WATER CAPACITY ANALYSIS

Orange Corp Yard Workforce Housing

637 West Struck Avenue

Orange, CA 92867

June 1, 2020

Prepared by:

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INTRODUCTION

This Water Capacity Analysis for the "Orange Corp Yard Workforce Housing" project was commissioned by C & C Development Co., LLC and prepared by So Cal Civil Solutions, Inc. The purpose of this study is to evaluate the capacity of the existing water system and the capacity of the system to serve the proposed project.

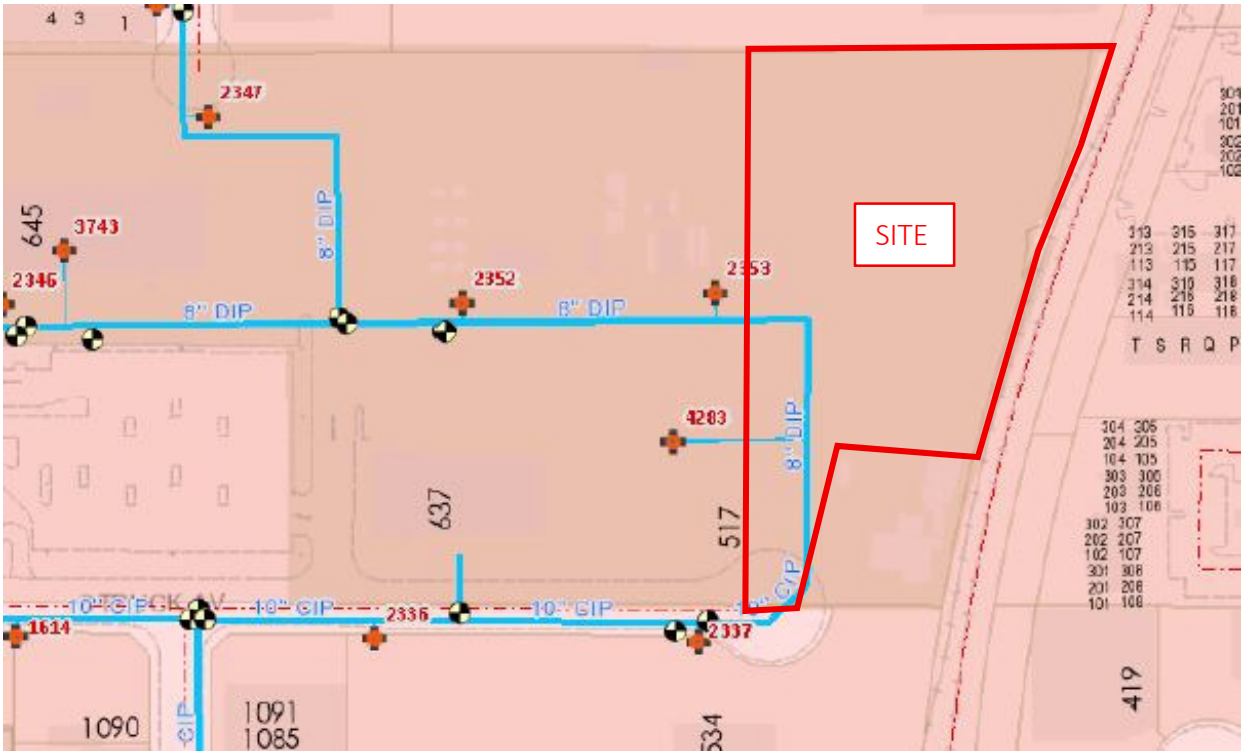
PROJECT AND SITE DESCRIPTION

The proposed project site encompasses 2.8 acres at 637 West Struck Avenue in the City of Orange, California (see Site Map). The proposed housing project will consist of 62 workforce units in a new multi-family complex. This project will be subdivided from the existing eastern half of the city of Orange Corporate Yard be processing and recording a new parcel map, 2020-127.

Site Map

EXISTING WATER CAPACITY

The City of Orange owns, operates, and maintains the water system in the vicinity of this site, which consists of a 10” CIP mainline that runs easterly in West Struck Avenue to the cul de sac, then the main turns into an 8” DIP with runs northerly for approximately 300 ft. At that point the main turns west towards North Batavia Street. See City Water Atlas below.



A flow test was performed by SoCal Flow Testing on 3/18/20 on the nearest fire hydrant (2nd hydrant east of N Parker St on south side of W Struck Ave). The static pressure in the 10” main in Struck Avenue was 82 PSI, the 2-1/2 inch nozzle flow rate was 1,256 GPM with a residual pressure of 55 PSI. The calculated flow at 20 PSI residual is 4,432 GPM.

