WASTEWATER

PRELIMINARY BASIS OF DESIGN REPORT

PRELIMINARY Basis of Design Report

- [x] **ACCEPTED**
- [ ] **ACCEPTED AS NOTED**
- [ ] **REVISE AND RESUBMIT**

CITY OF SCOTTSDALE

SCOTTSDALE WATER

9379 E San Salvador Dr.
Scottsdale, AZ 85258

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 RSacks **DATE** 8/9/2023

Headwaters Scottsdale
Scottsdale, Arizona

Prepared for:

Headwater Group
5265 S Rio Grande Ste 201
Littleton, CO 80120

Prepared by:

Kimley»Horn

291753000
November 2022

Headwaters Scottsdale

WASTEWATER BASIS OF DESIGN REPORT

MARCH 2023

Prepared By:

Kimley»Horn

Contents

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1.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this Wastewater Basis of Design Report for the proposed minimal residential healthcare living development at the southeast corner of 100th Street and Frank Lloyd Wright Boulevard in Scottsdale, Arizona. This report will demonstrate that the proposed project conforms to the City of Scottsdale design requirements.

Headwaters Scottsdale, the "project", encompasses approximately 6.707 gross acres and contains a 203,929 gross square foot three-story and 5 one-story minimal residential healthcare facility with 217 parking spaces. The total number of units between the three-story and one-story is 172. The complex also includes a swimming pool located in the center of the three-story multifamily complex. The project lies within a portion of the Southwest Quarter of Section 8 and a Portion of the Northeast Quarter of Section 17, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian in Maricopa County, Arizona. More specifically, the project is bound by East Frank Lloyd Wright Boulevard to the north, Belmont retirement community, 134 units, to the east, single-family to the south, and North 100th Street to the west. See **Appendix A** for the Vicinity Map.

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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 VCP sewer main located in 100th Street west of the site. There is an existing public sewer main that runs through the private access road to connect the Belmont Village (134 units) to the sewer located in 100th Street. The existing public sewer main in the private road will be relocated around the proposed building. The water/sewer easement that the sewer is located in will be abandoned.

The existing public sewer main will be cut and tie into a new manholes that will allow the system to be relocated around the proposed development. The proposed 8-inch PVC will extend south, looping around the building and reconnecting to the existing 8-inch sewer main along the private access road near 100th Street entrance. A proposed 20’ sewer and sewer/water easement is proposed for the relocation of the public sewer main.

The proposed 8-inch sewer main will have services for the southern buildings and main building. 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 8-inch sewer main extending into the site. This analysis is limited to the use of the proposed development and existing Belmont development.

Per the City of Scottsdale request sewer monitoring was conducted at the manhole located at the intersection of Cactus Road and 100th Street. Based on the monitoring the max flow is 130.93 gallons per minute (gpm) currently. The max capacity of the pipe at maximum depth to diameter ratio (d/D) of 0.65 is 577.30 gpm. See **Appendix F** for the max sewer capacity calculation.

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. See **Appendix** C for the Scottsdale Quarter Section Map.

Table 1: Proposed Sewer Main Demands

Building	Use	DUs	Demand [1] per unit (GPD)	Average Daily Flow (GPD)	Peak Flow [2] (GPD)	Peak Flow (GPM)
Headwaters Minimal Residential Healthcare Facility	Multifamily	172	140	24,080	108,360	75
Belmont Assisted Living	Multifamily	134	140	18,760	84,420	59
Pool Backwash						100
Total For 8" Diameter Pipe						**234**

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 multifamily 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 main has adequate capacity to serve the project, design flows were analyzed with Flow Master using pipe design slopes. Pool backwash shall be connected to the sanitary sewer system through the building service 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: Proposed Sewer Main Capacity

	Peak Flow (GPM)	Manning Roughness (n)	Slope (ft/ft)	d/D	Velocity (ft/s)
8" Diameter Pipe	234	0.010	0.0052	0.475	3.18

The development will add a peak flow of 234 gpm to the existing sewer. The monitoring and the proposed peak flow from the development will total 364.93 gpm. The difference between the calculated flow and the monitored flow is 212.37 gpm. Based on this information the sewer provides enough capacity for the proposed development.

4.0 CONCLUSION

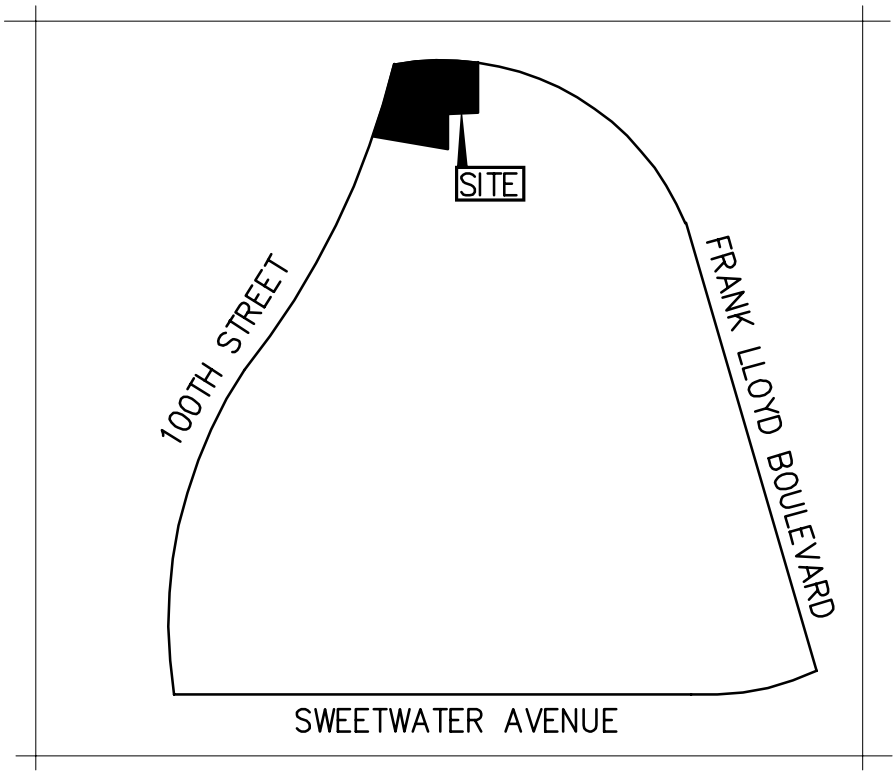
The development proposes to connect one new 8-inch sewer service to the existing 8-inch sewer main in the private access drive via manhole. The proposed sewer main will loop on the south side of the proposed building and reconnect to the existing sewer main near the 100th Street entrance. The proposed and existing sewer infrastructure as outlined by this analysis has adequate capacity for the flows generated by the proposed building located at the southeast corner of 100th Street and Frank Lloyd Wright Boulevard.

5.0 REFERENCES

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

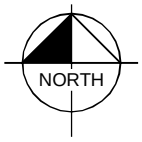
2. Sustainability Engineering Group, *Preliminary Basis of Design for Wastewater*, September 2018.

Appendix A – Vicinity Map



VICINITY MAP

CITY OF SCOTTSDALE
N.T.S.



