Water Basis of Design Report

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 Levi Dillon **DATE** 8/27/2024

Address comments below and herein within the DR case BOD submittal and stipulated as part of the zoning case specifically noted below:

1) **STIPULATION**
For fire unutilized fire lines: replace the two tees in the public main with DIP spool pieces. Existing tees, tapping sleeves and related appurtenances that are not utilized by a development shall be removed by the contractor. Remove all services up to the corp stop on the public main. DS&PM 6-1.408

2) The 3-inch meter and vault need to be placed within a dedicated water line easement DS&PM 6-1.416, G. Note: Based on demand it is unclear why a 3-inch meter would be needed. Confirm meter sizing in subsequent submittal.

3) Buildings with mixed uses should consider a separate meter and be separately plumbed for each type of use. Scottsdale's sewer billing structure supports separate metering for each of the user codes described in SRC Sec. 49-141(g). In the event
separate use metering is not provided, sewer billing will be applied at the higher use rate applicable to that building. Developers should consider the economic benefits of separate metering. DS&PM 6-1.416*
*Also note that separate metering may require special plumbing separations and/or building use separations. Refer to building code and City building plan reviewers as necessary.

4) Installation of 3 inch to 6-inch metered services require a tee and shutoff valve or tapping sleeve and valve on the public main per MAG Standard Detail No. 340 and 391-1, Type "C". DS&PM 6-1.416, F.

5) City GIS states this is 8" cast iron pipe. Replacement with DIP may be necessary. Note the requirements of DS&PM 6-1.408 & 6-1.413, D. Cast iron is unrestrained and equivalent to ACP.

6) Address comments on the utility plan

The Clayton on Earll

3-ZN-2024

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
35476
BRIAN T.
BERNARD
Date Signed 7-31-24
ARIZONA, U.S.A.

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Civil Engineering Land Development
Water Resources

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LIST OF EXHIBITS

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1.0 Introduction

This Water Basis of Design Report has been prepared for the Clayton on Earll (2.93 acre) Mixed-Use Redevelopment, which is being developed by Clayton Companies, an Arizona Corporation.

1.1 Project Location

The project is located in a portion of the Southwest 1/4 of Section 26, Township 2 North, Range 4 East of the Gila and Salt River Baseline and Meridian, Maricopa County, Arizona. It is on the northwest corner of the intersection of Earll Drive and Civic Center Plaza. The address being 7300 E. Earll Drive, Scottsdale. *See Figure 1, Vicinity Map.*

1.2 Property Description

The project is located within the City of Scottsdale, Arizona. The project is approximately 2.93 gross acres with several parcels that will be combined. The project is a proposed Mixed-Use Redevelopment project with a total of 89 dwelling units and 6,300 square feet of commercial space. The project is currently zoned as C-3, DO. The project Land use is maximum 50 Dwelling units per acre. The project has several existing buildings that will be demolished and removed. The property currently is flat with less than 2 feet of fall across the site.

1.3 Purpose

This Report has been prepared to satisfy the City of Scottsdale requirements for the Rezoning process for the property. This report provides design calculations to determine the amount of water this project is expected to use both during Average Day, Maximum Day, Peak Hour and Maximum Day with Fire Flow. This property is located within Quarter Section map 15-45 as C.O.S. project number 76-PA-2024 The Clayton on Earll.

2.0 Description of Existing Conditions

2.1 On-Site Current Conditions

The site is currently developed with five (5) existing commercial buildings with approximately 29,150 square feet of building area. The entire existing site improvements will be demolished and removed. The development is to be supplied from existing City water system adjacent to the property. Based on Figure 6-1.3, Pressure Zone Map of the City of Scottsdale Design Standards and Policies Manual the project is located in pressure Zone 1. A Zone 1, 8-inch transmission line is located within Earll Drive and Civic Center Plaza. *See Figure 2- Water Distribution Plan*.

2.2 Pressure Zone

The project is located within the Downtown (DIA) water resource planning area. The project is within pressure zone 1. Zone 1 lower elevation is 1230 and upper elevation is 1330, range 100 feet. The hydraulic grade line for Zone 1 is 1240 feet.

3.0 Proposed Water Distribution Plan

3.1 Design Criteria

As per the City of Scottsdale this Basis of Water Design Report was prepared according to the Design Standards & Policies Manual, dated 2018. The following is a summary of the design criteria upon which this study is based.

