

WASTEWATER 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

Added 11/4/2021
7) Stipulation: The sewer for the Phase 1 Townhomes shall be a private sewer within the onsite underground garage and outlet onto Marshall. Design for this sewer service shall be coordinated with Phase 1.

Prepared by:

Kimley»Horn

291430000
April 2021
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FINAL Basis of Design Report

- APPROVED
- APPROVED AS NOTED
- REVISE AND RESUBMIT



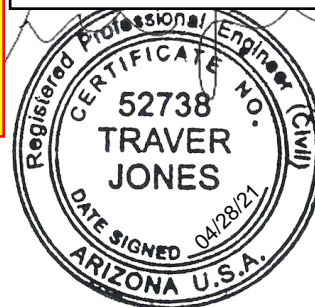
Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, 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 Idillon


DATE 11/4/2021

Address comments below and herein on submitted plans:

- 1.) **Stipulation:** Demolish/remove entirety unused sewer line including any offsite service lines or manholes attached to it.
- 2.) Both proposed service lines shall be per MAG 440-3. Existing 6" service shall be retrofitted to conform to 440-3, double CO probably ok.
- 3.) **Stipulation:** Route pool backwash to southern sewer service connection shown on utility plan herein (or optionally, but better, to manhole to south where sewer converts to 12").
- 4.) **Stipulation:** Confirm if existing interconnect between east and west sewer on Marshall exists as shown on utility plan and that invert is acceptably high enough to only function as emergency relief connection. If not high enough then plug connection.
- 5.) **Stipulation:** All associated improvements to coordinate with attached utility phasing plan and proposed street paving.
- 6.) Address markups on utility plans herein.



Expires: 09/30/23

- 
- AND CONN. 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.

WASTEWATER BASIS OF DESIGN REPORT

APRIL 2021

Prepared By:

Kimley»»Horn

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Appendix B –Site Plan

Appendix C – Scottsdale Quarter Section Map and Sewer Camera Test Results

Appendix D – Sewer Calculations

Appendix E – Preliminary Utility Plan and Demolition Plan

Appendix F – Museum Square Preliminary Basis of Design for Wastewater

1.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this Wastewater Basis of Design Report for the proposed apartment development at the northeast corner of East 2nd Street and North 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 East 2nd Street to the south, North Marshall Way to the west, East 1st Street to the north, and existing parking lots to the east. 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 is capable of satisfying the projected wastewater demands for the proposed development and future Museum Square developments 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 10-inch parallel sewer main located in North Marshall Way west of the site and north of East 2nd Street. The 8-inch and 10-inch parallel sewer main combine to an existing 12-inch sewer main at the intersection of North Marshall Way and East 2nd Street. The 10-inch sewer main was recently completed with the Hilton Canopy Improvements north of the proposed site. There is an existing 8-inch abandoned sewer lateral located on the site which will be removed prior to construction. For verification of abandonment, the 8-inch lateral had a camera test performed on July 13th, 2020 by Pro-Pipe. Reference **Appendix C** for the sewer camera test results.

The existing 8-inch abandoned sewer lateral and associated fittings will be removed with the proposed improvements. Two new 6-inch building sewer services will connect to the existing 10-inch sewer main in North Marshall Way at existing manholes west 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 10-inch sewer main in North Marshall Way north of East 2nd Street and the existing 12-inch sewer in North Marshall Way south of East 2nd Street. As previously stated, the analysis will take the proposed site, future Museum Square developments, and the existing Hilton Canopy into consideration.

4 total pools, ok

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: North Marshall Way Sewer Demands

Building	Use	# of DUs	Demand ¹ per unit (GPD)	Average Daily Flow (GPD)	Peak Flow ² (GPD)	Peak Flow (GPM)
Museum Square Bldg 4	Condominium	92	140	12,880	57,960	40
Museum Square Hotel	Resort Hotel	190	380	72,200	324,900	226
Canopy Hilton	Resort Hotel	176	380	66,880	300,960	209
Total For 10" Diameter Pipe North of E. 2nd St without Pool Backwash		458		151,960	683,820	475
Pool Backwash ³	MS Hotel, MS Condo, and Hilton Pool	(3) Pools	50 gpm per pool including 50% reduction	-	-	150
Total For 10" Diameter Pipe North of E. 2nd St with Pool Backwash		458		151,960	683,820	625
Flow Monitoring ⁴	-	-	-	-	197,280	137
Residential 1	Condominium	61	140	8,540	38,430	27
Residential 2	Condominium	79	140	11,060	49,770	35
Residential 3	Condominium	77	140	10,780	48,510	34
Total For 12" Diameter Pipe South of E. 2nd St without Pool Backwash		217		30,380	333,990	708
Pool Backwash ³	MS Condo	(1) Pool	50 gpm per pool including 50% reduction	-	-	50
Total For 12" Diameter Pipe South of E. 2nd St with Pool Backwash		217		30,380	333,990	908

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 and resort hotel uses is 4.5
3. It is assumed that pool backwashing for the proposed hotel, apartment, and residential buildings will not be simultaneous, occur infrequently during off peak hours, and will be completed in a few minutes. Per City of Scottsdale policy, a 50% pool backwash reduction has been applied.
4. The flow monitoring test took place in an existing manhole on the 12-inch sewer main in N. Marshall Way, south of E. 2nd Street. 137 gpm is the peak flow from the monitoring test. Reference the Preliminary Basis of Design Report by SEG for Flow Monitoring Results (**Reference 2, Appendix F**).

Math error should be, 858

acceptable vales w/
and w/o backwash,
but at maximums

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 10-inch main, and existing 12-inch main has 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: North Marshall Way Sewer Capacity

	Peak Flow (GPM)	Manning Roughness (n)	Slope (ft/ft)	d/D	Velocity (ft/s)
6" Diameter Pipe	140	0.013	0.01100	0.52	3.0
10" Diameter Pipe without Pool Backflow	475	0.013	0.0039	0.66	2.8
10" Diameter Pipe with Pool Backflow	625	0.013	0.0039	0.83	2.9
12" Diameter Pipe without Pool Backflow	708	0.013	0.0048	0.58	3.3
12" Diameter Pipe with Pool Backflow	908	0.013	0.0048	0.69	3.5

per utility plan this is being routed to two service lines. Pool backwash should be routed to southern service line.

should be 858, math error on previous page

acceptable

recalculated @ 0.66, acceptable

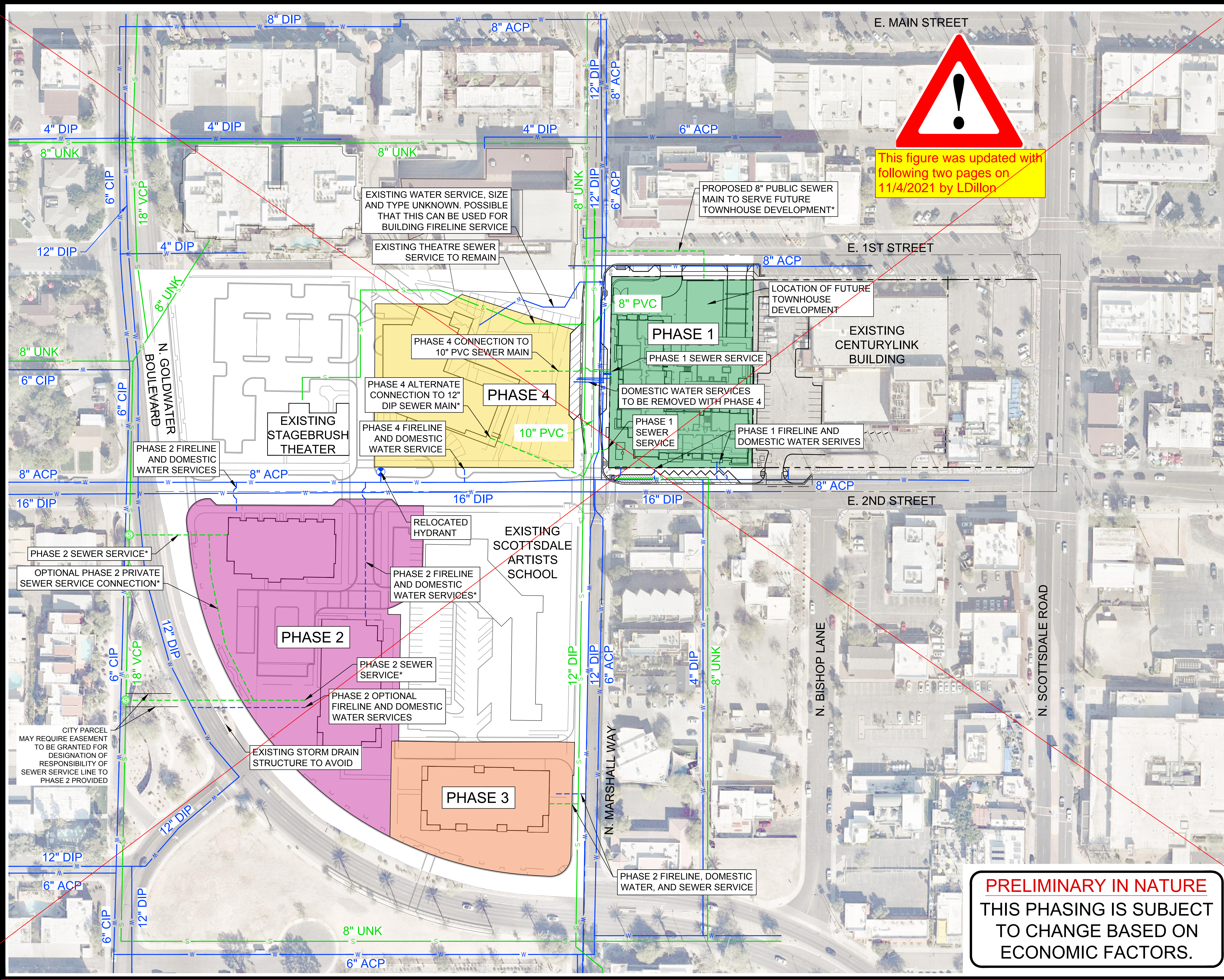
4.0 CONCLUSION

The development proposes to connect two 6-inch sewer service to the existing 10-inch sewer main in N. Marshall Way via existing manholes. 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 northeast corner North Marshall Way and East 2nd Street.

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.

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

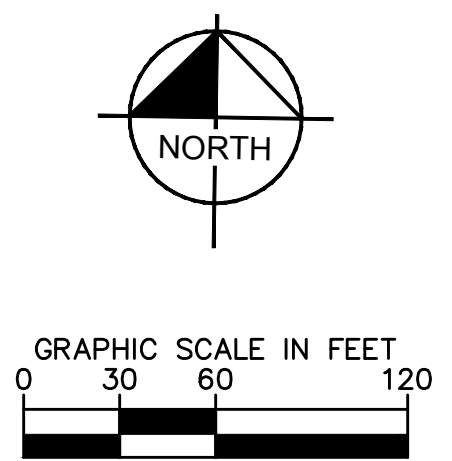


This figure was updated with following two pages on 11/4/2021 by LDillon

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

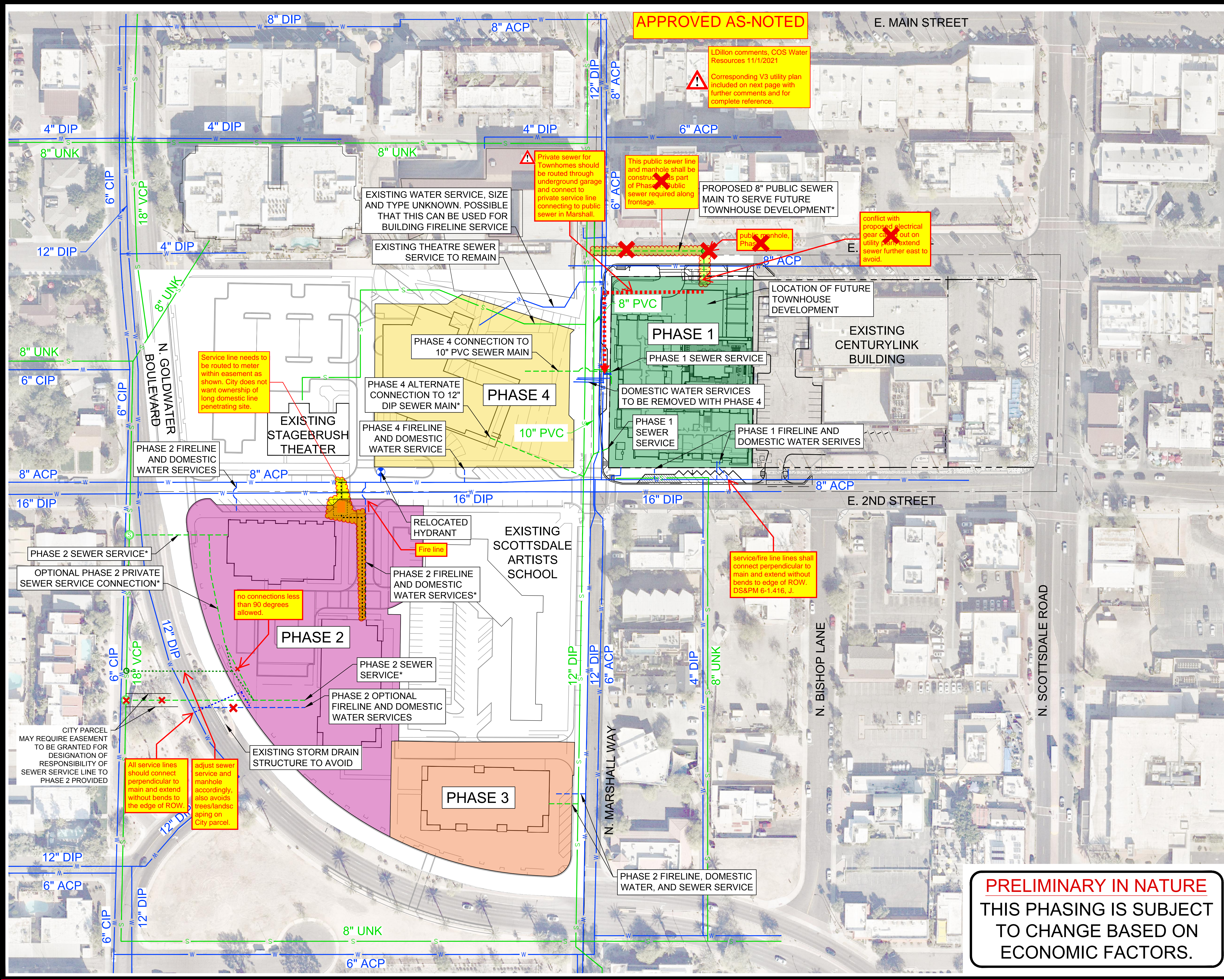
- NOTES:**
1. DOMESTIC WATER SERVICES TO BE REMOVED SHALL BE REMOVED TO THE MAIN, WITH THE CORP STOP CLOSED AT THE MAIN.
 2. FIRELINE SERVICES TO BE REMOVED SHALL BE REMOVED TO THE MAIN, WITH THE TEE REMOVED FROM THE MAIN AND REPLACED WITH A PIPE SPOOL.
- *DENOTES SERVICE LOCATIONS THAT ARE DIFFERENT FROM THE MASTER BOD REPORT PREPARED BY SEG ENGINEERING FOR THE REZONING CASE 13-ZN-2018.



