CITY OF SCOTTSDALE

Wastewater Study

Land DEVELOPMENT GROUP

PRELIMINARY WATER AND SEWER BASIS OF DESIGN REPORT

FLEETWOOD 6 TOWNHOMES
NEC 1st Ave. & 69th St.

PRELIMINARY Basis of Design Report

- ☐ ACCEPTED
- ☑ ACCEPTED AS NOTED
- ☐ REVISE AND RESUBMIT

CITY OF SCOTTSDALE
SCOTTSDALE WATER
9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY ldillon DATE 1/11/2019

PRELIMINARY

Address for final BOD during DR case: Domestic service line will supply fire sprinklers. Final sizing of water service line, meter, and PRV must be in accordance with fixture units and sprinkler design. PRV is required for each service.

LDG PROJECT #1805133

Prepared for:
Mr. Lance D. Baker, AIA
Synectic Design Incorporated
1111 W. University Drive, Suite 104
Tempe, Arizona 85281

Submitted to:
City of Scottsdale
Stormwater Management
7447 E Indian School Road, Suite #125
Scottsdale, Arizona 85251

Prepared by:
Land Development Group, LLC
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P: 602 889 1984

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO. 41005
NICKOLA J. PRODANOV
Date Signed 12/10/18
ARIZONA, U.S.A.
EXPIRES 06/30/2019

July 30, 2018
Rev. 1 December 10, 2018

TABLE OF CONTENTS

		PAGE
1.	Introduction	2
2.	Domestic Water and Fire Suppression System	2
3.	Sanitary Sewer System	3
4.	References	4

APPENDICES

Appendix A-1	Vicinity Map	5
Appendix A-2	Water System Design Calculations	6
Appendix A-3	Sanitary Sewer System Design Calculations	7
Appendix A-4	Conceptual Private Water and Sanitary Sewer Layout	9
Appendix A-5	City of Scottsdale Water and Sewer Map	10
Appendix A-6	Hydrant Fire Flow Test Report	11

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1. INTRODUCTION

This Preliminary Water and Sewer Basis of design report and related design have been developed in accordance with the current City of Scottsdale Design Standards & Policies Manual. It provides preliminary engineering analysis and assessment of the required water and sanitary sewer services for the proposed multifamily development.

The site consists of two developed parcels, with a total area of 0.480 acres, located at 6902 & 6908 E 1st Ave, Scottsdale, AZ 85251 (APNs 130-11-055 & 130-11-056). The property is bounded by 69th Street on the west, 1st Avenue on the south, an alley on the north and a vacant lot on the east side. The parcels are located within the Scottsdale Q.S. 16-44 and are being a part of previously approved plat – Taylors Addition, recorded in book 22 of maps, page 3, MCR, being a portion of the NE ¼ of the NW ¼ of the NE ¼ Section 27, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.
Refer to Appendix A-1 – Vicinity Map.

The proposed multifamily project will consist of six townhomes (three stories) with common walls and shared driveway access on the east side. New site improvements include new site walls for privacy, paving, and landscape.

Preliminary and final plats are being prepared as a part of the project development, subject to the City of Scottsdale review and approval. The plat shows location and area of each building and common elements in the community.

The site is located within the City of Scottsdale water and sewer service area. There are existing 12" DIP and 8” water mains that run in 69th Street. Another 6” CIP runs in 1st Avenue and it is connected to the 8” main in 69th Street. There is also an existing 4” DIP in the Alley running along the north property line. New services for the project are proposed to be connected to the 8” main in 69th Street.
There is an existing 8” PVC sanitary sewer main in the Alley. New sanitary sewer service and new manhole are proposed to connect to this 8” main.
Existing sewer service taps located in the Alley are noted to be permanently capped at the property line and abandoned. Water meters and services to be removed by City staff upon payment of abandonment fees.

2. DOMESTIC WATER AND FIRE SUPPRESSION SYSTEM

Each residence of the Fleetwood 6 Townhomes will be serviced by a separate domestic water service tapped off the existing 8” water main in 69th Street. Fire sprinklers for each residence will be fed off the domestic water service. All existing water services not used for the site will be required to be removed per the City of Scottsdale requirements.

Existing 4” water line in the alley along the northern frontage of the project will be replaced with a new 6” water line.