Basis of Water Design

- The project is located in Zone 1according to figure 6.1-3 pressure zone map.
- The total number of dwelling units = 89
- The total square footage of commercial space is 6,300 square feet.
- Average day water demand calculations were analyzed using Figure 6.1-2 Average Day Water Demands in Gallons Per Day.
- Residual pressure between 50psi and 120 psi at the highest finished floor level.
- Minimum of 30 psi under design fire flow requirements.

3.2 Proposed Condition

The development will be of Mixed-Use development, consisting of 6,300 offices commercial and 89 multifamily residential dwelling units. The dwelling units will be a combination of one- and two-bedroom apartments. The development will connect to the existing 8-inch water line within Earll Drive with a 6-inch fire line to the building connection. The development will propose two new 2-inch domestic water services with meters. There are seven existing water meters along Earll Drive and Civic Center Plaza that will be utilized or removed. *See Figure 2-Water Distribution Plan* for the location of the proposed water meters or the removal of existing water meters. How the existing water meters will be removed is per the City's requirements.

Fire protection for the development shall follow the Design Standards & Policies Manual, 2018 under section 6-1.500. There are three existing Fire hydrants that surround the project. Two are on Earll Drive and one is on Civic Center Plaza. Fire sprinklers will be required for the development. No new fire hydrants will be required. Each fire hydrant is within the required 700 feet spacing.

Domestic flow was calculated as follows:

Total units = 89 x 0.27 gpm/unit = 24 gpm average day
Total Office Space = 6,300 sf x 0.000834 gallons/sf = 5.3 gpm average day
Total average day Flow = 29.3 gpm
Peak hour Flow = 3.5 * 29.3 = 102.6 gpm
Maximum day Demand = 2.0 *29.3 = 58.6 gpm

4.0 Water Model

A flow test was performed by EJ Flow Test on April 18, 2024. See Appendix A for the results of the flow test. Per the flow test, the static pressure with an 18 psi safety factor is 72.0 psi. The dynamic pressure is 67 psi. The flow at 67 psi is 2,256 gpm. The calculated flow at 20 psi with an 18 psi safety factor is 7,989. The ground floor of the project will be Type IA, and floors 2-4 will be Type VA. The total square feet for the Type IA building is 42,749. The total square feet for the Type VA building is 117,875. The International Fire Code Appendix B, Table B105.1(2) shows the required fire flows without sprinklers. A 75% reduction is allowed if the building is sprinkled. The required Fire Flow demand for the building is 1,562.5 gpm with sprinklers at a duration of 4 hours. Per the flow test, the calculated 7,989 gpm at 20 psi is larger than the required 1,562.5 gpm fire flow demands.

- Hazen Williams 'C' Coefficient: 130
- Pressure Zone : Zone 1
- Static Modeled Hydraulic Grade Line, Zone 1: 1240 feet
- Fire flow Demand with sprinklers 1,562.5 gpm
- Calculated Available flow at 20 PSI 7,989 gpm

