

PRELIMINARY Basis of Design Report

- ☐ ACCEPTED
☒ ACCEPTED AS NOTED
☐ REVISE AND RESUBMIT



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 or 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 or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY Idillon

DATE 10/6/2022



PRELIMINARY WATER AND SEWER BASIS OF DESIGN REPORT

NOTE STIPULATED ITEMS AND ADDRESS COMMENTS BELOW AND HEREIN WITHIN A FINAL BASIS OF DESIGN REPORT UNDER THE APPLICABLE DR CASE

Sewer

- 1) **STIPULATION**: Extend 8" sewer in San Miguel approximately 25 feet east of existing manhole and provide cleanout 3 feet east of proposed sewer service line connection. Service line must connect perpendicular to public sewer within ROW. DS&PM 7-1.409B
- 2) Sewer services shall be per MAG 440-3 with cleanout located within the ROW. DS&PM 7-1.409B
- 3) If not active or proposed to be used remove or abandon cleanout located on south edge of property and abandon sewer line by capping at the property line. Coordinate with Camelback Mountainview Estates. DS&PM 7-1.409
- 4) Verify existing sewer connection locations and coordinate with proposed connections
- 5) Address comments within utility plan.

Water

- 1) **STIPULATION**: Where connecting new water services to the ACP main 3 segments of ACP main shall be replaced with DI pipe. Approximately 30ft. DS&PM 6-1.408
- 2) **STIPULATION**: Water meters must be located within the ROW or within a dedicated water facilities easement. Indicate this on the utility plan and plat dedication.
- 3) Backflow preventer shall be shown on private property directly adjacent to the water meter.
- 4) Verify locations of existing water services to coordinate with new proposed services.
- 5) Address comments within utility plan.

MODUS SCOTTSDALE 6

7801 E San Miguel Ave.

ADDED, include and revise for DR case

COS Case #: 9-PP-2022

Plan Check #

LDG PROJECT #2206207

Prepared for:

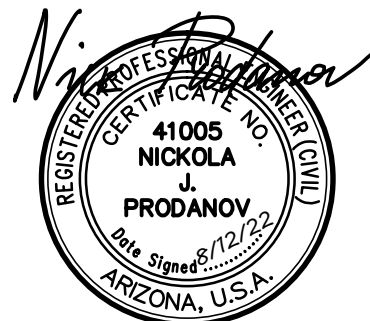
Modus Development
3219 E Camelback Rd, #291
Phoenix, Arizona 85018

Submitted to:

City of Scottsdale
Water Resources Department
7447 E Indian School Road, Suite #105
Scottsdale, Arizona 85251

Prepared by:

Land Development Group, LLC
8808 N Central Ave., Ste 288
Phoenix, Arizona 85020
Contact: Nick Prodanov, PE, PMP
P: 602 889 1984



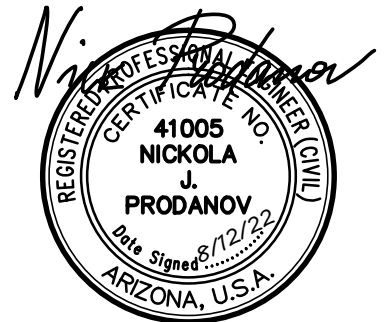
August 12th, 2022

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August 12th, 2022



THE DEVELOPMENT BEING PROPOSED IS NOT MULTIFAMILY IT IS R-4 OR R-4R. TOWNHOMES ARE INDIVIDUALLY OWNED AND PLATTED PROPERTIES AND EACH UNIT HAS DEDICATED WATER/SEWER UTILITIES AND FIRE SPRINKLER SYSTEM CONNECTED TO THE DOMESTIC WATER LINE.

1. INTRODUCTION

This Preliminary Water and Sewer Basis of design report and related design have been developed in accordance with the current City of Scottsdale Design Standards & Policies Manual. It provides preliminary engineering analysis and assessment of the required water and sanitary sewer services for the proposed multifamily development.

The site is located at 7801 E San Miguel Avenue, Scottsdale, AZ 85250 (APN – 173-03-012E). It is fully developed with a single-family residence and accessory structure. Its total area is 0.845 acres. The property is bounded by San Miguel Avenue on the north, 78th Street on the west and multifamily development on the east and south. The parcel is located within the Scottsdale Q.S. 20-46. The subject property is currently not a part of a recorded subdivision. It is described as a portion of the NW ¼ of the SE ¼ of the NE ¼ Section 14, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Refer to Appendix A-1 – Vicinity Map.