The fire hydrant coverage for this site is provided by an existing fire hydrant located at the southeast property corner of 69th Street and 1st Avenue. This hydrant is approximately 238-feet from the most remote portion of the buildings. Fire hydrant coverage around the building is in accordance with the City of Scottsdale Design Standards & Polices Manual requirements. Water demand calculations are provided in Appendix A-2. Hydrant fire flow test is provided in Appendix A-6.

3. SANITARY SEWER SYSTEM

New 8" sewer main is proposed to run in the common driveway serving the community. The 8” line will discharge into the existing 8” public sewer main in the Alley along the north property line. New manhole will be required to be installed at the point of the connection to the existing sewer main. Each townhome residence is serviced by a separate 4" service line. The sewer services are sized per IPC based on 256 anticipated plumbing fixture units from the site. Minimum slope of 2% will be used for the 4" services. Minimum slope of 1% will be used for the 8" line.

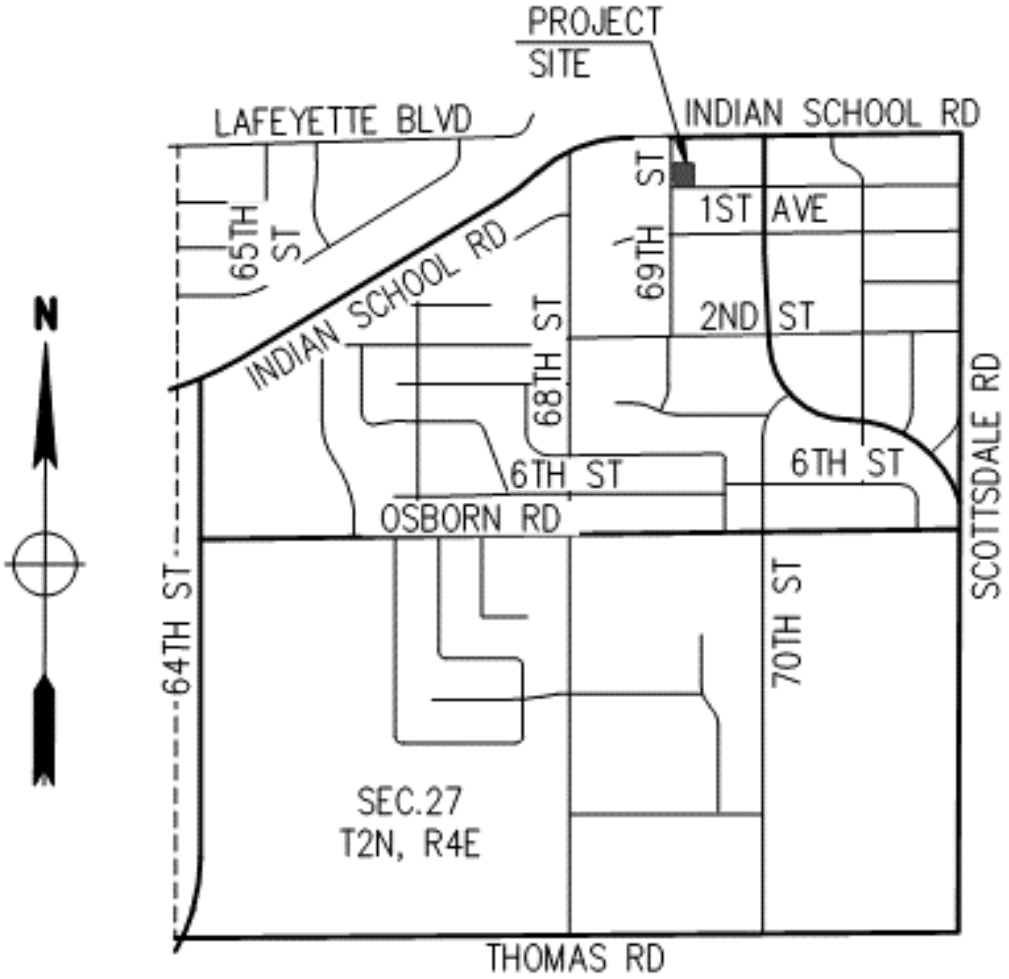
We have calculated that the peak daily discharge from this development will be 3.75 gpm. In our opinion the portion of 8” public sewer line that this site discharges to has an adequate capacity.

