FINAL WASTEWATER REPORT

for

Magnolia on Osborn

Scottsdale, Arizona

Prepared For:

Magnolia PROPERTY COMPANY

Prepared by:

SEG

Sustainability Engineering Group
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Scottsdale, AZ 85260
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Project Number: 220205

Submittal Date: January 16, 2023
Revised: June 1, 2023

Case No.: 18-ZN-2022 Plan Check No.: TBD

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1. INTRODUCTION

1.1 SUMMARY OF PROPOSED DEVELOPEMENT

Magnolia on Osborn is a proposed 92-unit four-story multifamily development, with 5,800 s.f. of retail space located at the northeast corner of 70th Street and Osborn Road in Scottsdale, Arizona.

The purpose of this report is to provide an updated sewer system analysis supporting the proposed development. Wastewater service will be provided via a new connection to the existing 8" sewer line along 6th Street.

1.2 LEGAL DESCRIPTION

The following parcels of subdivided land are located in 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.

- APN 130-13-064; 31,490 s.f. (0.73 ac) NET
- APN 130-13-062; 31,430 s.f. (0.72 ac) NET

The two APNs are platted as Lots 16 and 18, Orange Acres and recorded in Book 31, Page 14 of Maricopa County Records. The total land area is 1.45 acres, more or less.

2. DESIGN DOCUMENTATION

2.1 DESIGN COMPLIANCE

The proposed sewer system is designed to meet the latest design criteria of the City of Scottsdale ("the city") Design Standards & Policies Manual ("DS+PM"), the city Municipal Code, the Arizona Department of Environmental Quality ("ADEQ"), and Maricopa County Environmental Services Department ("MCESD").

2.2 PROCEDURES, POLICIES AND METHODOLOGIES

Hydraulic design of the service pipe will include the peak flow, including pool backwash, compliant to the calculated demand.

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 two existing parcels are presently zoned C-3.

70th Street Lofts northwest of the site is zoned D/DMU-2, a parcel southwest of the site is zoned C-3 and both parcels to the east are zone C-3.

3.2 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

The west parcel is a parking lot. The east parcel is an office building with surface parking and an enclosed storage yard. Site topography slopes from the northwest to the southeast with approximately three feet of 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 16-44)

- An existing 12" VCP sanitary sewer line is located along the south side of Osborn Road.
- An existing 8" VCP sanitary sewer line is located along the center of East 6th Street and presently provides service to the site.

4. PROPOSED CONDITIONS

4.1 SITE PLAN

All onsite structures and service lines will be removed compliant to City requirements.

4.2 PROPOSED SEWER SERVICE CONNECTIONS

Sewer service will consist of a 6'' service line connecting to the 8" sewer in East 6th Street. A utility plan layout is shown in **APPENDIX II**.

4.3 MAINTENANCE RESPONSIBILITIES

The sewer service line will be owned and maintained by the property owner.

5. SEWER SYSTEM COMPUTATIONS

5.1 SEWER DEMANDS

The unit demands are taken from Figure 7.1-2 in the City's DS+PM.

Table 1: PROPOSED SEWER DEMAND CALCULATIONS

	Bldg Area (sq.ft.)	Dwelling Units	ADD (gpd/unit)	Peaking Factor	Avg. Day Demand (gpm)	Peak Flow (gpm)
Residential		92	140	4.5	8.9	40.3
Retail	5,800		0.5	3.0	2.0	6.0
Pool			144,000		100.0	100.0
				TOTAL DEMANDS (gpm):	111.0	146.3

5.2 MINIMUM SERVICE REQUIREMENTS

A 6" service line is sufficient to convey the peak flow without the pool backwash at a depth of 1.7" and velocity of 2.2 fps. The peak flow with the pool backwash will have a depth of 3.3" and velocity of 3.5 fps. Refer to **APPENDIX I** for the service pipe hydraulic calculations.

5.3 FLOW MONITORING OF EXISTING SYSTEM:

Flow monitoring is not proposed as the service area to the existing 8" sewer along 6th Street and the 10" sewer in Bishop Lane was evaluated for capacity using criteria from the DS+PM applied to site usage and areas gathered from the County Assessor's Interactive Maps. **APPENDIX I** shows the 8" Sewer in 6th Street, at the shallowest slope, has sufficient capacity to convey the

144 gpm peak flow with 150 gpm for pool backwashes. The 10" Sewer in Bishop Lane has a 1,197 gpm capacity at a d/D of 0.8 and will easily convey peak flows in addition to pool backwashes from the service area.