HYDRANT FLOW TEST CALCULATOR: CALCULATE RATED CAPACITY AT 20 PSI

The Hydrant Flow Test Calculator measures the rated capacity at 20 psi of a fire hydrant. The rated capacity calculation is useful in determining the total water supply at a given point in the hydrant or water main. The calculation offers more useful information than the test flow by itself and is used by insurance underwriters. For more information see NFPA 291, AWWA M-17, or our web page on Hydrant Flow Testing.

Static Pressure (PSI):

82

Residual Pressure (PSI):

76

Total Test Flow-rate (GPM):

1256

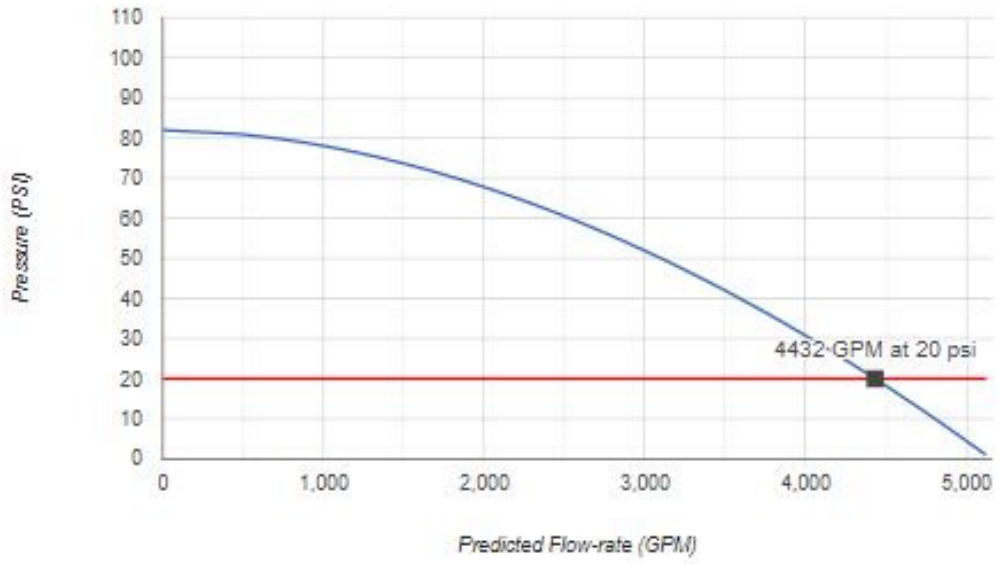
CALCULATE

GPM at 20 psi: 4432

Class: AA

Marking color: Light Blue

% Pressure Drop: 7.3%



PROPOSED WATER CAPACITY

As mentioned before the proposed project proposes 62 workforce units. Per the current plumbing code, this project consists of two and three bedroom apartments with full bath, kitchen sink, and dishwasher having a total fixture count of 934 Fixture Units for the proposed project which equates to a peak water supply demand of 220 gallons per minute.

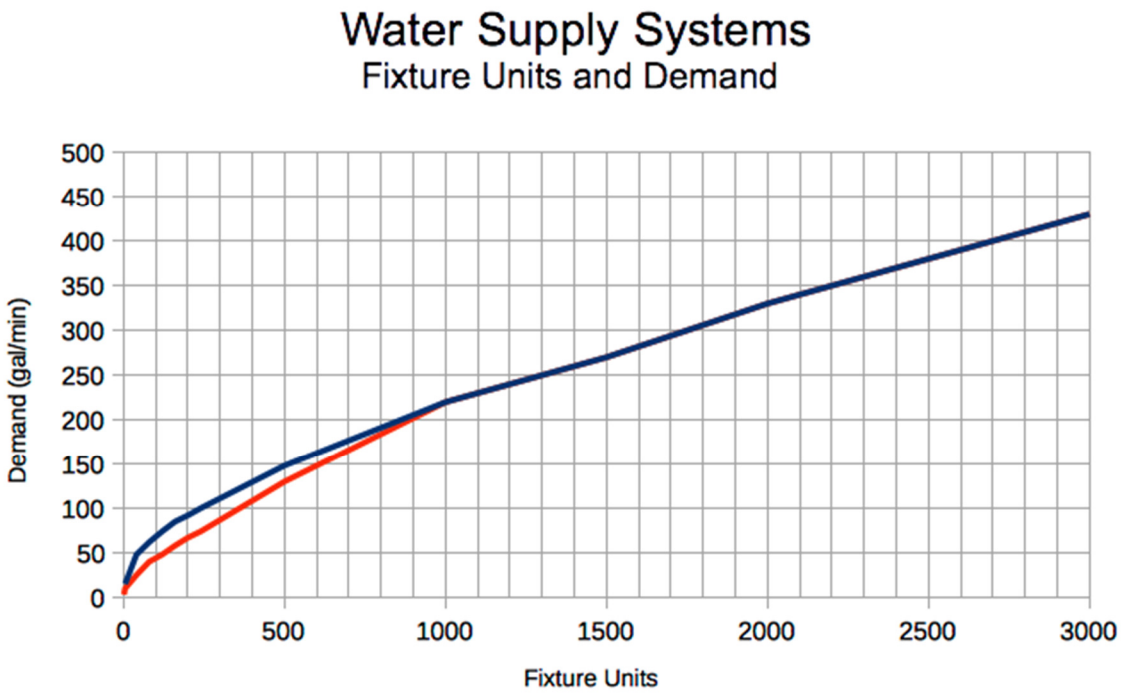
Land Use Type	Units	Fixture Units/ Unit (FU/DU)	Total Fixture Units	Water Supply Demand (gpm)
Workforce Units	62	15.1	934	220
		Total	934	220

