WATER

BASIS OF DESIGN REPORT

Museum Square Building 4
Scottsdale, Arizona

Prepared for:

ARC Scottsdale Holdings, LLLP
3225 N. Central Avenue, Suite 100
Phoenix, AZ 85012

Note: Phasing plan and utility plan comments within updated on 11/4/2021 by LDillon.

Prepared by:

Kimley»Horn

291430000
April 2021

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.

11/4/2021

BY ldillon **DATE** 11/4/2021

Address comments below and herein on submitted plans:
1.) Stipulation: Portion of service line between meter and BFP must be backfilled with CLSM since the BFP is not directly adjacent to the meter. This is to prevent connections without backflow prevention.
2.) Stipulation: Marshall Way remove existing 6" water main connection, including any tees or fittings on the existing main and replace segment of Marshall Way main with DIP spool piece.
3.) Stipulation: Demolish/remove entirety of the buried unused 6" water main including offsite portion.
4.) Stipulation: All proposed improvements to coordinate with attached utility phasing plan and proposed street paving.
5.) Address markups on utility plans herein.

Registered Professional Engineer (Civil)
CERTIFICATE NO.
52738
TRAVER
JONES
DATE SIGNED 04/28/21
ARIZONA U.S.A.
Expires: 09/30/23

11-DR-2020
5/21/2021

Museum Square Building 4

WATER BASIS OF DESIGN REPORT

APRIL 2021

Prepared By:

Kimley»Horn

11-DR-2020
5/21/2021

Contents

Appendices

1.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this Water Basis of Design Report for the proposed apartment development at the northeast corner of E. 2nd Street and N. Marshall Way in Scottsdale, Arizona. This report will demonstrate that the proposed project conforms to the City of Scottsdale design requirements.

Museum Square Building 4, the "project", encompasses approximately 1.24 net acres and contains a 93,438 gross square foot six-story apartment with a 72,063 gross square foot two-level underground parking garage. The project includes 92 units with a pool amenity area. The project lies within a portion of the Northeast Quarter of Section 27, Township 2 North, Range 4 East of the Gila and Salt River Baseline and Meridian in Maricopa County, Arizona. More specifically, the project is bound by E. 2nd Street to the south, N. Marshall Way to the west, E. 1st Street to the north, and existing parking lots to the east. See **Appendix A** for the Vicinity Map.

2.0 DOMESTIC WATER ANALYSIS

2.1 INTENT AND SCOPE

The intent of this section is to evaluate the potable water infrastructure for the proposed development. As a result of this analysis, it will be determined if the potable water infrastructure is capable of satisfying the projected water demands for the proposed development in accordance with the City of Scottsdale Design Standards & Policies Manual (**Reference 1**) and the 2015 International Fire Code (**Reference 2**) for fire prevention.

2.2 GENERAL THEORY

The water system modeling program Water CAD, developed by Haestad Methods, is used to model the water system servicing the proposed development. The program uses the fluid mechanic head loss theory known as the Hazen-Williams method. This is the typical method used to evaluate water distribution systems.

2.3 DOMESTIC WATER SUPPLY

There is an existing 6-inch ACP and 12-inch DIP water main located in N. Marshall Way west of the site. The existing 6-inch ACP water main and 12-inch DIP water main both connect to an existing 8-inch ACP water main in E. 2nd Street south of the site.

An existing 6-inch ACP connects to the water main in Marshall Way and bisects the site, running east/west across the middle of the parcel. Upon further investigation, this 6-inch water main is not in use and does not provide domestic water service or fireline service to sites east of the subject site. The building to the east of the site is a CenturyLink data center facility, and coordination with CenturyLink building management has confirmed that domestic water service and fireline service to the building are both provided from the water main in 1st Street. The existing 6-inch ACP water service line will be removed to the existing 6-inch ACP water main in N. Marshall Way. The existing tee will be replaced with a spool of pipe to repair the pipe.

A new 8-inch DIP private fire service will connect to the existing 8-inch ACP water main in E. 2nd Street with an 8-inch by 8-inch tee. One 3-inch domestic water service will connect to the proposed 8-inch ACP pipe via an 8-inch by 3-inch tapping sleeve. Refer to **Appendix B** for the Preliminary Utility Plan.

Residual and static pressures were obtained from a flow test performed on two fire hydrants (one flow and one pressure) in East 2nd Street, by EJ Flow Tests on May 5th, 2019. The tested fire hydrants were selected due to the proximity to the proposed building. See **Appendix D** for the Fire Flow Test results.

2.4 INTERNATIONAL FIRE CODE, 2015

According to the City of Scottsdale Fire Department, the 2015 International Fire Code (IFC) with City of Scottsdale Amendments is currently the governing code with respect to fire protection requirements. The IFC evaluates the building construction type, occupancy descriptions, and square footage to set minimum fire flow requirements with regards to a particular development.

The proposed building and garage are Construction Type I-B. Per Section B104.3 of **Reference 2,** fire flow floor area calculations for building types I-A and I-B are based on the three largest successive floors. Per Table B105.1(2) of **Reference 2**, the required fire flow is 2,500 gallons per minute. A reduction in fire-flow of 25% percent is allowed when the building is equipped with an approved fire sprinkler system. The apartment building and parking garage will be equipped with an approved fire sprinkler system. The minimum fire flow requirements per the IFC 2015 and COS DS&PM 6-1.501 for the proposed building are shown in Table 1. Table 1 also shows the required building fire flow based upon a maximum fire flow reduction of 75% allowed by the IFC 2015. The reduced fire flow shall not be less than 1,500 gpm. See **Appendix C** for IFC 2015 Appendix B.

Table 1 Required Building Fire Flows

Building	Building Construction Type	Area of the largest 3 successive floors (sf)	Required Fire Flow per IFC 2015 (gpm)	Reduction	Required Fire Flow per IFC with Reduction (gpm)
Apartment & Garage	I-B	52,920	2,500	75%	1,500

2.5 WATER DEMANDS

According to the guidelines provided in Figure 6-1.2 of **Reference 1**, the proposed development will add the following demands to the existing water system for Average Day Demand (ADD), Maximum Day Demand (MDD), and Peak Hour Demand (PHD):

Table 2: Domestic Water Demands

Building	Building Area (SF)	# DUs	Total Demand[1] (GPM/DU)	ADD (GPM)	MDD[2] (GPM)	PHD[3] (GPM)
Building 1 + Garage	165,450	92	0.27	24.84	49.68	86.94

Notes:
1. For high density condominium land use, average day demand is 185.3 gpd/du or 0.27 gpm/du.
2. Maximum day demand defined as 2 times the average day demand.
3. Peak hour demand defined as 3.5 times the average day demand.

Three water analyses were performed to evaluate the existing adjacent off-site water infrastructure and the proposed on-site water system:

1. Average Day Demand
2. Peak Hour Demand
3. Maximum Day Demand + Fire Flow

The system was analyzed for the worst-case scenario to ensure that the existing and proposed public water infrastructure can maintain a minimum pressure of 50 psi for the Peak Hour demand, and 30 psi for the Maximum Day plus Fire Flow demand. See **Appendix D** for water model layout to identify nodes and pipes.

See **Appendix D** for the Fire Flow Test and Water CAD Analysis and Layout. A summary of the water analysis results for the project is tabulated below:

Table 3 Domestic Water Model Result Summary

Criteria	Peak Hour Demand	Constraint	Peak Hour Pressure at Demand	Node with Minimum Pressure
Minimum Pressure	87 gpm	50 psi	71 psi	BLDG DW
Meets Criteria?	-	-	Yes*	

*The hydraulic water model was analyzed at the ground floor elevation of the proposed high-rise building. Reference plumbing calculations for any internal booster pump systems to provide adequate water pressures to the higher floors of the building.

Table 4 Max Day + Fire Flow Water Model Result Summary

Criteria	Max Day + Fire Flow Demand	Constraint	Max Day + Fire Flow Pressure at Demand	Node with Minimum Pressure
Minimum System Pressure	1,550 gpm	30 psi	64.0 psi	BLDG FIRE
Meets Criteria?	-	-	Yes*	

*The hydraulic water model was analyzed at the ground floor elevation of the proposed high-rise building. Reference plumbing calculations for any internal booster pump systems to provide adequate water pressures to the higher floors of the building.

