

PRELIMINARY WASTEWATER REPORT

for

3200 SCOTTSDALE

3202 N. Scottsdale Road,
Scottsdale, Arizona

Prepared For:

3202 Scottsdale, LLC

7669 E. Pinnacle Peak Rd., Ste. 250
Scottsdale, AZ 85255



Prepared by:



Solidity Engineering Group

Golding Drive, Suite 101

Scottsdale, AZ 85260

480-226-2266 www.azSEG.com

PRELIMINARY Basis of Design Report (ZN) <input type="checkbox"/> ACCEPTED <input checked="" type="checkbox"/> ACCEPTED AS NOTED <input checked="" type="checkbox"/> REVISE AND RESUBMIT	Reviewed By:  On behalf of the Scottsdale Water Resources Department
<p>DISCLAIMER: If accepted, the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (Typically during the DR and PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission. For questions and clarifications contact the Water Resources Planning and Engineering Department at 480-321-5685</p>	
REVIEWER: EMAIL: ANDREW BUELL ABUELL@CAROLLO.COM	DATE 08/25/2022

Noted.

Project Number: 210708

Submittal Date: April 6, 2022

Revision Date: August 3, 2022

Case#: 6-ZN-2022

Plan Check#: TBD

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1. INTRODUCTION

1.1 SUMMARY OF PROPOSED DEVELOPEMENT

3200 N. Scottsdale Road is a proposed 150-unit high-density multifamily project located between N. 71 Street and N. Scottsdale Road in Scottsdale, Arizona. The project will include a health club/gym on the ground floor. Wastewater service will be provided off the existing sewer system in N. Scottsdale Road. The purpose of this memo is to provide a preliminary wastewater analysis for rezoning.

1.2 LEGAL DESCRIPTION

The following parcel of subdivided land is located in the East ½ of the SE ¼ of Section 27, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian in Scottsdale, Arizona. Refer to **EXHIBIT 1** for a vicinity map.

x APN 130-16-007A, Scottsdale Trailer Corral.

All part of Lot 4, Security Acres Amended, as recorded in Book 8, Page 59 of Maricopa County Records. The total land area is 91,855 sq. ft. (2.11 acres), more or less.

2. DESIGN DOCUMENTATION

2.1 DESIGN COMPLIANCE

The proposed sewer system is designed to meet design criteria established by the Maricopa County Water Resources Department, the Arizona Department of Environmental Quality and the Scottsdale City of Scottsdale. The design is based on the design criteria established by the Maricopa County Water Resources Department, the Arizona Department of Environmental Quality and the Scottsdale City of Scottsdale.

2.2 PROCEDURES, POLICIES AND METHODOLOGIES

This project proposes a new service connection to the existing sewer system in N. Scottsdale Road. Hydraulic design of the service pipe will include the peak flow, including pool backwash.

2.3 SOFTWARE ACKNOWLEDGEMENT:

Onsite sewer service line will be hydraulically evaluated using Bentley FlowMaster® V8i (SELECTseries 1).

3. EXISTING CONDITIONS

3.1 EXISTING AND PROPOSED ZONING AND LAND USES

The parcel is presently zoned C-3, Highway Commercial. The project is proposing rezoning to D/DMU-2, Downtown Multiple Use, Type 2.

3.2 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

The parcel is fully developed as a for rent residential trailer and RV community. The topography slopes from the northwest to the southeast with approximately two feet fall. Refer to **EXHIBIT 2** for an aerial of the overall project existing conditions.

3.3 EXISTING SEWER INFRASTRUCTURE:

See **EXHIBIT 3** - City of Scottsdale (QS 15-44)

INCLUDE CALCULATED & DERIVED POOL FILTER BACKWASH FLOWS HERE (SEE NOTES ON NEXT PAGE)

x d Á } ô _ ' ° Á ° , o] v ° ° Æ] ' i ' s b Street from 71st. The western VCP line has been severed, plugged just north of the Earll Drive manhole. Any service connections to this pipe are unknown. The eastern PVC/VCP line provides service to properties along 71st Street including a service connection to the site (that is to be abandoned and plugged per City requirements.

City approved report has been requested. Will include with subsequent submittal

x v ô s_ W o] v ° ° Æ] ' i ' , > not presently provide any service cor.....

x An existing î í _ ' v] i , Ç û n Æ line is located near the Earll Drive centerline and flows east to Miller Road.

Provide City approved report if available.

REPORT IN GPM

gpm column added

3.4 FLOWS IN EXISTING SEWER SYSTEM:

As discussed in the Final Sewer Capacity Report for Alta Drinkwater (A.K.A. Osborn), dated July 2017 and prepared by SEG (Refer to **APPENDIX III**), flow in the existing Scottsdale Road sewer line is as follows:

Table 1: EXISTING FLOW IN SCOTTSDALE ROAD 8" SEWER (Ties in at Earll Drive 21" Sewer)

	Units or s.f. com.	ADF (gpcu) or per s.f.	Avg. Day Flow (GPD)	Peaking Factor	Peak Hour (GPD)
Aqave Apartments W/POOL	247	140	34,580	4	138,320 +POOL
Good Egg restaurant	7,000 s.f.	1.2	8,400	6	50,400
ALTA Osborn Apartments W/POOL	134	143	19,162	4	76,648 +POOL
Existing Flow to 21" Earll Drive Sewer			62,142		265,368

Note: Pool backwash will be accounted in Table 3.

4. PROPOSED CONDITIONS

add: "to Thomas 8" sewer and then..."

Text updated

4.1 SITE PLAN

EXHIBIT 4 depicts the preliminary site plan. All onsite structures and service line will be removed. The property is being re-developed with a structure containing 150 apartment units. The ground floor will include 4,000 sf of health club/gym use (commercial/retail).

4.2 PROPOSED SEWER SERVICE CONNECTIONS

Sewer service will consist of a 6 [pipe from the east end of the building connected to the existing 8 _ ' ° Á ° N. Scottsdale Road per MAG SD 440-1. No service connection is proposed to the 71st St. line. The preliminary utility plan is shown in **APPENDIX I**.

4.3 MAINTENANCE RESPONSIBILITIES

The sewer service line and any necessary grease interceptors with be owned and maintained by the property owner.

INCORRECT CLASSIFICATION.

DSPM 7-1.403 TABLE 4.3

Classification updated to fitness center/spa/health club per DSPM

7-1.403 TABLE 4.3

DS&PM 7-1.202, G., 5. Provide pool filter backwash flow calculation meeting ARS title 18, article 2 design requirements or as otherwise stated here. The value shown assumes default backwash value of 100gpm. These are very large pools and default value is not adequate. There will be 3 large pools (2 existing) on this line + large hot tubs (2 existing). To analyze offsite sewer capacity use 50% of total combined backwash peak flow for pools and spas. For existing pools & spas measure area from aerial and scale proposed pool backwash rate to provide values. For filter sizing use pool volume turnover rate of 6hrs and use 20 minutes for spa. Show all calcs. Note: Cartridge filters cannot be assumed.

EG

"LEED®ing and Developing Smart Projects"

SEWER SYSTEM COMPUTATIONS

PROPOSED NEW SEWER DEMAND

Table 2: SEWER DEMAND CALCULATIONS

	Area (sq.ft.)	Dwelling Units	ADD (gpd/unit)	Peaking Factor	Avg. Day Demand (gpm)	Peak Flow (gpm)	Peak Flow (gpd)
Residential	-	150	140	4.5	14.6	65.6	94,500
Commercial/Retail	4,000	-	0.5	3.0	1.4	4.2	6,000
Total without Pool backwash					16.0	69.8	100,500
Pool				N/A	100.0	100.0	144,000
Total with Pool backwash					116.0	169.8	244,500

INCORRECT DEMAND/PF. REFER TO DSPM 7-1.403 TABLE 4.3

Demand updated to fitness center/spa/health club per DSPM 7-1.403 TABLE 4.3

REVISE AS APPLICABLE FOR DROP SERVICE CONNECTION

MINIMUM SERVICE REQUIREMENTS

A 6" pipe at 0.5% slope is sufficient to convey the peak flow without the pool backwash at a depth of 1.6' and velocity of 3.8 fps. The peak flow with the pool backwash will have a depth of 2.5' and velocity of 4.9 fps.

Pool backwash calculations updated. Volume calculated assuming 5 ft depth for pools and 3 ft depths for spas.

II. Turnover rate of 6 hrs used for pools and 20 min used for spas. Calculations added to the report. Offsite sewer capacity analyzed at 50% of total combined backwash peak flows for pools and spas.

Refer to APPENDIX II for the calculations.

ROAD SEWER CAPACITY

SPM. Hydraulics for this line is shown in Table 3. Expected peak flows for Road project were added to the existing pipe flows. Refer to APPENDIX hydraulic calculations.

the maximum allowable limit without pool backwash and a d/D ratio of 0.65 for pool backwash. For both scenarios, the maximum calculated flow at the project to convey the new wastewater flows from the project.

design, the quarter-section data was used indicating a 1% slope on the pipe invert = 1232.88, downstream manhole invert = 1228.73, pipe length

SEWER CAPACITY				
	Total Peak Flow (gpd)	Allowed d/D	Max Flow Capacity at allowed d/D (gpd)	Calculated Velocity (fps)
Existing Flow (Table 1a)	265,368			
Proposed Flow (Table 2)	100,500			
Total without Pool Backwash	365,868	0.65	590,736	3.8
Pool Backwash *	288,000			
Total with Pool Backwash	653,868	0.80	763,377	4.0

* Table assumes two simultaneous pool backwash scenarios

site plan shows 2,000ft2 pool. Provide filter backwash calculations. DS&PM 7-1.202, G., 5

Filter backwash calculations provided.

6. SUMMARY / CONCLUSIONS

6.1 Summary:

The proposed sewer flows and service connection are designed to meet criteria of the City of Scottsdale Design Standards and Policies Manual, the Arizona Department of Environmental Quality (ADEQ), and Maricopa County Environmental Services Department (MCESD).

The hydraulic output shown in **APPENDIX II** indicates that the system is designed to provide service to this project. The hydraulic output in **APPENDIX IIA** indicates that the

calculations are based on the assumption that a grease interceptor will be provided for any food facility.

A grease interceptor will be provided for any food facility.

REVISE CALCS TO CONFIRM

6.2 PROJECT SCHEDULE:

As a residential apartment development, the infrastructure and buildings are proposed to be constructed in a single phase.

Calculations revised.

7. REFERENCES

1. COS Sewer Q-S MAP 15-44
2. City of Scottsdale Design Standards & Policies Manual, 2018 (Chapter 7 - Sewer)

8. EXHIBITS:

- EXHIBIT 1 - Vicinity Map- Local Aerial
- EXHIBIT 2 - Aerial
- EXHIBIT 3 - COS Sewer Q-S Map 15-44
- EXHIBIT 4 - Preliminary Site Plan

IF THERE IS INTENT TO HAVE A FOOD FACILITY, INCLUDE IN DESCRIPTION, GREASE INTERCEPTOR CALCULATIONS AND LOCATE ON UTILITY MAP.

Grease interceptor removed.

9. APPENDICES:

- APPENDIX I - Preliminary Utility Plan/Service Layout
- APPENDIX II - Preliminary Onsite Sewer Service Line Hydraulic Calculations
- APPENDIX IIA- Preliminary Offsite Sewer Hydraulic Calculations
- APPENDIX III - Alta Drinkwater Final Sewer Capacity Report Case No. 42-DR-2016

EXHIBITS

- 1. *Vicinity Map***
- 2. *Aerial***
- 3. *Sewer Q-S 15-44***
- 4. *Preliminary Site Plan***

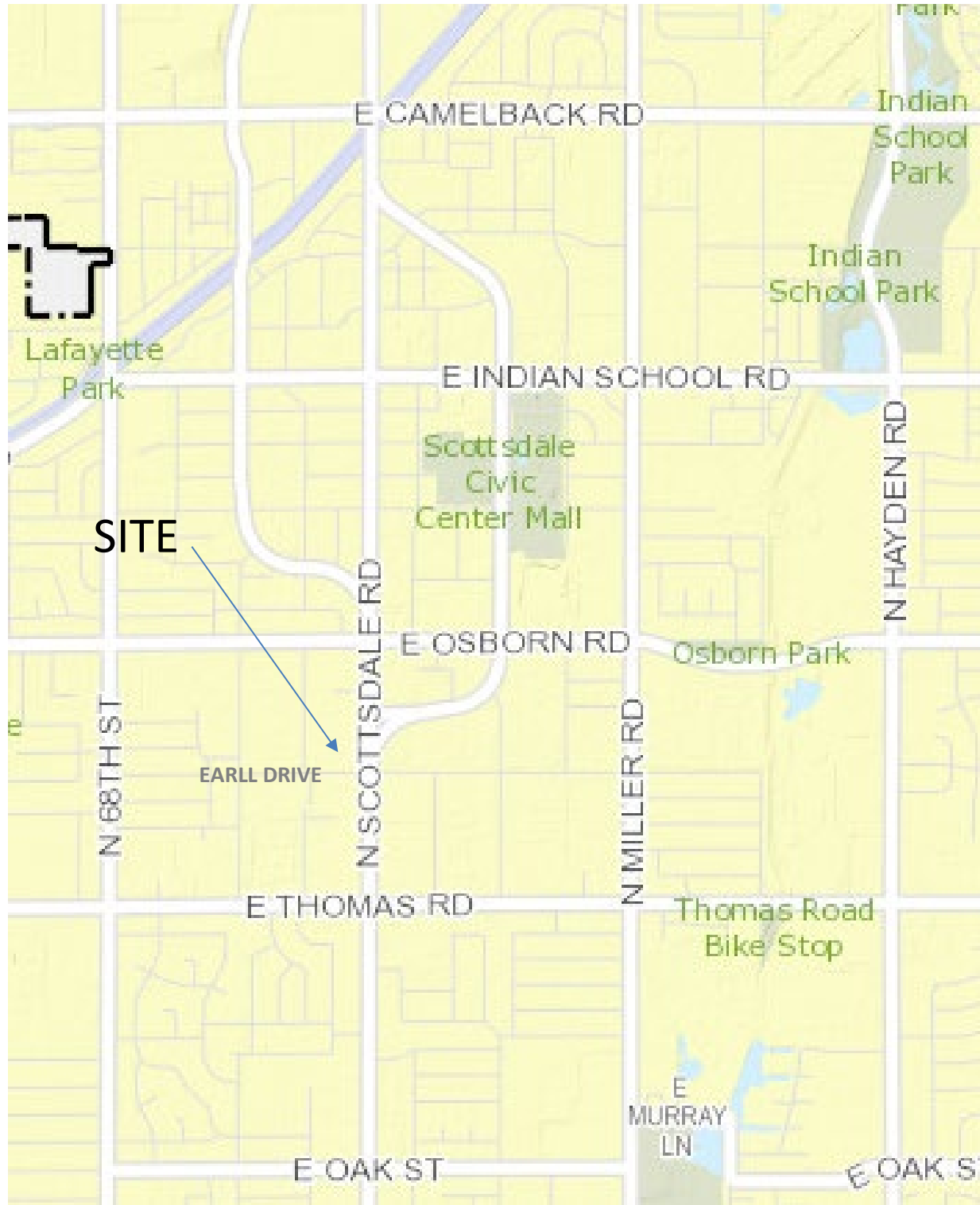
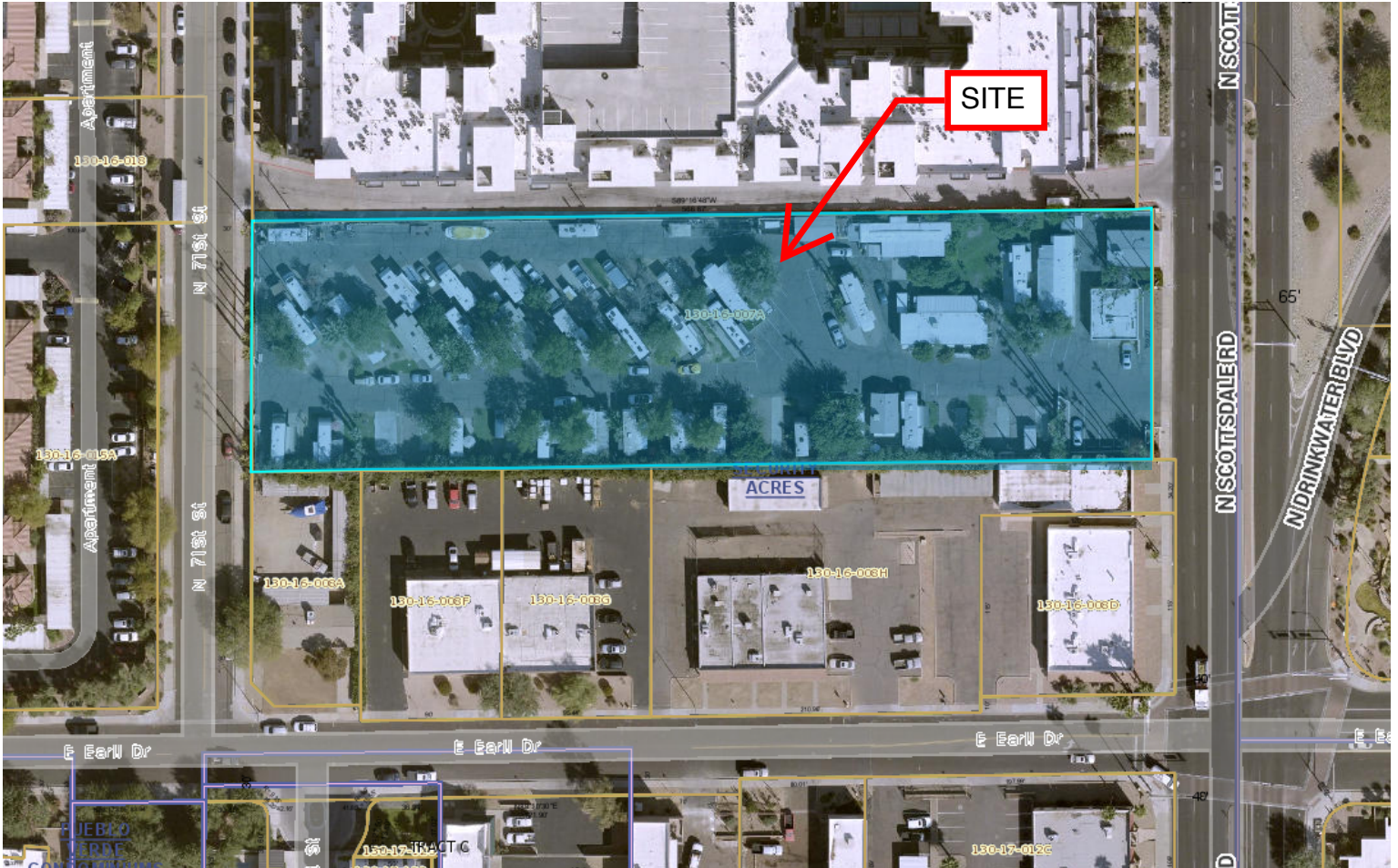


