Windward Preserve
Potable Water Main Report

MADDEN
MOORHEAD & STOKES, LLC
CIVIL ENGINEERS

Prepared by:

Madden, Moorhead and Stokes, LLC.
431 East Horatio Avenue, Suite 260
Maitland, FL 32751

November 5, 2022
Revised October, 2023
Revised November, 2023

David A. Stokes, P.E. #66,527
Certificate of Authorization No. CA-0007723

➢ **APPENDIX**

A Potable Water Demand Calculations Phase 1 & Phase 1/2 Combined
B HGL Calculations
C Fire Hydrant Flow Test Results
D NFF + Max Day WaterCAD Analysis Phase 1
E NFF + Max Day WaterCAD Analysis Phase 1 & 2
F Peak Hour WaterCAD Analysis Phase 1
G Peak Hour WaterCAD Analysis Phase 1 & 2
H NFF for Amenity Center

Introduction

Taylor Morrison has plans to develop a 385-lot single family residential subdivision located within the City of Cocoa. The property is located at the SE corner of the intersection of I-95 and 528. The property is also bounded on the east by Friday Road, and to the south by James Road. The property is currently vacant and contains a mixture of vegetation, wetlands, and open areas. The purpose of this report is to show the potable water main proposed is sufficient to provide potable water service to the proposed lots as well as the NFF for the lots.

Appendix A includes the potable water demand calculations for the project Maximum Day flow and Peak Hour flow. The NFF for single family is 1,000 gpm per NFPA. The NFF for the 2,900sf Amenity Center is 1,500 gpm per NFPA.

Potable Water Main Analysis

The potable water main was analyzed under the following scenarios;

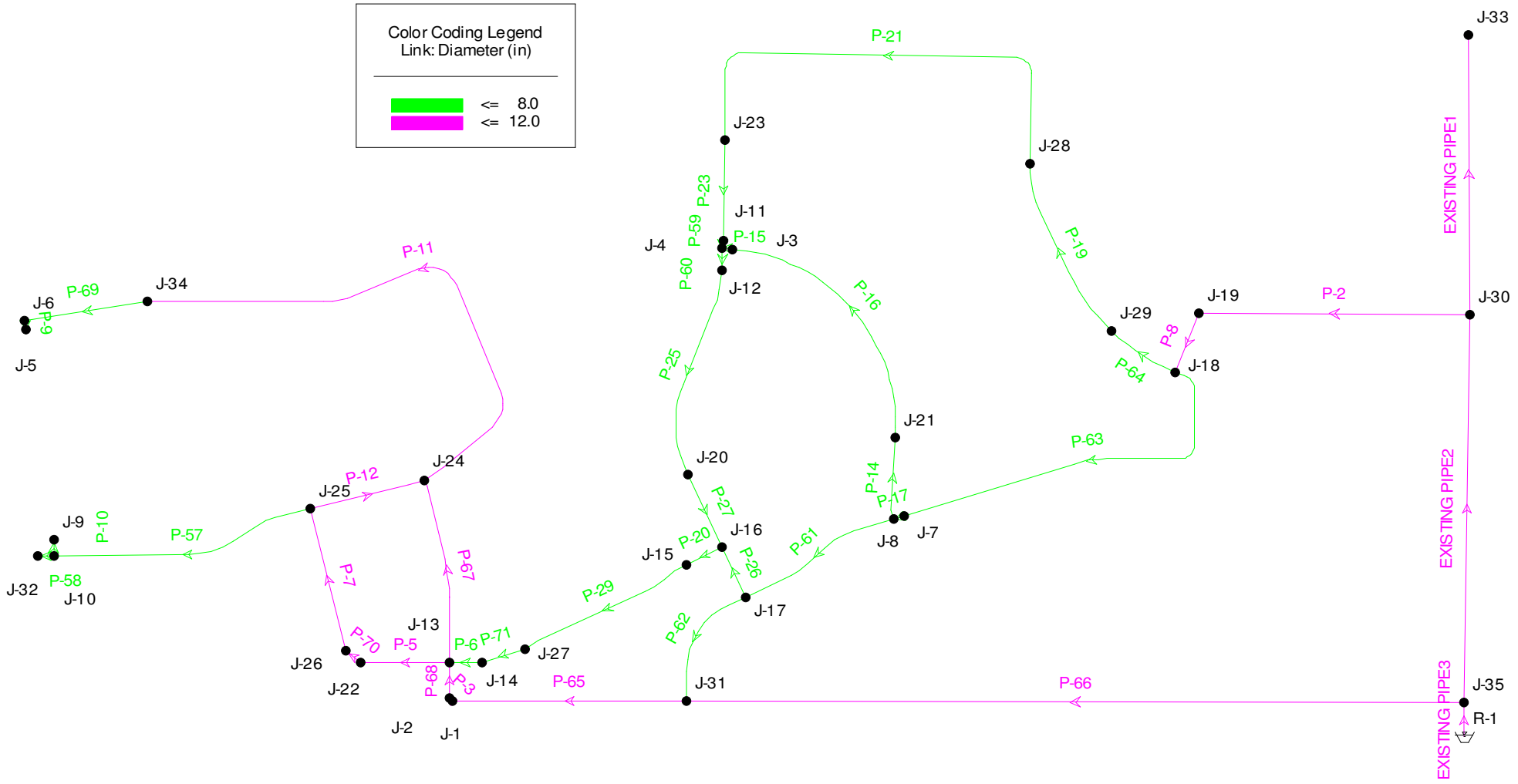
1. NFF + Max Day for Phase 1 Only
2. NFF + Max Day for Phase 1 and Phase 2
3. Peak Hour for Phase 1 Only
4. Peak Hour for Phase 1 and Phase 2
5. NFF for Amenity Center