The required fire flow for residential construction is 1,500 GPM. The proposed project water demand is 220 GPM. Fire plus domestic is 1,720 GPM. The calculated flow available in the 10 inch main is 4,432 GPM.

CONCLUSION

Based on this water analysis, adequate capacity exists in the existing 10 inch main on W Struck Avenue. The proposed project water demands will have minimal impact on the existing system.

APPENDIX


Water Supply Systems
Fixture Units and Demand
Demand (gal/min)
500
450
400
350
300
250
200
150
100
50
0
0
500
1000
1500
2000
2500
3000
Fixture Units

Orange City Fire Department
Fire Prevention Division
Flow Test Record

TEST HYDRANT DATA

LOCATION: 534 W. Struck Ave.

HYDRANT I.D. NO.: 2337 SIZE MAIN: 10" TYPE HYDRANT: wet

STATIC (PSI): 82

RESIDUAL (PSI): 76

PRESSURE DROP (PSI): 6 "K" FACTOR FOR (PDI)*:

FLOW HYDRANT(S) DATA

LOCATION NO. 1: 534 W. Struck I.D. NO.: 2336

LOCATION NO. 2: I.D. NO.:

LOCATION NO. 3: I.D. NO.:
(MAIN)

#1 PITOT-PSI 56 GPM 1256 (4" OR 2 ½") 2 ½"

#2 PITOT-PSI GPM (4" OR 2 ½")

#3 PITOT-PSI GPM (4" OR 2 ½")

CALCULATED TEST AND FLOW DATA $\frac{Q1 \times PD2\ K}{PD1\ K} = Q2$
(Completed by test company)

STATIC (PSI)

DESIRED RESID.

PRESSURE DROP (PD2) "K" FACTOR FOR (PD2)
(ENTER K-FACTOR IN FORMULA)

(Q1) TIMES (PD2)K DIVIDED BY (PD1)K EQUALS (Q2) GPM @ 20 PSI RESIDUAL

TEST CONDUCTED FOR: 517 W. Struck Ave. / Design
(LOCATION & REASON)

NAME: Dan Hildebrandt

TITLE: owner

COMPANY: SoCal Flow Testing

DATE: 3/18/20 TIME: 10:45AM INSPECTOR: R. Desimone

SoCal Flow Testing
3741 Rose Dr, Yorba Linda, CA 92886
714-261-5716 * 714-393-3877**
email: info@socalflowtest.com

Hydrant Flow Test Report

Project	Orange Corporate Yard project			Test date	3/18/20
Address	517 W Struck Ave			Test time	10:45
City	Orange	State	CA	File no.	

Test hydrant location: 2nd hydrant east of N Parker St on south side of W Struck Ave
Hydr # H-J06-2337 Elev (ft +/-) Grade

Flow hydrant location: 1st hydrant east of N Parker St on south side of W Struck Ave
Hydr # H-J06-2336 Elev (ft +/-) Grade

Static Pressure 82 PSI Report Date 3/18/20

Outlet	C-value	Diam	Pitot		Volume	
A	0.9	2.0	0	PSI	0	GPM
B	0.9	2.5	56	PSI	1256	GPM
C	0.9	3.0	0	PSI	0	GPM
D	0.83	4.0	0	PSI	0	GPM

Residual Pressure 76 PSI at an observed volume of 1256 GPM

Projected Pressure 20 PSI calculates to a volume of 4432 GPM

Although the results are accurate for the date and time given, they may not accurately reflect higher or lower readings which vary due to seasonal conditions and time of day.

Per NFPA 24-10, Table C.4.10.1(a), note 1, $Q=29.84 \times c(d)^2(p)^{0.5}$

Per NFPA 24-10, Paragraph C.4.10.1.2, $Q_r = Q_f \times (h_r/h_f)^{0.54}$

Test by: Dan Hildebrandt

Witness Robert DeSimone
Fire Safety Specialist
City of Orange Fire Dept

Client John Deykes
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(949) 322-3657

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john@socalcivilsolutions.com

Symbols
T = Test hydrant
F = Flow hydrant