

**FINAL**  
**~~PRELIMINARY~~**  
**WATER DISTRIBUTION SYSTEM**  
**BASIS OF DESIGN REPORT**

**FOR**

**Marshall Four**

**4251 N Marshall Way**

**Scottsdale, Arizona**

**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** 1/6/2023

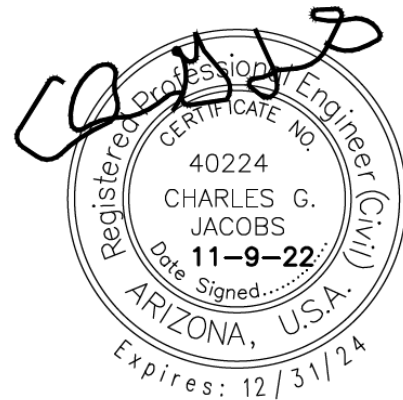
Address comments below and herein on the submitted improvement plans:

- 1) a separate domestic service line and meter needs to be provided for both commercial and residential use i.e. provide 2 total and separate service lines, meters, and backflows (unless the existing 5/8" meter will be used for the commercial uses?)
- 2) new meters and backflows should be located on western frontage of property (not down alley)
- 3) Clarification of fire line routing should be provided with submitted plans
- 4) Note that a meter credit can be obtained for the existing 5/8" meter (unless the existing 5/8" meter will be used for the commercial uses?)

11/8/2022

Prepared for

Tomecack Design  
Mark Tomecack



**JACOBS WALLACE, LLC**  
*ENGINEERING PLANNING MANAGEMENT*  
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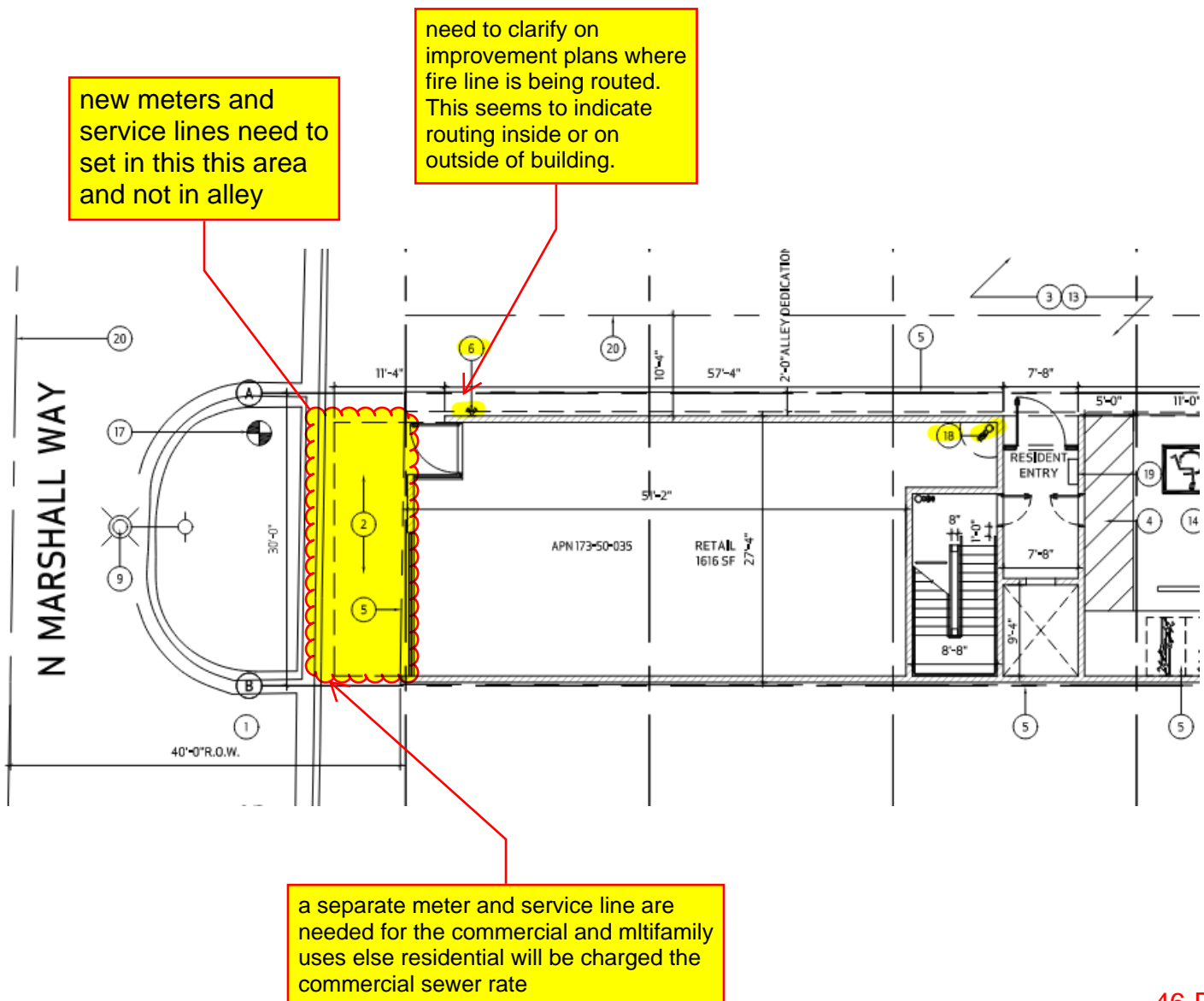
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Vicinity Map

