FLORIDA ENGINEERING GROUP
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Engineering the Future

Hydraulic Modeling for Potable Water and Irrigation System Report

Range Road Subdivision
N. Range Road
Cocoa, Florida 32926

Gregory R Crawford

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Date: 2022.06.15 14:39:22 -04'00'

Prepared for:
Karali Associates, LLC.
June 15, 2022
FEG 19-070

Gregory R. Crawford, PE #51335
Florida Engineering Group, Inc.
Certificate No. EB0006595

CONTENTS

I. Project Description

The Range Road Subdivision project site is located south of the intersection Hooper Road and Range Road in the City of Cocoa, Brevard County, Florida. Specifically, the site is located in Sections 19 and 30, Township 24 South, Range 36 East. The proposed project includes Parcel ID numbers 24-36-19-00-501, 24-36-30-00-258, and 24-36-30-00-252. A Site Location Map is provided in **Appendix A** of this report.

The proposed project consists of 71 single-family residential units with its associated roadways, utility facilities, recreational areas, and stormwater system. The utility facilities will consist of potable water, irrigation distribution system, and sanitary sewer.

The proposed potable water distribution system will connect to an existing 12-inch water line on Range Road; this connection supplies an available assumed residual pressure of 50 psi. The proposed system will have two points of connection. The first point of connection will be located to the south at the intersection of Hopper Road and Range Road. The second point of connection will be located to the north, roughly about 740 feet north of the Hopper Road and Range Road intersection. The system will then loop through the development having a blow-off valve at the cul-de-sac for Street A on southeast end of the subdivision and a blow-off valve at the cul-de-sac for Street B on the north end of the subdivision. The fire flow system will be served off the potable water main with a 6-inch pipe into the fire hydrant assembly. Five (5) fire hydrants are proposed around the development.

The proposed irrigation distribution system will consist of two points of connection; each connection supplies an assumed residual pressure of 50 psi. The first point of connection will be located to the south at the intersection of Hopper Road and Range Road. The second point of connection will be located at northeast entrance of the proposed property, roughly about 790 feet north of the Hopper Road and Range Road intersection. The system will then loop through the development having a blow-off valve at the cul-de-sac for Street A on southeast end of the subdivision and a blow-off valve at the cul-de-sac for Street B on the north end of the subdivision.

II. Hydraulic Modeling for Potable Water and Fire Flow Analysis

A. Potable Water Demand Design Flows

Based on City of Cocoa Utilities Handbook, Section 3.3.3 Impact Fees, the calculated water flow demand is:

Table II-1 - Water Demand Calculations

	ERC/Unit	Number of Units	GPD/Unit	Average Daily Flow (GPD)	Maximum Daily Flow (2xADF)		Peak Daily Flow (4xADF)	
					GPD	GPM	GPD	GPM
Single-Family Residence	1.00 ERC	71	265	18,815	37,630	26.13	75,260	52.26

B. Fire Water Demand Design Flows

Using ISO Standards, the Needed Fire Flow for a single-family dwelling unit is 1,250 GPM. This Needed Fire Flow will be assigned to each of the proposed fire hydrants in order to confirm that the minimum required pressure (20 PSI) is maintained in the system and to check pipe velocities. Fire hydrants will be spaced throughout the subdivision with a maximum separation of 500 feet. The ISO worksheet is provided in **Appendix B**.

C. Potable Water and Fire Flow Modeling

The following analysis represents the water modeling for The Range Road Subdivision. The WaterCad software was used to analyze the proposed water system to ensure that the required flows and pressures are available to provide fire protection and the peak demand for proposed development.

As required by the City of Cocoa Utilities Handbook, the project will be modeled using factors of Maximum = 2.0 and Peak = 4.0 (see Table II-I above for demand calculations). Based on the flows listed in Table II-I above, the follow scenarios will be modeled for the proposed development.

- Total Project Peak Daily Flow Demand, excluding Fire Flow
- Total Project Maximum Daily Flow Demand with Fire Flow

1. Existing Municipal Distribution

The residual pressure of the existing municipal water distribution system was assumed to have a residual pressure of 50 psi. The existing system was model and the point of connection are represented as reservoirs R-1 and R-2. The ground elevation at the P.O.C. was used, along with 3.5 feet of cover and the assumed pressure, to calculate the hydraulic grade line at each reservoir.

