ASSOCIATES, INC.
3120 N. 24th ST.
PHOENIX, ARIZONA 85016
(602) 954-6399

EXP. 09/30/17

JOB NO. 2259.01
DATE: 08/10/2017
SCALE: 1"=30'
DRAWN: J.A.L.
DESIGN: L.J.E.
CHECKED: L.J.E.
SHEET NO.

PLATE 4

J2 Engineering and Environmental Design, LLC
4649 E. Cotton Gin Loop
Suite B2
Phoenix, Arizona 85040
Phone: 602.438.2221
Fax: 602.438.2225

To: The Bell Group LLC
c/o George H. Bell

Date: October 18, 2017

From: Jamie Blakeman, PE, PTOE

Job Number: 17.1033.001

RE: Storage @ Shea LLC
Traffic Impact & Mitigation Analysis

Location: Approx. 300' east of 116th St. south of Shea Blvd.

Registered Professional Engineer (Civil)
40961
JAMIE ANN K. BLAKEMAN
Date Signed 10.18.17
ARIZONA, U.S.A.
EXPIRES 6·30·19

INTRODUCTION

J2 Engineering and Environmental Design (J2) has prepared a Traffic Impact and Mitigation Analysis for the proposed Shea Self Storage development, located approximately 300 feet east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona. See **Figure 1** for a vicinity map.

The proposed development will be comprised of an approximately 105,864 square foot (SF) building with a net leasable area of 79,398 SF intended for 700 storage units. See **Attachment A** and **Figure 2** for the site map.

The objective of this Traffic Impact and Mitigation Analysis is to analyze the traffic related impacts of the proposed development to the adjacent roadway network.

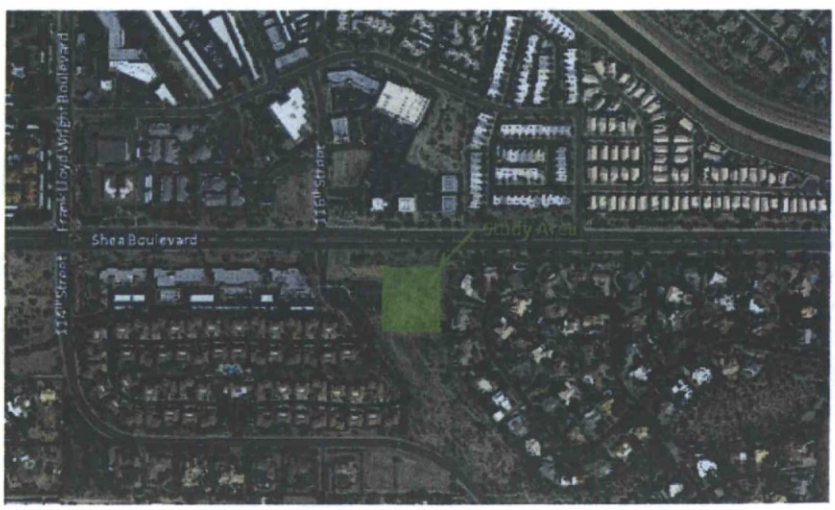


Figure 1- Vicinity Map

EXISTING CONDITIONS

This parcel is currently undeveloped land, and is currently zoned for S-R developments. Shea Boulevard borders the property to the north. Directly east of the property is a residential community. The main buildings for the Mirage Crossing Office Condominiums, an office and residential development, are located west of 116th Street. A parking lot also serving the Mirage Crossing Office Condominiums is located to the east of 116th Street just west of the proposed Shea Self Storage. Immediately south of the proposed development is currently undeveloped land.

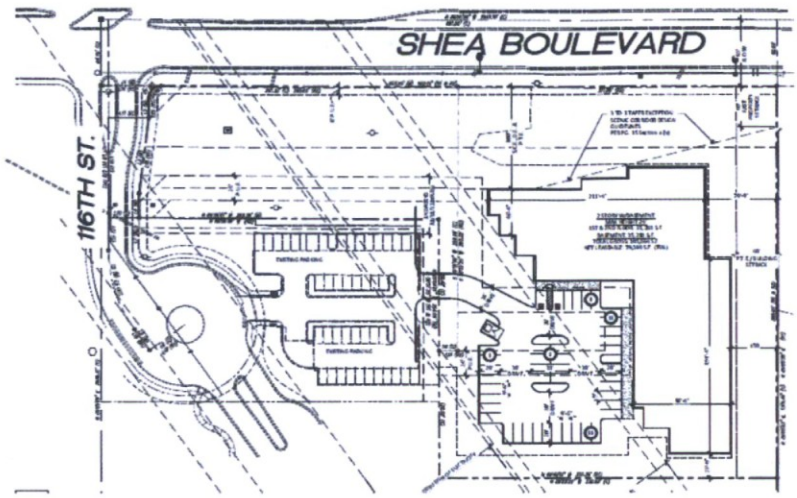


Figure 2- Site Map

STUDY ROADWAY SEGMENTS

Shea Boulevard is an east-west roadway within the vicinity of the proposed development. Shea Boulevard provides three (3) lanes for each direction of travel, with a raised center median. At the intersection with 116th Street, Shea Boulevard provides dedicated left and right turn lanes for both directions of travel. The access at the intersection is limited to left-in, right-in and right-out. The 2014 Average Daily Traffic (ADT) volume along Shea Boulevard from Frank Lloyd Wright Boulevard/114th Street to 124th Street is 39,000 vehicles per day. The 2016 City of Scottsdale *Transportation Master Plan* categorizes Shea Boulevard as a major arterial. There is a posted speed limit of 50 mph within the vicinity area.

Frank Lloyd Wright Boulevard/114th Street is a north-south roadway within the vicinity of the proposed development. North of Shea Boulevard, Frank Lloyd Wright Boulevard provides two (2) lanes for each direction of travel, with a raised center median. South of Shea Boulevard, 114th Street provides one (1) lane for each direction of travel with a two-way left turn lane. The 2014 Average Daily Traffic (ADT) volume along Frank Lloyd Wright Boulevard from Shea Boulevard to Via Linda is 21,500 vehicles per day, 114th Street between Shea Boulevard and Mountain View Road is 3,000 vehicles per day. The 2016 City of Scottsdale *Transportation Master Plan* categorizes Frank Lloyd Wright Boulevard as a minor arterial, with 114th Street classified as a minor collector. There is a posted speed limit of 40 mph north of Shea Boulevard, and 30 mph south of Shea Boulevard.

116th Street is a north-south roadway within the vicinity of the proposed development. 116th Street provides one (1) lane for each direction of travel. There is a posted speed limit of 25 mph.

PROPOSED DEVELOPMENT

The proposed Shea Self Storage development will include one two-story building, with a basement. The site will be located approximately 300 feet east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona.

The proposed site plan indicates that this development will have one (1) access point. The single access driveway will connect through the existing Mirage Crossing Office Condominiums parking lot.

TRIP GENERATION (EXISTING ZONING)

The existing parcel is currently zoned for S-R land uses. The trip generation for the existing S-R zoning was calculated utilizing the Institute of Transportation Engineers (ITE) publication entitled *Trip Generation Manual, 9th Edition*. This publication is considered the standard for the transportation engineering profession. The ITE trip generation rates and equations are based on studies that measured the trip generation characteristics for various types of land uses. The rates and equations are expressed in terms of trips per unit of land use type.

According to the City of Scottsdale Code of Ordinances, the S-R Service Residential zoning is intended primarily to provide offices of a residential scale and character to serve nearby neighborhoods; and secondarily, to offer medium density residential land uses. Therefore an office building was assumed on this site for the S-R zoning.

As shown on the site plan, the net site area is 165,029 SF. It is reasonable to assume a development with a floor area ratio (FAR) of 0.50 on this site. Therefore, an 82,515 SF office building (S-R zoning) was assumed. The trip generation was calculated utilizing the ITE Land Use 710 General Office Building. See **Table 1** below. See **Attachment B** for detailed trip generation calculations.

Table 1 – Trip Generation for S-R Land Use (82,515 SF Office)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	82.5	1000 SF GFA	910	129	113	15	123	21	102

Another land use allowed under S-R zoning is a day care center. The Tutor Time of Scottsdale located at 11350 E. Via Linda less than a mile northwest of the proposed site is a 10,000 SF building, and The Goddard Preschool located at 13940 N. Frank Lloyd Wright Boulevard less than three miles northwest of the proposed site is a 7,500 SF building. Therefore, as a conservative estimate, a 10,000 SF day care center was assumed. The trip generation was calculated utilizing the ITE Land Use 565 Day Care Center. See **Table 2** below. See **Attachment B** for detailed trip generation calculations.

Table 2 – Trip Generation for S-R Land Use (10,000 SF Day Care Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Day Care Center	565	10	1000 SF GFA	741	122	65	57	123	58	65

A charter school is a potential land use under S-R zoning. Student enrollment for some of nearby charter schools located in the City of Scottsdale range between 400 to 1,400 students. BASIS Scottsdale, located approximately 1 ½ miles east of the proposed development, is an approximate 70,377 SF school, with an estimated student enrollment of approximately 1,100 students. Mission Montessori Academy is located $1\ ^{2}/_{3}$ mile east of the proposed development with an approximate enrollment of 270 students.

Taking the average between the two nearby charter schools, a charter school with an enrollment of 685 students was assumed. Due to the assumed similar operations, trip generation for a charter school was calculated utilizing the ITE Lane Use 536 Private School (K-12). See **Table 3** below. See **Attachment B** for detailed trip generation calculations.

Table 3 – Trip Generation for S-R Land Use (635 Student Charter School)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Charter School	536	685	Students	1,699	555	338	216	116	49	68

TRIP GENERATION (PROPOSED ZONING)

It has been requested that the parcel be rezoned from S-R zoning to C-1 zoning. According to the City of Scottsdale Code of Ordinances, the C-1 Neighborhood Commercial zoning is intended to provide a center for convenience shopping and services for nearby neighborhoods. The district provides for small business retail and service establishments which supply commodities and services to meet the daily needs of the community.

For the purposes of this report, the trip generations for two different C-1 land uses were calculated, first for a fast-food restaurant with a drive-through window, and second for a shopping center.

The fast-food restaurant with a drive-through window was assumed to be 3,000 SF, which is a typical size for this type of use. The trip generation was calculated utilizing the ITE Land Use 934 Fast-Food Restaurant with Drive-Through Window. See **Table 4** below. See **Attachment B** for detailed trip generation calculations.

Table 4 – Trip Generation for C-1 Land Use (3,000 SF Fast-Food w/Drive-Thru)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	1,488	136	69	67	98	51	47

An 82,515 SF shopping center was assumed utilizing a reasonable FAR of 0.50. The trip generation was calculated utilizing the ITE Land Use 820 Shopping Center. See **Table 5** below. See **Attachment B** for detailed trip generation calculations.

Table 5 – Trip Generation for C-1 Land Use (82,515 SF Shopping Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Shopping Center	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159

TRIP GENERATION (PROPOSED DEVELOPMENT)

The proposed self storage development will be comprised of a 105,864 SF building with a net rentable area (NRA) of 79,398 SF intended for 700 storage units. See **Figure 2** for the site map. The proposed trip generation was calculated utilizing the ITE Land Use 151 Mini-Warehouse. See **Table 6** below. See **Attachment B** for detailed trip generation calculations.

Table 6 – Trip Generation for the Proposed Development (105,864 SF GLA/79,398 SF NRA Self Storage)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Mini-Warehouse	151	79.4	1000 SF NRA	131	9	5	4	15	8	7
			Total	131	9	5	4	15	8	7

TRIP GENERATION COMPARISON

The trips generated by an 82,515 SF office building, a 10,000 SF day care center, and a charter school with an enrollment of 685 students under the existing S-R zoning were compared. The charter school generated more trips than the office building or the day care center.

For the proposed C-1 zoning, the trips generated by a 3,000 SF fast-food restaurant with drive-through window, and a 82,515 SF shopping development were compared. While the fast-food restaurant generated more AM peak hour trips, the shopping center generates more daily and PM peak hour trips. Therefore, the trips generated by a charter school with 685 students (existing S-R zoning) and an 82,515 SF shopping center (proposed C-1 zoning) were compared and are shown in **Table 7**.

Table 7 - Trip Generation Comparison
Existing S-R Zoning (Charter School) vs. Proposed C-1 Zoning (Shopping Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Existing S-R Zoning (Charter School)	536	685	Students	1,699	555	338	216	116	49	68
Proposed C-1 (Shopping Center)	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159
			Difference	1,825	-476	-289	-186	190	98	92

Selecting the higher trip generator of the two existing zoning land uses and comparing it to the higher trip generator of the three proposed zoning land uses results in the proposed zoning land uses to potentially generate 1,825 additional daily trips, 476 fewer AM peak hour trips, and 190 additional PM peak hour trips.

SUMMARY

The proposed development of the Shea Self Storage consists of a 105,864 SF building with a NRA of 79,398 SF intended for 700 storage units. Shea Self Storage will be located approximately 300' east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona. The proposed development is anticipated to generate a total of 131 weekday trips, with 9 and 15 trips occurring during the AM and PM peak hours, respectively.

Existing S-R Zoning

The trip generation for three potential S-R land uses was calculated and included an 82,515 SF office, a 10,000 SF day care center, and a charter school with an enrollment of 685 students. A charter school generated the most trips with 1,699 weekday, 405 AM peak, and 85 PM peak hour trips.

Proposed C-1 Zoning

The trip generation for two potential C-1 land uses was calculated and included a 3,000 SF fast-food restaurant with drive-through window and an 82,515 SF shopping center. While the fast-food restaurant

generated more AM peak hour trips, the shopping center generated more daily and PM peak hour trips. The shopping center generated 3,523 weekday trips, and 79 and 306 trips during the AM and PM peak hours, respectively.

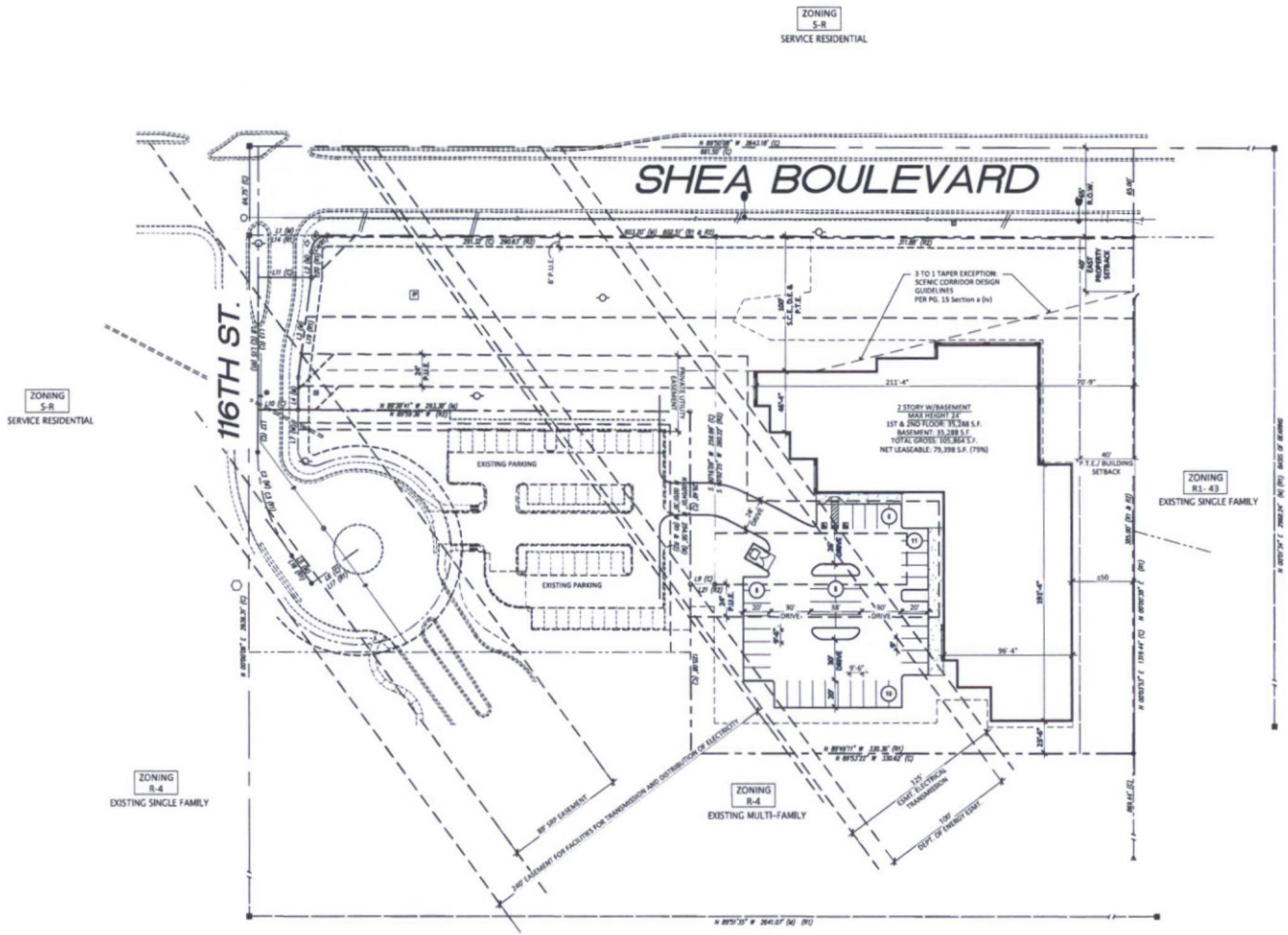
The six trip generation comparison calculations are shown in **Table 8**. The proposed self storage development generates far fewer trips than the existing S-R zoning for a potential office, a day care center or a charter school land use. Additionally, the proposed site generates far fewer trips than the proposed C-1 zoning for a potential fast-food restaurant with drive-through window or a shopping center. The proposed C-1 zoning has the potential to generate more weekday daily trips, however fewer AM and PM peak hour trips, with the exception of the PM peak hour trips for a shopping center.