The enclosed Appendices include the WaterCAD model under these four scenarios. Each scenario shows that in any scenario modeled, the proposed water main provides the required flows, while maintaining a minimum working pressure.

Phase 1- 185 lots, 1 Amenity Center
- 186 Water Meters
- 186 Reclaim Meters
- 16 Hydrants

Phase 2- 200 lots
- 200 Water Meters
- 200 Reclaim Meters
- 12 Hydrants

Scenario: Base



Madden Engineering, Inc.
© Haestad Methods, Inc. 37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Appendix A
Potable Water Demand Calculations Phase 1 & Phase 1/2 Combined

Windward Preserve
Water Demand Calculations - Phase 1

TYPE	ERC (GPD)	DESIGN FACTOR	# OF UNITS	ERC TOTAL	DEMAND TOTAL (GPD)
Single Family Homes (Phase 1)	350	1.000	185	185.00	64,750
Amenity (Phase 1)	350	0.667	1	0.67	233
				185.67	64,983

FLOW SUMMARY

Average Day	64,983	GPD	45.13	GPM
Maximum Day (Average Day x2.0)	129,966	GPD	90.25	GPM
Peak Hour (Average Day x4.0)	259,932	GPD	180.51	GPM

Windward Preserve
Water Demand Calculations - Phases 1/2

TYPE	ERC (GPD)	DESIGN FACTOR	# OF UNITS	ERC TOTAL	DEMAND TOTAL (GPD)
Single Family Homes (Phase 1&2)	350	1.000	385	385.00	134,750
Amenity (Phase 1)	350	0.667	1	0.67	233
				385.67	134,983

FLOW SUMMARY

Average Day	134,983 GPD	93.74 GPM
Maximum Day (Average Day x2.0)	269,966 GPD	187.48 GPM
Peak Hour (Average Day x4.0)	539,932 GPD	374.95 GPM