6. SUMMARY / CONCLUSIONS

6.1 SUMMARY:

The proposed sewer flow, and connections are designed to meet criteria of the City's 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 I** indicates that the 6" sewer connection is sufficient to provide service to this project.

6.2 PROJECT SCHEDULE:

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

7. REFERENCES

1. COS Sewer Q-S MAP 16-44
2. City of Scottsdale Design Standards & Policies Manual, 2018 (Chapter 7 – Sewer)

EXHIBITS

1. Vicinity Map

2. Aerial

3. Sewer Quarter Section Map

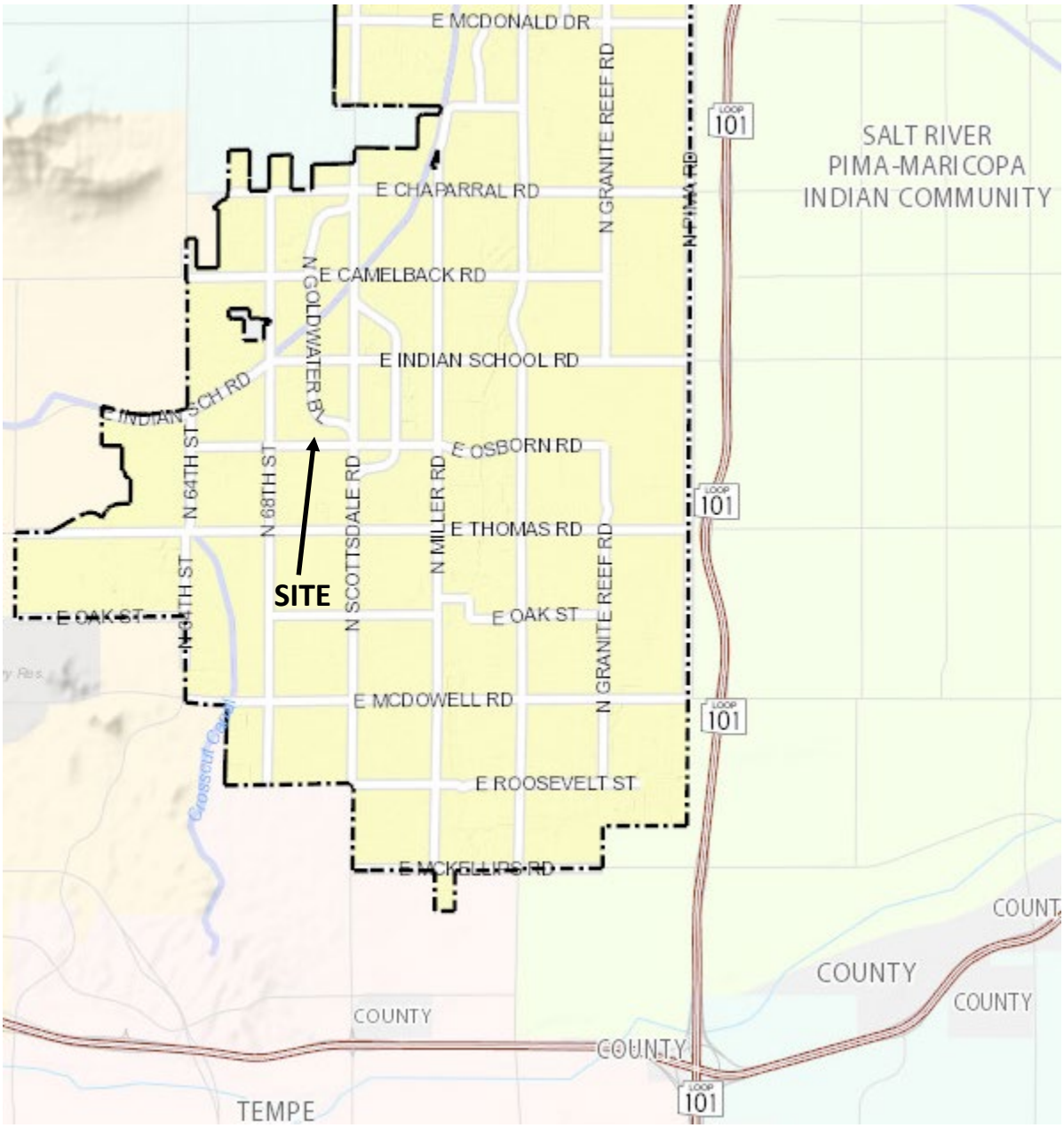


EXHIBIT 1 – Vicinity Map

EXHIBIT 2 –
Aerial

17-44

16-43

16-45

15-44

30-JAN-22

GENERAL NOTES:

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

LEGEND:

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

VICINITY MAP

The map scale of 1" = 100' is based on a full size print of 30" x 36"

SEWER

QUARTER SECTION MAP

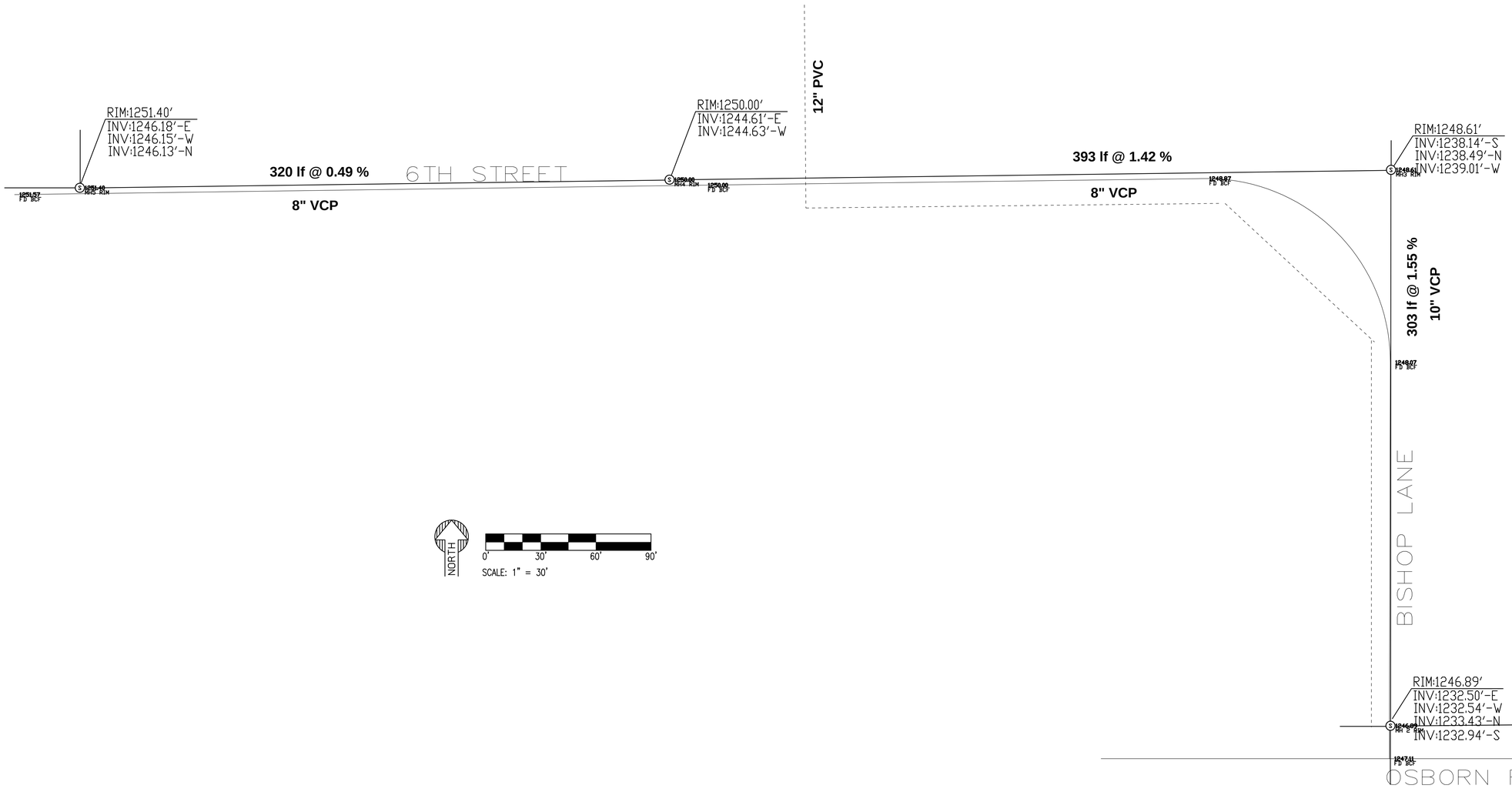
16-44

NE 1/4 SEC. 27 T2N R4E

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251



APPENDIX III -
Exist Sewer Survey

APPENDIX I.