Table 5 Fire Hydrant Flow Water Model Result Summary

Criteria	Fire Flow Demand	Constraint	Fire Flow Pressure at Demand	Meets Criteria?
Hydrant 1	1,500 gpm	30 psi	62.0 psi	YES
Hydrant 2	1,500 gpm	30 psi	64.0 psi	YES

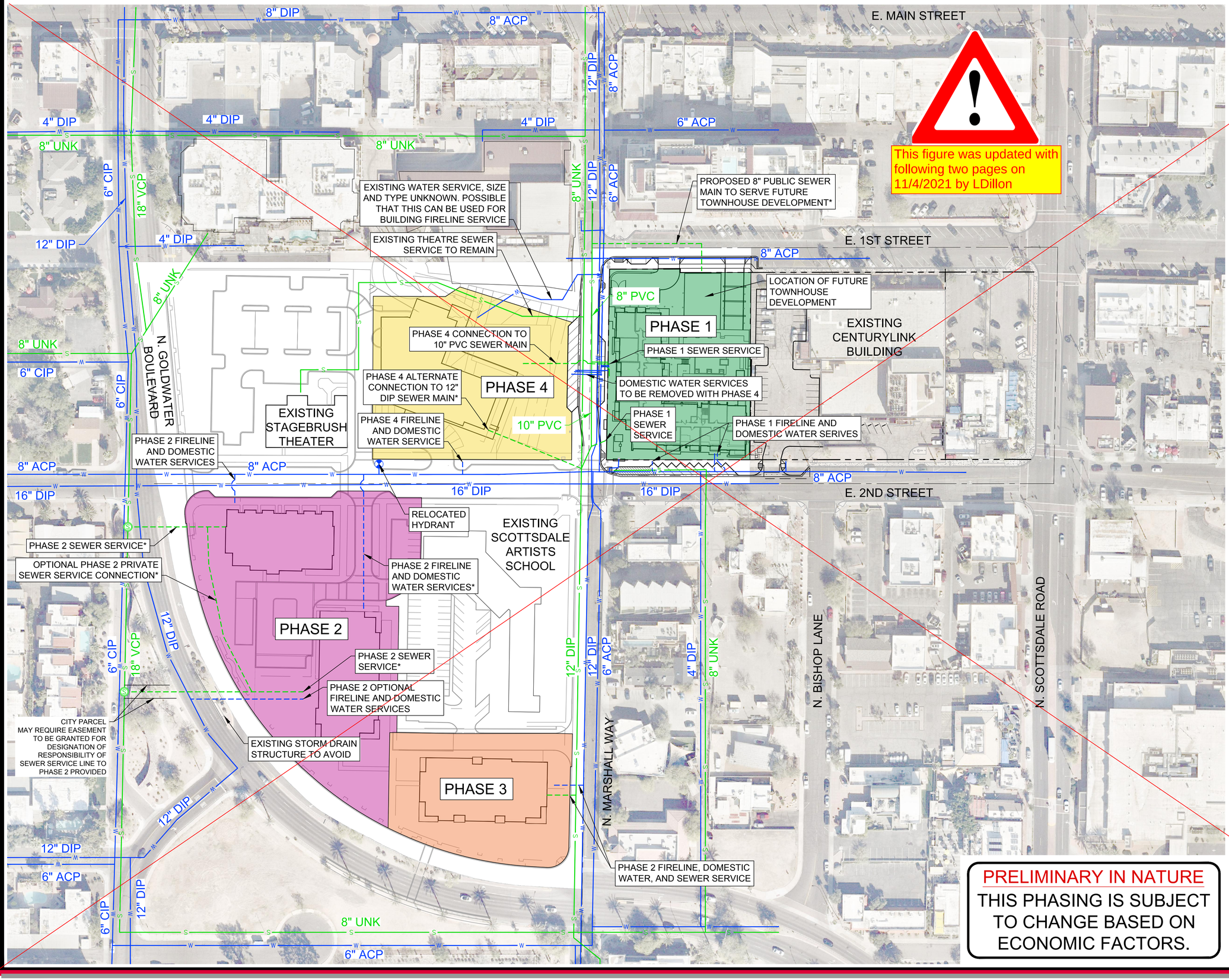
4.0 CONCLUSION

The proposed and existing on-site water system as outlined by this analysis appears adequate and sufficient to meet the required fire flow demand to the first floor of the proposed Museum Square development near the northest corner of 2nd Street and N Marshall Way in Scottsdale, Arizona. The proposed building may require a domestic booster system to provide adequate water pressures to the top floors of the building based on plumbing calculations.

5.0 REFERENCES

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

2. International Code Council, *2015 International Fire* Code. May 2014.



LEGEND

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- EXISTING WATER
- EXISTING SANITARY SEWER
- PROPOSED WATER
- PROPOSED SANITARY SEWER
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER MANHOLE

NOTES:

1. DOMESTIC WATER SERVICES TO BE REMOVED SHALL BE REMOVED TO THE MAIN, WITH THE CORP STOP CLOSED AT THE MAIN.
2. FIRELINE SERVICES TO BE REMOVED SHALL BE REMOVED TO THE MAIN, WITH THE TEE REMOVED FROM THE MAIN AND REPLACED WITH A PIPE SPOOL.

*DENOTES SERVICE LOCATIONS THAT ARE DIFFERENT FROM THE MASTER BOD REPORT PREPARED BY SEG ENGINEERING FOR THE REZONING CASE 13-ZN-2018.

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

PRELIMINARY IN NATURE

THIS PHASING IS SUBJECT TO CHANGE BASED ON ECONOMIC FACTORS.

MUSEUM SQUARE PHASING EXHIBIT
UTILITIES
6/11/2021

Kimley»Horn

K:\PHX_Civil\291430000 - Museum Square\CADD\Exhibits\2021-04-23 Utility Phasing Exhibit.dwg Jun 11, 2021 brandon.robinson

APPROVED AS-NOTED

LDillon comments, COS Water Resources 11/1/2021

Corresponding V3 utility plan included on next page with further comments and for complete reference.

E. MAIN STREET

8" DIP
8" ACP
12" DIP
8" ACP
4" DIP
4" DIP
4" DIP
6" ACP
8" UNK
8" UNK
6" CIP
18" VCP
12" DIP
4" DIP
6" ACP

Private sewer for Townhomes should be routed through underground garage and connect to private service line connecting to public sewer in Marshall.

This public sewer line and manhole shall be constructed as part of Phase 1. Public sewer required along frontage.

PROPOSED 8" PUBLIC SEWER MAIN TO SERVE FUTURE TOWNHOUSE DEVELOPMENT*

public manhole. Phase

conflict with proposed electrical gear ca out on utility main extend sewer further east to avoid.

EXISTING WATER SERVICE, SIZE AND TYPE UNKNOWN. POSSIBLE THAT THIS CAN BE USED FOR BUILDING FIRELINE SERVICE

EXISTING THEATRE SEWER SERVICE TO REMAIN

8" ACP

8" PVC

LOCATION OF FUTURE TOWNHOUSE DEVELOPMENT

PHASE 1

PHASE 1 SEWER SERVICE

EXISTING CENTURYLINK BUILDING

DOMESTIC WATER SERVICES TO BE REMOVED WITH PHASE 4

PHASE 1 SEWER SERVICE

PHASE 1 FIRELINE AND DOMESTIC WATER SERIVES

8" UNK
6" CIP
6" CIP
8" UNK

N. GOLDWATER BOULEVARD

Service line needs to be routed to meter within easement as shown. City does not want ownership of long domestic line penetrating site.

PHASE 4 CONNECTION TO 10" PVC SEWER MAIN

PHASE 4 ALTERNATE CONNECTION TO 12" DIP SEWER MAIN*

PHASE 4

10" PVC

PHASE 4 FIRELINE AND DOMESTIC WATER SERVICE

EXISTING STAGEBRUSH THEATER

PHASE 2 FIRELINE AND DOMESTIC WATER SERVICES

8" ACP
8" ACP
16" DIP
16" DIP
16" DIP
8" ACP
E. 2ND STREET

RELOCATED HYDRANT

Fire line

EXISTING SCOTTSDALE ARTISTS SCHOOL

PHASE 2 FIRELINE AND DOMESTIC WATER SERVICES*

service/fire line lines shall connect perpendicular to main and extend without bends to edge of ROW. DS&PM 6-1.416, J.

