

SEWER BASIS OF DESIGN REPORT

Scottsdale UMC Multifamily

Parcel 173-52-001A

4140 North Miller Road
Scottsdale, AZ 85251

RICK Job No. 7251
October 2, 2025

FINAL Basis of Design Report

- ☒ **APPROVED**
☐ **APPROVED AS NOTED**
☐ **REVISE AND RESUBMIT**



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 Levi Dillon

DATE 11/25/2025



Scottsdale UMC Multifamily

Parcel 173-52-001A
4140 North Miller Road
Scottsdale, AZ 85251

Sewer Basis of Design Report
COS#: 14-DR-2025

Prepared For:

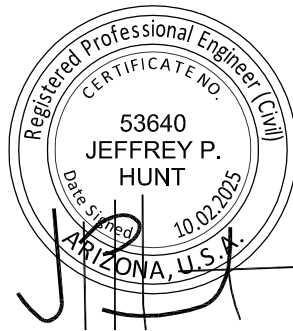
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Attn: Dan Klocke



Jeff Hunt, P.E.

June 25, 2025

Prepared By:

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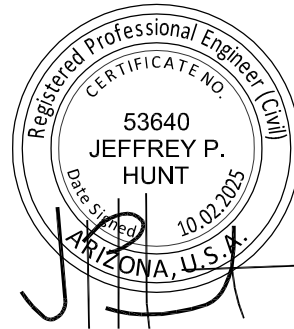
JOB NUMBER 7251

TABLE OF CONTENTS

I.	INTRODUCTION	
	1. PROJECT NAME AND LOCATION	2
	2. EXISTING STUDIES	2
	3. GOVERNING JURISDICTIONS	2
II.	EXISTING CONDITIONS	
	1. EXISTING SEWER SYSTEM	2
III.	PROPOSED CONDITIONS	
	1. PROPOSED SEWER SYSTEM	2
	2. DEMANDS	3
IV.	RESULTS AND CONCLUSION	
	1. CONCLUSION	3

APPENDICES

- A Location Map
- B Preliminary Utility Plan
- C Sewer Pipe Calculations



I. INTRODUCTION

1. PROJECT NAME AND LOCATION

The Project is known as 'Scottsdale UMC Multifamily' and is located at 4140 N Miller Road in Scottsdale, Arizona. Refer to Appendix A for a Location Map.

The project site is a portion of a developed parcel bounded by N Miller Road to the east, N 75th St to the west, a condominium complex to the north, and commercial development to the south. The proposed Project consists of two new buildings that make up a 83-unit multifamily residential housing complex and associated paved parking, fire system and drainage infrastructure.

The City of Scottsdale is the sewer service provider for this site.

2. EXISTING STUDIES

3. No existing studies could be found for this project that would impact the analysis of the proposed water system.

4. GOVERNING JURISDICTIONS

The project lies within the City of Scottsdale service area. The project is governed by and is design in accordance with the following requirements:

- Arizona Administrative Code Title 18 Chapter 5, "Department of Environmental Quality Environmental Reviews and Certification"
- Arizona Department of Environmental Quality, Engineering Bulletin No. 10, "Guidelines for Construction of Water Systems".
- Arizona Department of Environmental Quality, Engineering Bulletin No. 8, "Disinfection of Water Systems".
- City of Scottsdale Design Standards & Policy Manual

& COS MAG supplements and details

II. EXISTING CONDITIONS

1. SEWER SYSTEM

According to utility system maps and as-built records, the existing sewer infrastructure in the area consists of 6-inch sewer services to the existing buildings that outfall to an existing 8-inch sewer main within the Miller Road right-of-way at the southeast corner of the project site. The existing buildings consist of school (daycare), office, and church sanctuary uses. 1 of the 3 existing buildings will be removed as part of this Project.

III. PROPOSED CONDITIONS

1. PROPOSED SEWER SYSTEM

The proposed sewer system consists of 2 (1 per building) 6-inch PVC wastewater line discharging to the to the existing 8-inch sewer main in Miller Road on the east side of the site. The 6-inch sewer service lines will slope at a minimum of 1.1% per the requirements of the IPC and will outfall into the existing 8-inch sewer main to the east

of the project. Refer to Appendix B for the Preliminary Utility Plan and Appendix C for the Pipe Flow Calculations.