Hydraulic Calculations

6" Service Line at 1.0% w/o Pool Backwash

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Diameter	6.0	in
Discharge	46.3	gpm

Results

Normal Depth	1.74	in
Flow Area	0.05	ft²
Wetted Perimeter	0.57	ft
Hydraulic Radius	1.00	in
Top Width	5.4	in
Critical Depth	1.90	in
Percent Full	29.0	%
Critical Slope	0.00709	ft/ft
Velocity	2.18	ft/s
Velocity Head	0.07	ft
Specific Energy	0.22	ft
Froude Number	1.19	
Maximum Discharge	270.9	gpm
Discharge Full	251.8	gal/min
Slope Full	0.00034	ft/ft
Flow Type	SuperCritical	

APPENDIX I – Hydraulic Calculations and Service Area

6" Service Line at 1.0% w/ Pool Backwash

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

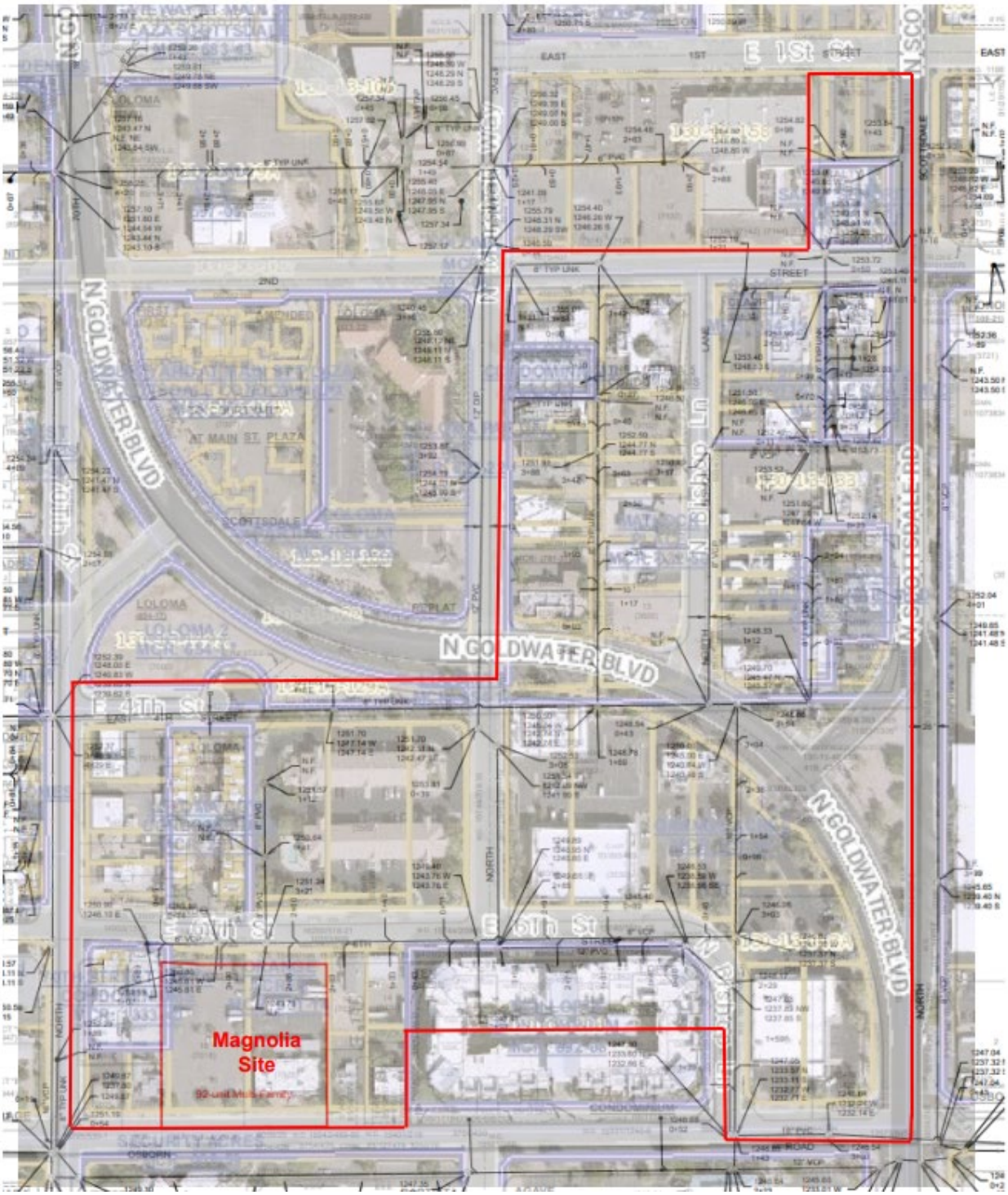
Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Diameter	6.0	in
Discharge	146.3	gpm