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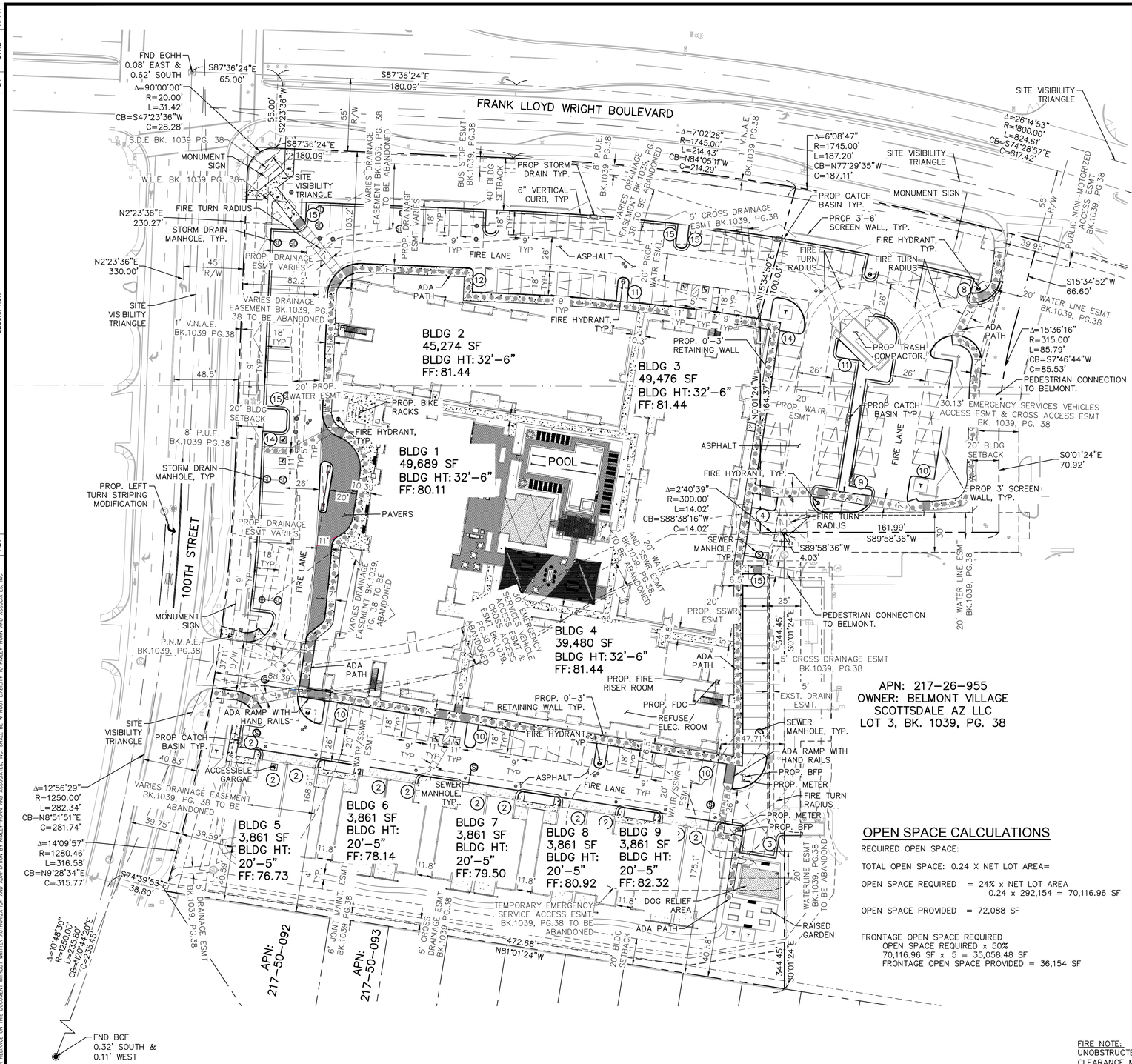
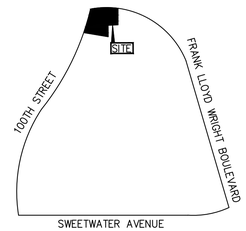
Appendix B – Site Plan

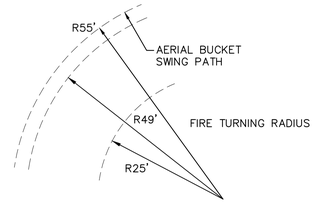




VICINITY MAP
CITY OF SCOTTSDALE
N.T.S.

LEGEND

- CONCRETE HARDSCAPE
- RIGHT OF WAY LINE
- PROPERTY LINE
- BUILDING SETBACK LINE
- PROPOSED SIDEWALK
- PROPOSED CROSSWALK
- (6) PARKING SPACE COUNT



PROJECT INFORMATION

PROPOSED USE:	MINIMAL RESIDENTIAL HEALTHCARE FACILITY
ZONING:	
EXISTING ZONING:	PNC PCD
PROPOSED ZONING:	C-O PCD

BUILDING SETBACKS:	REQUIRED	PROVIDED
MINIMUM SIDE SETBACK:	0'	20'
MINIMUM REAR SETBACK:	20'	20'
MINIMUM FRONT SETBACK:	40'	40'

SITE CALCULATIONS

	GROSS(AC)	NET(AC)
LOT AREA	6.707±	6.707±
	292,145 SF	292,145 SF
BUILDING HEIGHT	32'-6"	
TOTAL MAIN BUILDING AREA	184,624 SF	
TOTAL BUNGALOW AREA	19,305 SF	
BUILDING AREA	203,929	
TOTAL LOT COVERAGE	79,604 SF/ 292,145 = 27.2%	

PARKING REQUIREMENTS

PARKING REQUIRED

1.25 SPACES PER DWELLING UNIT.	171 US *1.25= 214 SPACES
ACCESSIBLE SPACES	7 SPACES

PARKING PROVIDED:

STANDARD	97 SPACES
COVERED STANDARD	100 SPACES
STANDARD GARAGE	19 SPACES
ACCESSIBLE GARAGE	1 SPACES
ACCESSIBLE	3 SPACES
COVERED ACCESSIBLE	3 SPACES
TOTAL	223 SPACES

BICYCLE PARKING REQUIRED:

1 SPACE PER 10 PARKING SPACE.	217 SPACES /10 = 22 SPACES

BICYCLE PARKING PROVIDED

TOTAL	24 SPACES

OPEN SPACE CALCULATIONS

REQUIRED OPEN SPACE:

TOTAL OPEN SPACE: 0.24 X NET LOT AREA=

OPEN SPACE REQUIRED = 24% x NET LOT AREA
0.24 x 292,154 = 70,116.96 SF

OPEN SPACE PROVIDED = 72,088 SF

FRONTAGE OPEN SPACE REQUIRED
OPEN SPACE REQUIRED x 50%
70,116.96 SF x .5 = 35,058.48 SF
FRONTAGE OPEN SPACE PROVIDED = 36,154 SF

APN: 217-26-955
OWNER: BELMONT VILLAGE SCOTTSDALE AZ LLC
LOT 3, BK. 1039, PG. 38

CIVIL ENGINEER

KIMLEY-HORN AND ASSOCIATES, INC.
1001 W SOUTHERN AVE. SUITE 131
MESA, ARIZONA 85210
TEL: (480) 207-2666
FAX: (602) 944-7423
CONTACT: STERLING MARGETTS, PE

FIRE NOTE:
UNOBSTRUCTED VERTICAL CLEARANCE MINIMUM: 13'-6"

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

CALL TWO WORKING DAYS BEFORE YOU DIG
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(OUTSIDE MARICOPA COUNTY)

Kimley»Horn
1001 West Southern Avenue, Suite 131
Mesa, Arizona 85210 (480)207-2666

SEC FRANK LLOYD WRIGHT BOULEVARD & 100TH STREET
SITE PLAN
SCOTTSDALE, ARIZONA

PROJECT No. 291753000
SCALE (H): 1"=20'
SCALE (V): NONE
DRAWN BY: AMF
DESIGN BY: AMF
CHECK BY: STM
DATE: 06/06/2023

DESIGN DEVELOPMENT SUBMITTAL

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SP
4 OF 38 SHEETS

APPR | DATE | BY | DESCRIPTION | REV

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Appendix C – Scottsdale Quarter Section Map

33-52

32-51

32-53

31-52

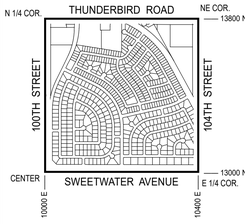
GENERAL NOTES:

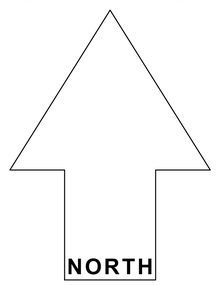
- THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
- THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND.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

LEGEND:

- 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





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

32-52

NE 1/4 SEC. 17 T3N R5E

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251

23-JAN-22

31-51

31-53

30-52

GENERAL NOTES:

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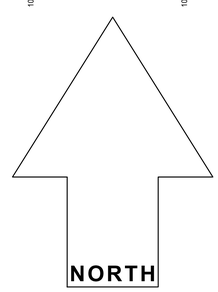
LEGEND:

- Cleanout
- Lift Station (SLS)
- 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



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"

SEWER

QUARTER SECTION MAP

31-52

SE 1/4 SEC. 17 T3N R5E

16-JUL-23

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

Appendix D – Sewer Calculations

Sewer Capacity

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

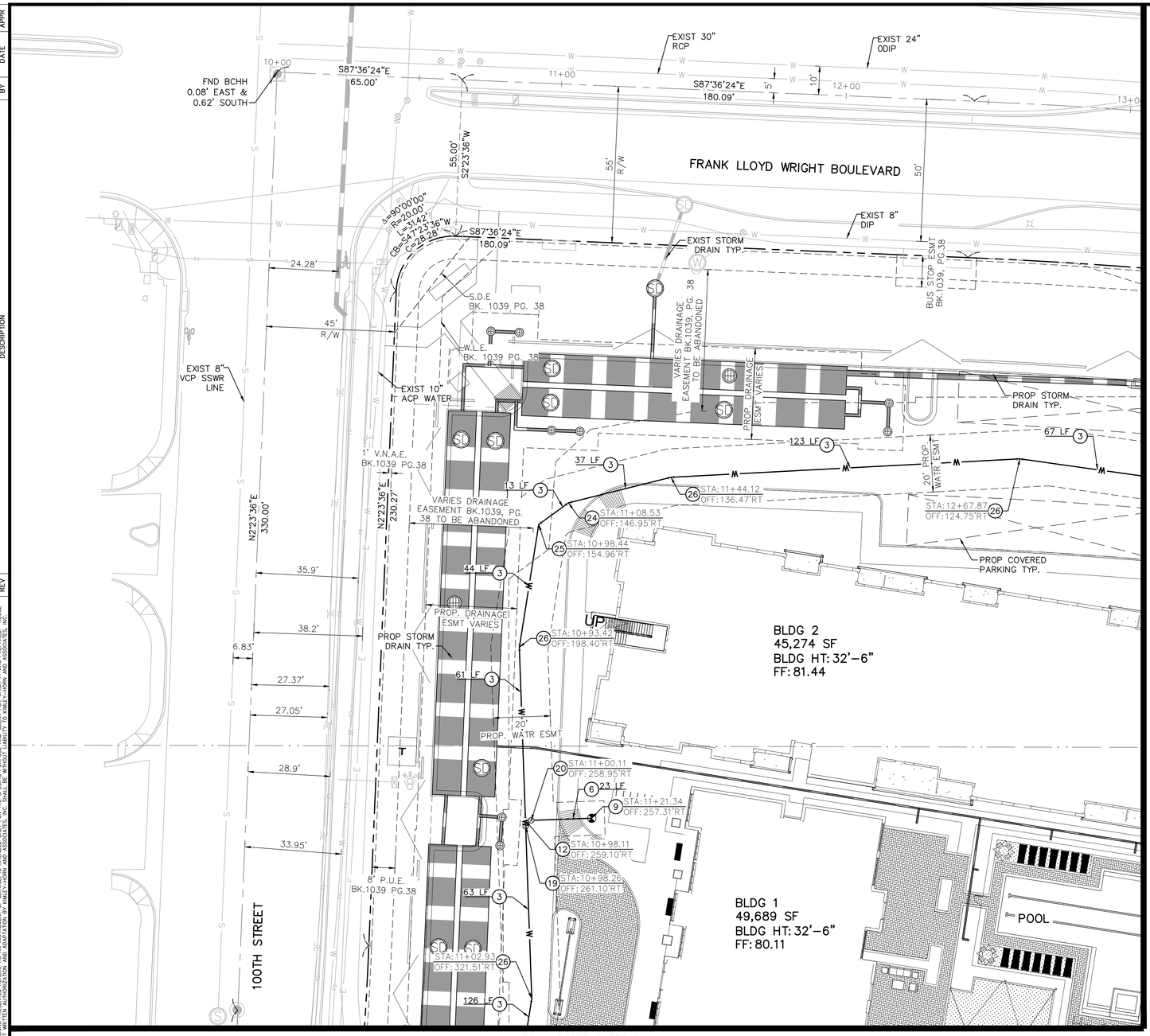
Input Data	
Roughness Coefficient	0.010
Channel Slope	0.520 %
Diameter	8.0 in
Discharge	234.00 gpm

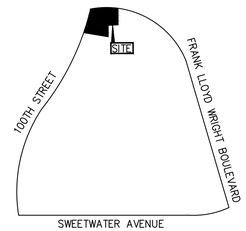
Results	
Normal Depth	3.8 in
Flow Area	0.2 ft²
Wetted Perimeter	1.0 ft
Hydraulic Radius	1.9 in
Top Width	0.67 ft
Critical Depth	4.1 in
Percent Full	47.6 %
Critical Slope	0.418 %
Velocity	3.18 ft/s
Velocity Head	0.16 ft
Specific Energy	0.47 ft
Froude Number	1.129
Maximum Discharge	546.91 gpm
Discharge Full	508.42 gpm
Slope Full	0.110 %
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	47.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.8 in
Critical Depth	4.1 in
Channel Slope	0.520 %
Critical Slope	0.418 %

Appendix E – Utility Plan





VICINITY MAP
CITY OF SCOTTSDALE
N.T.S.

LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT
- EXISTING SANITARY SEWER MAIN
- EXISTING PUBLIC WATER MAIN
- EXISTING ELECTRIC LINE
- PROPOSED WATER MAIN
- PROPOSED SEWER MAIN
- PROPOSED FIRE MAIN
- PROPOSED STORM DRAIN
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING CATCH BASIN
- PROPOSED CLEANOUT
- PROPOSED FDC
- DEMO UTILITY

SEWER CONSTRUCTION NOTES

PUBLIC WATER NOTES

(3) INSTALL 8" DUCTILE IRON CLASS 350 WATERLINE WITH POLYWRAP WITH BEDDING AND BACKFILL PER EPCOR STD DET. 350-1. LENGTH PER PLAN. 3' MIN COVER.

(6) INSTALL 6" DUCTILE IRON WITH POLYWRAP PRESSURE CLASS 350 WATERLINE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN.

(9) INSTALL FIRE HYDRANT ASSEMBLY AND VALVE COMPLETE PER MAG STD DET 360-1. PROVIDE MIN. CLEARANCE PER MAG STD DET 362, INSTALL 6-INCH D.I. FIRE LINE, MORTAR LINED PER MAG SPEC 750 WITH POLYWRAP CORROSION PROTECTION PER MAG SPEC 610.5, BEDDING AND BACKFILL PER MAG SPECS. 4' MINIMUM COVER REQUIRED. LENGTH PER PLAN.

(12) INSTALL 8"X6" TEE WITH RESTRAINED JOINTS PER COS DET DET 2342-2 AND MAG STD DET 303.

(19) INSTALL 8" GATE VALVE PER MAG STD DET 391-1 TYPE C AND COS STD DET 2770.

(20) INSTALL 6" GATE VALVE PER MAG STD DET 391-1 TYPE C AND COS STD DET 2770.

(24) INSTALL 8" 22° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342-2. AND MAG STD DET 303.

(25) INSTALL 8" 45° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342-2. AND MAG STD DET 303.

(26) INSTALL 8" 11° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342-2. AND MAG STD DET 303.