Appendix B
HGL Calculations

Windward Preserve

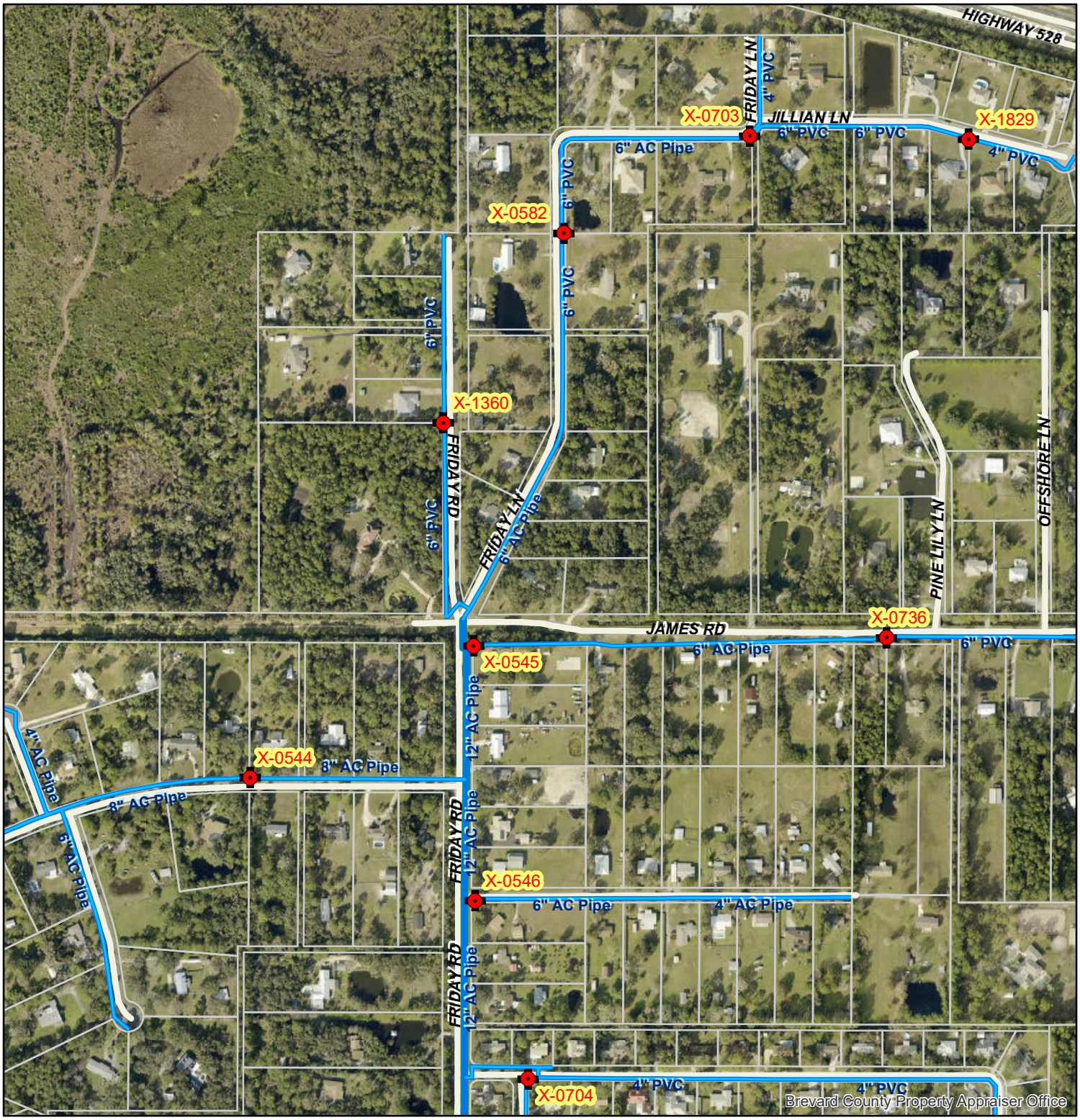
Hydraulic Grade Line Calculations - Potable Water Main

HGL Calculations

Peak Hour Flow		
Tie-In Elevation	25.0	ft
Water Main Pressure (from City test)	63.0	psi
Water Main Pressure Head	145.4	ft
Total Head	170.4	ft
HGL Total	**170.4**	**ft**

NFF + Max Day		
Tie-In Elevation	24.0	ft
Water Main Pressure (from City test)	42.0	psi
Water Main Pressure Head	96.9	ft
Total Head	120.9	ft
HGL Total	**120.9**	**ft**

Appendix C
Fire Hydrant Flow Test Results



Water Hydrants

Cocoa Utilities

Water Mains

Water Main

Friday Rd

Cocoa,FL

0 100 200 400 600 800 1,000 Feet

City of Cocoa
Utilities Department
Engineering
351 Shearer Blvd.
Cocoa FL 32922

Disclaimer: Maps are for reference purposes only and are not intended to replace any official record. The user is responsible for confirming the accuracy of all data contained herein.

REQ. DATE: 10/10/22 10/10/22 8:42:33
CREW: WFO - HYDRANT HYD
EXT. ADDR.: REF NBR: 0000
SCHED START: 10/10/22 SCHED COMPLETION:
GEN. LOC.: COCOA COMP DATE: 10/10/22
REQ DEPT: Utilities Department PRIORITY: High
REQUESTOR: RENEE L SPALDING ORIGIN: INTERNAL
REQ USER: COCORLS AUTH USER:COCORLS WRK TYPE:ROUTINE

RESIDUAL HYDRANTS X-0545 & X-0546 FLOWS @ FRIDAY/JANET RD - COCOA

ENTER REFERENCE/ACCT NO.? YES Y

PRIMARY CONTACT INFORMATION
RENEE L SPALDING ( ) ( ) ( ) ( )

