

Exhibit E

AVIDA (DOS2016-00049) HYDRAULIC CALCULATIONS (October 2016)



Digitally signed by Kenneth W. Kellum, P.E. #47657 State of Florida using an SHA-1 authentication code. Printed copies of this document are not considered signed & sealed & the SHA-1 authentication code must be verified on any electronic copies. Date: 2016.10.13 09:21:08 -04'00'

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INTRODUCTION:

The following calculations for the project known as Avida and will demonstrate that the proposed water distribution system is capable of meeting project demand including peak system demand and fire flow in accordance with LDC criteria.

DESIGN CRITERIA:

The estimated flow calculations for the project were separated into three different areas: the proposed Independent Living Cottages (Multi-family), the 190-unit Assisted Living facility and the amenity center.

From Lee County Utility Operations Manual:

Average per capita consumption = 100 GPD

2.0 Persons per multi-family residence

From Chapter 64E-6, Florida Administrative Code:

Nursing, rest homes, adult congregate living facilities per bed = 100 GPD

Add per meal prepared = 5 GPD

From NFPA Section 18.4.5.1.2:

In buildings other than one- and two-family dwellings shall be as specified in Table 18.4.5.1.2 and as modified by 18.4.5.2.1 (Required fire flow shall be reduced by 75% when the building is protected throughout by an approved automatic sprinkler system. The resulting fire flow shall not be less than 1,000 GPM. For Type III(200) with the largest total floor area greater than 138,300 SF, the required fire flow is 8,000 GPM. This is reduced per NFPA Section 18.4.5.2.1 by 75 percent to 2,000 GPM.

DESIGN ASSUMPTIONS:

The required fire flow for the ILF facility is 2,000 GPM. The water system serving Avida is a 12" watermain. Use Hazen-Williams equation to calculate head losses. Neglect head losses through fittings. Instead, use a friction coefficient C of 120 for PVC pipe to account for fitting losses. Neglect differences in elevation of the Project.

DESIGN CALCULATIONS:

SERVICE AREA: This portion of the water system serves the following:

Avida

CALCULATE ADF FOR SYSTEM LOADING PURPOSES:

Independent Living Cottages (Multi-family): 28 @ 200 GPD = 5,600 GPD

Amenity Center: = 500 GPD

Assisted Living Units: 190 units @ 100 GPD = 19,000 GPD

Meals: 3 meals/day/unit @ 5 GPD = 2,850 GPD

Commercial/Office Area: 75,000 SF @ 0.15 GPD = 11,250 GPD

Retail Area: 25,000 SF with 46 Employees @ 20 GPD = 920 GPD

Total = 40,120 GPD
= 27.9 GPM

CALCULATE PEAK FLOW FOR SYSTEM LOADING PURPOSES:

Avida: 40,120 GPD @ 3.5 = 140,420 GPD
= 97.5 GPM

Total Peak Flow = 97.5 GPM

CALCULATE HEAD LOSSES:

There is approximately 3,490 LF of 12" water main from the most hydraulically remote location in Avida to the fire hydrant tested.

Head losses based on Fire Control Ordinance:

The required minimum fire flow for a Type III(200) building with a total floor area greater than 138,300-SF that is equipped with automatic sprinklers is 2,000 GPM 20 psi (per required fire flow). The total peak domestic demand is 27.9 GPM. The total system demand is 2,028 GPM. The hydrant flow is 2,993 GPM at 20 psi based on the flow test dated July 21, 2016 from the South Trail Fire & Rescue Service District.

Compute head losses with design flows using Hazen-Williams equation:

Head loss in 3,490 of 12" water main

Flow = 2,028 GPM

Line Losses = (2,028 GPM, 3,490', 12", C = 120) = 38.0' = 16.5 psi

Total pressure at the most hydraulically remote location = 56 – 16.5 = 39.5 psi

CONCLUSIONS:

The proposed water system at Avida is based on sound engineering practices and provides equivalent service and is capable of providing 2,028 GPM (total fire and domestic demand) at a pressure of 39.5 psi (20 psi minimum required by LDC). This equivalent service is consistent with LDC criteria to allow the approval of the deviation and does not jeopardize the health, safety, and welfare of the public.

SOUTH TRAIL FIRE PROTECTION & RESCUE SERVICE DISTRICT

Emergency 911

5531 Halifax Ave.
Fort Myers, Florida 33912

Prevention # (239) 482-8030
Fax # (239) 433-2185

Business # (239) 433-0080
Fax # (239) 433-1941

FIRE FLOW TEST

DATE : 07/21/2016

OUT OF DATE: 07/21/2017

TIME : 07:30

HYDRANT #: 3052

HYDRANT (TEST) LOCATION : GLADIOLUS DR COCA SABAL LN LANE

STATIC: 68

RESIDUAL: 56

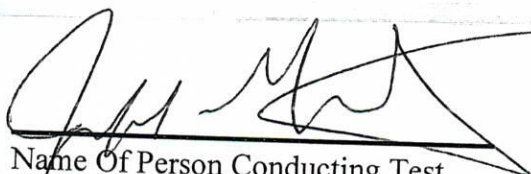
HYDRANT (FLOW) LOCATION : HYDRANT # 3053 GLADIOLUS AND CONGDON

PITOT 1: 22

GPM: 1416

PITOT 2: 22

HYDRANT FLOW AT 20 PSI: 2993


Name Of Person Conducting Test
(Signature)

Notice : The results of this water flow test are an indicator of the available water for fire protection on this date, time, and location, as specified above. The South Trail Fire District makes no expressed or implied guarantees of future water flow for this, or any other location.