Table 8 - Trip Generation Calculation Summary

Land Use		ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
					Total	Total	In	Out	Total	In	Out
Existing S-R Zoning	Office	710	82.5	1000 SF GFA	910	129	113	15	123	21	102
	Day Care Center	565	10	1000 SF GFA	741	122	65	57	123	58	65
	Private School (K-12)	536	685	Students	1,699	555	338	216	116	49	68
Proposed C-1 Zoning	Fast-Food w/Drive-Thru	934	3	1000 SF GFA	1,488	136	69	67	98	51	47
	Shopping Center	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159
Proposed Development	Self Storage	151	79	1000 SF NRA	131	9	5	4	15	8	7

The location of the proposed site provides direct access to Shea Boulevard through the use of 116th Street. The 2014 ADT along Shea Boulevard from Frank Lloyd Wright Boulevard/114th Street to 124th Street was 39,000 vehicles per day. It is assumed that all trips for the proposed Shea Self Storage development will access the site via Shea Boulevard. Therefore, the weekday volume along Shea Boulevard will increase by 131 vehicles per day. This is an approximate increase of 0.34% in the average weekday traffic volume along Shea Boulevard. **Therefore, the proposed Shea Self Storage development will have minimal impacts to the traffic operations along the surrounding roadway network.**

Attachment A
Proposed Site Plan



SITE PLAN

SCALE: 1" = 40'-0"

NORTH

0' 20' 40' 80'

PROJECT DIRECTORY

DEVELOPER:
THE BELL GROUP, LLC
18061 N. 99TH STREET
SCOTTSDALE, ARIZONA 85255
CONTACT: GEORGE H. BELL
PHONE: (480) 538-5474
E-MAIL: ghbell@landrd.com

ARCHITECT:
ROBERT KUBICEK ARCHITECTS & ASSOCIATES
2233 EAST THOMAS ROAD
PHOENIX, ARIZONA 85016
CONTACT: ROBERT KUBICEK / EDGAR FELIX
PHONE: (602) 955-3900
FAX: (602) 955-0496
E-MAIL: rkubicek@rkaa.com / efelix@rkaa.com

SITE DATA

EXISTING ZONING:	SR REZONE TO C-1
GROSS SITE AREA:	4.60 ACRES (200,492 S.F.)
NET SITE AREA:	3.78 ACRES (165,029 S.F.)
PROPOSED USE:	INTERNALIZED COMMUNITY STORAGE
MAX BUILDING HEIGHT:	24 FEET
BUILDING AREA (2-STORY W/BSMT.):	105,864 S.F.
SITE COVERAGE:	22%
FAR (0.8 MAX):	132,023 S.F. ALLOWED 70,576 S.F. PROVIDED
OPEN SPACE/LANDSCAPE	(104,463 S.F.) 63%
TOTAL PARKING REQUIRED:	43 SPACES
STORAGE (105,864 S.F.) INTERNALIZED COMMUNITY STORAGE @ 1/2500 = 43 SPACES	
TOTAL PARKING PROVIDED:	43 SPACES
ACCESSIBLE SPACES REQUIRED:	2 SPACES
ACCESSIBLE SPACES PROVIDED:	2 SPACES

STORAGE AT SHEA (CONCEPTUAL)

SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 06-14-2017 (PRELIMINARY)

SP-1

RKAA# 17120.5

RKAA ARCHITECTS, INC

Attachment B
Trip Generation

Self Storage
Land Research & Development, Inc.

engineering and environmental design

Completed: JKB 6/1/2017
Checked: MS 10/16/2017

Trip Generation Calculations

Self Storage - Net Rentable Area

151-Mini-Warehouse

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Mini-Warehouse	151	79.4	1000 SF NRA	1.65	50%	50%	0.11	52%	48%	0.19	53%	47%	131	66	65	9	5	4	15	8	7	Average
Mini-Warehouse	151	79.4	1000 SF NRA	1.19	50%	50%	0.04	52%	48%	0.11	53%	47%	94	47	47	3	2	1	9	5	4	Minimum
Mini-Warehouse	151	79.4	1000 SF NRA	2.17	50%	50%	0.19	52%	48%	0.64	53%	47%	172	86	86	15	8	7	51	27	24	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Mini-Warehouse	151	79.4	1000 SF NRA	N/A	N/A	N/A	T-0.14(X) - 2.06	52%	48%	N/A	N/A	N/A	N/A	N/A	N/A	9	5	4	N/A	N/A	N/A	Equation

Mini-Warehouse	Standard Deviation	1.34		0.34		0.45
	Number of Studies	4		7		7
	Average Size	114		85		85

Mini-warehouses are buildings in which a number of storage units or vaults are rented for the storage of goods. They are typically referred to as "self-storage" facilities. Each unit is physically separated from other units, and access is usually provided through an overhead door or other common access point.

S-R Zoning Use

710-General Office Building

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
General Office Building	710	82.5	1000 SF GFA	11.03	50%	50%	1.56	88%	12%	1.49	17%	83%	910	455	455	129	113	15	123	21	102	Average
General Office Building	710	82.5	1000 SF GFA	3.58	50%	50%	0.6	88%	12%	0.49	17%	83%	295	148	148	50	44	6	40	7	34	Minimum
General Office Building	710	82.5	1000 SF GFA	28.80	50%	50%	5.98	88%	12%	6.39	17%	83%	2,376	1188	1188	493	434	59	527	90	438	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
General Office Building	710	82.5	1000 SF GFA	Ln(T)=0.76Ln(X)+3.68	50%	50%	Ln(T)=0.80Ln(X)+1.57	88%	12%	T=1.12(X)+78.45	17%	83%	1,134	567	567	164	144	20	171	29	142	Equation

General Office Building	Standard Deviation	6.15		1.4		1.37
	Number of Studies	79		218		236
	Average Size	197		222		215

565-Day Care Center

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Day Care Center	565	10	1000 SF GFA	74.06	50%	50%	12.18	53%	47%	12.34	47%	53%	741	370	370	122	65	57	123	58	65	Average
Day Care Center	565	10	1000 SF GFA	35	50%	50%	4.43	53%	47%	2.66	47%	53%	350	175	175	44	23	21	27	13	14	Minimum
Day Care Center	565	10	1000 SF GFA	126.07	50%	50%	34.92	53%	47%	33.66	47%	53%	1,261	630	630	349	185	164	337	158	178	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Day Care Center	565	10	1000 SF GLA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Equation

Day Care Center	Standard Deviation	24.53		6.4		6.93
	Number of Studies	7		67		68
	Average Size	5		4		4

C-1 Zoning Use

934-Fast-Food Restaurant with Drive-Through Window

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	496.12	50%	50%	45.42	51%	49%	32.65	52%	48%	1,488	744	744	136	69	67	98	51	47	Average
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	195.98	50%	50%	1.02	51%	49%	7.96	52%	48%	588	294	294	3	2	1	24	12	11	Minimum
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	1132.92	50%	50%	163.33	51%	49%	117.15	52%	48%	3,399	1699	1699	490	250	240	351	183	169	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Equation

Fast-Food Restaurant with Drive-Through Window	Standard Deviation	242.52		28.63		19.73
	Number of Studies	21		75		132
	Average Size	3		4		3

820-Shopping Center

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Shopping Center	820	82.5	1000 SF GFA	42.7	50%	50%	0.96	62%	38%	3.71	48%	52%	3,523	1762	1762	79	49	30	306	147	159	Average
Shopping Center	820	82.5	1000 SF GFA	12.5	50%	50%	0.1	62%	38%	0.68	48%	52%	1,031	516	516	8	5	3	56	27	29	Minimum
Shopping Center	820	82.5	1000 SF GFA	270.89	50%	50%	9.05	62%	38%	29.27	48%	52%	22,352	11176	11176	747	463	284	2,415	1159	1256	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Shopping Center	820	82.5	1000 SF GFA	Ln(T)=0.65Ln(X)+5.83	50%	50%	Ln(T)=0.61Ln(X)+2.24	62%	38%	Ln(T)=0.67Ln(X)+3.31	48%	52%	5,994	2,997	2,997	139	86	53	527	253	274	Equation

Shopping Center	Standard Deviation	21.25		1.31		2.74
	Number of Studies	302		104		426
	Average Size	331		310		376

534-Private School (K-8)

Land Use	ITE Code	Qty	Unit	Weekday*			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Private School (K-8)	534	70	1000 SF GLA	15.43	50%	50%	11.59	55%	45%	6.53	49%	51%	1,080	540	540	811	446	365	457	224	233	Average
Private School (K-8)	534	70	1000 SF GLA	4.69	50%	50%	6.92	55%	45%	4.17	49%	51%	328	164	164	484	266	218	292	143	149	Minimum
Private School (K-8)	534	70	1000 SF GLA	30.15	50%	50%	20.65	55%	45%	9	49%	51%	2,111	1055	1055	1,446	795	650	630	309	321	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Private School (K-8)	534	70	1000 SF GLA	N/A	N/A	N/A	T=9.23(X)+58.83	55%	45%	N/A	N/A	N/A	N/A	N/A	N/A	705	388	317	N/A	N/A	N/A	Equation

Private School (K-8)	Standard Deviation	N/A		5.53		2.74
	Number of Studies	N/A		4		3
	Average Size	N/A		25		28

*Weekday rate from Lane Use 520 Elementary School used for for Weekday calculations

536-Private School (K-12)

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Private School (K-12)	536	685	Students	2.48	50%	50%	0.81	61%	39%	0.17	42%	58%	1,699	849	849	555	338	216	116	49	68	Average
Private School (K-12)	536	685	Students	1.74	50%	50%	0.52	61%	39%	0.13	42%	58%	1,192	596	596	356	217	139	89	37	52	Minimum
Private School (K-12)	536	685	Students	3.12	50%	50%	0.96	61%	39%	0.13	42%	58%	2,137	1069	1069	658	401	256	89	37	52	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Private School (K-12)	536	685	Students	N/A	0.5	0.5	T=0.77(X)+19.92	61%	39%	T=0.43(X)+79.59	0.42	0.58	N/A	N/A	N/A	620	378	242	413.15	174	239.15	Equation

Private School (K-12)	Standard Deviation	*		0.91		0.77
	Number of Studies	2		5		4
	Average Size	537		460		506

J2 Engineering and Environmental Design, LLC
4649 E. Cotton Gin Loop
Suite B2
Phoenix, Arizona 85040
Phone: 602.438.2221
Fax: 602.438.2225

To: George Bell
Land Research & Development, Inc.

Date: June 19, 2017

From: Jamie Blakeman, PE, PTOE

Job Number: 17.1033.001

RE: Shea Self Storage
Traffic Impact & Mitigation Analysis

Location: Approx. 300' east of 116th St. south of Shea Blvd.

Registered Professional Engineer (Civil)
CERTIFICATE NO.
40961
JAMIE ANN K.
BLAKEMAN
Date Signed 6.19.17
ARIZONA, U.S.A.
EXPIRES 6-30-19

INTRODUCTION

J2 Engineering and Environmental Design (J2) has prepared a Traffic Impact and Mitigation Analysis for the proposed Shea Self Storage development, located approximately 300 feet east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona. See **Figure 1** for a vicinity map.

The proposed development will be comprised of an approximately 105,864 square foot building with a net leasable area of 79,398 square feet intended for 700 storage units. See **Attachment A** and **Figure 2** for the site map.

The objective of this Traffic Impact and Mitigation Analysis is to analyze the traffic related impacts of the proposed development to the adjacent roadway network.

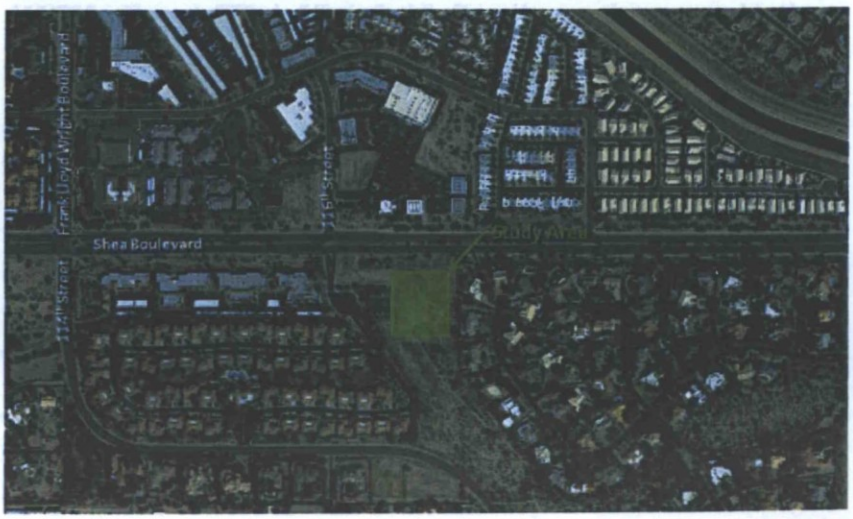


Figure 1- Vicinity Map

9-ZN-2017
6/20/2017

EXISTING CONDITIONS

This parcel is currently undeveloped land, and is currently zoned for S-R developments. Shea Boulevard borders the property to the north. Directly east of the property is a residential community. The main buildings for the Mirage Crossing Office Condominiums, an office and residential development, are located west of 116th Street. A parking lot also serving the Mirage Crossing Office Condominiums is located to the east of 116th Street just west of the proposed Shea Self Storage. Immediately south of the proposed development is currently undeveloped land.

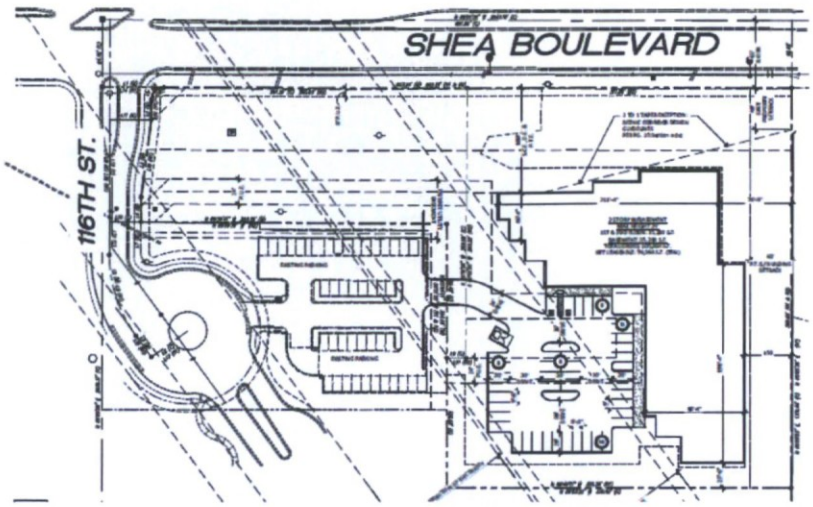


Figure 2- Site Map

STUDY ROADWAY SEGMENTS

Shea Boulevard is an east-west roadway within the vicinity of the proposed development. Shea Boulevard provides three (3) lanes for each direction of travel, with a raised center median. At the intersection with 116th Street, Shea Boulevard provides dedicated left and right turn lanes for both directions of travel. The access at the intersection is limited to left-in, right-in and right-out. The 2014 Average Daily Traffic (ADT) volume along Shea Boulevard from Frank Lloyd Wright Boulevard/114th Street to 124th Street is 39,000 vehicles per day. The 2016 City of Scottsdale *Transportation Master Plan* categorizes Shea Boulevard as a major arterial. There is a posted speed limit of 50 mph within the vicinity area.

Frank Lloyd Wright Boulevard/114th Street is a north-south roadway within the vicinity of the proposed development. North of Shea Boulevard, Frank Lloyd Wright Boulevard provides two (2) lanes for each direction of travel, with a raised center median. South of Shea Boulevard, 114th Street provides one (1) lane for each direction of travel with a two-way left turn lane. The 2014 Average Daily Traffic (ADT) volume along Frank Lloyd Wright Boulevard from Shea Boulevard to Via Linda is 21,500 vehicles per day, 114th Street between Shea Boulevard and Mountain View Road is 3,000 vehicles per day. The 2016 City of Scottsdale *Transportation Master Plan* categorizes Frank Lloyd Wright Boulevard as a minor arterial, with 114th Street classified as a minor collector. There is a posted speed limit of 40 mph north of Shea Boulevard, and 30 mph south of Shea Boulevard.

116th Street is a north-south roadway within the vicinity of the proposed development. 116th Street provides one (1) lane for each direction of travel. There is a posted speed limit of 25 mph.

PROPOSED DEVELOPMENT

The proposed Shea Self Storage development will be comprised of a two (2) story building, with a basement. The site will be located approximately 300 feet east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona.

The proposed site plan indicates that this development will be one (1) access point. The single access point will be through the existing Mirage Crossing Office Condominiums parking lot.

TRIP GENERATION (EXISTING ZONING)

The existing parcel is currently zoned for S-R land uses. The trip generation for the existing S-R zoning was calculated utilizing the Institute of Transportation Engineers (ITE) publication entitled *Trip Generation Manual, 9th Edition*. This publication is considered the standard for the transportation engineering profession. The ITE trip rates and equations are based on studies that measured the trip generation characteristics for various types of land uses. The rates and equations are expressed in terms of trips per unit of land use type.

According to the City of Scottsdale Code of Ordinances, the S-R Service Residential zoning is intended primarily to provide offices of a residential scale and character, to serve nearby neighborhoods; and secondarily, to offer medium density residential land uses. Therefore an office was assumed on this site for the S-R zoning.

As shown on the site plan, the net site area is 165,029 square feet. It is reasonable to expect a development with a floor area ratio (FAR) of 0.50 on this site. Therefore, an 82,515 square foot office building (S-R zoning) was assumed. The trip generation was calculated utilizing the ITE Land Use 710 General Office Building. See **Table 1** below. See **Attachment B** for detailed trip generation calculations.