2. Physical Characteristics

Hazen-Williams Coefficient: A Hazen Williams Coefficient of 120 was used for all PVC pipes.

Head Loss: Head losses were calculated using the Hazen Williams formula from the WaterCad software.

$$H_f = \frac{10.45 * L * Q^{1.85}}{(C^{1.85} * D^{4.8655})}$$

Where,
H_f = Head Loss through a pipe
L = Length of Pipe
Q = Flow
C = 120 for PVC
D = Diameter of pipe

Minor Loss: Minor losses due to valves, backflow preventers, etc. are calculated using the method of loss coefficient:

$$H_f = K * \frac{V^2}{2g}$$

Minor losses due to bends & tees were determined through the use of a resistance coefficient, which was applied to the velocity head of the flow to find the friction loss in the bend or tee. This allows the analysis model to adjust the head loss in a bend or tee as the flow rate changes. Minor loss coefficients for bends, tees, and pipe size were taken from Ingersoll Rand's Cameron Hydraulic Data 17th Edition. The minor loss coefficients are summarized below.

Table II-2 - Minor Loss Coefficients Bend, Valves and Tees

	6" Nominal Diameter	8" – 10" Nominal Diameter
90° Elbow	0.45	0.42
90° Long Radius Elbow	0.24	0.22
Gate valve	0.12	0.11
Tee, Through Flow	0.3	0.28
Tee, Branch Flow	0.9	0.84

Table II-3 - Minor Loss Coefficients Due to Change in Pipe Size

From/To	4"	6"	8"
4"	N/A	0.31	0.56
6"	0.28	N/A	0.19
8"	0.38	0.22	N/A

3. Potable Water and Fire Flow Hydraulic Analysis Summary

Scenario 1: examines the system under peak hour potable demand with no fire flow demand.

Potable Demand: 46.32 GPM Fire Hydrant Demand: 0.00 GPM

Scenario 2: examines the system under maximum daily potable demand along with the required fire flow demand.

Potable Demand: 26.13 GPM Fire Hydrant Demand: 1,250 GPM

See **Appendix C** for results of the hydraulic analysis for the peak hour flow with no fire flow (Scenario 1) and **Appendix D** for the results of the hydraulic analysis for the maximum daily flow with the required fire flow from each fire hydrant separately (Scenario 2). As can be seen, all of the demand sources maintain the required minimum operating pressure of 40 psi under peak daily flow conditions and a minimum pressure of 20 psi under fire flow conditions.

III. Hydraulic Modeling for Potable Water and Fire Flow Analysis

A. Reuse Water Demand Design Flows

Reclaimed water demand was calculated using the standard irrigation design for peak hour flow per zone; the zones where divided into 71 single-family residence units and one recreational area. The maximum daily demand was calculated based on 1.25 inches of irrigation during 7 days. The maximum day irrigation demand rate was estimated as follows:

$$\frac{1.25\ in}{1\ week} * \frac{1\ week}{7\ days} * \frac{1\ day}{24\ hours} * \frac{1\ hour}{60\ minutes} * \frac{1\ ft}{12\ in} * 24.19 acres * \frac{43560\ SF}{1\ acre} =$$

$$10.89 \frac{ft^3}{minute} * \frac{7.48\ gallons}{1\ ft^3} = 81.45\ GPM$$

However, for pipe sizing purpose, the peak hour demand flow was used to ensure the required minimum pressure was met throughout the development under the peak demand conditions. Peak hour demand was estimated at a maximum 8 GPM per zone, per lot, knowing only 1 zone per lot operates at one time. The minimum required pressure for an irrigation system is 30 psi. Table III-1 below summarize the demand results

Table III-1 - Demand Summary

Demand Source	Demand Flow Rate
Zones	72 zones
Peak Hour Reclaimed Water Demand per zone	8 GPM
Peak Hour Reclaimed Demand per Development	**576 GPM**

The demand for the five (5) junctions is based on 8 GPM per lot.

B. Reclaimed Water Flow Modeling

The following analysis represents the water modeling for The Range Road Subdivision. The WaterCad software was used to analyze the proposed reclaimed water system to ensure that the required flows and pressures are available to provide irrigation services around the proposed development.

1. Existing Municipal Distribution

The residual pressure of the existing municipal water distribution system was assumed to have a dynamic pressure of 40 psi. The existing system was modeled and the point of connection are represented as reservoirs R-1 and R-2. The ground elevation at the P.O.C. was used, along with a 3 feet of cover and the assumed pressure, to calculate the hydraulic grade line at each reservoir.