PHASE 2 SEWER SERVICE*

OPTIONAL PHASE 2 PRIVATE SEWER SERVICE CONNECTION*

no connections less than 90 degrees allowed.

PHASE 2

PHASE 2 SEWER SERVICE*

PHASE 2 OPTIONAL FIRELINE AND DOMESTIC WATER SERVICES

CITY PARCEL MAY REQUIRE EASEMENT TO BE GRANTED FOR DESIGNATION OF RESPONSIBILITY OF SEWER SERVICE LINE TO PHASE 2 PROVIDED

EXISTING STORM DRAIN STRUCTURE TO AVOID

All service lines should connect perpendicular to main and extend without bends to the edge of ROW.

adjust sewer service and manhole accordingly, also avoids trees/landscaping on City parcel.

PHASE 3

PHASE 2 FIRELINE, DOMESTIC WATER, AND SEWER SERVICE

6" CIP
18" VCP
12" DIP
12" DIP
12" DIP
6" ACP
6" CIP
12" DIP
12" DIP
6" ACP
12" DIP
6" ACP
4" DIP
8" UNK
8" UNK
6" ACP

N. MARSHALL WAY

N. BISHOP LANE

N. SCOTTSDALE ROAD

LEGEND

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- EXISTING WATER
- EXISTING SANITARY SEWER
- PROPOSED WATER
- PROPOSED SANITARY SEWER
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER MANHOLE

NOTES:

1. DOMESTIC WATER SERVICES TO BE REMOVED SHALL BE REMOVED TO THE MAIN, WITH THE CORP STOP CLOSED AT THE MAIN.
2. FIRELINE SERVICES TO BE REMOVED SHALL BE REMOVED TO THE MAIN, WITH THE TEE REMOVED FROM THE MAIN AND REPLACED WITH A PIPE SPOOL.
3. ON-SITE SEWER COLLECTION SYSTEMS SHALL NOT TRAVERSE BELOW SEPARATE STRUCTURES.
4. THE OWNER SHALL PROVIDE ALL WATER AND WASTEWATER INFRASTRUCTURE IMPROVEMENTS, INCLUDING ANY NEW SERVICE LINES, CONNECTION, FIRE HYDRANTS, AND MANHOLES, NECESSARY TO SERVE EACH PHASE OF THE PROJECT AS IT DEVELOPS.
5. THE OWNER SHALL PROVIDE FIRE HYDRANT(S) AND RELATED WATER INFRASTRUCTURE ADJACENT TO LOT, IN THE LOCATIONS DETERMINED BY THE FIRE DEPARTMENT CHIEF, OR DESIGNEE.
6. ALL EXISTING ABOVE GROUND UTILITY LINES ALONG AND WITHIN PROJECT BOUNDARIES, AND ANY NEW OR RELOCATED UTILITY LINES, SHALL BE PLACED UNDERGROUND.

*DENOTES SERVICE LOCATIONS THAT ARE DIFFERENT FROM THE MASTER BOD REPORT PREPARED BY SEG ENGINEERING FOR THE REZONING CASE 13-ZN-2018.

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

PRELIMINARY IN NATURE

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MUSEUM SQUARE PHASING EXHIBIT
UTILITIES
10/5/2021

Kimley»Horn

K:\PHX_Civil\291430000 - Museum Square\CADD\Exhibits\2021-04-23 Utility Phasing Exhibit.dwg Oct 05, 2021 trover.jones

APPROVED AS-NOTED BY WATER RESOURCES (SEPARATE CITY PLAN REVIEW APPROVAL REQUIRED)

LDillon, COS Water Resources , 11/1/2021

STIPULATIONS FROM APPROVED AS NOTED WATER BOD

2.) Stipulation: Marshall Way remove existing 6" water main connection, including any tees or fittings on the existing main and replace segment of Marshall Way main with DIP spool piece.

3.) Stipulation: Demolish/remove entirety of the buried unused 6" water main including offsite portion.

8" sewer and manhole needs to be constructed for Townhomes associated with Phase 1

8" exist sewer

10" exist sewer

MAG 440-3 is standard with CO in ROW. Double cleanout on private property may suffice. Defer to plan reviewer.

Need to call out double cleanout MAG detail.

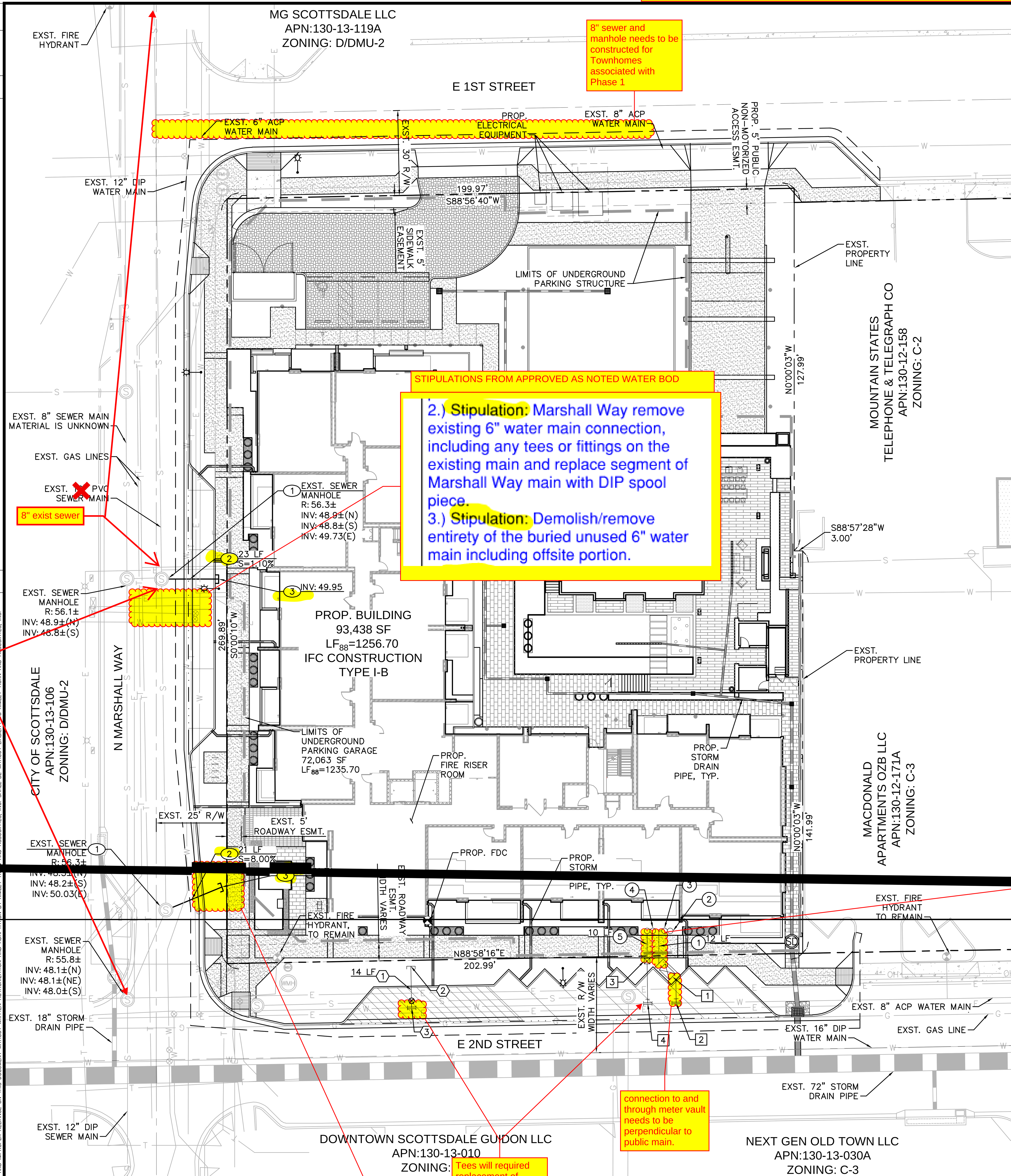
Yes tee required

section shall have CLSM backfill if not adjacent to meter vault.

connection to and through meter vault needs to be perpendicular to public main.

Tees will required replacement of segment of ACP with DIP per City standard. Possibly will need to be done on tapping sleeves if too close to joint.

