FINAL WASTEWATER BASIS OF DESIGN REPORT

FINAL Basis of Design Report

☐ APPROVED

☑ APPROVED AS NOTED

☐ REVISE AND RESUBMIT

CITY OF SCOTTSDALE

SCOTTSDALE WATER

9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY ldillon **DATE** 3/28/2022

Address within or prior to submittal of plans:
1) Confirm 2 existing sewer services are 6". If not upsize to required min size. DS&PM 7-1.409
2) All new services to be per MAG 440-3, min 6".

Scottsdale Miller Plaza
Scottsdale, Arizona

Prepared for:

Toll Brothers Apartment Living
8767 E. Via de Ventura, Suite 390
Scottsdale, AZ 85258

Prepared by:

Kimley»Horn

291245002
March 2022

Scottsdale Miller Plaza

FINAL WASTEWATER BASIS OF DESIGN REPORT

MARCH 2022

Prepared By:

Kimley»Horn

Contents

Appendices

1.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this Wastewater Basis of Design Report for the proposed apartment development at the northwest corner of East 6th Avenue and North Miller Road in Scottsdale, Arizona. This report will demonstrate that the proposed project conforms to the City of Scottsdale design requirements.

Scottsdale Miller Plaza, the "project", encompasses approximately 1.38 net acres and contains a 153,373 gross square foot five-story apartment with a 90,330 gross square foot two-level underground parking garage. The project includes 148 units with a pool amenity area. The project lies within a portion of the Southwest Quarter of Section 23, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian in Maricopa County, Arizona. More specifically, the project is bound by East 6th Avenue to the south, North Miller Road to the east, and existing commercial developments to the north and west. See **Appendix A** for the Vicinity Map.

2.0 WASTEWATER ANALYSIS

2.1 INTENT AND SCOPE

The intent of this section is to evaluate the wastewater infrastructure for the proposed development. As a result of this analysis, it will be determined if the wastewater infrastructure can satisfy the projected wastewater demands for the proposed development in accordance with the City of Scottsdale Design Standards & Policies Manual (**Reference 1**).

2.2 GENERAL THEORY

The hydraulic modeling program FlowMaster, a Bentley Systems product developed by Haestad Methods, was used to model the wastewater infrastructure servicing the proposed development. The program uses the Manning equation for flow analysis of non-pressurized closed pipes. This is the typical method used to evaluate wastewater distribution systems.

2.3 WASTEWATER SUPPLY

There is an existing 8-inch and 12-inch parallel sewer main located in East 6th Avenue south of the site. The 8-inch and 12-inch parallel sewer main combine to an existing 24-inch sewer main at the intersection of North Miller Road and East 6th Avenue. The proposed development will connect to the existing 8-inch sewer main. There is an existing 6-inch and 4-inch sewer lateral located on south side of the site, connecting to the existing 8-inch main in East 6th Avenue.

The existing 6-inch and 4-inch sewer laterals and associated fittings will be utilized with the proposed improvements. One new 6-inch building sewer service will also connect to the existing 8-inch sewer main in East 6th Avenue south of the site. Refer to **Appendix E** for the Preliminary Utility Plan.

The analysis of sewer capacities in this Basis of Design Report will be limited to the existing 8-inch sewer main in East 6th Avenue, west of North Miller Road. This analysis is limited to the use of the proposed development.

2.4 WASTEWATER DEMANDS

The following calculations and demands are based on Figure 7-1.2 in the City of Scottsdale's 2018 DS&PM. For clarity of building locations, reference **Appendix B** for the Site Plan.

Table 1: East 6th Avenue Sewer Demands

Building	Use	DUs	Demand [1] per unit (GPD)	Average Daily Flow (GPD)	Peak Flow [2] (GPD)	Peak Flow (GPM)
Miller West Service	Condominium	123	140	17,220	77,490	54
Miller Central Service	Pool Backwash	-	-	-	-	100
Miller East Service	Condominium	25	140	3,500	15,750	11
Total For 8" Diameter Pipe West of N. Miller Rd						**165**

Combine with about 190gpm of existing peak flows = 355gpm total, OK

from Zoning: units dropped by 34, flow dropped by 15gpm. OK

Notes:

1. Demands are based on Figure 7-1.2 in City of Scottsdale's 2018 DS&PM
2. The design peak flow factor for condominium use is 4.5.
3. The pool backwash rate of 100 gpm is based on correspondence with City of Scottsdale staff.