EXHIBIT 1 – Vicinity Map

8280 E. Gelding Dr., Suite 101
Scottsdale, AZ 85260



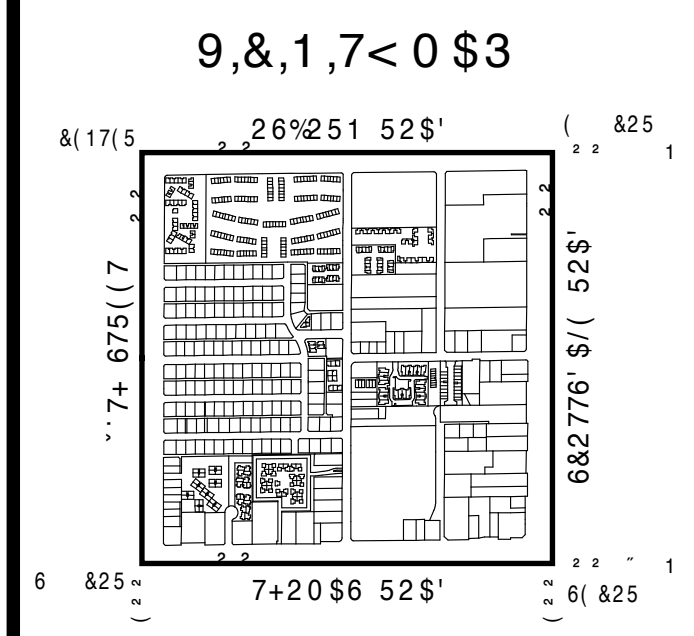
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Aerial

8280 E. Gelding Dr., Suite 101
Scottsdale, AZ 85260

GENERAL NOTES:
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 0.8' (38570 (175'
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) 577(1' 72' 5281' 4(51.12.8251(5. 58(281'
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 8251(56.51' 55(127' 86.88(88(57' 21.7+(0.83

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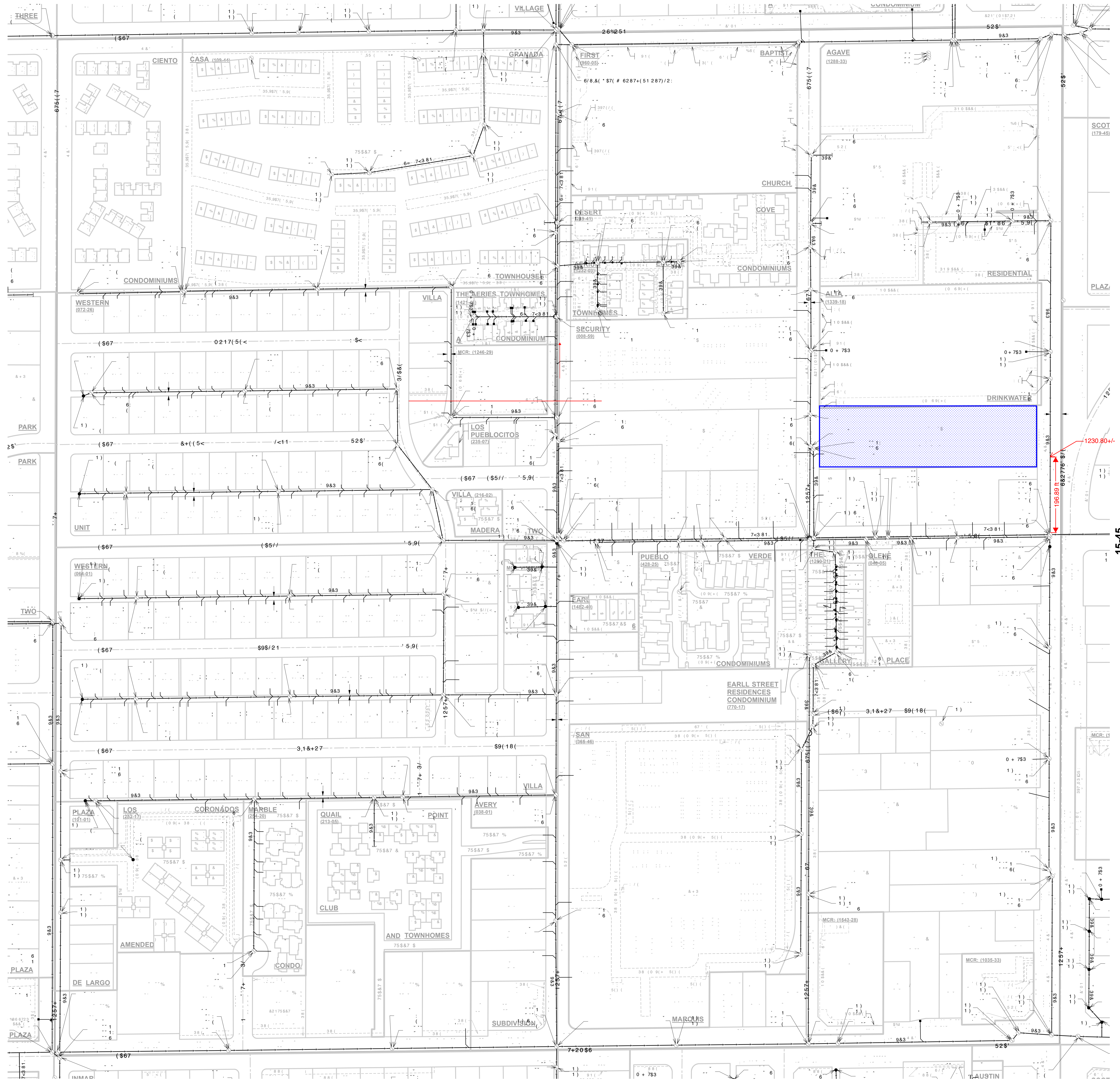
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- 6HZHJDSH ⊗
- 7UDHJHJH3R/W ⊗
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- 6HZHJDO) FUH →
- 6HZHJDO 3 UMDW →



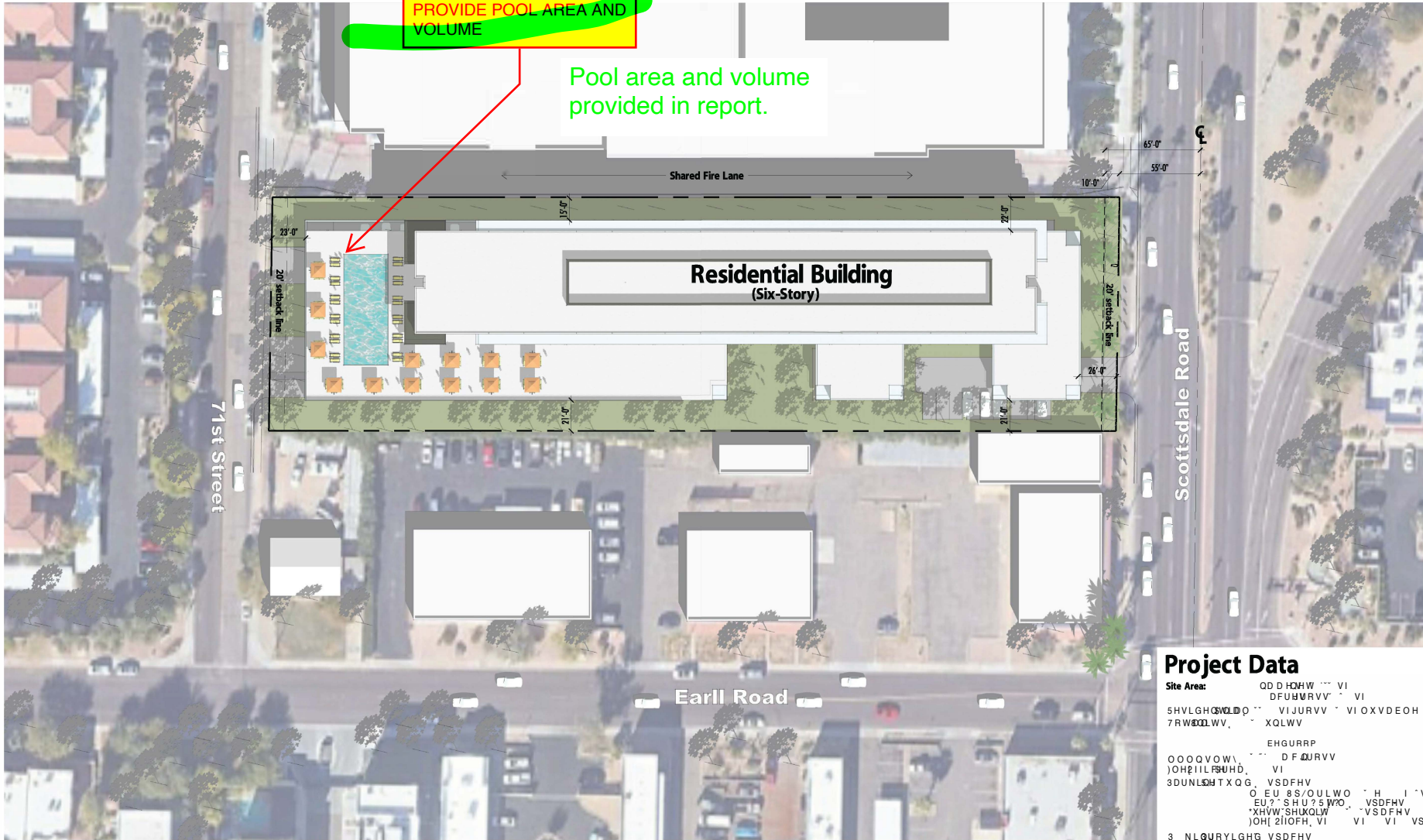
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15-44
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EXHIBIT 3

CITY OF SCOTTSDALE SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS
 1 PLAN LINC DMU FROM 0.6 6 FROM 2.5 U.F.C.D.



NOTICE
 THE CITY OF SCOTTSDALE
 04-JUL-21



Project Data

Site Area: QD D HQHW " VI
 DFUWRVV " VI
 SHVLGHGVLDP " VIJURVV " VIOXVDEOH
 7RWXQLWV, " XQLWV
 EHGURRP
 OOOQVOW, " DFQRVV
 JOHEILLFVHD, VI
 3DUNLSHTXOG, VSDFHV
 O EU 8S/OULWO " H I "VSDFHV-
 EU? SHU? 5 WQ, "VSDFHV
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80W



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 6-ZN-2022
 8/11/2022



APPENDICIES

- I.* Preliminary Service/ Utility Plan
- II.* Service Pipe Hydraulics
- IIA.* Offsite Sewer Pipe Hydraulics
- III.* Alta Drinkwater Final Sewer Capacity Report Case No. 42-DR-2016

CIVIL ENGINEER
SUSTAINABILITY ENGINEERING GROUP
8280 E. GELDING DR., SUITE 101
SCOTTSDALE, ARIZONA 85260
PHONE: 480-588-7226
ATTN: ALI FAKIH
EMAIL: ALI@AZSEG.COM

ARCHITECT:
DAVIS
3033 N. CENTRAL AVE, SUITE 800
PHOENIX, AZ 85012

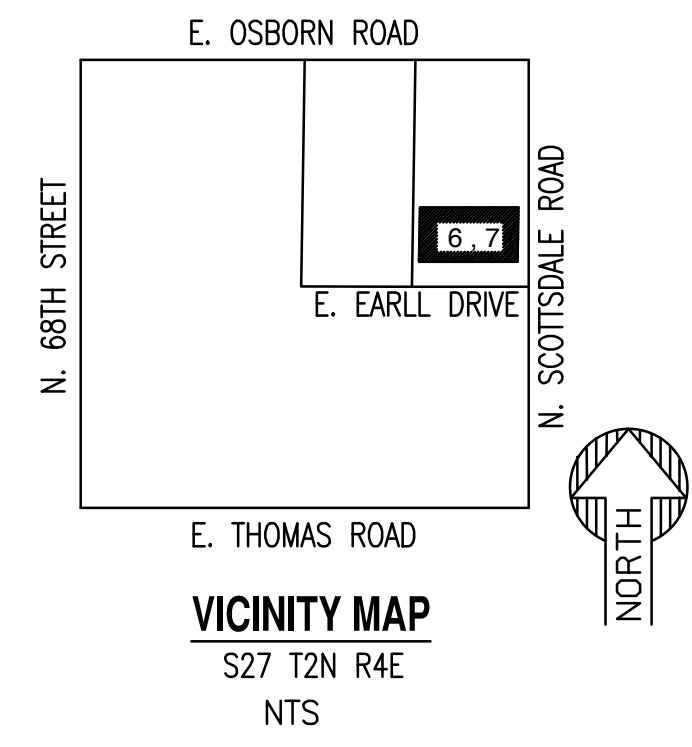
SURVEYOR
AW LAND SURVEYING, LLC
P.O. BOX 2170
CHANDLER, ARIZONA 85244
PHONE: 480-244-7630
ATTN: DANIEL ARMUJO
EMAIL: ARMUJODARMUJO@AWLANDSURVEY.COM

OWNER/DEVELOPER:
3202 SCOTTSDALE, LLC.

3200 SCOTTSDALE PRELIMINARY UTILITY PLAN

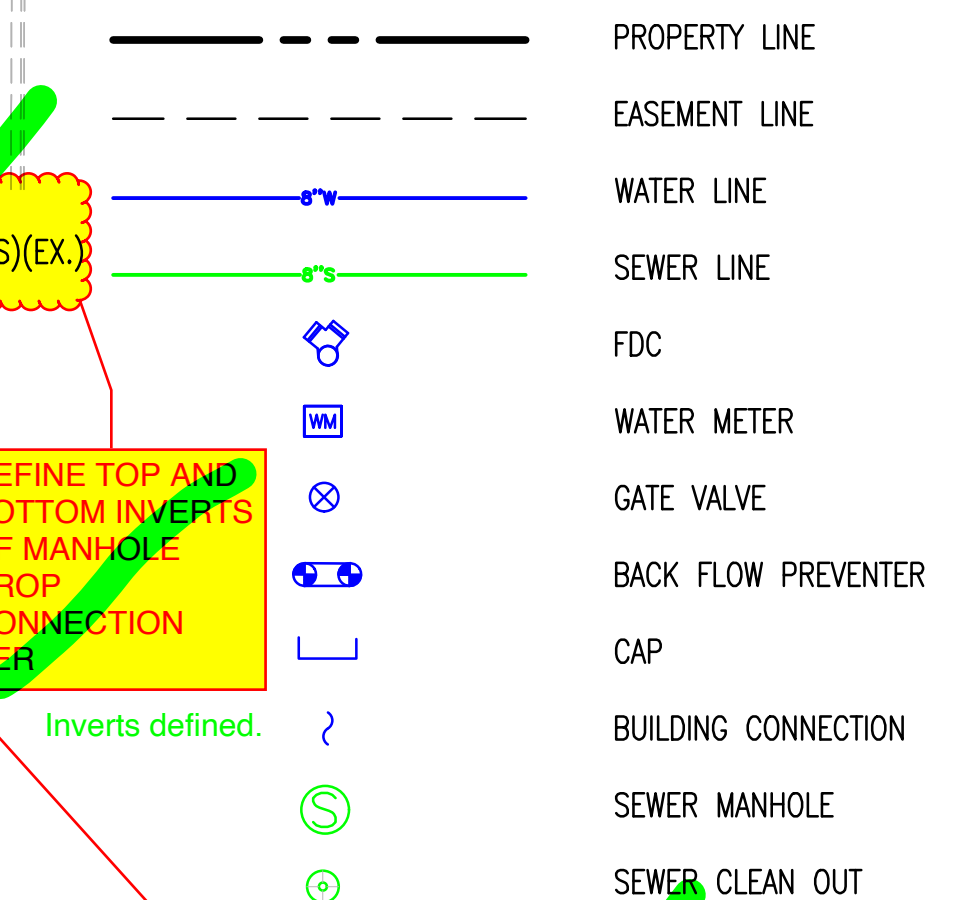
3202 N. SCOTTSDALE ROAD, SCOTTSDALE, AZ.
A PORTION OF THE EAST HALF OF THE SOUTHEAST QUARTER OF SECTION 27, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