The proposed multifamily project will consist of three separate buildings on two levels, housing total of 6 dwelling units with total building area of 14,078 s.f. New driveways, landscape and site improvements are proposed for the surrounding area.

The site is located within the City of Scottsdale water and sewer service area. There is an existing 8" ACP water line that runs in San Miguel Avenue. Another 8" ACP connected to the 8" ACP at San Miguel Avenue runs in 78th Street. There is an existing 8" VCP sanitary sewer mains in both San Miguel Avenue and 78th Street. The nearest fire hydrant is located near the southwest corner of 78th Street and San Miguel Ave.

2. DOMESTIC WATER AND FIRE SUPPRESSION SYSTEM

Each residence of the Modus Scottsdale 6 will be serviced by a separate domestic water service tapped off the existing 8" water main located in San Miguel Avenue. Fire sprinklers for each residence will be fed off the domestic water service. All existing water services not used for the site will be required to be removed per the City of Scottsdale requirements. Six water meters are proposed for the six main lines connected to the 8" water main. Existing water meter located on site will be utilized for landscaping services.

The fire hydrant coverage for this site is provided by an existing fire hydrant located 60-feet from the northwesterly property corner at 78th Street. This hydrant is approximately 260-feet from the most remote portion of the buildings. Fire hydrant coverage around the building is in accordance with the City of Scottsdale Design Standards & Policies Manual requirements. Water demand calculations are provided in Appendix A-2.

2% required per MAG 440-3 detail, residential building code is 1% (confirm for plan submittal), 2% is better

3. SANITARY SEWER SYSTEM

New 4" service lines are proposed to serve the six buildings. They are connected to the 8" VCP main in San Miguel Avenue. The sewer services are sized per IPC based from the site. Minimum slope of 2% will be used for the 4" services.

We have calculated that the peak daily discharge from this development will be 104 gpm. In our opinion the portion of 12" public sewer line that this site discharges to has an adequate capacity.

We have also estimated the sewer discharge from the site using The City of Scottsdale Design Standards & Policies Manual. The average daily flow was estimated at 0.00495 cfs. The peak discharge was calculated by increasing the average daily flow by a factor of 4.5, which is a total of 0.0077 cfs. Using Manning's Equation, we calculated that the proposed 8-inch sewer line at a minimum of 0.5% have a velocity of 2.45 fps flowing full with a capacity of 0.86 cfs. Pool backwash shall be connected to the sanitary sewer system and not discharge to the storm drain system. For the purpose of the design we have assumed a pool backwash flow rate of 100 gpm (0.22 cfs). Actual backwash discharge rate shall not exceed 100 gpm. Backwash pump and pipe sizing will be done by the pool designer under separate permit for each unit. Refer to Sanitary Sewer System Design Calculations in Appendix A-4.

THIS IS AN
EXISTING 8" LINE.

MIN
ASSUMED,OK

BACKWASH FLOWS DO NOT
APPLY TO INDIVIDUALLY
OWNED SFR OR TOWNHOMES
WITH PRIVATE POOLS

4. REFERENCES

- City of Scottsdale Design Standards & Policies Manual.
- 2015 International Fire Code, Appendix B, Fire Flow Requirements for Buildings.

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Not Provided
Project Address:	7801 East San Miguel Avenue, Scottsdale, Arizona, 85250
Client Project No.:	Not Provided
Arizona Flow Testing Project No.:	22503
Flow Test Permit No.:	C69516
Date and time flow test conducted:	July 21, 2022 at 7:30 AM
Data is current and reliable until:	January 21, 2023
Conducted by:	Floyd Vaughan- Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Ray Padilla -City of Scottsdale-Inspector (602-541-0586)

Raw Test Data

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

Residual Pressure: **64.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **33.0 PSI**
(Measured in pounds per square inch)

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

Coefficient of Diffuser 0.9

Flowing GPM: **2,468 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **5,671 GPM**

Data with 10% Safety Factor

Static Pressure: **68.4 PSI**
(Measured in pounds per square inch)

Residual Pressure: **56.4 PSI**
(Measured in pounds per square inch)