2. Reclaimed Water Hydraulic Analysis Summary

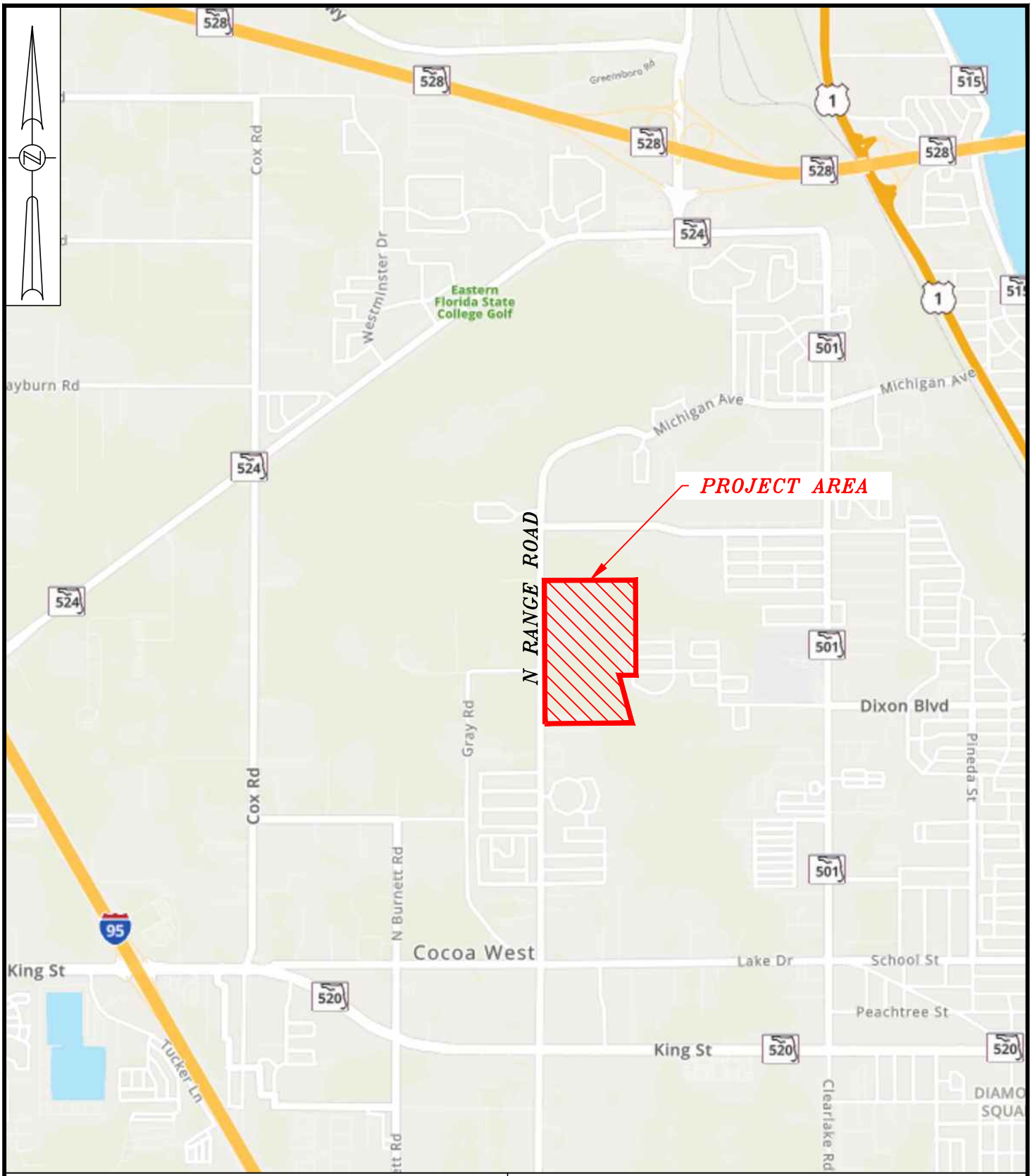
The WaterCad model analyzed the system under peak hour reclaimed demand of 576 GPM.

Table III-2 - Summary of Results

Demand Source	Demand (GPM)	Pressure (psi)
CU-1	85.00	36
CU-2	60.00	36
CU-3	125.00	36
CU-4	90.00	35

Table III-2 above shows the operating pressure for the on-site demand sources. All of the demand sources maintain the required minimum operating pressure of 30 psi under peak hour demand conditions. See **Appendix D** for complete water and fire analysis results.