Calculations

City of Scottsdale Quarter Section Map



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a separate domestic service line and meter need to be provided for commercial use

## **INTRODUCTION**

The proposed project consists of a multi-story mixed use project podium style building. The existing building and parking will be demolished. The new building will be retail and multi-family residential.

The 0.10-acre site is located near the intersection of 5<sup>th</sup> Ave and Marshall Way on the east side of Marshall Way at 4251 N. Marshall Way. The site is bordered on all sides by existing commercial/multifamily developments.

The site lies within the Southeast Quarter of Section 22, Township 2 North, Range 4 East of Gila and Salt River Base and Meridian. See the Appendix for a vicinity map.

## **EXISTING CONDITIONS**

There is an existing 6" ACP water main in Marshall Way. There are 2 proposed services to the site. One for fire and the other for domestic water (residential service). The existing service and meter will be utilized for the domestic service for the retail space.

## **PROPOSED CONDITIONS**

The proposed project will install a new 4" fireline and a new 1-1/2" domestic water meter to service the proposed residential portion of the project. The existing water meter will service the proposed retail space. The new services will connect to the existing 6" main in Marshall Way.

All water line construction and design will conform to M.A.G. standards and specifications and the latest revision of the City of Scottsdale Design Standards and Policies Manual. All water demands are based on Figure 4.1-3, Average Day Water Demand per Dwelling Unit of the City of Scottsdale Design Standards and Policies Manual.

## **WATER ANALYSIS**

Residential: 4 units

Retain: 1616 sf

typically this needs to be shown on a utility plan

Average Daily Flow:

Residential: 4 units \* 185.3gpd/unit = 741.2gpd -0.51 GPM

Retail: 1616 sf \* 0.8 gpd/sf= 1292.8 gpd – 0.90 GPM

Maximum Daily Demand: Average Daily Demand x 2

1.41gpm\*2=2.82 **gpm**

Peak Demand: Maximum Daily Demand x 3.5

2.82gpm\*3.5 = **9.87gpm**

Fire Flow Demand: (Per City of Scottsdale DSPM Section 6-1.501)

1,500 gpm @ 30 psi (For commercial, industrial, and multi-family)

Max Daily Demand + Fire Flow = **1,503 gpm @ 30 psi (COS requirement)**

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## **WATER MODEL RESULTS**

A water model will not be completed for this project. There are no new fire hydrants being installed. A fire flow test was completed on the existing hydrant located near the northwest corner of the site to ensure adequate supply and fire protection for the site.