We have also estimated the sewer discharge from the site using The City of Scottsdale Design Standards & Polices Manual. The average daily flow was estimated at 0. 001857 cfs. The peak discharge was calculated by increasing the average daily flow by a factor of 4.5, which is a total of 0.00836 cfs. Using Manning’s Equation, we calculated that the proposed 8-inch sewer line at a minimum of 1.0% have a velocity of 3.81 fps flowing at depth to diameter ration of d/D=0.65 with a capacity of 0.91 cfs. Refer to Sanitary Sewer System Design Calculations in Appendix A-4.

4. REFERENCES

- City of Scottsdale Design Standards & Policies Manual.
- 2015 International Fire Code, Appendix B, Fire Flow Requirements for Buildings.

APPENDIX A-1
Vicinity Map



APPENDIX A-2
Water System Design Calculations

RESIDENTIAL

Number of units:	6
Average day demand per dwelling unit:	185.3
Average day demand:	**6 x 185.3 = 1,112 gpd (0.772 gpm)**

Maximum daily peaking factor:	2.0
Maximum daily demand per dwelling unit:	370.60 gpd
Maximum day demand:	**6 x 370.60 = 2,224 gpd (1.544 gpm)**

Peak hour demand factor:	4.5
Peak hour demand per dwelling unit:	833.85 gpd
Peak hour demand:	**6 x 833.85 = 5,003 gpd (3.474 gpm)**

FIRE FLOW DEMAND

Building Area = 13,418 sf, Construction Type = V-B, Required Fire Flow = 3,000 gpm

Per 2015 International Fire Code, Appendix B, Section B105.2, up to a 75% reduction in the fire flow can be approved if an approved automatic sprinkler system is installed. The resulting fire flow shall not be less than the required minimum of 1,500 gpm. We are using a fire flow of 1,500 gpm since the 75% reduction would result in a fire flow less than the minimum required fire flow.

Fire hydrant flow test shall be submitted with the fire sprinkler design.

TOTAL SITE DEMAND

Fire flow demand (see demand calculation above):	1,500 gpm
Peak hour demand + Fire Flow Demand	**3.47 + 1,500 = 1,504 gpm**

APPENDIX A-3
Sanitary Sewer System Design Calculations

Manning's Formula

8" Pipe Flowing at depth to diameter ratio d/D=0.65

Capacity

$$Q = \frac{1.49}{n} * R^{2/3} * S^{1/2} * A$$

n = 0.013
R = 0.16667
A = 0.3490
S = 0.001 ft/ft

Q = 0.91 cfs

Velocity

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

n = 0.013
R = 0.1921
S = 0.001 ft/ft

V = 3.81 fps

Sewer Demand Calculations

Average daily flow

Number of Units:	6
Average day demand per dwelling unit:	200
Average day demand:	**6 x 200 = 1,200 gpd**

Total average daily flow: **1,200 gpd = 0.001857 cfs**

Peak daily flow

0.001857 cfs x 4.5 = 0.00836 cfs or 3.75 gpm

4" service lines are connected to an 8" sewer line that is connected to the existing 8" public sewer main.

