

I. Assessment of Sewer Capacity Availability



CONSULTING, INC.
CIVIL ENGINEERING
LAND PLANNING & SURVEYING

150 NEWPORT CENTER DRIVE

TENTATIVE TRACT MAP Nº 17915

**ASSESSMENT OF SEWER CAPACITY AVAILABILITY
FOR PROPOSED RESIDENTIAL DEVELOPMENT**

SEPTEMBER 2, 2015

INTRODUCTION

The subject site is currently occupied by a single story car wash facility on a 1.26 acre lot. The proposed site will consist of 49 condominium units within a seven story building. The proposed site is anticipated to result in a decreased demand on the local sanitary sewer system when compared to the existing car wash use. The proposed site will utilize existing public utilities in place, therefore this assessment has been prepared to determine whether there is adequate capacity within the existing infrastructure in the vicinity to serve the proposed residential development.

EXISTING SITE CONDITIONS

The site is contained within an area of existing development bound by Anacapa Dr., Newport Center Dr., and a low-rise commercial office space development. The site sanitary sewer is served by an 8" lateral which connects to a 15" main on Newport Center Dr. flowing at 3.28% and a 6" lateral which connects to an 8" main on Anacapa Dr. flowing at 3.80%. Using the Orange County Sanitation District flow factors for office/commercial (2,262 GPD/acre) it was estimated that the existing flow from the site is 2,850 GPD, however this calculated flow is much lower than the actual conditions because the existing car wash has a higher flow factor than the average office or commercial building. Using the existing car wash's water utility bills for the past six months the water usage was found to be 12,395 GPD (see "Existing Carwash Water Demand Summary" attached). To keep results on the conservative side it is then assumed that only 90% of the water used would be discharged into the sewer which results in:

$$12,395 \text{ GPD} \times 90\% = \underline{11,156 \text{ GPD of existing sanitary sewer demand}}$$

The total flow is then assumed to be evenly split between the sanitary sewer systems on both streets resulting in:

5,578 GDP of existing sanitary sewer demand on Anacapa Dr.

5,578 GDP of existing sanitary sewer demand on Newport Center Dr.

PROPOSED IMPROVEMENTS

There is one 6" sanitary sewer lateral connection proposed on Anacapa Dr. The two existing 8" and 6" laterals will remain and serve the proposed residential building on Newport Center Dr. and Anacapa Dr. respectively. Using the Orange County Sanitation District flow factors for high density residential it was found that the proposed flow from the site is:

$7,516 \text{ GPD/AC} \times 1.26 \text{ AC} = \underline{9,470 \text{ GPD of proposed sanitary sewer demand}}$

The total flow is then assumed to be evenly split between the sanitary sewer systems on both streets resulting in:

4,735 GPD of proposed sanitary sewer demand on Anacapa Dr.

4,735 GPD of proposed sanitary sewer demand on Newport Center Dr.

CAPACITY ASSESSMENT

An analysis of existing conditions for both mains on Newport Center Dr. and Anacapa Dr was done using flow factors provided by the Orange County Sanitary District for proposed conditions and 90% of the total known water usage from existing conditions. The tributary areas upstream of the project site were calculated using the flow factors and found to be 229,449 GPD of sanitary sewer flow on Newport Center Dr. and 2,624 GPD of sanitary sewer flow on Anacapa Dr. The proposed total flow is assumed to be split between the two mains, the respective halves of the proposed flow were then added to the existing flow and the mains were compared against the existing conditions to verify that the flow would not adversely impact each main's capacity.

15" main on Newport Center Dr.

The upstream tributary areas and existing site results in a flow of 235,027 GPD or 0.363 CFS which calculates to be 1.9" of depth or 12.8% of the depth to diameter total main capacity.

The upstream tributary areas and proposed site results in a flow of 234,184 GPD or 0.362 CFS which calculates to be 1.8" of depth or 12.0% of the depth to diameter total main capacity.

Therefore it was found that the proposed site would reduce the total flow depth by 0.8% for the main located on Newport Center Dr.