Table 1 – Trip Generation for S-R Land Use (82,515 sf Office)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	82.5	1000 SF GFA	910	129	113	15	123	21	102

An additional use allowed under S-R zoning is day care centers. The Tutor Time of Scottsdale located at 11350 E. Via Linda less than a mile northwest of the proposed site is a 10,000 square foot building, and The Goddard School located at 13940 N. Frank Lloyd Wright Boulevard less than three miles northwest of the proposed site is a 7,500 square foot building. Therefore, as a conservative estimate, a 10,000 square foot day care center was assumed. The trip generation was calculated utilizing the ITE Land Use 565 Day Care Center. See **Table 2** below. See **Attachment B** for detailed trip generation calculations.

Table 2 – Trip Generation for S-R Land Use (10,000 sf Day Care Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Day Care Center	565	10	1000 SF GFA	741	122	65	57	123	58	65

TRIP GENERATION (PROPOSED ZONING)

It has been requested that the parcel be rezoned from S-R zoning to C-1 zoning. According to the City of Scottsdale Code of Ordinances, the C-1 Neighborhood Commercial zoning is intended to provide a center for convenience shopping and services for nearby neighborhoods. The district provides for small business retail and service establishments which supply commodities and services to meet the daily needs of the community.

For the purposes of this report, the trip generation for two C-1 uses were calculated, the first one for a fast-food restaurant with a drive-through window, and the second for a shopping center.

The fast-food restaurant with a drive-through window was assumed to be 3,000 square feet, which is a typical size for this type of use. The trip generation was calculated utilizing the ITE Land Use 934 Fast-Food Restaurant with Drive-Through Window. See **Table 3** below. See **Attachment B** for detailed trip generation calculations.

Table 3 – Trip Generation for C-1 Land Use (3,000 sf Fast-Food w/Drive-Thru)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	1,488	136	69	67	98	51	47

Utilizing a reasonable FAR of 0.50, an 82,515 square foot shopping center was assumed. The trip generation was calculated utilizing the ITE Land Use 820 Shopping Center. See **Table 4** below. See **Attachment B** for detailed trip generation calculations.

Table 4 – Trip Generation for C-1 Land Use (82,515 sf Shopping Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Shopping Center	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159

TRIP GENERATION (PROPOSED DEVELOPMENT)

The proposed self storage development will be comprised of a 105,864 square foot building, with a net leasable area of 79,398 square feet intended for 700 storage units. See **Figure 2**.The proposed development trip generation was calculated utilizing the ITE Land Use 151 Mini-Warehouse. See **Table 5** below. See **Attachment B** for detailed trip generation calculations.

Table 5 – Trip Generation for the Proposed Development (105,864 sf GLA/79,398 sf NRA Self Storage)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Mini-Warehouse	151	79.4	1000 SF NRA	131	9	5	4	15	8	7
			Total	131	9	5	4	15	8	7

TRIP GENERATION COMPARISON

The trips generated by a 82,515 square foot office building, and a 10,000 square foot day care center under the existing S-R zoning were calculated. The 82,515 square foot office generates more than the 10,000 square foot day care center. For the proposed C-1 zoning, the trips generated by a 3,000 square foot fast-food restaurant with drive-through window, and a 82,515 square foot shopping development were calculated. While the 3,000 square foot fast-food restaurant with drive-through window generates more AM peak hour trips, the 82,515 square foot shopping center generates more daily and PM peak hour trips. Therefore, a comparison between the trips generated by a 82,515 square foot office (existing S-R zoning) versus a 82,515 square foot shopping center (proposed C-1 zoning) was calculated and is shown in **Table 6**.

Table 6 - Trip Generation Comparison
Existing S-R Zoning (Office) vs. Proposed C-1 Zoning (Shopping Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Existing S-R Zoning (Office)	710	82.5	1000 SF GFA	910	129	113	15	123	21	102
Proposed C-1 (Shopping Center)	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159
			Difference	-2,613	50	64	-15	-183	-126	-57

Selecting the higher trip generation of the two existing zoning land uses, as well as the higher trip generation of the two proposed zoning land uses, results in the proposed zoning with the potential to generate 2,613 additional daily trips, 50 less AM peak hour trips and 183 more PM peak hour trips.

SUMMARY

The proposed development of the Shea Self Storage consisting of a 105,864 square foot building with a net leasable area of 79,398 square feet intended for 700 storage units. Shea Self Storage will be located approximately 300 feet east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona. The proposed development is anticipated to generate a total of 131 weekday trips with 9 and 15 occurring during the AM and PM peak hours, respectively.

Existing S-R Zoning

The trip generation for two potential S-R land uses were calculated, this includes an 82,515 square foot office and a 10,000 square foot day care center. The office generates more trips with 910 weekday trips with 129 and 123 occurring during the AM and PM peak hours, respectively.

Proposed C-1 Zoning

The trip generation for two potential C-1 land uses were calculated, this includes a 3,000 square foot fast-food restaurant with drive-through window generates and a 82,515 square foot shopping center.

While the 3,000 square foot fast-food restaurant with drive-through window generates more AM peak hour trips, the 82,515 square foot shopping center generates more daily and PM peak hour trips. The shopping center generates 3,523 weekday trips with 79 and 306 occurring during the AM and PM peak hours, respectively.

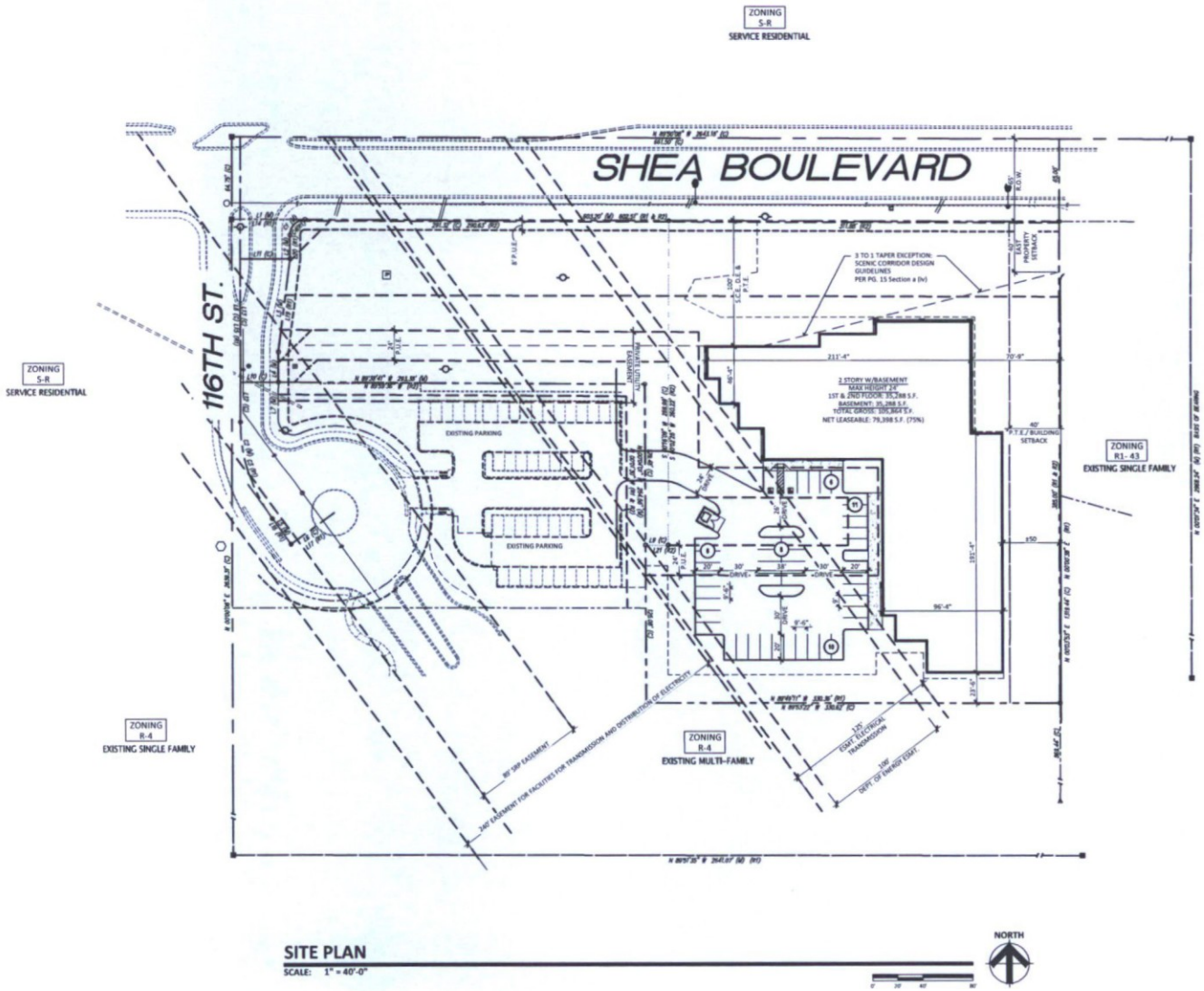
The five trip generation calculations are shown in **Table 7**. The proposed self storage development generates significantly less trips than the existing S-R zoning as an office or day care center, as well as the proposed C-1 zoning as a fast-food restaurant with drive-through window or shopping center. Based on the four uses selected, the proposed C-1 zoning has the potential to generate more weekday daily trips. However, the AM and PM peak hours appears to be similar when comparing potential S-R and C-1 land uses with the exception of the PM peak hour for a shopping center.

Table 7 - Trip Generation Calculation Summary

Land Use		ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
					Total	Total	In	Out	Total	In	Out
Existing S-R Zoning	Office	710	82.5	1000 SF GFA	910	129	113	15	123	21	102
	Day Care Center	565	10	1000 SF GFA	741	122	65	57	123	58	65
Proposed C-1 Zoning	Fast-Food w/Drive-Thru	934	3	1000 SF GFA	1,488	136	69	67	98	51	47
	Shopping Center	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159
Proposed Development	Self Storage	151	79	1000 SF NRA	131	9	5	4	15	8	7

The location of the proposed site provides direct access to Shea Boulevard through the use of 116th Street. The 2014 ADT along Shea Boulevard from Frank Lloyd Wright Boulevard/114th Street to 124th Street is 39,000 vehicles per day. It is assumed that all trips for the proposed Shea Self Storage development will access the site via Shea Boulevard. Therefore, the weekday volume along Shea Boulevard will increase by 131 vehicles per day. This is an approximate increase of 0.34% in average weekday traffic along Shea Boulevard. **Therefore, the proposed Shea Self Storage development will have minimal impacts to the traffic operations along the surrounding roadway network.**

Attachment A
Proposed Site Plan



SITE PLAN

SCALE: 1" = 40'-0"

PROJECT DIRECTORY

DEVELOPER:
THE BELL GROUP, LLC
18061 N. 99TH STREET
SCOTTSDALE, ARIZONA 85255
CONTACT: GEORGE H. BELL
PHONE: (480) 538-5474
E-MAIL: ghbell@landrd.com

ARCHITECT:
ROBERT KUBICEK ARCHITECTS & ASSOCIATES
2233 EAST THOMAS ROAD
PHOENIX, ARIZONA 85016
CONTACT: ROBERT KUBICEK / EDGAR FELIX
PHONE: (602) 955-3900
FAX: (602) 955-0496
E-MAIL: rkubicek@rkaa.com / efelix@rkaa.com

SITE DATA

EXISTING ZONING:	SR REZONE TO C-1
GROSS SITE AREA:	4.60 ACRES (200,492 S.F.)
NET SITE AREA:	3.78 ACRES (165,029 S.F.)
PROPOSED USE:	INTERNALIZED COMMUNITY STORAGE
MAX BUILDING HEIGHT:	24 FEET
BUILDING AREA (2-STORY W/BSMT.):	105,864 S.F.
SITE COVERAGE:	22%
FAR (0.8 MAX):	132,023 S.F. ALLOWED 70,576 S.F. PROVIDED
OPEN SPACE/LANDSCAPE	(104,463 S.F.) 63%
TOTAL PARKING REQUIRED:	43 SPACES
STORAGE (105,864 S.F.) INTERNALIZED COMMUNITY STORAGE @ 1/2500 = 43 SPACES	
TOTAL PARKING PROVIDED:	43 SPACES
ACCESSIBLE SPACES REQUIRED:	2 SPACES
ACCESSIBLE SPACES PROVIDED:	2 SPACES

STORAGE AT SHEA (CONCEPTUAL)

SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 06-14-2017 (PRELIMINARY)

SP-1

RKAA# 17120.5

RKAA ARCHITECTS, INC

Attachment B
Trip Generation

Self Storage
Land Research & Development, Inc.
engineering and environmental design

Completed JKR 6/1/2017
Checked GT 6/1/2017

Trip Generation Calculations

Self Storage - Net Rentable Area

151-Mini-Warehouse

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Mini-Warehouse	151	79.4	1000 SF NRA	1.65	50%	50%	0.11	52%	48%	0.19	53%	47%	131	66	65	9	5	4	15	8	7	Average
Mini-Warehouse	151	79.4	1000 SF NRA	1.19	50%	50%	0.04	52%	48%	0.11	53%	47%	94	47	47	3	2	1	9	5	4	Minimum
Mini-Warehouse	151	79.4	1000 SF NRA	2.17	50%	50%	0.19	52%	48%	0.64	53%	47%	172	86	86	15	8	7	51	27	24	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Mini-Warehouse	151	79.4	1000 SF NRA	N/A	N/A	N/A	T-0.14(X) - 2.06	52%	48%	N/A	N/A	N/A	N/A	N/A	N/A	9	5	4	N/A	N/A	N/A	Equation

Mini-Warehouse	Standard Deviation	1.34	0.34	0.45	
	Number of Studies	4	7	7	
	Average Size	114	85	85	

Mini-warehouses are buildings in which a number of storage units or vaults are rented for the storage of goods. They are typically referred to as "self-storage" facilities. Each unit is physically separated from other units, and access is usually provided through an overhead door or other common access point.

S-R Zoning Use

710-General Office Building

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
General Office Building	710	82.5	1000 SF GFA	11.03	50%	50%	1.56	88%	12%	1.49	17%	83%	910	455	455	129	113	15	123	21	102	Average
General Office Building	710	82.5	1000 SF GFA	3.58	50%	50%	0.6	88%	12%	0.49	17%	83%	295	148	148	50	44	6	40	7	34	Minimum
General Office Building	710	82.5	1000 SF GFA	28.80	50%	50%	5.98	88%	12%	6.39	17%	83%	2,376	1188	1188	493	434	59	527	90	438	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
General Office Building	710	82.5	1000 SF GFA	Ln(T)=0.76Ln(X)+3.68	50%	50%	Ln(T)=0.80Ln(X)+1.57	88%	12%	T=1.12(X)+78.45	17%	83%	1,134	567	567	164	144	20	171	29	142	Equation

General Office Building	Standard Deviation	6.15	1.4	1.37	
	Number of Studies	79	218	236	
	Average Size	197	222	215	

565-Day Care Center

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Day Care Center	565	10	1000 SF GFA	74.06	50%	50%	12.18	53%	47%	12.34	47%	53%	741	370	370	122	65	57	123	58	65	Average
Day Care Center	565	10	1000 SF GFA	35	50%	50%	4.43	53%	47%	2.66	47%	53%	350	175	175	44	23	21	27	13	14	Minimum
Day Care Center	565	10	1000 SF GFA	126.07	50%	50%	34.92	53%	47%	33.66	47%	53%	1,261	630	630	349	185	164	337	158	178	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Day Care Center	565	10	1000 SF GLA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Equation

Day Care Center	Standard Deviation	24.53	6.4	6.93	
	Number of Studies	7	67	68	
	Average Size	5	4	4	

C-1 Zoning Use

934-Fast-Food Restaurant with Drive-Through Window

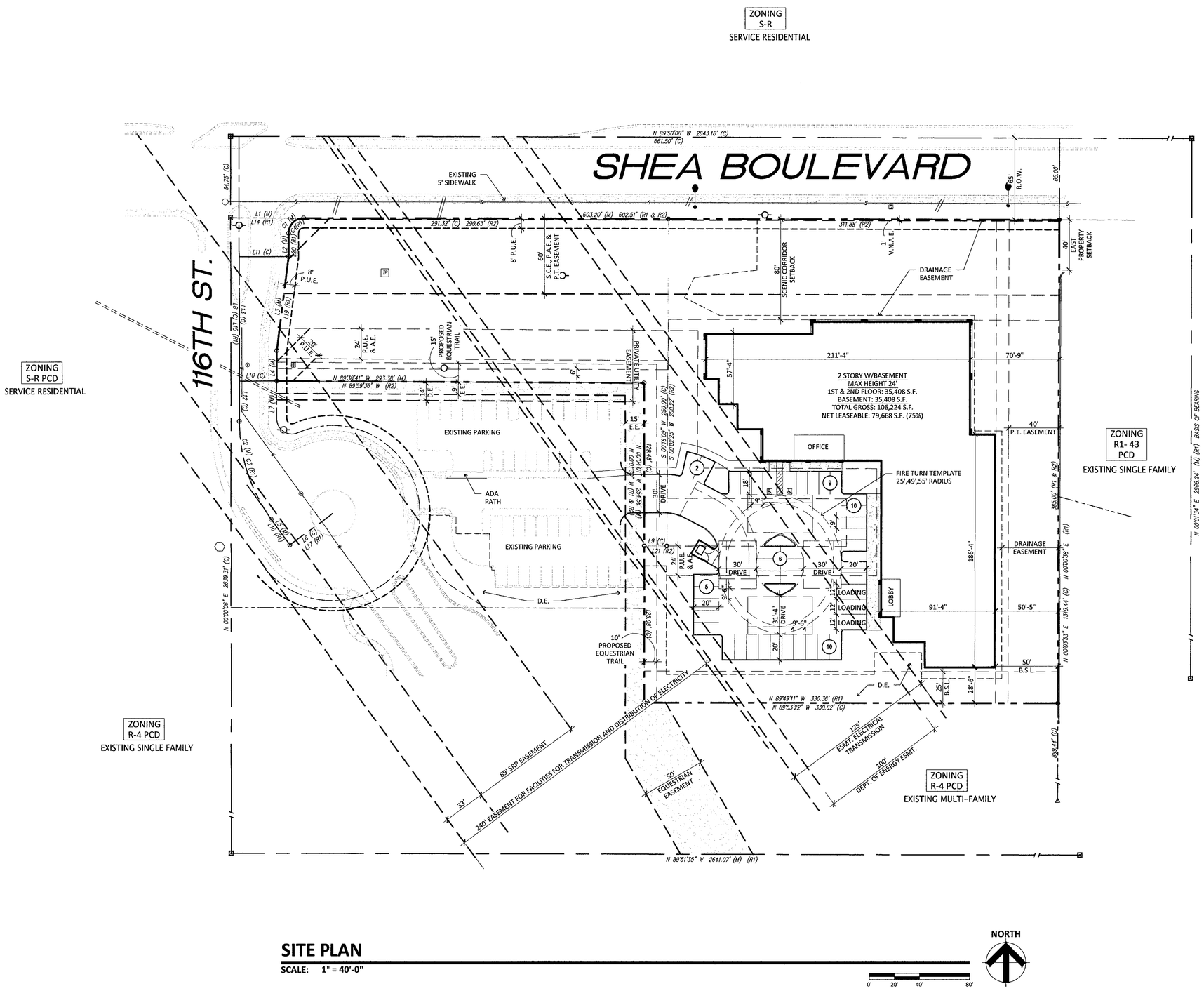
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	496.12	50%	50%	45.42	51%	49%	32.65	52%	48%	1,488	744	744	136	69	67	98	51	47	Average
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	195.98	50%	50%	1.02	51%	49%	7.96	52%	48%	588	294	294	3	2	1	24	12	11	Minimum
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	1132.92	50%	50%	163.33	51%	49%	117.15	52%	48%	3,399	1699	1699	490	250	240	351	183	169	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Equation