Distance between hydrants: Approx.: 470-Feet

Main size: Not Provided

Flowing GPM: **2,468 GPM**

GPM @ 20 PSI: **5,242 GPM** ✓

@30 PSI THE
RESULTING FLOW
AVAILABLE WILL BE
MORE THAN
ADEQUATE TO
OBTAIN 1,500GPM

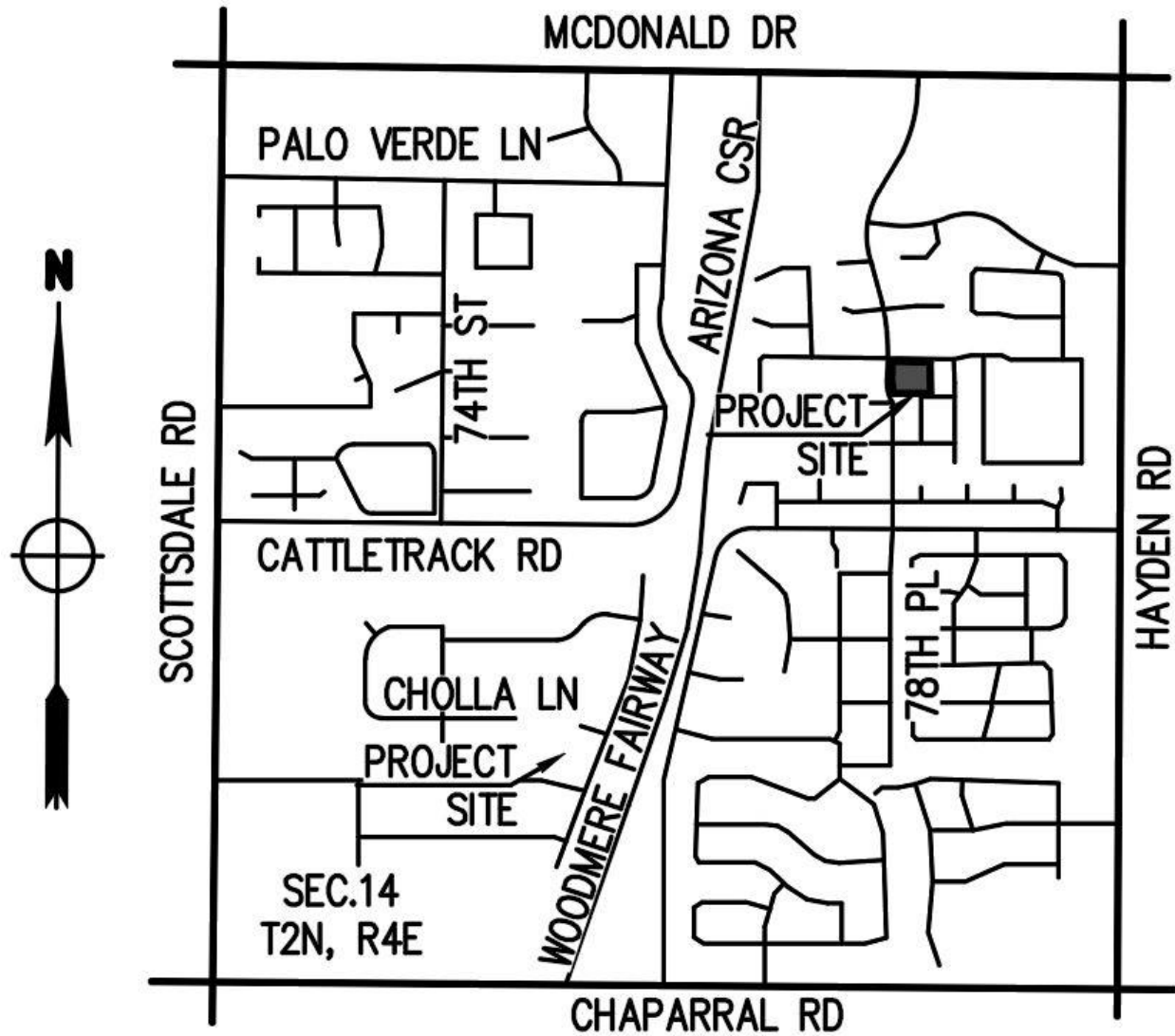
Flow Test Location

North ↑



APPENDIX A-1

Vicinity Map



APPENDIX A-2

Water System Design Calculations

RESIDENTIAL

Number of units:

Average day demand per dwelling unit:

Average day demand:

USE MULTIPLIER FOR THE
APPROPRIATE DENSITY FROM
FIGURE 6-1.2. (248gpd/unit for
7.1 units per acre)

6

185.3

$$6 \times 185.3 = 1,112 \text{ gpd (0.77 gpm)}$$

Maximum daily peaking factor:

2.0

Maximum daily demand per dwelling unit:

370.60 gpd

Maximum day demand:

$$6 \times 370.60 = 2,224 \text{ gpd (1.54 gpm)}$$

Peak hour demand factor:

INCORRECT
PEAKING FACTOR
DSPM 6-1.404.B.2
(should be 3.5)

4.5

Peak hour demand per dwelling unit:

833.85 gpd

Peak hour demand:

$$6 \times 833.85 = 5,003 \text{ gpd (3.47 gpm)}$$

same as if correct values had
been used, ok

FIRE FLOW DEMAND

Building Area = 14,078 sf, Construction Type = V-B, Required Fire Flow = 3,000 gpm

Per 2015 International Fire Code, Appendix B, Section B105.2, a 75% reduction in the fire flow can be approved if an approved automatic sprinkler system is installed. The resulting fire flow shall not be less than the required minimum of 1,500 gpm. We are using a fire flow of 1,500 gpm since the 75% reduction would result in a fire flow less than the minimum required fire flow.

Fire hydrant flow test shall be submitted with the fire sprinkler design.

TOTAL SITE DEMAND

Fire flow demand (see demand calculation above):

1,500 gpm

Peak hour demand + Fire Flow Demand

$$3.47 + 1,500 = 1,503.5 \text{ gpm}$$

TO BE SUBMITTED WITH BOD.
DSPM 6-1.201.A.2/PREAPP
COMMENTS. APPENDED
HEREIN BY WATER
RESOURCES.

APPENDIX A-3

Sanitary Sewer System Design Calculations

Manning's Formula

8" Pipe Flowing Full

Capacity

$$Q = \frac{1.49}{n} * R^{\frac{2}{3}} * S^{\frac{1}{2}} * A$$

$$n = 0.013$$

$$R = 0.16667$$

$$A = 0.3490$$

$$S = 0.0050 \text{ ft/ft}$$

$$Q = 0.86 \text{ cfs}$$

Velocity

$$Q = \frac{1.49}{n} * R^{\frac{2}{3}} * S^{\frac{1}{2}}$$

$$n = 0.013$$

$$R = 0.16667$$

$$S = 0.0050 \text{ ft/ft}$$

$$V = 2.45 \text{ fps}$$

Manning's Formula

4" Pipe Flowing Full

Capacity

$$Q = \frac{1.49}{n} * R^{\frac{2}{3}} * S^{\frac{1}{2}} * A$$

$$n = 0.013$$

$$R = 0.083$$

$$A = 0.086$$

$$S = 0.020 \text{ ft/ft}$$

$$Q = 0.262 \text{ cfs}$$

Velocity

$$Q = \frac{1.49}{n} * R^{\frac{2}{3}} * S^{\frac{1}{2}}$$

$$n = 0.013$$

$$R = 0.083$$

$$S = 0.020 \text{ ft/ft}$$

$$V = 3.064 \text{ fps}$$

FOR SFR, USE 100GPCPD
AND 2.5 PERSONS/DU
DSPM 7-1.403.A

Sewer Demand Calculations

Average daily flow

Number of Units:

Average day demand per dwelling unit:

Average day demand:

6
200
 $6 \times 200 = 1,200 \text{ gpd}$

Total average daily flow:

$1,200 \text{ gpd} = 0.00186 \text{ cfs}$

Peak daily flow

$0.00186 \text{ cfs} \times 4.5 = 0.00837 \text{ cfs}$ or 3.76 gpm

PF=4
DSPM 7-1.403.A

NOT A RELEVANT AMOUNT
OF FLOW TO CAUSE
CONCERN WITH SEWER
CAPACITY

4" service lines are connected to the existing 8" public sewer main.

Capacity of 8" sewer line is **0.86 cfs** > Peak Demand of **0.00837 cfs**



Pool Backwash Flow Rate

100 gpm (0.22 cfs) assumed for preliminary purposes. Actual discharge and pipe sizing will be calculated at the time of final design.