8" main on Anacapa Dr.

The upstream tributary areas and existing site results in a flow of 8,202 GPD or 0.013 CFS which calculates to be 0.48" of depth or 6% of the depth to diameter total main capacity.

The upstream tributary areas and proposed site results in a flow of 7,359 GPD or 0.011 CFS which calculates to be 0.42" of depth or 5.3% of the depth to diameter total main capacity.

Therefore it was found that the proposed site would reduce the total flow depth by 0.7% for the main located on Newport Center Dr.

CONCLUSION

The project demand for the proposed residential units will have no adverse impact on any downstream facilities because of the expected decrease in sewer demand from the proposed site. Therefore it can be concluded that the existing facilities that will serve this project are more than adequate for the proposed development.

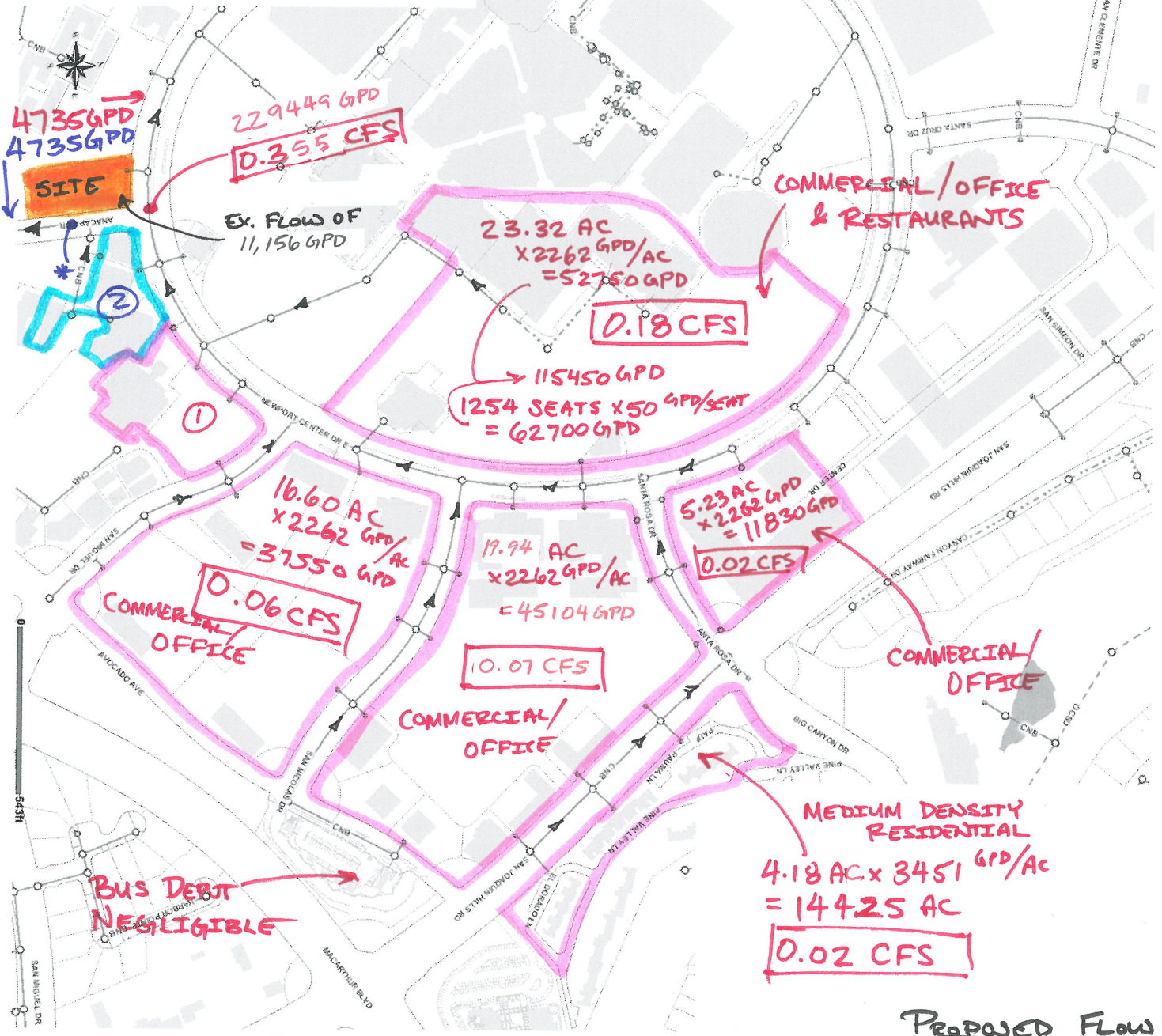
DANE P. MCDOUGALL, P.E.
C&V Consulting, Inc.