PRELIMINARY IN NATURE
 THIS PHASING IS SUBJECT
 TO CHANGE BASED ON
 ECONOMIC FACTORS.

MUSEUM SQUARE PHASING EXHIBIT
 UTILITIES
 6/11/2021

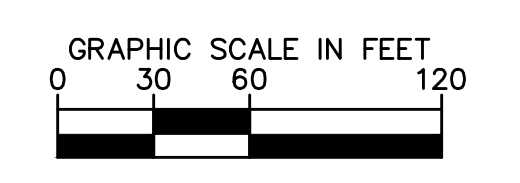
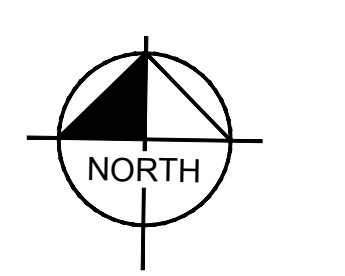
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LEGEND

- 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 BOB REPORT PREPARED BY SEG ENGINEERING FOR THE ZONING CASE 13-ZN-2018.



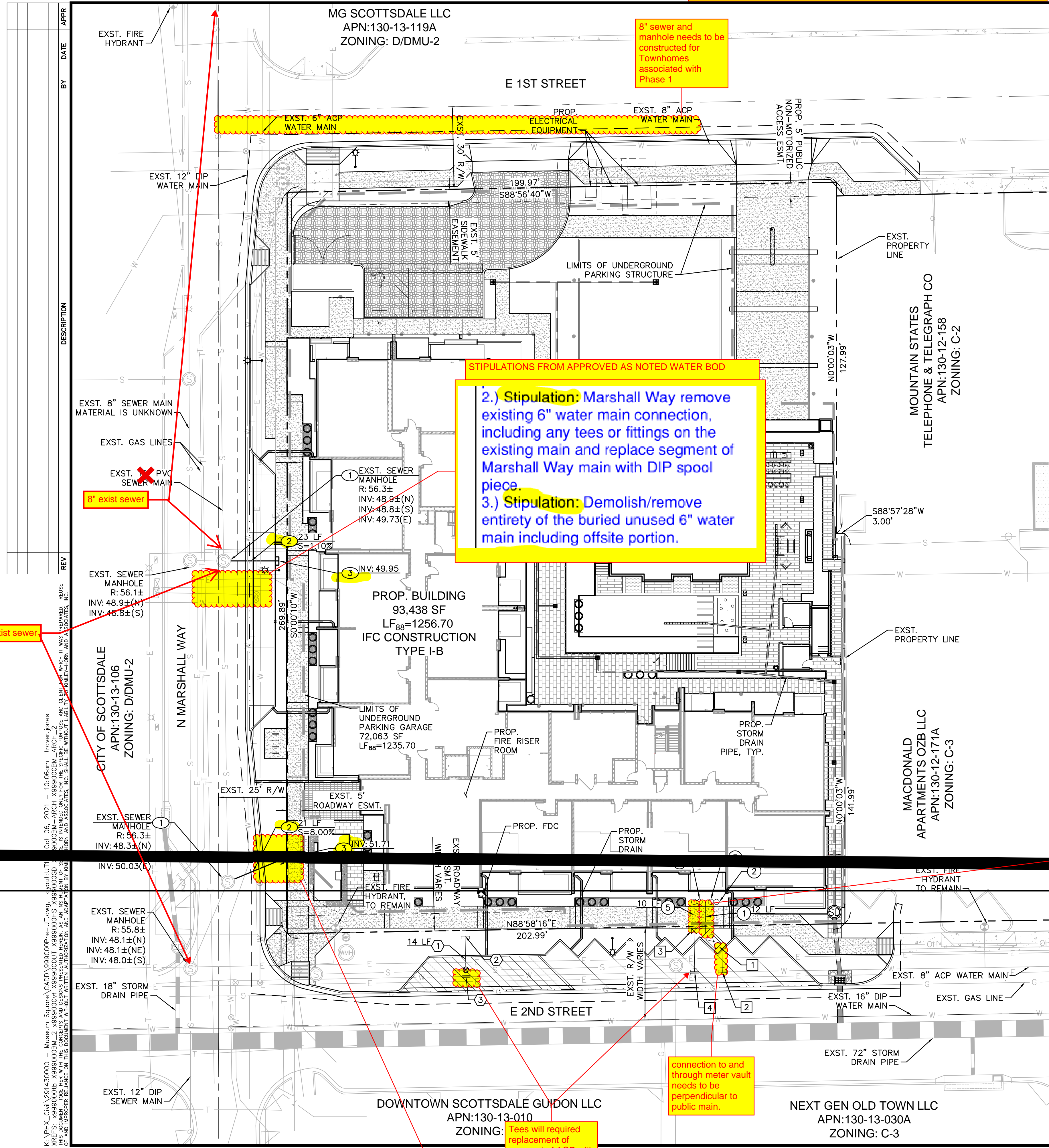
PRELIMINARY IN NATURE
THIS PHASING IS SUBJECT
TO CHANGE BASED ON
ECONOMIC FACTORS.

MUSEUM SQUARE PHASING EXHIBIT
UTILITIES
10/5/2021

Kimley»Horn

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

LDillon, COS Water Resources, 11/1/2021



DEVELOPER/OWNER
ARC SCOTTSDALE HOLDINGS, LLLP
3225 N CENTRAL AVE, STE 100
PHOENIX, AZ 85012
PH: (480) 315-1108
CONTACT: BILL BORDERS

LAND SURVEYOR
SURVEY INNOVATION GROUP, INC
22425 N 16TH ST, STE 1
PHOENIX, ARIZONA 85024
PH: (480) 922-0780
CONTACT: JARED HANSMANN, R.L.S.

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC
7740 N 16TH STREET, STE 300
PHOENIX, ARIZONA 85020
PH: (602) 944-5500
CONTACT: TRAYER JONES, PE

ARCHITECT
SWABACK PLLC
7550 E MCDONALD DR
SCOTTSDALE, ARIZONA 85250
PH: (480) 367-2100
CONTACT: JEFF DENZAK

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.

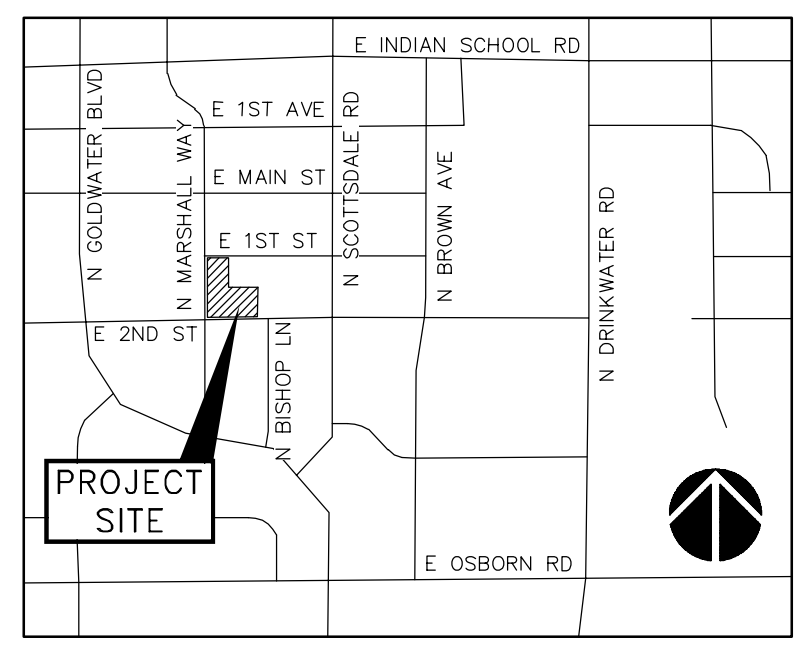
BENCHMARK
FOUND 3" CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE AT THE INTERSECTION OF OSBORN ROAD AND SCOTTSDALE ROAD.
GDACS DATA
NAVD88
ELEVATION = 1246.52'

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

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
- EXISTING SEWER MAIN
- EXISTING PUBLIC WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED SEWER MAIN
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- EXISTING MANHOLE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- PROPOSED CATCH BASIN



VICINITY MAP
SCOTTSDALE, AZ
N.T.S.

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.

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.

SEWER CONSTRUCTION NOTES

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

FIRE CONSTRUCTION NOTES

- 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.
- CONNECT TO BUILDING FIRE LINE, REF MEP PLANS FOR CONTINUATION. BACKFLOW PREVENTOR TO BE IN FIRE RISER ROOM.
- INSTALL 8"X8" TEE AND 8" GATE VALVE PER MAG STD DET 391-1.

PUBLIC WATER CONSTRUCTION NOTES

- 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.
- INSTALL 8"X3" TAPPING SLEEVE.
- INSTALL TYPE "K" COPPER WATER SERVICE LINE CONNECTION WITH 1" LANDSCAPE DOMESTIC WATER FORCES.
- INSTALL 8"X1" TAPPING SLEEVE.

PRIVATE WATER CONSTRUCTION NOTES

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

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.

Pool backwash shall be routed here per stipulation

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.

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

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

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

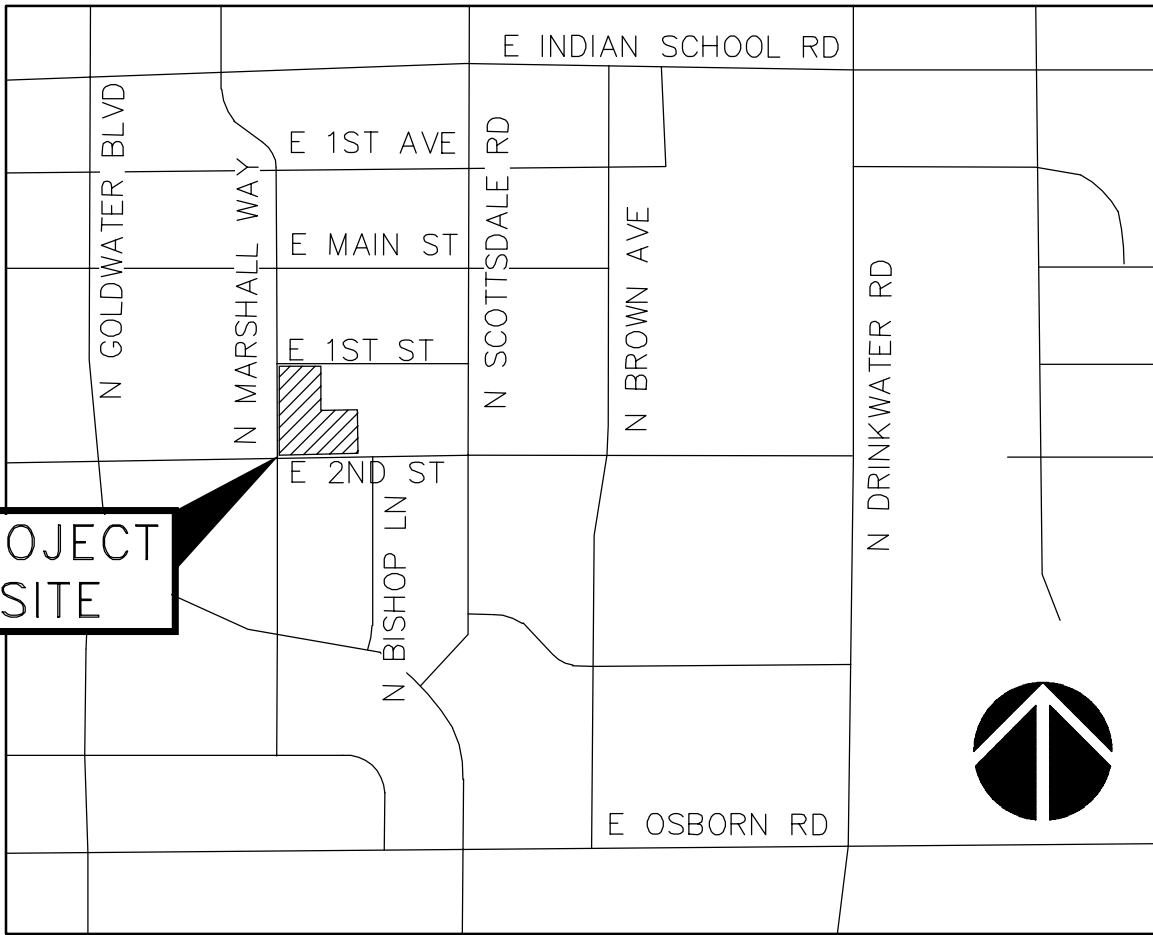
Professional Engineer (PE) No. 52738
TRAYER JONES
Arizona, USA
Exp. 12/15/21