PRIVATE WATER

NOTES:
1. STATION AND OFFSET BASED ON FRANK LLYOD WRIGHT BOULEVARD CENTERLINE.
2. ALL VALVES SHALL BE FLANGED TO TEES, BENDS, AND CROSSES.
3. ADD 1400 TO ALL ELEVATIONS.
4. ALL 8" PIPE SHALL HAVE 3' MINIMUM COVER.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

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(OUTSIDE MARICOPA COUNTY)

APPR	DATE	BY	DESCRIPTION	REV

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Mesa, Arizona 85210 (480)207-2666

SEC FRANK LLOYD WRIGHT BOULEVARD & 100TH STREET

UTILITY PLAN

SCOTTSDALE, ARIZONA

PROJECT No.
291753000

SCALE (H):1"=20'
SCALE (V):NONE
DRAWN BY: AMF
DESIGN BY: AMF
CHECK BY: STM
DATE: 06/06/2023

DEVELOPMENT DESIGN SUBMITTAL

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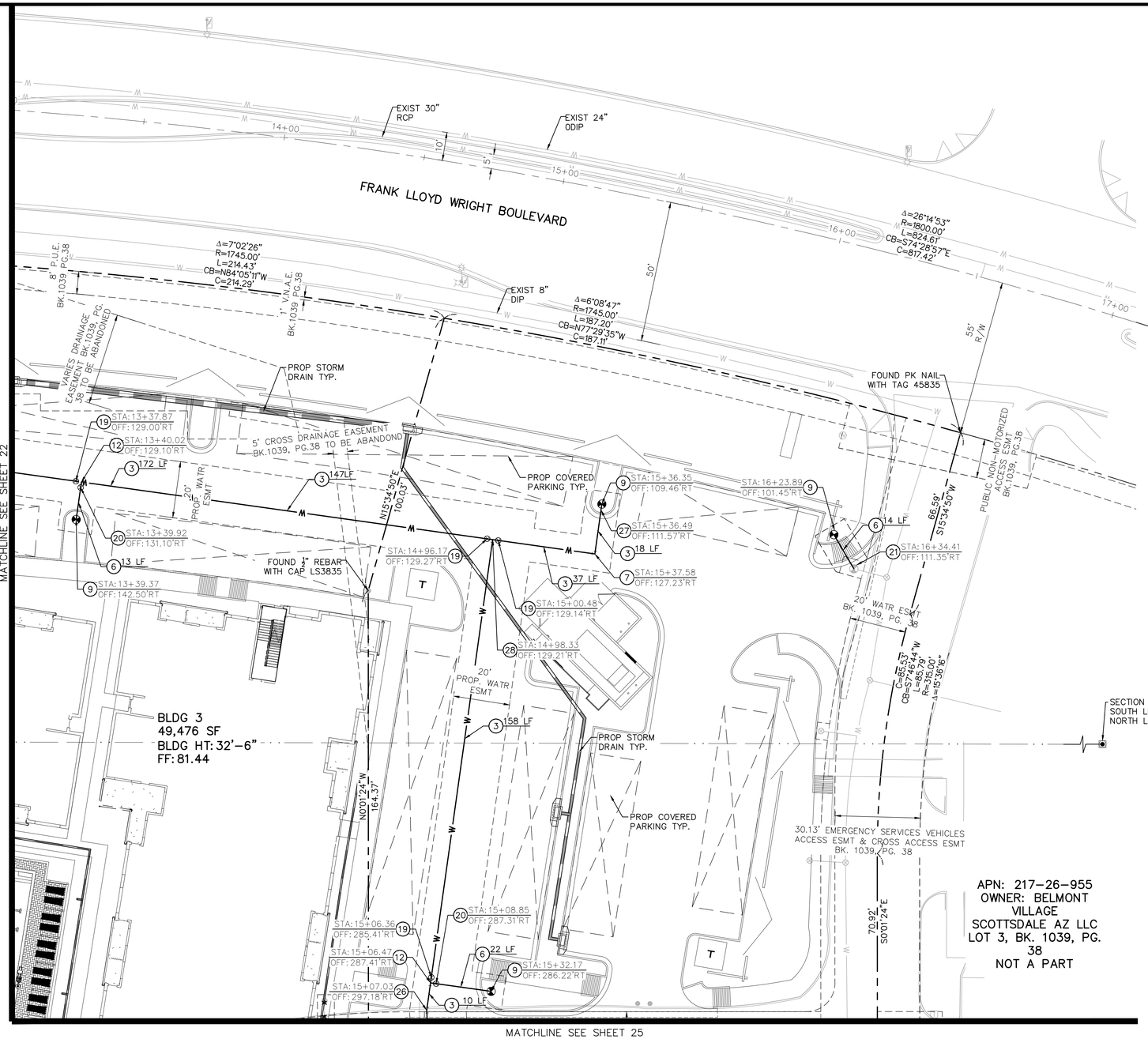
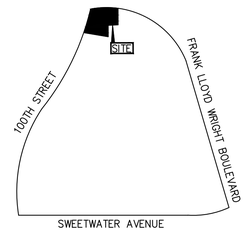
22 OF 38 SHEETS





VICINITY MAP
CITY OF SCOTTSDALE
N.T.S.

LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT
- EXISTING SANITARY SEWER MAIN
- EXISTING PUBLIC WATER MAIN
- EXISTING ELECTRIC LINE
- PROPOSED WATER MAIN
- PROPOSED SEWER MAIN
- PROPOSED FIRE MAIN
- PROPOSED STORM DRAIN
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING CATCH BASIN
- PROPOSED CLEANOUT
- PROPOSED FDC
- DEMO UTILITY

PUBLIC WATER NOTES

(3) INSTALL 8" DUCTILE IRON CLASS 350 WATERLINE WITH POLYWRAP WITH BEDDING AND BACKFILL PER EPCOR STD DET. 350–1. LENGTH PER PLAN. 3' MIN COVER.

(6) INSTALL 6" DUCTILE IRON WITH POLYWRAP PRESSURE CLASS 350 WATERLINE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN.

(7) INSTALL 8" DUCTILE IRON 90° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342–2 AND MAG STD DET 303.

(9) INSTALL FIRE HYDRANT ASSEMBLY AND VALVE COMPLETE PER MAG STD DET 360–1. PROVIDE MIN. CLEARANCE PER MAG STD DET 362. INSTALL 6–INCH D.I. FIRE LINE, MORTAR LINED PER MAG SPEC 750 WITH POLYWRAP CORROSION PROTECTION PER MAG SPEC 610.5, BEDDING AND BACKFILL PER MAG SPECS. 4' MINIMUM COVER REQUIRED. LENGTH PER PLAN.

(12) INSTALL 8"X6" TEE WITH RESTRAINED JOINTS PER COS DET DET 2342–2 AND MAG STD DET 303.

(19) INSTALL 8" GATE VALVE PER MAG STD DET 391–1 TYPE C AND COS STD DET 2770.

(20) INSTALL 6" GATE VALVE PER MAG STD DET 391–1 TYPE C AND COS STD DET 2770.

(21) REMOVE EXISTING FIRE HYDRANT AND INSTALL 6" DUCTILE IRON WITH PLYWRAP PRESIRE CLASS 150 FIRELINE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN.

(26) INSTALL 8" 11° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342–2. AND MAG STD DET 303.

(27) INSTALL 8"X6" REDUCER.

(28) INSTALL 8"X8" TEE WITH RESTRAINED JOINTS PER COS STD DET 2342–2 AND MAG STD DET 303.

NOTES:
1. STATION AND OFFSET BASED ON FRANK LLYOD WRIGHT BOULEVARD CENTERLINE.
2. ALL VALVES SHALL BE FLANGED TO TEES, BENDS, AND CROSSES.
3. ADD 1400 TO ALL ELEVATIONS.
4. ALL 8" PIPE SHALL HAVE 3' MINIMUM COVER.