DATE

- TRIBUTARY AREA TO NEWPORT CENTER DR. MAIN

- TRIBUTARY AREA TO ANACAPA DR. MAIN

NORTH



4735 GPD
4735 GPD
SITE

229449 GPD
0.355 CFS

Ex. Flow of 11,156 GPD

23.32 AC
x 2262 GPD/AC
= 52750 GPD

0.18 CFS

115450 GPD
1254 SEATS x 50 GPD/SEAT
= 62700 GPD

16.60 AC
x 2262 GPD/AC
= 37550 GPD

0.06 CFS

COMMERCIAL/OFFICE

19.94 AC
x 2262 GPD/AC
= 45104 GPD

0.07 CFS

COMMERCIAL/OFFICE

5.23 AC
x 2262 GPD
= 11830 GPD

0.02 CFS

COMMERCIAL/OFFICE

MEDIUM DENSITY RESIDENTIAL
4.18 AC x 3451 GPD/AC
= 14425 GPD

0.02 CFS

BUS DEBT
NEGLECTIBLE

① COMMERCIAL/OFFICE
2.25 AC x 2262 GPD/AC
= 5090 GPD

0.01 CFS

② COMMERCIAL/OFFICE
1.16 AC x 2262 GPD/AC
= 2624 GPD

0.01 CFS * 0.004 CFS

PROPOSED FLOW:
HIGH DENSITY RES.
1.26 AC x 7516 GPD/AC
= 9470 GPD

0.01 CFS

Channel Report

Newport Center Dr - 15in SS Main - Existing Flow

Circular

Diameter (ft) = 1.25

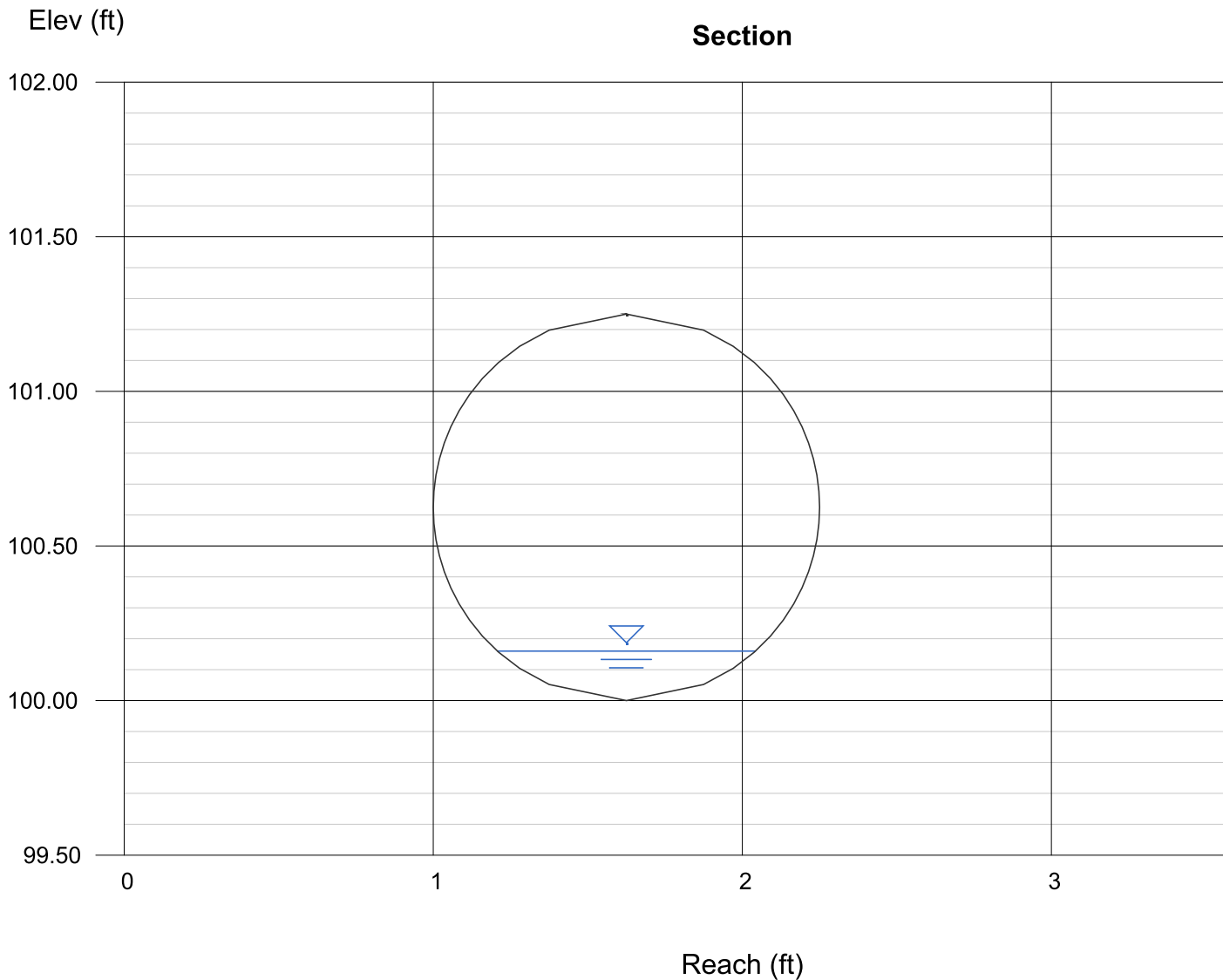
Invert Elev (ft) = 100.00
Slope (%) = 3.28
N-Value = 0.013

Highlighted

Depth (ft) = 0.16
Q (cfs) = 0.363
Area (sqft) = 0.09
Velocity (ft/s) = 3.91
Wetted Perim (ft) = 0.92
Crit Depth, Yc (ft) = 0.24
Top Width (ft) = 0.84
EGL (ft) = 0.40