UT1
1 OF 1 SHEETS

Oct 05, 2021 - 10:06am - trayer.jones
80008M-ARCH_X999000M_ARCH_2
K:\PHX_Civil\291430000 - Museum_Survey\CADD\999000Pre-UT.dwg, L:\X:\UT
XREFS: X999000M_ARCH_X999000M_ARCH_2 X999000M_ARCH_X999000M_ARCH_2
DATE AND TIME: 10/05/21 10:06:00 AM
DRAWN BY: TRAYER JONES
CHECKED BY: BEQ
DATE: 10/05/21



Appendix A – Vicinity Map



PROJECT
SITE

VICINITY MAP

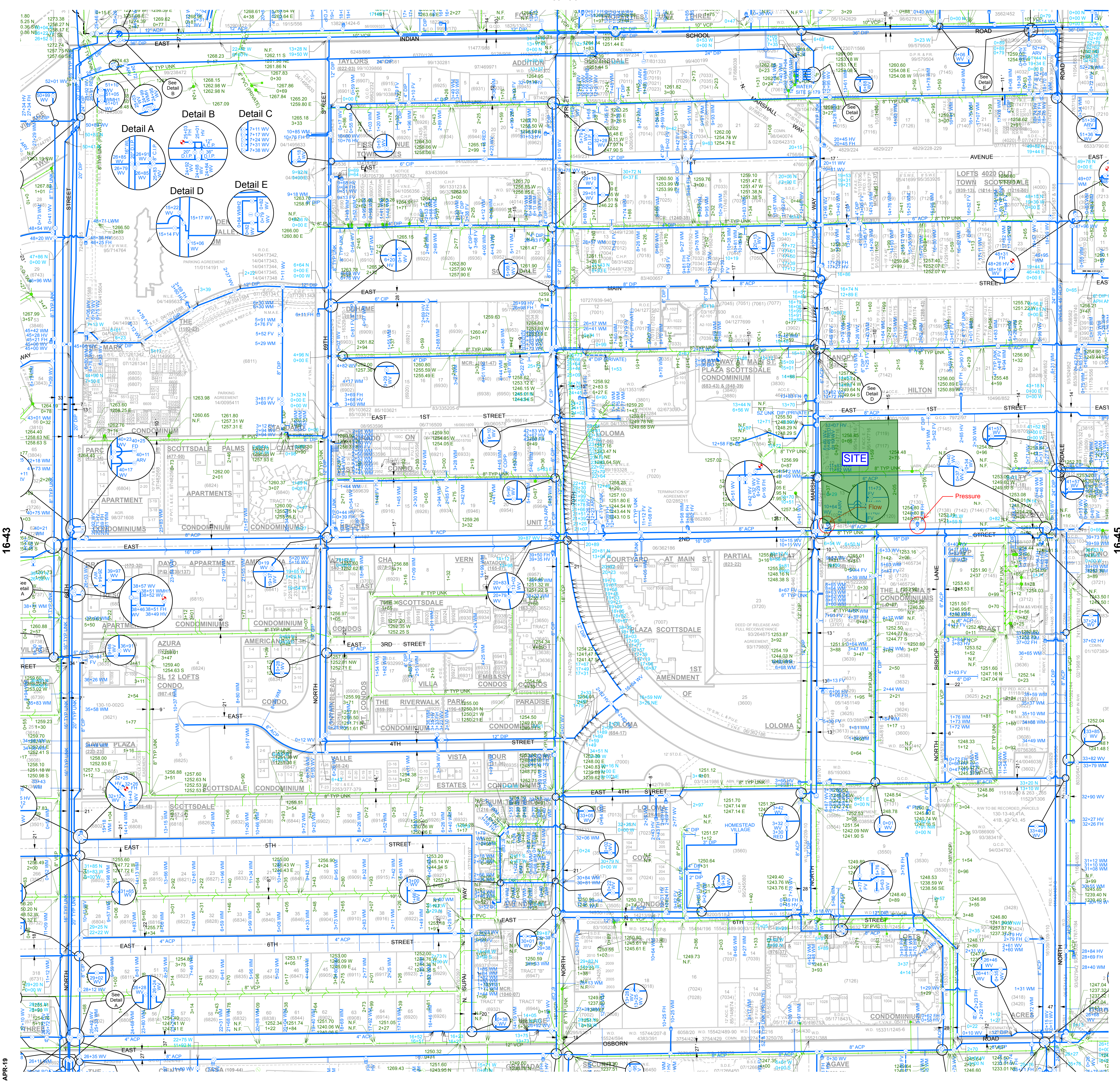
SCOTTSDALE, AZ
N.T.S.

Appendix B –Site Plan



The master plan for Museum Square

Appendix C – Scottsdale Quarter Section Map and Sewer Camera Test Results

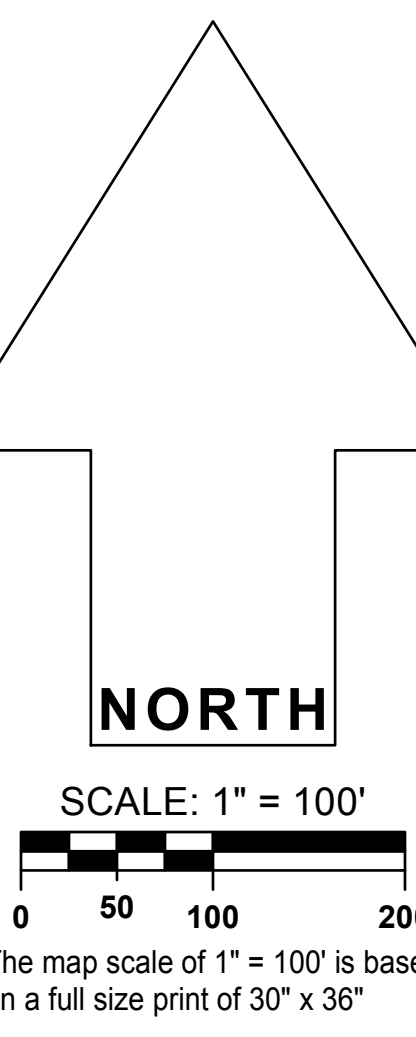
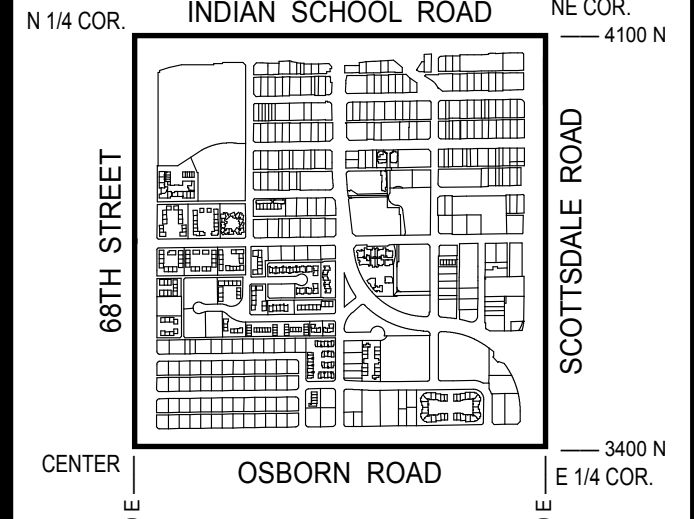


GENERAL NOTES:
 * THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.
 * THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED 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 Lift Station
- Sewer Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Non-Scottsdale Sewer Main
- Sewer Service

VICINITY MAP



WATER & SEWER
 QUARTER SECTION MAP
16-44
 NE 1/4 SEC. 27 T2N R4E

NOTICE
 THIS DOCUMENT IS PROVIDED FOR GENERAL INFORMATION PURPOSES ONLY. THE CITY OF SCOTTSDALE DOES NOT WARRANT ITS ACCURACY, COMPLETENESS OR SUITABILITY FOR ANY PARTICULAR PURPOSE. IT SHOULD NOT BE RELIED UPON WITHOUT FIELD VERIFICATION.
 21-APR-19
 THE CITY OF SCOTTSDALE

Professional Pipe Services
4940 W Watkins St
Phoenix, AZ 85043
602.861.3944



Project Summary

MUSEUM SQUARE SEWER

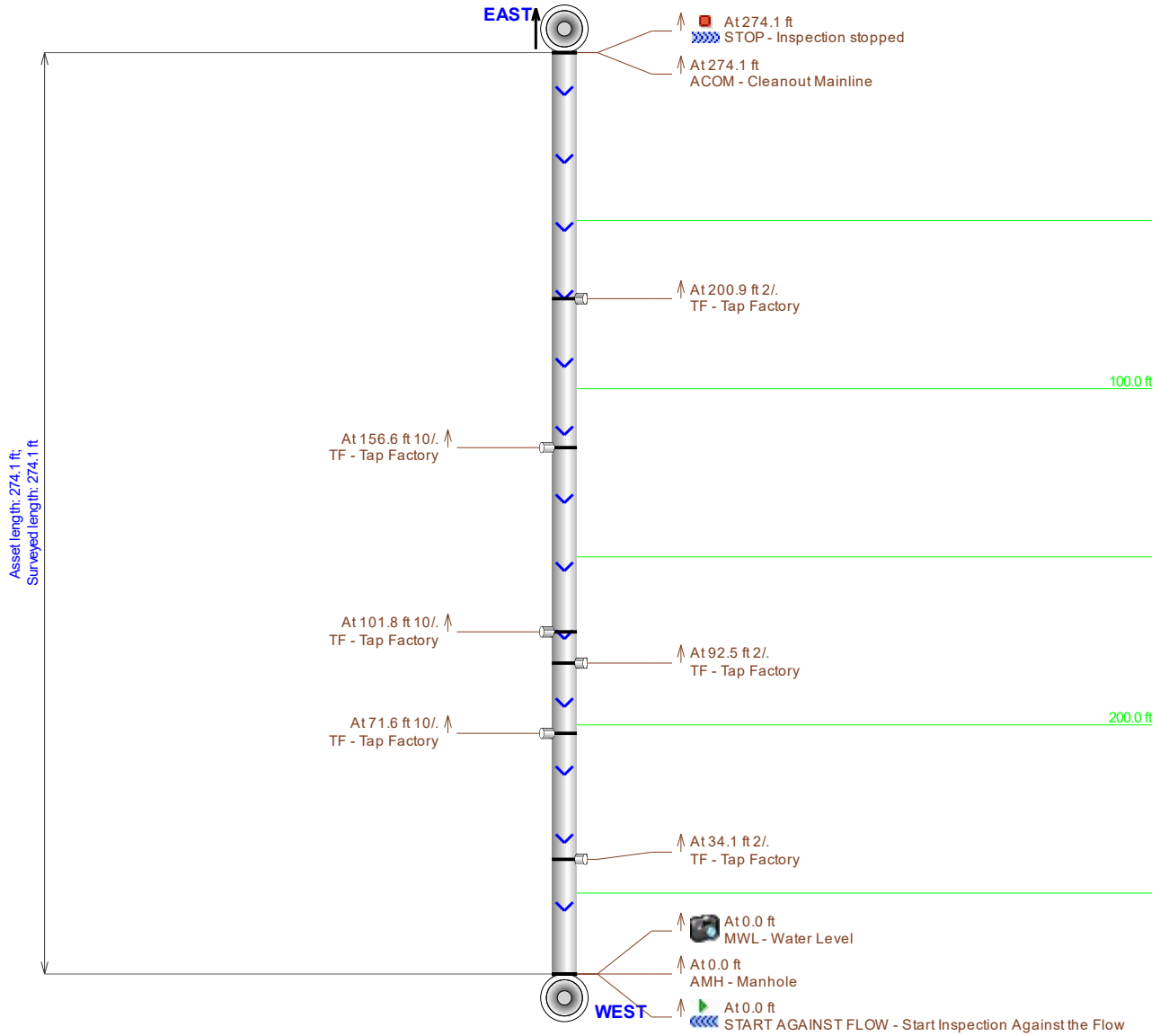
Main ID	Date	Address	Start MH	Finish MH	Pipe	Asset length	Surveyed Length
EAST-WEST	7/13/2020	MARSHALL	WEST	EAST	VCP	274.1	274.1