2. DEMANDS

Domestic

Guidance for demand and peaking flow rates is taken from the 2018 City of Scottsdale Design Standards & Policies Manual.

Proposed Buildings

Total Dwelling Units	83 DU
Assumed Residential Density	2.5 persons/DU
Average Day Demand Factor	100 gal/person/day
Average Daily Demand	20,750 gpd
Peak Day Factor	4.0 x ADD
Peak Daily Demand	83,000 gpd (58 gpm)

Using calculations per the AAC Title 18, Chapter 9, the velocity for the full flow in an 6-inch line at a minimum 1.1% slope is 3.41 ft/sec and the d/D ratio for partial flow is 0.19. Thus, the expected maximum demand of 83,000 gpd is acceptable in the 6-inch lateral. Note that the flow can be broken down further as each building has its own, independent connection to Miller Road however, the calculations herein demonstrate that the system performs in a very conservative analysis. Refer to Appendix C for Pipe Flow Calculations.

Existing Buildings (to remain) – daycare and office

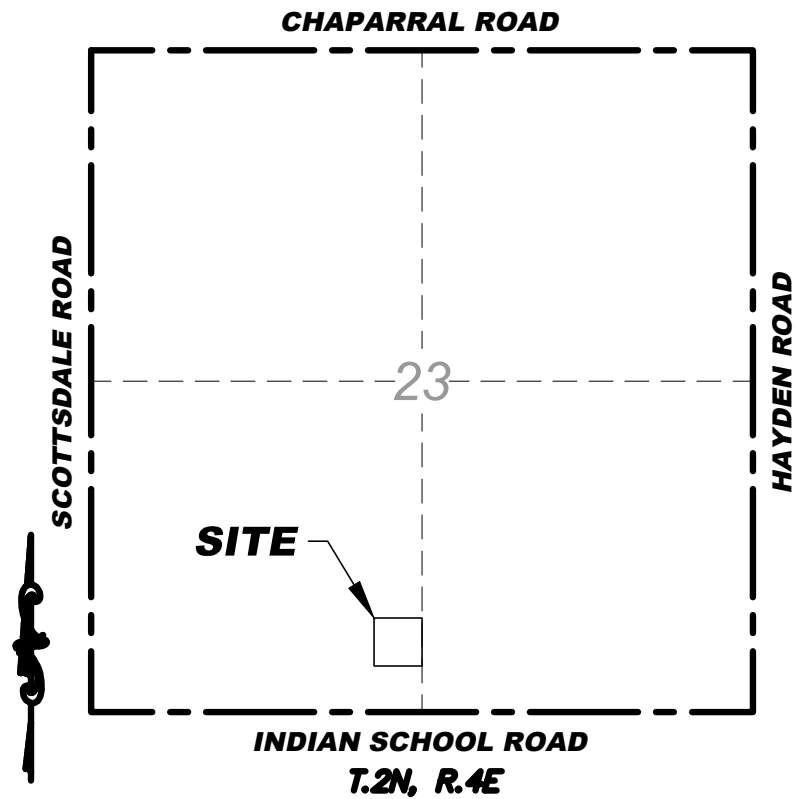
Total Square Footage	24,400 SF
Demand (0.4 gpd per sf)	9,760 gpd
Estimated Student Load (max)	100 students
Deman (30 gpd per student)	3,000 gpd
Average Daily Demand	12,760 gpd
Peak Day Factor (using school – conservative)	6.0 x ADD
Peak Daily Demand	76,560 gpd

No pool or spa amenities are included with this development.

IV. CONCLUSION

The sewer pipe calculations have shown the system to be compliant with the City of Scottsdale Design Standards & Policy Manual.