Calculations

Compute by: Known Q
Known Q (cfs) = 0.36



Channel Report

Newport Center Dr - 15in SS Main - Proposed Flow

Circular

Diameter (ft) = 1.25

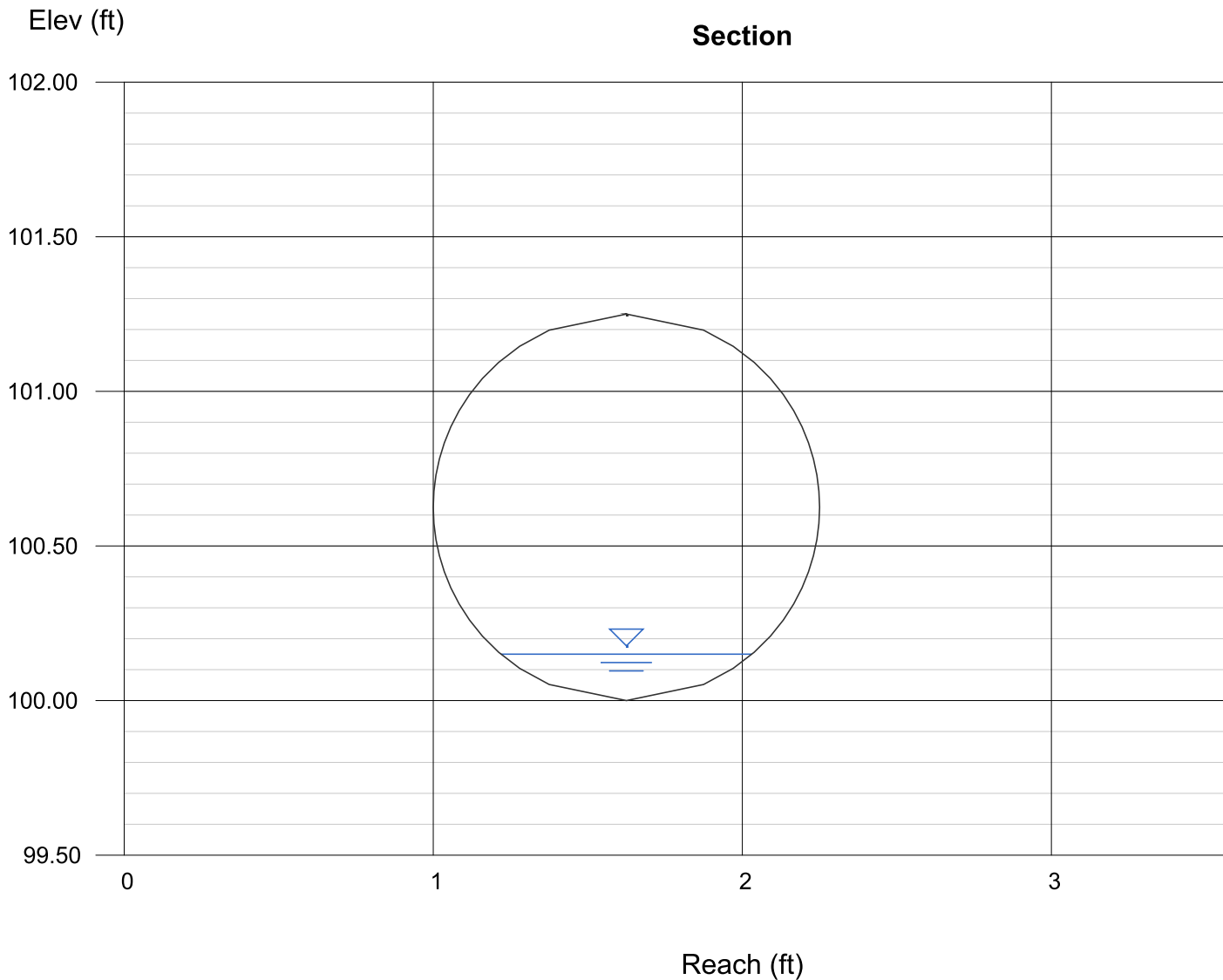
Invert Elev (ft) = 100.00
Slope (%) = 3.28
N-Value = 0.013

Highlighted

Depth (ft) = 0.15
Q (cfs) = 0.362
Area (sqft) = 0.08
Velocity (ft/s) = 4.30
Wetted Perim (ft) = 0.89
Crit Depth, Y_c (ft) = 0.24
Top Width (ft) = 0.81
EGL (ft) = 0.44