Number of inspections: 1 **Subtotal** 274.1 ft 274.1 ft

Total 274.1 ft 274.1 ft

Main Inspection with Pipe-Run Graph

Project Name: MUSEUM SQUARE SEWER	Pipeline segment ref: EAST-WEST	City: SCOTTSDALE, AZ	Street: MARSHALL
Start date/time: 7/13/2020	Width: 	Height: 8	Material: VCP
Location code: 	Weather: 		
Direction: UPSTREAM	Length surveyed: 274.1	Surveyed by: BRIAN N	Additional info:






Observation Report with Still Images

Pipeline segment ref: EAST-WEST	Project Name: MUSEUM SQUARE SEWER	Start date/time: 7/13/2020 8:07:57 AM	Weather:	Surveyed by: BRIAN N	
Upstream manhole No: EAST	Depth US:	Downstream manhole No: WEST	Depth DS:	Total length: 274.1	Extra:

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
0.0		START AGAINST FLOW	Yes	/		
0.0		AMH	Yes	/		WEST - START SURVEY
0.0		MWL	Yes	/		
<div style="display: flex; align-items: center;">  </div>						
34.1		TF	Yes	2 /		
71.6		TF	Yes	10 /		
92.5		TF	Yes	2 /		
101.8		TF	Yes	10 /		
156.6		TF	Yes	10 /		
200.9		TF	Yes	2 /		
274.1		ACOM	Yes	/		WEST - END SURVEY
274.1		STOP	Yes	/		

3/13/2020

116.9 FT

U~C

Uppercase and lowercase letters
Punctuation marks and symbols

Special characters

Numbers

Alphabets

and symbols

Uppercase letters
Lowercase letters
Punctuation marks
Special characters
Numbers
Alphabets
and symbols

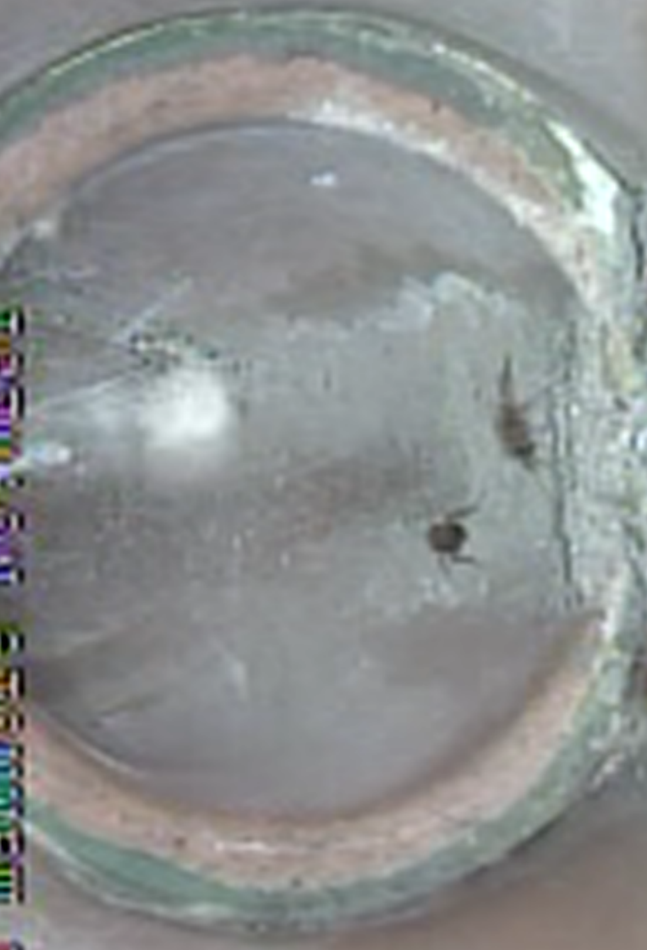
7/13/2020

271.0 FT

വർഷങ്ങൾക്കുള്ളിൽ മാറ്റം വരുത്തേണ്ടിരിക്കുന്ന
വർഷങ്ങൾക്കുള്ളിൽ മാറ്റം വരുത്തേണ്ടിരിക്കുന്ന

B~C

വർഷങ്ങൾക്കുള്ളിൽ മാറ്റം വരുത്തേണ്ടിരിക്കുന്ന



Appendix D – Sewer Calculations

Worksheet for 6" (140 gpm)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.01100 ft/ft
Diameter	6.0 in
Discharge	140.00 gpm
Results	
Normal Depth	3.1 in
Flow Area	0.1 ft ²
Wetted Perimeter	0.8 ft
Hydraulic Radius	1.5 in
Top Width	0.50 ft
Critical Depth	3.4 in
Percent Full	51.8 %
Critical Slope	0.00825 ft/ft
Velocity	3.04 ft/s
Velocity Head	0.14 ft
Specific Energy	0.40 ft
Froude Number	1.183
Maximum Discharge	284.12 gpm
Discharge Full	264.12 gpm
Slope Full	0.00309 ft/ft
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	51.8 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.1 in
Critical Depth	3.4 in
Channel Slope	0.01100 ft/ft
Critical Slope	0.00825 ft/ft

Worksheet for 10" No Pool Backwash (475 gpm)

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.00390 ft/ft
Diameter	10.0 in
Discharge	475.00 gpm
Results	
Normal Depth	6.6 in
Flow Area	0.4 ft ²
Wetted Perimeter	1.6 ft
Hydraulic Radius	2.9 in
Top Width	0.79 ft
Critical Depth	5.5 in
Percent Full	66.0 %
Critical Slope	0.00683 ft/ft
Velocity	2.77 ft/s
Velocity Head	0.12 ft
Specific Energy	0.67 ft
Froude Number	0.702
Maximum Discharge	660.58 gpm
Discharge Full	614.09 gpm
Slope Full	0.00233 ft/ft
Flow Type	Subcritical
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	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	6.6 in
Critical Depth	5.5 in
Channel Slope	0.00390 ft/ft
Critical Slope	0.00683 ft/ft

Worksheet for 10" with Pool Backwash (625 gpm)

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.00390 ft/ft
Diameter	10.0 in
Discharge	625.00 gpm
Results	
Normal Depth	8.4 in
Flow Area	0.5 ft ²
Wetted Perimeter	1.9 ft
Hydraulic Radius	3.0 in
Top Width	0.62 ft
Critical Depth	6.3 in
Percent Full	83.7 %
Critical Slope	0.00760 ft/ft
Velocity	2.86 ft/s
Velocity Head	0.13 ft
Specific Energy	0.82 ft
Froude Number	0.566
Maximum Discharge	660.58 gpm
Discharge Full	614.09 gpm
Slope Full	0.00404 ft/ft
Flow Type	Subcritical
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	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	8.4 in
Critical Depth	6.3 in
Channel Slope	0.00390 ft/ft
Critical Slope	0.00760 ft/ft

Worksheet for 12" No Pool Backwash (708 gpm)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.00480 ft/ft
Diameter	12.0 in
Discharge	708.00 gpm
Results	
Normal Depth	7.0 in
Flow Area	0.5 ft ²
Wetted Perimeter	1.7 ft
Hydraulic Radius	3.3 in
Top Width	0.99 ft
Critical Depth	6.4 in
Percent Full	58.1 %
Critical Slope	0.00633 ft/ft
Velocity	3.33 ft/s
Velocity Head	0.17 ft
Specific Energy	0.75 ft
Froude Number	0.848
Maximum Discharge	1,191.70 gpm
Discharge Full	1,107.83 gpm
Slope Full	0.00196 ft/ft
Flow Type	Subcritical
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	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	7.0 in
Critical Depth	6.4 in
Channel Slope	0.00480 ft/ft
Critical Slope	0.00633 ft/ft

Worksheet for 12" with Pool Backwash (908 gpm)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.00480 ft/ft
Diameter	12.0 in
Discharge	908.00 gpm
Results	
Normal Depth	8.3 in
Flow Area	0.6 ft ²
Wetted Perimeter	2.0 ft
Hydraulic Radius	3.5 in
Top Width	0.93 ft
Critical Depth	7.3 in
Percent Full	68.9 %
Critical Slope	0.00689 ft/ft
Velocity	3.51 ft/s
Velocity Head	0.19 ft
Specific Energy	0.88 ft
Froude Number	0.784
Maximum Discharge	1,191.70 gpm
Discharge Full	1,107.83 gpm
Slope Full	0.00322 ft/ft
Flow Type	Subcritical
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	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	8.3 in
Critical Depth	7.3 in
Channel Slope	0.00480 ft/ft
Critical Slope	0.00689 ft/ft

Appendix E – 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

Future townhomes must route a new public sewer generally along this routing. Refer to attached utility phasing plan.

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CONTACT: BILL BORDERS

LAND SURVEYOR
SURVEY INNOVATION GROUP, INC
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CONTACT: JARED HANSMANN, R.L.S.

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC
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PH: (602) 944-5500
CONTACT: TRAVER JONES, PE

ARCHITECT
SWABACK PLLC
7550 E MCDONALD DR
SCOTTSDALE, ARIZONA 85250
PH: (480) 367-2100
CONTACT: JEFF DENZAK

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.

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
---	EXISTING STORM DRAIN
⊗	EXISTING MANHOLE
⊙	EXISTING FIRE HYDRANT
⊕	PROPOSED FIRE HYDRANT
⊖	PROPOSED CATCH BASIN

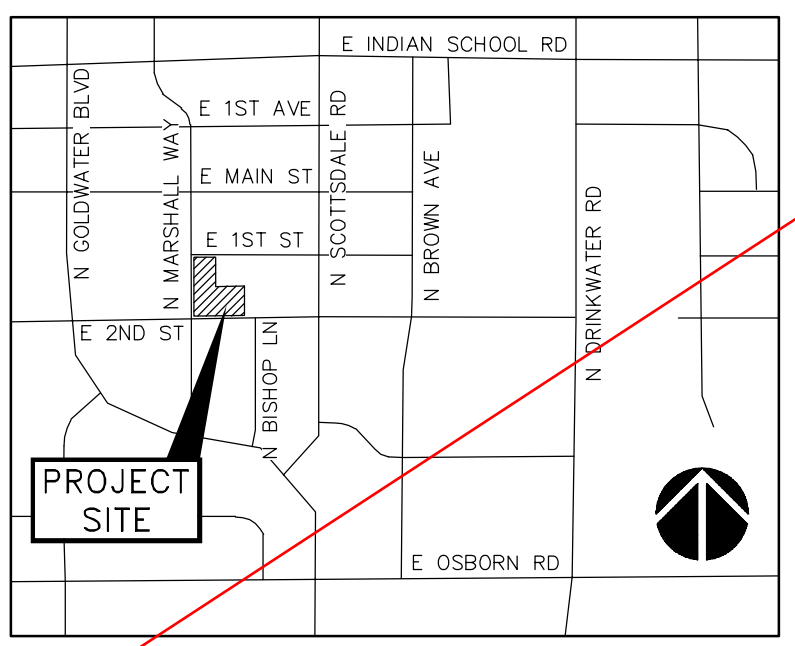
Shall be per MAG 440-3. Two-way likely acceptable also. Call out MAG detail.

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

- FIRE CONSTRUCTION NOTES**
- 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.
 - CONNECT TO BUILDING FIRE LINE, REF MEP PLANS FOR CONTINUATION. BACKFLOW PREVENTOR TO BE IN FIRE RISER ROOM.
 - INSTALL 8"x8" TEE AND 8" GATE VALVE PER MAG STD DET 391-1.

- PUBLIC WATER CONSTRUCTION NOTES**
- 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.
 - INSTALL 8"x3" TAPPING SLEEVE.
 - INSTALL TYPE "K" COPPER WATER SERVICE LINE CONNECTION WITH 1" LANDSCAPE DOMESTIC WATER METER AND BOX. METER TO BE INSTALLED BY CITY FORCES.
 - INSTALL 8"x1" TAPPING SLEEVE.

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



VICINITY MAP
SCOTTSDALE, AZ
N.T.S.