Pool backwash shall be routed here per stipulation



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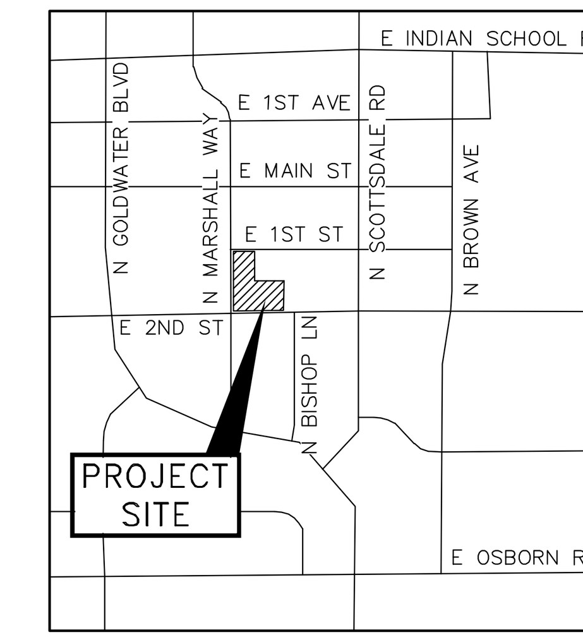
CONTACT: JEFF DENZAK



VICINITY MAP
SCOTTSDALE, AZ
N.T.S.

FLOOD INFORMATION
ACCORDING TO THE FLOOD INSURANCE RATE MAP #04013C2235L DATED OCTOBER 16, 2013 THIS PROPERTY IS LOCATED IN FLOOD ZONE "X": AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

BENCHMARK
FOUND 3" CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE AT THE INTERSECTION OF OSBORN ROAD AND SCOTTSDALE ROAD.

GDACS DATA
NAVD88
ELEVATION = 1246.52'

BASIS OF BEARING
THE CENTERLINE OF 2ND STREET AS IN BOOK 32, PAGE 50, MARICOPA COUNTY RECORDS. SAID LINE BEARS N89°03'00"E.

NOTES
1. ADD 1200' TO ALL ELEVATIONS.
2. ALL ELEVATIONS ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED.
3. EXISTING WATER SERVICES SHALL BE REMOVED AT THE CONNECTION TO THE MAIN. THE SERVICE TEE SHALL BE REMOVED AND REPLACED WITH A PIPE SPOOL.

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

SEWER CONSTRUCTION NOTES
1. CONNECT TO EXISTING SANITARY SEWER MANHOLE, RIM AND INVERT ELEVATIONS PER PLAN.
2. INSTALL 6" SDR 35 PVC SEWER SERVICE, LENGTH AND SLOPE PER PLAN. BEDDING AND BACKFILL PER COS STD DET 2201.
3. CONNECT TO BUILDING AT TWO-WAY CLEANOUT, INVERT PER PLAN. REF MEP PLANS FOR CONTINUATION.

FIRE CONSTRUCTION NOTES
1. INSTALL 8" CLASS 350 MORTAR LINED DIP FIRE LINE POLYWRAPPED WITH TRACER WIRE, LENGTH PER PLAN. MINIMUM 3' COVER. BEDDING AND BACKFILL PER COS STD DET 2201.
2. CONNECT TO BUILDING FIRE LINE, REF MEP PLANS FOR CONTINUATION. BACKFLOW PREVENTOR TO BE IN FIRE RISER ROOM.
3. INSTALL 8"X8" TEE AND 8" GATE VALVE PER MAG STD DET 391-1.

PUBLIC WATER CONSTRUCTION NOTES
1. INSTALL TYPE "K" COPPER WATER SERVICE LINE CONNECTION WITH 3" DOMESTIC WATER METER AND VAULT PER COS STD DET 2345-1, METER BOX PER MAG STD DET 321. METER TO BE INSTALLED BY CITY FORCES. BOTH VAULT STEEL VENT PIPES TO BE LOCATED ON NORTH SIDE OF VAULT.
2. INSTALL 8"X3" TAPPING SLEEVE.
3. INSTALL TYPE "K" COPPER WATER SERVICE LINE [redacted] FORCES.
4. INSTALL 8"X1" TAPPING SLEEVE.

PRIVATE WATER CONSTRUCTION NOTES
1. INSTALL 4" TYPE "K" COPPER DOMESTIC WATER SERVICE, LENGTH PER PLAN.
2. BUILDING DOMESTIC WATER CONNECTION.
3. INSTALL 3" REDUCED PRESSURE BACKFLOW ASSEMBLY PER COS STD DET 2353.
4. INSTALL LANDSCAPE 1" REDUCED PRESSURE BACKFLOW ASSEMBLY PER COS STD DET 2354.
5. INSTALL 1" TYPE "K" COPPER LANDSCAPE WATER SERVICE, LENGTH PER PLAN.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

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

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

PRELIMINARY UTILITY PLAN
7108 E. 2ND STREET
SCOTTSDALE, ARIZONA 85251

PROJECT No. 291999000
SCALE (H): 1"=20'
SCALE (V): NONE
[redacted]
DESIGN BY: BEQ
CHECK BY: TMJ
DATE: 10/05/21

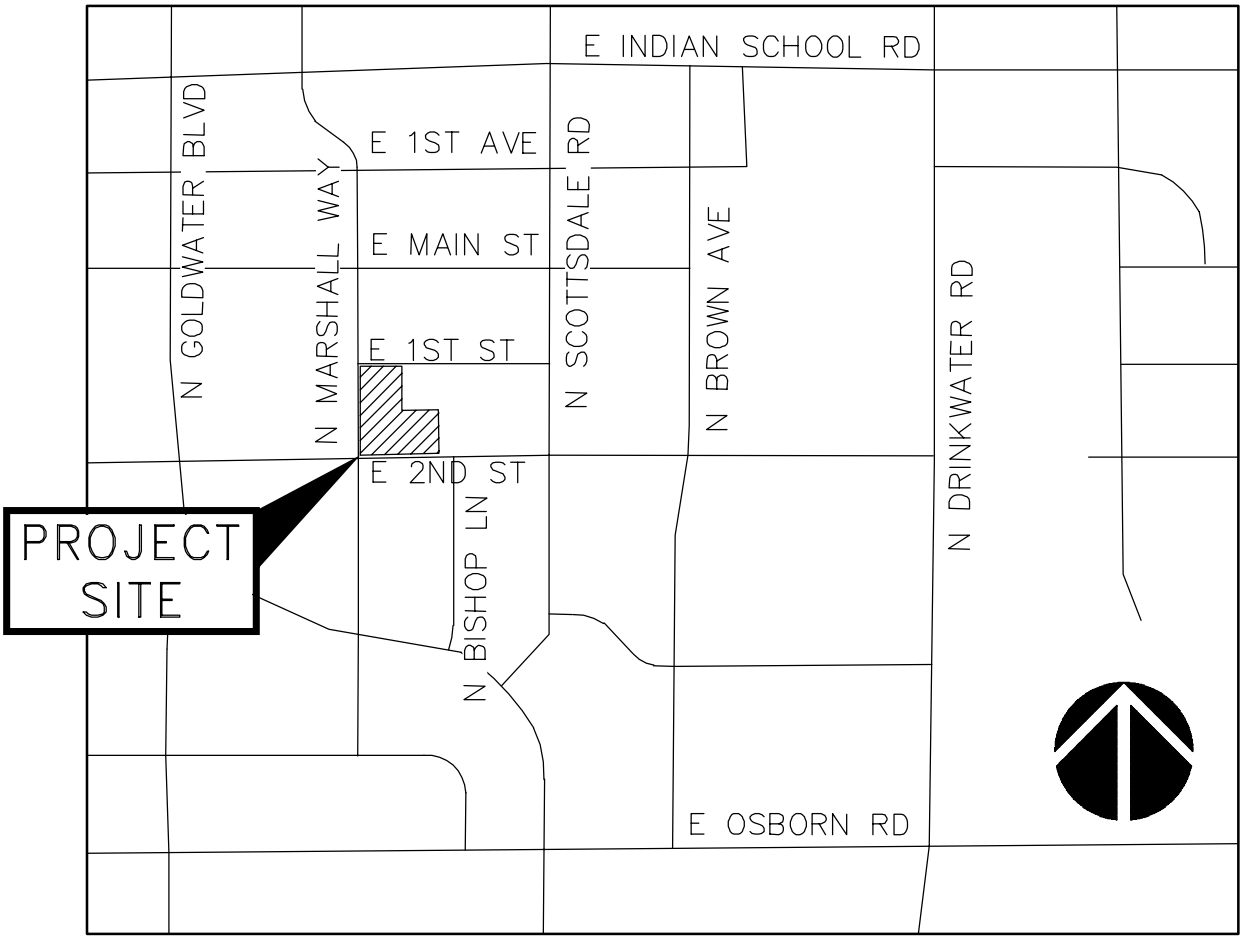
Registered Professional Engineer (Civil)
CERTIFICATE NO. 52738
TRAVER JONES
Date Signed 10/05/21
ARIZONA, U.S.A.
Expires 09/30/23