### **EXISTING PRESSURE & FLOW**

test taken 11-04-22 by EJ (See Attached)

#### **Raw Data:**

Static Pressure: 105 psi

Residual Pressure: 71 psi

Flow: 2,169 gpm

20psi Flow: 3,558 gpm

#### **Data with required 33psi safety Factor:**

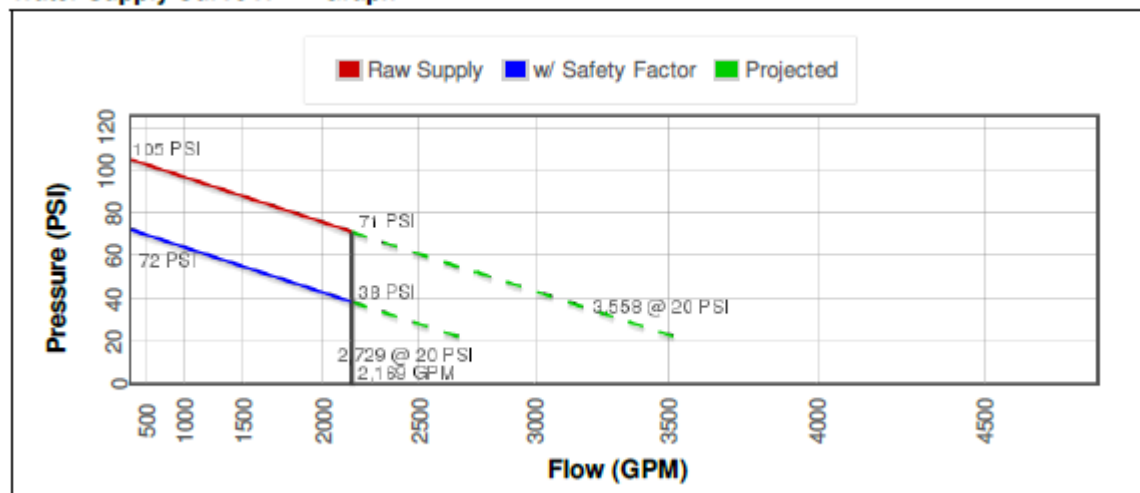
Static Pressure: 70 psi

Residual Pressure: 38 psi

Flow: 2,169 gpm

20psi Flow: 2,729 gpm

**Water Supply Curve N<sup>1.85</sup> Graph**

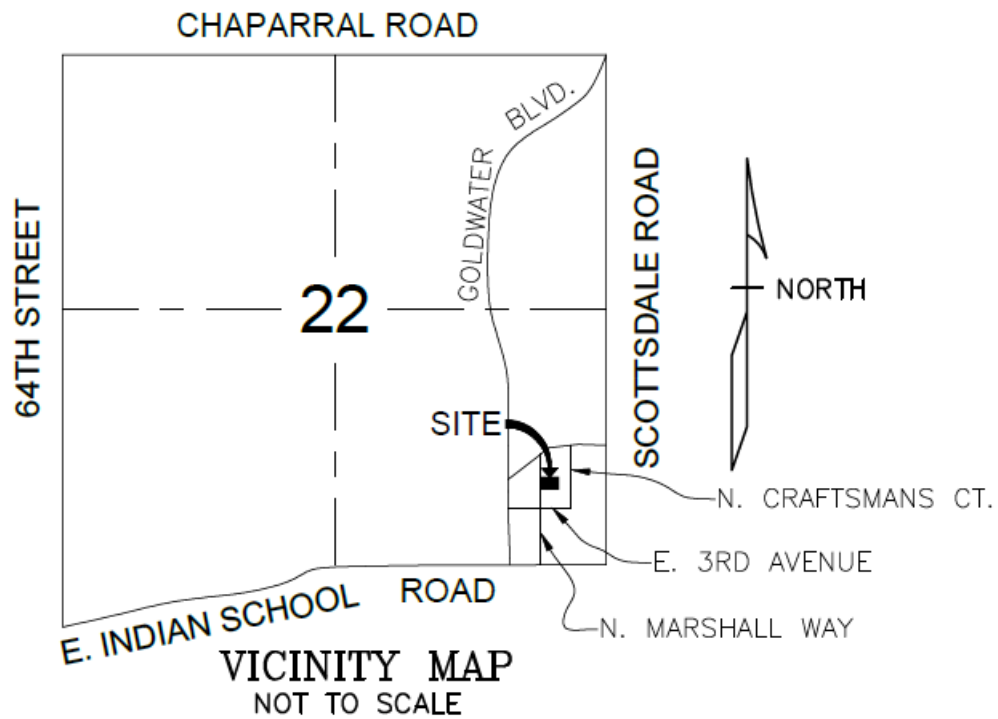


## **CONCLUSION**

Based on the information provided and the flow test results, the city system will be able to handle the proposed project demands as estimated above. The flow test shows that there is adequate flow and pressure for proper fire protection.

It is important to note that the actual available flow can be affected by varying seasonal and diurnal water demands, growth within the City, and system operations. This report solely describes the flow available at a design maximum day condition based on current flow tests.