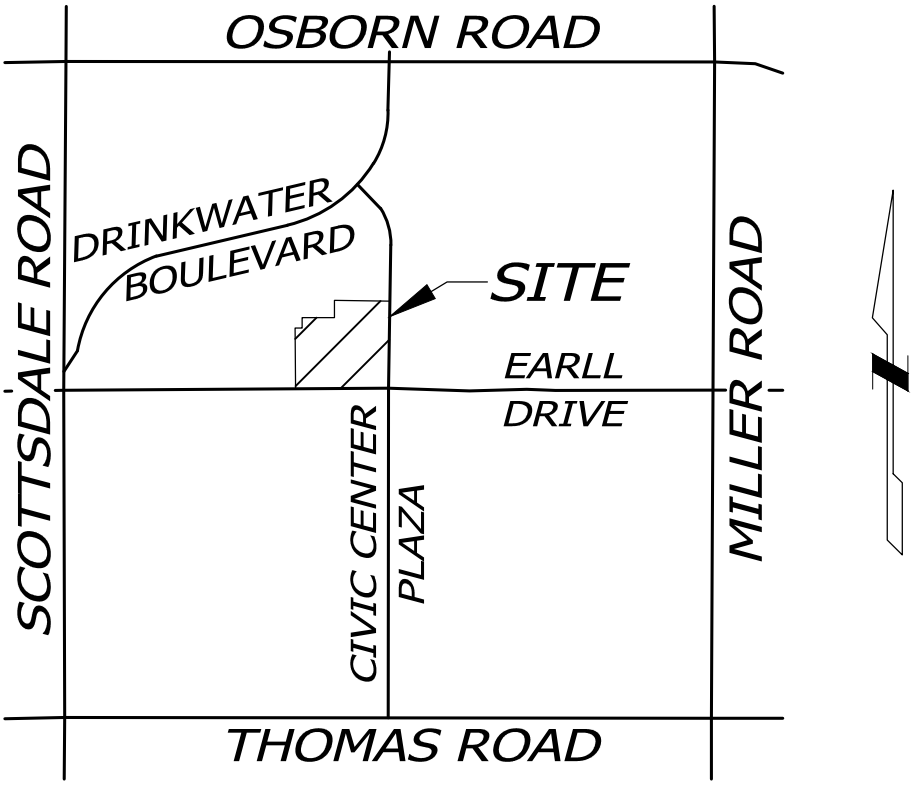
6.0 Conclusions

- The water system is to be designed, operation and pressures will be in accordance with the City of Scottsdale Design Standards and Policies.
- All Mixed Use dwelling units and office space are to use fire sprinkler systems.

7.0 References

1. City of Scottsdale Design Standards & Policies Manual, *2018.*
2. *International Fire Code-Appendix B*

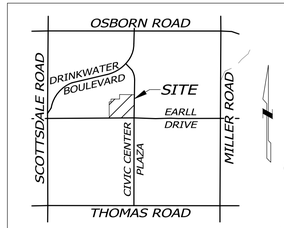
Figure 1: Vicinity Map



VICINITY MAP

NOT TO SCALE

Figure 2: Water Distribution Map



VICINITY MAP

NOT TO SCALE

2002-1233203 M.C.R.

A.P.N. 130-21-001F
3295 DRINKWATER LLC
2002-1233204 M.C.R.

COMMON ELEMENT
INSPIRE ON EARLL CONDOMINIUMS
BK. 1239, PG. 41, M.C.R.
A.P.N. 130-21-153

EXISTING LANDSCAPE WATER METER TO REMAIN

EXISTING WATER LINE TO BE REMOVED TO MAIN PER QS 15-45

replace tee in main with spool piece. Existing tees, tapping sleeves and related appurtenances that are not utilized by a development shall be removed by the contractor. DS&PM 6-1.408

Warning: City GIS states this cast iron pipe. CIP does not have restrained joints. Main isolation plan needs to be well developed.

EXISTING FH

note to remain

EXISTING O.H.E. LINES TO BE RELOCATED UNDERGROUND

Civic Center Plaza

Earll Drive

call out City riser detail

water meter to be within vault per COS detail 2345. Call out on drawing.

FIRE RISER

PROPOSED 3" WATER METER AND 3" BACKFLOW PREVENTER

PROPOSED 6 FIRE LINE

meter and vault need to be placed within a dedicated water line easement DS&PM 6-1.416, G

Buildings with mixed uses should consider a separate meter and be separately plumbed for each type of use. Scottsdale's sewer billing structure supports separate metering for each of the user codes described in SRC Sec. 49-141(g). In the event separate use metering is not provided, sewer billing will be applied at the higher use rate applicable to that building. Developers should consider the economic benefits of separate metering. DS&PM 6-1.416

Also note that separate metering may require special plumbing separations and/or building use separations. Refer to building code and City building plan reviewers as necessary.

Are one of the existing meters on the south frontage needed for landscape on south frontage? Clarify on plans.

add: "and service line "(typ. all)

EXISTING WATER METER TO BE REMOVED TO MAIN

EXISTING 4" FIRE LINE TO BE REMOVED TO MAIN

PROPOSED 8"SS CONNECT TO BUILDING SS PLUMBING

existing FH, note to remain

note to remain

EXISTING FH

note contractor to locate and to protect in place on plans, typ. all

EXISTING ARV

EXISTING WATER METER TO BE REMOVED TO MAIN

EXISTING ARV

EXISTING WATER METER TO BE REMOVED TO MAIN

EXISTING ARV TO BE RELOCATED OUTSIDE OF DRIVEWAY

INSTALL 8" DIP W

air/vac combo valve should be off sidewalk, confirm, typ. all

20' CATCH BASIN

19' CATCH BASIN

13' CATCH BASIN

6inch TS&V required on 6" fire line.