Fast-Food Restaurant with Drive-Through Window	Standard Deviation	242.52		28.63		19.73
	Number of Studies	21		75		132
	Average Size	3		4		3

820-Shopping Center

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Shopping Center	820	82.5	1000 SF GFA	42.7	50%	50%	0.96	62%	38%	3.71	48%	52%	3,523	1762	1762	79	49	30	306	147	159	Average
Shopping Center	820	82.5	1000 SF GFA	12.5	50%	50%	0.1	62%	38%	0.68	48%	52%	1,031	516	516	8	5	3	56	27	29	Minimum
Shopping Center	820	82.5	1000 SF GFA	270.89	50%	50%	9.05	62%	38%	29.27	48%	52%	22,352	11176	11176	747	463	284	2,415	1159	1256	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Shopping Center	820	82.5	1000 SF GFA	Ln(T)=0.65Ln(X)+5.83	50%	50%	Ln(T)=0.61Ln(X)+2.24	62%	38%	Ln(T)=0.67Ln(X)+3.31	48%	52%	5,994	2,997	2,997	139	86	53	527	253	274	Equation

Shopping Center	Standard Deviation	21.25		1.31		2.74
	Number of Studies	302		104		426
	Average Size	331		310		376



SITE PLAN

SCALE: 1" = 40'-0"

NORTH

0' 20' 40' 80'

PROJECT DIRECTORY

DEVELOPER:
THE BELL GROUP, LLC
18061 N. 99TH STREET
SCOTTSDALE, ARIZONA 85255
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ARCHITECT:
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2233 EAST THOMAS ROAD
PHOENIX, ARIZONA 85016
CONTACT: ROBERT KUBICEK / EDGAR FELIX
PHONE: (602) 955-3900
FAX: (602) 955-0496
E-MAIL: rkubicek@rkaa.com / efelix@rkaa.com

SITE DATA

EXISTING ZONING:	SR- PCD REZONE TO C-1
GROSS SITE AREA:	4.60 ACRES (200,492 S.F.)
NET SITE AREA:	3.78 ACRES (165,030 S.F.)
PROPOSED USE:	INTERNALIZED COMMUNITY STORAGE
MAX BUILDING HEIGHT:	24 FEET
BUILDING AREA (2-STORY W/BSMT.):	106,224 S.F.
SITE COVERAGE:	22%
FAR (0.8 MAX):	132,023 S.F. ALLOWED 70,816 S.F. PROVIDED
OPEN SPACE/LANDSCAPE	(107,382 S.F.) 65%
TOTAL PARKING REQUIRED:	42 SPACES
STORAGE (106,224 S.F.) INTERNALIZED COMMUNITY STORAGE @ 1/2500 = 42 SPACES	
TOTAL PARKING PROVIDED:	42 SPACES
ACCESSIBLE SPACES REQUIRED:	2 SPACES
ACCESSIBLE SPACES PROVIDED:	2 SPACES

Site Plan
Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona
By: Patrick Rackman
Date: 09/07/2017

9-ZN-2017
08/28/17

STORAGE AT SHEA (CONCEPTUAL)

SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-28-2017 (PRELIMINARY)

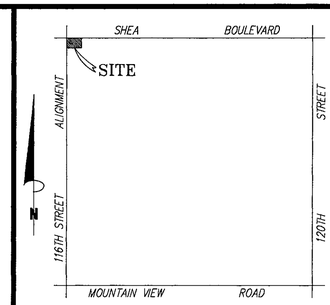
SP-1

RKAA# 17120.5

RKAA ARCHITECTS, INC

ALTA/ACSM LAND TITLE SURVEY

LOT 1, MIRAGE CROSSING, PARCEL A1–A4, CONDOMINIUM RE–PLAT & A PORTION OF THE NORTHEAST QUARTER, SECTION 27, TOWNSHIP 3 NORTH, RANGE 5 EAST, GILA & SALT RIVER BASE & MERIDIAN, MARICOPA COUNTY, ARIZONA.



VICINITY MAP
NOT TO SCALE

PROPERTY DESCRIPTION

A PORTION OF THE NORTHEAST QUARTER OF SECTION 27, TOWNSHIP 3 NORTH, RANGE 5 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHWEST COMER OF THE NORTHEAST QUARTER OF SAID SECTION 27; THENCE SOUTH 89 DEGREES 49 MINUTES 11 SECONDS EAST ALONG THE NORTH LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 660.74 FEET, SAID POINT BEING THE NORTHEAST COMER OF THE WEST HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 27, AND ALSO THE NORTHWEST COMER OF MONTANA RANCH, AS RECORDED IN BOOK 290 OF MAPS, PAGE 8, RECORDS OF MARICOPA COUNTY, ARIZONA; THENCE SOUTH 00 DEGREES 03 MINUTES 07 SECONDS WEST ALONG THE WEST LINE OF SAID MONTANA RANCH, A DISTANCE OF 450.00 FEET; THENCE NORTH 89 DEGREES 49 MINUTES 11 SECONDS WEST TO THE EAST LINE OF THE WEST HALF OF THE WEST HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 27, A DISTANCE OF 330.34 FEET; THENCE NORTH 00 DEGREES 02 MINUTES 53 SECONDS EAST ALONG SAID EAST LINE A DISTANCE OF 255.00 FEET; THENCE NORTH 89 DEGREES 49 MINUTES 11 SECONDS WEST TO THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 27, A DISTANCE OF 330.36 FEET; THENCE NORTH 00 DEGREES 02 MINUTES 39 SECONDS EAST ALONG SAID WEST LINE A DISTANCE OF 195.00 FEET TO THE POINT OF BEGINNING.
APN: 217–33–004C, 217–33–985

TITLE REFERENCE

THIS SURVEY IS BASED UPON THE TITLE COMMITMENT PREPARED BY PLACER TITLE COMPANY NO. A–100612

ARIZONA SURVEYORS, INC. HAS RELIED SOLELY UPON THE INFORMATION CONTAINED WITHIN THE TITLE COMMITMENT AND SCHEDULE B DOCUMENTS PROVIDED BY FIRST AMERICAN TITLE INSURANCE COMPANY AS LISTED HEREON. ARIZONA SURVEYORS, INC AND JOHN M. WARE (RLS) MAKE NO STATEMENT AS TO THE ACCURACY OR COMPLETENESS OF THE SUBJECT REPORT.

SUPPORTING DOCUMENTS

232–39 MCR

290–08 MCR

521–12 MCR

585–15 MCR

752–33 MCR

806–49 MCR (R1)

1043–33 MCR

1045–8 MCR (R2)

MONUMENT NOTES

1) FOUND 1/2" REBAR W/CAP RLS 16097
.03' NORTH RIGHT OF WAY LINE
HELD FOR COMMON LINE THIS SURVEY
AND 290–08 MCR.

2) FOUND 1/2" REBAR W/CAP RLS 16097
POSINTIONALLY ACCEPTED PER HELD AS SHOWN
ON 290–08 MCR.
HELD FOR COMMON LINE THIS SURVEY
AND 290–08 MCR.

SITE INFORMATION

OWNER: MIRAGE CROSSING OFFICE, LLC.

APN: 217–33–985

SITE ADDRESS: 10105 NORTH 116TH STREET SCOTTSDALE, ARIZONA 85259

AREA THIS SURVEY: 122,602 SQUARE FEET +/–

APN: 217–33–004C

SITE ADDRESS: NA

AREA THIS SURVEY: 42,428 SQUARE FEET +/–

QS: 28–56

ZONING: S–R PCD

BENCHMARK

GPS POINT: 8272

E/W STREET ALIGNMENT: SHEA BOULEVARD
N/S STREET ALIGNMENT: 120TH STREET

DESCRIPTION: CITY OF SCOTTSDALE BRASS CAP IN HAND HOLE

ELEVATION: 1516.98' (NAVD '88)

PROVIDED BY THE CITY OF SCOTTSDALE

BASIS OF BEARING

EAST LINE, NE. COR. SEC. 27, T3N, R5E
BEARING SOUTH 01° 34' WEST AND IS IDENTICAL TO THAT SHOWN ON 806–49 MCR. BASED UPON SHOWN FOUND MONUMENTS.

SCHEDULE "B" – EXCEPTIONS ⬡

8. EASEMENTS, RESTRICTIONS, RESERVATIONS, CONDITIONS, SET BACK LINES AND ALL OTHER MATTERS AS SET FORTH ON THE PLAT OF MIRAGE CROSSING OFFICE II MINOR SUBDIVISION FINAL PLAT, RECORDED IN BOOK 1045 OF MAPS, PAGE 8, BUT DELETING ANY COVENANT, CONDITION OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS OR NATIONAL ORIGIN.
9. EASEMENTS, RESTRICTIONS, RESERVATIONS, CONDITIONS, SET BACK LINES AND ALL OTHER MATTERS AS SET FORTH ON THE PLAT OF MIRAGE CROSSING PARCEL A1–A4 CONDOMINIUM REPLAT, RECORDED IN BOOK 1043 OF MAPS, PAGE 33, BUT DELETING ANY COVENANT, CONDITION OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS OR NATIONAL ORIGIN.
10. EASEMENTS, RESTRICTIONS, RESERVATIONS, CONDITIONS, SET BACK LINES AND ALL OTHER MATTERS AS SET FORTH ON THE PLAT OF REPLAT AND 1ST AMENDMENT MIRAGE CROSSING PARCEL A1–A4 CONDOMINIUM PLAT, RECORDED IN BOOK 806 OF MAPS, PAGE 49, AND THEREAFTER AFFIDAVITS OF CORRECTION RECORDED IN DOCUMENT NO. 2006–213519; DOCUMENT NO. 2006–310914 AND DOCUMENT NO. 2006–639353, BUT DELETING ANY COVENANT, CONDITION OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS OR NATIONAL ORIGIN.
11. EASEMENTS, RESTRICTIONS, RESERVATIONS, CONDITIONS, SET BACK LINES AND ALL OTHER MATTERS AS SET FORTH ON THE PLAT OF FINAL PLAT OF MIRAGE CROSSING, RECORDED IN BOOK 521 OF MAPS, PAGE 12, BUT DELETING ANY COVENANT, CONDITION OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS OR NATIONAL ORIGIN.
12. 13.EASEMENTS, RESTRICTIONS, RESERVATIONS, CONDITIONS, SET BACK LINES AND ALL OTHER MATTERS AS SET FORTH ON THE PLAT OF DEDICATION PLAT FOR SCOTTSDALE EQUESTRIAN CENTER, RECORDED IN BOOK 232 OF MAPS, PAGE 39, BUT DELETING ANY COVENANT, CONDITION OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS OR NATIONAL ORIGIN.
13. EASEMENT FOR ELECTRIC TRANSMISSION LINES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 388, PAGE 27, AND THEREAFTER AMENDED IN DOCKET 399, PAGE 474.
14. EASEMENT FOR ELECTRIC TRANSMISSION LINES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 388, PAGE 27, AND THEREAFTER AMENDED IN DOCKET 399, PAGE 474.
15. EASEMENT FOR ELECTRIC TRANSMISSION LINES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 394, PAGE 396.
16. EASEMENT FOR ELECTRIC TRANSMISSION LINES AND COMMUNICATION FACILITIES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 4235, PAGE 445, AND THEREAFTER CORRECTED IN DOCKET 4424, PGE 435.
17. EASEMENT FOR ELECTRIC TRANSMISSION LINES AND COMMUNICATION FACILITIES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCKET 4333, PAGE 256.
25. EASEMENT FOR PUBLIC UTILITIES AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCUMENT NO. 2000–231331.
27. EASEMENT FOR DRAINAGE AND FLOOD CONTROL AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCUMENT NO. 2001–308834.
30. EASEMENT FOR DRAINAGE AND FLOOD CONTROL AND RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT RECORDED IN DOCUMENT NO. 2007–657698.

CURVE	RADIUS	ARC LENGTH	DELTA ANGLE
C1	12.05'	18.97'	90°12'23"
C2	132.50'	83.35'	36°02'38"
C3	132.50'	83.42'	36°04'14"
C4	12.00'	18.81'	89°48'18"

LINE	BEARING	DISTANCE
L1	N 89°35'33" W	58.24'
L2	N 00°01'44" E	18.46'
L3	N 07°18'00" E	75.47'
L4	S 00°02'23" W	24.18'
L5	S 36°01'44" E	25.16'
L6	N 54°02'29" E	42.50'
L7	N 00°02'23" E	30.07'
L8	N 00°00'53" W	226.84'
L9	N 89°52'24" W	18.10'
L10	S 89°59'07" W	30.04'
L11	S 89°59'07" W	39.67'
L12	N 00°00'53" W	31.97'
L13	N 00°00'53" W	99.04'
L14	N 89°51'37" W	58.31'
L15	S 00°00'22" E	226.63'
L16	S 36°07'02" E	25.14'
L17	N 53°57'11" E	42.51'
L18	N 00°00'22" W	54.78'
L19	N 07°13'46" E	75.56'
L20	N 00°00'22" W	18.44'
L21	N 90°00'00" E	18.10'

SURVEYORS NOTES

1. MONUMENTS FOUND DURING THIS FIELD SURVEY WERE ACCEPTED UNLESS OTHERWISE NOTED HEREIN.

2. THIS SURVEY WAS CONDUCTED WITH THE BENEFIT OF A TITLE REPORT. THIS SURVEY MAKES NO WARRANTY AS TO THE EXISTENCE OF ANY ADDITIONAL EASEMENTS OF RECORD AND/OR RESTRICTIONS TO AFFECTED PARCELS.

3. IT IS RECOMMENDED THAT THE CLIENT RETAIN LEGAL CONSULTATION TO THOROUGHLY EXAMINE TITLE FOR ANY CLAIMS, DEFECTS OR LIABILITY UNDISCLOSED BY THIS SURVEY.

4. ALL BEARINGS AND DISTANCES SHOWN ARE RECORD PLAT UNLESS OTHERWISE NOTED.

5. DECLARATION IS MADE TO ORIGINAL PURCHASER OF THE SURVEY. IT IS NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.

6. EVERY DOCUMENT OF RECORD REVIEWED AND CONSIDERED AS PART OF THIS SURVEY IS NOTED HEREON. ONLY THE DOCUMENTS NOTED HEREON WERE SUPPLIED TO OR OBTAINED BY THIS SURVEYOR. OTHER DOCUMENTS OF RECORD MAY EXIST WHICH WOULD AFFECT THIS PARCEL.

7. ALL SURFACE AND SUBSURFACE IMPROVEMENTS ON AND ADJACENT TO THIS SUBJECT PARCEL ARE NOT NECESSARILY SHOWN.

8. ALL SURFACE AND SUBSURFACE IMPROVEMENTS ON AND ADJACENT TO THIS SUBJECT PARCEL ARE NOT NECESSARILY SHOWN.

9. A.R.S. 32–151 STATES THAT THE USE OF THE WORD "CERTIFY" OR "CERTIFICATION" BY A PERSON OR FIRM THAT IS REGISTERED OR CERTIFIED BY THE BOARD IS AN EXPRESSION OF PROFESSIONAL OPINION REGARDING FACTS OR FINDINGS THAT ARE SUBJECT OF THE CERTIFICATION AND DOES NOT CONSTITUTE AN EXPRESS OR IMPLIED WARRANTY OR GUARANTEE.

10. THIS FIRM IS LICENSED TO PERFORM SPECIFIC SURVEY TASKS. C.C & R'S, ZONING MATTERS, A.D.A. REQUIREMENTS; LOCAL ORDINANCES, ETC. ARE LEGAL MATTERS AND SHOULD BE REVIEWED BY AN ATTORNEY.