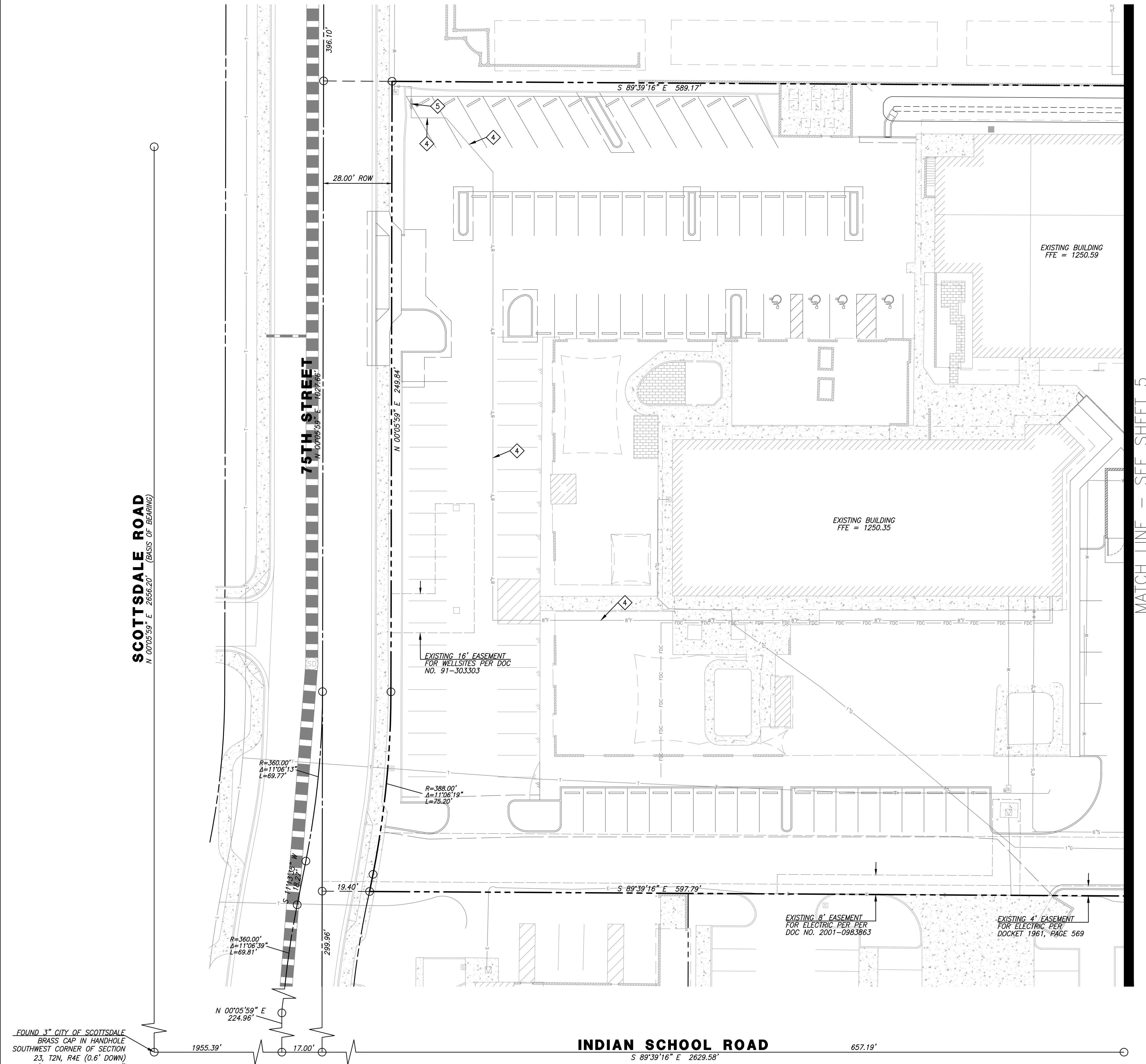
ATTACHMENT A
LOCATION MAP



VICINITY MAP

N.T.S.

ATTACHMENT B
PRELIMINARY UTILITY PLAN



PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

- | WATER KEYNOTES | |
|-----------------------|---|
| 1 | NEW 2" SERVICE AND METER FOR DOMESTIC WATER SERVICE. |
| 2 | NEW 2" DOMESTIC WATER LINE. |
| 3 | NEW RPPB DOMESTIC BACKFLOW PREVENTER PER CITY OF SCOTTSDALE DETAIL 2354. |
| 4 | EXISTING 1-1/2" SERVICE TO REMAIN. RELOCATE METER TO OUTSIDE PUBLIC SIDEWALK AND PRESERVE SERVICE TO EXISTING BUILDING. |
| 5 | EXISTING DOMESTIC WATER LINE TO REMAIN. |
| 6 | NEW 1" SERVICE AND METER FOR IRRIGATION SERVICE. |