2.5 WASTEWATER ANALYSIS

Sanitary sewer lines will be designed to maintain a maximum depth to diameter ratio (d/D) of 0.65, a minimum full flow velocity of 2.5 ft/sec and a maximum full flow velocity of 10.0 ft/sec in the ultimate peak flow condition. To verify the proposed 6-inch service, existing 6-inch and 4-inch services, and existing 8-inch main have adequate capacity to serve the project, design flows were analyzed with Flow Master using pipe design slopes. As shown in **Table 1** above, pool backwash shall be connected to the sanitary sewer system and not discharge to the storm drain system. Backwash pump and pipe sizing will be done by the pool designer under separate permit. Refer to **Table 2** below and **Appendix D** for the Sewer Capacity Calculations.

Table 2: East 6th Avenue Sewer Capacity

	Peak Flow (GPM)	Manning Roughness (n)	Slope (ft/ft)	d/D	Velocity (ft/s)
6" Diameter Pipe (West)	54	0.013	0.080	0.19	4.8
6" Diameter Pipe (Central)	100	0.013	0.020	0.37	3.5
4" Diameter Pipe (East)	11	0.013	0.040	0.18	2.5
8" Diameter Pipe (Main)	165	0.013	0.014	0.35	3.5

verified on utility plan

4.0 CONCLUSION

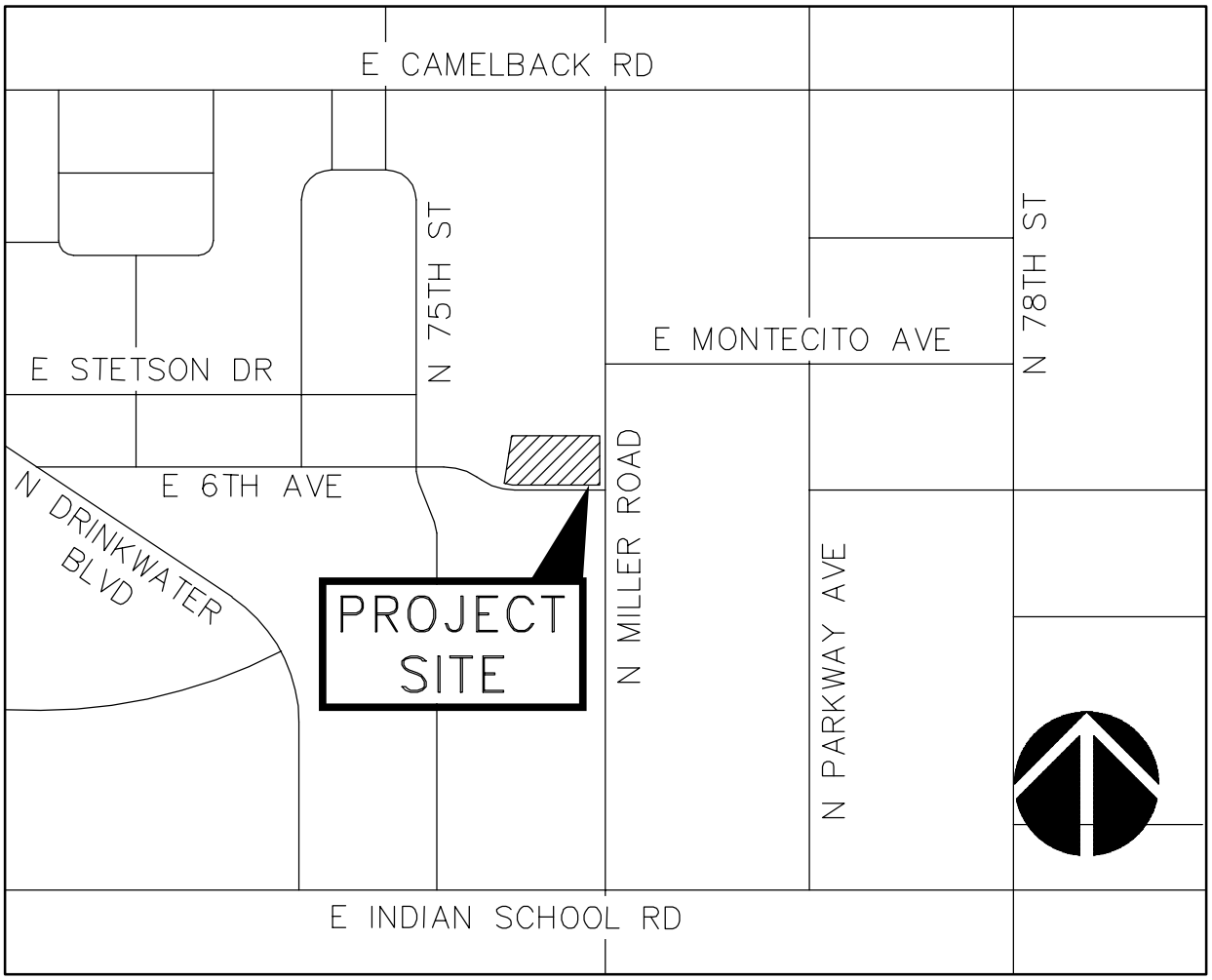
The development proposes to connect one new 6-inch sewer service to the existing 8-inch sewer main in East 6th Avenue via saddle tap, and also utilize the existing 6-inch and 4-inch sewer services already connected to the 8-inch main in East 6th Avenue. The proposed and existing sewer infrastructure as outlined by this analysis has adequate capacity for the flows generated by the proposed building located at the northwest corner North Miller Road and East 6th Avenue.

