J. Assessment of Water Availability

C&V CONSULTING, INC.
CIVIL ENGINEERING
LAND PLANNING & SURVEYING

150 NEWPORT CENTER DRIVE
TENTATIVE TRACT MAP № 17915
ASSESSMENT OF WATER AVAILABILITY
FOR PROPOSED RESIDENTIAL DEVELOPMENT

AUGUST 31, 2015

INTRODUCTION

The subject site is currently occupied by a single story car wash facility on a 1.26 acre lot located on the corner of Anacapa Dr. and Newport Center Dr. The proposed site will consist of 49 condominium units within a seven story building. The proposed site is anticipated to result in a decrease in local water demand and utilizes an existing 12" water main on Newport Center Dr. for service. This study will determine the adequacy of the existing facilities to serve the proposed residential development. It is not meant to be a Water Supply Assessment under California SB610/SB221.

EXISTING CONDITIONS ANALYSIS

The existing car wash is currently served by a 2" domestic water service which connects to a 12" main located on Newport Center Dr. The existing site domestic water demand was calculated from six months of water bills for the existing meter servicing the car wash. The average gallon per day usage was found to be:

12,395 GPD or 8.61 GPM (See attached table for water demand summary).

To find a peak demand the Newport Beach "Design Criteria Manual" uses a factor of 2.13 for Newport Center, however a factor of 3.00 was used for safety:

8.61 GPM x 3.00 = 25.83 GPM of domestic water at peak demand

For this analysis existing flow and pressure at the site were determined from a Fire Hydrant Flow Test conducted by the City of Newport Beach Utilities Department on 2/25/2015. The findings of this flow test were then used to create a model of the domestic water pipe network in the immediate vicinity of the site using WaterCAD v8i by Bentley Systems, Inc. The existing surrounding development's water demands were estimated using the Orange County Sanitation District flow factors multiplied by a factor of 110%

and a factor of 3.00 to determine peak flow as explained above. It was determined that a portion of Fashion Island serviced by the 12" main in Newport Center Dr. would have a peak demand of 90 GPM, while a portion of the 200 block serviced by the 12" main on Anacapa Dr. would have a peak demand of 33 GPM.

PROPOSED IMPROVEMENTS ANALYSIS

The proposed residential development will be serviced by a proposed 6" domestic water service, 2" irrigation service, and 8" fire service connection to the 12" main on Newport Center Dr. Proposed site domestic water demand was calculated assuming that 110% of the calculated effluent from the Orange County Sanitation District flow factors would make up the total water demand for the site. For high density residential the following was calculated as the average demand:

1.26 Acres x 7,516 GPD/acre = 9,470 GPD x 110% = 10,417 GPD or 7.23 GPM

To find the peak demand the Newport Beach "Design Criteria Manual" uses a factor of 2.13 for Newport Center, however a factor of 3.00 was used for safety:

7.32 GPM x 3.00 = 21.96 GPM of domestic water at peak demand

CAPACITY ASSESMENT AND CONCLUSION

An analysis of the existing conditions for both domestic water mains on Newport Center Dr. and Anacapa Dr. resulted in a decrease in water demand by approximately 4 GPM at peak hours. Therefore it has been determined the 12" domestic water main on Newport Center Dr. is more than adequate to handle the peak demand of the proposed residential development as the existing facilities can adequately handle the current demand.

An analysis of the average water demand estimates that the proposed residential development will demand 10,417 GPD versus the existing demand of 12,395 GPD. This will lead to an estimated 16% net decrease in total domestic water demand and help the City of Newport Beach municipal water services meet future conservation goals set forth by the State of California.

8/31/15

DANE P. MCDOUGALL, P.E. *DATE*

C&V Consulting, Inc.

150 Newport Center Drive

Existing Carwash Water Demand Summary

Billing Start Date	Billing End Date	Billed Days	Total HCF Read	Total Gal Calcualted	Total GPD Calculated
7/16/2015	8/18/2015	33	516	385968	11696.00
6/16/2015	7/16/2015	30	496	371008	12366.93
5/19/2015	6/16/2015	28	360	269280	9617.14
4/15/2015	5/19/2015	34	606	453288	13332.00
3/17/2015	4/15/2015	29	601	449548	15501.66
2/18/2015	3/17/2015	27	428	320144	11857.19
		Six Month Average GPD =			**12395.15**