999000Pre-UT.dwg

UT1
1 OF 1 SHEETS

REV	DESCRIPTION	BY	DATE	APPR

Appendix A – Vicinity Map



VICINITY MAP

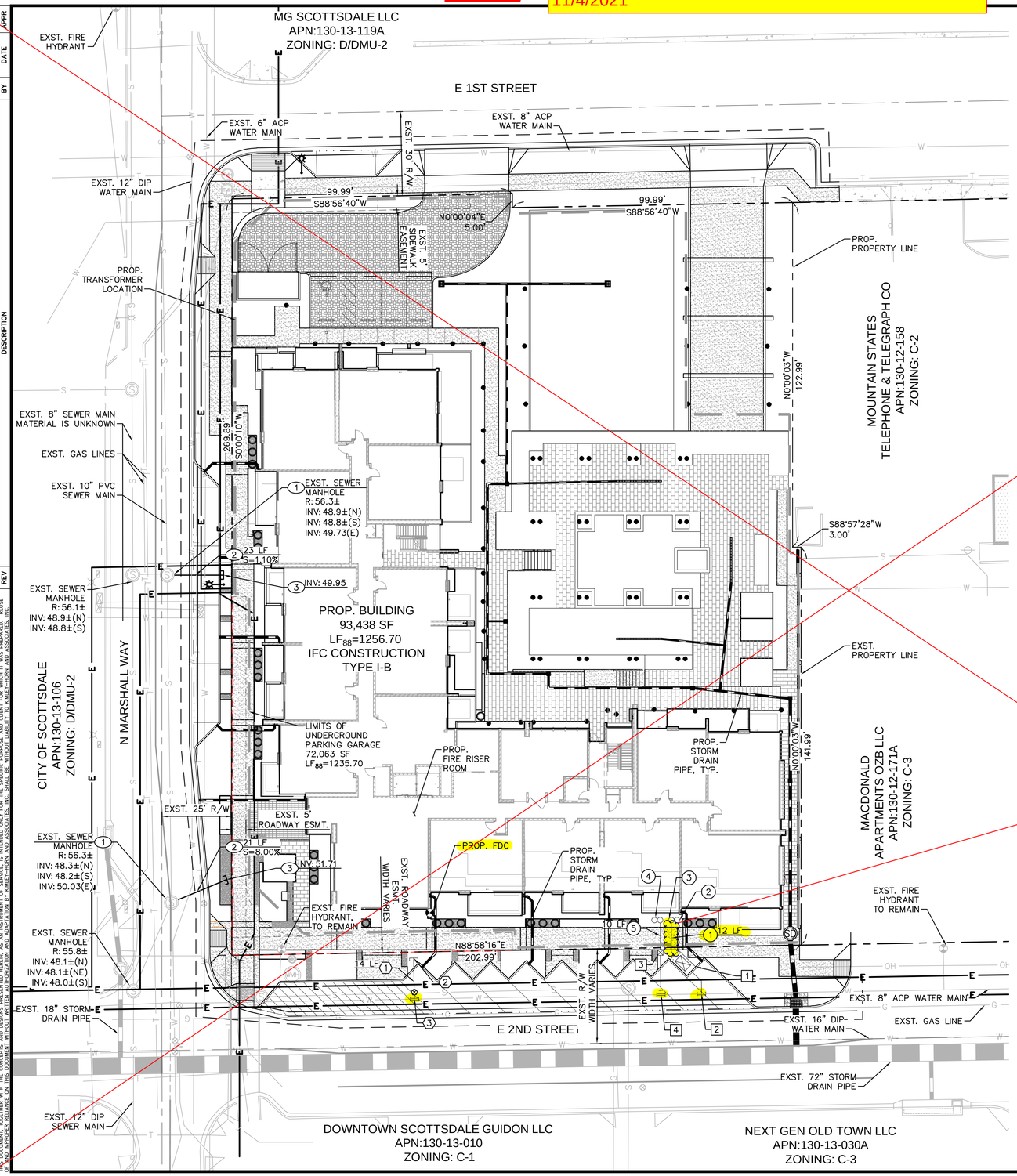
SCOTTSDALE, AZ
N.T.S.

Kimley»Horn

11-DR-2020
5/21/2021

Appendix B – Preliminary Utility Plan and Demolition Plan

Refer to updated figure version on last two pages of main report body. Comments and information on this figure are only applicable if not modified there. LDillon 11/4/2021



this portion of line must be backfilled with CLSM since the BFP is not directly adjacent to the meter. This is to prevent connections without backflow prevention.

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7550 E MCDONALD DR
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PH: (480) 367-2100
CONTACT: JEFF DENZAK

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NOTES
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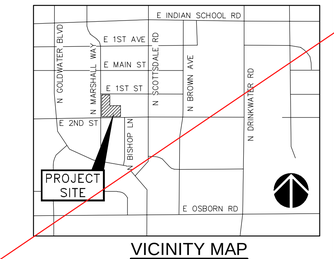


VICINITY MAP
SCOTTSDALE, AZ
N.T.S.

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

SEWER CONSTRUCTION NOTES
1. CONNECT TO EXISTING SANITARY SEWER MANHOLE, RIM AND INVERT ELEVATIONS PER PLAN.
2. INSTALL 6" SDR 35 PVC SEWER SERVICE, LENGTH AND SLOPE PER PLAN. BEDDING AND BACKFILL PER COS STD DET 2201.
3. CONNECT TO BUILDING AT TWO-WAY CLEANOUT, INVERT PER PLAN. REF MEP PLANS FOR CONTINUATION.

FIRE CONSTRUCTION NOTES
1. INSTALL 8" CLASS 350 MORTAR LINED DIP FIRE LINE POLYWRAPPED WITH TRACER WIRE, LENGTH PER PLAN. MINIMUM 3' COVER. BEDDING AND BACKFILL PER COS STD DET 2201.
2. CONNECT TO BUILDING FIRE LINE, REF MEP PLANS FOR CONTINUATION. BACKFLOW PREVENTOR TO BE IN FIRE RISER ROOM.
3. INSTALL 8"X8" TEE AND 8" GATE VALVE PER MAG STD DET 391-1.

PUBLIC WATER CONSTRUCTION NOTES
1. INSTALL TYPE "K" COPPER WATER SERVICE LINE CONNECTION WITH 3" DOMESTIC WATER METER AND VAULT PER COS STD DET 2345-1, METER BOX PER MAG STD DET 321. METER TO BE INSTALLED BY CITY FORCES. BOTH VAULT STEEL VENT PIPES TO BE LOCATED ON NORTH SIDE OF VAULT.
2. INSTALL 8"X3" TAPPING SLEEVE.
3. INSTALL TYPE "K" COPPER WATER SERVICE LINE CONNECTION WITH 1" LANDSCPAE DOMESTIC WATER METER AND BOX. METER TO BE INSTALLED BY CITY FORCES.
4. INSTALL 8"X1" TAPPING SLEEVE.

PRIVATE WATER CONSTRUCTION NOTES
1. INSTALL 4" TYPE "K" COPPER DOMESTIC WATER SERVICE, LENGTH PER PLAN.
2. BUILDING DOMESTIC WATER CONNECTION.
3. INSTALL 3" REDUCED PRESSURE BACKFLOW ASSEMBLY PER COS STD DET 2353.
4. INSTALL LANDSCAPE 1" REDUCED PRESSURE BACKFLOW ASSEMBLY PER COS STD DET 2354.
5. INSTALL 1" TYPE "K" COPPER LANDSCAPE WATER SERVICE, LENGTH PER PLAN.