Appendix A – Location Map



PROJECT NAME: RANGE ROAD SUBDIVISION	**SITE LOCATION MAP**
CLIENT: KARALI ASSOCIATES, LLC	
S, T, R: S 30 T 24S R 36E	**F.E.G. PROJECT NO.:** 19-070
DATE: APRIL 01, 2022	**SCALE:** 1" = 200'

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Appendix B – ISO Worksheet

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FIRE FLOW WORKSHEET I.S.O. METHOD

Date: _____ Calculated by: Gregory Crawford, Florida Engr. Group, Inc.

Osceola County Project # _____ - _____ Owner: Karali Associates, LLC

Project Address: Range Road Subdivision

Construction Type: V Number of stories: 1 Occupancy Type: Single Family Residential

Step 1 Take Ai which is 100% sq. ft. of 1st floor plus the following percentage of the total area of the other floors, and find its square root:

1st Floor 2,800 Sq. Ft. @ 100%

BUILDINGS CLASSIFIED AS CONSTRUCTION CLASSES 1-4: 50% OF ALL OTHER FLOORS
BUILDINGS CLASSIFIED AS CONSTRUCTION CLASSES 5 OR 6: IF ALL VERTICAL OPENINGS ARE PROTECTED, 25% OF THE AREA NOT EXCEEDING THE TWO LARGEST FLOORS.
IF ONE OR MORE VERTICAL OPENINGS IN THE BUILDING ARE UNPROTECTED 50% OF THE AREA OF NOT EXCEEDING 8 OTHER FLOORS

Total _____ Sq. Ft. for fire flow = Ai
(Find square root of "Total Sq. Ft. for Fire Flow)

2,800 first = 2,800 Sq. Ft. = 52.9 Ai

TAKE SQUARE ROOT OF Ai AND MULTIPLY BY "F" (COEFFICENT FOR CONSTRUCTION TYPE)

STEP 2

F = Coefficient Related to the class of construction		SBC Type
F = 1.5 for Construction Class 1	(Wood Frame)	VI
F = 1.0 for Construction Class 2	(Joisted Masonry)	V
F = 0.8 for Construction Class 3	(Non-Combustible) &	IV
Construction Class 4	(Masonry Non-Combustible)	III
F = 0.6 for Construction Class 5	(Modified Fire Resistive) &	II
Construction Class 6	(Fire Resistive)	I

Sq. Rt. 52.9 **X F** 1.0 **=** 52.9

STEP 3 **MULTIPLY RESULT OF STEP 2 BY 18**

52.9 **X 18 =** 952.2 **GPM** (round off to nearest GPM in table on Step 4 below)

STEP 4 **ROUND OFF TO THE NEAREST 250 GPM (ROUND UP OR DOWN)**

500 TO 625 = 500 GPM	**626 TO 875 = 750 GPM**	**876 TO 1125 = 1000 GPM**
1126 TO 1375 = 1250 GPM	**1376 TO 1625 = 1500 GPM**	**1626 TO 1875 = 1750 GPM**
1876 TO 2125 = 2000 GPM	**2126 TO 2375 = 2250 GPM**	**2376 TO 2625 = 2500 GPM**
2626 TO 2875 = 2750 GPM	**2876 TO 3125 = 3000 GPM**	**3126 TO 3375 = 3250 GPM**

ROUNDED OFF TO THE NEAREST 250 GPM = 1,000 **GPM Sub Total**

STEP 5 **MULTIPLY RESULT OF ROUNDED OFF GPM (X) FROM ABOVE BY THE OI (OCCUPANT FACTOR)**

		OCC. FACTOR
C-1	(NON-COMBUSTIBLE) CLAY, BLOCK STORAGE, ETC.	0.75
C-2	(LIMITED COMBUSTIBLE) APARTMENTS, OFFICE, CHURCH, ETC.	0.85
C-3	(COMBUSTIBLE) MERCANTILE, RESTAURANTS, ETC.	1.00
C-4	(FREE BURNING) MIXED STORAGE, COMBUSTIBLE & FLAMABLE	1.15
C-5	(RAPID BURNING) EXPLOSIVES, VAPORS, ETC.	1.25

ROUNDED GPM 1,000 **X OI** 0.75 **=** 750 **GPM Sub Total**

County Project # _____-_____ Date: January 27, 2022

Rounded off GPM Sub Total from step 4 1,000 **b = (GPM)**

I.S.O. Sprinkler Reduction % Varies with Building Hazard.