CITY OF NEWPORT BEACH
UTILITIES DEPARTMENT

FIRE HYDRANT FLOW TEST

AMOUNT PAID: $343.00 DATE: 02/25/2015
CHECK NO: N/A TIME: 10:00 AM
TEST NO: N/A WEATHER: CLEAR

PROJECT:
PROJECT LOCATION: ANACAPA DRIVE AND NEWPORT CENTER DRIVE
TEST CONDUCTED FOR: FUSCOE ENGINEERING
TEST PERFORMED BY: BULLMAN, AUGER
TEST WITNESSED BY:

FIELD OBSERVATIONS AND FLOW DATA

STATIC HYDRANT # : 1288 LOCATION: 143 NEWPORT CENTER DRIVE
F/H MANUFACTURER: JONES NUMBER & SIZE OF OUTLETS: 2-2.5" 1-4"
STATIC PRESSURE, (Ps , psi), PRE-FLOW: 137
RESIDUAL PRESSURE, (Pr , psi) FLOWING: 114
FLOW HYDRANT # : 1292 LOCATION: 210 NEWPORT CENTER DRIVE
F/H MANUFACTURER: JONES NUMBER & SIZE OF OUTLETS: 2-2.5" 1-4 "
STATIC PRESSURE, PRE-FLOW (INFO ONLY, NOT FOR TEST CALCS) :
F/H OUTLET SIZE (2.5 or 4.0): 2.5 (d, inches)
FLOW LOSS COEFFICIENT - TUBE C=1.0 / BUTT C=0.9 0.9
PITOT GAUGE READING (p, psi): 94

OBSERVED FLOW: THE OBSERVED FLOW FROM A HYDRANT OUTLET IS CALCULATED FROM THE FOLLOWING EQUATION:

$$Q_s = 29.83(Cd^2)\sqrt[2]{p}$$

WHERE; Q IS THE OBSERVED FLOW IN GPM; d IS THE OUTLET DIAMETER IN INCHES; p IS THE PITOT GAUGE PRESSURE IN PSI; AND C IS THE FLOW LOSS COEFFICIENT (C = 1.0 FOR FLOW TUBES AND C = 0.9 FOR BUTT FLOW READINGS).

OBSERVED FLOW (Qs, gpm): 1627 GPM

DISCHARGE CALCS: THE DISCHARGE FOR A GIVEN FIRE HYDRANT CAN BE DETERMINED FROM THE FOLLOWING EQUATION USING THE INITIAL (STATIC) WATER PRESSURE AND THE RESIDUAL (DYNAMIC) WATER PRESSURE:

$$Q_r = Q_s\left(\frac{P_s - 20}{P_s - P_r}\right)^{0.54}$$

WHERE; Q (STATIC OR RESIDUAL) IS THE FLOW IN GPM; AND P (STATIC OR RESIDUAL) IS THE PRESSURE IN PSI. NOTE: A 10 PSI DROP IS REQUIRED FOR VALID TEST!