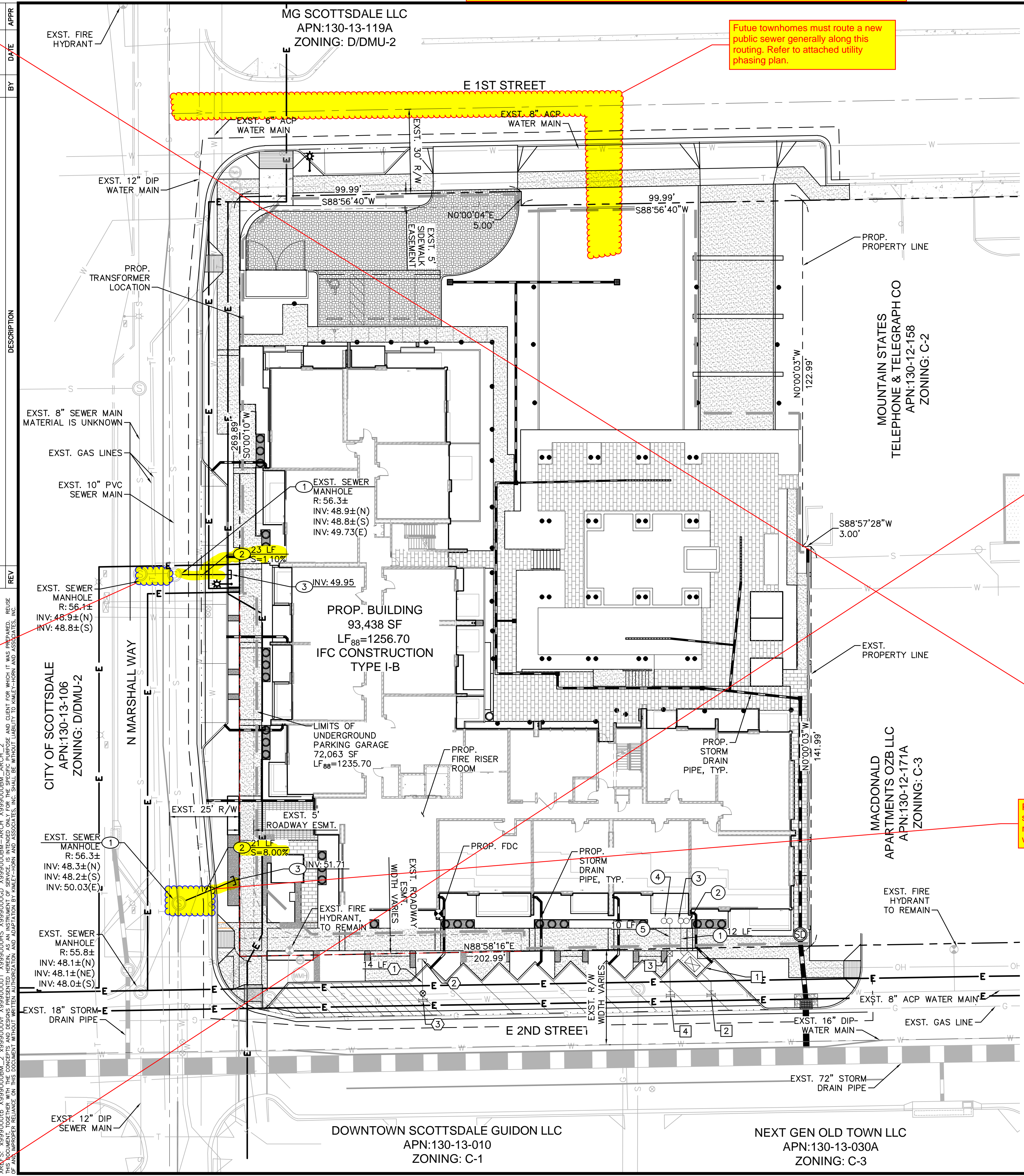
Kimley-Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

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

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



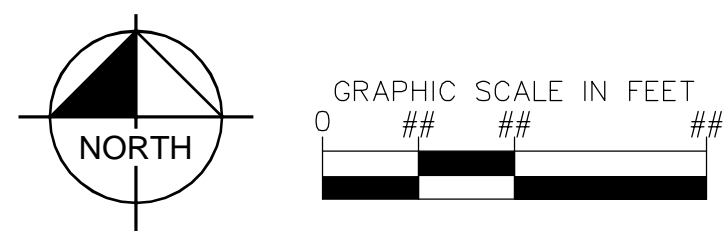
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UT1
1 OF 1 SHEETS



Still in place? confirm on plans. Could be left as emergency reliever is high enough above eastern sewer inverts.

Pool backwash should be routed to this service line, even better would be to route it to the manhole to the south, where sewer changes to 12"

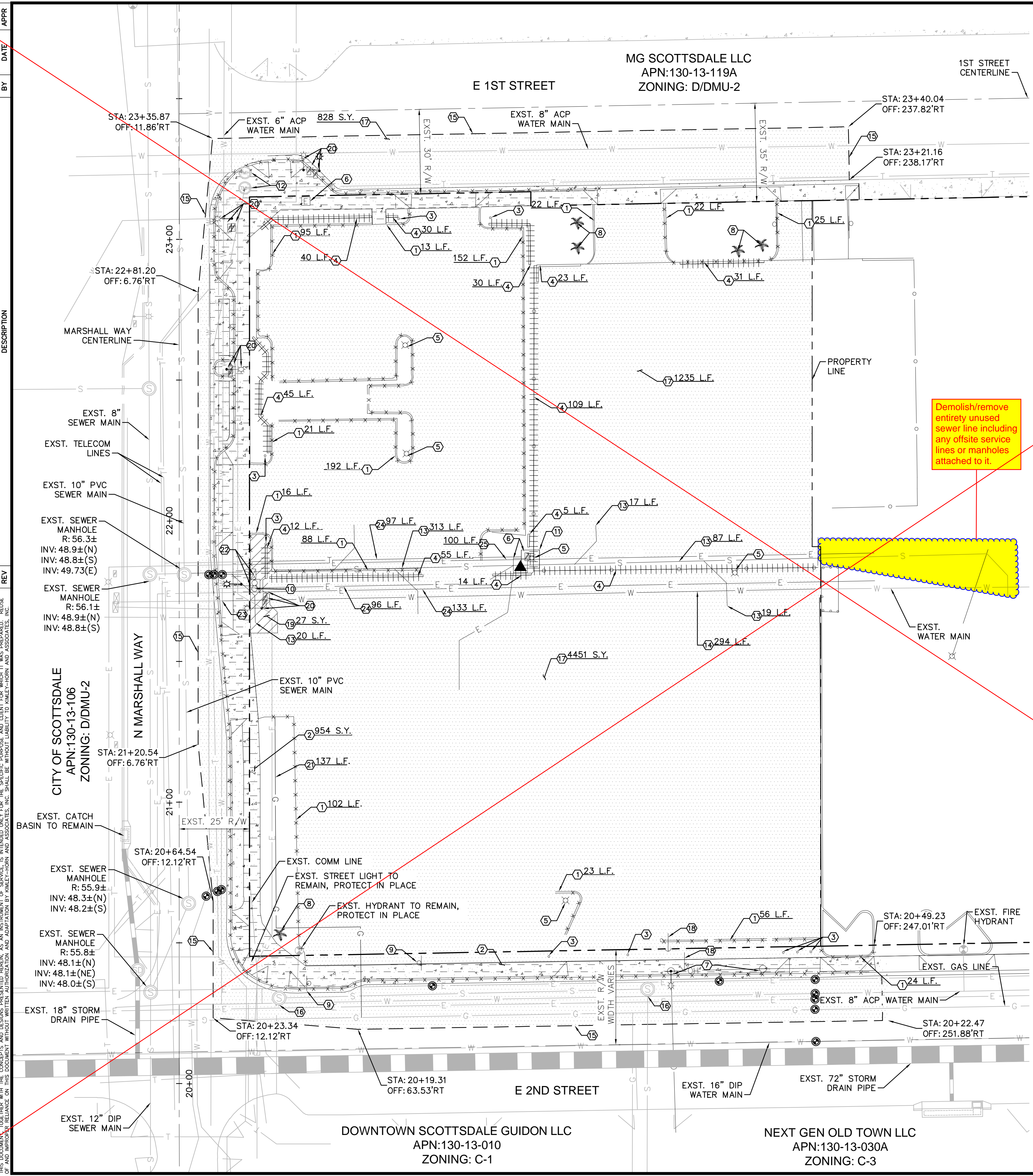
DATE: APR 28, 2021 11:49am
BY: TRAVER JONES
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Refer to updated figure version on last two pages of main report body. Comments and information on this figure are only applicable if not modified there. LDillon 11/4/2021

REV	DESCRIPTION	DATE	BY	APPROVED



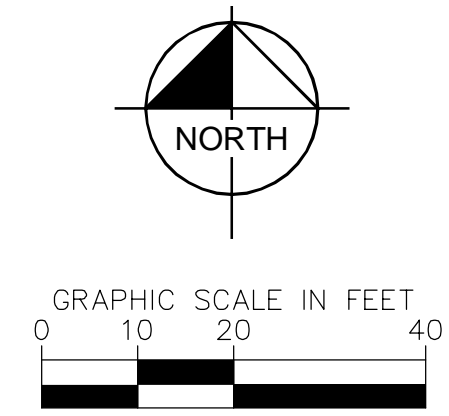
DEMOLITION NOTES

- 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 ABANDONMENTS 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 EXISTING 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 entirely unused sewer line including any offsite service lines or manholes attached to it.

LEGEND

- x x x x - 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



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.

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
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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



Appendix F – Museum Square
Preliminary Basis of Design for
Wastewater

PRELIMINARY BASIS OF DESIGN for WASTEWATER MUSEUM SQUARE

PRELIMINARY Basis of Design Report

- ACCEPTED
 ACCEPTED AS NOTED
 REVISE AND RESUBMIT



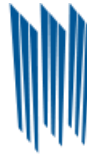
2nd Steet and Marshall Way
Scottsdale, AZ

Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.

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

BY Idillon DATE 11/14/2018

Prepared For:



MACDONALD
DEVELOPMENT CORPORATION

3225 N. Central Avenue, Suite 100
Phoenix, AZ 85012

Comments throughout.
See next page for
highlights.

Prepared by:



Sustainability Engineering Group
8280 E. Gelding Drive, Suite 101
Scottsdale, AZ 85260
480.588.7226 www.azSEG.com
Project Number: 180109



EXPIRES 12-31-19

This is review Round 3



Submittal Date: June 15, 2018
Revision Date: September 25, 2018

Case No.: 391-PA-2018; 13-ZN-2018

Plan Check No.: TBD

LDillon comments 11/14/2018

New 10"/8" parallel sewer servicing Canopy Hotel and Museum Square hotel and condos is proposed herein. Coordination with Canopy is required as Canopy is further along.



If a parallel sewer is not able to be constructed then upsizing of the existing sewer shall be required. Upsized sewer shall convey 813gpm/453gpm at max $d/D=0.65$. Given the slope of the existing 8" sewer this would be a 12-inch min sewer from 2nd Street north to Museum Square Hotel/condo tie-in to convey 813gpm, then a 10-inch min sewer north to alley north of 1st street to convey 453gpm.

Note that only 4.5ft of wall to wall separation from new to existing sewer is shown on the utility plan herein. Minimum separation is 6 feet. Refer to utility plan comments.

Private sewer shall conform to Scottsdale adopted plumbing code.

Per Section 5.1 herein: "South of 2nd Street - three residential buildings will be constructed over a common underground garage and operate as a single structure located on a single lot under management of a property agreement. Sewer service will be routed through a privately owned, operated and maintained sewer line from each high-rise down through the garage and over to Marshall Way"

Note that garage limits are not clear on utility plan herein. Several sections of pipe appears to leave building envelope and reenter another building. This is not allowed per plumbing code. Clarify/correct as needed on submitted plans.

Designer shall confirm all sewer diameters, inverts, and hydraulic/capacity conformance for formal design and plan submittal.

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EXECUTIVE SUMMARY

Museum Square is a proposed mixed-use development located within the West Main Street area of Scottsdale generally lying south and west of East 1st Avenue and Marshall Way. The project includes:

- a high-rise hotel
- an apartment / condominium building
- three high-rise residential buildings
- related site amenities

1. INTRODUCTION

1.1 OBJECTIVE:

The purpose of this report is to provide an analysis of the impact to the existing sewer system and make recommendations for any necessary improvements.

1.2 LEGAL DESCRIPTION:

The improvement area lies within Sections 27 of Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The present Assessor's Parcel Numbers are as follows:

Hotel: North of 2nd Street and west of Marshall Way. Part of APNs 130-13-106, -108, and -109A

Apartment / Condos: North of 2nd Street east of Marshall Way. APNs 130-13 -164A, -165A, -166A, and -169B

2nd Street ROW: APNs 130-13-111 and -112 (from Goldwater Blvd to Marshall Way). Plus, 121A and 131A

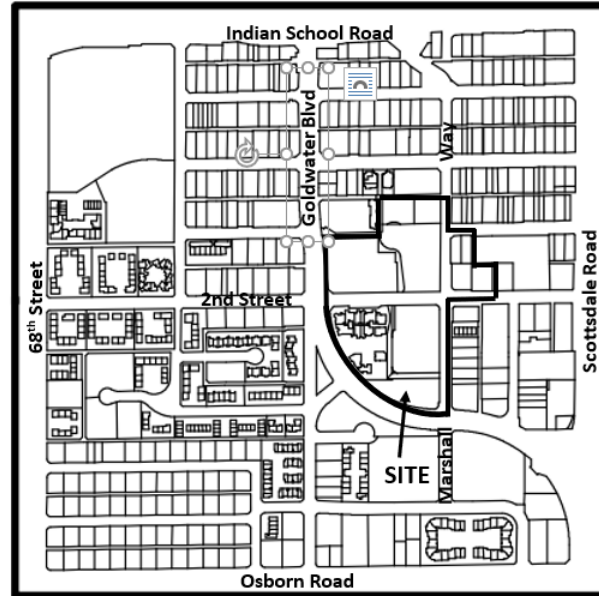
Marshall Way ROW: APNs 130-13-107 and -117 (from Goldwater Blvd to an alley south of E Main Street).

Residential Buildings: Courtyard at Main Street Plaza Scottsdale Condominium (MCR 973-06 and Loloma Partial Replat (MCR 823-22), and APN 130-12-172 an access drive.

1.3 EXISTING AND PROPOSED SITE ZONING AND LAND USES:

In 2003 Scottsdale City Council approved the Downtown Overlay to this general area. The original Loloma school site is zoned C-2 DO HP with the surrounding properties a mix of D/OC-2 PBD DO, D/DMU-2 PDB DO and D/OC-2 DO. The site presently supports the Loloma School, Museum of the West, The Stagebrush Theatre, the Loloma Transportation Center, and various parking areas. The transit center will be razed.

Proposed development will be a combination of a high-rise hotel, three residential buildings, and an apartment/condominium building along with the associated site amenities.



Vicinity Map

1.4 SUMMARY OF PROPOSED DEVELOPMENT:

297 residential units within four buildings and a hotel with 190 rooms are proposed on what is presently vacant land. Reference **APPENDIX I** for a **Preliminary Site Plan**.