EXISTING 8"SS

PROPOSED 8"SS SEE PROFILE THIS SHEET

EXISTING 21"SS

PROPOSED 50" SSMH INV=1223.33 CONNECT TO EXISTING 21"SS

refer to sewer BOD utility plan for comments on sewer

indicate hydrant line

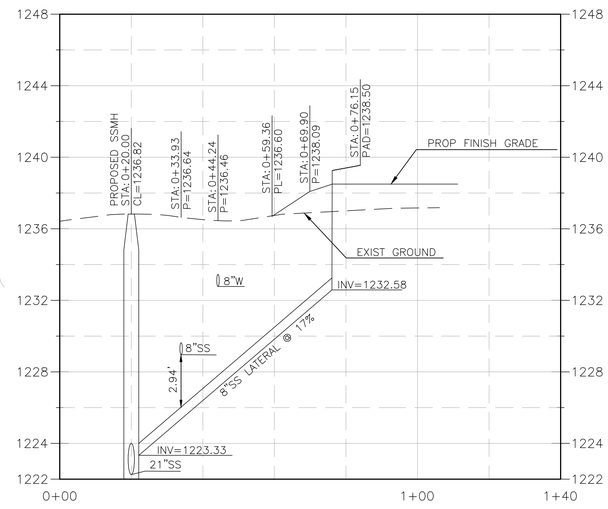
Installation of 3 inch to 6-inch metered services require a tee and shutoff valve or tapping sleeve and valve on the public main per MAG Standard Detail No. 340 and 391-1, Type "C". DS&PM 6-1.416, F.

replace tee in main with spool piece. Existing tees, tapping sleeves and related appurtenances that are not utilized by a development shall be removed by the contractor. DS&PM 6-1.408

Warning: City GIS states this cast iron pipe. CIP does not have restrained joints. Main isolation plan needs to be well developed.

LEGEND

- BOUNDARY LINE
- CENTER LINE OR MONUMENT LINE
- CONCRETE SURFACE
- 24 INCH VERTICAL CURB & GUTTER
- 24 INCH ROLLED CURB
- 6 INCH CONCRETE CURB
- ACCESS — INDICATES DRIVEWAY (MEANS OF ACCESS)
- WALL
- FENCE
- O.H.E. — OVERHEAD ELECTRIC LINE
- E — UNDERGROUND ELECTRIC LINE
- G — UNDERGROUND GAS LINE
- S — UNDERGROUND SANITARY SEWER LINE
- SD — UNDERGROUND STORM SEWER LINE
- T — UNDERGROUND TELECOMMUNICATIONS LINE
- TV — UNDERGROUND TELEVISION LINE
- W — UNDERGROUND WATER LINE



8" SEWER LATERAL

HORIZ: 1"=20'
VERT: 1"=4'

HORIZONTAL SCALE

20 0 10 20 40 80

(IN FEET)
1 INCH = 20 FT.

CIVIL DESIGN SOLUTIONS, LLC
15925 W. Glenrosa Avenue
Goodyear, Arizona 85395
602.214.4854

NO.	DATE	INT.	REVISIONS
A			
A			
A			
A			
A			
A			

THE CLAYTON ON EARLL
SEWER AND WATER DISTRIBUTION MAP

FIGURE 2

DESIGN/DRAWN/CHECK: BTB / BTB / WEG

DATE: 4/2024

PROJ. NO. P1144-24

DWG NO.

SHEET 1 OF 1

Appendix A

Flow Test Summary

Project Name:	EJFT 24112 - The Clayton on Earll
Project Address:	E Earll Dr & N Civic Center Plaza, Scottsdale, Az 85251
Date of Flow Test:	2024-04-18
Time of Flow Test:	6:33 AM
Data Reliable Until:	2024-10-18
Conducted By:	Steven S. & Simon R. (EJ Flow Tests) 602.999.7637
Witnessed By:	Christopher Mendez (City of Scottsdale) 602.908.9046
City Forces Contacted:	City of Scottsdale (602.908.9046)
Permit Number:	C74982

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

Raw Flow Test Data

Static Pressure:	90.0 PSI
Residual Pressure:	85.0 PSI
Flowing GPM:	2,256
GPM @ 20 PSI:	9,379