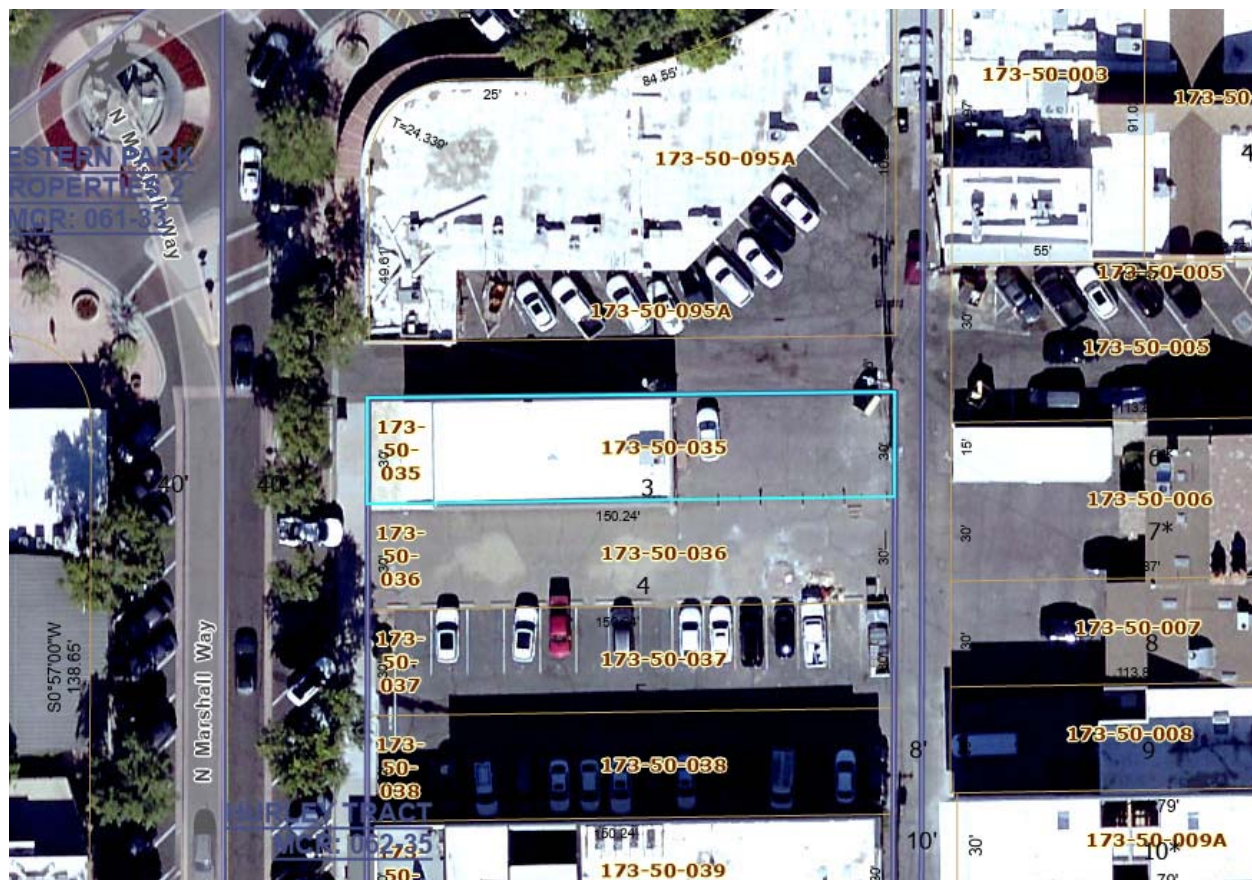
## Vicinity Map







## Aerial Map





# Flow Test Summary

Project Name: EJFT 22475 - Marshall Way  
Project Address: 4251 Marshall Way, Scottsdale, AZ 85251  
Date of Flow Test: 2022-11-04  
Time of Flow Test: 7:05 AM  
Data Reliable Until: 2023-05-04  
Conducted By: Eder Cueva & Caleb Crabbs (EJ Flow Tests) 602.999.7637  
Witnessed By: Chris Mendez (City of Scottsdale) 602.908.9046  
City Forces Contacted: City of Scottsdale (602.541.0586)  
Permit Number: C70620

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

## Raw Flow Test Data

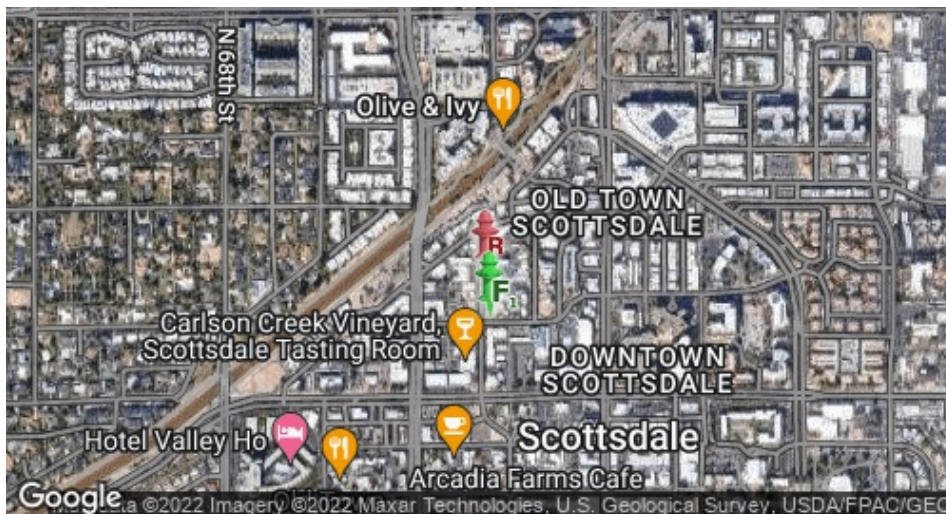
Static Pressure: 105.0 PSI  
Residual Pressure: 71.0 PSI  
Flowing GPM: 2,169  
GPM @ 20 PSI: 3,558



## Data with a 33 PSI Safety Factor

Static Pressure: 72.0 PSI  
Residual Pressure: 38.0 PSI  
Flowing GPM: 2,169  
GPM @ 20 PSI: 2,729

## Hydrant F<sub>1</sub>

Pitot Pressure (1): 37 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<sub>1</sub> and R  
280 ft (measured linearly)  
Static-Residual Elevation  
1268 ft (above sea level)  
Flow Hydrant (F<sub>1</sub>) Elevation  
1265 ft (above sea level)  
Elevation & distance values are approximate



## Static-Residual Hydrant



## Flow Hydrant (only hydrant F1 shown for clarity)



## Approximate Project Site



## Water Supply Curve N<sup>1.85</sup> Graph