CERTIFICATION

TO: THE BELL GROUP LLC C/O GEORGE H BELL. 18061 N 99TH STREET, SCOTTSDALE, ARIZONA 85255
AND MIRAGE CROSSING OFFICE, LLC.
PO BOX 317 TIBURON CA 94920

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 4, 5, 8, 11 & 13 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON 06/5/2017.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDATION

ARIZONA SURVEYORS, INC.
11445 EAST VIA LINDA SUITE 2-447
SCOTTSDALE, ARIZONA 85259-2638
PHONE - (480) 816-9773 FAX - (480) 816-9735
E-MAIL:
jwazrls@gmail.com
WEBSITE:
www.arizonasurveyors.com

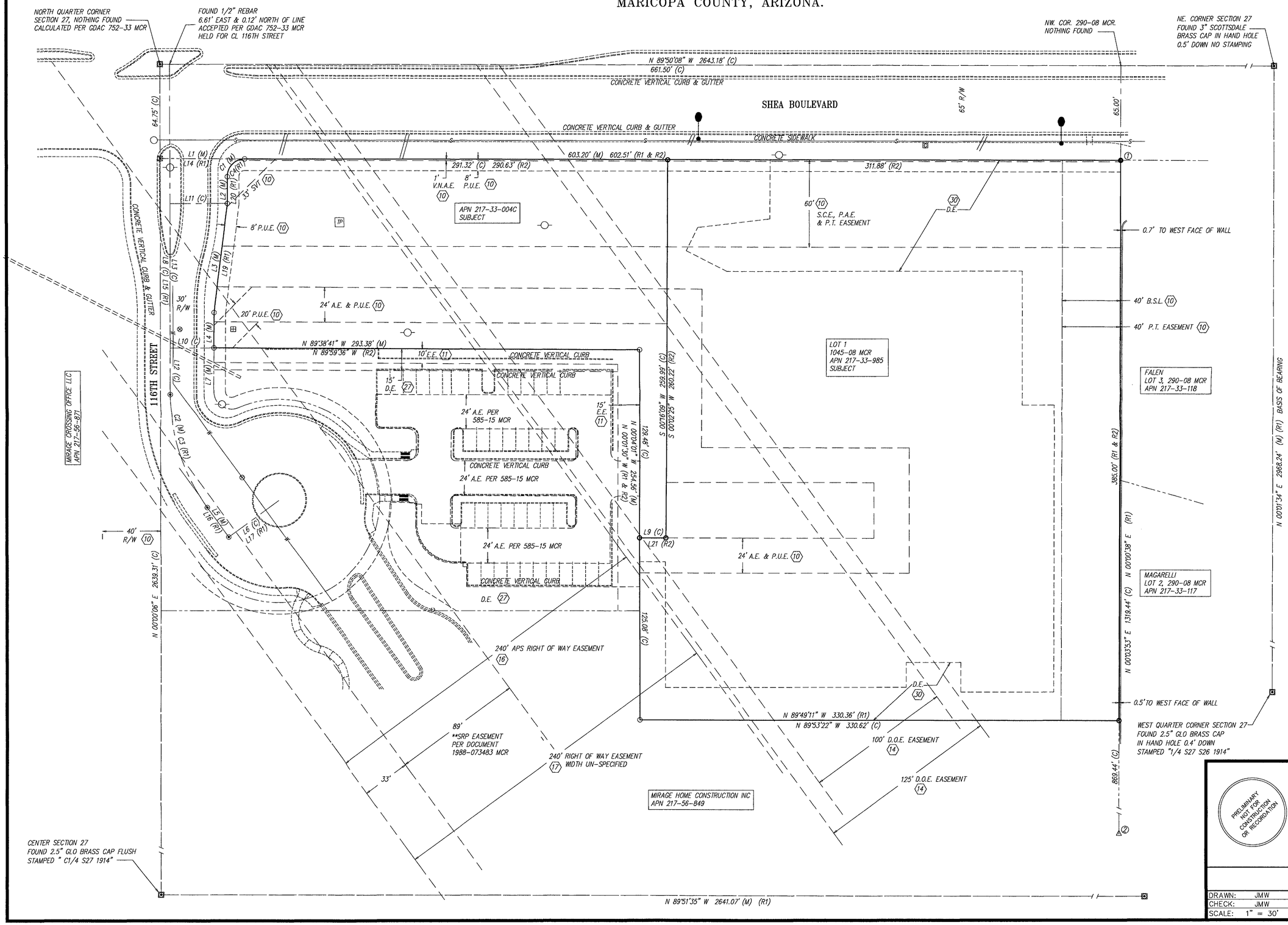
ALTA SURVEY

DRAWN: JMW	JOB NO: BELL	DATE:	06/12/2017
CHECK: JMW	SURVEYOR: JMW		
SCALE: 1" = 30'	SHEET 1 OF 3		

9-ZN-2017
6/20/2017

ALTA/ACSM LAND TITLE SURVEY

LOT 1, MIRAGE CROSSING, PARCEL A1–A4, CONDOMINIUM RE–PLAT & A PORTION OF THE NORTHEAST QUARTER, SECTION 27, TOWNSHIP 3 NORTH, RANGE 5 EAST, GILA & SALT RIVER BASE & MERIDIAN, MARICOPA COUNTY, ARIZONA.



N

30 0 30 40

Scale 1" = 30'

LEGEND:

- SEWER MANHOLE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- GAS LINE MARKER
- TP TRANSFORMER PAD
- POWER POLE
- —s— SEWER LINE PER CITY 1/4 SECTION
- —w— WATER LINE PER CITY 1/4 SECTION
- // PIPE
- EASEMENT LINE
- P.U.E. EASEMENT LINE
- SETBACK LINE
- MONUMENT LINE
- PROPERTY LINE
- ADJOINING LOT LINE
- SECTION LINE

P.U.E.	PUBLIC UTILITY EASEMENT
D.E.	DRAINAGE EASEMENT
D.O.E.	DEPARTMENT OF ENERGY
N.V.A.E.	NON–VEHICULAR ACCESS EASEMENT
A.E.	ACCESS EASEMENT
E.E.	EQUESTRIAN EASEMENT
R/W	RIGHT OF WAY
B.S.L.	BUILDING SETBACK LINE
M.C.R.	MARICOPA COUNTY RECORDER
M.C.A.	MARICOPA COUNTY ASSESSOR
CMU	CONCRETE MASONRY UNIT

- ○ FOUND 1/2" REBAR W/CAP RLS 25395
- ◙ SECTION MONUMENT AS NOTED
- ⊙ FOUND 3" SCOTTSDDALE BRASS CAP FLUSH
- ● FOUND 1/2" REBAR W/CAP RLS 16097
- ○ SET 1/2" REBAR W/CAP RLS 37937
- △ FOUND 1/2" REBAR WITH ILLEDGIBLE CAP
- ⊠ FOUND X ON CURB

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jwazrls@gmail.com
WEBSITE:
www.arizonasurveyors.com

ALTA SURVEY

DRAWN: JMW	JOB NO: BELL	DATE:	06/12/2017
CHECK: JMW	SURVEYOR: JMW		
SCALE: 1" = 30'	SHEET 2 OF 3		

9-ZN-2017
6/20/2017

ALTA/ACSM LAND TITLE SURVEY

LOT 1, MIRAGE CROSSING, PARCEL A1-A4, CONDOMINIUM RE-PLAT & A
PORTION OF THE NORTHEAST QUARTER, SECTION 27, TOWNSHIP 3 NORTH,
RANGE 5 EAST, GILA & SALT RIVER BASE & MERIDIAN,
MARICOPA COUNTY, ARIZONA.

NORTH QUARTER CORNER SECTION 27, NOTHING FOUND CALCULATED PER GDAC 752-33 MCR
FOUND 1/2" REBAR 6.61' EAST & 0.12' NORTH OF LINE ACCEPTED PER GDAC 752-33 MCR HELD FOR CL 116TH STREET
NW. COR. 290-08 MCR. NOTHING FOUND
NE. CORNER SECTION 27 FOUND 3" SCOTTSDALE BRASS CAP IN HAND HOLE 0.5' DOWN NO STAMPING
N 89°50'08" W 2643.18' (C)
661.50' (C)
CONCRETE VERTICAL CURB & GUTTER
SHEA BOULEVARD
CONCRETE SIDEWALK
603.20' (M) 602.51' (R1 & R2)
291.32' (C) 290.63' (R2)
311.88' (R2)
65' R/W
65.00'
0.7' TO WEST FACE OF WALL
APN 217-33-004C SUBJECT
V.N.A.E.
P.U.E.
8' P.U.E.
60' S.C.E. P.A.E. & P.T. EASEMENT
D.E.
24' A.E. & P.U.E.
20' P.U.E.
40' B.S.L.
40' P.T. EASEMENT
N 89°38'41" W 293.38' (M)
N 89°38'36" W (R2)
10' E.E.
CONCRETE VERTICAL CURB
15' D.E.
15' E.E.
24' A.E. PER 585-15 MCR
LOT 1 1045-08 MCR APN 217-33-985 SUBJECT
FALEN LOT 3, 290-08 MCR APN 217-33-118
MAGARELLI LOT 2, 290-08 MCR APN 217-33-117
385.00' (R1 & R2)
N 00°00'38" E (R1)
N 00°03'53" E 1319.44' (C)
N 00°01'34" E 2968.24' (M) (R1) BASIS OF BEARING
S 00°02'25" W 260.22' (R2)
129.48' (C)
125.08' (C)
24' A.E. & P.U.E.
116TH STREET
30' R/W
40' R/W
CONCRETE VERTICAL CURB & GUTTER
MIRAGE CROSSING OFFICE LLC APN 217-56-871
N 00°00'06" E 2639.31' (C)
240' APS RIGHT OF WAY EASEMENT
89' **SRP EASEMENT PER DOCUMENT 1988-073483 MCR
240' RIGHT OF WAY EASEMENT WIDTH UN-SPECIFIED
MIRAGE HOME CONSTRUCTION INC APN 217-56-849
N 89°49'11" W 330.36' (R1)
N 89°53'22" W 330.62' (C)
100' D.O.E. EASEMENT
125' D.O.E. EASEMENT
0.5' TO WEST FACE OF WALL
WEST QUARTER CORNER SECTION 27 FOUND 2.5" GLO BRASS CAP IN HAND HOLE 0.4' DOWN STAMPED "1/4 S27 S26 1914"
869.14' (C)
CENTER SECTION 27 FOUND 2.5" GLO BRASS CAP FLUSH STAMPED " C1/4 S27 1914"
N 89°51'35" W 2641.07' (M) (R1)
N
Scale 1" = 30'

LEGEND:

○	SEWER MANHOLE
	FIRE HYDRANT
⊗	WATER VALVE
⊞	WATER METER
	GAS LINE MARKER
TP	TRANSFORMER PAD
	POWER POLE
—S—	SEWER LINE PER CITY 1/4 SECTION
—W—	WATER LINE PER CITY 1/4 SECTION
//	PIPE
	EASEMENT LINE
	P.U.E. EASEMENT LINE
	SETBACK LINE
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	PROPERTY LINE
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	SECTION LINE
P.U.E.	PUBLIC UTILITY EASEMENT
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○	FOUND 1/2" REBAR W/CAP RLS 25395
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ALTA SURVEY

DRAWN: JMW	JOB NO: BELL	DATE: 06/12/2017	
CHECK: JMW	SURVEYOR: JMW		
SCALE: 1" = 30'	SHEET 3 OF 3		

9-ZN-2017
6/20/2017

Preliminary Drainage Report

Storage at Shea

SEC 116th Street & Shea Boulevard

Scottsdale, Arizona

COS

Case No.

Plan Check No. : 9-ZN-2017

Prepared for:

George H. Bell

Land Research and Development, Inc.

18061 N. 99th St.

Scottsdale, Arizona 85255

Plan # 9-ZN-17
Case #
Q-S #
☑ Accepted
☐ Corrections
DG 9/12/17
Reviewed By Date

For submittal to:

City of Scottsdale

Registered Professional Engineer (Civil) CERTIFICATE NO. 10274 LEONARDO J. ERIE, II 10 Aug 17 ARIZONA, U.S.A.
EXP 9/30/17

Prepared by:

Erie & Associates, Inc.

3120 North 24th Street

Phoenix, Arizona 85016

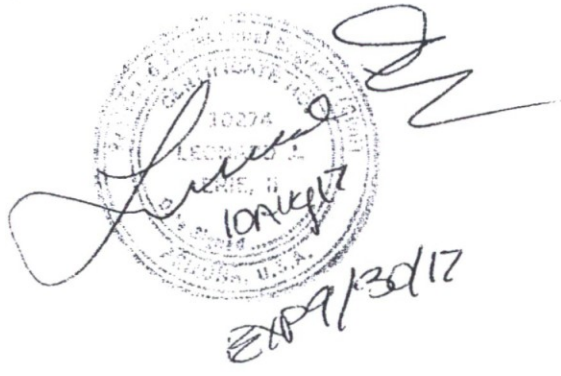
9-ZN-2017
08/28/17

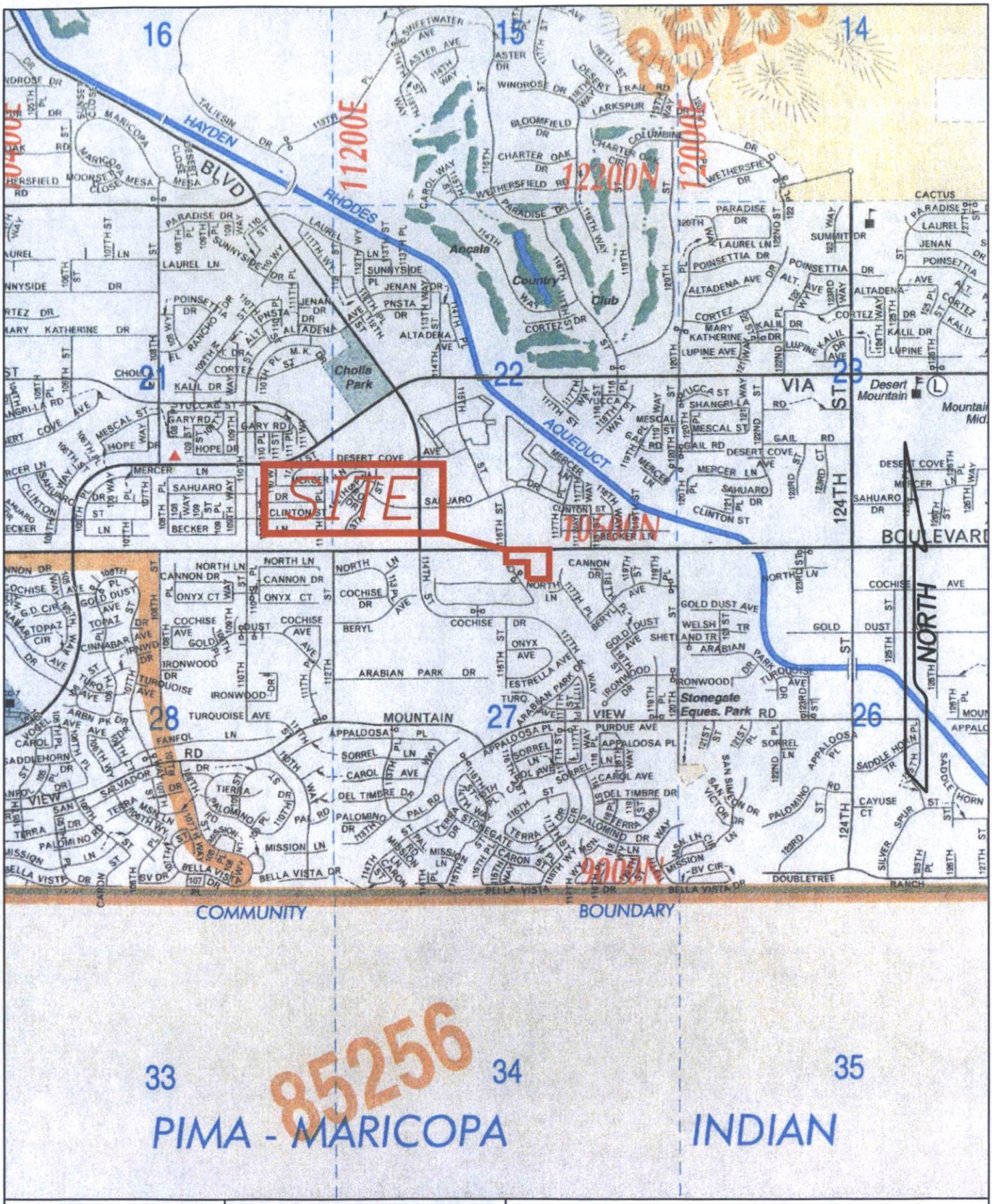
EA #2259.01

August 9, 2017

1.0 Table of Contents

2.0 List of Plates and Tables





JOB NO. 2259.01 DATE: 3/21/2017 SCALE: 1"=2000'	ERIE & ASSOCIATES, INC. 3120 NORTH 24th STREET PHOENIX, ARIZONA 85016 (602) 954-6399	STORAGE AT SHEA PLATE 1 – LOCATION MAP

JOB NO. 2259.01 DATE: 6/19/2017 SCALE: 1"=2000'	ERIE & ASSOCIATES, INC. 3120 NORTH 24th STREET PHOENIX, ARIZONA 85016 (602) 954-6399	STORAGE AT SHEA PLATE 2 – FEMA MAP

3.3 Drainage Concepts

- Detention basins will be provided for the 100-year, 2-hour onsite runoff volume from the developed portions of the site.

- Detention basins drain within 36 hours.

- Offsite flow will be collected in a constructed perimeter channel and routed around the east side of the development. For post-development conditions the flows will leave the site in the pre-development location. *Plate 5 – Master Drainage Plan.*

- Peak flows leaving the site during post-development conditions will not exceed predevelopment flows.

4.0 Hydrology

A hydrologic analysis was completed to determine the flows entering the site, for pre-development conditions. The peak flows for the 100-year storm event were calculated using the Rational Method. See *Appendix A* for hydrologic data and calculations. The methodology used to calculate the peak flows is consistent with requirements outlined in the City of Scottsdale's Design Standards and Policies Manual.

4.1 Existing Hydrology

The offsite tributary area was delineated using City of Scottsdale topo and field reconnaissance. The remainder of the offsite and onsite tributary was determined using a one foot contour interval topo and point elevations survey completed as part of this project and field reconnaissance. See *Plate 4 – Existing Tributary Map* for the existing tributary areas. See *Appendix A* for the hydrologic worksheets and calculations.