Calculations

Compute by: Known Q
Known Q (cfs) = 0.36



Channel Report

Anacapa Dr - 8in SS - Existing Flow

Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 100.00

Slope (%) = 3.80

N-Value = 0.013

Calculations

Compute by: Known Q

Known Q (cfs) = 0.01

Highlighted

Depth (ft) = 0.04

Q (cfs) = 0.013

Area (sqft) = 0.01

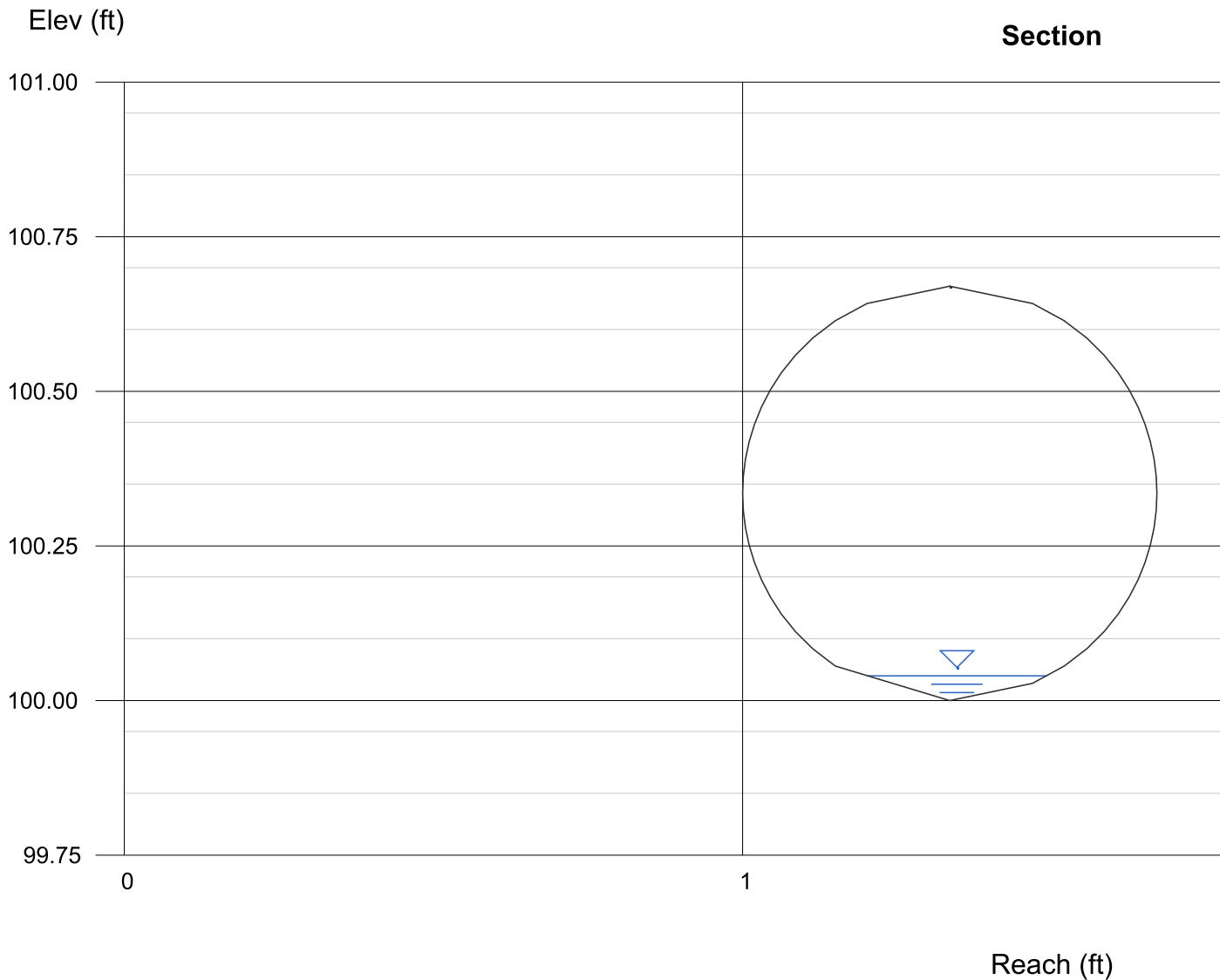
Velocity (ft/s) = 1.50

Wetted Perim (ft) = 0.33

Crit Depth, Yc (ft) = 0.06

Top Width (ft) = 0.32

EGL (ft) = 0.08



Channel Report

Anacapa Dr - 8in SS - Proposed Flow

Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 100.00