Results

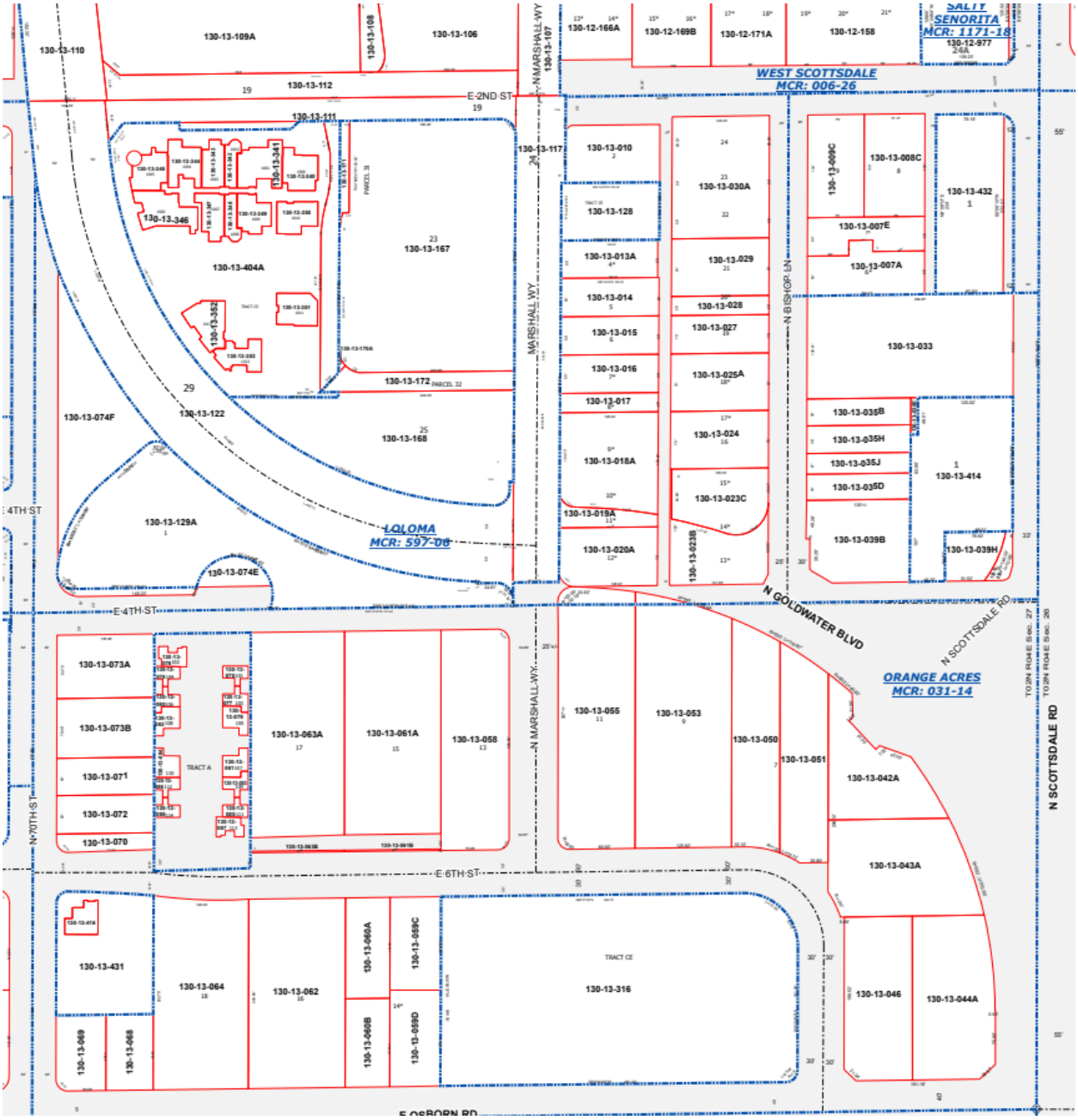
Normal Depth	3.28	in
Flow Area	0.11	ft²
Wetted Perimeter	0.83	ft
Hydraulic Radius	1.58	in
Top Width	6.0	in
Critical Depth	3.47	in
Percent Full	54.7	%
Critical Slope	0.00835	ft/ft
Velocity	2.96	ft/s
Velocity Head	0.14	ft
Specific Energy	0.41	ft
Froude Number	1.11	
Maximum Discharge	270.9	gpm
Discharge Full	251.8	gal/min
Slope Full	0.00338	ft/ft
Flow Type	SuperCritical	