See *Table 1 – Existing Sub-Area Parameters*. The 100-year peak flow summary for existing conditions is included in *Table 2*.

Table 1 – Existing Sub-Area Parameters

Sub-Area	Area (acres)	i (in/hr)	C	Tc (min)
SA-1	0.65	7.8	0.7	5
SA-2	0.89	7.8	0.7	5
SA-3	1.17	7.8	0.7	5
SA-4	1.98	7.8	0.45	7

Table 2 – 100-Year Flow Summary

Sub-Area ID	Location/Description	Existing Peak Flow (cfs)
SA-1	Offsite tributary to the east	4
SA-2	Onsite tributary and street along the north side of site	5
SA-4	Onsite tributary	7
SA-3+SA-2	Onsite tributary and street along the north side of site	11

4.1 Developed Hydrology

The offsite area to the northeast runs through an undeveloped area east of the proposed building. The remaining tributary area is approximately 1.98 acres. The average runoff coefficient is 0.78 (see *Appendix A*). The peak flow into the basins is approximately 12 CFS.

5.0 Hydraulics

The offsite flow from the northeast corner is conveyed by a channel that runs along the east and a portion of the south property line. The channel is 1 foot deep with 4H:1V side slopes. The channel capacity is 13 CFS vs. the estimated 100 year flow of 4 CFS.

The velocity in the channel is 3.2 FPS with an assumed manning n-factor of 0.04 to account for native landscaping. Calculations are included in *Appendix A*.

The proposed finish floor elevation (FF=1471.0) is 3 feet higher than the highest proposed ponding elevation (WS=1468.0) as discussed in Section 6.0 Onsite Drainage/Detention.

The capacity of the proposed 12" outfall pipe is approximately 6.5 CFS at the maximum ponding elevation of 3 feet. See *Appendix A* for calculations.

6.0 Onsite Drainage/Detention

Onsite runoff will be directed to two basins as shown on *Plate 4*. The detention basins are sized for the 100-year, 2-hour volume. Approximately the north 25% of the site will be drained to detention basin DB-2 and the remainder of the site will drain to detention basin DB-1. A summary of the detention basins is provided in *Table 3*.

Table 3 – Onsite Detention Basin Summary

Sub-Area	Area (acres)	C	Vreq (ac-ft)	Vprov (ac-ft)	Ponding WS
DB-1	2.46	0.7	0.33	0.34	1467.5
DB-2	0.82	0.7	0.11	0.12	1468.0
			Total=0.44	Total=0.46	

Where V=(d/12)(A)(C) and d=2.3"

The basins are sized to take the whole eastern parcel including Shea Boulevard right-of-way, even though portions of the north and east sides of the parcel do not drain to the basins. The proposed basin volume is over sized for the area draining to it. The western parcel drains to an existing basin on the 116th Street cul-de-sac that drains west.

The basins are designed to bleed off by a 12" pipe and to drain within a 24 hour period at a flow rate below the existing outfall from the site of 7 CFS. Calculations are included in *Appendix A*.

7.0 References

"Drainage Design Manual for Maricopa County, Arizona", prepared by Flood Control District of Maricopa County, dated 2009.

"Design Standards and Policies Manual", prepared by City of Scottsdale, dated January 2010.

Appendix A – Calculation Worksheets

STORAGE AT SHEA	EA# 2259 BY: JAL	DATE: 6-14-17

Revised Aug 8, 2017 by LE

SA-1 (RATIONAL) EXISTING

$Q = CiA$

$Q = 0.7(7.8)(0.65)$

$Q = 4$ CFS

$A = 0.65$ ac

$i = 7.8$ in/hr

$C = 0.5(0.95) + 0.5(0.45)$

$C = 0.7$

SA-2 EXISTING

$Q = 0.7(7.8)(0.89)$

$Q = 5$ CFS

$A = 0.89$ ac

$i = 7.8$ in/hr

$C = 0.7$

SA-3 EXISTING $A_{SA3} = 1.17$ ac $+ SA_2 = 1.17 + 0.89$

$= 2.06$ ac $TC = 5$ min

$i = 7.8$ in/hr

$C = 0.7$

$Q = (0.7)(7.8)(2.06) \cong 11.$ CFS

SA-4 EXISTING

$A = 220(320) = 1.98$ ac

$T_c = 5$ min $i = 7.8$ in/hr

$C = 0.45$ undev. desert

$Q_{EX} = (0.45)(7.8)(1.98) = 6.95$ CFS

SAY 7. CFS

SA 4 Developed

$A = 27\alpha(320) = 1.98$ ac

$T_c = 5$ min, $i_{100} = 7.8$ IN/HR

Composite

$A_{\text{parking and building}} = 1.31$ ac $C = 0.95$

$A_{\text{open}} = 1.98 - 1.31 = 0.67$ $C = 0.45$

$$C_{AVE} = \frac{1.31(0.95) + 0.67(0.45)}{1.98}$$

$C_{AVE} = 0.78$

$\therefore Q_{\text{INTO BUSINESS}} = (0.78)(7.8)(1.98) = 12.4$ cfs

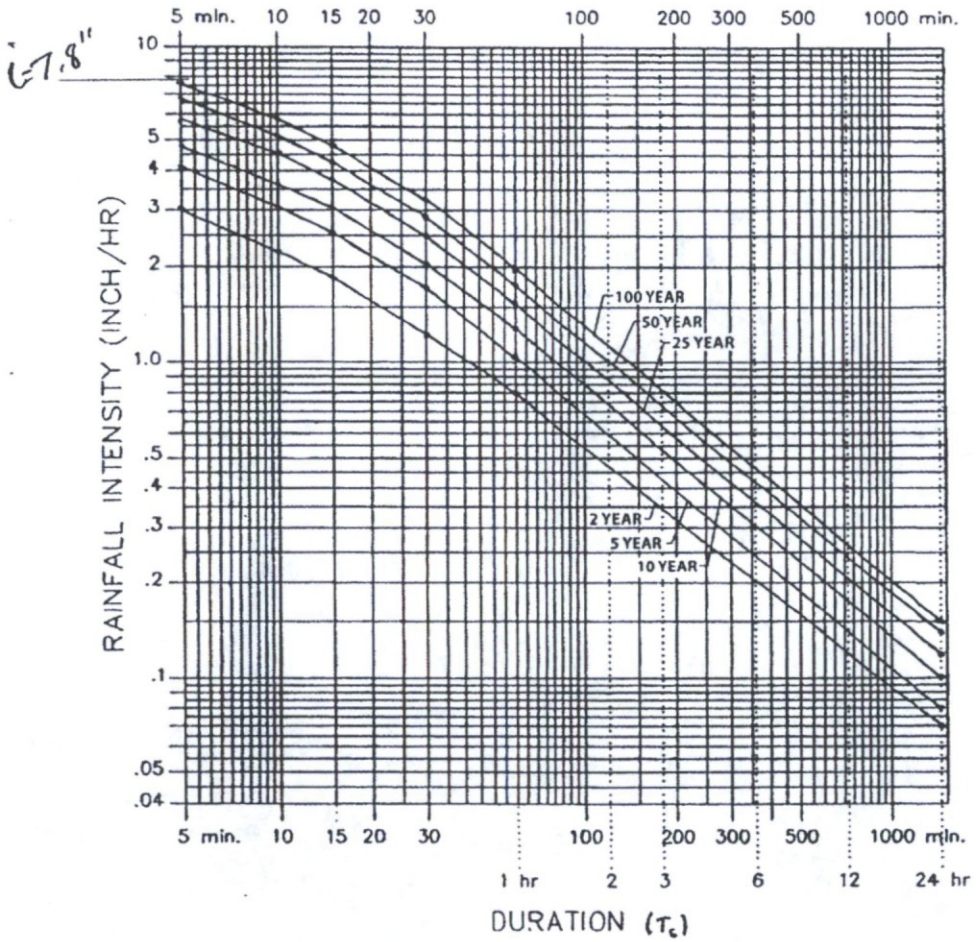
given flood event. For infrastructure design, the estimate of the actual split based on a hydraulic analysis of the current channel cross sections must include a minimum safety factor of 30 percent of the total flow. If the designer feels that there are extenuating factors affecting the stability of the split, the safety factor should be increased accordingly. The report should include a description of all assumptions made regarding watershed conditions used to calculate the peak flow rates.

C. The Rational Method

The Rational Method is limited to use on small, uniform, regularly shaped watersheds less than or equal to 160 acres in size. The methodology is provided in the Drainage Design Manual for Maricopa County, Hydrology.

1. Precipitation

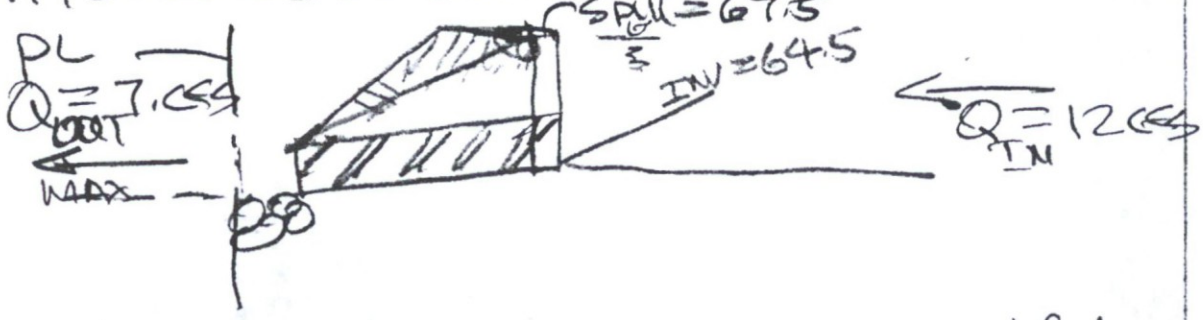
Precipitation input is rainfall intensity, "**I**," and can be obtained directly from NOAA 14 at http://hdsc.nws.noaa.gov/hdsc/pfds/sa/az_pfds.html or from Figure 4.1-3. The time of concentration, "**Tc**," is all that is required to determine "**I**" from this figure.(source: NOAA 14)



RAINFALL INTENSITY–DURATION–FREQUENCY RELATION
FOR MARICOPA COUNTY, ARIZONA

FIGURE 4.1-3 RAINFALL INTENSITY (I) VALUES FOR USE IN RATIONAL METHOD

Hydraulics of outlet at lower basin.



Assume for this short pipe that it's in inlet control

MAXIMUM $Q_{out} = 7.0$ cfs

$HW_{MAX} = 3' \pm$

Try a 12" pipe

$\therefore HW/D = 3/1 = 3$

$\therefore Q_{out} = 6.5$ cfs $<$ 7 cfs (Ex Q)

$\therefore$ OK Use a 12" pipe at the outlet.

INLET CONTROL
NOMOGRAPH FOR CONCRETE PIPE WITH HEADWALL
(Socket Opening)

AND

CONCRETE PIPE WITH HEADWALL AND 45° WINGWALLS
(Socket Opening)

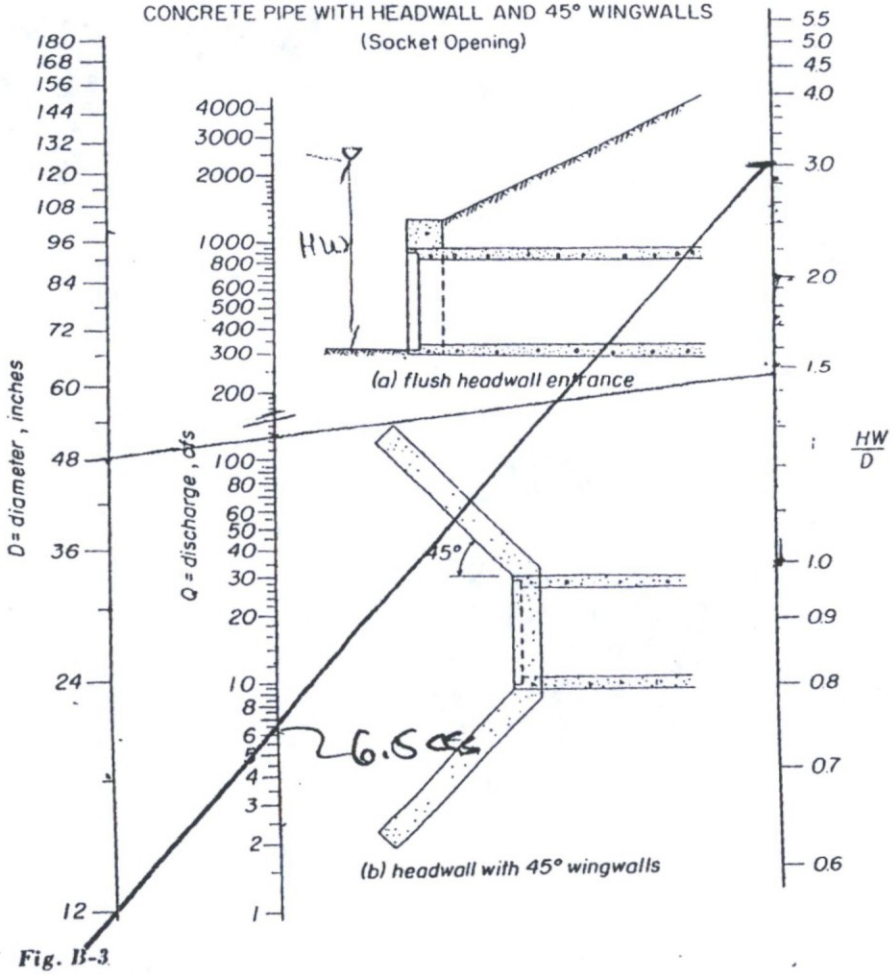


Fig. B-3

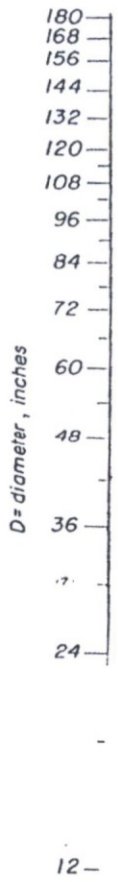


Fig. B-4

plate 4 - [illegible]

100-2 VOLUME CALCULATION (EAST PARCEL)

$$V_r = \frac{P}{12} A C$$

$A_T = 3.28$ ac

$A_{SHEA\ AC} = 0.32$ ac $C = 0.95$

$A_{PARK+BLDG} = 1.31$ ac $C = 0.95$

$A_{UNDEV} = 1.65$ ac $C = 0.45$

$\Sigma = 3.28$ ac

$$C = \frac{1.63(0.95) + 1.65(0.45)}{3.28}$$

$C = 0.70$

$$V_r = \frac{2.3}{12}(3.28)(0.70) = 0.44 \text{ ac-ft}$$

2. Time of Concentration

Time of concentration "**Tc**" is the total time of travel from the most hydraulically remote part of the watershed to the concentration point of interest. The calculation of "Tc" must follow FCDMC Hydrology Manual procedures.

***Note:** **Do not add a standard set amount of time to the estimated "Tc" for lot runoff delay (such as 5 or 10 minutes).** Natural land slopes are too variable in Scottsdale to add a set amount of time for lot runoff.

3. Runoff Coefficients

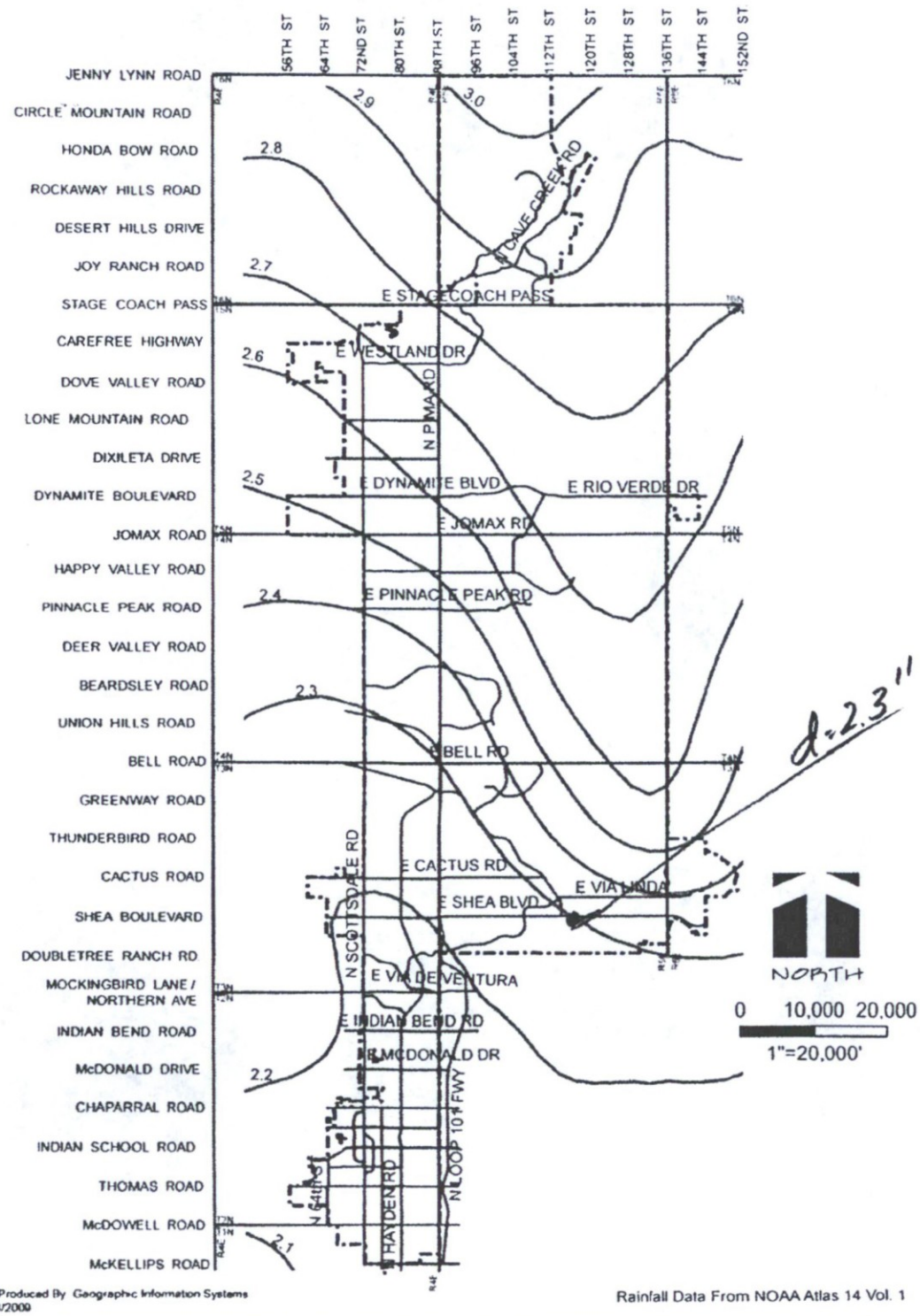
Use Figure 4.1-4 or equivalent to obtain the runoff coefficients or "**C**" values. Composite "**C**" values for the appropriate zoning category or weighted average values calculated for the specific site are both acceptable approaches.