5.0 REFERENCES

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

2. Sustainability Engineering Group, *Preliminary Basis of Design for Wastewater*, September 2018.

Appendix A – Vicinity Map

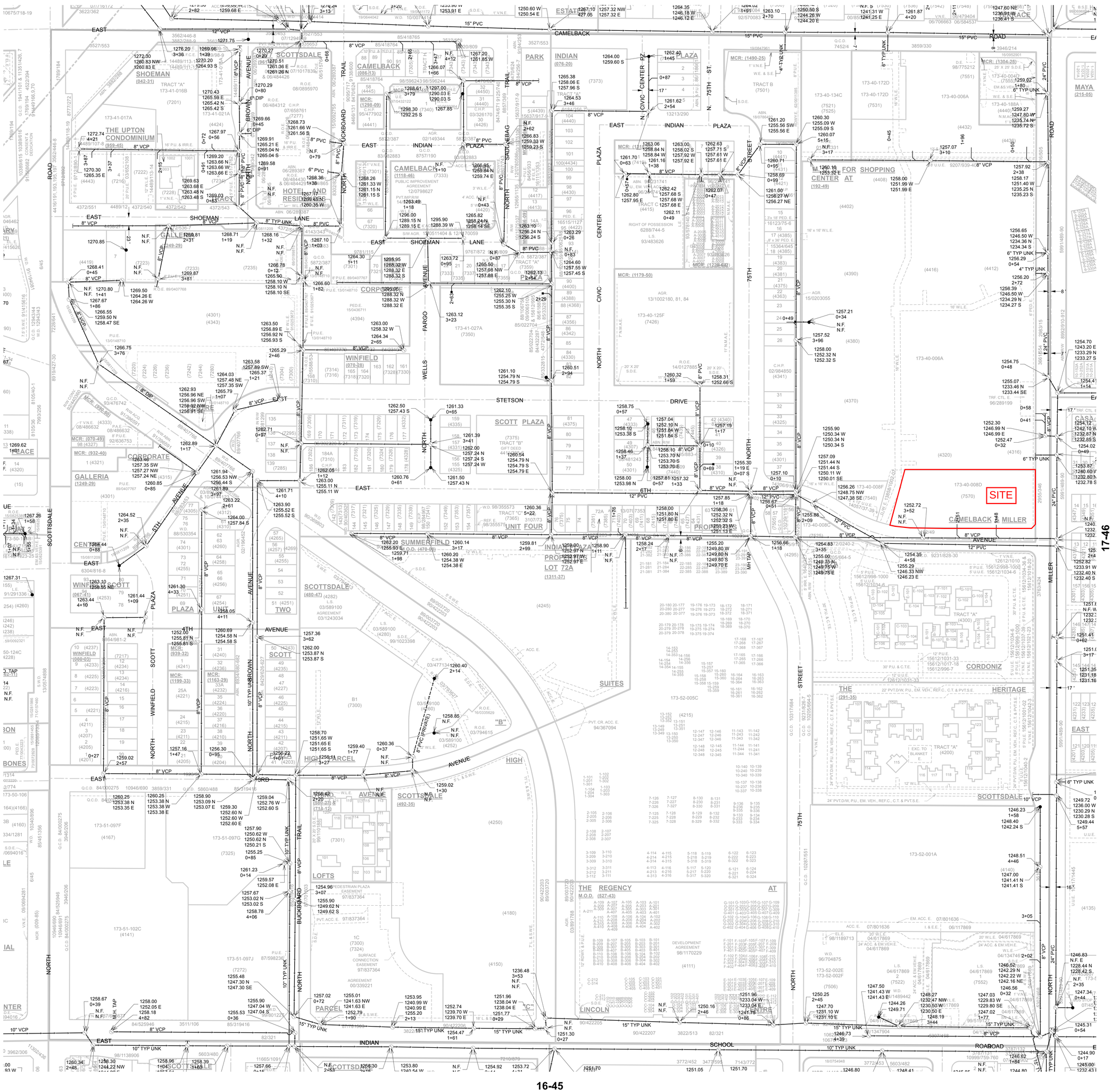


VICINITY MAP

SCOTTSDALE, AZ
N.T.S.

Kimley»Horn

Appendix B – Scottsdale Quarter Section Map



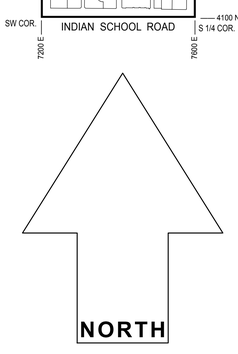
GENERAL NOTES:

- 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
- 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

17-45

SW 1/4 SEC. 23 T2N R4E

02-FEB-20

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

Appendix C – Sewer Calculations

Circular Pipe (2022-01-20 Wastewater BOD.fm8)

Label	Solve For	Friction Method	Roughness Coefficient	Channel Slope (%)	Normal Depth (in)	Diameter (in)	Discharge (gpm)	Flow Area (ft²)	Wetted Perimeter (ft)	Hydraulic Radius (in)	Top Width (ft)
West Service	Normal Depth	Manning Formula	0.013	8.000	1.1	6.0	54.00	0.0	0.4	0.7	0.39