APPENDIX I – Hydraulic Calculations and Service Area

Evaluate Service Area for 6th Street and Bishop Lane Sewer System



APPENDIX I – Hydraulic Calculations and Service Area



APPENDIX I – Hydraulic Calculations and Service Area

Table A - Service Area to 8" Sewer in 6th St

Parrcel APN / Development	Site Use	Sq. Ft.	Units	Pool	Demand (gpd or unit)	Avg Day Demand (gpd)	Peaking Factor	Peak Demand (gpd)	Pool Backwash Gpd)
130-13-073A	Office	3,648			0.4	1,459	3.0	4,378	
130-13-073B	Office	2,601			0.4	1,040	3.0	3,121	
130-13-071	Residential		1		250	250	4.0	1,000	
130-13-072	Retail	1,427			0.5	714	3.0	2,141	
70th St Lofts	Condominium		28	1	140	3,920	4.5	17,640	72,000
130-13-069	Medical	1,042			0.5	521	4.5	2,345	
130-13-068	Residential		1		250	250	4.0	1,000	
130-13-064 130-13-062	Proposed Site Residential-Retail		92	1	140	12,880	4.5	57,960	72,000
		5,800			0.5	2,900	3.0	8,700	
130-13-060A	Warehouse	1,800			0.4	720	3.0	2,160	
130-13-060B	Office	1,341			0.4	536	3.0	1,609	
130-13-059C	Office	1,728			0.4	691	3.0	2,074	
130-13-059D	Office	2,511			0.4	1,004	3.0	3,013	
Stay America	Multi-Family		160	1	140	22,400	4.5	100,800	72,000
					Totals (gpd)	49,286		207,940	216,000
					Totals (gpm)	34		**144**	**150**

Table B - Service Area to 10" Sewer in Bishop Lane

Parrcel APN / Development	Site Use	Sq. Ft.	Units	Pool	Demand (gpd or unit)	Avg Day Demand (gpd)	Peaking Factor	Peak Demand (gpd)	Pool Backwash
130-13-316	Motel		50	1.5	380	19,000	4.5	85,500	108,000
130-13-046	Retail	14,820			0.5	7,410	3.0	22,230	
130-13-050	Retail	3,080			0.5	1,540	3.0	4,620	
130-13-053	Retail	16,995			0.5	8,498	3.0	25,493	
130-13-055	Retail	9,142			0.5	4,571	3.0	13,713	
130-13-018A	Church	7,238			0.1	724	3.0	2,171	
130-13-015	Retail	5,062			0.5	2,531	3.0	7,593	
130-13-014	Commercial	3,456			0.5	1,728	3.0	5,184	
130-13-013A	Motel	6,417	12	1.5	380	4,560	4.5	20,520	108,000
130-13-128	Condominiums		5		140	700	4.5	3,150	
130-13-010	Retail	4,325			0.5	2,163	3.0	6,488	
130-13-024	Office	1,644			0.4	658	3.0	1,973	
130-13-025A	Retail	1,666			0.5	833	3.0	2,499	
130-13-030A	Restaurant	5,120			1.2	6,144	6.0	36,864	
130-13-039B	Retail	3,327			0.5	1,664	3.0	4,991	
130-13-035H	Retail	7,087			0.5	3,544	3.0	10,631	
130-13-035H	Residential		1		250	250	4.0	1,000	
130-13-414	Restaurant	5,452			1.2	6,542	6.0	39,254	
130-13-414	Retail	5,040			0.5	2,520	3.0	7,560	
130-13-033	Restaurant	4,910			1.2	5,892	6.0	35,352	
130-13-007A	Retail	5,018			0.5	2,509	3.0	7,527	
130-13-432	Retail	10,599			0.5	5,300	3.0	15,899	
130-13-008C	Commercial	7,500			0.5	3,750	3.0	11,250	
130-12-977	Restaurant	4,264			1.2	5,117	6.0	30,701	
130-12-977	Retail	1,001			0.5	501	3.0	1,502	
					Totals (gpd)	98,646		403,662	216,000
					Totals (gpm)	69		**280**	**150**

Peak domestic demand in 10" sewer at Bishop Lane and Osborn Road: 144 gpm (Table A) + 280 gpm (Table B) + 300 gpm (pools) = 724 gpm

Reference APPENDIX I for the 10" pipe hydraulic calculations
Reference FIGURE 4 for the existing manhole survey

10" pipe capacity at 1.55% with d/D=0.80 is 1,197 gpm so calculated 724 gpm peak demand including pool backwash is okay

APPENDIX I – Hydraulic Calculations and Service Area

8" 6th St Sewer at shallowest slope; d/D=0.8

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00490	ft/ft
Normal Depth	6.40	in
Diameter	8.0	in