Automatic Sprinklers: _____ Subtract _____% Times b = _____ GPM

Subtotal N/A GPM

Building exposures: **Distance** **Exposure**

1. Front 70' including street Add 10 %
2. Left 10' Add 25 %
3. Rear 25' Add 20 %
4. Right 10' Add 25 %

Total Use highest per ISO Standards

Use 25% % X b = + 250

Total 1,250 GPM

Final Fire Flow Required 1,250 **GPM**

The percentage for any one side generally should not exceed the following limits for the separations shown:

Separation	Percentage
0 – 10 feet	25%
11 – 30 feet	20%
31 – 60 feet	15%
61 – 100 feet	10%
101 – 150 feet	5%

Dwellings – For groupings of 1 – family and small 2 – family dwellings not exceeding 2 stories in height, the following short method may be used. (*For other residential buildings, the regular method should be used*.)

Exposure distances	Suggested required fire flow
Over 100 feet	500 GPM
31 to 100 feet	750 – 1000 GPM
11 to 30 feet	1000 – 1500 GPM
10 feet or less	1500 – 2000 GPM

Appendix C – Potable Water and Fire Flow Analysis Results

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	20.52	1,255	130.39	48
FH-2	20.74	5	131.04	48
FH-3	20.09	5	132.07	48
FH-4	20.19	5	133.10	49
FH-5	21.10	5	133.18	48
J-2	20.80	0	131.04	48
J-6	19.79	0	133.18	49

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Length (ft)	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Pressure Loss (psi)
P-1	R-1	FH-1	8.0	PVC	120.0	121	2.790	948	6.05	1.7
P-3	FH-1	J-2	8.0	PVC	120.0	265	0.280	-307	1.96	0.3
P-4	J-2	FH-2	8.0	PVC	120.0	65	0.280	5	0.03	0.0
P-6	J-2	FH-3	8.0	PVC	120.0	393	1.060	-312	1.99	0.4
P-8	FH-3	FH-4	8.0	PVC	120.0	400	0.280	-318	2.03	0.4
P-10	FH-4	J-6	8.0	PVC	120.0	23	0.280	-323	2.06	0.0
P-11	J-6	FH-5	8.0	PVC	120.0	372	0.500	5	0.03	0.0
P-13	J-6	R-2	8.0	PVC	120.0	240	2.570	-328	2.09	0.4

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	20.52	5	131.52	48
FH-2	20.74	1,255	125.43	45
FH-3	20.09	5	129.98	48
FH-4	20.19	5	132.13	48
FH-5	21.10	5	132.30	48
J-2	20.80	0	127.80	46
J-6	19.79	0	132.30	49

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Length (ft)	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Pressure Loss (psi)
P-1	R-1	FH-1	8.0	PVC	120.0	121	2.790	793	5.06	1.2
P-3	FH-1	J-2	8.0	PVC	120.0	265	0.280	788	5.03	1.6
P-4	J-2	FH-2	8.0	PVC	120.0	65	0.280	1,255	8.01	1.0
P-6	J-2	FH-3	8.0	PVC	120.0	393	1.060	-467	2.98	0.9
P-8	FH-3	FH-4	8.0	PVC	120.0	400	0.280	-473	3.02	0.9
P-10	FH-4	J-6	8.0	PVC	120.0	23	0.280	-478	3.05	0.1
P-11	J-6	FH-5	8.0	PVC	120.0	372	0.500	5	0.03	0.0
P-13	J-6	R-2	8.0	PVC	120.0	240	2.570	-483	3.08	0.7

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	20.52	5	132.59	48
FH-2	20.74	5	130.27	47
FH-3	20.09	1,255	126.74	46
FH-4	20.19	5	130.63	48
FH-5	21.10	5	130.93	48
J-2	20.80	0	130.27	47
J-6	19.79	0	130.93	48