Central Service	Normal Depth	Manning Formula	0.013	2.000	2.2	6.0	100.00	0.1	0.6	1.2	0.48
East Service	Normal Depth	Manning Formula	0.013	4.000	0.7	4.0	11.00	0.0	0.3	0.4	0.25
Main	Normal Depth	Manning Formula	0.013	1.400	2.8	8.0	165.00	0.1	0.8	1.5	0.63

Critical Depth (in)	Percent Full (%)	Critical Slope (%)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Maximum Discharge (gpm)	Discharge Full (gpm)	Slope Full (%)	Flow Type	Notes
2.1	18.6	0.710	4.77	0.35	0.45	3.305	766.20	712.28	0.046	Supercritical	
2.8	36.2	0.757	3.47	0.19	0.37	1.677	383.10	356.14	0.158	Supercritical	
1.0	17.2	0.822	2.45	0.09	0.15	2.166	183.76	170.83	0.017	Supercritical	
3.4	34.6	0.666	3.43	0.18	0.41	1.470	690.29	641.71	0.093	Supercritical	

Messages

Appendix D – Utility Plan

SEWER CONSTRUCTION NOTES

1. 6" SDR 35 PVC SEWER SERVICE, LENGTH AND SLOPE PER PLAN.
2. PROP. BUILDING CONNECTION.
3. WYE CONNECTION TO EXISTING SEWER MAIN.