PRIVATE WATER

SEWER CONSTRUCTION NOTES

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

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HEADWATERS GROUP
WATER & WASTEWATER

SEC FRANK LLOYD WRIGHT BOULEVARD & 100TH STREET
UTILITY PLAN
SCOTTSDALE, ARIZONA

PROJECT No. 291753000
SCALE (H): 1"=20'
SCALE (V): NONE
DRAWN BY: AMF
DESIGN BY: AMF
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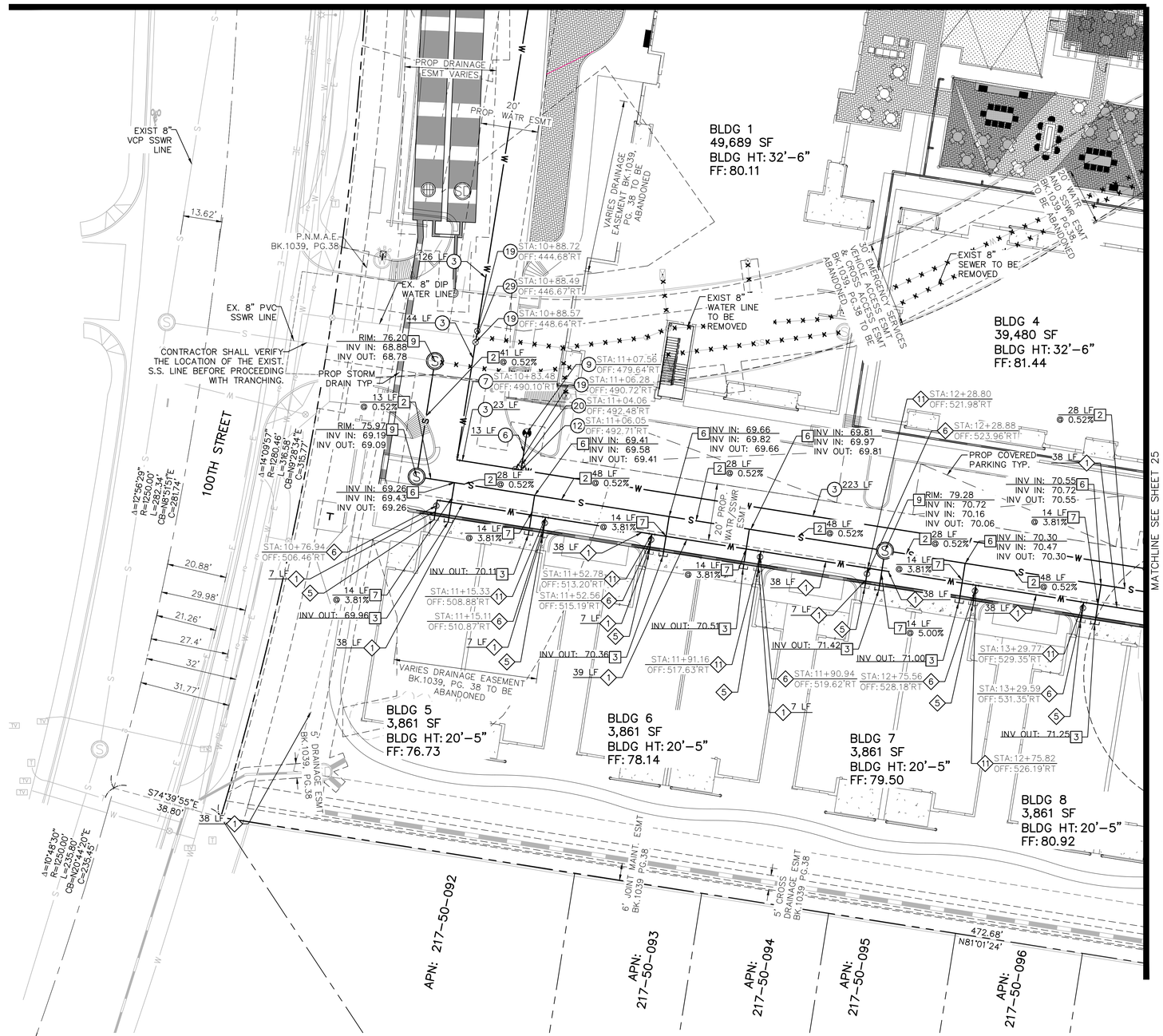
DATE: 06/06/2023

DEVELOPMENT DESIGN SUBMITTAL

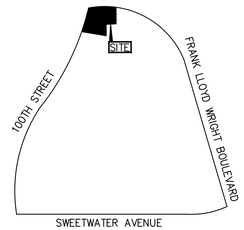
UT.dwg
UT–2
23 OF 38 SHEETS

REV	DESCRIPTION	BY	DATE	APPR



LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT
- S — EXISTING SANITARY SEWER MAIN
- W — EXISTING PUBLIC WATER MAIN
- E — EXISTING ELECTRIC LINE
- W — PROPOSED WATER MAIN
- S — PROPOSED SEWER MAIN
- F — PROPOSED FIRE MAIN
- PROPOSED STORM DRAIN
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING CATCH BASIN
- CO — PROPOSED CLEANOUT
- PROPOSED FDC
- DEMO UTILITY



VICINITY MAP

CITY OF SCOTTSDALE
N.T.S.

PUBLIC WATER NOTES

(3) INSTALL 8" DUCTILE IRON CLASS 350 WATERLINE WITH POLYWRAP WITH BEDDING AND BACKFILL PER EPCOR STD DET. 350-1. LENGTH PER PLAN. 3' MIN COVER.

(6) INSTALL 6" DUCTILE IRON WITH POLYWRAP PRESSURE CLASS 350 WATERLINE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN.

(7) INSTALL 8" DUCTILE IRON 90° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342-2 AND MAG STD DET 303.

(9) INSTALL FIRE HYDRANT ASSEMBLY AND VALVE COMPLETE PER MAG STD DET 360-1. PROVIDE MIN. CLEARANCE PER MAG STD DET 362, INSTALL 6-INCH D.I. FIRE LINE, MORTAR LINED PER MAG SPEC 750 WITH POLYWRAP CORROSION PROTECTION PER MAG SPEC 610.5, BEDDING AND BACKFILL PER MAG SPECS. 4' MINIMUM COVER REQUIRED. LENGTH PER PLAN.

(12) INSTALL 8"X6" TEE WITH RESTRAINED JOINTS PER COS DET DET 2342-2 AND MAG STD DET 303.

(19) INSTALL 8" GATE VALVE PER MAG STD DET 391-1 TYPE C AND COS STD DET 2770.

(20) INSTALL 6" GATE VALVE PER MAG STD DET 391-1 TYPE C AND COS STD DET 2770.

(29) CUT AND INSTALL 8"X8" TEE WITH RESTRAINED JOINTSPER COS STD DET 2342-2 AND MAG STD DET 303.

SEWER CONSTRUCTION NOTES

[2] INSTALL 8" P.V.C. SDR 35 SANITARY SEWER SERVICE LINE, BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH AND SLOPE PER PLAN.

[3] CONNECT TO BUILDING 2-WAY CLEANOUT, INVERT PER PLAN. REF MEP PLANS FOR CONTINUATION.

[6] INSTALL INLINE 4"X8" SEWER WYE.

[7] INSTALL 6" P.V.C SDR 35 SANITARY SEWER LATERAL, BEDDING AND BACKFILL PER MAG SPEC 601, LENGTH AND SLOPE PER PLAN.

[9] INSTALL 60" SANITARY SEWER MANHOLE PER MAG STD DET 420-1. MANHOLE SHALL HAVE 30" FRAME AND COVER PER COS STD DET 2421. RIM AND INVERT PER PLAN.

PRIVATE WATER

<1> INSTALL 2" COPPER TYPE 'K' DOMESTIC WATER SERVICE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN. 3' MIN COVER.

<5> DOMESTIC WATER BUILDING CONNECTION, REF MEP PLANS FOR CONTINUATION.

<6> INSTALL 2" GATE VALVE PER COS STD DET 2770 AND PER MAG STD DET 391-1, TYP C

<11> INSTALL 2"X2" COPPER TEE.