RUNOFF COEFFICIENTS - "C" VALUE

Land Use	Storm Frequency		
Composite Area-wide Values	2-25 Year	50 Year	100 Year
Commercial & Industrial Areas	0.80	0.83	0.86
Residential Areas-Single Family (average lot size)			
R1-1-1901	0.33	0.50	0.53
R1-130	0.35	0.51	0.59
R1-70	0.37	0.52	0.60
R1-43	0.38	0.55	0.61
R1-35 (35,000 square feet/lot)	0.40	0.56	0.62
R1-18 (18,000 square feet/lot)	0.43	0.58	0.64
R1-10 (10,000 square feet/lot)	0.47	0.62	0.67
R1-7 (7,000 square feet/lot)	0.51	0.64	0.94
Townhouses (R-2, R-4)	0.63	0.74	0.94
Apartments & Condominiums (R-3, R-5)	0.76	0.83	0.94
Specific Surface Type Values			
Paved streets, parking lots (concrete or asphalt), roofs, drive-ways, etc.	0.90	0.93	0.95
Lawns, golf courses, & parks (grassed areas)	0.20	0.25	0.30
Undisturbed natural desert or desert landscaping (no impervious weed barrier)	0.37	0.42	045
Desert landscaping (with impervious weed barrier)	0.63	0.73	0.83
Mountain terrain – slopes greater than 10%	0.60	0.70	0.80
Agricultural areas (flood-irrigated fields)	0.16	0.18	0.20

FIGURE 4.1-4 RUNOFF COEFFICIENTS FOR USE WITH RATIONAL METHOD

100 Year 2 Hour Precipitation in Inches



Map Produced By Geographic Information Systems
04/03/2009

Rainfall Data From NOAA Atlas 14 Vol. 1

DRAINAGE SWALE
Worksheet for Triangular Channel

Project Description	
Project File	d:\flowmaster\2259.fm2
Worksheet	DRAINAGE SWALE
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coefficient	0.040	
Channel Slope	0.020000	ft/ft
Depth	1.00	ft
Left Side Slope	4.000000	H : V
Right Side Slope	4.000000	H : V

Results		
Discharge	12.97	cfs
Flow Area	4.00	ft²
Wetted Perimeter	8.25	ft
Top Width	8.00	ft
Critical Depth	0.92	ft
Critical Slope	0.031464	ft/ft
Velocity	3.24	ft/s
Velocity Head	0.16	ft
Specific Energy	1.16	ft
Froude Number	0.81	
Flow is subcritical.		

Exterior Building Color & Material Samples

Color Drawdowns

Archaeological Resources

Airport Vicinity Development Checklist

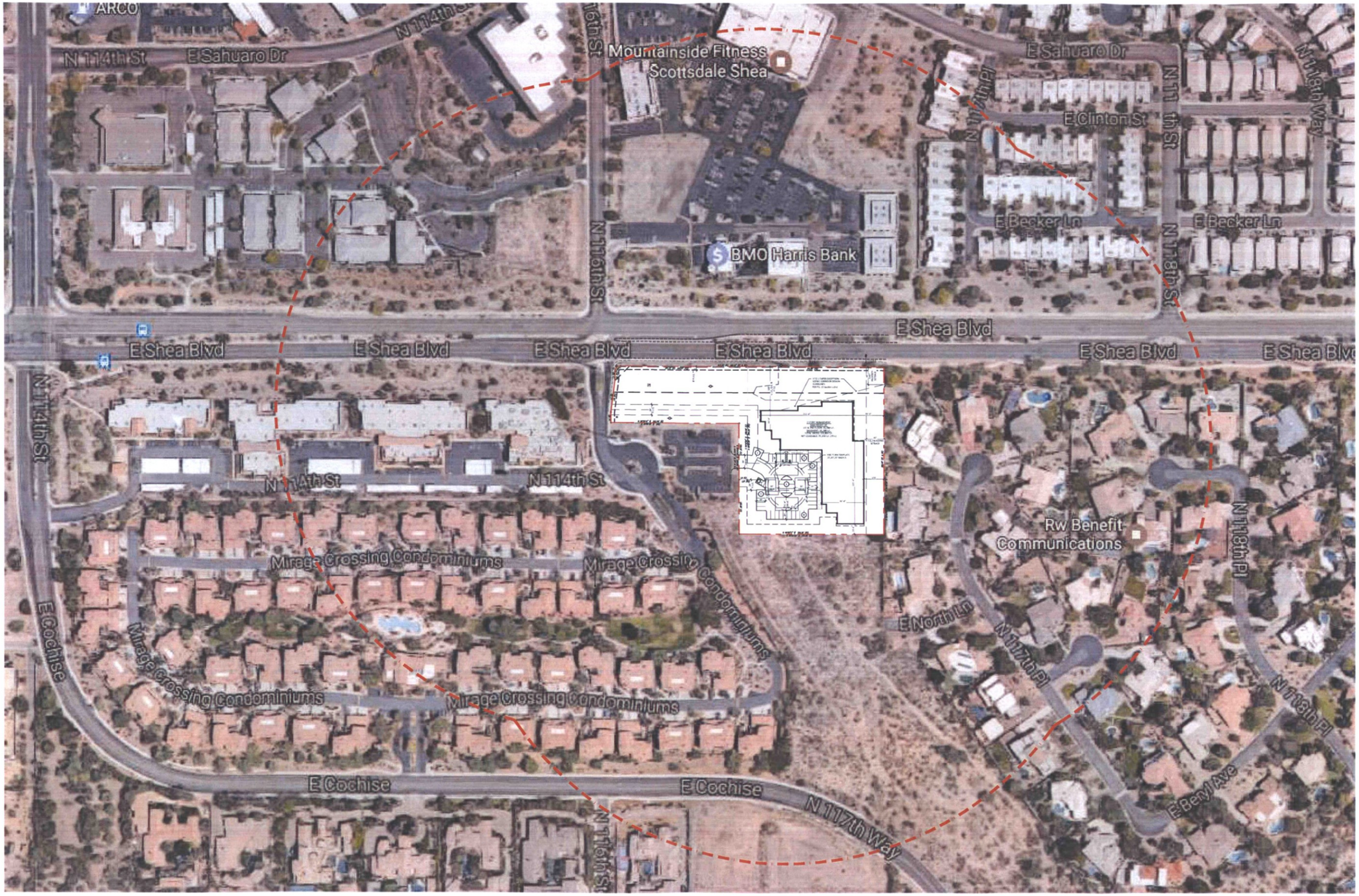
Parking Study

Trip Generation Comparison

Parking Master Plan

NO DOCUMENTS IN THIS CATEGORY

Full Size or Largest Size
(site plan, landscape, elevations)



AERIAL: RADIUS 750'

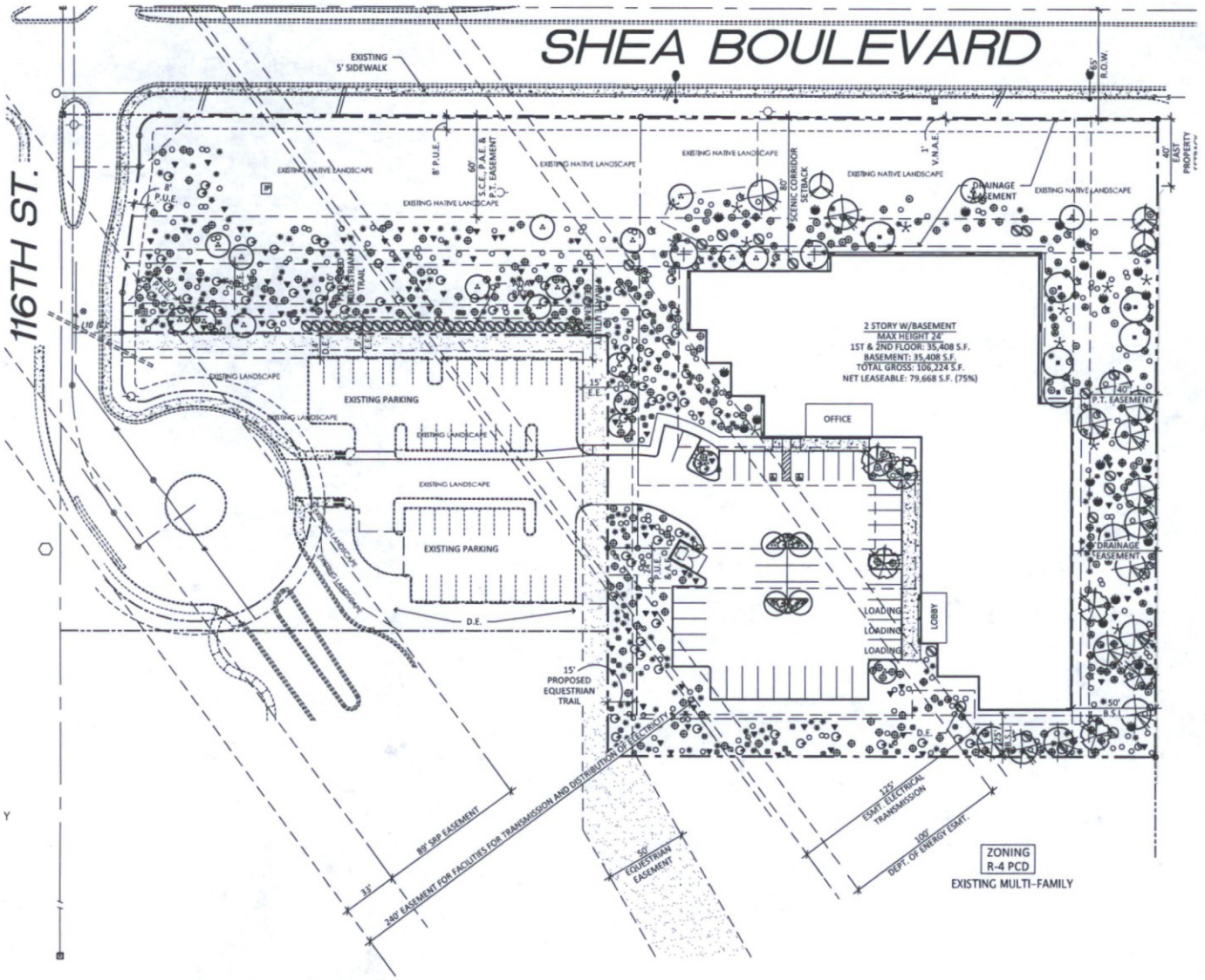
STORAGE AT SHEA
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 06-06-2017 (PRELIMINARY)

AERIAL

RKAA# 17120.5

RKAA ARCHI

9-ZN-2017
6/20/2017



LANDSCAPE LEGEND

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- ACACIA SALICINA — WILLOW ACACIA — 24" BOX
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- DASYLIRION WHEELERII — DESERT SPOON — 5 GALLON
- XXX — XXX — 5 GALLON
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- DODONEA VISCOSA — HOP BUSH — 5 GALLON
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1/4" MINUS MADISON GOLD DECOMPOSED GRANITE 2" DEPTH IN ALL LANDSCAPE AREAS

T.J. McQUEEN & ASSOCIATES, INC.
LANDSCAPE ARCHITECTURE
URBAN DESIGN
SITE PLANNING
8433 East Cholla St., Suite 101
Scottsdale, Arizona 85260
P. (602) 265-0320 F. (602) 265-6619
EMAIL: timmcqueen@tjmla.net

LANDSCAPE PLAN
SCALE: 1" = 30'-0"

NORTH

NEW SELF STORAGE

SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-25-2017 (PRELIMINARY)

La.01

RKAA# 17035.5

RKAA ARCHITECTS, INC

9-ZN-2017
08/28/17

VIEW LOOKING SOUTH EAST ON 116TH & SHEA

9-ZN-2017
08/28/17

STORAGE AT SHEA (CONCEPTUAL)
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-28-2017 (PRELIMINARY)

VIEW 2

RKAA# 17120.5

RKAA ARCHITECTS, INC

VIEW LOOKING SOUTH EAST ON 116TH & SHEA

VIEW LOOKING SOUTH WEST ON SHEA

STORAGE AT SHEA (CONCEPTUAL)
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-28-2017 (PRELIMINARY)

VIEW 1

RKAA# 17120.5

RKAA ARCHITECTS, INC

9-ZN-2017
08/28/17

VIEW LOOKING SOUTH EAST ON 116TH & SHEA

VIEW LOOKING SOUTH WEST ON SHEA

9-ZN-2017
08/28/17

STORAGE AT SHEA (CONCEPTUAL)
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-28-2017 (PRELIMINARY)

VIEW 1

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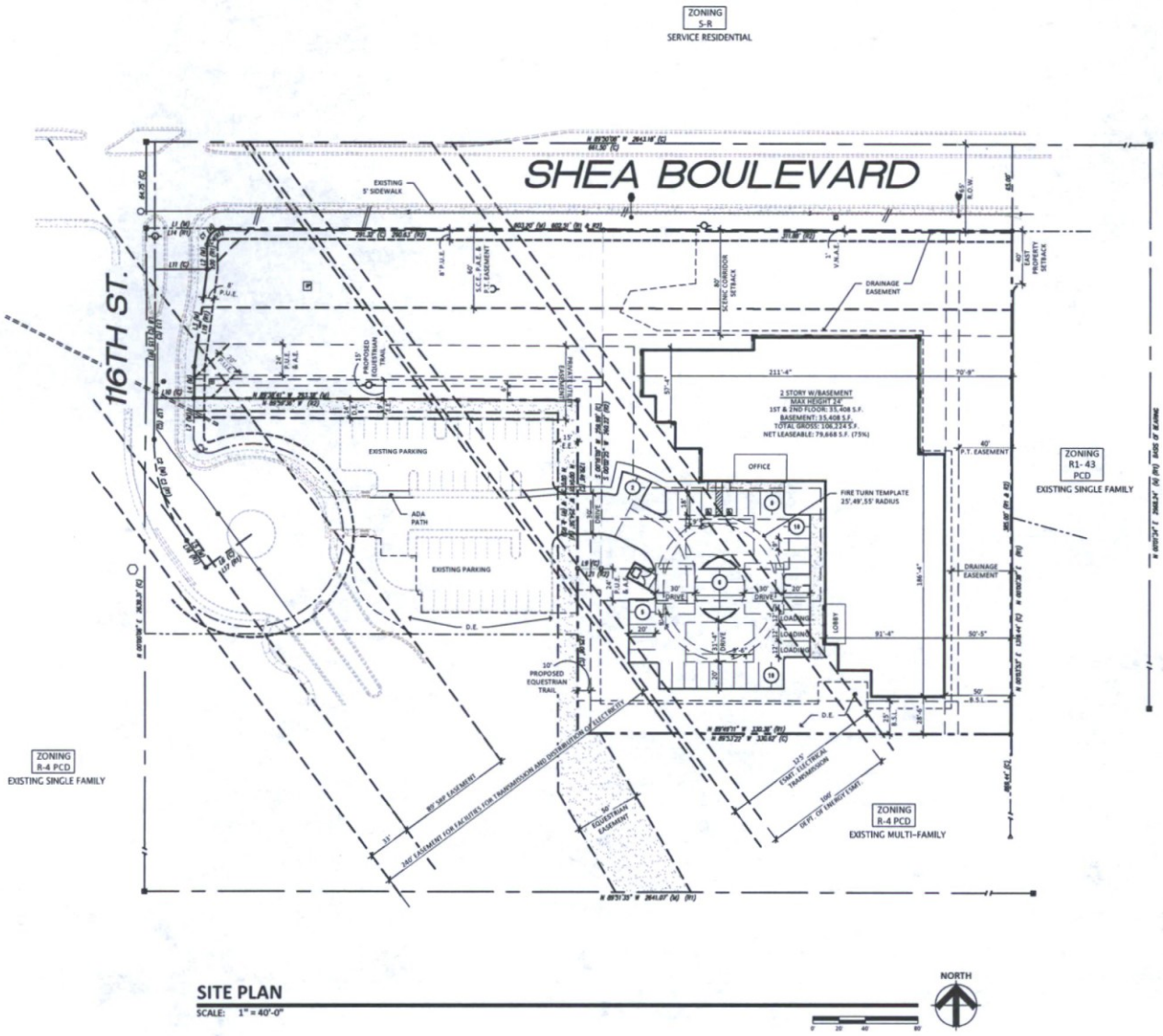


SITE PLAN

SCALE: 1" = 40'-0"

PROJECT DIRECTORY

DEVELOPER:
THE BELL GROUP, LLC
18061 N. 99TH STREET
SCOTTSDALE, ARIZONA 85255
CONTACT: GEORGE H. BELL
PHONE: (480) 538-5474
E-MAIL: ghbell@landrd.com