NOT NEEDED ON
INDIVIDUAL
SFR/TOWNHOME
PRIVATE POOLS

Sewer Peak Daily Flow

$3.76 \text{ gpm} + 100 \text{ gpm (pool)}$

104 gpm or 0.23 cfs

Capacity of 8" sewer line is **0.86 cfs** > Peak Daily Flow of **0.25 cfs**

APPENDIX A-4

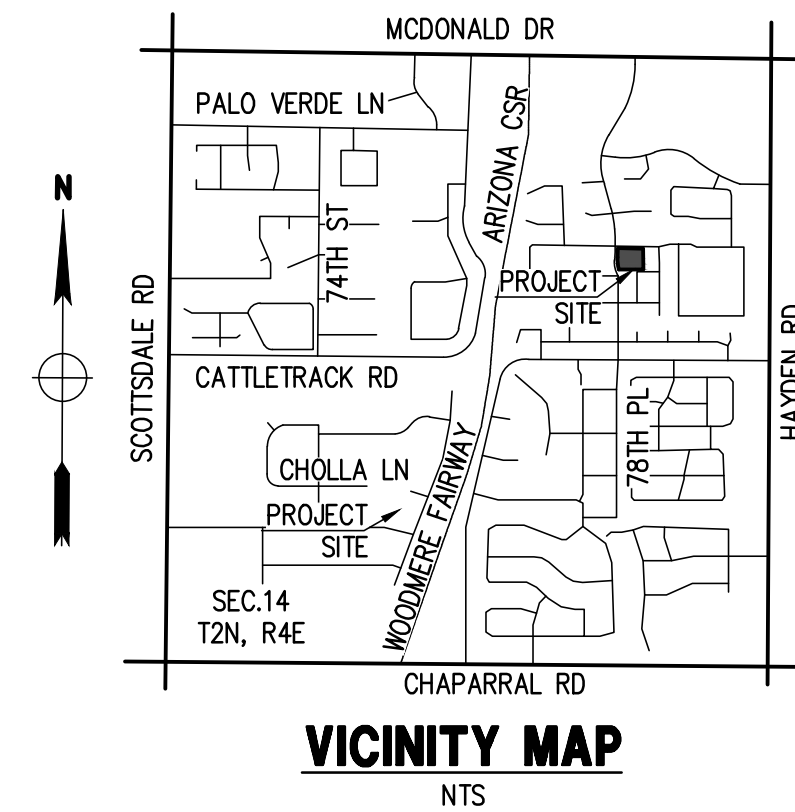
Preliminary Water & Sewer Plan

PRELIMINARY WATER & SEWER PLAN

"MODUS SCOTTSDALE 6"

7801 E SAN MIGUEL AVE, SCOTTSDALE, AZ 85250

LOCATED IN A PORTION OF THE THE NW 1/4 OF THE SE 1/4 OF THE NE 1/4 OF SECTION 14, T.2N, R.4E
OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA



DEVELOPER

MODUS DEVELOPMENT
3219 E CAMELBACK RD, #291
PHOENIX, AZ 85018
P: 480-329-7504
CONTACT: ED GORMAN

ARCHITECT

DREWEY WORKS ARCHITECTURE
7144 E STEVENSON DR, STE. 204,
SCOTTSDALE, AZ 85251
P: 480-329-7504
CONTACT: ROB BANACH

SITE DATA

APN: 716-03-012E
ADDRESS: 7801 E SAN MIGUEL AVE,
SCOTTSDALE, AZ 85250
LOT AREA: 35,439 S.F. (0.814 AC.)
OS #: 20-46

CIVIL ENGINEER

LAND DEVELOPMENT GROUP
8808 N CENTRAL AVE, SUITE 288
PHOENIX, AZ 85020
P: 602-889-1984
CONTACT: NICK PRODANOV

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS NORTH 00°16'12" EAST ALONG THE EAST LINE OF THE NORTHEAST QUARTER OF SECTION 14, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, ACCORDING TO BOOK 734 OF MAPS, PAGE 10, MARICOPA COUNTY RECORDS.

BENCHMARK

CITY OF SCOTTSDALE BRASS CAP IN A HAND HOLE AT THE INTERSECTION OF HAYDEN ROAD AND McDONALD DRIVE.
ELEVATION=1265.90' (NAVD 88)

I HEREBY CERTIFY THAT ALL ELEVATIONS REPRESENTED ON THIS PLAN ARE BASED ON THE ELEVATION DATUM FOR THE CITY OF SCOTTSDALE BENCHMARK PROVIDED ABOVE.