NOTES:
1. STATION AND OFFSET BASED ON FRANK LLYOD WRIGHT BOULEVARD CENTERLINE.
2. ALL VALVES SHALL BE FLANGED TO TEES, BENDS, AND CROSSES.
3. ADD 1400 TO ALL ELEVATIONS.
4. ALL 8" PIPE SHALL HAVE 3' MINIMUM COVER.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

Kimley»Horn © 2023
1001 West Southern Avenue, Suite 131
Mesa, Arizona 85210 (480)207-2666

HEADWATERS GROUP
WATER RIGHTS CONSULTANTS

SEC FRANK LLOYD WRIGHT BOULEVARD & 100TH STREET
SCOTTSDALE, ARIZONA

UTILITY PLAN

PROJECT No. 291753000
SCALE (H): 1"=20'
SCALE (V): NONE
DRAWN BY: AMF
DESIGN BY: AMF
CHECK BY: STM
DATE: 06/06/2023

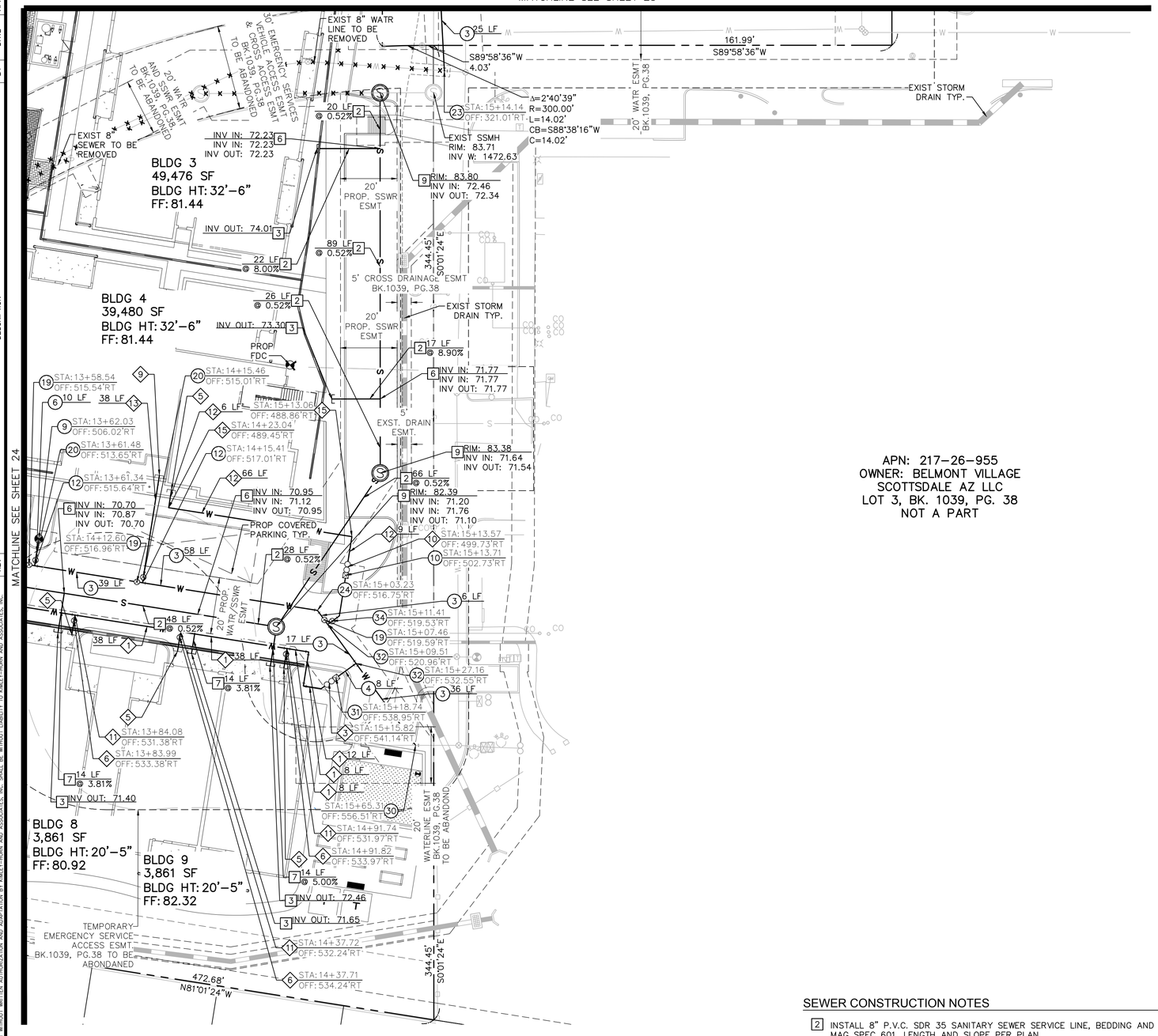
DEVELOPMENT DESIGN SUBMITTAL

UT.dwg

UT-3

24 OF 38 SHEETS

APPR	DATE	BY	DESCRIPTION	REV



APN: 217-26-955
OWNER: BELMONT VILLAGE SCOTTSDALE AZ LLC
LOT 3, BK. 1039, PG. 38
NOT A PART

NOTES:
1. STATION AND OFFSET BASED ON FRANK LLYOD WRIGHT BOULEVARD CENTERLINE.
2. ALL VALVES SHALL BE FLANGED TO TEES, BENDS, AND CROSSES.
3. ADD 1400 TO ALL ELEVATIONS.
4. ALL 8" PIPE SHALL HAVE 3' MINIMUM COVER.

LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT
- S — EXISTING SANITARY SEWER MAIN
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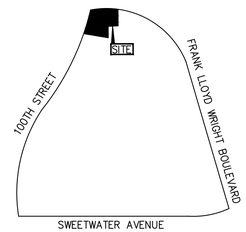


VICINITY MAP
CITY OF SCOTTSDALE
N.T.S.

PUBLIC WATER NOTES

(3) INSTALL 8" DUCTILE IRON CLASS 350 WATERLINE WITH POLYWRAP WITH BEDDING AND BACKFILL PER EPCOR STD DET. 350-1. LENGTH PER PLAN. 3' MIN COVER.

(4) INSTALL 4" D.I. WATER SERVICE LINE, MIN. CLASS 350. 3' MINIMUM COVER, LENGTH PER PLAN.

(6) INSTALL 6" DUCTILE IRON WITH POLYWRAP PRESSURE CLASS 350 WATERLINE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN.

(9) INSTALL FIRE HYDRANT ASSEMBLY AND VALVE COMPLETE PER MAG STD DET 360-1. PROVIDE MIN. CLEARANCE PER MAG STD DET 362, INSTALL 6-INCH D.I. FIRE LINE, MORTAR LINED PER MAG SPEC 750 WITH POLYWRAP CORROSION PROTECTION PER MAG SPEC 610.5, BEDDING AND BACKFILL PER MAG SPECS. 4' MINIMUM COVER REQUIRED. LENGTH PER PLAN.

(10) INSTALL 3" WATER METER BOX PER MAG STD DET 345-1 AND COS STD DET 2345.

(12) INSTALL 8"X6" TEE WITH RESTRAINED JOINTS PER COS DET DET 2342-2 AND MAG STD DET 303.

(19) INSTALL 8" GATE VALVE PER MAG STD DET 391-1 TYPE C AND COS STD DET 2770.

(20) INSTALL 6" GATE VALVE PER MAG STD DET 391-1 TYPE C AND COS STD DET 2770.

(23) CUT AND CONNECT TO EXISTING WATER LINE AT 8" 90° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342-2 AND MAG STD DET 303.

(24) INSTALL 8" 22° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342-2. AND MAG STD DET 303.

(30) CUT AND INSTALL 8" 45° BEND WITH RESTRAINED JOINTS PER COS STD DET 2342-2. AND MAG STD DET 303.

(31) INSTALL 2" WATER METER BOX PER MAG STD DET 345-1 AND COS STD DET 2345.

(32) INSTALL 8"X3" TEE WITH RESTRAINED JOINTS PER COS DET DET 2342-2 AND MAG STD DET 303.

(34) INSTALL 3" GATE VALVE PER MAG STD DET 391-1 TYPE C AND COS STD DET 2770.

PRIVATE WATER

(1) INSTALL 2" COPPER TYPE 'K' DOMESTIC WATER SERVICE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN. 3' MIN COVER.

(3) INSTALL 2" BACKFLOW PREVENTOR PER COS STD DET 2353.

(5) DOMESTIC WATER BUILDING CONNECTION, REF MEP PLANS FOR CONTINUATION.