ARCHITECT:
ROBERT KUBICEK ARCHITECTS & ASSOCIATES
2233 EAST THOMAS ROAD
PHOENIX, ARIZONA 85016
CONTACT: ROBERT KUBICEK / EDGAR FELIX
PHONE: (602) 955-3900
FAX: (602) 955-0496
E-MAIL: rkubicek@rkaa.com / efelix@rkaa.com

SITE DATA

EXISTING ZONING:	SR- PCD REZONE TO C-1
GROSS SITE AREA:	4.60 ACRES (200,492 S.F.)
NET SITE AREA:	3.78 ACRES (165,030 S.F.)
PROPOSED USE:	INTERNALIZED COMMUNITY STORAGE
MAX BUILDING HEIGHT:	24 FEET
BUILDING AREA (2-STORY W/BSMT.):	106,224 S.F.
SITE COVERAGE:	22%
FAR (0.8 MAX):	132,023 S.F. ALLOWED 70,816 S.F. PROVIDED
OPEN SPACE/LANDSCAPE	(107,382 S.F.) 65%
TOTAL PARKING REQUIRED:	42 SPACES
STORAGE (106,224 S.F.) INTERNALIZED COMMUNITY STORAGE @ 1/2500 = 42 SPACES	
TOTAL PARKING PROVIDED:	42 SPACES
ACCESSIBLE SPACES REQUIRED:	2 SPACES
ACCESSIBLE SPACES PROVIDED:	2 SPACES

STORAGE AT SHEA (CONCEPTUAL)

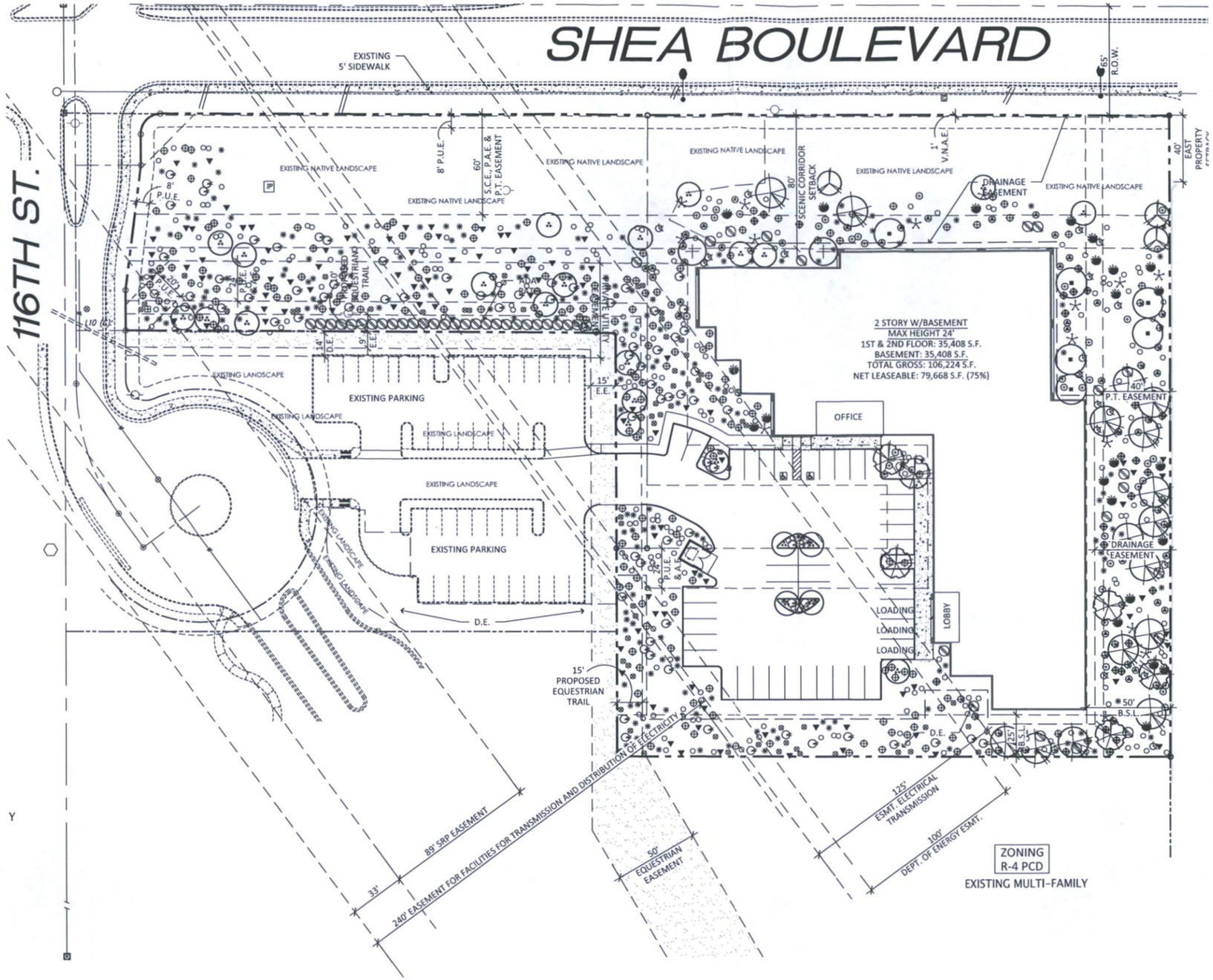
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-28-2017 (PRELIMINARY)

SP-1

RKAA# 17120.5

RKAA ARCHITECTS INC

9-ZN-2017
08/28/17



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1/4" MINUS MADISON GOLD DECOMPOSED GRANITE 2" DEPTH IN ALL LANDSCAPE AREAS

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EMAIL: tjmmcqueen@tjmla.net

T&M ASSOCIATES

27166 TIMOTHY J. McQUEEN 08/28/17 Scottsdale, Arizona U.S.A. EXPIRES 06/30/2020

LANDSCAPE PLAN
SCALE: 1" = 30'-0"
0' 15' 30' 60'

NORTH

NEW SELF STORAGE
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-25-2017 (PRELIMINARY)

La.01

RKAA# 17035.5

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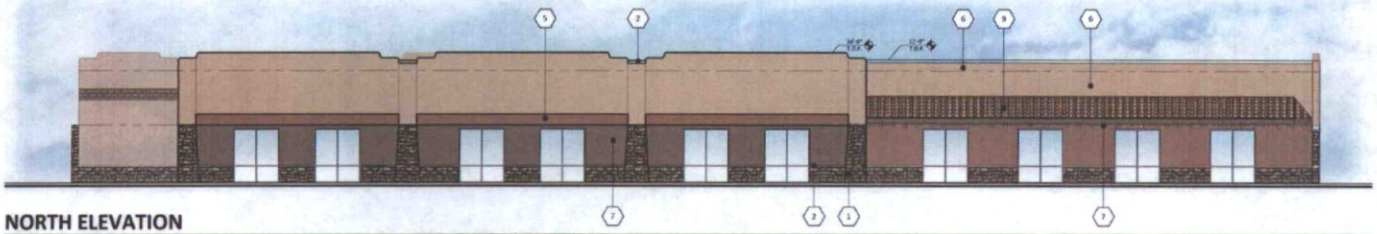
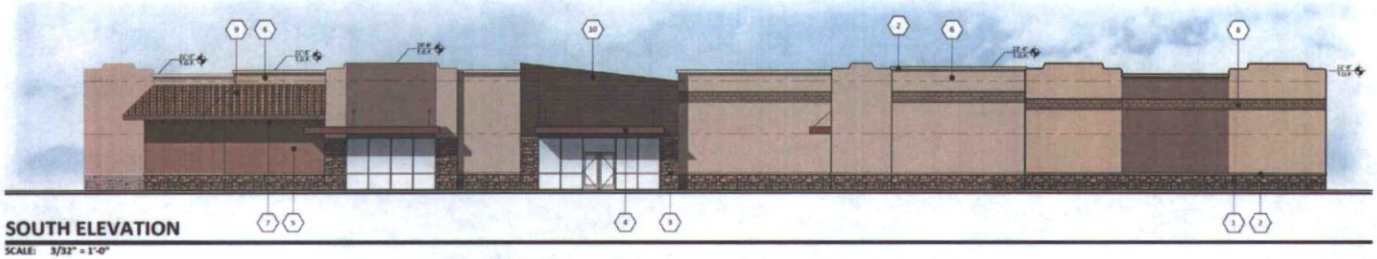
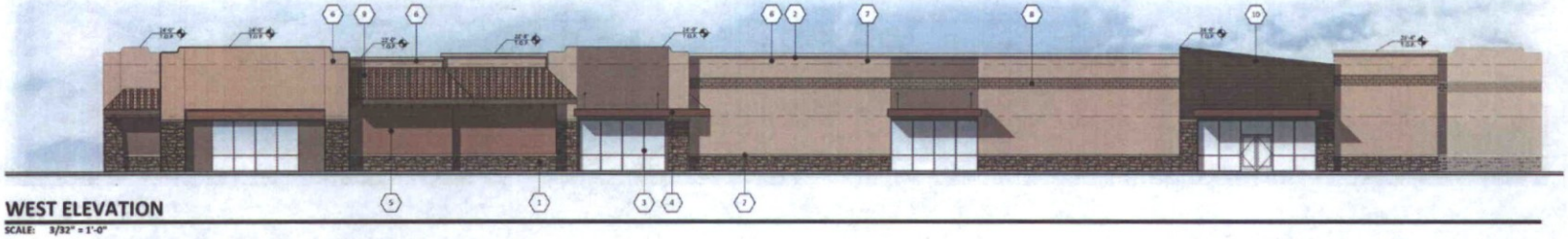


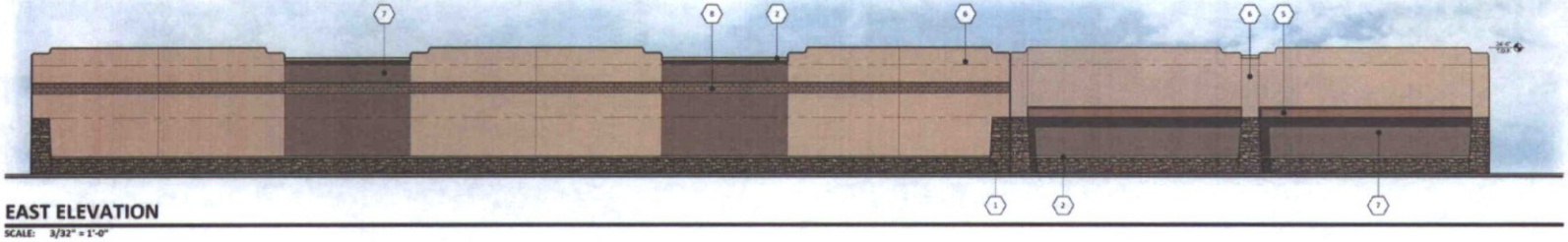
NORTH ELEVATION
SCALE: 3/32" = 1'-0"



SOUTH ELEVATION
SCALE: 3/32" = 1'-0"

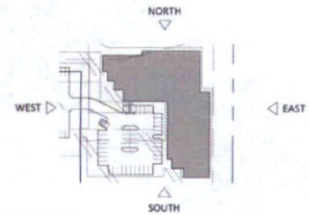


WEST ELEVATION
SCALE: 3/32" = 1'-0"



EAST ELEVATION
SCALE: 3/32" = 1'-0"

#	MATERIALS
1	CORONADO STONE ROCKY MOUNTAIN LEDGE BITTERROOT
2	TRIM DUNN EDWARDS DE6213 FINE GRAIN
3	STOREFRONT KAWNEER ANODIZED CLEAR
4	AWNINGS MBCI COLONIAL RED
5	FINE FINISH STUCCO PAINTED DUNN EDWARDS DE6091 RED HOOK
6	FINE FINISH STUCCO PAINTED DUNN EDWARDS DEC717 BAKED POTATO
7	FINE FINISH STUCCO PAINTED DUNN EDWARDS DEA161 WILD MUSTANG
8	SUPERLITE BLOCK SMOOTH FACE COCOA BROWN
9	BORAL ROOFING 2-PIECE MISSION PALERMO BLEND
10	METAL SIDING AEP SPAN WEATHERED COPPER



KEY MAP
SCALE: N.T.S.

STORAGE AT SHEA (CONCEPTUAL)

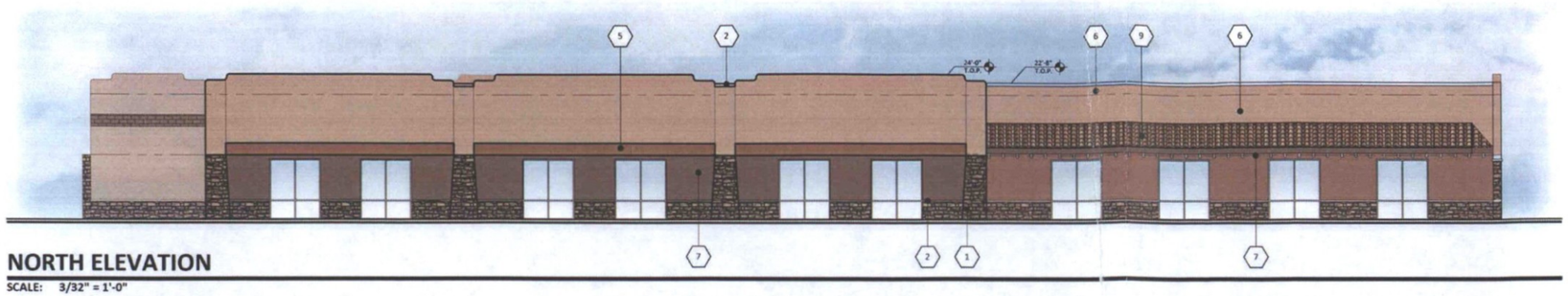
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE,AZ
DATE: 08-28-2017 (PRELIMINARY)

EL-1

RKAA# 17120.5

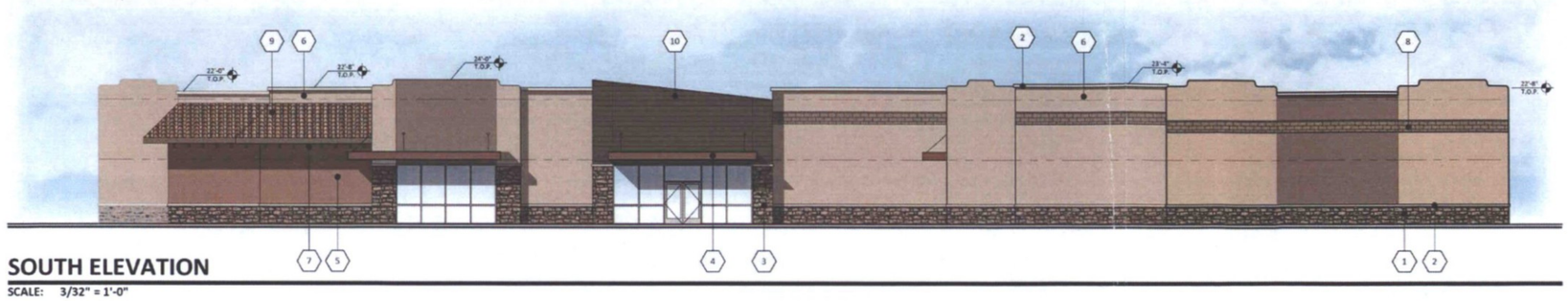
RKAA ARCHITECTS, INC

9-ZN-2017
08/28/17



NORTH ELEVATION

SCALE: 3/32" = 1'-0"



SOUTH ELEVATION

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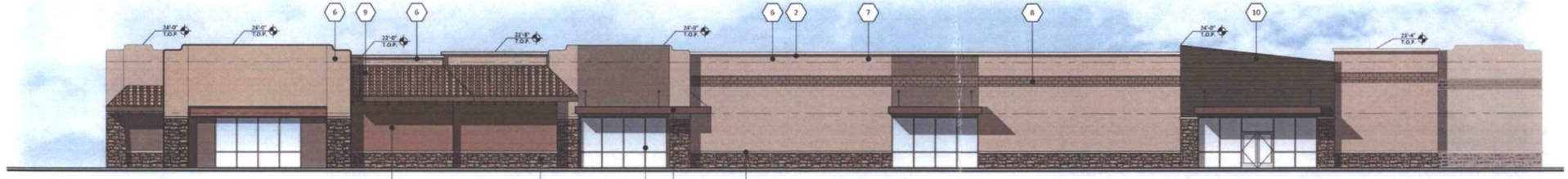
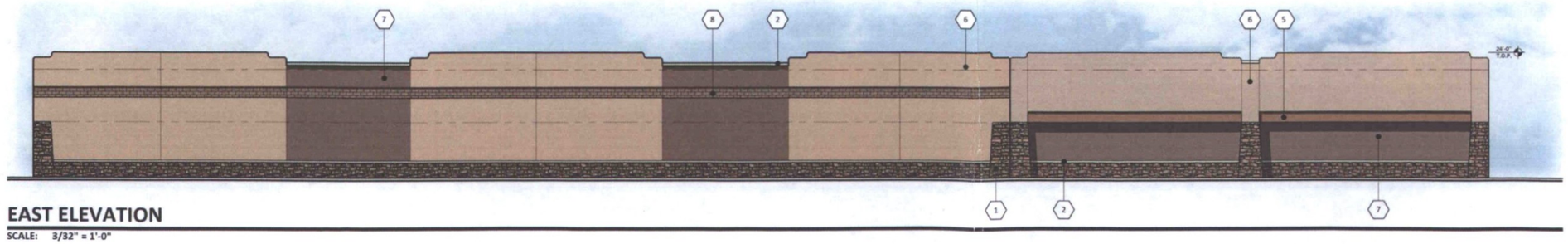


WEST ELEVATION

SCALE: 3/32" = 1'-0"



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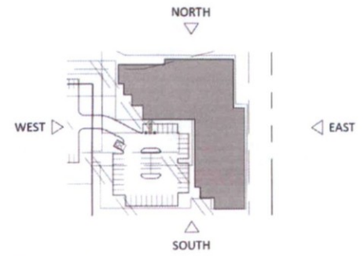

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