NORTH

GRAPHIC SCALE IN FEET
0 ## ## ##

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

Kimley»Horn

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

7108 E. 2ND STREET
SCOTTSDALE, ARIZONA 85251

PRELIMINARY UTILITY PLAN

PROJECT No.
291999000

SCALE (H): 1"=20'
SCALE (V): NONE
DRAWN BY: BEQ
DESIGN BY: BEQ
CHECK BY: TMJ
DATE: 04/29/21

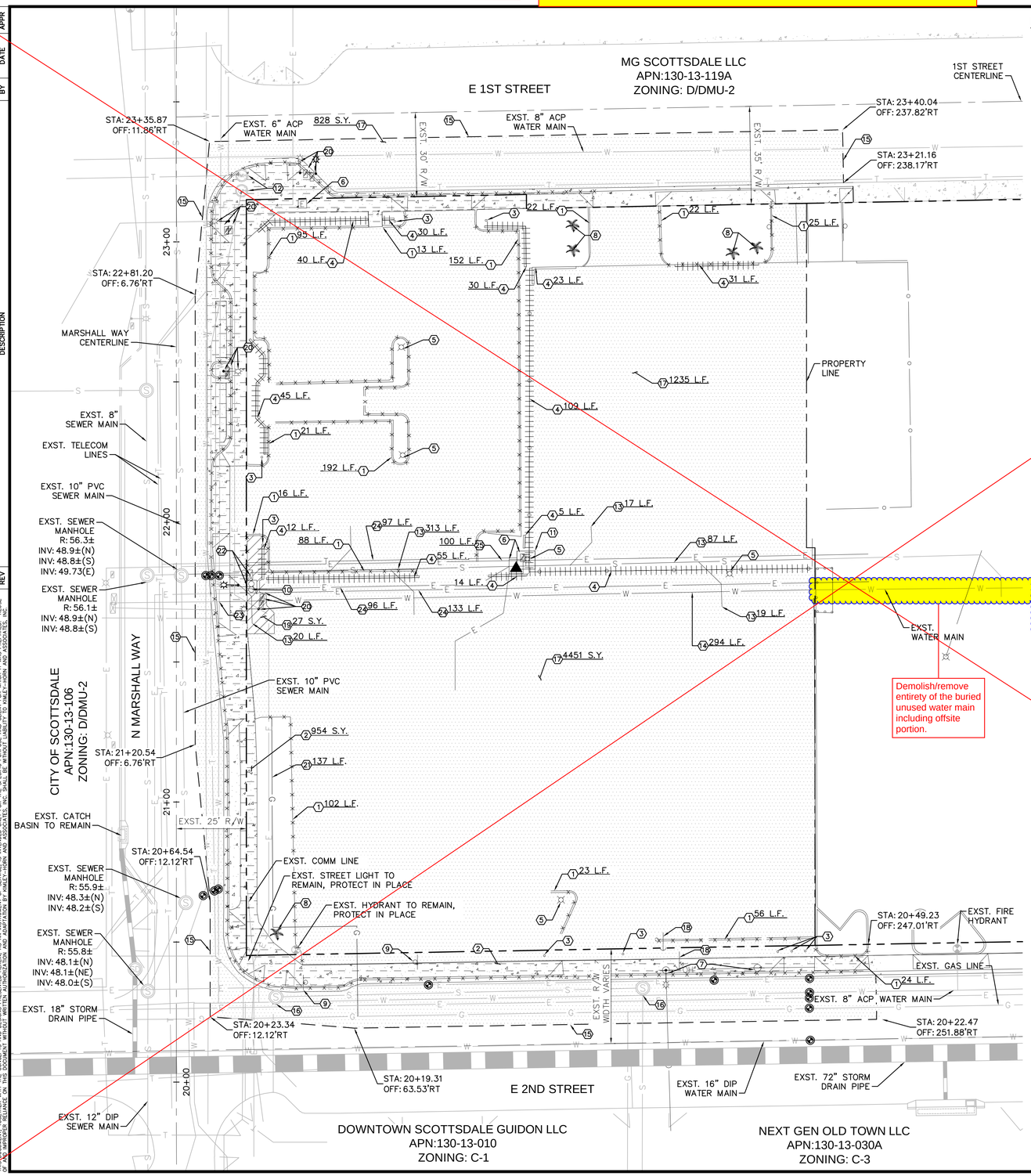
Registered Professional Engineer
CERTIFICATE NO.
52738
TRAVER JONES
Date Signed 04/29/21
ARIZONA, U.S.A.
Expires 09/30/23

999000Pre-UT.dwg

UT1
1 OF 1 SHEETS

11-DR-2020
5/21/2021

Refer to updated figure version on last two pages of main report body. Comments and information on this figure are only applicable if not modified there. LDillon 11/4/2021



DEMOLITION NOTES

1. SAWCUT AND REMOVE EXISTING CURB, LENGTH PER PLAN.
2. REMOVE EXISTING SIDEWALK/PAVERS.
3. REMOVE EXISTING BOLLARD.
4. REMOVE EXISTING WALL/FENCE, LENGTH PER PLAN.
5. REMOVE EXISTING LIGHT POLE, FOUNDATION, AND CONDUITS.
6. REMOVE/RELOCATE ELECTRICAL EQUIPMENT. COORDINATE EASEMENT ABANDONEMENTS AS NECESSARY, REF APS PLANS FOR DETAILS.
7. REMOVE EXISTING ELECTRIC POLE, REF APS PLANS FOR DETAILS.
8. REMOVE EXISTING TREE.
9. REMOVE EXISTING SIGN.
10. REMOVE EXISTING WATER BACKFLOW PREVENTER.
11. REMOVE EXISTING TELECOM EQUIPMENT, REF TELECOM PLANS FOR DETAILS.
12. EXISTING TELECOM MANHOLE TO REMAIN, PROTECT IN PLACE.
13. REMOVE SEWER LINE, STUB AND PLUG AT MANHOLE, LENGTH PER PLAN.
14. REMOVE WATER LINE, STUB AND PLUG AT MAIN, LENGTH PER PLAN.
15. PROPOSED SAWCUT LINE, 2' MIN SAWCUT WIDTH.
16. SEWER MANHOLE TO REMAIN, PROTECT IN PLACE.
17. SAWCUT AND REMOVE EXISTING ASPHALT PAVEMENT AND AGGREGATE BASE COURSE.
18. REMOVE EXISTING POWER POLE DOWN GUY.
19. REMOVE EXISITNG DG/GRAVEL.
20. EXISTING STREET LIGHT TO BE SALVAGED AND RELOCATED. REF SHEET C6 AND APS PLANS.
21. REMOVE EXISTING GAS LINE, REF SW GAS PLANS FOR DETAILS.
22. REMOVE EXISTING DOMESTIC/IRRIGATION WATER SERVICE AND METER. WATER LINE TO BE REMOVED TO THE MAIN, AND CORP STOP CLOSED AT THE MAIN.
23. REMOVE EXISTING 6" WATER MAIN CONNECTION AND GATE VALVE. REMOVE TEE FROM WATER MAIN AND REPLACE WITH PIPE SPOOL.

Demolish/remove entirety of the buried unused water main including offsite portion.

good

LEGEND

- EXISTING CURB TO BE REMOVED
- EXISTING WALL/FENCE TO BE REMOVED
- EXISTING AC PAVEMENT TO BE REMOVED.
- EXISTING CONCRETE PAVEMENT OR SIDEWALK TO BE REMOVED.
- PAVEMENT SAWCUT LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- UTILITY CROSSING TO BE POTHOLED PRIOR TO CONSTRUCTION

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

NOTES:

1. STATION AND OFFSETS ARE BASED ON MARSHALL WAY CENTERLINE.
2. ON-SITE REMOVALS ARE SHOWN FOR REFERENCE ONLY AND ARE NOT REVIEWED/APPROVED BY THE CITY OF SCOTTSDALE.

NOTICE TO CONTRACTOR:
CONTRACTOR SHALL USE CAUTION DURING DEMOLITION OF EXISTING SITE, AS UNKNOWN PRIVATE UTILITIES MAY BE PRESENT. CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEER REGARDING ANY CONFLICTS WITH EXISTING UTILITIES AND PROPOSED IMPROVEMENTS.