- ### **FIRE LINE KEYNOTES**
- | | |
|---|---|
| 1 | CONNECT TO EXISTING 8" WATER MAIN USING CUT-IN TEE FOR FIRE SERVICE. INSTALL PER CITY OF SCOTTDALE DETAIL 2362-2. |
| 2 | NEW 8" DIP FIRE LINE. |
| 3 | NEW 8" FIRE BACKFLOW PREVENTER IN RISER ROOM. |
| 4 | EXISTING FIRE LINE TO REMAIN |
| 5 | EXISTING BACKFLOW PREVENTER TO REMAIN. |

- PRIVATE SEWER KEYNOTES**
- 1 CONNECT TO EXISTING 8" PVC SEWER MAIN PER MAG DETAIL 440-3.
 - 2 NEW 6" PVC SDR-35 SEWER LINE.
 - 3 CONNECT TO BUILDING SANITARY SEWER.



SEAL:

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PROJECT NO:	7251	DRAWN/DESIGNED BY:	CN
DATE:	10/02/2025	CHECKED BY:	JH

PRELIMINARY IMPROVEMENT PLAN PREPARED FOR:

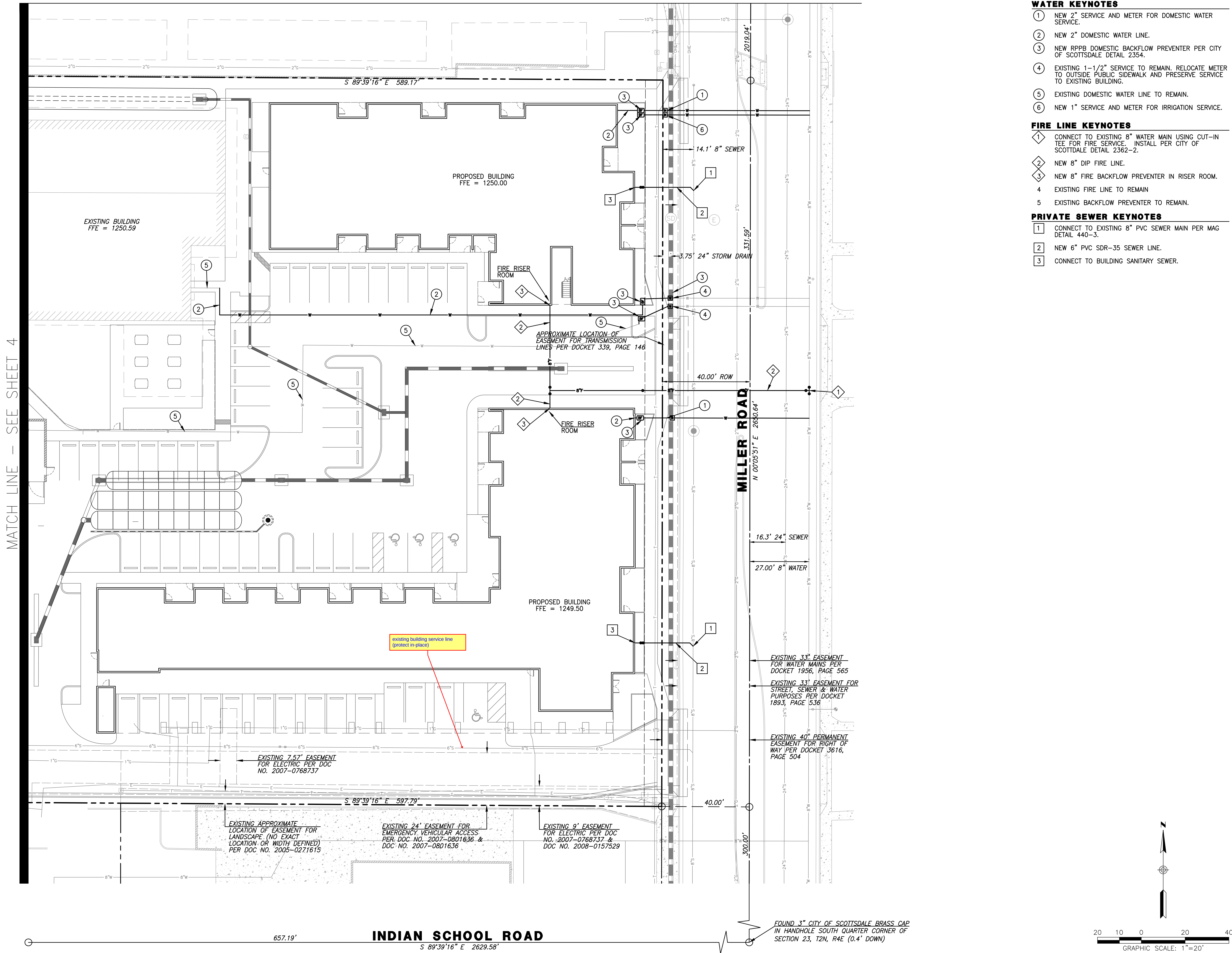
SCOTTSDALE UMC MULTIFAMILY

4140 NORTH MILLER ROAD
SCOTTSDALE, ARIZONA 85251
CITY OF SCOTTSDALE

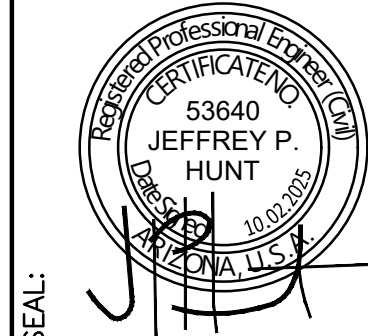
ON-SITE UTILITY PLAN



DRAWING NO.
UT1
SHEET NO. 4 OF 6



- WATER KEYNOTES**
- 1 NEW 2" SERVICE AND METER FOR DOMESTIC WATER SERVICE.
 - 2 NEW 2" DOMESTIC WATER LINE.
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PRELIMINARY IMPROVEMENT PLAN PREPARED FOR:
SCOTTSDALE UMC MULTIFAMILY
4140 NORTH MILLER ROAD
SCOTTSDALE, ARIZONA 85251
CITY OF SCOTTSDALE
ONSITE UTILITY PLAN



DRAWING NO.
UT2
SHEET NO. 5 OF 6

14-DR-2025

ATTACHMENT C
PIPE FLOW CALCULATIONS



RICK

Sewer Design Report Calculations

Scottsdale UMC Multifamily

this is the new total two building flow, analysis should be on largest new building flow (this was a previous BOD comment)