EVERY LOT OR BUILDING MUST BE PROVIDED WITH ITS OWN INDIVIDUAL SERVICE LINE UNLESS OTHERWISE APPROVED IN WRITING BY THE WATER RESOURCES DEPARTMENT. THE SERVICE LINE LOCATION SHOULD BE COORDINATED TO AVOID CONFLICTS WITH OTHER UTILITIES OR PLACEMENT WITH DRIVEWAY LOCATIONS AND SHOULD BE LOCATED WITHIN THE DOWNSTREAM 1/3 OF THE FRONTING SS LINE LENGTH. DS&PM 7-1.409.C

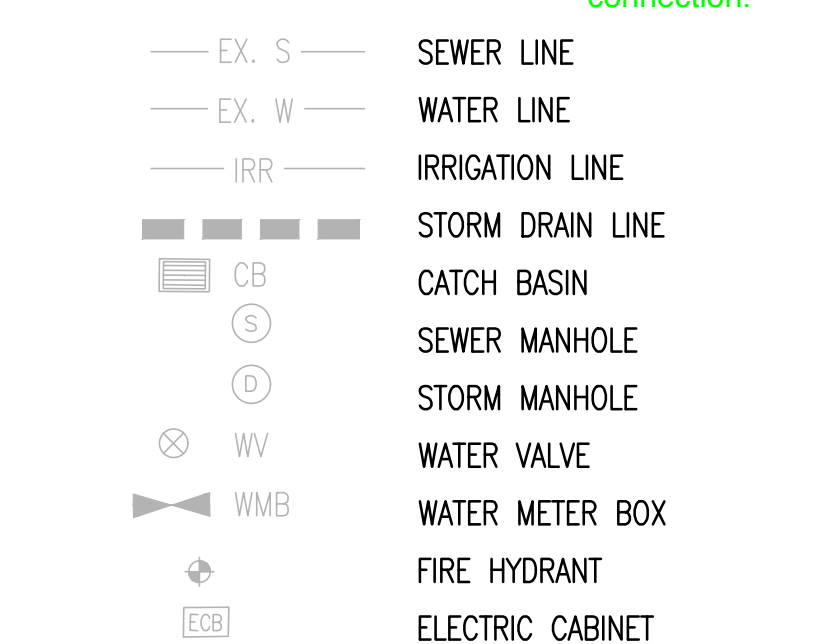


ZONING:
EXISTING: C-3, HIGHWAY COMMERCIAL
CALL OUT MAG 440-3 W/TOWN MULTIPLE USE, TYPE 2
SERVICE CONNECTION DS&PM 7-1.409.B.
SIMILAR, NO WYE, CONNECT TO PUBLIC SEWER VIA DROP CONNECTION
MAG 440-3 connection called out.

PROPOSED UTILITY LEGEND:



EXISTING LEGEND:



PRELIMINARY SEWER KEY NOTES

- VERIFY EXISTING SEWER LOCATION PRIOR TO CONSTRUCTION.
- SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT, SIDEWALK AND CURB AND GUTTER.
- 6" PVC SEWER SERVICE CONNECTION LENGTH AND SLOPE PER PLAN. PER MAG STD. DET. 440-1.
- SEWER CONNECTION TO BUILDING. Updated to MAG STD. DET. 440-3. NO SEE COMMENTS ABOVE

PRELIMINARY WATER KEY NOTES

- CONNECTION TO EXISTING WATER LINE. REPLACE AT LEAST 3' OF ACP PIPE PER C.O.S. REQUIREMENTS.
- SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT.
- GATE VALVE WITH VALVE BOX AND COVER, SIZE PER PLAN.
- 6" DUCTILE IRON PIPE. LENGTH PER PLAN.
- INSTALL CUT-IN TEE, SIZE PER PLAN.
- DOMESTIC CONNECTION TO BUILDING.
- FIRE CONNECTION TO BUILDING.
- BACKFLOW PREVENTION, SIZE TO MATCH WATER METER SIZE.
- INSTALL 3" TYPE "K" COPPER DOMESTIC SERVICE CONNECTION. LENGTH PER PLAN.
- CONNECT TO EXISTING WATER METER AND INSTALL 1-1/2" TYPE "K" COPPER IRRIGATION SERVICE LINE. LENGTH PER PLAN.
- INSTALL 3" DOMESTIC SERVICE VAULT.
- INSTALL FIRE DEPARTMENT CONNECTION.
- FIRE HYDRANT.

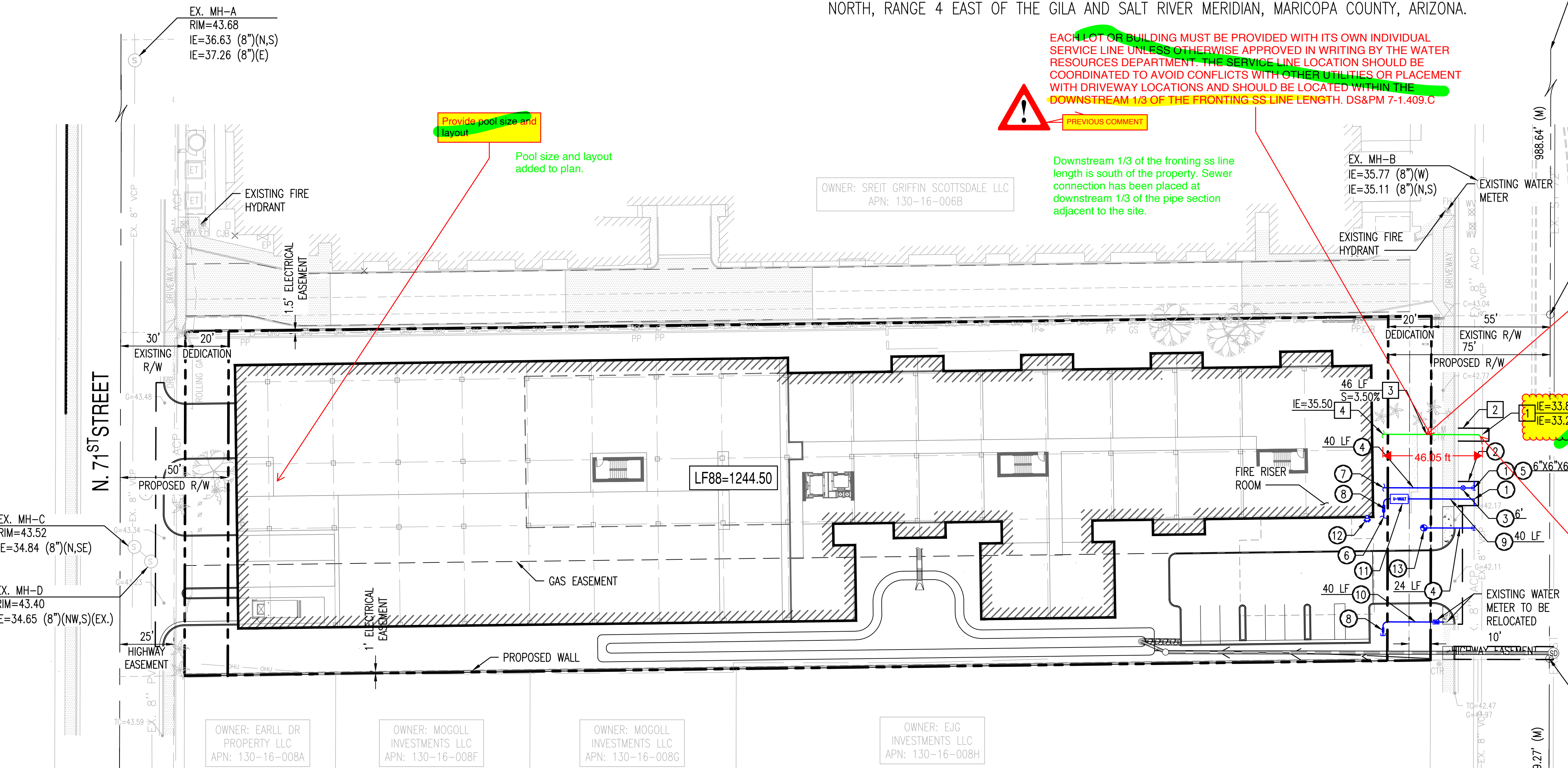
NOTES FOR IMPROVEMENTS PLANS WHERE THERE IS EXISTING ACP OR PVC PIPE:

ANY WATER LINE PROJECT THAT INVOLVES CONNECTING TO AN EXISTING ACP OR PVC PIPE REQUIRES SPECIAL ATTENTION. PER DSPM SECTION 6-1.408:

FITTINGS INSTALLED INTO ASBESTOS CEMENT PIPE (ACP) OR PVC PIPE WITHIN 6- FEET OF ANOTHER FITTING OR JOINT WILL REQUIRE THAT SECTION OF PIPE TO BE REMOVED AND REPLACED WITH DUCTILE IRON PIPE (DIP). EXISTING TEES, TAPPING SLEEVES AND RELATED APPURTENANCES THAT ARE NOT UTILIZED BY A DEVELOPMENT SHALL BE REMOVED BY THE CONTRACTOR. A MINIMUM 3-FOOT SECTION OF PIPE SHALL BE REMOVED, WITH NO LESS THAN 6 FEET REMAINING TO THE NEAREST JOINT. THE REMOVED PIPE SHALL BE REPLACED WITH DIP. WHEN MORE THAN 3- FEET OF EXISTING ACP OR PVC WATER LINES ARE EXPOSED DURING CONSTRUCTION AND THE BEDDING IS DISTURBED, THE WATER LINE MUST BE REPLACED WITH DIP (MINIMUM CLASS 350) WITH MECHANICAL JOINTS OR FLANGED JOINTS TO 3- FEET PAST THE SIDES OF THE EXPOSED CROSSING TRENCH. REFER TO MAG STANDARD DETAIL NO. 403-3. NO TAPPING SLEEVE AND VALVE SHALL BE USED ON ACP PIPE. VALVES WILL NEED TO BE CUT INTO ACP PIPE. DISPOSAL OF MATERIALS CONTAINING ASBESTOS AND/OR LEAD SHALL BE IN CONFORMANCE WITH ALL REGULATIONS, LAWS AND ORDINANCES.

NOTE:

- EXISTING MANHOLES RIMS AND INVERTS HAVE BEEN SET BASED ON QUARTER SECTION MAP QS# 15-44. DATED 07/04/2021. ELEVATIONS TO BE VERIFIED IN FIELD.
- EXISTING MANHOLES RIMS AND INVERTS HAVE BEEN SET BASED ON ALTA DRINKWATER UTILITY PLAN SHEET C4.00 AND C4.10. DATED 08/03/2018. ELEVATIONS TO BE VERIFIED IN FIELD.



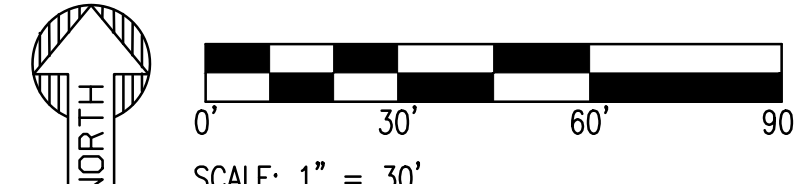
OWNER: SREIT GRIFFIN SCOTTSDALE LLC
APN: 130-16-006B

OWNER: EARLL DR PROPERTY LLC
APN: 130-16-008A

OWNER: MOCOLL INVESTMENTS LLC
APN: 130-16-008F

OWNER: MOCOLL INVESTMENTS LLC
APN: 130-16-008G

OWNER: EJC INVESTMENTS LLC
APN: 130-16-008H



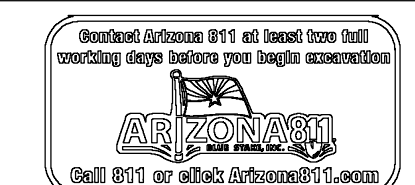
C.O.S. GENERAL NOTES FOR PUBLIC WORKS CONSTRUCTION

- ALL CONSTRUCTION IN THE PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MAG UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE CITY'S SUPPLEMENTAL STANDARD DETAILS WILL GOVERN.
- THE CITY ONLY APPROVES THE SCOPE, NOT THE DETAIL, OF ENGINEERING DESIGNS; THEREFORE, IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
- THE APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF A RIGHT-OF-WAY PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS MUST BE RESUBMITTED TO THE CITY FOR REAPPROVAL.
- A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY RIGHTS-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO BEGINNING CONSTRUCTION BY CALLING 480-312-5750.
- WHENEVER EXCAVATION IS NECESSARY, CALL THE BLUE STAKE CENTER, 811, TWO WORKING DAYS BEFORE EXCAVATION BEGINS. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT.
- RIGHT-OF-WAY PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. A RIGHT-OF-WAY PERMIT WILL BE ISSUED BY THE CITY ONLY AFTER THE REGISTRANT HAS PAID A BASE FEE PLUS A FEE FOR INSPECTION SERVICES. COPIES OF ALL PERMITS MUST BE RETAINED ON-SITE AND BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE SUSPENSION OF ALL WORK UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
- ALL EXCAVATION AND GRADING THAT IS NOT IN THE PUBLIC RIGHTS-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO APPENDIX J, GRADING, OF THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY THE CITY.

PRELIMINARY
NOT FOR
CONSTRUCTION

SUSTAINABILITY
ENGINEERING
GROUP

SEG



PROJECT: 3200 SCOTTSDALE
LOCATION: 3202 N. SCOTTSDALE ROAD, SCOTTSDALE, AZ.

DRAWN: LP 08/03/2022
DESIGNED: LP 08/03/2022
QC: SC 08/01/2022
FINAL QC:
PROJ. MGR.: AF 08/03/2022

DATE: 08/03/2022
ISSUED FOR: REZONING

REVISION NO.	DATE

JOB NO.: 210708
SHEET TITLE: PRELIMINARY UTILITY PLAN

PAGE NO.:
SHEET NO.: C4.10

APPENDIX I

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

6" Sewer Service @ 3.5% w/o pool backwash

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.03500	ft/ft
Diameter	6.0	in
Discharge	69.8	gpm

Results

Normal Depth	1.56	in
Flow Area	0.04	ft²
Wetted Perimeter	0.54	ft
Hydraulic Radius	0.91	in
Top Width	5.3	in
Critical Depth	2.36	in
Percent Full	26.0	%
Critical Slope	0.00722	ft/ft
Velocity	3.83	ft/s
Velocity Head	0.23	ft
Specific Energy	0.36	ft
Froude Number	2.22	
Maximum Discharge	506.8	gpm
Discharge Full	471.1	gal/min
Slope Full	0.00077	ft/ft
Flow Type	SuperCritical	

APPENDIX II – Pipe Hydraulics

6" Sewer Service @ 3.5% w/ pool backwash

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	0.03500 ft/ft
Diameter	6.0 in
Discharge	169.8 gpm

Results

Normal Depth	2.49 in
Flow Area	0.08 ft ²
Wetted Perimeter	0.70 ft
Hydraulic Radius	1.32 in
Top Width	5.9 in
Critical Depth	3.75 in
Percent Full	41.5 %
Critical Slope	0.00890 ft/ft
Velocity	4.91 ft/s
Velocity Head	0.38 ft
Specific Energy	0.58 ft
Froude Number	2.19
Maximum Discharge	506.8 gpm
Discharge Full	471.1 gal/min
Slope Full	0.00455 ft/ft
Flow Type	SuperCritical

APPENDIX II – Pipe Hydraulics

Scottsdale Road 8" Sewer @ 1%, d/D= 0.65

Project Description

Friction Method Manning Formula
 Solve For Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.01000 ft/ft
Normal Depth	5.2 in
Diameter	8 in

Results

Discharge	590736 gal/day
Flow Area	0.24 ft²
Wetted Perimeter	1.25 ft
Hydraulic Radius	2.3 in
Top Width	7.63 in
Critical Depth	5.44 in
Percent Full	65.0 %
Critical Slope	0.00882 ft/ft
Velocity	3.81 ft/s
Velocity Head	0.23 ft
Specific Energy	0.66 ft
Froude Number	1.09
Maximum Discharge	840099 gal/day
Discharge Full	780975 gal/day
Slope Full	0.00572 ft/ft
Flow Type	SuperCritical

APPENDIX IIA – Pipe Hydraulics

Scottsdale Road 8" Sewer @ 1%, d/D= 0.8

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.01000 ft/ft
Normal Depth	6.4 in
Diameter	8 in

Results

Discharge	763377 gal/day
Flow Area	0.30 ft²
Wetted Perimeter	1.48 ft
Hydraulic Radius	2.4 in
Top Width	6.40 in
Critical Depth	6.18 in
Percent Full	80.0 %
Critical Slope	0.01075 ft/ft
Velocity	3.95 ft/s
Velocity Head	0.24 ft
Specific Energy	0.78 ft
Froude Number	0.93
Maximum Discharge	840099 gal/day
Discharge Full	780975 gal/day
Slope Full	0.00955 ft/ft
Flow Type	SubCritical

APPENDIX IIA – Pipe Hydraulics

APPENDIX III

FINAL SEWER CAPACITY REPORT

ALTA DRINKWATER
3220 N. Scottsdale Road
Scottsdale, AZ

Prepared For:



8777 E. Via De Ventura
Scottsdale, AZ 85258
Phone: 480.607.0622

Prepared by:



EXPIRES 12-31-17

THIS DOES NOT
APPEAR TO BE AN
APPROVED BOD.
WHERE IS THE CITY
STAMP OF APPROVAL?