2. DESIGN DOCUMENTATION AND CRITERIA

2.1 DESIGN COMPLIANCE:

The sewer system will be evaluated and designed compliant with the City's 2012 Water Reuse Master Plan and 2018 Design Standards and Criteria Manual (DS+PM) along with requirements of Arizona Department of Environmental Quality ("ADEQ") and Maricopa County Environmental Services Department ("MCESD").

Not applicable, flow monitoring performed

2.2 DESIGN DOCUMENTATION:

City of Scottsdale Sewer Quarter-Section Map 16-44
 Downtown water and sewer line as-built plans

OK, but field confirm for plan submittal, due diligence

2.3 DESIGN CRITERIA:

Domestic demands are from DS+PM Figure 7-1.2 Average Day Sewer Demand and referenced in **Table 1**.

TABLE 1 - AVERAGE DAILY DEMANDS

Land Use	Demand (gpd)	Units	Peaking Factors
High Density Condominium (condo)	140	per unit	4.5
Resort Hotel (includes site amenities)	380	per room	4.5
Restaurant	1.2	per sf	6
Commercial/ Retail	0.5	per sf	3
Commercial High Rise	0.5	per sf	3
Office	0.4	per sf	3
School: without cafeteria	30	per person	6

Same flows updated here were used for the Canopy hotel case analysis.

3. SEWER DEMANDS

3.1 AVERAGE DAY AND MAXIMUM DAY DEMANDS:

The following chart represents the proposed flow from both Museum Square and the Canopy Hotel projects. It will be added to the monitored peak flow for basis of evaluating the sewer infrastructure.

Canopy Hilton

TABLE 2 - CALCULATED WASTEWATER DEMANDS

Map Key	Use	Sq. Ft.	Units	Total Use (gpd)	ADD (gpm)	MDD (gpm)
4	Hotel		190	380	50.1	225.6
5	Residential	105,000	80	140	7.8	35.0
18	Hotel (by others)		176	380	46.4	209.0
N/A	School		50	30	1.0	6.3
Additional flow due to a pool backwash					100.0	100.0
New Demand North of 2nd Street					205.4	575.9
N/A	School		50	30	1.0	6.3
1	Residential	115,000	61	140	5.9	26.7
2	Residential	162,000	79	140	7.7	34.6
3	Residential	150,000	77	140	7.5	33.7
New Demand South of 2nd Street					22.1	101.2
Totals					227.5	677.1

309 gpm (100gpm Canopy pool backwash)

675.9

777.1 + 137gpm (exist. flows) ----- 908gpm

Note that there are also pools associated with residential building #2 and the apartment/condo building..simultaneous backwash of all 4 pools during peak sewer flow period is unlikely.. therefore only the 2 hotel pool backwash flows impacting the upper lower capacity 8" line are accounted for in the design flows revised in Table 2.

4. EXISTING SEWER INFRASTRUCTURE

4.1 EXISTING SEWER SYSTEM:

Wastewater from this area generally flows to Marshall Way. An 8" pipe north of 2nd Street flows to a 12" pipe south of 2nd Street, then continues south to a 12" pipe in Osborn Road and east to the trunk sewer in Miller Road. The City's modeled system includes hydraulics on the existing Osborn

Road line. Therefore, analysis of sewer capacities in this report will be limited to the sewer north of Osborn Road. ✓

Existing manhole inverts and related pipe slopes were surveyed. This data is shown on the Preliminary Utility Plan. The segment of 8" pipe with the shallowest slope is just north of 2nd Street at 0.0059 ft/ft. The segment of 12" pipe with the shallowest slope is just south of 4th Street at 0.0048 ft/ft.

Refer to **APPENDIX II – COS QS Map 16-44** and the **APPENDIX IV - Preliminary Utility Plan** for reference.

Table 3 and **Table 4** represent the existing pipe hydraulics of the two reaches described above.

TABLE 3 - Ex 8" Pipe at d/D = 0.65		
Inputs:		
Pipe Diameter, d _o	8	in
Manning Roughness, n	0.0130	
Slope (ft/ft)	0.0059	slope
d/D	0.65	fraction
Results:		
Flow, Q	315.1	gal/min
Velocity, v	2.9	ft/s
Velocity head, hv	0.1328	ft
Flow Area, A	34.5867	in ²
Wetted Perimeter, P	15.0039	in
Hydraulic Radius	2.3052	in
Top Width, T	7.6315	in
Froude Number, F	0.84	
Shear Stress (tractive force), τ	0.1596	psf

TABLE 5 - Ex 12" Pipe at d/D = 0.65		
Inputs:		
Pipe Diameter, d _o	12	in
Manning Roughness, n	0.0130	
Slope (ft/ft)	0.0048	slope
d/D	0.65	fraction
Results:		
Flow, Q	838.0	gal/min
Velocity, v	3.5	ft/s
Velocity head, hv	0.1855	ft
Flow Area, A	77.8201	in ²
Wetted Perimeter, P	22.5059	in
Hydraulic Radius	3.4578	in
Top Width, T	11.4473	in
Froude Number, F	0.81	
Shear Stress (tractive force), τ	0.1948	psf

4.2 FLOW MONITORING:

A flow monitor was placed by RDH Environmental in the manhole just south of 2nd Street (Ex. MH#7) on April 27, 2018 and data was collected for 14 days. RDH used an AV Sensor with logger to monitor the flow in the 12" pipe system flowing straight through the manhole. Notes indicate the flow was steady and the system was clean. A plotted flow graph of the 12" sewer in APPENDIX III – Flow Monitoring indicates an average high flow of approximately 30 gpm with sixteen daily spikes between 35 and 136.8 gpm. The realty school was verified to be closed at the time of monitoring.

used peak in capacity calcs ✓

5. PROPOSED SEWER INFRASTRUCTURE

5.1 LINE EXENSIONS:

A previous report for Zoning Case 21-ZN-2017 noted the proposed peak flows for that development were less than the existing peak flows generated by the present use, therefore, no offsite sewer improvements were found to be necessary for that project. The maximum monitored flow noted above is well within the capacity of the existing system.

not all info was provided or analysis completed for Canopy rezoning case

North of 2nd Street – a hotel and residential building along with the Canopy Hotel are occurring over presently vacant land. The sewer system is being evaluated by adding the proposed peak flow to the monitored maximum flow and checking capacity of the existing 8" sewer segment with the shallowest slope. From Table 2, the total maximum flow north of 2nd Street is proposed to be 713.7 gpm (575.9 + 136.8 gpm). A parallel reach of 10" sewer is will be constructed north of the 2nd Street intersection with a slope similar to the existing 8" pipe. The two pipes will have a combined capacity of 886.4 gpm (315.1 + 571.3 gpm). It should be noted that four highest existing peak flows were recorded in the midnight to 2 am period potentially representing final cleanup activities in local restaurants. The average daily flow was on the order of 30 to 35 gpm and would represent the time period of the proposed maximum residential demands.

675.9gpm

813gpm



If a parallel sewer is not able to be constructed then upsizing of the existing sewer shall be required. Upsized sewer shall convey 813gpm/453gpm at max d/D=0.65. Given the slope of the existing 8" sewer this would be a 12-inch min sewer from 2nd Street north to Museum Square Hotel/condo tie-in to convey 813gpm, then a 10-inch min sewer north to alley north of 1st street to convey 453gpm.

TABLE 5 - New 10" Pipe at d/D = 0.65		
Inputs:		
Pipe Diameter, d _o	10	in
Manning Roughness, n	0.0130	
Slope (ft/ft)	0.0059	slope
d/D	0.65	fraction
Results:		
Flow, Q	571.3	gal/min
Velocity, v	3.4	ft/s
velocity head, hv	0.1788	ft
Flow Area, A	54.0418	in ²
Wetted Perimeter, P	18.7549	in
Hydraulic Radius	2.8815	in
Top Width, T	9.5394	in
Froude Number, F	0.87	
Shear Stress (tractive force), τ	0.1995	psf

Note: new 8" sewer extending north from new 10" for Canopy would convey 309gpm
Smin=0.59%, d/D=0.65, ok ✓

225.6+100+35 +6.3+309= 676gpm, Smin=0.59%, d/D=0.73, acceptable in the 10" dead-end extension ✓

South of 2nd Street - three residential buildings will be constructed over a common underground garage and operate as a single structure located on a single lot under management of a property agreement. Sewer service will be routed through a privately owned, operated and maintained sewer line from each high-rise down through the garage and over to Marshall Way. Total flow in the existing 12" pipe at the connection to Marshall Way will be 813.9 ((677.1 (from Table 2) + 136.38 (monitored peak)). Capacity of the 12" sewer at a d/D of 0.65 per Table 4 is 838.0 gpm. As previously stated, the offset time periods of the existing vs. proposed peak flows along with consideration of a 100 gpm pool backwash provide a further buffer in the daily operating capacity of the 12" sewer.

913gpm

S_{min}=0.48%
, d/D=0.69
acceptable in
the 12" given
modest
upstream
basin size ✓

777gpm

for both hotels

5.2 SERVICES

All service laterals will be provided with cleanouts at the right-of-way per City requirements. Any proposed restaurant will need to provide an individual on-site grease interceptor.

5.3 PHASING:

The area will be developed in phases but it is anticipated the necessary building leads will be provided at the time of any public road improvements.

5.4 MAINTENANCE RESPONSIBILITIES:

No main extensions are proposed. Therefore, the existing public mains will continue to be owned, operated and maintained by the City.

6. SEWER SYSTEM COMPUTATIONS

6.1 PROCEDURES, POLICIES AND METHODOLOGIES:

Spreadsheets will be included in the final report detailing the flows and hydraulics of all pipes and laterals from the north end of this project down to the connection at Osborn Road. The City's sewer modeling output at Osborn Road will be requested for reference.

Separate discussion on this for Canopy Hotel. This may be applied to Museum Square as an in lieu payment or payback.

7. SUMMARY/CONCLUSIONS

7.1 SUMMARY OF PROPOSED SEWER IMPROVEMENTS:

One new reach of a parallel 10" public sewer main is proposed north of 2nd Street.

Sewer monitoring indicates the 12" line in Marshall Way south of 2nd Street is sufficient to serve this development.

7.2 PROJECT SCHEDULE:

Scottsdale board approvals are expected by Fall 2018. Final design reports and improvement plans will follow.

Yes, but 0.69 d/D is approaching upper reasonable limit

8. APPENDICIES

- I Preliminary Site Plan
- II COS Q-S Map
- III Sewer Flow Monitoring Results
- IV Preliminary Utility Plan

APPENDIX I

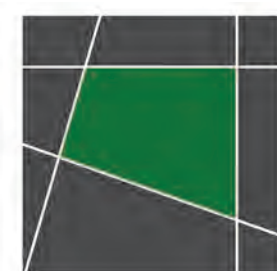
Preliminary Site Plan

MAP KEY

- 1** RESIDENTIAL BUILDING #1
- 11 STORIES
- 135' HEIGHT
- 2** RESIDENTIAL BUILDING #2
- 13 STORIES
- 150' HEIGHT
- 3** RESIDENTIAL BUILDING #3
- 13 STORIES
- 150' HEIGHT
- 4** HOTEL - THE ARIZONAN
- 13 STORIES
- 150' HEIGHT
- 190 KEYS
- 5** APARTMENT / CONDO BUILDING
- TBD
- 6** SURFACE PARKING LOT
- 120 SPACES
- 7** ADDITIONAL ON-STREET PARKING
- UP TO 46 SPACES (W. of Marshall Way)
- 8** RESIDENTIAL PARCEL PURCHASE
- 134,213 SQFT
- 9** NORTH / SOUTH DISTRICT PROMENADE
- 10** CONDOMINIUM PARKING TRAY
- 376 SPACES
- 11** GARAGE PARKING ACCESS
- 12** PLAZA / DRIVE COURT
- 13** MUSEUM "BRIDGE" EXPANSION
- 14** POOL & TERRACE
- 15** OPEN SPACE / GARDENS
- 16** MUSEUM EXPANSION
- 30,000 SQFT +/-
- 17** ADDITIONAL ON-STREET PARKING
- UP TO 21 SPACES (north of 1st street)
- 18** PROPOSED HOTEL (HILTON CANOPY)
- 66' HEIGHT
- 185 KEYS
- 19** MULTI-USE PUBLIC SPACE
- LAWN AREA, PATIOS, & TERRACES
- PERFORMANCE SPACE
- SPLASH PAD
- SCULPTURE GARDEN
- 20** RECONFIGURED HOTEL PARCEL PURCHASE
- (47,343 SQFT)
- 21** ADDITIONAL ON STREET PARKING
- UP TO 28 SPACES (south of 1st street)
- 22** PEDESTRIAN CONNECTION
- 23** ADDITIONAL ON-STREET PARKING
- UP TO 37 SPACES (East of Marshall Way)
- 24** HOTEL PARKING TRAY
- UPPER LEVEL (84 SPACES)
- LOWER LEVEL (84 SPACES)
- 25** COVERED PROMENADE
- 26** RECONFIGURED ENTRY DRIVE
(SHARED ACCESS / EGRESS)
- 27** ADDITIONAL ON-STREET PARKING
- UP TO 37 SPACES (South of 2nd Street)
- 28** MAIN ART SCHOOL SHARED
DRIVE ENTRY
- 29** HOTEL GARAGE PARKING ACCESS
- 30** THE GOLDWATER (CONDOMINIUMS)
- 31** NEW SIGNALIZED CROSSWALK
- 32** NEW SIGNALIZED MID-BLOCK
CROSSWALK (HAWK)