PARENT LEGAL DESCRIPTION

THE NORTH 197 FEET OF THE WEST 208 FEET OF THAT PART OF THE NORTHEAST QUARTER OF SECTION 14, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA DESCRIBED AS FOLLOWS: BEGINNING AT THE EAST QUARTER CORNER OF SAID SECTION 14; RUN THENCE NORTH 0 DEGREES 28 MINUTES 52 SECONDS WEST 989.98 FEET; THENCE WEST 825 FEET TO THE TRUE POINT OF BEGINNING; THENCE SOUTH 0 DEGREES 28 MINUTES 52 SECONDS EAST 619.17 FEET; THENCE SOUTH 89 DEGREES 59 MINUTES 38 SECONDS WEST 495.17 FEET; THENCE NORTH 0 DEGREES 26 MINUTES 22 SECONDS WEST 619.11 FEET; THENCE EAST 494.59 FEET TO THE TRUE POINT OF BEGINNING; EXCEPT THE NORTH 20 FEET THEREOF.

FLOOD INSURANCE RATE MAP (FIRM) DATA

COMMUNITY #	PANEL #	SUFFIX	BASE FLOOD ELEVATION
045012	1770 OF 4425	M	N/A
MAP #	PANEL DATE	FIRM INDEX DATE	ZONE
04013C	09/18/2020	12/08/2021	X*

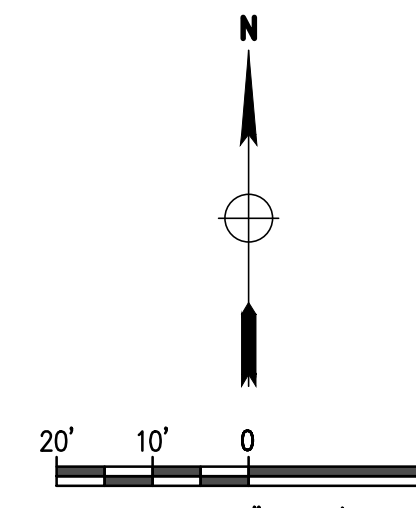
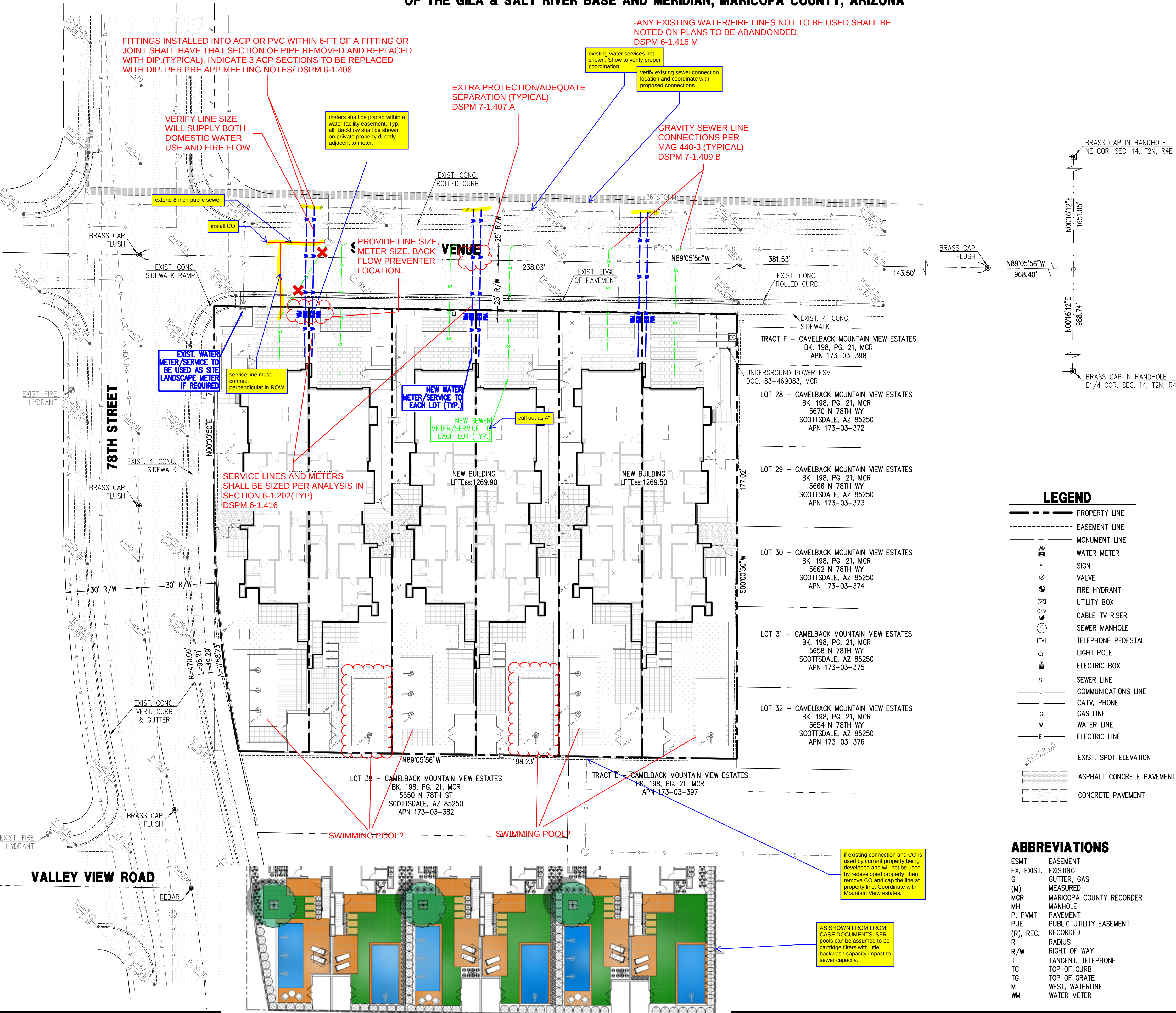
*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