Approved BOD has
been requested.

Sustainability Engineering Group

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

Project Number: 160410
Submittal Date: July 21, 2017

Case No.: 42-DR-2016

Plan Check No.: 2157-17

6-ZN-2022
8/11/2022



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APPENDIX II	Calculations
APPENDIX III	Utility Plan
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1. INTRODUCTION

1.1 SUMMARY OF PROPOSED DEVELOPMENT:

Proposed development consists of a maximum of 277 apartment units in a four (4) story building complex that includes a clubhouse and parking garage. The purpose of this report is to provide an analysis of the impact that this development will have on the city's wastewater system.

1.2 LEGAL DESCRIPTION:

The project property consists of a parcel of land located on the west side of Scottsdale Road, across from the Drinkwater Boulevard intersection. It is further bound by 71st Street to the west, developed commercial property to the north, and a mobile home park to the south. It is located in a portion of Section 27, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County,

- x Arizona Parcel ID numbers APN: 130 16 006A
- x Street address is 3220 N. Scottsdale Road
- x The legal description is:

Lot three (3), Block twenty nine (29), Security Acres Amended, according to the plat of record in the office of the County Recorder of Maricopa County, Arizona in Book 8 of Maps, page 59.

Except the east 22 feet thereof, and

Except the east 5 feet of the west 30 feet conveyed to the City of Scottsdale in instrument recorded June 7, 1983, document no. 83 217883.

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

1.3 EXISTING AND PROPOSED SITE ZONING AND LAND USES:

The overall project parcel is zoned C B (Highway Commercial). Rezoning to D/DMU r2 PBD DO is proposed. Auto collision/repair facilities and a vacant car dealership currently exist on the property. The site will be totally demolished for the redevelopment into an apartment complex.

1.4 REFERENCES:

The project falls within Mixed Use Neighborhoods conceptual land use district of the City's General Plan and appears to be located in the Downtown Plan character area.

2. DESIGN DOCUMENTATION

2.1 DESIGN COMPLIANCE:

The analysis of the proposed and existing sewer system is done in compliance with Chapter 7 – Wastewater of the City of Scottsdale 2010 update of the Design Standards & Policies Manual (DS&PM). Design flow calculations for the on site system will be based on the recommendations in Section 7 1.403 of the DS&PM.

3. EXISTING CONDITIONS

3.1 EXISTING ZONING & LAND USE:

Land ownership, as defined by ALTA/ACSM Land Title Survey by AW Land Surveying, LLC dated 04/13/16 includes 183,705.9 square feet or 4.217+/- acres of commercially developed land. City of Scottsdale zoning map designates this parcel as C B.

3.2 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

This site is fully developed as a car dealership. The topography generally slopes from the west r northwest to the southeast corner at approximately one half percent with a change in elevation of approximately three and one half (3.5) feet. Typical desert landscaping exists at the perimeter of the site. Refer to **FIGURE 2** for an aerial of the overall project existing conditions.

FIRM Map Number 04013C2235L dated October 16, 2013 indicates this site is designated as Zone "X". As such, it is defined as areas outside of the 0.2% annual chance of flooding. Refer to **FIGURE 3** for the FIRM.

3.3 EXISTING UTILITIES:

Sanitary Sewer: QS 15 #4 City of Scottsdale

- x An 8" VCP sanitary sewer is available approximately six (6) feet east of the 71st Street centerline. A manhole is located off both the NW corner and SE corner of the subject site. Depth to invert is approximately 8'. Per the QS map, a service lead to this system exists approximately in the middle of the property.
- x An 8" VCP sanitary sewer is also available in Scottsdale Road approximately in the centerline of the road. Depth to invert is approximately 8.5'

Refer to **FIGURE 4** for the City quarter section map (**QS 15 #4**)

4. PROPOSED CONDITIONS

4.1 SITE PLAN:

The property is proposed to be re developed with new lot configurations into 277 apartment homes. Development will include a 24' wide paved access road along the southerly property line from Scottsdale Road to 71st Street. A 24' wide fire lane is also proposed along the northerly property line. This is conceptualized to be GrassPave type of reinforcement. An open courtyard is proposed in the westerly third of the units, with a parking structure near the center of the site, and an amenities / pool area and clubhouse in the easterly portion.

4.2 PROPOSED SEWER SYSTEM:

Sewer service will consist of stubs from the east and west ends of the building to existing 8" sewers in 71st Street and Scottsdale Road respectively.



Refer to **APPENDIX III** for the Utility Plan.

4.3 MAINTENANCE RESPONSIBILITIES:

The on site sewer line for the proposed development will be private and maintained by the property owner. The off site sewer is a public system maintained by the City of Scottsdale.

5. SANITARY SYSTEM COMPUTATIONS

5.1. SEWER FLOW DEMANDS:

DS&PM, Chapter 7 – Wastewater specifies that for residential uses, sanitary sewer lines 8 to 12 inches in diameter will be designed using 100 gallons per capita per day (gpdpc) and a peaking factor of 4.

Per the developer, the average person per unit for this product has been trending at approximately 1.1 capita per dwelling unit (c/du). For the purposes of this report, an assumption of one (1) person per bedroom will be used.

227DU/4.22A=27DU/A

Therefore the average proposed design flow is:

DENSITIES OVER 22DU/ACRE TO ASSUME 1.7-2.2 PERSONS PER UNIT. DSPM7-1.403

- x One Bedroom: 172 units x 1 = 172
- x Two Bedroom: 92 units x 2 = 184
- x Three Bedroom: 13 units x 3 = 39

Approved BOD has been requested.

TOTAL = 395 persons / 277 units or 1.43 c/du
= 143 gpdpc

277 units x 1.43 persons/du x 100 gpdpc = **39,611 gpd (Average)**
Peak Flow: 39,611 gpd x 4 = **158,444 gpd (Peak)**

The existing commercial buildings total approximately 32,681 s.f. in area. Per the referenced manual, sewer demands are 0.5 per sq.ft. with a peaking factor of 3 for commercial use.

Therefore the average original design flow was:

32,681 s.f. x 0.5 = 16,341 gpd (Average)
Peak Flow: 16,341 gpd x 3 = 49,023 gpd (Peak)

This represents an increase of 23,270 gpd (average daily flow) or 109,421 gpd (peak) over the existing development contributions.

5.2. VARIANCE FROM STATED DESIGN FLOWS:

Stated design flows for the on site system will be used as recommended.

5.3. SEWER SYSTEM ANALYSIS (Off site):

- x No off site contributions will be carried through the proposed on site system.
- x On site system will consist of a sewer service stub from the east and west end of the building directly to the existing sewers in 71st Street and Scottsdale Road as noted below.



- X The proposed Agave Old Town Apartments to the north include 365 units. These are split 143 units toward 71st street and 247 units toward Scottsdale Road. Note that a portion of the existing sanitary sewer in Angus Drive is be removed as a result of the Agave development. The sewer in 71st Street is being extended south to connect to the existing sewer adjacent to the subject parcel.

Refer to APPENDIX IV for excerpts from the Agave Old Town Apartments basis of design report.

At the request of the City of Scottsdale staff, the existing sanitary sewer systems in 71st Street(8"), Earll Drive(21"), and Scottsdale Road (8") have been analyzed. The flow parameters of these three sewers are shown in Appendix 2. The present flow rate of 0.729mgd in the 21" sewer at 71st Street and Earll Drive was provided from the City wastewater model by City staff. The pipe capacity at d/D of 0.7 was calculated to be 4.7mgd, shown in Appendix 2. Including both the Agave and Alta project's flows increased the flow rate in Earll Drive to 0.87 mgd. At this capacity, the d/D is calculated at 0.26, shown in Appendix 2. Additional wastewater contributions to the existing public sewers, based on the contribution boundary presented as FIGURE 4A, are summarized in Table 1 below as follows:

Table 1: Sewer Demand Calculations (gpd)					
	Units or s.f. com.	ADF (gpcu) or per s.f.	Avg. Day Flow (GPD)	Peaking Factor	Peak Hour (GPD)
71st Street (DP 1 to DP 2)	Point of tie in to 71st Street				
Baptist Church	24,500 s.f.	0.1	2,450	3	7,350
Aqave Apartments	118	140.0	16,520	4	66,080
ALTA Osborn Apartments*	143	143.0	20,449	4	81,796
Security Acres	92	250.0	23,000	4	92,000
Mobile Home Park (Assumed full)	40	250.0	10,000	4	40,000
MHP commercial	2,000 s.f.	0.5	1,000	3	3,000
Duplex	2	250.0	500	4	2,000
	SUBTOTAL (DP 1 to DP 2)		73,919		292,226
Earll Drive 8" (DP 2 to DP 3)	For information only				
Pueblo Condo's area (west)	36	250.0	9,000	4	36,000
Commercial	41,000 s.f.	0.5	20,500	3	61,500
	SUBTOTAL (DP 2 to DP 3)		103,419		97,500
Scottsdale Road (DP 4 TO DP 5)	Ties in at Earll Drive				
Aqave Apartments	247	140	34,580	4	138,320
Good Egg restaurant	7,000 s.f.	1.2	8,400	6	50,400
ALTA Osborn Apartments	134	143	19,162	4	76,648
	SUBTOTAL (DP 4 to DP 5)		62,142		265,368

5.4. DEMAND FACTORS:

DS&PM requires a peak factor of 4 for the residential units. Refer to Section 5.1 above for calculations. Additionally, the following peak factors are used for off site contributions to the existing systems:

- x Commercial: PF=3
- x Restaurants: PF=6

5.5. SEWER CAPACITY CALCULATIONS

Flowmaster calculations of the existing sewer capacities can be found in Appendix II. Based on the Peak Hour calculations shown above in Section 5.3, the following Table 2 is provided as a summary of the capacity of the existing sewers in 71st Street, Earll Drive, and Scottsdale Road.

Location	Diameter (inch)	Proposed Peak Flow (gpd)	Full Flow Capacity (gpd)	Peak Flow to Full Flow Capacity Ratio
71st Street (DP 1 to DP 2)	8	292,226	454,642	0.64
Scottsdale Road (DP 4 to DP 6)	8	265,368	576,171	0.46
Earll Drive (21")	Re: Section 5.3			

6. SUMMARY

6.1 SUMMARY OF PROPOSED IMPROVEMENTS:

- x The proposed wastewater improvement was designed based on the current City of Scottsdale's design standards and policies.
- x The average day and peak sewer flows discharging to 71st Street from ALTA Osborn apartments are estimated to be 20,449 gpd and 81,796 gpd respectively.
- x The average day and peak sewer flows discharging to Scottsdale Road from ALTA Osborn apartments are estimated to be 19,162 gpd and 76,648 gpd respectively.
- x The existing 8" sewer in 71st Street has a full flow capacity of 454,642 gpd and is adequately sized to accommodate the anticipated flows from the contributing developments (existing and proposed)
- x The existing 21" sewer in Earll has a capacity of 4.7mgd and is adequately sized to accommodate the anticipated flows from the contributing developments (existing and proposed)
- x The existing 8" sewer in Scottsdale Road has a full flow capacity of 576,171 gpd and is adequately sized to accommodate the anticipated flows from the contributing developments (existing and proposed)

6.2 PROJECT SCHEDULE:

As a residential apartment development the infrastructure and buildings are proposed to be constructed in a single phase.



7 SUPPORTING MAPS

7.1 UTILITY PLAN

Refer to **APPENDIX III** for a Preliminary Utility Plan

8 REFERENCES

1. *COS QS Sewer Plan number 15 #4*
2. *City of Scottsdale Design Standards & Policies Manual, 2010 (Chapter 7 – Wastewater)*
3. *Wastewater Basis of Design Report for Agave Old Town Apartments prepared by Hilgart Wilson dated December 10, 2015.*



PROJECT
LOCATION

3222 N Scottsdale Rd

FIGURE 1
VICINITY MAP

E Thomas Rd
© 2016 Google



E Angus Dr

N Drinkwater Blvd

3220 N Scottsdale Rd

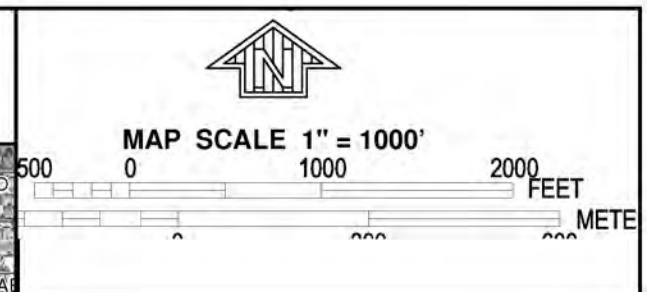
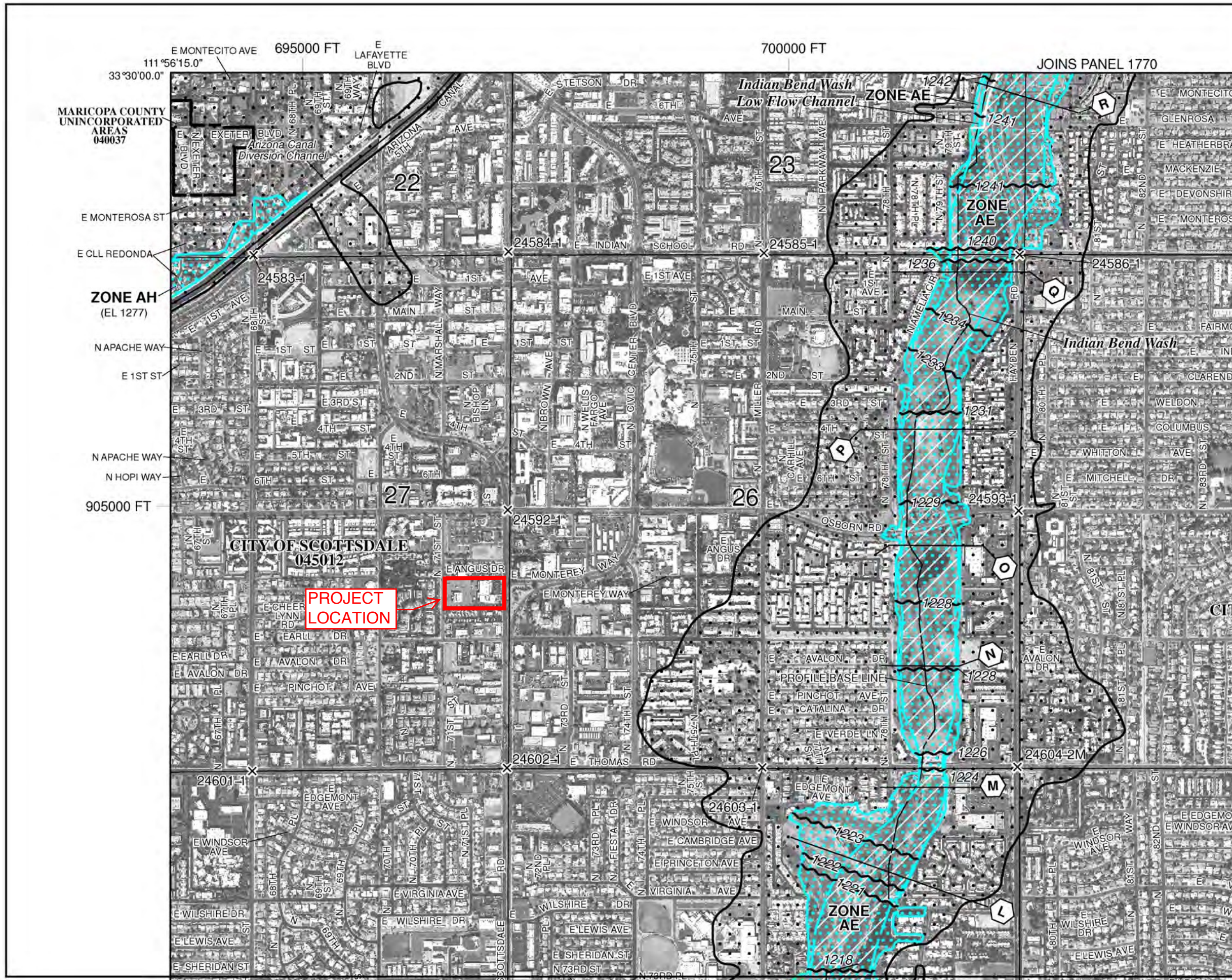
PROJECT LOCATION

N 71st St

N Scottsdale Rd

© 2016 Google

FIGURE 2
AERIAL



PANEL 2235L

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY,
ARIZONA
AND INCORPORATED AREAS

PANEL 2235 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	2235	L
MESA, CITY OF	040048	2235	L
SCOTTSDALE, CITY OF	045012	2235	L
TEMPE, CITY OF	040054	2235	L

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
04013C2235L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