(6) INSTALL 2" GATE VALVE PER COS STD DET 2770 AND PER MAG STD DET 391-1, TYP C

(9) FIRE LINE BUILDING CONNECTION TO WITHIN 5' OF BUILDING. REF MEP PLANS FOR CONTINUATION.

(10) INSTALL 3" BACKFLOW PREVENTOR PER COS STD DET 2353.

(11) INSTALL 2"X2" COPPER TEE.

(12) INSTALL 4" D.I. WATER SERVICE LINE, MIN. CLASS 350. 3' MINIMUM COVER, LENGTH PER PLAN.

(13) INSTALL 6" DUCTILE IRON WITH POLYWRAP PRESSURE CLASS 150 FIRELINE WITH BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH PER PLAN

(15) INSTALL 4" 90° BEND WITH THRUST BLOCKS PER MAG STD DET 391 AND NFPA 24.

SEWER CONSTRUCTION NOTES

[2] INSTALL 8" P.V.C. SDR 35 SANITARY SEWER SERVICE LINE, BEDDING AND BACKFILL PER MAG SPEC 601. LENGTH AND SLOPE PER PLAN.

[3] CONNECT TO BUILDING 2-WAY CLEANOUT, INVERT PER PLAN. REF MEP PLANS FOR CONTINUATION.

[6] INSTALL INLINE 4"X8" SEWER WYE.

[7] INSTALL 6" P.V.C SDR 35 SANITARY SEWER LATERAL, BEDDING AND BACKFILL PER MAG SPEC 601, LENGTH AND SLOPE PER PLAN.

[9] INSTALL 60" SANITARY SEWER MANHOLE PER MAG STD DET 420-1. MANHOLE SHALL HAVE 30" FRAME AND COVER PER COS STD DET 2421. RIM AND INVERT PER PLAN.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

Kimley»Horn © 2023
1001 West Southern Avenue, Suite 131
Mesa, Arizona 85210 (480)207-2666

HEADWATERS GROUP
WATER & WASTEWATER

SEC FRANK LLOYD WRIGHT BOULEVARD & 100TH STREET

UTILITY PLAN

SCOTTSDALE, ARIZONA

PROJECT No.
291753000

SCALE (H): 1"=20'
SCALE (V): NONE
DRAWN BY: AMF
DESIGN BY: AMF
CHECK BY: STM
DATE: 06/06/2023

DEVELOPMENT DESIGN SUBMITTAL

UT.dwg

UT-4

25 OF 38 SHEETS

APPR | DATE | BY | DESCRIPTION | REV

K:\LEAN_Civil\Handwerkers Scottsdale\CAD\UT.dwg, Layout:UT-4 Jun 06, 2023 - 8:13pm ally.fedor
XREFS: +TB xBM_AUT xSD_xVP_xUT-PUBLIC

Appendix F – Max Sewer Capacity Calculation

SL1526 RDH Flow Study for Kimley Horn

Sterling Margetts
Kimley Horn
7740 N. 16th St., Suite 300, Phoenix, AZ 85020

SL1526 RDH Flow Study, 1 site total in Scottsdale, AZ from Friday 06-23-23 to Monday 07-03-23.

Equipment for Site: Hach 901 Logger with Flo-Dar Sensor (Area Velocity)**.**
The equipment was installed on Friday, 06/23/23 with confined space entry, pipe size confirmed, sensor calibrated, and level depth confirmed to the flow level.

Duration of monitoring: 9-days including 2 weekends
Monitor: Flow (gpm), Level (in), and Velocity (fps)
Data logging: 5-minute intervals (No averaged intervals)

Calibration Performed: Calibration method using 4.00-inch target.
Target Measure: 4.00 in Meter Read: 4.01 in 6/23/2023 07:46 am

Meter Validation: PASSED

Location #1 located on N. 100th St. and E. Cactus Rd.
72" Diameter, Rim to Invert: 115.00 inches
8" PVC pipe, flowing South
No Lateral(s)
The pipe condition is intact and reasonably clean.
Scum line of 2 inches
Flo-Dar installed pointing upstream in the 8" pipe channel.

Flow Data is valid having no missing, erroneous, or anomalies with data.

Attached is a MS Excel summary showing level, velocity, and flow logged at 5-minute intervals during the monitoring period.

RDH Environmental Services
Jeff Schulte
Operations Manager
servicemanager@rdh-env.com

SL1526 RDH Flow Study for Kimley Horn

Pictures:

RDH ENVIRONMENTAL SERVICES, L.L.C.
3802 E. University Dr., Suite #4 ● Phoenix, AZ 85034 ● (602) 381-1960
Licenses: 122278 A

SL1526 RDH Flow Study for Kimley Horn

Period Summaries:

KH COS MH1 Period Summary: Flow				
Measures	**Value**	**Unit**	**Date**	**Time**
Max.	130.93	gpm	Sunday, July 2, 2023	10:00 AM
Min.	0.00	gpm	Friday, June 23, 2023	7:15 PM
Avg.	53.84	gpm		
Total	771,041.23	gal		

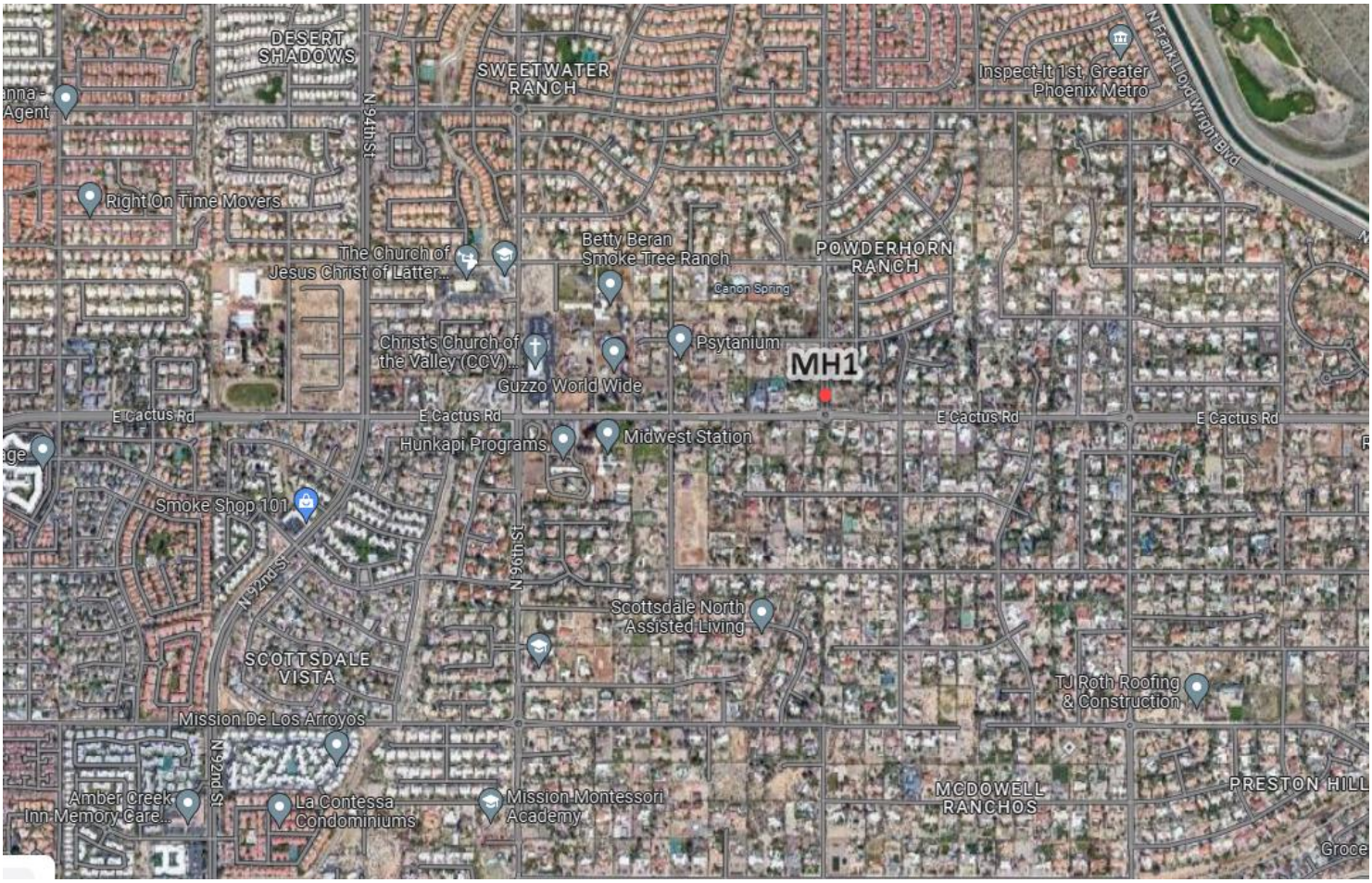
KH COS MH1 Period Summary: Level				
Measures	**Value**	**Unit**	**Date**	**Time**
Max.	2.65	in	Sunday, July 2, 2023	10:00 AM
Min.	0.00	in	Friday, June 23, 2023	7:15 PM
Avg.	1.31	in		