Capacity of 8" sewer line is **0.91** cfs > Peak Demand of **0.00836 cfs**

APPENDIX A-4

Conceptual Private Water and Sanitary Sewer Layout

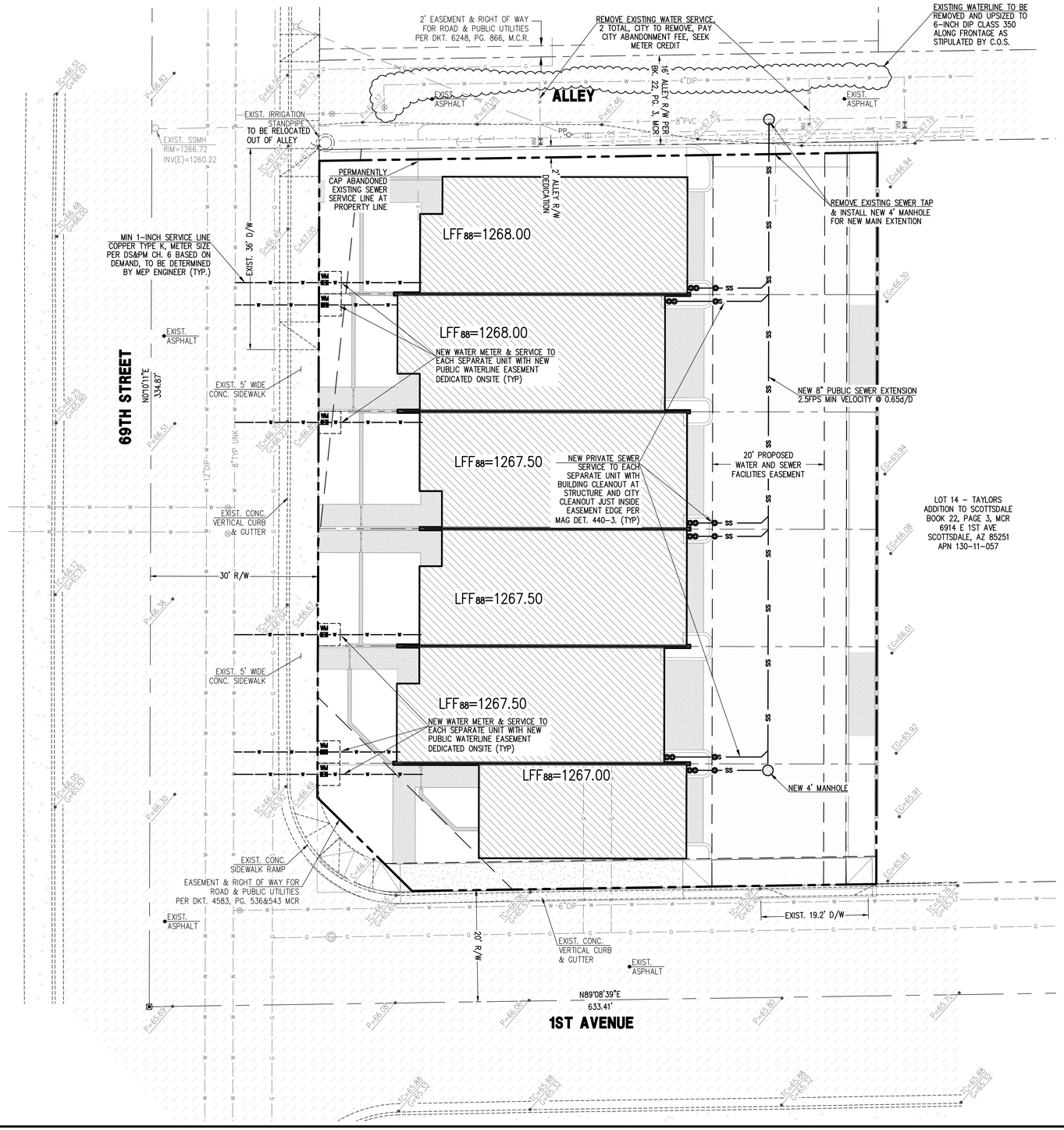
PRELIMINARY WATER & SEWER PLAN
"FLEETWOOD 6 TOWNHOMES"
6902 & 6908 E 1ST AVE., SCOTTSDALE, AZ 85251
LOCATED IN A PORTION OF THE NE 1/4 OF THE NW 1/4 OF THE NE 1/4 OF SECTION 27, T.2N, R.4E OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA

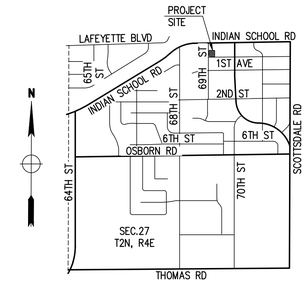
LEGEND

- SECTION CORNER
- 1/4 QUARTER
- SCRIBED "X" IN CONCRETE
- BRASS CAP IN HANDHOLE
- BRASS CAP FLUSH
- FOUND 1" IRON PIPE
- SET 1/2" REBAR & TAG OR AS NOTED
- CALCULATED POINT
- PROPERTY LINE
- EASEMENT LINE
- MONUMENT LINE
- SIGN
- LIGHT POLE
- WM WATER METER
- WATER VALVE
- FIRE HYDRANT
- CTV CABLE TV RISER
- WATER METER BOX
- SEWER MANHOLE
- TELEPHONE PEDESTAL
- T CATV, PHONE
- S SEWER LINE
- W WATER LINE
- E ELECTRIC LINE
- C COMMUNICATIONS LINE
- G GAS LINE
- 1421 EXISTING CONTOUR
- EXIST. DRAINAGE FLOW
- x21.12 EXIST. SPOT ELEVATION