FIGURE 3

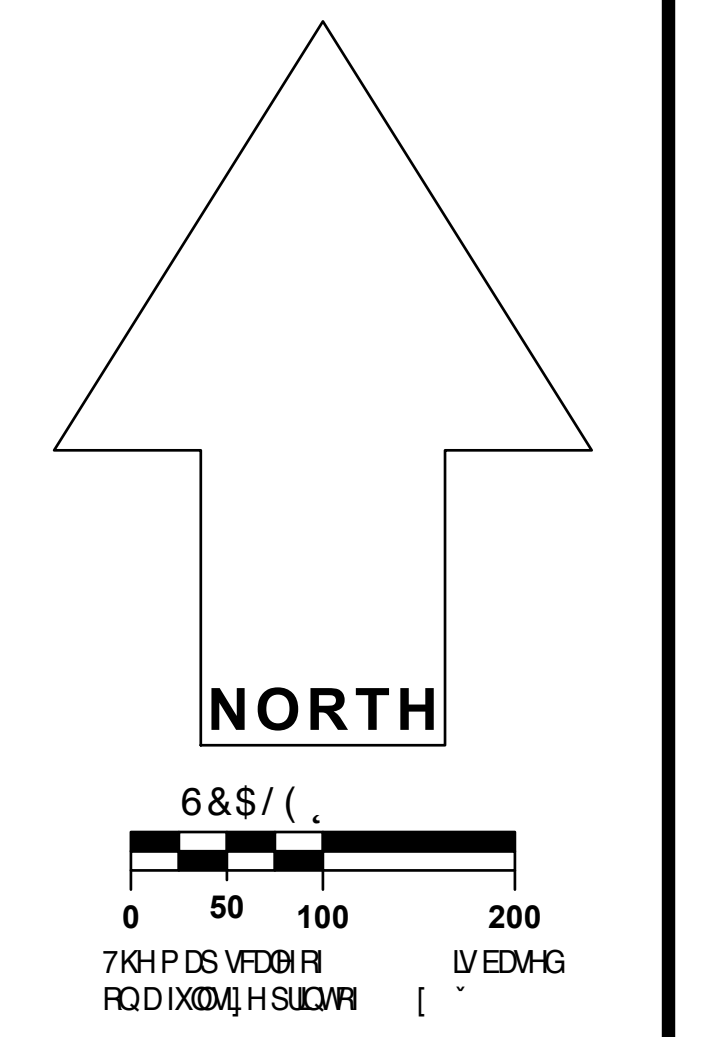
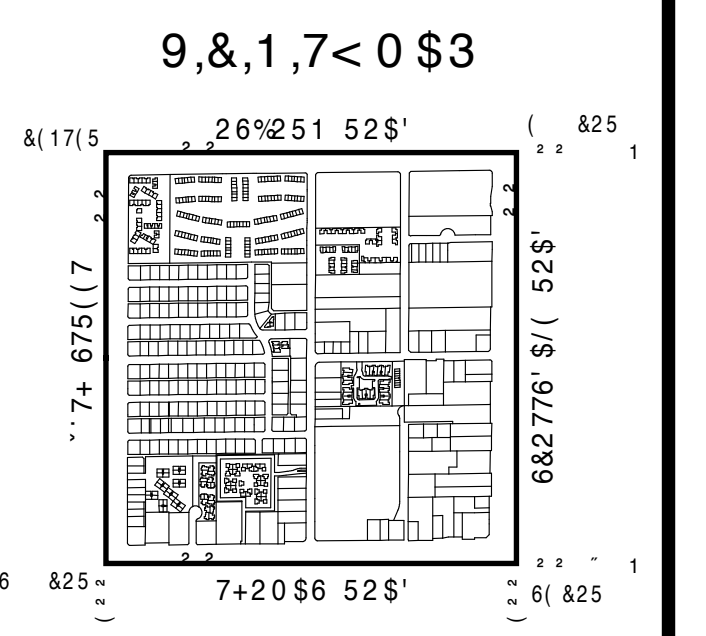
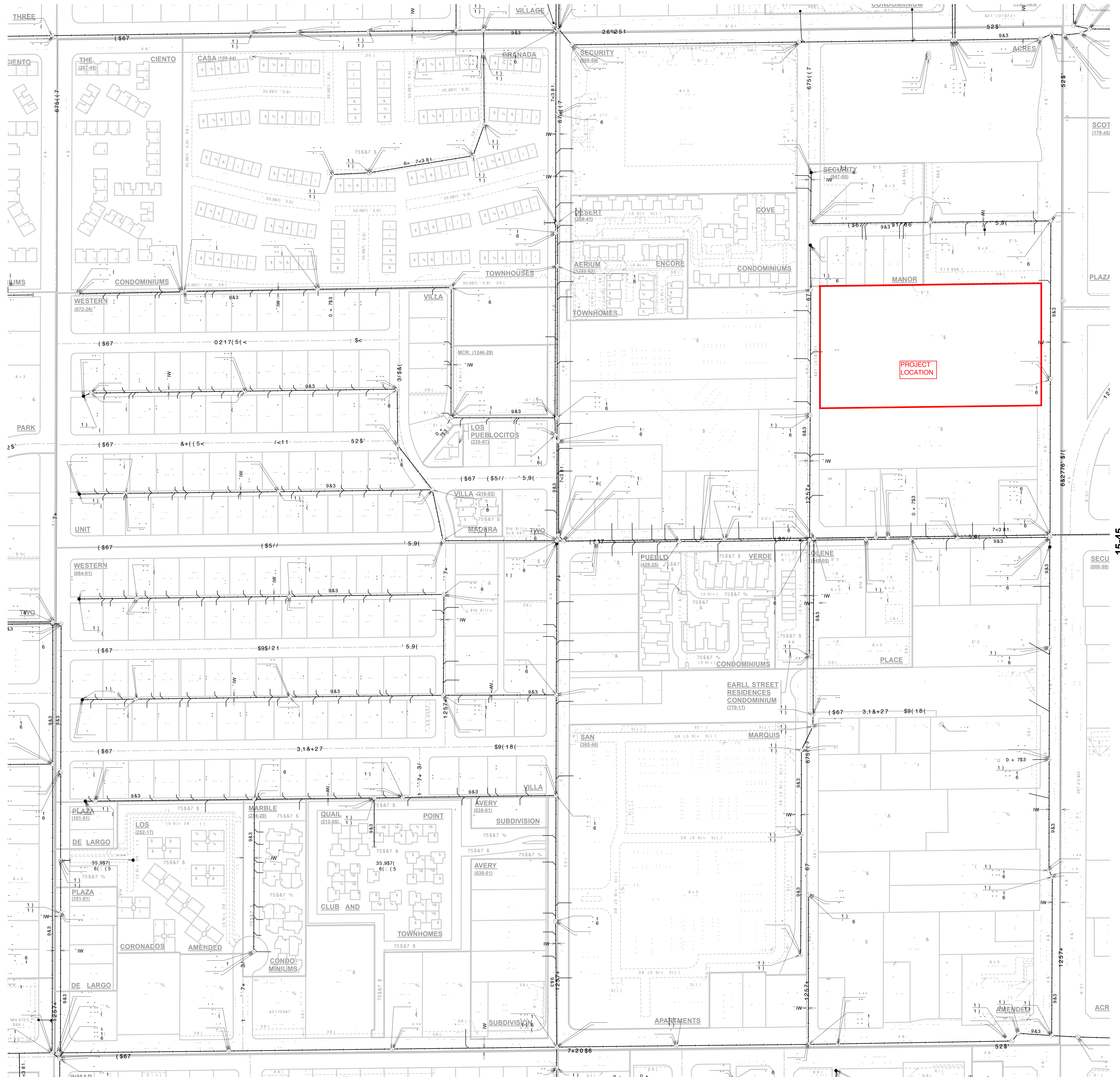
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

GENERAL NOTES:
7+6.8820387(5' (1)537' 55' 1" 2551'
5(9.21631(56' 82'75877(6.7-2) 682776' S/(
' 8' (38570(175)

7+(6(8721' 1(455.1' 51' 87518(655' 986'
217+(6.7-2) 682776' S/('36 6859(<2) 6(37(0%'
' 55.1' 655' 15' ' 5' 51' 67518(655'
)577(1' 72' 5281' : 4(5' 12 8251(5' 58' 281'
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8251(5631' 55(127(' 86 88/88/57(217+(6(83

LEGEND:

- 6800FW ●
- 1/16 VMPQ □
- 0 DCRB ○
- 1 RQ 36 3 ROW ○
- 3 QU]
- 6HZH6HMH3 ROW ■
- 6HZH7DS3 ROW ●
- 6HZH8DQH ⊗
- 7UDR HD 8 DOW ⚡
- 6HZHU DQ * UMW →
- 6HZHU DQ) FUH — Force
- 6HZHU DQ 3 UDMW →



SEWER
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15-44
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FIGURE 4

N O T I C E
 THE CITY OF SCOTSDALE
 05-APR-16

CITY OF SCOTSDALE
 SCOTSDALE GEOGRAPHIC INFORMATION SYSTEMS
 1 PLAN LINC DMJ/FK/RY/MLG
 6/FM/EDH/SJ/FCD

281-PA-2016 Sewer Basin

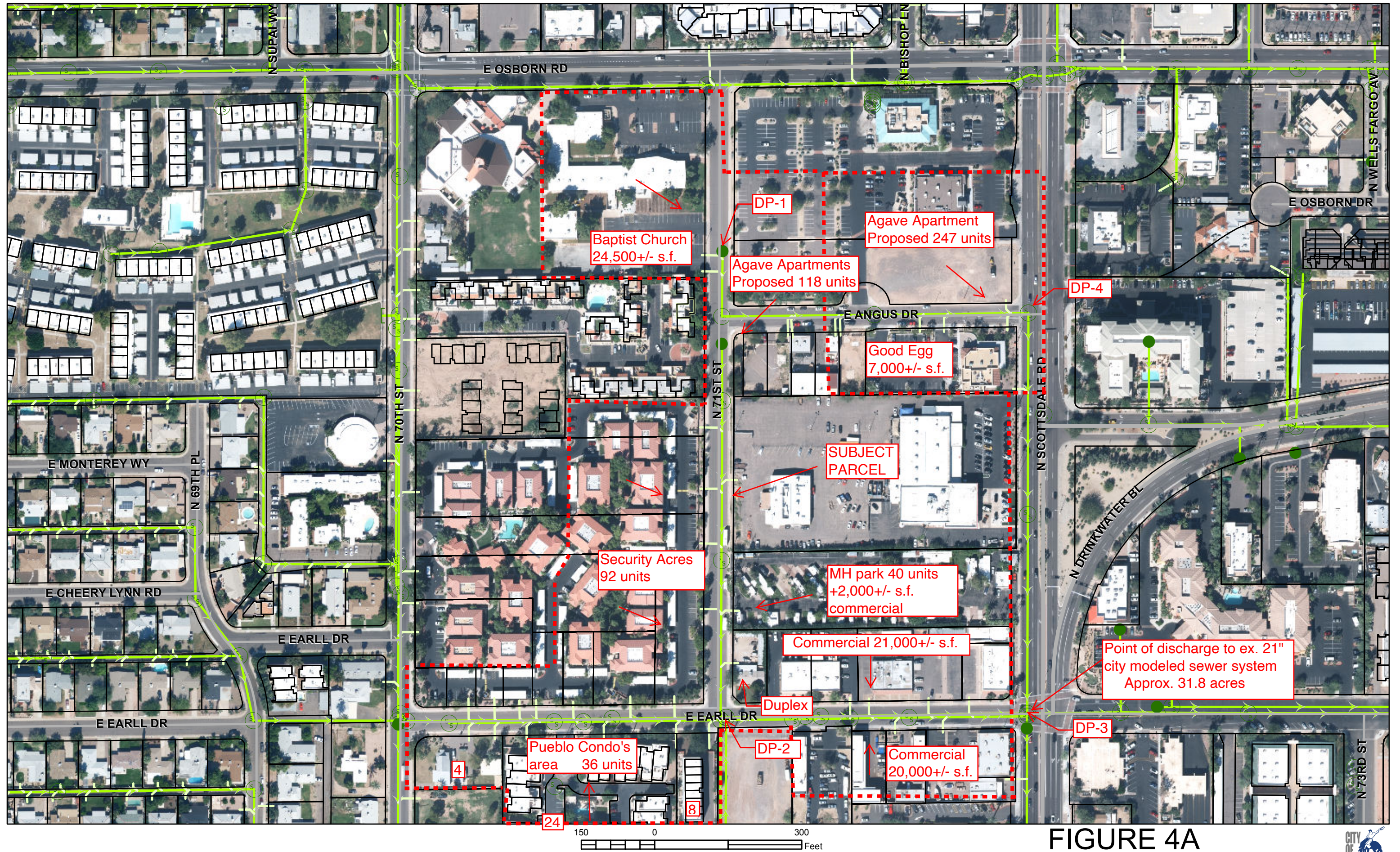


FIGURE 4A
Contribution Boundary



^>"~ €]vP v^ ~°À°o}>]vP ^u „I W„}

APPENDIX I

Design Requirements

8280 E. Gelding Dr., Suite 101
Scottsdale, AZ 85260

4. The water line and sanitary sewer line will run parallel to each other, with 9 feet of separation to the pipes' centerline in order to maintain 6 feet of clearance at manholes.
5. Deflections in the sanitary sewer line shall be designed to nominal fitting angles within standard tolerances and will occur at the same locations where the water line is deflected.

See [Section 6-1.302](#) for related water system criteria.

DESIGN FLOWS

7-1.403

A. Residential

Sanitary sewer lines 8 to 12 inches in diameter will be designed using 100 gallons per capita per day (gpcpd) and a peaking factor of 4.

Sanitary sewer lines larger than 12 inches in diameter will be designed using 105 gpcpd and a peaking factor developed from "Harmon's Formula":

$$Q_{max} = Q_{avg} [1+14 / (4+P1/2)]$$

$$P = Population / 1,000$$

Residential densities are to assume 2.5 persons per dwelling unit, apartment or town home.

B. Commercial and Industrial

Wastewater flows for uses other than those listed below shall be based upon known regional or accepted engineering reference sources approved by the Water Resources Department.

AVERAGE DAY SEWER DEMANDS		
Land Use	Demand	Peaking Factor
Commercial/Retail	0.5 per sq. ft.	3
Office	0.4 per sq. ft.	3
Restaurant	1.2 per sq. ft.	6
High Density Condominium	140 per room	4.5
Resort Hotel (includes site amenities)	380 per room	4.5
School: without cafeteria	30 per student	6
School: with cafeteria	50 per student	6
Cultural	0.1 per sq. ft.	3

FIGURE 7.1-2 AVERAGE DAY SEWER DEMAND IN GALLONS

HYDRAULIC DESIGN

7-1.404

No public sanitary sewer lines will be less than 8 inches in diameter unless permission is received in writing from the Water Resources Department.

Sanitary sewer lines should be designed and constructed to give mean full flow velocities of not less than 2.5 fps, based upon Manning's Formula, using an "n" value of 0.013.

Conversely, to prevent abrasion and erosion of the pipe material, the maximum velocity will be limited to 10 fps at estimated peak flow. Where velocities exceed this maximum figure, the engineer will be required to submit a hydraulic analysis along with construction recommendations to the Water Resources Department for consideration. In no case will velocities greater than 15 fps be allowed.

Actual velocities will be analyzed under peak flow conditions for each reach of pipe.