Results

Discharge	371.1	gpm
Flow Area	0.30	ft²
Wetted Perimeter	1.48	ft
Hydraulic Radius	2.43	in
Top Width	6.4	in
Critical Depth	5.17	in
Percent Full	80.0	%
Critical Slope	0.00834	ft/ft
Velocity	2.76	ft/s
Velocity Head	0.12	ft
Specific Energy	0.65	ft
Froude Number	0.65	
Maximum Discharge	408.4	gpm
Discharge Full	379.6	gal/min
Slope Full	0.00468	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	80.00	%
Downstream Velocity	Infinity	ft/s

APPENDIX I – Hydraulic Calculations and Service Area

10" Bishop Lane Sewer at 1.55%; d/D=0.8

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01550	ft/ft
Normal Depth	8.00	in
Diameter	10.0	in

Results

Discharge	1196.7	gpm
Flow Area	0.47	ft²
Wetted Perimeter	1.85	ft
Hydraulic Radius	3.04	in
Top Width	8.0	in
Critical Depth	8.65	in
Percent Full	80.0	%
Critical Slope	0.01361	ft/ft
Velocity	5.70	ft/s
Velocity Head	0.50	ft
Specific Energy	1.17	ft
Froude Number	1.20	
Maximum Discharge	1316.9	gpm
Discharge Full	1224.2	gal/min
Slope Full	0.01481	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	80.00	%
Downstream Velocity	Infinity	ft/s

APPENDIX I – Hydraulic Calculations and Service Area

APPENDIX II.