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Length (ft)	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Pressure Loss (psi)
P-1	R-1	FH-1	8.0	PVC	120.0	121	2.790	616	3.93	0.7
P-3	FH-1	J-2	8.0	PVC	120.0	265	0.280	610	3.90	1.0
P-4	J-2	FH-2	8.0	PVC	120.0	65	0.280	5	0.03	0.0
P-6	J-2	FH-3	8.0	PVC	120.0	393	1.060	605	3.86	1.5
P-8	FH-3	FH-4	8.0	PVC	120.0	400	0.280	-650	4.15	1.7
P-10	FH-4	J-6	8.0	PVC	120.0	23	0.280	-655	4.18	0.1
P-11	J-6	FH-5	8.0	PVC	120.0	372	0.500	5	0.03	0.0
P-13	J-6	R-2	8.0	PVC	120.0	240	2.570	-661	4.22	1.3

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	20.52	5	133.42	49
FH-2	20.74	5	132.21	48
FH-3	20.09	5	130.40	48
FH-4	20.19	1,255	128.68	47
FH-5	21.10	5	129.14	47
J-2	20.80	0	132.21	48
J-6	19.79	0	129.14	47

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Length (ft)	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Pressure Loss (psi)
P-1	R-1	FH-1	8.0	PVC	120.0	121	2.790	434	2.77	0.4
P-3	FH-1	J-2	8.0	PVC	120.0	265	0.280	429	2.74	0.5
P-4	J-2	FH-2	8.0	PVC	120.0	65	0.280	5	0.03	0.0
P-6	J-2	FH-3	8.0	PVC	120.0	393	1.060	424	2.71	0.8
P-8	FH-3	FH-4	8.0	PVC	120.0	400	0.280	419	2.67	0.7
P-10	FH-4	J-6	8.0	PVC	120.0	23	0.280	-837	5.34	0.2
P-11	J-6	FH-5	8.0	PVC	120.0	372	0.500	5	0.03	0.0
P-13	J-6	R-2	8.0	PVC	120.0	240	2.570	-842	5.37	2.1

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	20.52	5	133.48	49
FH-2	20.74	5	132.36	48
FH-3	20.09	5	130.67	48
FH-4	20.19	5	129.08	47
FH-5	21.10	1,255	116.45	41
J-2	20.80	0	132.36	48
J-6	19.79	0	128.96	47

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Length (ft)	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Pressure Loss (psi)
P-1	R-1	FH-1	8.0	PVC	120.0	121	2.790	418	2.67	0.4
P-3	FH-1	J-2	8.0	PVC	120.0	265	0.280	413	2.63	0.5
P-4	J-2	FH-2	8.0	PVC	120.0	65	0.280	5	0.03	0.0
P-6	J-2	FH-3	8.0	PVC	120.0	393	1.060	407	2.60	0.7
P-8	FH-3	FH-4	8.0	PVC	120.0	400	0.280	402	2.57	0.7
P-10	FH-4	J-6	8.0	PVC	120.0	23	0.280	397	2.53	0.0
P-11	J-6	FH-5	8.0	PVC	120.0	372	0.500	1,255	8.01	5.4
P-13	J-6	R-2	8.0	PVC	120.0	240	2.570	-858	5.48	2.2

Hydraulic Model Inventory: WaterCAD.wtg

Title	
Engineer	
Company	
Date	1/26/2022
Notes	

Scenario Summary

ID	67
Label	Scenario - 2 - MDF + Fire Flow
Notes	
Active Topology	<I> Base Active Topology
Physical	Fire
Demand	Fire
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	<I> Base Fire Flow
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	<I> Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Network Inventory

Pipes	8	Pump Stations	0
Laterals	0	Variable Speed Pump Batteries	0
Junctions	7	PRV's	0
Hydrants	0	PSV's	0
Tanks	0	PBV's	0
Reservoirs	2	FCV's	0
Customer Meters	0	TCV's	0
Taps	0	GPV's	0
SCADA Elements	0	Isolation Valves	0
Pumps	0	Spot Elevations	0

Transient Network Inventory

Turbines	0	Rupture Disks	0
Periodic Head-Flows	0	Discharges to Atmosphere	0
Air Valves	0	Orifices Between Pipes	0
Hydropneumatic Tanks	0	Valves With Linear Area Change	0
Surge Valves	0	Surge Tanks	0
Check Valves	0		