^>"~ €]vP v^ ~°À°o}>]vP ^u „I W„}

APPENDIX II

Calculations

SEWER DESIGN CALCULATIONS:

Table 1: Sewer Demand Calculations (gpd)					
	Units or s.f. com.	ADF (gpcu) or per s.f.	Avg. Day Flow (GPD)	Peaking Factor	Peak Hour (GPD)
71st Street (DP 1 to DP 2)	Point of tie in to 71st Street				
Baptist Church	24,500 s.f.	0.1	2,450	3	7,350
Aqave Apartments	118	140.0	16,520	4	66,080
ALTA Osborn Apartments*	143	143.0	20,449	4	81,796
Security Acres	92	250.0	23,000	4	92,000
Mobile Home Park (Assumed full)	40	250.0	10,000	4	40,000
MHP commercial	2,000 s.f.	0.5	1,000	3	3,000
Duplex	2	250.0	500	4	2,000
	SUBTOTAL (DP 1 to DP 2)		73,919		292,226
Earll Drive 8" (DP 2 to DP 3)	For information only				
Pueblo Condo's area (west)	36	250.0	9,000	4	36,000
Commercial	41,000 s.f.	0.5	20,500	3	61,500
	SUBTOTAL (DP 2 to DP 3)		103,419		97,500
Scottsdale Road (DP 4 TO DP 3)	Ties in at Earll Drive				
Aqave Apartments	247	140	34,580	4	138,320
Good Egg restaurant	7,000 s.f.	1.2	8,400	6	50,400
ALTA Osborn Apartments	134	143	19,162	4	76,648
	SUBTOTAL (DP 4 to DP 3)		62,142		265,368

Table 2: Pipe Capacity of Existing Sewers				
Location	Diameter (inch)	Proposed Peak Flow (gpd)	Full Flow Capacity (gpd)	Peak Flow to Full Flow Capacity Ratio
71st Street (DP 1 to DP 2)	8	292,226	454,642	0.64
Scottsdale Road (DP 4 to DP 3)	8	265,368	576,171	0.46
Earll Drive (21")	Re: Section 5.3			

Worksheet for 8" Sewer in 71st Street @ 0.33%

Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

Roughness Coefficient 0.013
Channel Slope 0.00330 ft/ft
Normal Depth 0.67 ft
Diameter 0.67 ft

Results

Discharge 454642.75 gal/day
Flow Area 0.35 ft²
Wetted Perimeter 2.10 ft
Hydraulic Radius 0.17 ft
Top Width 0.00 ft
Critical Depth 0.40 ft
Percent Full 100.0 %
Critical Slope 0.00770 ft/ft
Velocity 2.00 ft/s
Velocity Head 0.06 ft
Specific Energy 0.73 ft
Froude Number 0.00
Maximum Discharge 0.76 ft³/s
Discharge Full 0.70 ft³/s
Slope Full 0.00330 ft/ft
Flow Type SubCritical

GVF Input Data

Downstream Depth 0.00 ft
Length 0.00 ft
Number Of Steps 0

GVF Output Data

Upstream Depth 0.00 ft
Profile Description
Profile Headloss 0.00 ft
Average End Depth Over Rise 0.00 %
Normal Depth Over Rise 100.00 %
Downstream Velocity Infinity ft/s

Worksheet for 8" Sewer in 71st Street @ 0.33%

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.67	ft
Critical Depth	0.40	ft
Channel Slope	0.00330	ft/ft
Critical Slope	0.00770	ft/ft

Worksheet for 8" sewer in Earll Drive @0.33%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00330	ft/ft
Normal Depth	0.67	ft
Diameter	0.67	ft

Results

Discharge	0.70	ft ³ /s
Flow Area	0.35	ft ²
Wetted Perimeter	2.10	ft
Hydraulic Radius	0.17	ft
Top Width	0.00	ft
Critical Depth	0.40	ft
Percent Full	100.0	%
Critical Slope	0.00770	ft/ft
Velocity	2.00	ft/s
Velocity Head	0.06	ft
Specific Energy	0.73	ft
Froude Number	0.00	
Maximum Discharge	0.76	ft ³ /s
Discharge Full	0.70	ft ³ /s
Slope Full	0.00330	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

Worksheet for 8" sewer in Earll Drive @0.33%

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.67	ft
Critical Depth	0.40	ft
Channel Slope	0.00330	ft/ft
Critical Slope	0.00770	ft/ft

Worksheet existing 8" sewer in Scottsdale Road

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00530	ft/ft
Normal Depth	0.67	ft
Diameter	0.67	ft

Results

Discharge	576170.79	gal/day
Flow Area	0.35	ft ²
Wetted Perimeter	2.10	ft
Hydraulic Radius	0.17	ft
Top Width	0.00	ft
Critical Depth	0.45	ft
Percent Full	100.0	%
Critical Slope	0.00861	ft/ft
Velocity	2.53	ft/s
Velocity Head	0.10	ft
Specific Energy	0.77	ft
Froude Number	0.00	
Maximum Discharge	0.96	ft ³ /s
Discharge Full	0.89	ft ³ /s
Slope Full	0.00530	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

Worksheet existing 8" sewer in Scottsdale Road

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.67	ft
Critical Depth	0.45	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00861	ft/ft

Worksheet for 21" Sewer in Earll Drive @ dD = 0.70

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00300	ft/ft
Normal Depth	1.23	ft
Diameter	1.75	ft

Results

Discharge	4695963.10	gal/day
Flow Area	1.80	ft ²
Wetted Perimeter	3.47	ft
Hydraulic Radius	0.52	ft
Top Width	1.60	ft
Critical Depth	1.00	ft
Percent Full	70.0	%
Critical Slope	0.00547	ft/ft
Velocity	4.04	ft/s
Velocity Head	0.25	ft
Specific Energy	1.48	ft
Froude Number	0.67	
Maximum Discharge	9.34	ft ³ /s
Discharge Full	8.68	ft ³ /s
Slope Full	0.00210	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	70.00	%
Downstream Velocity	Infinity	ft/s

Worksheet for 21" Sewer in Earll Drive @ dD = 0.70

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.23	ft
Critical Depth	1.00	ft
Channel Slope	0.00300	ft/ft
Critical Slope	0.00547	ft/ft

Worksheet for Proposed Flow in 8" Sewer in 71st Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00330	ft/ft
Diameter	0.67	ft
Discharge	292226.00	gal/day

Results

Normal Depth	0.39	ft
Flow Area	0.21	ft ²
Wetted Perimeter	1.16	ft
Hydraulic Radius	0.18	ft
Top Width	0.66	ft
Critical Depth	0.31	ft
Percent Full	58.3	%
Critical Slope	0.00683	ft/ft
Velocity	2.12	ft/s
Velocity Head	0.07	ft
Specific Energy	0.46	ft
Froude Number	0.66	
Maximum Discharge	0.76	ft ³ /s
Discharge Full	0.70	ft ³ /s
Slope Full	0.00136	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	58.31	%
Downstream Velocity	Infinity	ft/s

Worksheet for Proposed Flow in 8" Sewer in 71st Street

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.31	ft
Channel Slope	0.00330	ft/ft
Critical Slope	0.00683	ft/ft

Worksheet for Proposed Flow in 21" Sewer in Earll Road

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00300	ft/ft
Diameter	1.75	ft
Discharge	876876.00	gal/day

Results

Normal Depth	0.47	ft
Flow Area	0.52	ft ²
Wetted Perimeter	1.90	ft
Hydraulic Radius	0.27	ft
Top Width	1.55	ft
Critical Depth	0.42	ft
Percent Full	26.7	%
Critical Slope	0.00470	ft/ft
Velocity	2.63	ft/s
Velocity Head	0.11	ft
Specific Energy	0.57	ft
Froude Number	0.80	
Maximum Discharge	9.34	ft ³ /s
Discharge Full	8.68	ft ³ /s
Slope Full	0.00007	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	26.73	%
Downstream Velocity	Infinity	ft/s

Worksheet for Proposed Flow in 21" Sewer in Earll Road

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.47	ft
Critical Depth	0.42	ft
Channel Slope	0.00300	ft/ft
Critical Slope	0.00470	ft/ft

Worksheet for Proposed Flow in 8" Sewer in Scottsdale Road

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00530	ft/ft
Diameter	0.67	ft
Discharge	265368.00	gal/day

Results

Normal Depth	0.32	ft
Flow Area	0.17	ft ²
Wetted Perimeter	1.02	ft
Hydraulic Radius	0.16	ft
Top Width	0.67	ft
Critical Depth	0.30	ft
Percent Full	47.7	%
Critical Slope	0.00674	ft/ft
Velocity	2.48	ft/s
Velocity Head	0.10	ft
Specific Energy	0.41	ft
Froude Number	0.88	
Maximum Discharge	0.96	ft ³ /s
Discharge Full	0.89	ft ³ /s
Slope Full	0.00112	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	47.65	%
Downstream Velocity	Infinity	ft/s

Worksheet for Proposed Flow in 8" Sewer in Scottsdale Road

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.32	ft
Critical Depth	0.30	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00674	ft/ft



"LEED®ing and Developing Smart Projects"

APPENDIX III

Utility Plan

8280 E. Gelding Dr., Suite 101
Scottsdale, AZ 85260

PROPERTY OWNER
DAVID L. CHAPMAN TRUST
6601 E. MCDOWELL RD
SCOTTSDALE, ARIZONA 85257

CIVIL ENGINEER
SUSTAINABILITY ENGINEERING GROUP
8280 E. GELDING DR, SUITE 101
SCOTTSDALE, ARIZONA 85260
PHONE 480-588-7226
ATTN: ALI FAKIH

ALTA DRINKWATER UTILITY PLAN

3234 N SCOTTSDALE RD, SCOTTSDALE ARIZONA 85251

UTILITY NOTES

- REFER TO SHEET CO.10 FOR ADDITIONAL GENERAL NOTES.
- PROTECT AND MAINTAIN CROSSINGS OF OTHER UTILITY LINES.
- PROPER COORDINATION WITH THE RESPECTIVE UTILITY COMPANIES SHALL BE PERFORMED BY THE CONTRACTOR TO INSURE THAT ALL UTILITY COMPANY, LOCAL MUNICIPALITY, AND LOCAL COUNTY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET.
- ALL WATER MAINS, WATER SERVICES, AND SANITARY SEWER LATERALS SHALL CONFORM TO THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, APPLICABLE COUNTY AND LOCAL DEPARTMENTS, AND APPROPRIATE UTILITY COMPANY SPECIFICATIONS.
- CONTRACTOR TO PROVIDE SLEEVES UNDER FOOTINGS OR THROUGH FOUNDATIONS FOR UTILITY CONNECTIONS.
- CONTRACTOR SHALL PROVIDE ALL BENDS, FITTINGS, ADAPTERS, ETC. AS REQUIRED FOR PIPE CONNECTIONS TO BUILDING SUB-OUTS, INCLUDING ROOF/FOOTING DRAIN CONNECTIONS TO ROOF LEADERS AND TO STORM DRAINAGE SYSTEM.
- ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION PRIOR TO APPROVAL FOR BACKFILL, IN ACCORDANCE WITH THE APPROPRIATE UTILITY COMPANY, LOCAL MUNICIPALITY, AND/OR LOCAL COUNTY REQUIREMENTS.
- UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY COMPANY AND LOCAL AGENCY REVIEW.
- CAP STUBS AND PROVIDE FIELD MARKERS.
- FOR PIPE INSTALLATION, PROVIDE TRENCH EXCAVATION, BEDDING AND BACKFILLING, AND COMPACTION PER MAG SPECIFICATION SECTION 601. REFER TO CITY OF SCOTTSDALE STANDARD DETAIL 2201 & 2202 FOR DETAIL.
- BEDDING MATERIAL TO BE IN ACCORDANCE WITH MAG SECTION 702.2 AND TABLE 702-1.
- FOR HDPE PIPE INSTALLATION, PROVIDE TRENCH EXCAVATION, BEDDING AND BACKFILLING, AND COMPACTION PER MAG SPECIFICATION SECTION 603.
- PROTECT CROSSING OF OTHER UTILITIES. MAINTAIN MINIMUM SEPARATION BETWEEN UTILITIES PER CITY OF SCOTTSDALE STANDARD DETAIL 2372.
- ALL JOINTS FOR D.I.P. WATER MAINS AND SEWER MAINS TO BE RESTRAINED WITH MEGA LUG JOINTS PER MAG STANDARD DETAIL 303-1 AND 303-2 UNLESS OTHERWISE NOTED.
- ALL PRODUCTS USED ON THIS SITE SHALL CONFORM TO ANSI/NSF STANDARDS 60 AND 61 IN ACCORDANCE WITH REGULATORY CITATION R18-4-213.
- PROVIDE ANCHOR BLOCKS FOR VERTICAL BENDS PER MAG STANDARD DETAIL 381.
- PROVIDE WARNING TAPE ABOVE UTILITIES PER CITY OF SCOTTSDALE REQUIREMENTS.
- PROVIDE 5' MINIMUM COVER FOR SANITARY LEADS AT LOT LINES.
- PROVIDE 3' MINIMUM COVER FOR WATER SERVICE LEADS AT LOT LINES.
- MAINTAIN SANITARY SEWER SEPARATION/PROTECTION FROM WATER AND UTILITIES PER CITY OF SCOTTSDALE STANDARD DETAIL 2401.

WATER LINE CONSTRUCTION NOTES:

- FURNISH & INSTALL 6" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN. MEGA LUG RESTRAINED JOINT PER MAG STD DET 303-1 & 303-2.
- FURNISH & INSTALL 4" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN. MEGA LUG RESTRAINED JOINT PER MAG STD DET 303-1 & 303-2.
- FURNISH & INSTALL 3" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN. MEGA LUG RESTRAINED JOINT PER MAG STD DET 303-1 & 303-2.
- FURNISH & INSTALL 1" COPPER TYPE "K" WATER SERVICE LINE CONNECTION PER COS STD DET 2330.
- FURNISH & INSTALL 8"x6" TAPPING SLEEVE, VALVE, BOX, & COVER PER M.A.G. STD DET 340 AND 391-1 TYPE 'c' WITH LOCKING LID. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 6"x6" CUT-IN TEE. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 8"x4" TAPPING SLEEVE, VALVE, BOX, & COVER PER M.A.G. STD DET 340 AND 391-1 TYPE 'c' WITH LOCKING LID. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 6"x4" TAPPING SLEEVE, VALVE, BOX, & COVER PER M.A.G. STD DET 340 AND 391-1 TYPE 'c' WITH LOCKING LID. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 3" VAULT AND COMPOUND METER PER C.O.S. DET 2345-2. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 3" DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY PER C.O.S. DET 2351. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2. GUARD POSTS PER C.O.S. DET 2356. 4"x3" REDUCER ON DOWNSTREAM SIDE. PROVIDE SCREENED ENCLOSURE WITH 24" CLEAR AROUND THE ASSEMBLY.
- FURNISH & INSTALL 1" DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY PER C.O.S. DET 2352. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 4" 45° BEND. PROVIDE ELECTRONIC MARKER PER C.O.S. STD DET 2397. MEGA LUG RESTRAINED JOINTS PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 6" 45° BEND. PROVIDE ELECTRONIC MARKER PER C.O.S. STD DET 2397. MEGA LUG RESTRAINED JOINTS PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL FIRE HYDRANT (INCLUDING 6" GATE VALVE, BOX, & COVER) PER M.A.G. STD DET 360-1. PROVIDE PAVEMENT (PM) MARKER PER C.O.S. DET 2363. NOZZLE TO BE 1' FROM SIDEWALK. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- FURNISH & INSTALL 6" GATE VALVE, BOX, & COVER PER M.A.G. STD DET 340 & 391-1 WITH 40" DIA. CONCRETE COLLAR. MEGA LUG RESTRAINED JOINTS PER M.A.G. STD DET 303-1 & 33-2.
- SAWCUT/REMOVE AND REPLACE ASPHALT FOR TRENCHING PER C.O.S. DET 2200 & 2201, (T-TOP).
- FURNISH & INSTALL REMOTE F.D.C. PER C.O.S. STD DET 2367.
- REFER TO ARCHITECTURAL PLANS FOR PLUMBING CONTINUATION.
- 45" CONC PIPE IN SCOTTSDALE ROAD IS ABANDONED. REMOVE SECTION OF PIPE FOR CROSSING AND PLUG ENDS WITH BRICK AND MORTAR PER MAG STD DET 427 FOR DRAIN LINE PLUGS.
- CONSTRUCT VERTICAL REALIGNMENT OF WATERMAIN C.O.S. STD DET 2370. PROTECT WATERMAIN PER MAG STD DET 404-1 AND 404-2 AND 404-3. CONSTRUCTION SHALL MEET ARIZONA ADMINISTRATIVE CODE SECTION R18-5-502.

PROPOSED LEGEND

- PROPERTY LINE
- SAWCUT LINE
- 6"W WATER LINE
- 6"S SEWER LINE
- WATER METER VAULT
- WATER METER BOX
- WATER BACKFLOW PREVENTER
- WATER VALVE
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- ⊙ SEWER MANHOLE