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

Kimley»Horn

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

7108 E. 2ND STREET
DEMOLITION PLAN
SCOTTSDALE, ARIZONA

PROJECT No.	291999000
SCALE (H):	1"=20'
SCALE (V):	NONE
DRAWN BY:	AEH
DESIGN BY:	BEQ
CHECK BY:	TMJ
DATE:	04/29/21

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
80% PROGRESS SET

999000DM.dwg

C3
3 OF 7 SHEETS

NO.	DESCRIPTION	DATE	BY	APPR
REV				

K:\PHX_Civil\291430000 - Museum Square\CADD\Improvement Plans\999000DM.dwg, Layout:C3 Apr 29, 2021 - 9:15am Moira.Laughlin

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5/21/2021

Appendix C – Fire Flow Requirements from 2015 IFC

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION B101
GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102
DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103
MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code.*

SECTION B104
FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by *fire walls* without openings, constructed in accordance with the *International Building Code,* are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration requirements for one- and two-family *dwellings*, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.1(1) and B105.1(2).

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings*, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.2 and B105.1(2).

TABLE B105.1(1)
REQUIRED FIRE-FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0-3,600	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	500	$^1/_2$
3,601 and greater	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	$^1/_2$ value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m.

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

TABLE B105.2
REQUIRED FIRE-FLOW FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the *International Fire Code*	25% of the value in Table B105.1(2)[a]	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the *International Fire Code*	25% of the value in Table B105.1(2)[b]	Duration in Table B105.1(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.
a. The reduced fire-flow shall be not less than 1,000 gallons per minute.
b. The reduced fire-flow shall be not less than 1,500 gallons per minute.

Appendix D – Fire Flow Test and Water CAD Results and Layout

Flow Test Summary

Project Name:	EJFT 19096
Project Address:	7125 E 2nd St, Scottsdale, AZ 85251
Date of Flow Test:	2019-05-03
Time of Flow Test:	7:34 AM
Data Reliable Until:	2019-11-03
Conducted By:	Eder Cueva & Tayler Lynch (EJ Flow Tests) 602.999.7637
Witnessed By:	Ray Padilla (City of Scottsdale) 602.541.0586
City Forces Contacted:	City of Scottsdale (602.541.0586)
Permit Number:	C58183

Note Scottsdale requires a max static pressure of 72 psi for safety factor

Raw Flow Test Data

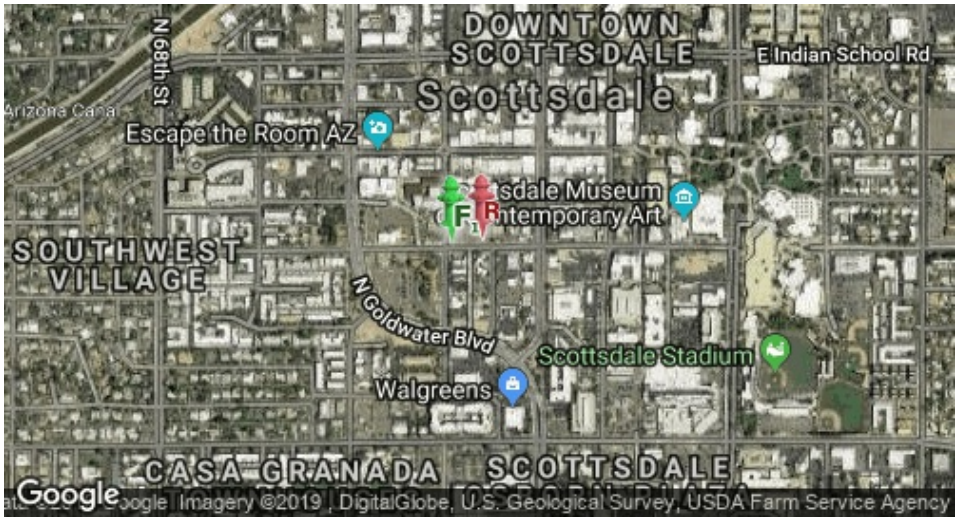
Static Pressure:	88.0 PSI
Residual Pressure:	82.0 PSI
Flowing GPM:	1,575
GPM @ 20 PSI:	5,841

Data with a 16 PSI Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	66.0 PSI
Flowing GPM:	1,575
GPM @ 20 PSI:	5,054

Hydrant F_1

Pitot Pressure (1):	22	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	22	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches



Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
204 ft (measured linearly)

Static-Residual Elevation
1257 ft (above sea level)

Flow Hydrant (F_1) Elevation
1257 ft (above sea level)

Elevation & distance values are approximate

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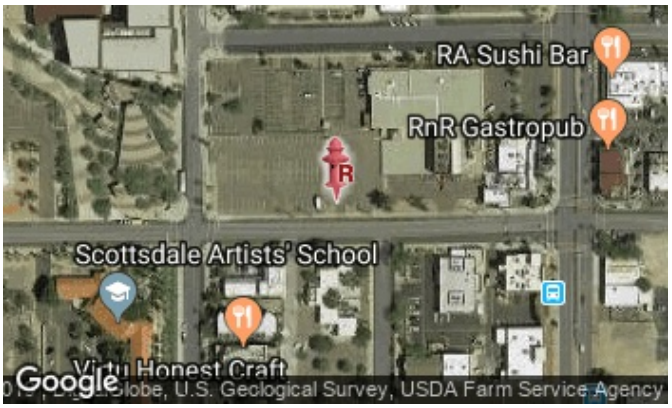
5/21/2021