ABBREVIATIONS

ARV	AIR RELEASE VALVE
BC	BACK OF CURB
BSL	BUILDING SETBACK LINE
C11	CURVE LABEL
C.B.	CATCH BASIN
℄	CENTERLINE
COS	CITY OF SCOTTSDALE
DE	DRAINAGE EASEMENT
DG	DECOMPOSED GRANITE
EG	EXISTING GRADE
EL, ELEV	ELEVATION
ESMT	EASEMENT
EX, EXIST.	EXISTING
FCDMC	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FG	FINISH GRADE
FL	FLOW LINE
FND	FOUND
G	GUTTER, GAS
INV	INVERT
L11	LINE LABEL
(M)	MEASURED
MAG	MARICOPA ASSOCIATION OF GOVERNMENTS
MCR	MARICOPA COUNTY RECORDER
MH	MANHOLE
P, PVMT	PAVEMENT
PUE	PUBLIC UTILITY EASEMENT
(R), REC.	RECORDED
R	RADIUS
R/W	RIGHT OF WAY
SD	STORM DRAIN
T	TANGENT, TELEPHONE
TC	TOP OF CURB
TG	TOP OF GRATE
TW	TOP OF WALL
V.G.	VALLEY GUTTER
W	WEST, WATERLINE
WDO	WALL DRAINAGE OPENING
WM	WATER METER





VICINITY MAP
NTS

SITE DATA

APN: 130-11-055 & 130-11-056
ADDRESS: 6902 & 6908 E 1ST AVE., SCOTTSDALE, AZ 85251
ZONING: C-2
NET AREA: 13,150 S.F. (0.302 AC.)
GROSS AREA: 20,926 S.F. (0.480 AC.)
QS #: 16-44

CIVIL ENGINEER
LAND DEVELOPMENT GROUP, LLC
8808 N CENTRAL AVE, SUITE 288
PHOENIX, AZ 85020
CONTACT: NICK PRODANOV, PE
P: 602-889-1984

ARCHITECT
SYNECTIC DESIGN, INC.
1111 W UNIVERSITY DRIVE, SUITE 104
TEMPE, AZ 85281
P: 480-948-9766
F: 480-948-9211
CONTACT: LANCE BAKER

OWNER
BLUEPRINT 6902, LLC,
P.O. BOX 16438,
SEATTLE, WA 98116

BASIS OF BEARINGS
THE MONUMENT LINE OF INDIAN SCHOOL ROAD, ALSO BEING THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 27, USING A BEARING OF NORTH 89 DEGREES 08 MINUTES 22 SECONDS EAST, PER THE RECORD OF SURVEY, RECORDED N BOOK 1176, PAGE 41, M.C.R.

BENCHMARK
BRASS CAP IN HANDHOLE AT THE INTERSECTION OF INDIAN SCHOOL AND SCOTTSDALE ROAD HAVING AN ELEVATION OF 1260.34 CITY OF SCOTTSDALE DATUM, NAVD 88

LEGAL DESCRIPTION
LOTS TWELVE (12) AND THIRTEEN (13), BLOCK ONE (1), TAYLORS ADDITION TO SCOTTSDALE, ACCORDING TO THE PLAT OF RECORD IN THE OFFICE OF THE MARICOPA COUNTY RECORDER IN BOOK 22 OF MAPS, PAGE 3.

FLOOD INSURANCE RATE MAP (FIRM) DATA

COMMUNITY # 045012	PANEL # 2235 OF 4425	SUFFIX L	BASE FLOOD ELEVATION N/A
MAP # 04013C	PANEL DATE 10/16/2013	ZONE X*	

*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

UTILITIES
WATER: CITY OF SCOTTSDALE
SANITARY SEWER: CITY OF SCOTTSDALE
ELECTRIC: ARIZONA PUBLIC SERVICE
TELEPHONE: CENTURY LINK, COX COMM.
NATURAL GAS: SOUTHWEST GAS
CABLE TV: CENTURY LINK, COX COMM.