KH COS MH1 Period Summary: Velocity				
Measures	**Value**	**Unit**	**Date**	**Time**
Max.	3.71	fps	Saturday, June 24, 2023	9:00 AM
Min.	0.00	fps	Friday, June 23, 2023	7:15 PM
Avg.	2.72	fps		

*Data begins at 8:30 am on June 23rd and ends at 7:10 am on July 3rd.

SL1526 RDH Flow Study for Kimley Horn

Site Map:



RDH ENVIRONMENTAL SERVICES, L.L.C.
3802 E. University Dr., Suite #4 ● Phoenix, AZ 85034 ● (602) 381-1960
Licenses: 122278 A

CONFINED SPACE ENTRY PERMIT

ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

LOCATION/DESCRIPTION OF CONFINED SPACE: K.H. Cactus Rd.

DATE: 6-23-23

TIME: 7:15

EXPIRATION: 6-23-23

PURPOSE OF ENTRY: Flow Study Install

EXPECTED HAZARDOUS: Gases

COMMUNICATIONS: Hand & Verbal

ENTRY SUPERVISOR: Nick Albertson

SPECIAL REQUIREMENTS BEFORE ENTRY:	YES	NO		YES	NO
Lockout De-energize - Test and Verify		N	Escape Harness Required	Y	
Lines Broken - Capped or Blanked		N	Tripod Emergency Escape Unit		
Purge - Flush and Vent		N	Lifelines		N
Ventilation		N	Fire Extinguishers		N
Secure Area (Post and Flag)	Y		Lighting (Explosion proof)	N	
Breathing Apparatus		N	Protective Clothing	N	
Resucitator - Inhalator		N	Respirator		Y

TEST INTERVAL: 15 Min

TEST(S) TO BE TAKEN / ACCEPTABLE ENTRY CONDITIONS
DO NOT ENTER IF PERMISSIBLE ENTRY LEVELS ARE EXCEEDED

	Permissible Entry Level			DATE											
				TESTER											
				TIME											
				AM/PM	M	M	M	M	M	M	M	M	M	M	M
% of Oxygen	19.5% to 23.5%				20.9	20.9	20.9	20.9							
^ of L.F.L.* (Gas/Vapor/Mist)	Less than 10%				0	0	0	0							
Carbon Monoxide	35 ppm (8 hr.)				0	0	0	0							
Aromatic Hydrocarbon	1 ppm (8 hr.)				0	0	0	0							
Hydrogen Sulfide	10 ppm (8 hr.)				0	0	0	0							
Sulfur Dioxide	2 ppm (8 hr.)				0	0	0	0							
Ammonia	25 ppm (8 hr.)				0	0	0	0							

NAME OF GAS TERSTER(S)

NOTE: Continuous/periodic tests shall be established before beginning the job.
Any questions pertaining to test requirements should be directed to

TESTING INSTRUMENTS USED	NAME	TYPE	IDENTIFICATION NUMBER
Honeywell	BW Tech	GasAlertMax XT II	XT-XWHM-Y-NA MA215-026608

AUTHORIZED ENTRANTS
Zac Schulte

AUTHORIZED ATTENDANTS
Jordan Ostrowski
Nick Albertson

PERMIT AUTHORIZATION

I certify that all actions and conditions necessary for safe entry have been performed

Nick Albertson — NAME (Print)

Signature

6-23-23 — DATE

8:20 — TIME

IN CASE OF AN EMERGENCY CALL 911

CONFINED SPACE ENTRY PERMIT

ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

LOCATION/DESCRIPTION OF CONFINED SPACE: K. H. Cactus Rd.
PURPOSE OF ENTRY: Flow Study Removal
EXPECTED HAZARDOUS: Gases
COMMUNICATIONS: Hand & Verbal
ENTRY SUPERVISOR: Nick Albertson

DATE: 7-3-23
TIME: 8:25
EXPIRATION: 7-3-23

SPECIAL REQUIREMENTS BEFORE ENTRY:	YES	NO
Lockout De-energize - Test and Verify		Y
Lines Broken - Capped or Blanked		Y
Purge - Flush and Vent		Y
Ventilation		Y
Secure Area (Post and Flag)	Y	
Breathing Apparatus		Y
Resucitator - Inhalator		Y

	YES	NO
Escape Harness Required	Y	
Tripod Emergency Escape Unit	Y	
Lifelines		Y
Fire Extinguishers		Y
Lighting (Explosion proof)	Y	
Protective Clothing	Y	
Respirator		X

TEST INTERVAL: 15 Min

TEST(S) TO BE TAKEN / ACCEPTABLE ENTRY CONDITIONS
DO NOT ENTER IF PERMISSIBLE ENTRY LEVELS ARE EXCEEDED

	Permissible Entry Level												
DATE				7-3	7-3								
TESTER				NA	NA								
TIME				8:30	8:30								
AM/PM				M	M	M	M	M	M	M	M	M	M
% of Oxygen	19.5% to 23.5%			20.7	20.9								
^ of L.F.L.* (Gas/Vapor/Mist)	Less than 10%			0	0								
Carbon Monoxide	35 ppm (8 hr.)			0	0								
Aromatic Hydrocarbon	1 ppm (8 hr.)			0	0								
Hydrogen Sulfide	10 ppm (8 hr.)			0	0								
Sulfur Dioxide	2 ppm (8 hr.)			0	0								
Ammonia	25 ppm (8 hr.)			0	0								

NAME OF GAS TERSTER(S)

NOTE: Continuous/periodic tests shall be established before beginning the job.
Any questions pertaining to test requirements should be directed to

TESTING INSTRUMENTS USED	NAME	TYPE	IDENTIFICATION NUMBER
Honeywell	BW Tech	GasAlertMax XT II	XT-XWHM-Y-NA MA215-026608

AUTHORIZED ENTRANTS
Zac Schulte

AUTHORIZED ATTENDANTS
Jordan Astmborski
Nick Albertson

PERMIT AUTHORIZATION

I certify that all actions and conditions necessary for safe entry have been performed

Nick Albertson — NAME (Print)
Nick Albertson — Signature
7-3-23 — DATE
8:45 — TIME

IN CASE OF AN EMERGENCY CALL 911

100th Street Sewer

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.010
Channel Slope	1.172 %
Normal Depth	5.2 in
Diameter	8.0 in

Results	
Discharge	577.30 gpm
Flow Area	0.2 ft²
Wetted Perimeter	1.3 ft
Hydraulic Radius	2.3 in
Top Width	0.64 ft
Critical Depth	6.4 in
Percent Full	65.0 %
Critical Slope	0.695 %
Velocity	5.36 ft/s
Velocity Head	0.45 ft
Specific Energy	0.88 ft
Froude Number	1.536
Maximum Discharge	820.99 gpm
Discharge Full	763.21 gpm
Slope Full	0.670 %
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	65.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.2 in
Critical Depth	6.4 in
Channel Slope	1.172 %
Critical Slope	0.695 %