Flow Test Summary

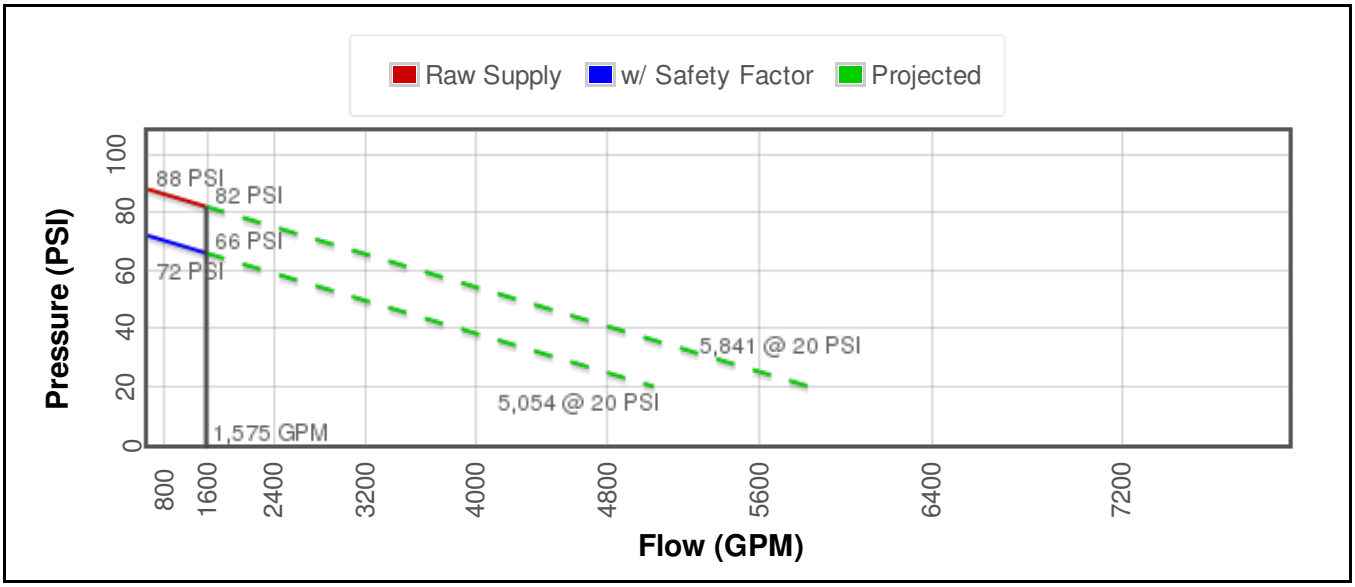
Static-Residual Hydrant



Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph



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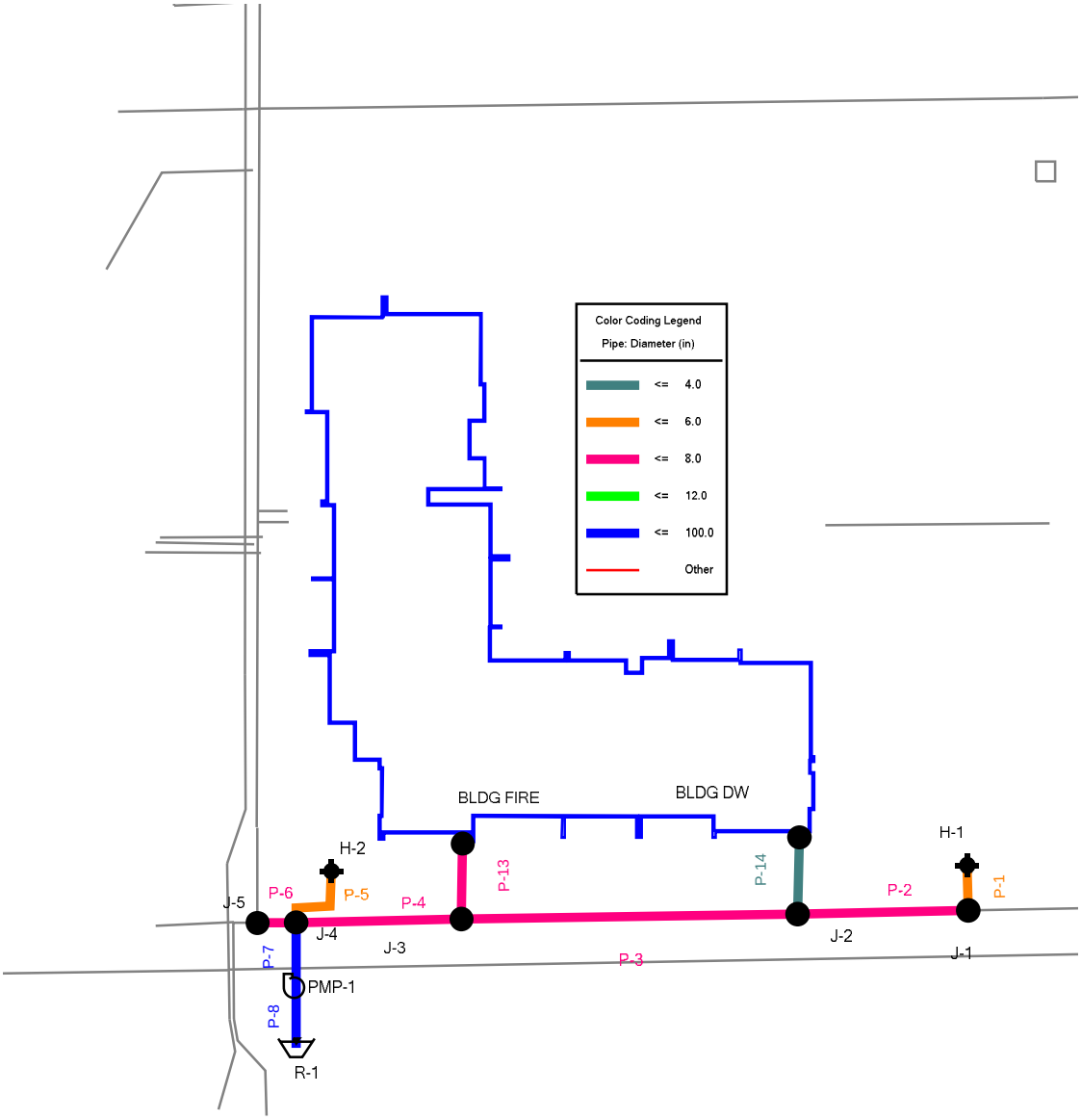
Water CAD Layout



Pump Definition Detailed Report: 2019-05-03 FF Test

Element Details

ID	54	Notes	
Label	2019-05-03 FF Test		

Pump Definition Type

Pump Definition Type	Standard (3 Point)	Design Head	152.46 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	5,054 gpm
Shutoff Head	166.32 ft	Maximum Operating Head	46.20 ft
Design Flow	1,575 gpm		

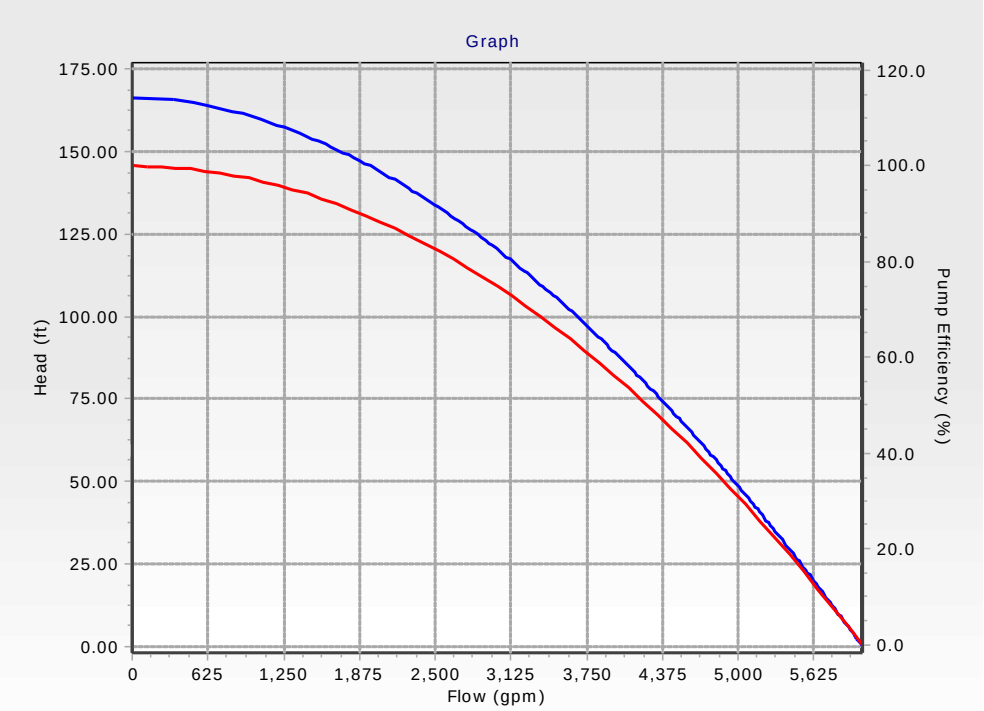
Pump Efficiency Type

Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		

Transient (Physical)

Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: 2019-05-03 FF Test



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Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: MDD+FF

Label	Satisfies Fire Flow Constraints?	Elevation (ft)	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual @ Total Flow Needed) (psi)	Is Fire Flow Run Balanced?
H-1	True	55.07	1,500	3,212	62	True
H-2	True	55.52	1,500	3,774	64	True
J-1	True	54.39	0	3,424	39	True
J-4	True	55.32	0	4,468	52	True
J-5	True	55.63	0	4,404	51	True
BLDG FIRE	True	56.70	1,550	3,962	64	True
BLDG DW	True	56.70	0	1,176	-163	True
J-2	True	54.63	0	3,595	43	True
J-3	True	54.65	0	4,117	49	True

FlexTable: Junction Table

Active Scenario: PHD

ID	Label	Is Active?	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-1	True	54.39	0	221.54	72
33	J-4	True	55.32	0	221.58	72
37	J-5	True	55.63	0	221.58	72
61	BLDG FIRE	True	56.70	0	221.54	71
63	BLDG DW	True	56.70	87	221.37	71
68	J-2	True	54.63	0	221.54	72
72	J-3	True	54.65	0	221.54	72

FlexTable: Pipe Table

Active Scenario: PHD

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
32	P-1	17	H-1	J-1	6.0	Ductile Iron	130.0	0	0.00	0.000
36	P-5	31	J-4	H-2	6.0	Ductile Iron	130.0	0	0.00	0.000
38	P-6	14	J-4	J-5	8.0	Asbestos Cement	140.0	0	0.00	0.000
50	P-7	23	J-4	PMP-1	100.0	Ductile Iron	130.0	-87	0.00	0.000
52	P-8	23	PMP-1	R-1	100.0	Ductile Iron	130.0	-87	0.00	0.000
69	P-2	63	J-1	J-2	8.0	Asbestos Cement	140.0	0	0.00	0.000
71	P-13	30	BLDG FIRE	J-2	8.0	Ductile Iron	130.0	0	0.00	0.000
73	P-3	7	J-2	J-3	8.0	Asbestos Cement	140.0	0	0.00	0.000
74	P-4	179	J-3	J-4	8.0	Asbestos Cement	140.0	-87	0.56	0.000
75	P-14	30	BLDG DW	J-3	4.0	Ductile Iron	130.0	-87	2.22	0.006