OFF-SITE SEWER CONSTRUCTION NOTES

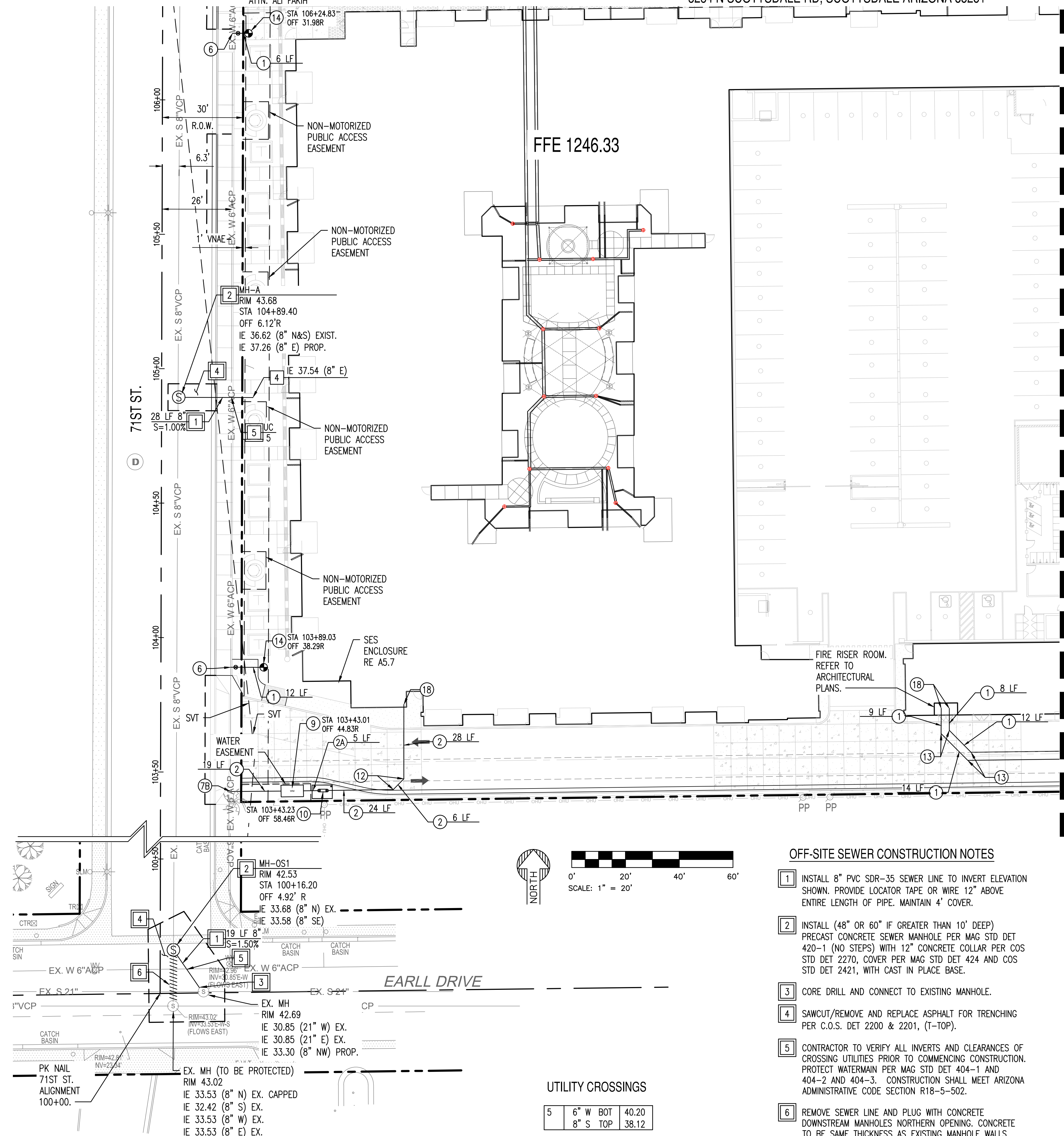
- INSTALL 8" PVC SDR-35 SEWER LINE TO INVERT ELEVATION SHOWN. PROVIDE LOCATOR TAPE OR WIRE 12" ABOVE ENTIRE LENGTH OF PIPE. MAINTAIN 4' COVER.
- INSTALL (48" OR 60" IF GREATER THAN 10' DEEP) PRECAST CONCRETE SEWER MANHOLE PER MAG STD DET 420-1 (NO STEPS) WITH 12" CONCRETE COLLAR PER COS STD DET 2270, COVER PER MAG STD DET 424 AND COS STD DET 2421, WITH CAST IN PLACE BASE.
- CORE DRILL AND CONNECT TO EXISTING MANHOLE.
- SAWCUT/REMOVE AND REPLACE ASPHALT FOR TRENCHING PER C.O.S. DET 2200 & 2201, (T-TOP).
- CONTRACTOR TO VERIFY ALL INVERTS AND CLEARANCES OF CROSSING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT WATERMAIN PER MAG STD DET 404-1 AND 404-2 AND 404-3. CONSTRUCTION SHALL MEET ARIZONA ADMINISTRATIVE CODE SECTION R18-5-502.
- REMOVE SEWER LINE AND PLUG WITH CONCRETE. DOWNSTREAM MANHOLES NORTHERN OPENING. CONCRETE TO BE SAME THICKNESS AS EXISTING MANHOLE WALLS.

SEWER CONSTRUCTION NOTES

- INSTALL 8" PVC SDR-35 SEWER LINE TO INVERT ELEVATION SHOWN. PROVIDE LOCATOR TAPE OR WIRE 12" ABOVE ENTIRE LENGTH OF PIPE. MAINTAIN 4' COVER.
- INSTALL (48" OR 60" IF GREATER THAN 10' DEEP) PRECAST CONCRETE SEWER MANHOLE PER MAG STD DET 420-1 (NO STEPS) WITH 12" CONCRETE COLLAR PER COS STD DET 2270, COVER PER MAG STD DET 424 AND COS STD DET 2421, WITH CAST IN PLACE BASE.
- CONTRACTOR TO VERIFY ALL INVERTS AND CLEARANCES OF CROSSING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT WATERMAIN PER MAG STD DET 404-1 AND 404-2 AND 404-3. CONSTRUCTION SHALL MEET ARIZONA ADMINISTRATIVE CODE SECTION R18-5-502.
- CONNECTION TO BUILDING. REFER TO PLUMBING PLANS FOR CONTINUATION.
- SAWCUT/REMOVE AND REPLACE ASPHALT FOR TRENCHING PER C.O.S. DET 2200 & 2201, (T-TOP).
- CONCRETE ENCASE EXISTING SEWER LINE TO PROTECT PER MAG STD DET 404-3.

UTILITY CROSSINGS

5	6" W BOT	40.20
	8" S TOP	38.12



SUSTAINABILITY ENGINEERING GROUP

SEG

8280 E GELDING DR #101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEEG.COM TEL. 480.888.7226

45621
ALI FAKIH
07-17-17

EXPIRES 12-31-17
PREPARED UNDER THE DIRECT SUPERVISION OF ALI FAKIH, P.E. ARIZONA REGISTRATION NO. 45621 FOR AND ON BEHALF OF SUSTAINABILITY ENGINEERING GROUP, LLC.

ALTA DRINKWATER
Apartment Homes
3234 NORTH SCOTTSDALE ROAD SCOTTSDALE, ARIZONA 85251

WOOD PARTNERS
8777 E. Via De Ventura Suite 201, Scottsdale, AZ. 85258
PHONE: 480-607-0822

THIRD CITY SUBMITTAL
07/14/2017

REVIEWS:

SCALE: 1"=20'

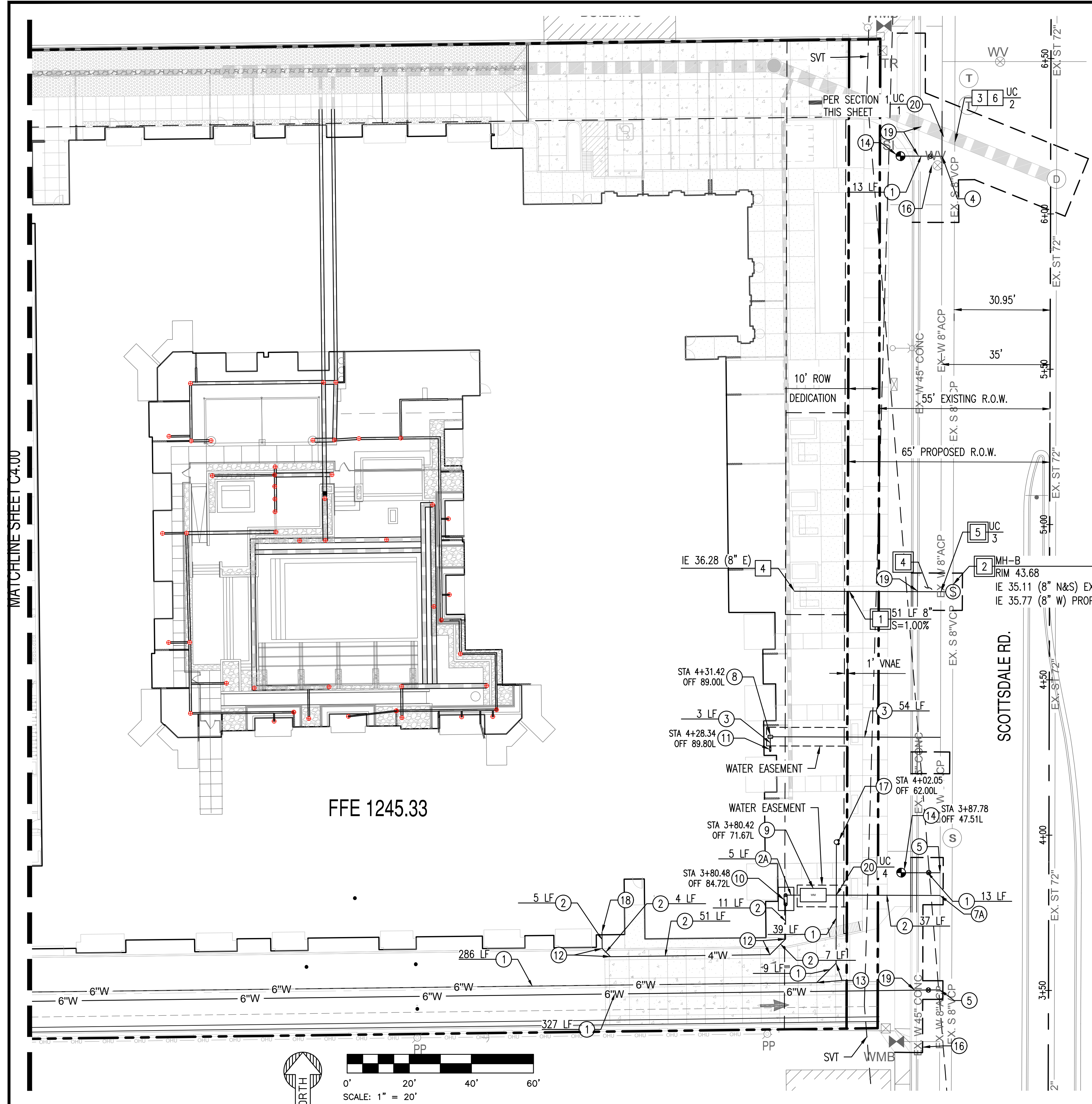
JOB NO: 15-054
SHEET NO:

UTILITY PLAN
C4.00

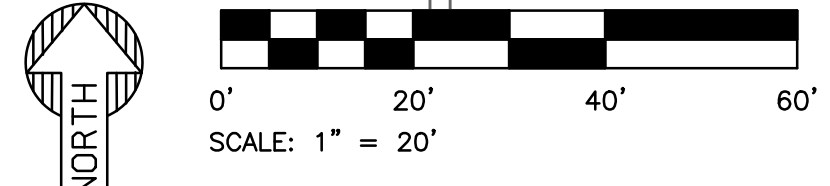
Call at least two full working days before you begin excavation.

ARIZONA 811
Arizona's 811
811-4-1 or 1-800-STAKE-IT (782-8249)
In Maricopa County: (602) 263-1100

NOTE TO CONTRACTOR: THESE SET OF DRAWINGS AND DOCUMENTS IS INTENDED AS A SET OF GUIDELINES FOR THE PROJECT AND ARE INTENDED TO BE USED IN CONJUNCTION WITH A SET OF CONSTRUCTION PERMITS TO BE SUPPLIED BY OWNER. THESE SETS SHOULD BE READ TO INCORPORATE ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES INCLUDING FEDERAL AIA REQUIREMENTS. THESE SETS ASSUMES THAT THE CONTRACTOR HAS READ AND UNDERSTANDS ALL APPLICABLE CODES AND THAT THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL APPLICABLE CODES AND TO INQUIRE OF THE OWNERS/ARCHITECTS OF ANY QUESTIONS OR CLARIFICATIONS BEFORE BEGINNING CONSTRUCTION. CONTRACTORS SHALL ALSO VISIT THE SITE BEFORE BEGINNING CONSTRUCTION. CONTRACTORS ARE REQUIRED TO KNOW ALL OBSERVABLE CONDITIONS AND APPLICABLE CODES.



MATCHLINE SHEET C4.00



PROPOSED LEGEND

- PROPERTY LINE
- - - SAWCUT LINE
- 6"W — WATER LINE
- 6"S — SEWER LINE
- WATER METER VAULT
- WATER METER BOX
- ◐ WATER BACKFLOW PREVENTER
- WATER VALVE
- FIRE HYDRANT
- ◉ FIRE DEPARTMENT CONNECTION
- ⊙ SEWER MANHOLE

UTILITY CROSSINGS

NO.	DESCRIPTION	TOP	BOT
1	48" ST BOT	37.23	34.77
2	48" ST BOT	37.21	36.34
3	8" W BOT	38.75*	36.48*
4	4" W BOT	40.50	40.00

* PIPE LOCATIONS ARE BASED ON POT-HOLE EXPLORATION PREFORMED ON 2/13/2017 BY SAFE SITE UTILITY SERVICES, LLC.

SEWER CONSTRUCTION NOTES:

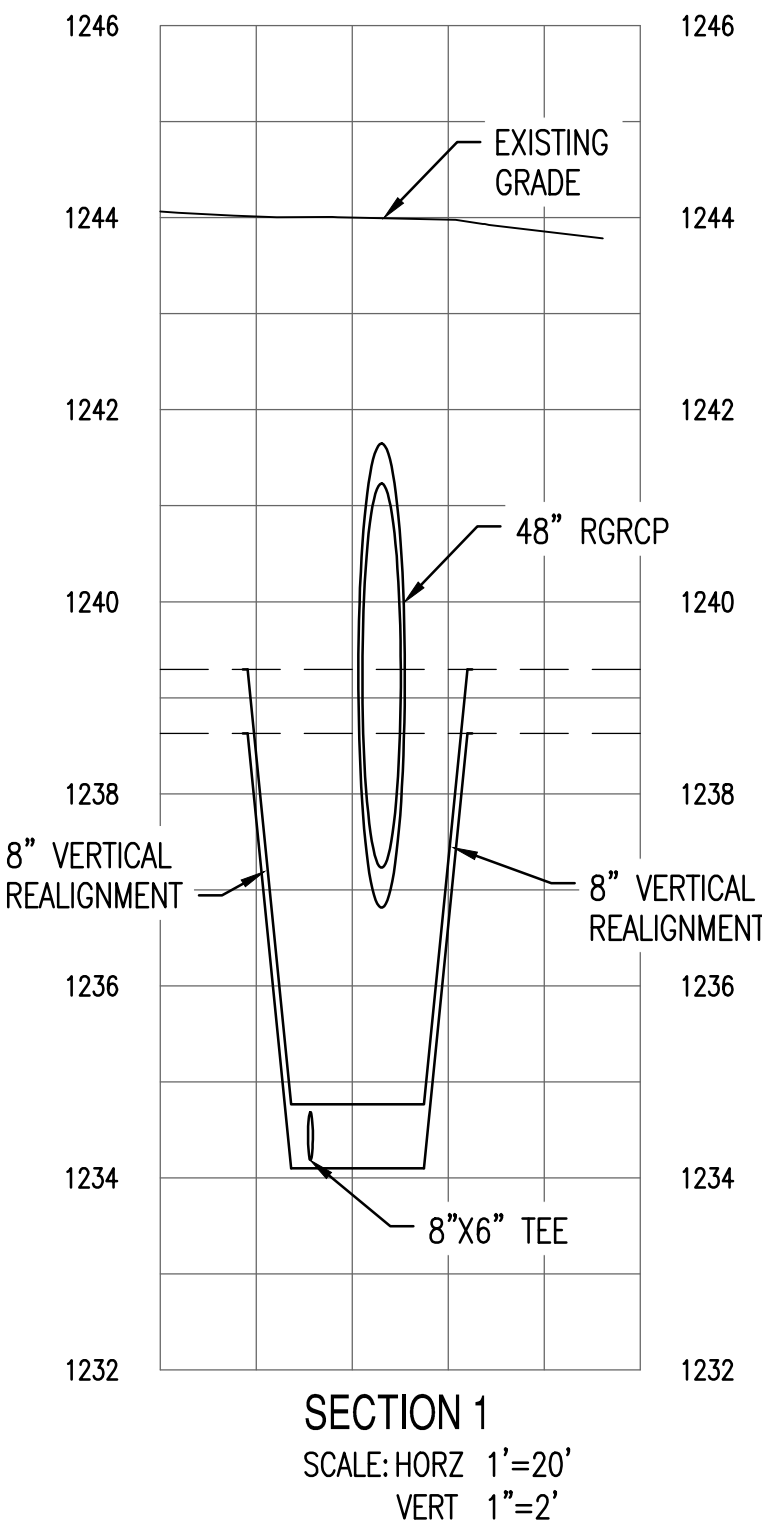
- 1 INSTALL 8" PVC SDR-35 SEWER LINE TO INVERT ELEVATION SHOWN. PROVIDE LOCATOR TAPE OR WIRE 12" ABOVE ENTIRE LENGTH OF PIPE. MAINTAIN 4' COVER.
- 2 INSTALL (48" OR 60" IF GREATER THAN 10' DEEP) PRECAST CONCRETE SEWER MANHOLE PER MAG STD DET 420-1 (NO STEPS) WITH 12" CONCRETE COLLAR PER COS STD DET 2270, COVER PER MAG STD DET 424 AND COS STD DET 2421, WITH CAST IN PLACE BASE.
- 3 CONTRACTOR TO VERIFY ALL INVERTS AND CLEARANCES OF CROSSING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT WATERMAIN PER MAG STD DET 404-1 AND 404-2 AND 404-3. CONSTRUCTION SHALL MEET ARIZONA ADMINISTRATIVE CODE SECTION R18-5-502.
- 4 CONNECTION TO BUILDING. REFER TO PLUMBING PLANS FOR CONTINUATION.
- 5 SAWCUT/REMOVE AND REPLACE ASPHALT FOR TRENCHING PER C.O.S. DET 2200 & 2201, (T-TOP).
- 6 CONCRETE ENCASE EXISTING SEWER LINE TO PROTECT PER MAG STD DET 404-3.