Utility Plan

MAGNOLIA AT OSBORN

PRELIMINARY UTILITY PLAN

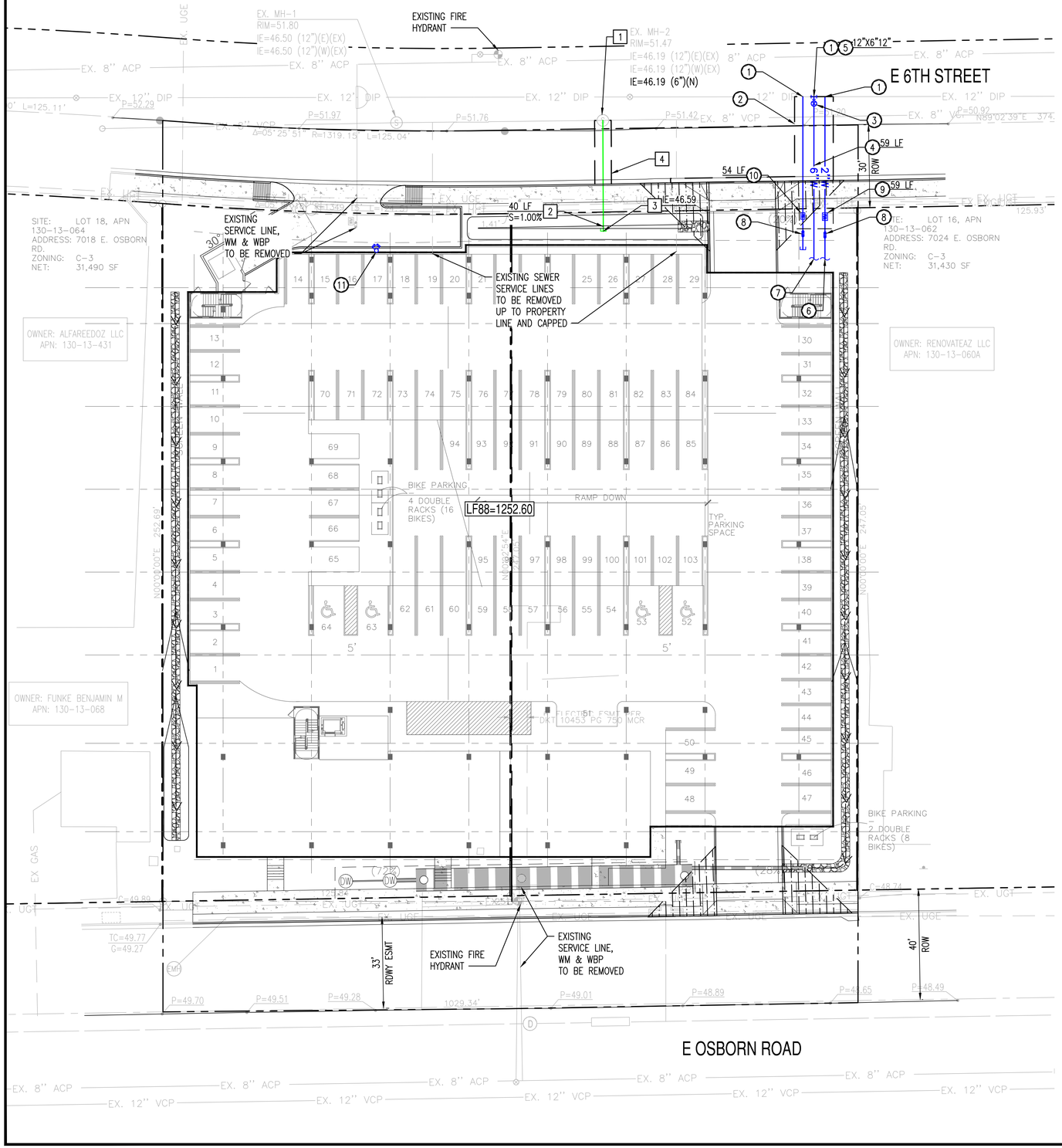
NEC OF 70TH STREET & OSBORN ROAD

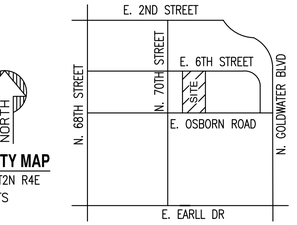
A PORTION OF THE NORTHEAST QUARTER OF SECTION 27, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

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

CLIENT:
MAGNOLIA PROPERTY COMPANY
2435 E SOUTHLAKE BLVD.. SUITE 150
SOUTHLAKE, TEXAS 76092

SURVEYOR
AW LAND SURVEYING, LLC
P.O. BOX 2170
CHANDLER, ARIZONA 85244
PHONE: 480-244-7630
ATTN: DANIEL ARMIJO





VICINITY MAP
S27 T2N R4E
NTS

PRELIMINARY WATER KEY NOTES

1. CONTRACTOR TO VERIFY SIZE AND LOCATION OF EXISTING WATER LINE PRIOR TO CONSTRUCTION.
2. SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT.
3. 6" GATE VALVE WITH VALVE BOX AND COVER.
4. 6" DUCTILE IRON PIPE. LENGTH PER PLAN.
5. INSTALL CUT-IN TEE, SIZE PER PLAN.
6. DOMESTIC CONNECTION TO BUILDING.
7. FIRE CONNECTION TO BUILDING.
8. BACKFLOW PREVENTION, SIZE TO MATCH WATER METER SIZE.
9. INSTALL 2" TYPE "K" COPPER DOMESTIC SERVICE CONNECTION. LENGTH PER PLAN.
10. INSTALL 1" TYPE "K" COPPER IRRIGATION SERVICE CONNECTION. LENGTH PER PLAN.
11. INSTALL FIRE DEPARTMENT CONNECTION.

PRELIMINARY SEWER KEY NOTES

1. CONNECTION TO EXISTING SEWER MANHOLE.
2. 6" PVC SEWER LINE PER MAG 440-3. LENGTH AND SLOPE PER PLAN.
3. SEWER CONNECTION TO BUILDING.
4. SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT.

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

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

NOTE:

1. EXISTING MANHOLES RIMS AND INVERTS HAVE BEEN SET BASED ON ALTA NO. 21-10003 BY MLC SERVICES DATED 11/02/2021. ELEVATIONS TO BE VERIFIED IN FIELD.

NORTH

0' 20' 40' 60'

SCALE: 1" = 20'

PROPOSED UTILITY LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- WATER LINE
- SEWER LINE
- FDC
- WATER METER
- GATE VALVE
- BACK FLOW PREVENTER
- CAP
- BUILDING CONNECTION
- FIRE HYDRANT

EXISTING LEGEND

- EX. S — SEWER LINE
- EX. W — WATER LINE
- IRR — IRRIGATION LINE
- STORM DRAIN LINE
- CB — CATCH BASIN
- S — SEWER MANHOLE
- D — STORM MANHOLE
- WV — WATER VALVE
- WMB — WATER METER BOX
- FIRE HYDRANT
- ECB — ELECTRIC CABINET

PRELIMINARY
NOT FOR CONSTRUCTION

SUSTAINABILITY ENGINEERING GROUP
SEG
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.259.3534

Magnolia PROPERTY COMPANY

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

PROJECT: MAGNOLIA ON OSBORN
LOCATION: NEC OF 70TH STREET AND OSBORN ROAD

DRAWN	JC	06/01/2023
DESIGNED	JC	06/01/2023
QC	SC	03/02/2022
FINAL QC		
PROJ. MGR.	AF	06/01/2023

DATE: 06/01/2023
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 220205

SHEET TITLE: **PRELIMINARY UTILITY PLAN**

PAGE NO.: 3 OF 3
SHEET NO.: **C4.10**