N

10' 5' 0 10'
SCALE 1" = 10'

CALL TWO WORKING DAYS BEFORE YOU DIG
(602) 263 1100
BLUE STAKE CENTER

DATE: 11/06/18
SCALE: 1"=10'
DESIGNED BY: NP
DRAWN BY: DW
CHECKED BY: JF
JOB: 1805133
VERSION: 1.1
PLOT DATE: 11/06/18
DATE:
REVISIONS:

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PRELIMINARY WATER & SEWER PLAN

FLEETWOOD 6 TOWNHOMES
6902 & 6908 E 1ST AVE
SCOTTSDALE, AZ 85251

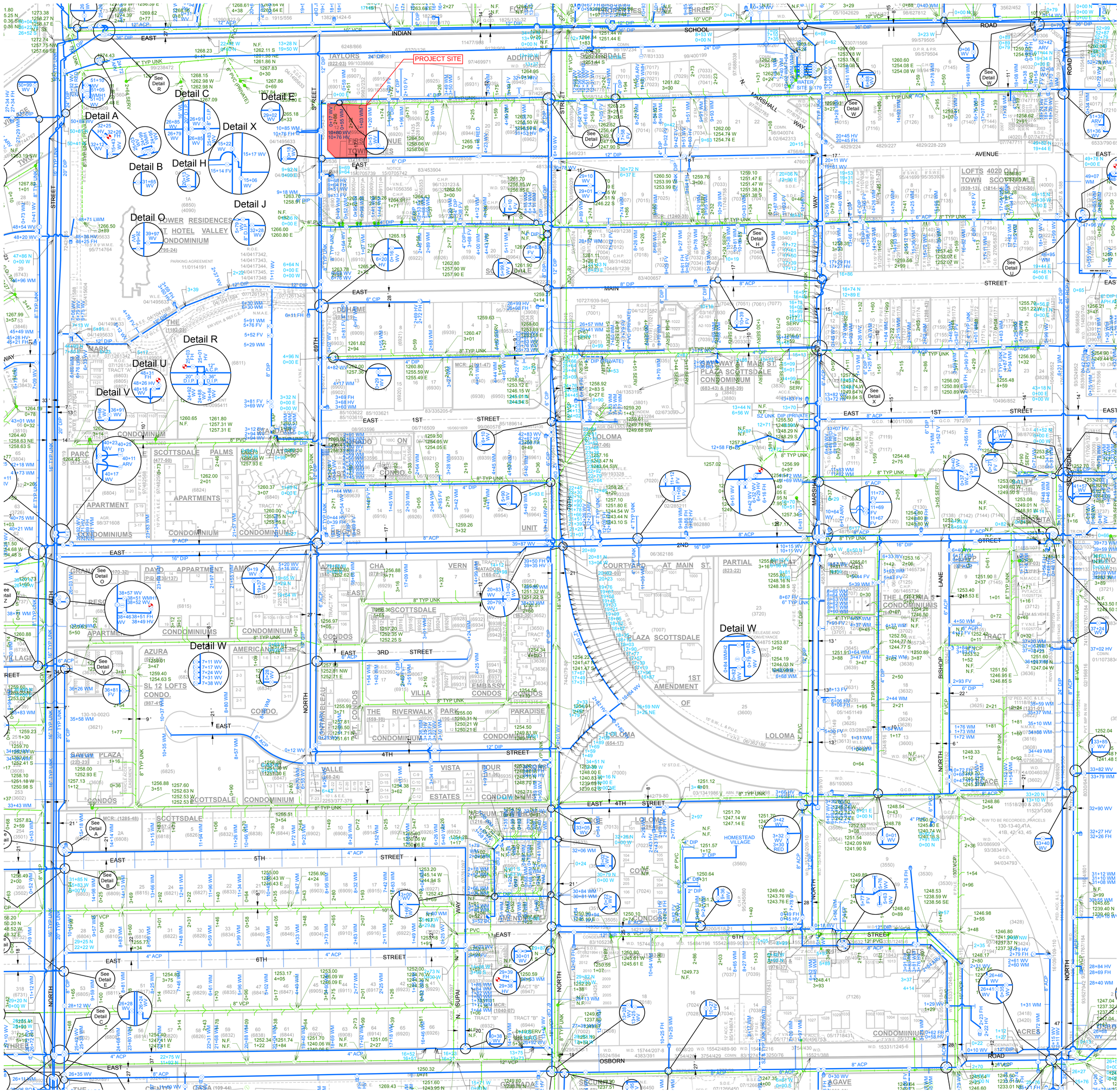
P 602 889 1984 | F 602 445 9482
8808 N CENTRAL AVE., SUITE 288
PHOENIX, AZ 85020
PHOENIX @ LDGENG.COM
Land DEVELOPMENT GROUP