FIRE CONSTRUCTION NOTES

1. 6" CLASS DIP FIRE LINE, LENGTH PER PLAN.
2. BUILDING FIRELINE CONNECTION.
3. 8"X6" TAPPING SLEEVE AND VALVE.

PUBLIC WATER CONSTRUCTION NOTES

1. 3" DOMESTIC WATER METER PER COS STD DET 2345-1.
2. 3" COPPER WATER SERVICE, LENGTH PER PLAN.
3. 3"X8" DOMESTIC WATER SADDLE TAP.

PRIVATE WATER CONSTRUCTION NOTES

1. 4" SCH 40 PVC DOMESTIC WATER SERVICE.
2. 3" DOMESTIC WATER BACKFLOW PREVENTION DEVICE.
3. BUILDING DOMESTIC WATER CONNECTION.

LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT LINE
- S — EXISTING SEWER MAIN
- W — EXISTING PUBLIC WATER MAIN
- W — PROPOSED WATER MAIN
- S — PROPOSED SEWER MAIN
- PROPOSED STORM DRAIN
- EXSTING STORM DRAIN
- EXISTING MANHOLE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- PROPOSED CATCH BASIN

DEVELOPER/OWNER

TOLL BROTHERS APARTMENT LIVING
8767 E. VIA DE VENTURA, SUITE 390
SCOTTSDALE, AZ 85258
PH: (480) 951-0785
CONTACT: RICK CORDOVA

CIVIL ENGINEER

KIMLEY-HORN AND ASSOCIATES, INC
7740 N. 16TH STREET, SUITE 300
PHOENIX, AZ 85020
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CONTACT: TRAVER JONES, PE

LAND SURVEYOR

ANTHONY SLATER
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PHOENIX, ARIZONA 85024
PHONE: 480-922-0780
TONYS@SIGSURVEYAZ.COM

ARCHITECT

ORB ARCHITECTURE, LLC.
2944 N. 44TH STREET, SUITE 101
PHOENIX, AZ 85018
PH: (602) 957-4530
CONTACT: RICH BARBER, AIA

FLOOD INFORMATION

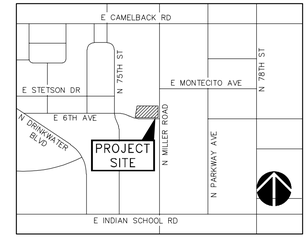
ACCORDING TO THE FLOOD INSURANCE RATE MAP #04013C2235M DATED SEPTEMBER 9, 2020 THIS PROPERTY IS LOCATED IN FLOOD ZONE "X": AREA OF MINIMAL FLOOD HAZARD.

BENCHMARK

PER SURVEY INNOVATION GROUP INC., THE BENCHMARK IS A FOUND BRASS CAP IN HANDHOLE AT THE INTERSECTION OF 6TH AVENUE AND MILLER ROAD.