LEGEND

---	PROPERTY LINE
---	EASEMENT LINE
---	MONUMENT LINE
W	WATER METER
S	SIGN
V	VALVE
F	FIRE HYDRANT
U	UTILITY BOX
C	CABLE TV RISER
M	SEWER MANHOLE
P	TELEPHONE PEDESTAL
L	LIGHT POLE
E	ELECTRIC BOX
S	SEWER LINE
C	COMMUNICATIONS LINE
T	CATV, PHONE
G	GAS LINE
W	WATER LINE
E	ELECTRIC LINE
SPOT	EXIST. SPOT ELEVATION
AC	ASPHALT CONCRETE PAVEMENT
CONC	CONCRETE PAVEMENT

ABBREVIATIONS

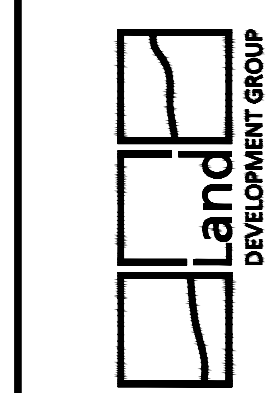
ESMT	EASEMENT
EX. EXIST.	EXISTING
G	GUTTER, GAS
(M)	MEASURED
MCR	MARICOPA COUNTY RECORDER
MH	MANHOLE
P. PWMT	PAVEMENT
PUE	PUBLIC UTILITY EASEMENT
(R), REC.	RECORDED
R	RADIUS
R/W	RIGHT OF WAY
T	TANGENT, TELEPHONE
TC	TOP OF CURB
TG	TOP OF GRATE
M	WEST, WATERLINE
WM	WATER METER