CALCULATED FLOW AT 20 psi (Qr, gpm): 3916 GPM

Water Analysis for Existing Conditions

FlexTable: Pipe Table

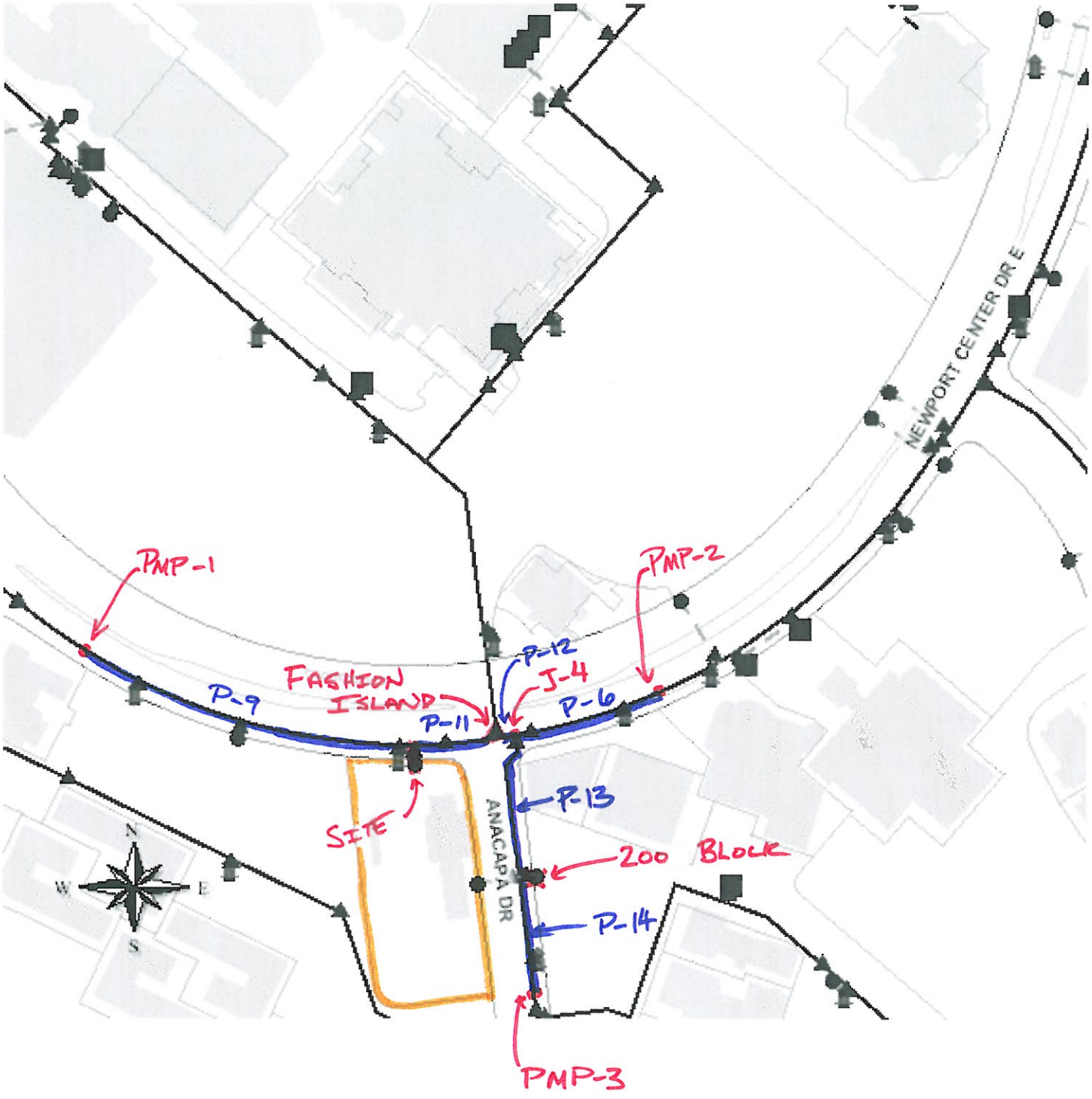
Label	Length (Scaled) (ft)	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-6	250	12.0	Asbestos Cement	140.0	130	0.37	0.000
P-9	516	12.0	Asbestos Cement	140.0	0	0.00	0.000
P-11	151	12.0	Asbestos Cement	140.0	7	0.02	0.000
P-12	29	12.0	Asbestos Cement	140.0	97	0.27	0.000
P-13	209	12.0	Asbestos Cement	140.0	33	0.09	0.000
P-14	168	12.0	Asbestos Cement	140.0	0	0.00	0.000

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-4	175.00	0	503.00	142
SITE	170.00	7	502.99	144
FASHION ISLAND	174.00	90	502.99	142
2000 BLOCK	170.00	33	502.99	144

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	165.00	165.00	481.50	0	316.50
PMP-2	187.00	187.00	503.01	130	316.01
PMP-3	164.00	164.00	480.50	0	316.50


NEWPORT CENTER DR E
PMP-1
PMP-2
P-9
FASHION ISLAND
P-11
P-12
J-4
P-6
SITE
ANACAPA DR
P-13
200 BLOCK
P-14
PMP-3
N
W
E
S

Wastewater Flow Estimates for Development Planning

- 727 gpd/acre for estate density residential (0-3 d.u. /acre);
- 1488 gpd/acre for low density residential (4-7d.u. /acre);
- 3451 gpd/acre for medium density residential (8-16 d.u./acre);
- 5474 gpd/acre for medium-high density residential (17-25 d.u./acre);
- 7516 gpd/acre for high density residential (26-35 d.u./acre);
- 2262 gpd/acre for commercial/office;
- 3167 gpd/acre for industrial;
- 2715 gpd/acre for institutional;
- 5429 gpd/acre for high intensity industrial/commercial;
- 150 gpd/room for hotels and motels;
- 50 gal/seat for restaurants, and
- 129 gpd/acre for recreation and open space usage.