Pressure Pipes Inventory

8.0 (in)	1,879 ft	All Diameters	1,879 ft

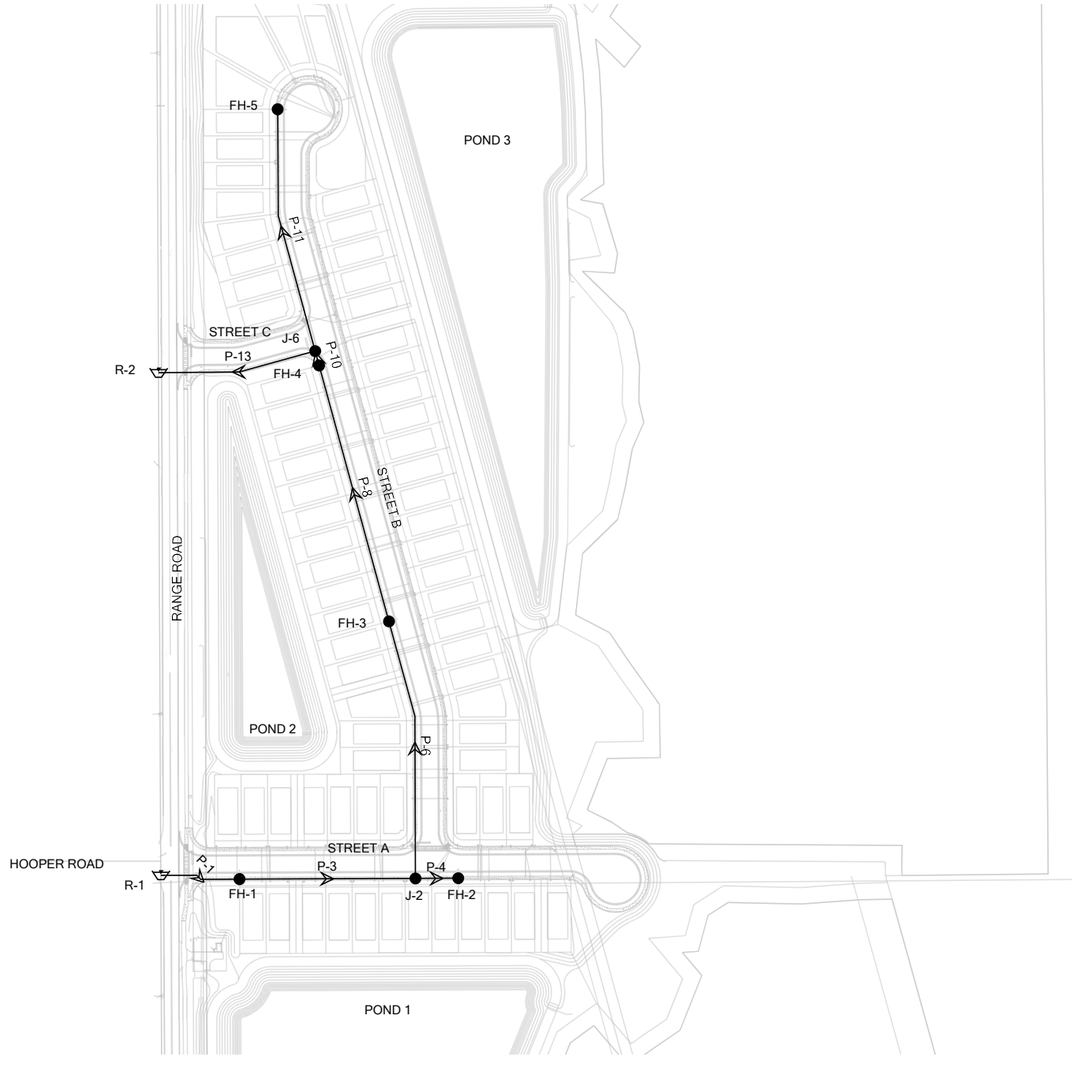
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	20.52	10	134.24	49
FH-2	20.74	10	134.17	49
FH-3	20.09	10	134.09	49
FH-4	20.19	10	134.03	49
FH-5	21.10	10	134.02	49
J-2	20.80	0	134.18	49
J-6	19.79	0	134.02	49

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Length (ft)	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Pressure Loss (psi)
P-1	R-1	FH-1	8.0	PVC	120.0	121	2.790	102	0.65	0.0
P-3	FH-1	J-2	8.0	PVC	120.0	265	0.280	92	0.59	0.0
P-4	J-2	FH-2	8.0	PVC	120.0	65	0.280	10	0.07	0.0
P-6	J-2	FH-3	8.0	PVC	120.0	393	1.060	81	0.52	0.0
P-8	FH-3	FH-4	8.0	PVC	120.0	400	0.280	71	0.45	0.0
P-10	FH-4	J-6	8.0	PVC	120.0	23	0.280	60	0.39	0.0
P-11	J-6	FH-5	8.0	PVC	120.0	372	0.500	10	0.07	0.0
P-13	J-6	R-2	8.0	PVC	120.0	240	2.570	50	0.32	0.0