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 32687 ARIZONA, U.S.A.
PRELIMINARY NOT FOR CONSTRUCTION
Expires 06/30/2019

P-WS
1 OF 1

APPENDIX A-5

City of Scottsdale Water and Sewer Map



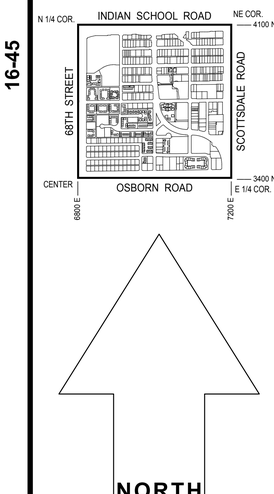
GENERAL NOTES:

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

LEGEND:

- Water Valve
- Non-potable Water Valve
- Fire Hydrant
- Water Blowoff
- Water Main Reducer
- Water Sample Station
- Water Air Release Valve
- Non-potable Water Air Release Valve
- Water Pressure Reducing Valve
- Water Vault
- Water Manhole
- Non-Potable Water Manhole
- Water Pump
- Water Main
- Non-Potable Water Main
- Fire Line
- Water Service
- Non-Scottsdale Water Main
- Sewer Manhole
- Sewer Cleanout
- Sewer Lift Station
- Sewer Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Non-Scottsdale Sewer Main
- Sewer Service

VICINITY MAP



SCALE: 1" = 100'

0 50 100 200

The map scale of 1" = 100' is based on a full size print of 30" x 36"

WATER & SEWER

QUARTER SECTION MAP

16-44

NE 1/4 SEC. 27 T2N R4E

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

N O T I C E

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.

THE CITY OF SCOTTSDALE

10-JUN-18

APPENDIX A-6

Hydrant Fire Flow Test Report

GRANTHAM DESIGN, LLC.
FIRE PROTECTION DESIGN & CONSULTING
3312 EAST ISABELLA AVENUE, MESA, ARIZONA 85204
PHONE: (480) 232-3601 EMAIL: FPPLANS@GMAIL.COM

HYDRANT FLOW TEST REPORT

Project Name:	Fleetwood 6
Project Address:	69th Street & 1st Avenue, Scottsdale, Arizona, 85251
Client Project No.:	Not Provided
Arizona Flow Testing Project No.:	18429
Flow Test Permit No.:	C56826
Date and time flow test conducted:	December 6, 2018 at 7:40 AM
Data is current and reliable until:	June 6, 2019
Conducted by:	Floyd Vaughan
Witnessed by:	Ray Padilla –City of Scottsdale-Inspector (602-541-0586)

Raw Test Data

Static Pressure: **80.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **70.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **17.0 PSI**
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One 4-inch Hose Monster
(Measured in inches)

Coefficient of Diffuser: .7875

Flowing GPM: **1,550 GPM**
(Measured in gallons per minute)

GPM @ 20 PSI: **4,079 GPM**

Data with 10% Safety Factor

Static Pressure: **72.0 PSI**
(Measured in pounds per square inch)

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

Residual Pressure: **62.0 PSI**
(Measured in pounds per square inch)

Distance between hydrants: Approx. 560 Feet

Main size: Not Provided

Flowing GPM: **1,550 GPM**

GPM @ 20 PSI: **3,776 GPM**

Flow Test Location

North

Project Site
69th Street & 1st Avenue

Pressure Fire Hydrant

North 69th Street

East 1st Avenue

East Main Street

Flow Fire Hydrant