Slope (%) = 3.80

N-Value = 0.013

Calculations

Compute by: Known Q

Known Q (cfs) = 0.01

Highlighted

Depth (ft) = 0.04

Q (cfs) = 0.010

Area (sqft) = 0.01

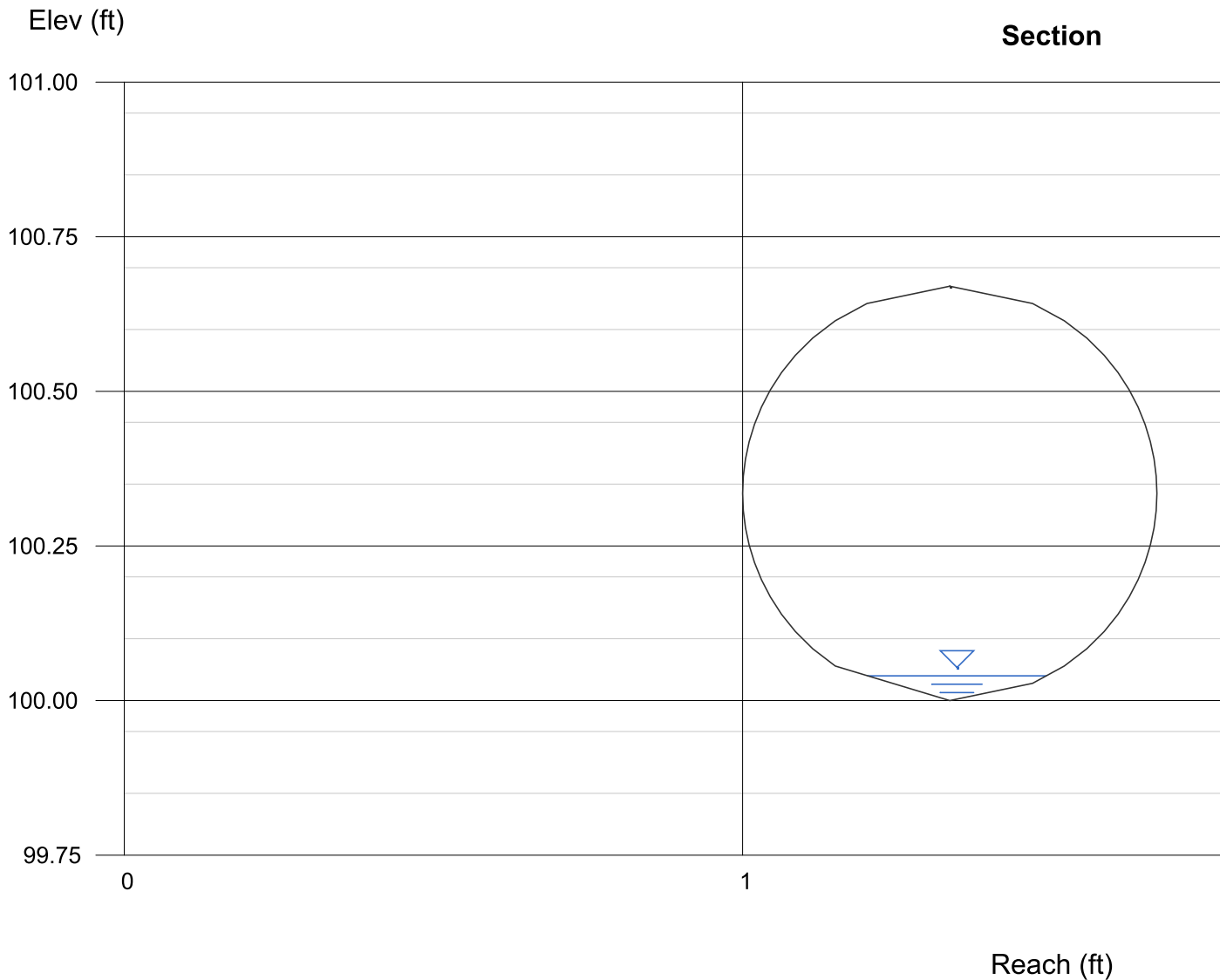
Velocity (ft/s) = 1.16

Wetted Perim (ft) = 0.33

Crit Depth, Yc (ft) = 0.05

Top Width (ft) = 0.32

EGL (ft) = 0.06



150 Newport Center Drive

Existing Carwash Water Demand Summary

Billing Start Date	Billing End Date	Billed Days	Total HCF Read	Total Gal Calculated	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

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.