23F. SITE PLAN
6.12.18



APPENDIX II

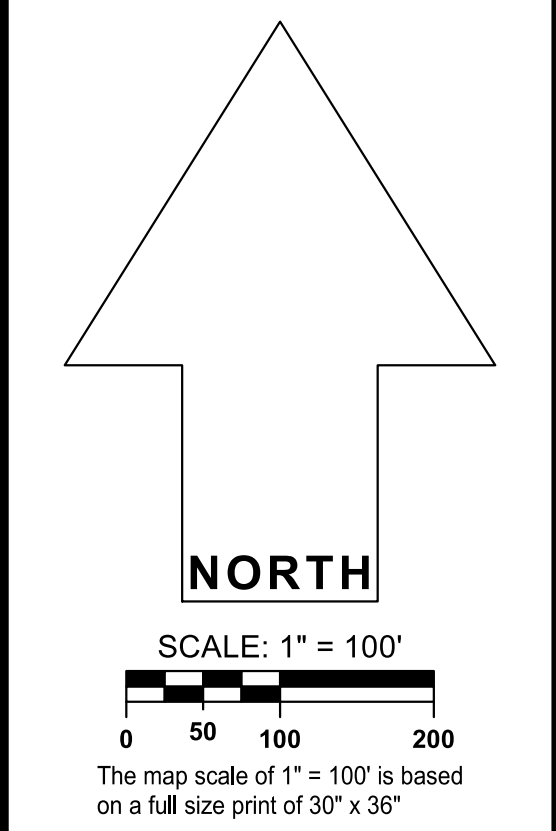
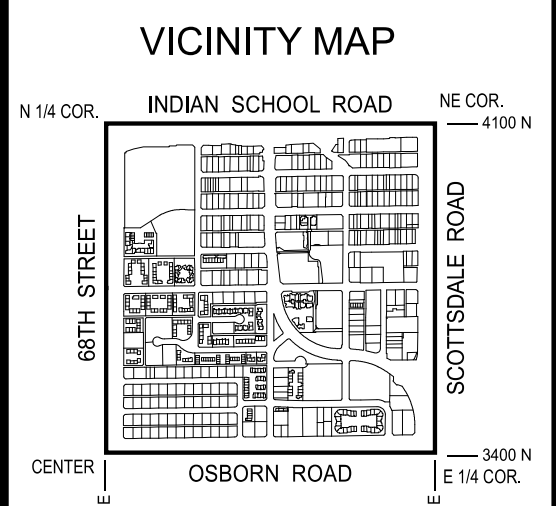
COS Q-S Map



GENERAL NOTES:
 * THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7162.
 * THE SECTION LINE BEARINGS AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER 1991. BEARINGS ARE IN 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
- Manhole
- Non-GPS Point
- Plug
- Sewer Service Point
- Sewer Tap Point
- Sewer Valve
- Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Sewer Main - Private



SEWER QUARTER SECTION MAP

16-44

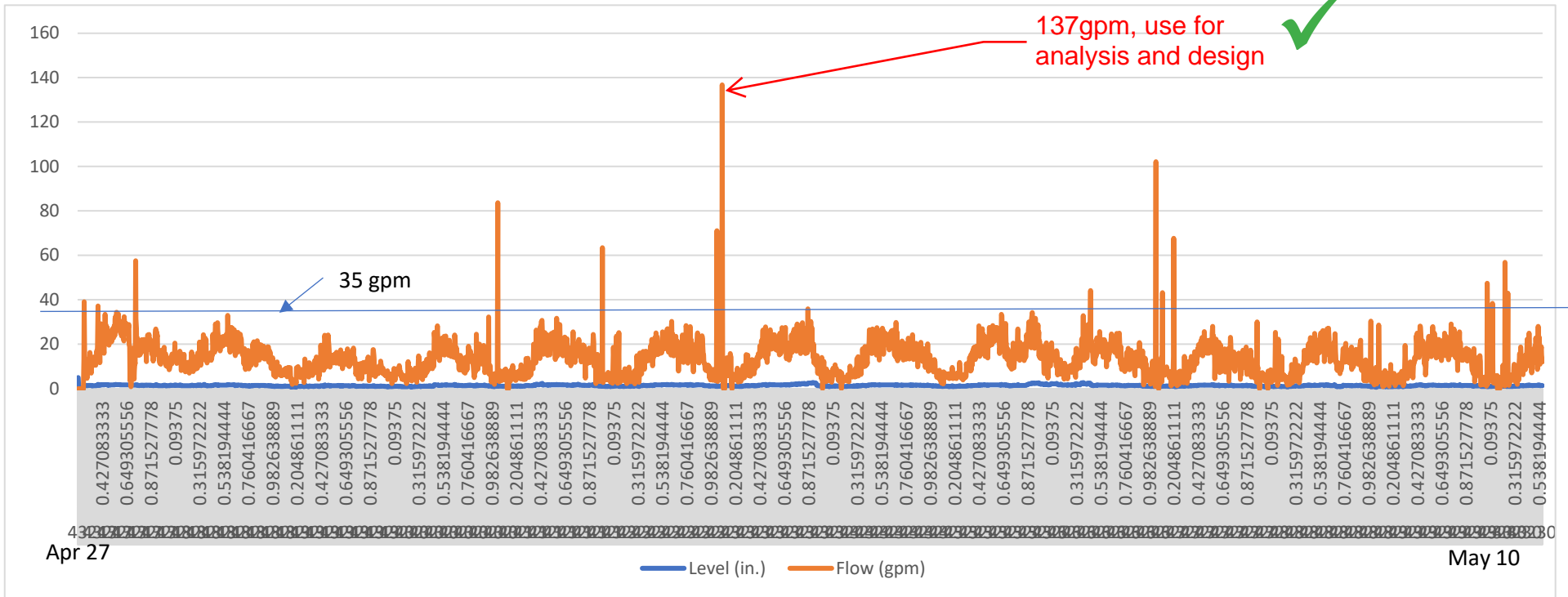
NE 1/4 SEC. 27 T2N R4E

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 25-JUN-17
 THE CITY OF SCOTTSDALE

APPENDIX III

Sewer Flow Monitoring Results

APPENDIX III - MONITORED FLOW DATA (gpm) ← In manhole on 12" Marshall line south of 2nd Street



APPENDIX III

Recorded Flows Above 35 gpm

Date	Time	Level (in.)	Flow (gpm)
3-May-18	2:05	1.643	136.766
7-May-18	1:05	1.484	102.221
1-May-18	0:55	1.462	83.724
3-May-18	0:55	1.33	71.094
7-May-18	5:00	1.352	67.727
1-May-18	23:50	1.372	63.433
27-Apr-18	17:35	1.721	57.539
10-May-18	5:35	1.32	56.858

Date	Time	Level (in.)	Flow (gpm)
10-May-18	1:40	1.199	47.416
6-May-18	10:45	2.187	44.143
7-May-18	2:30	1.197	43.257
10-May-18	6:10	1.214	42.955
27-Apr-18	6:20	1.544	39.167
10-May-18	2:50	1.307	38.379
27-Apr-18	9:20	1.907	37.216
3-May-18	20:50	2.501	35.929

APPENDIX IV

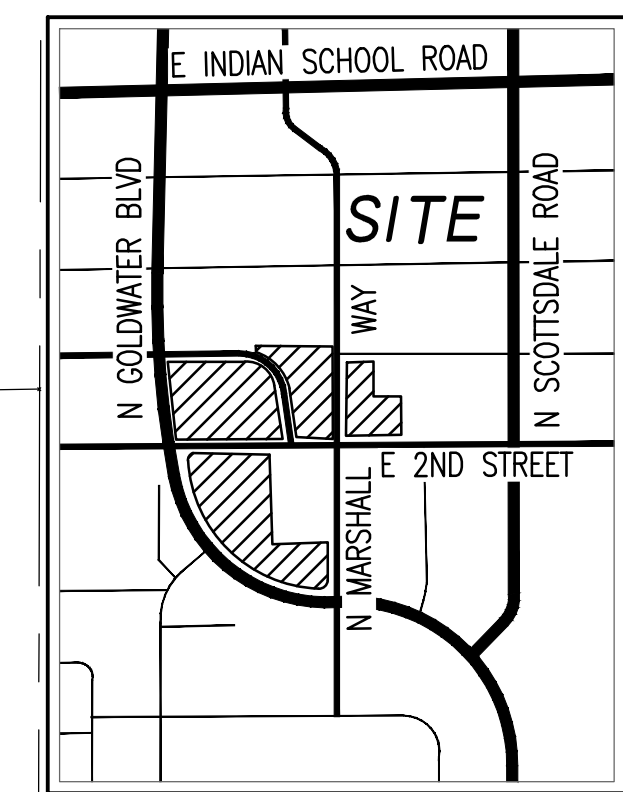
Preliminary Utility Plan

MUSEUM SQUARE
PRELIMINARY UTILITY PLAN
E 2ND STREET & N MARSHALL WAY SCOTTSDALE, AZ 85251

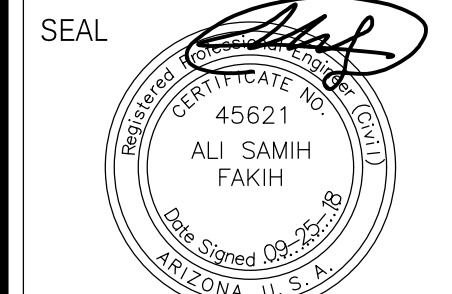
DEVELOPER
MACDONALD DEVELOPMENT
3225 N. CENTRAL AVENUE
PHOENIX, ARIZONA 85012
PHONE:
ATTN:

ARCHITECT
SWABACK
7550 E. MCDONALD DRIVE
SCOTTSDALE, ARIZONA 85260
PHONE: 480-367-2100
ATTN: CHRIS MCKIBBEN

ENGINEER
SUSTAINABILITY ENGINEERING GROUP
8280 E. GELDING DR. SUITE #101
SCOTTSDALE, ARIZONA 85260
PHONE: 480-588-7226
ATTN: ALI FAKIH

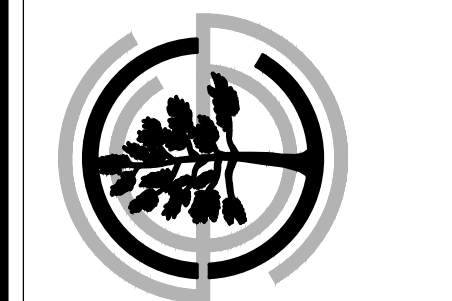


VICINITY MAP
SCALE: NTS



EXPIRES 12-31-18
PREPARED UNDER THE DIRECT SUPERVISION OF ALI FAKIH, P.E. FOR AND ON BEHALF OF SUSTAINABILITY ENGINEERING GROUP, LLC.

SEG
8280 E. GELDING DR. #101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL. 480.988.7226



MACDONALD DEVELOPMENT CORPORATION

PROJECT: MUSEUM SQUARE
LOCATION: E. 2ND STREET & N. MARSHALL WAY SCOTTSDALE, AZ 85251

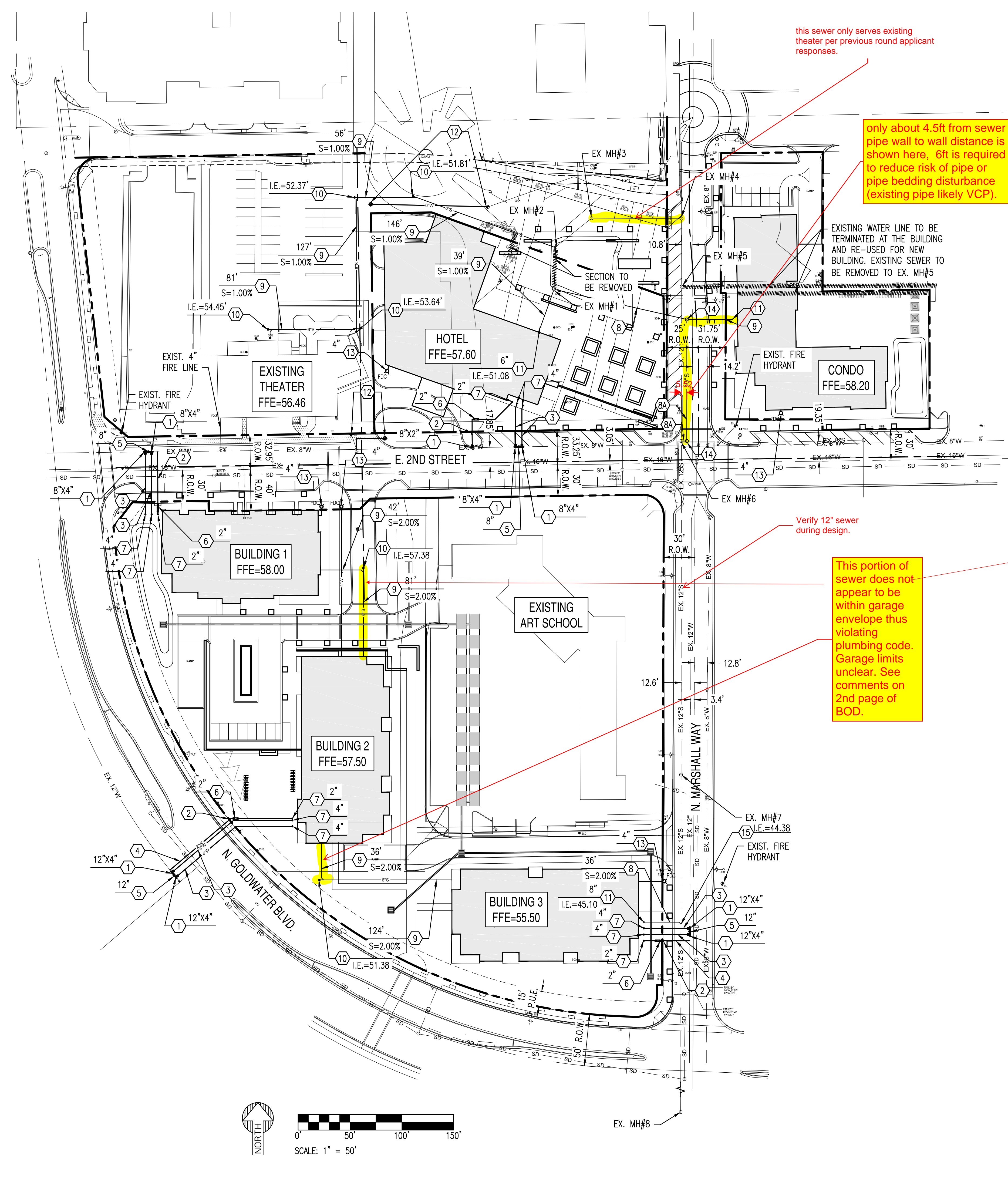
DRAWN: HARMOUCHE
DESIGNED: HARMOUCHE
CHECKED: COUNSELL
PROJ. MGR.: FAKIH

DATE: 09/25/2018
ISSUED FOR: REZONING

REVISION NO.	DATE

JOB NO.: 180109
SHEET TITLE: PRELIMINARY UTILITY PLAN

SHEET NO.: C4.00



this sewer only serves existing theater per previous round applicant responses.

only about 4.5ft from sewer pipe wall to wall distance is shown here, 6ft is required to reduce risk of pipe or pipe bedding disturbance (existing pipe likely VCP).