Scenario: Scenario - 1 - PDF



FlexTable: Reservoir Table

Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	134.30	<None>	418	134.30
R-2	134.00	<None>	858	134.00

Appendix D – Reclaimed Water Analysis Results

Junction Demand Control Center

Scenario Summary

ID	1
Label	Reclaimed Water
Notes	
Demand	Base Demand

ID	Label	Demand (Base) (gpm)	Pattern (Demand)	Zone
31	J-1	120.00	Fixed	<None>
37	J-2	56.00	Fixed	<None>
47	J-5	256.00	Fixed	<None>
33	J-3	8.00	Fixed	<None>
39	J-4	128.00	Fixed	<None>

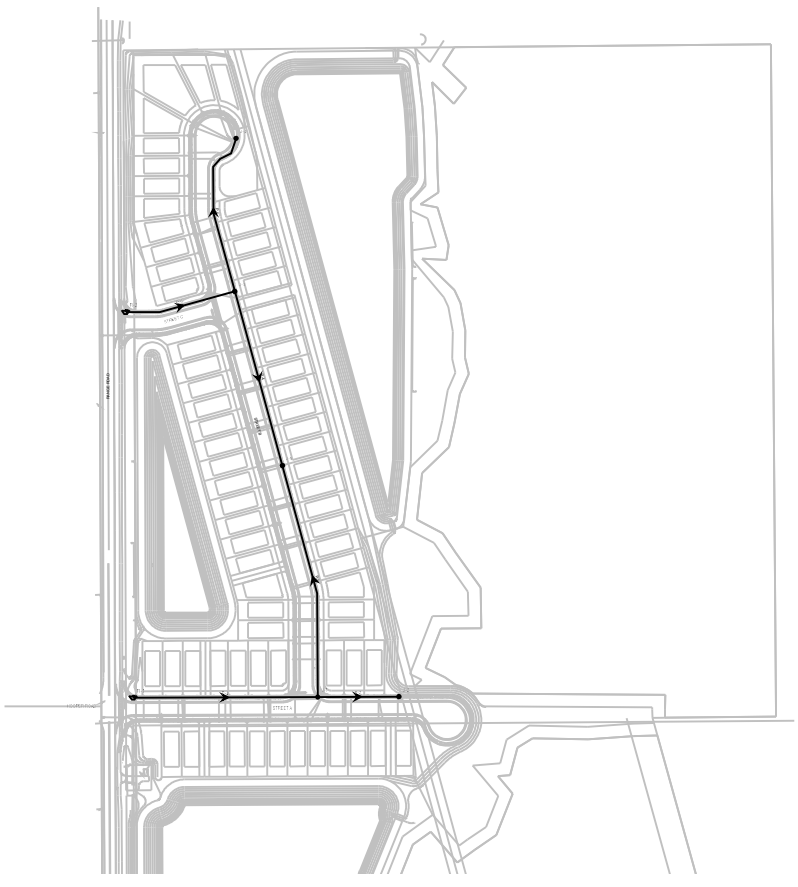
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	21.07	120	90.53	30
J-2	20.96	56	90.03	30
J-3	20.65	8	94.57	32
J-4	21.61	128	89.80	30
J-5	20.83	256	86.69	28

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Length (ft)	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Pressure Loss (psi)
P-1	R-1	J-1	4.0	PVC	120.0	367	2.860	271	6.92	9.7
P-2	J-1	J-2	4.0	PVC	120.0	161	0.610	56	1.43	0.2
P-3	J-1	J-5	4.0	PVC	120.0	469	1.290	95	2.43	1.7
P-4	J-5	J-3	4.0	PVC	120.0	358	1.290	-161	4.11	3.4
P-5	J-3	J-4	4.0	PVC	120.0	330	1.420	128	3.27	2.1
P-6	J-3	R-2	4.0	PVC	120.0	222	3.130	-297	7.58	7.5

Scenario: Reclaimed Water



FlexTable: Reservoir Table

Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	112.90	<None>	271	112.90
R-2	111.90	<None>	297	111.90