Sewage Flow Per Day (Scottsdale Design Standards & Policy Manual)

Dwelling Units	83
Residential Density (Persons/DU)	2.5
GPD per person	100
Peaking Factor	4
Average Daily Flow (GPD)	20,750
Design Flow/Peak (GPD)	83,000

$$Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$$

Where:

Q = flow in cfs

n = Manning's Roughness

Coefficient

A = Cross sectional area of flow

R = hydraulic radius

SYSTEM MINIMUM SLOPE

n =	0.013
Pipe diameter (in) =	6
Pipe Slope (ft/ft) =	0.011

SYSTEM MAXIMUM SLOPE

n =	0.013
Pipe diameter (in) =	6
Pipe Slope (ft/ft) =	0.02

Full Flow*

Depth of flow (in) =	4.50
f (radian) =	4.19
Area (in ²) =	22.75
Wetted Perimeter (in) =	12.57
Hydraulic Radius (in) =	1.81
Velocity (ft/sec) =	3.41
d/D ratio =	0.75
Pipe Capacity (GPD)	347,745

Full Flow*

Depth of flow (in) =	4.50
f (radian) =	4.19
Area (in ²) =	22.75
Wetted Perimeter (in) =	12.57
Hydraulic Radius (in) =	1.81
Velocity (ft/sec) =	4.59
d/D ratio =	0.75
Pipe Capacity (GPD)	468,899

Design Flow

Depth of flow (in) =	1.15
f (radian) =	1.81
Area (in ²) =	3.77
Wetted Perimeter (in) =	5.43
Hydraulic Radius (in) =	0.69
Velocity (ft/sec) =	1.80
d/D ratio =	0.19

should be 2.42, issue with equation

should be 0.32, issue with equation

Design Flow

Depth of flow (in) =	0.92
f (radian) =	1.61
Area (in ²) =	2.74
Wetted Perimeter (in) =	4.83
Hydraulic Radius (in) =	0.57
Velocity (ft/sec) =	2.12
d/D ratio =	0.15

*Full Flow refers to d/D of 0.75 per AAC R18-9-E301.4.01.D.2.e and Phoenix Waste Water Ma