EXISTING WATER LINE TO BE TERMINATED AT THE BUILDING AND RE-USED FOR NEW BUILDING. EXISTING SEWER TO BE REMOVED TO EX. MH#5

SECTION TO BE REMOVED

Verify 12" sewer during design.

This portion of sewer does not appear to be within garage envelope thus violating plumbing code. Garage limits unclear. See comments on 2nd page of BOD.

NOTES:
1. SANITARY SEWER BETWEEN BUILDINGS 1 & 2 AND 2 & 3 IS TO BE BELOW UNDERGROUND PARKING STRUCTURE CEILING.

2. IN ACCORDANCE WITH COS REVISED CODE, ALL EXISTING OVERHEAD UTILITIES ALONG AND WITHIN THE PROJECT BOUNDARIES SHALL BE PLACED UNDERGROUND.

Surveyed independently per applicant

EXISTING SANITARY SEWER MANHOLE SCHEDULE

MANHOLE #	RIM	INVERT	INVERT
EX MH#1	1257.74'	1250.69'	N&S&W
EX MH#2	1257.63'	1250.18'	NE&S
EX MH#3	1257.33'	1250.83'	N
EX MH#4	1256.63'	1249.42'	N&S
EX MH#5	1256.20'	1248.95'	N&S
EX MH#6	1255.76'	1248.07'	N&S
EX MH#7	1254.09'	1244.11'	N&S
EX MH#8	1251.83'	1242.24'	N

KEY NOTES

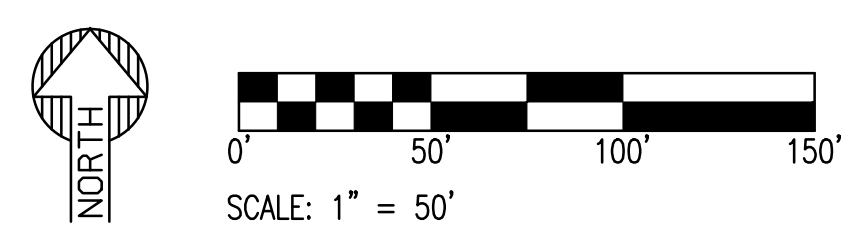
- ① TAPPING SLEEVE, VALVE, BOX, & COVER SIZE PER PLAN
- ② 2" WATER METER
- ③ 4" FIRE LINE
- ④ 2" WATER SERVICE
- ⑤ GATE VALVE, BOX, & COVER, SIZE PER PLAN
- ⑥ BACKFLOW PREVENTER, SIZE PER PLAN
- ⑦ TAPPED CAP WITH 2" CORP STOP, SIZE PER PLAN
- ⑧ 8" PVC SEWER LINE, SDR-35
- ⑧A 10" PVC SEWER LINE, SDR-35 ✓
- ⑨ 6" PVC SEWER LINE, SDR-35
- ⑩ SEWER CLEANOUT
- ⑪ SEWER PLUG, SIZE PER PLAN
- ⑫ RELOCATE EXISTING FIRE HYDRANT
- ⑬ FIRE DEPARTMENT CONNECTION (FDC), SIZE PER PLAN
- ⑭ NEW 4' DIA SANITARY SEWER MANHOLE
- ⑮ SEWER CONNECTION PER MAG STD DET. 440-2.

PROPOSED LEGEND

- 8" W WATER LINE
- METER BOX
- 6" S SEWER LINE
- BACKFLOW PREVENTER
- RISER ROOM
- TAPPING SLEEVE, VALVE BOX AND COVER
- FDC FIRE DEPART CONNECTION (FDC)

EXISTING LEGEND

- MANHOLE
- EX. 8" S SEWER LINE
- EX. 12" W WATER LINE
- FIRE HYDRANT
- CENTER LINE
- PROPERTY LINE



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COMMENT TRACKING LOG

CLIENT:	MacDonald Development	DATE:	9/11/2018
PROJECT:	Museum Square	REFERENCE:	Rezoning 2nd Comments

No.	Sheet No.	Reviewer	COMMENT	Responsible Party	RESPONSE
The following comments are from: City Of Scottsdale			Scottsdale Water: Levi Dillon		
1	Pg. 1	LD	Address comments on following page and throughout document.	SEG	Noted
2	Pg. 2	LD	1.) New 8" sewer extended north of 2nd Street. However, report text states it will be extended to new hotel. Utility plan only shows it extended to Building 5 (condo). It is expected and required that this new 8" sewer be extended all the way north to the new hotel as stated in the report. LDillon 9/7/18	SEG	It does go to Hotel service. The theater service from the west has been rerouted to go around the new hotel and has been separated from the hotel service.
3	Pg. 2	LD	2.) DS&PM 7-1.409. 2 cleanouts need to be added to each sewer service lines per MAG detail 440-3. LDillon 9/7/18	SEG	Added keynote 15 for MAG detail 440-2 (double CO)
4	Pg. 2	LD	3.) Refer to IPC 2015: utility plan needs to be modified to remove building sewer lines servicing multiple buildings from being routed underneath separate buildings. Multiple buildings may not share in the sewer system, public or private, that goes underneath other buildings. Update design and utility site plan included within BOD accordingly. LDillon 9/7/18"	SEG	Refer to Section 5.1 for clarification. Buildings are considered a single structure.

5	Pg. 2	LD	<p>4.) Sewer flow calculation in Table 2 states a negative flow of -41gpm (250 credit applied to 209) coming from map key area number 18. This is not possible unless the previous flow from this area was 459gpm and the revised flow for a development by others will be 209gpm. 209gpm should be used and the -250 gpm credit removed from the table. This will add 250gpm to the Table 2 totals. This will bring the existing sewer d/D up to max of 0.65 and require the new 8" sewer to be extended to accept the sewer from the new hotel. This will also result in the 12" sewer to slightly exceed 0.65 d/D (by the existing flow). Please further address the 12" flows in a subsequent ZN case BOD. LDillon 9/10/18</p>	SEG	Calculations are updated
6	Pg. 2	LD	<p>5.) Sewer outlet onto Marshall Way for building 1,2, and 3 is not clearly shown. Why is it shown with a sewer plug? Building leads for road work? LDillon 9/7/18</p>	SEG	Added keynote 15 for MAG detail 440-2 (double CO); all services are plugged / capped until building construction connects.
7	Pg. 2	LD	<p>6.) The utility plan provided shows the existing Marshall Way sewer south of 2nd street as 8". It should be shown as 12" south of 2nd Street as stated in the report (unless verified otherwise by the Engineer). LDillon 9/7/18</p>	SEG	Revised to 12"

8	Pg. 6	LD	<p>Refer to comment #4 on 2nd page: You are suggesting the future hotel and all upstream contributions will only amount to a peak of 95gpm...not valid!Canopy by Hilton in 22-DR-2018 SEG report suggests either a future max incoming basin flow of 394,000gpd (Table 3) or 693,000gpd (Figure 6), 273gpm or 481gpm, respectively. It is unclear in the SEG report where Fig.6 693,000gpd originates. Per SEG report 300,000gpd was to come from Canopy hotel versus 360,000gpd from AZ School of Real Estate and Business. As SEG projected, 79% (250gpm) of the existing total flow of 453,000gpd (314gpm) is from existing school flow, the flow monitoring data is therefore very sensitive to activities at the school. Given the large discrepancy of the peak flow monitoring value (136gpm) versus projected current peak flow (314gpm), and the inconsistency in the data it is unlikely the school flow was accurately captured, or captured at all, with flow monitoring.</p>	SEG	Calculations are updated
9	Pg. 6	LD	<p>In Table 2: -- Remove 250gpm credit. ---Add line item for existing flow amount of at least 64gpm (273-209), and at most 136gpm or more (if school not captured in flow monitoring or data is invalid)</p>	SEG	Calculations are updated. School reference is removed (building is vacant - not in operation during monitoring)

10	Pg. 6	LD	MDD 325.9 (gpm) change to 576-648gpm	SEG	Calculations updated
11	Pg. 6	LD	MDD 427.1 (gpm) change to 677-749gpm	SEG	Calculations updated
12	Pg. 6	LD	0.0059: Where did the revised inverts for 8" pipe come from to determine this slope? See note on utility plan.	SEG	Existing pipe data is confirmed by field survey
13	Pg. 7	LD	2.7 depth: Higher depths shown, why don't these correspond to higher flows? Is there averaging occurring? Want peak instantaneous minute flows not averages	SEG	Refer to revised monitoring data in Appendix III
14	Pg. 8	LD	Pool backwash: 576 to 648gpm, see section 3 notes. Proposed dual 8" should still work as long as all new hotel and condo flows go to new 8" sewer line.	SEG	Calculations updated
15	Pg. 8	LD	Tabel 4: 677 to 749gpm, see section 3 notes.	SEG	Calculations updated
16	Pg. 8	LD	Tabel 4 is 673.4 : Exceeding capacity slightly, in at least 1 pipe section	SEG	Calulations updated based on verified pipe data
17	Pg. 8	LD	(136.8 gpm + 427.1 gpm) : Refer to comments on flow monitoring data in appendix, could not make sense of data, no pattern...appears random. Was AZ real estate school in session?	SEG	Refer to revised monitoring data in Appendix III
18	Pg. 15	LD	Dates: Duration stated in report is 7 days.	SEG	Report corrected to 14 days
19	Pg. 15	LD	Dates: Was AZ real estate school in session?	SEG	No
20	Pg. 15	LD	Max Time: no consistent maximum, repeating diurnal pattern, random time and flow data	SEG	Refer to revised monitoring data in Appendix III

21	Pg. 15	LD	Maximum (in) 4.997: Depth of flow max here, where is corresponding max gpm value?	SEG	Refer to revised monitoring data in Appendix III
22	Pg. 15	LD	Maximum (in) 2.627 and Average (in) 1.677: Higher depths shown outside of May 3rd, why don't these correspond to higher flows? Is there averaging occurring? Want peak instantaneous minute flows not averages	SEG	Refer to revised monitoring data in Appendix III
23	Pg. 15	LD	DATA DOES NOT MAKE SENSE, NO INTERPRETATION OR EXPLANATION PROVIDED.	SEG	Refer to revised monitoring data in Appendix III
24	Pg. 17	LD	Extension of sewer appears to partially serve hotel	SEG	Theater and Hotel services are separated
25	Pg. 17	LD	Should be 12-inch sewer south of 2nd Street?? See note #6.	SEG	Revised to 12"
26	Pg. 17	LD	Shared building sewers under other buildings. Refer to note #3 in comments	SEG	Refer to Section 5.1 for clarification. Buildings are considered a single structure.
27	Pg. 17	LD	New 8" sewer extent only shown to condo, should extend to all points where hotel flows enter i.e. MH#4. Refer to note #1 in comments	SEG	New tie-in for Hotel is at proposed MH
28	Pg. 17	LD	Sewer connection and cleanout. Refer to note #2 and #5 in comments	SEG	Added key note 15
29	Pg. 17	LD	These elevations deviate from City GIS, what is the source of this information??	SEG	Verified by field survey

30	Pg. 17	LD	<p>Existing/Relevant GIS/quarter section invert data: MH#4 1248.29 MH#5 1247.95 Slope 4 to 5: $0.34/66=0.00515\text{ft}/\text{ft}$ (SEG has +0.00712) MH#6 1248.16 Slope 5 to 6: $-0.21/150=-0.0014\text{ft}/\text{ft}$** (SEG has +0.0058) **Slope is negative!!! Line slopes back to upstream manhole. Verify with invert survey data.</p>	SEG	Pipe data was verified by field survey
31	Pg. 17	LD	<p>Utility plan not reviewed for water infrastructure. Assumed no changes since 1st round "accepted as noted version".</p>	SEG	Noted