OFF-SITE SEWER CONSTRUCTION NOTES:

- 1 INSTALL 8" PVC SDR-35 SEWER LINE TO INVERT ELEVATION SHOWN. PROVIDE LOCATOR TAPE OR WIRE 12" ABOVE ENTIRE LENGTH OF PIPE. MAINTAIN 4' COVER.
- 2 INSTALL (48" OR 60" IF GREATER THAN 10' DEEP) PRECAST CONCRETE SEWER MANHOLE PER MAG STD DET 420-1 (NO STEPS) WITH 12" CONCRETE COLLAR PER COS STD DET 2270, COVER PER MAG STD DET 424 AND COS STD DET 2421, WITH CAST IN PLACE BASE.
- 3 CORE DRILL AND CONNECT TO EXISTING MANHOLE.
- 4 SAWCUT/REMOVE AND REPLACE ASPHALT FOR TRENCHING PER C.O.S. DET 2200 & 2201, (T-TOP).
- 5 CONTRACTOR TO VERIFY ALL INVERTS AND CLEARANCES OF CROSSING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT WATERMAIN PER MAG STD DET 404-1 AND 404-2 AND 404-3. CONSTRUCTION SHALL MEET ARIZONA ADMINISTRATIVE CODE SECTION R18-5-502.
- 6 REMOVE SEWER LINE AND PLUG WITH CONCRETE DOWNSTREAM MANHOLES NORTHERN OPENING. CONCRETE TO BE SAME THICKNESS AS EXISTING MANHOLE WALLS.

WATER LINE CONSTRUCTION NOTES:

- 1 FURNISH & INSTALL 6" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN. MEGA LUG RESTRAINED JOINT PER MAG STD DET 303-1 & 303-2.
- 2 FURNISH & INSTALL 4" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN. MEGA LUG RESTRAINED JOINT PER MAG STD DET 303-1 & 303-2.
- 2A FURNISH & INSTALL 3" DUCTILE IRON PIPE CLASS 350 WITH POLYETHYLENE WRAPPING. LENGTH PER PLAN. MEGA LUG RESTRAINED JOINT PER MAG STD DET 303-1 & 303-2.
- 3 FURNISH & INSTALL 1" COPPER TYPE "K" WATER SERVICE LINE CONNECTION PER COS STD DET 2330.
- 4 FURNISH & INSTALL 8"x6" TEE. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 5 FURNISH & INSTALL 8"x6" TAPPING SLEEVE, VALVE, BOX, & COVER PER M.A.G. STD DET 340 AND 391-1 TYPE 'C' WITH LOCKING LID. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 6 FURNISH & INSTALL 6"x6" CUT-IN TEE. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 7A FURNISH & INSTALL 8"x4" TAPPING SLEEVE, VALVE, BOX, & COVER PER M.A.G. STD DET 340 AND 391-1 TYPE 'C' WITH LOCKING LID. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 7B FURNISH & INSTALL 6"x4" TAPPING SLEEVE, VALVE, BOX, & COVER PER M.A.G. STD DET 340 AND 391-1 TYPE 'C' WITH LOCKING LID. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 8 FURNISH & INSTALL CONCRETE WATER METER BOX #1 PER M.A.G. STD DET 320 WITH LID PER M.A.G. STD DET 310 WITHIN 3' OF PROPERTY LINE. 1" WATER METER TO BE INSTALLED BY CITY FORCES.
- 9 FURNISH & INSTALL 3" VAULT AND COMPOUND METER PER C.O.S. DET 2345-2. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 10 FURNISH & INSTALL 3" DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY PER C.O.S. DET 2351. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2. GUARD POSTS PER C.O.S. DET 2356. 4"x3" REDUCER ON DOWNSTREAM SIDE. PROVIDE SCREENED ENCLOSURE WITH 24" CLEAR AROUND THE ASSEMBLY.
- 11 FURNISH & INSTALL 1" DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY PER C.O.S. DET 2352. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 12 FURNISH & INSTALL 4" 45° BEND. PROVIDE ELECTRONIC MARKER PER C.O.S. STD DET 2397. MEGA LUG RESTRAINED JOINTS PER M.A.G. STD DET 303-1 & 303-2.
- 13 FURNISH & INSTALL 6" 45° BEND. PROVIDE ELECTRONIC MARKER PER C.O.S. STD DET 2397. MEGA LUG RESTRAINED JOINTS PER M.A.G. STD DET 303-1 & 303-2.
- 14 FURNISH & INSTALL FIRE HYDRANT (INCLUDING 6" GATE VALVE, BOX, & COVER) PER M.A.G. STD DET 360-1. PROVIDE PAVEMENT (PM) MARKER PER C.O.S. DET 2363. NOZZLE TO BE 1' FROM SIDEWALK. MEGA LUG RESTRAINED JOINT PER M.A.G. STD DET 303-1 & 303-2.
- 15 FURNISH & INSTALL 6" GATE VALVE, BOX, & COVER PER M.A.G. STD DET 340 & 391-1 WITH 40" DIA. CONCRETE COLLAR. MEGA LUG RESTRAINED JOINTS PER M.A.G. STD DET 303-1 & 33-2.
- 16 SAWCUT/REMOVE AND REPLACE ASPHALT FOR TRENCHING PER C.O.S. DET 2200 & 2201, (T-TOP).
- 17 FURNISH & INSTALL REMOTE F.D.C. PER C.O.S. STD DET 2367.
- 18 REFER TO ARCHITECTURAL PLANS FOR PLUMBING CONTINUATION.
- 19 45" CONC PIPE IN SCOTTSDALE ROAD IS ABANDONED. REMOVE SECTION OF PIPE FOR CROSSING AND PLUG ENDS WITH BRICK AND MORTAR PER MAG STD DET 427 FOR DRAIN LINE PLUGS.
- 20 CONSTRUCT VERTICAL REALIGNMENT OF WATERMAIN C.O.S. STD DET 2370. PROTECT WATERMAIN PER MAG STD DET 404-1 AND 404-2 AND 404-3. CONSTRUCTION SHALL MEET ARIZONA ADMINISTRATIVE CODE SECTION R18-5-502.



NOTE TO CONTRACTOR:
THIS SET OF DRAWINGS AND DOCUMENTS IS INTENDED AS A SET OF GUIDELINES FOR THE PROJECT AND ARE INTENDED TO BE USED IN CONJUNCTION WITH A SET OF CONSTRUCTION SPECIFICATIONS TO BE SUPPLIED BY OWNER. THEY MUST BE READ TO INCORPORATE ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF ALL INFORMATION AND FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF ALL INFORMATION AND FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF ALL INFORMATION AND FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO CONSTRUCTION.

SUSTAINABILITY ENGINEERING GROUP

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THIRD CITY SUBMITTAL
07/14/2017

REVISIONS:

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JOB NO: 15-054
SCALE:
SHEET NO.

UTILITY PLAN
C4.10



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APPENDIX IV

Agave Old Town Apartments Sewer Report (excerpts)

8280 E. Gelding Dr., Suite 101
Scottsdale, AZ 85260

12/11/15

WASTEWATER BASIS OF DESIGN REPORT
FOR

**AGAVE OLD TOWN
APARTMENTS**

SWC OF OSBORN ROAD AND SCOTTSDALE ROAD
SCOTTSDALE, ARIZONA

Accepted for

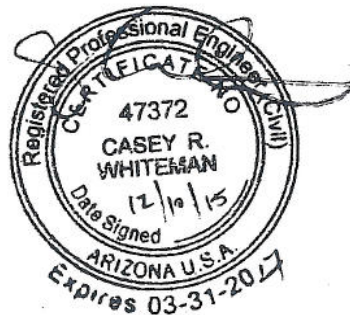
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REVISIONS:
Initial Issue - September 25, 2015
Revised Per City of Scottsdale Comments - December 10, 2015



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sewer

6929-15-1-51-6769

**WASTEWATER BASIS OF DESIGN REPORT
FOR
AGAVE OLD TOWN APARTMENTS**

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1.0 INTRODUCTION

1.1 GENERAL DESCRIPTION

Agave Old Town Apartments (Project) is a proposed multi-family development in the southeast quarter of Section 27 in Township 2 North, Range 4 East of the Gila and Salt River Base Line and Meridian in Scottsdale, Arizona in Maricopa County. Figure 1 in **Appendix A** provides a Vicinity Map for the Project.

Encompassing approximately 8.85 gross acres (7.10 net), the Project includes four multiple-story multi-family residences with a total of 365 units, a fitness/clubroom area, parking structure, sidewalks, driveways and landscaped areas. The total building area of the Project is anticipated to be greater than 449,107 square feet, excluding the parking garages. A breakdown of the proposed building is presented in Table 1. See **Appendix A** for the Architectural Site Plan A1.1 for the Agave Residences Layout.

Table 1. Building Breakdown		
Building	Building Area (ft ²)	Dwelling Units
Building Area 1	135,107	112
Building Area 2	87,781	72
Building Area 3	114,154	92
Building Area 4	112,065	89
Building Area 5 Parking Garage	205,093	0
Total		365
Notes:		
1. Rounding may affect total values.		

The Project is located on the southwest corner of Osborn Road and Scottsdale Road. The site is generally bound by an existing commercial development to the north, Scottsdale Road to the east, Angus Drive and commercial developments to the south and 71st Street to the west.

The site is currently occupied by a portion of Angus Drive, a vacant lot and two commercial developments with surface parking areas. These buildings and their respective sewer taps are intended to be removed as part of this project.

1.2 PURPOSE

The purpose of this wastewater basis of design report is to evaluate the existing and proposed wastewater system infrastructure for the Project and confirm design flows under average day and peak flow conditions.

2.0 DESIGN CRITERIA

The design criteria used in this Study for determining flow are based on the 2010 City of Scottsdale *Design Standards & Policies Manual*. A summary of the design criteria is shown in **Table 2** below.

Design Criteria	Criteria	Units
Average Day Unit Wastewater Flow		
Multi-Family Residential		140 gpd/unit
Peaking Factors		
Multi-Family Residential		4.0 times average day
Roughness Coefficient		
Manning's n		0.013

3.0 PROJECTED WASTEWATER FLOWS

The projected wastewater flows for the Project are based on the dwelling units described in **Table 2** and the design criteria detailed in **Section 2.0**. The collective average day and peak flows for the Project are anticipated to be 51,100 gallons per day (gpd) and 229,950 gpd, respectively. A summary of the projected wastewater flows is provided in **Table 3**.

Discharge Location	Average Day Flow (gpd)	Peaking Factor	Peak Flow (gpd)
To 71st Street	16,520	4.0	66,080
To Angus Drive / Scottsdale Road	34,580	4.0	138,320
Totals	51,100		204,400

4.0 WASTEWATER SYSTEM

4.1 EXISTING WASTEWATER SYSTEM INFRASTRUCTURE

The wastewater distribution system in the vicinity of the Project is very well established. A 12-inch sewer line exists along Osborn Road north of the Project that flows east to Scottsdale Road. Two 8-inch lines exist along 71st Street, both with a southerly direction flow. About 133 feet of 8-inch sewer line, along 71st Street, bends to the east on Angus Drive and connects to a sewer manhole located at the intersection of Scottsdale Road and Angus Drive. From this manhole the existing 8-inch sewer line continues along Scottsdale Road to the south. The second sewer line is located to the south of the intersection between 71st Street and Angus Drive. This sewer line continues to the south and connects to an existing 8-inch sewer line along Earll Drive. The existing 8-inch sewer main terminates east of 70th street so the tributary area is relatively and further analysis is not warranted.

4.2 PROPOSED WASTEWATER SYSTEM INFRASTRUCTURE

Since a portion of the existing 8-inch sewer main along Angus Road will be removed, a connection between the two 8-inch sewer mains along 71st Street will be made to reroute wastewater that currently flows to the east along Angus Road, to the south along 71st Street.

Two 8-inch services are proposed to connect to the sewer main along 71st Street and three 8-inch sewer services are proposed to connect to the sewer main along Angus Road, as shown in Figures 2 and 4, Appendix A.

5.0 PIPE CAPACITY ANALYSIS

The evaluations of the sewer lines in Angus Road and 71st street are provided in this report to confirm that there is available capacity for the Project estimated demands. A summary of the pipe capacity calculations is presented in Table 4. Related calculations are found in Appendix B.

Location	Diameter (inch)	Proposed Peak Flow (gpd)	Full Flow Capacity (gpd)	Peak Flow to Full Flow Capacity Ratio
71 st Street	8	66,080	449,897	0.15
Angus Drive	8	138,320	456,663	0.30
Scottsdale Road	8	138,320	570,157	0.24

6.0 CONCLUSIONS

This report analyzes the performance of the wastewater system. The system, as designed, meets the design parameters outlined within this report. The specific conclusions from this report are:

- The average day and peak sewer flows discharging to 71st Street are estimated to be 16,520 gpd, and 66,080 gpd, respectively.
- The existing sewer line in 71st Street has a capacity of 449,897 gpd and is adequately sized to accommodate the anticipated flows from Agave Old Town Apartments.
- The average day and peak sewer flows discharging to Angus Drive / Scottsdale Rd. are estimated to be 34,580 gpd, and 138,320 gpd, respectively.
- The existing sewer line in Angus Drive has a capacity of 445,663 gpd and is adequately sized to accommodate the anticipated flows from Agave Old Town Apartments.
- The existing sewer in Scottsdale Rd. has a capacity of 570,157 gpd and is adequately sized to accommodate the anticipated flows from Agave Old Town Apartments.

7.0 REFERENCES

City of Scottsdale. (2010). *Design Standards & Policies Manual*.

AT Scottsdale + EARL ALL goes into the 21"

APPENDIX B

SEWER CAPACITY CALCULATIONS

Sewer Capacity Calculation

Project: Agave Old Town Apartments
 Prepared By: JLB
 September 2015



Design Wastewater Flows		
Combined Sewer Flows to 71st Street		
Number of Units	118	Multi-Family
Average Daily Flow in Gallons per Dwelling Unit	140	per Table 7.1-2 of City of Scottsdale Design Standards & Policies, Section 7, January 2010.
Average Daily Flow:	16,520	gpd
Combined Sewer Flows to Scottsdale Road		
Number of Units	247	Multi-Family
Average Daily Flow in Gallons per Dwelling Unit	140	per Table 7.1-2 of City of Scottsdale Design Standards & Policies, Section 7, January 2010.
Average Daily Flow:	34,580	gpd
Average Daily Flow Summary		
Flow to 71 st Street	16,520	gpd
Flows to Angus Dr. / Scottsdale Road	34,580	gpd
Total Average Daily Flow	51,100	gpd
Peaking Factor:	4.00	per Table 7.1-2 of City of Scottsdale Design Standards & Policies, Section 7, January 2010.
Peak Daily Flow Calculations		
Flow to 71 st Street	66,080	gpd
Flows to Angus Dr. / Scottsdale Road	138,320	gpd
Total Peak Daily Flow	204,400	gpd

Capacity of Existing and Proposed Sewer Alignments

8" Sewer Main flowing South Along 71st Street

Sewer Segments:	8" @ 0.48%	Existing North Segment
	8" @ 1.94%	Proposed Connector Segment
Limiting Sewer Segment	8" @ 0.33%	Existing South Segment
Sewer Size (D):	8	in.
Manning's n-value (n):	0.013	
Minimum Required Slope of Sewer based on 2.0 ft/sec Velocity	0.0033	
Slope of Existing Sewer (S):	0.0033	ft/ft
Hydraulic Radius (R):	0.167	ft R=D/4 (full pipe)
Manning's Equation:	$V = (1.486/n) * R^{2/3} * S^{1/2}$	
Velocity In Proposed Sewer Pipe (V, full pipe):	2.0	ft/s minimum
Mannings Equation solved for Capacity (Q)	$Q = (1.49/n) * A * R^{2/3} * S^{1/2}$	
Proposed Sewer Pipe Capacity:	0.696	cfs
	449,897	gpd*
Proposed Peak Sewer Flows to 71st Street:	0.102	cfs
	66,080	gpd*

*The pipe capacity is greater than the total peak daily flow, therefore adequate capacity is available.

Remaining 8" East Segment (West Piece Demo'd) Flowing East Along Angus Dr to Scottsdale Rd

Sewer Segments:	8" @ 0.34%	Remaining East Segment
Sewer Size (D):	8	in.
Manning's n-value (n):	0.013	
Minimum Required Slope of Sewer based on 2.0 ft/sec Velocity	0.0033	
Slope of Existing Sewer (S):	0.0034	ft/ft
Hydraulic Radius (R):	0.167	ft R=D/4 (full pipe)
Manning's Equation:	$V = (1.486/n) * R^{2/3} * S^{1/2}$	
Velocity In Proposed Sewer Pipe (V, full pipe):	2.0	ft/s minimum
Mannings Equation solved for Capacity (Q)	$Q = (1.49/n) * A * R^{2/3} * S^{1/2}$	
Proposed Sewer Pipe Capacity:	0.707	cfs
	456,663	gpd*
Proposed Peak Sewer Flows To Angus Dr:	0.214	cfs
	138,320	gpd*

*The pipe capacity is greater than the total peak daily flow, therefore adequate capacity is available.

Existing 8" VCP Flowing South Along Scottsdale Road from Angus Drive

Sewer Segments:	8" @ 0.53%	
Sewer Size (D):	8	in.
Manning's n-value (n):	0.013	
Minimum Required Slope of Sewer based on 2.0 ft/sec Velocity	0.0033	
Slope of Existing Sewer (S):	0.0053	ft/ft
Hydraulic Radius (R):	0.167	ft R=D/4 (full pipe)
Manning's Equation:	$V = (1.486/n) * R^{2/3} * S^{1/2}$	
Velocity In Proposed Sewer Pipe (V, full pipe):	2.5	ft/s minimum
Mannings Equation solved for Capacity (Q)	$Q = (1.49/n) * A * R^{2/3} * S^{1/2}$	
Existing Sewer Pipe Capacity:	0.882	cfs
	570,157	gpd*
Proposed Peak Sewer Flows To Scottsdale Rd:	0.214	cfs
	138,320	gpd*

*The pipe capacity is greater than the total peak daily flow, therefore adequate capacity is available.