PRELIMINARY WATER & SEWER PLAN

"MODUS SCOTTSDALE 6"
7801 E SAN MIGUEL AVE,
SCOTTSDALE, AZ 85250

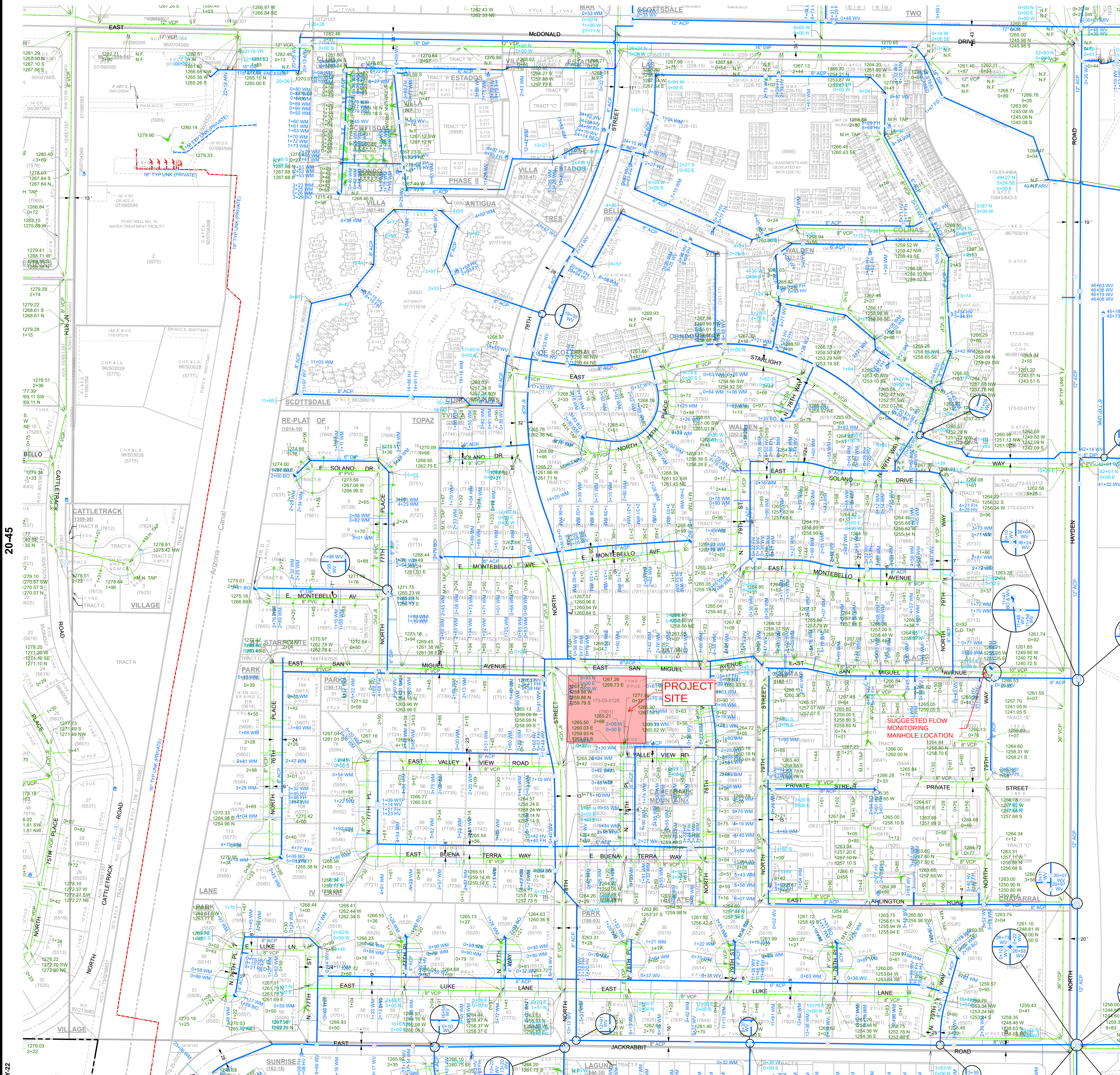
P. 602-889-1984 | F. 602-445-9482
8808 N CENTRAL AVE., SUITE 288
PHOENIX, AZ 85020
PHOENIX @ LDENG.COM



DATE: 08/17/22	DESIGNED BY: NP	CHECKED BY: NP
JOB: 2206207	DRAWN BY: DW	
VERSION: 1.1		
PLOT DATE: 08/17/22		

APPENDIX A-5

City of Scottsdale Water and Sewer Map

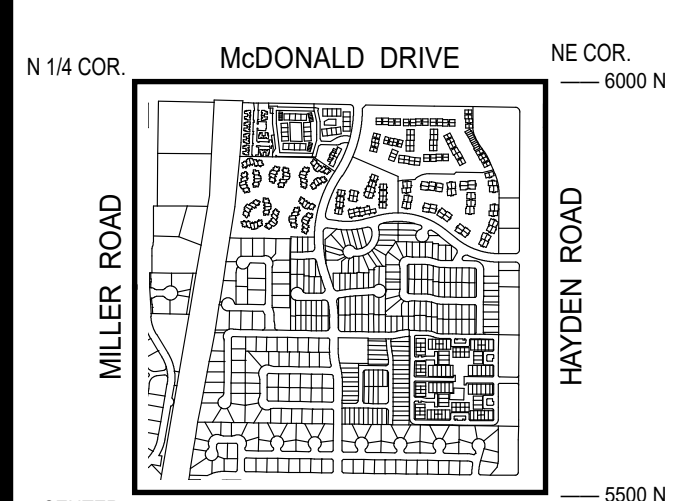


GENERAL NOTES:
THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.

LEGEND:

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

VICINITY MAP



NORTH

SCALE: 1" = 100'

0 50 100 200
The map scale of 1" = 100' is based on a full size print of 30" x 36"

WATER & SEWER
QUARTER SECTION MAP

20-46

NE 1/4 SEC. 14 T2N R4E

CITY OF SCOTTSDALE
SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS
3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

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

THE CITY OF SCOTTSDALE

22 MAY 22