BASIS OF BEARING

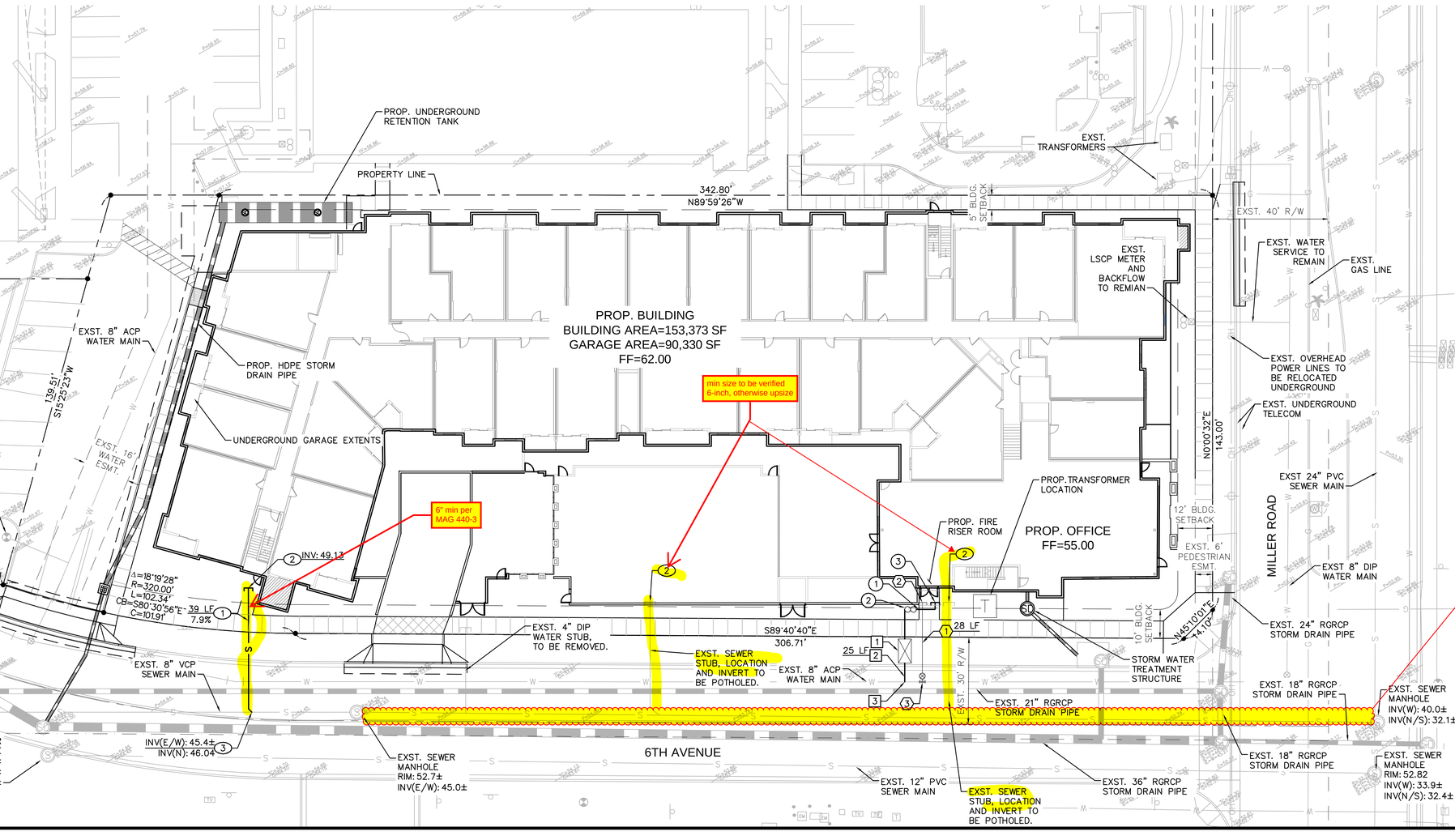
PER SURVEY INNOVATION GROUP INC., THE BASIS OF BEARING IS THE EAST LINE OF THE SOUTHWEST QUARTER OF SECTION 23, AS SHOWN IN BOOK 192, PAGE 49, MARICOPA COUNTY RECORDS. SAID LINE BEARS NORTH 00 DEGREES 00 MINUTES 32 SECONDS EAST.



VICINITY MAP
SCOTTSDALE, AZ
N.T.S.

NOTES

1. ADD 1200' TO ALL ELEVATIONS.
2. ALL ELEVATIONS ARE INVERT ELEVATIONS, UNLESS OTHERWISE NOTED.



Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

NWC OF N. MILLER ROAD AND E. 6TH AVENUE

PRELIMINARY UTILITY PLAN

SCOTTSDALE, ARIZONA

PROJECT No.	291245002
SCALE (H):	1"=20'
SCALE (V):	NONE
DRAWN BY:	CAF
DESIGN BY:	BEQ
CHECK BY:	TMJ
DATE:	01/20/2022

Registered Professional Engineer (Civil)
CERTIFICATE NO
52738
TRAVER JONES
Date Signed 01/20/22
ARIZONA, U.S.A.
Expires 09/30/23

245002Pre-UT.dwg

UT1
1 OF 1 SHEETS

REV	DESCRIPTION	BY	DATE	APPR