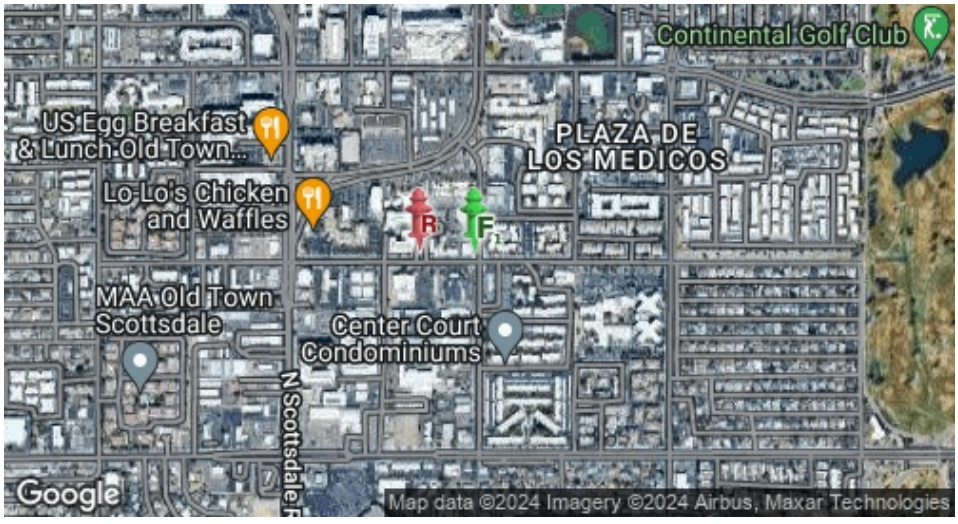
Data with a 18 PSI Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	67.0 PSI
Flowing GPM:	2,256
GPM @ 20 PSI:	7,989

Hydrant F_1

Pitot Pressure (1):	40	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	4	inches

Additional Coefficient 0.83 on orifice #1



Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
374 ft (measured linearly)

Static-Residual Elevation
1239 ft (above sea level)

Flow Hydrant (F_1) Elevation
1237 ft (above sea level)

Elevation & distance values are approximate

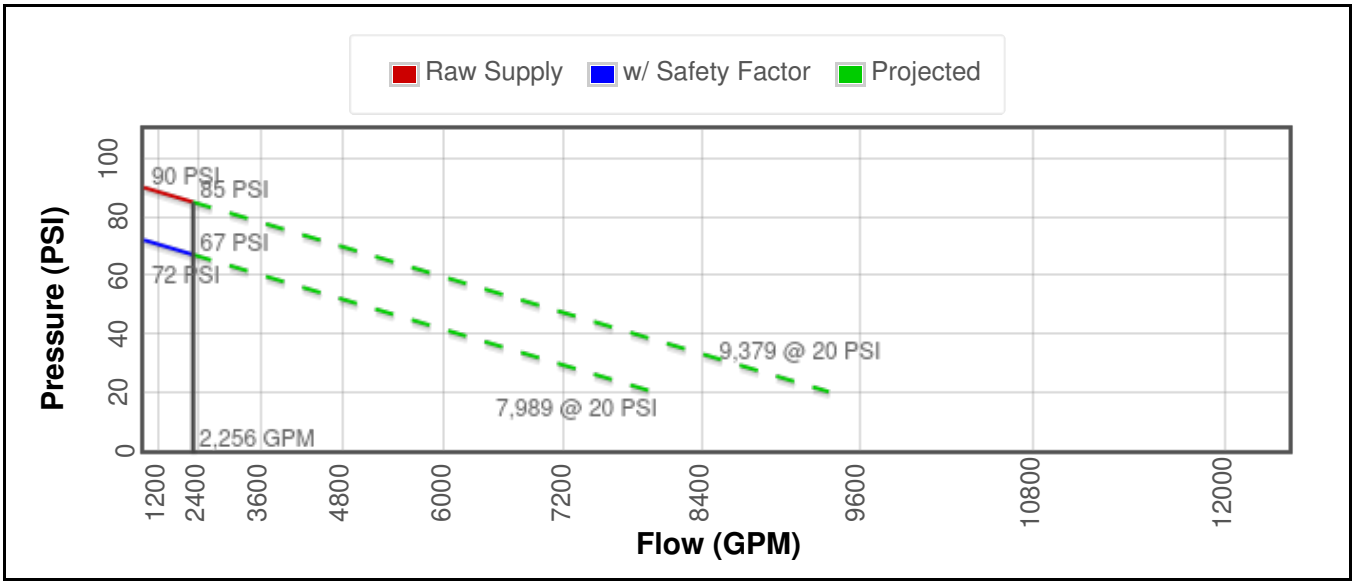
Flow Test Summary

Static-Residual Hydrant

Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph



16-45

15-44

15-46

14-45

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

NORTH

SCALE: 1" = 100'

0 50 100 200

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

WATER & SEWER

QUARTER SECTION MAP

15-45

SW 1/4 SEC. 26 T2N R4E

17-MAR-24

CITY OF SCOTTSDALE

SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS

3629 North Drinkwater Boulevard
Scottsdale, Arizona 85251