RESIDUAL HYDRANTS X-0545 & X-0546 FLOWS @ FRIDAY/JANET RD - COCOA
CATEGORY: UT WFO MAINTENANCE OPS UTTD
TASK: HYDRANT MAINTENANCE FHMN READY
DEPT: Utilities Department UT
SCHED START: 10/10/22 SCHED COMPLETION: 10/10/22
CREW: WFO - HYDRANT HYD
STD. TASK: TD Repair Fire Hydrant RH

JOB ORDER INSTRUCTIONS
REPAIR FIRE HYDRANT

Residual hydrant flow
X-0545 and X-0546

START DATE: ___/___/___ COMPLETION DATE: ___/___/___
START TIME: ___:___:___ COMPLETION TIME: ___:___:___
UNIT OF PRODUCTION: _____ QUANTITY: _____.___

LABOR				EQUIPMENT		MATERIAL		
DATE	EMPLOYEE	HRS	OT	NUMBER	HRS	ITEM	QTY	COST
10/19/22	Cawon D	1		Trk 55	1			
10/19/22	Shane S	1		Trk 55	1			

MISCELLANEOUS RECEIPT

CITY OF COCOA
CUSTOMER SERVICE
65 STONE ST.
COCOA, FLORIDA 32922

3579

FAX # NA

DATE October 7, 2022

PHONE # 407-629-8330 EXT 129

EMAIL: NICOLE@MADDEN-ENG.COM
DSTOKES@MADDEN-ENG.COM

RECEIVED FROM MADDEN, MOORHEAD & STOKES
ADDRESS 431 E HORATIO AVE SUITE 260 MAITLAND FL 32751
AMOUNT OF ONE HUNDRED FORTY AND NO/100 ********** DOLLARS
PROJECT: **WINDWARD PRESERVE| COCOA| HYD# X-0545 & X-0546**

	QTY		AMT			
FOR	1	X	$ 140.00	**HYD RESIDUAL FLOW TEST.....421-0000-343-39-06 FT**	$	140.00
		X			$	-
		X		FLOW | X-0545 NEAREST ADDRESS 2536 FRIDAY RD COCOA	$	-
		X		STATIC | X-0546 NEAREST ADDRESS 4646 JANET RD	$	-
		X			$	-
				TOTAL	$	140.00

BY: KELLY A BOWMAN

NOTE: Average Turnaround Time for Flow Test results are three (3) weeks from the date of this receipt. If you have not received your results, via email, within the allotted time frame, please contact Utilities Development at 321-433-8797.

Payment Receipt

MADDEN, MOORHEAD & STOKES (Account #999999-3579)

Manual Credit Card Payment

You made a Manual Credit Card Payment on 10/07/2022 at 3:15 PM for $142.99.

Payment on Card **********3241

Bill Amount: $140.00

Convenience Fee: $2.99

Total Payment Amount: $142.99

Confirmation Number: 202381663

Paid on Friday, 10/07/2022 at 3:15 PM.

Don't forget about our self-service portal providing time-saving online bill pay features that let you control when and how you make a payment. https://cocoafl.firstbilling.com

City of Cocoa, Florida

Serving the Community

UTILITIES DEPARTMENT
600 School Street Cocoa, Florida 32922
PHONE (321) 639-7653 FAX (321) 639-7522

FIRE HYDRANT FLOW INFORMATION REQUEST

Information requested by: _____ (Company)
_____ (Person)
_____ (Phone #)
_____ (Fax #)

Project Name: _____

Project Location: _____

Hydrant from which Information is needed: _____

Is a True Residual Pressure Required? ☐ YES ☐ NO

Date: _____ Prepared By: _____

RECORDED FIRE HYDRANT FLOW INFORMATION

Hydrant Number Flowed:	X-0545	X-0546
Hydrant Location:	Friday Rd	Janet Rd
Recorded Static Pressure:	64 p.s.i.	66 p.s.i.
Recorded Residual Pressure:	58 p.s.i.	58 p.s.i.
Recorded Flow:	30 / 920 p.s.i./g.p.m.	30 / 920 p.s.i./g.p.m.
Residual taken from hydrant:	X-0546	X-0545

Date of Recording: 10/19/22 Completed by: Cawen D, Shane S

Flow Recorded from 2.5" nozzle unless otherwise specified.

IMPORTANT NOTE: The above information is supplied for use in calculation of available fire flow. The information is an instantaneous recording and does not reflect flow and pressure variations in the City of Cocoa potable water system. A minimum of a 5 p.s.i. safety factor will be required for approval by the City. A larger safety factor may be required due to the location of the proposed project. Should you have any questions, please call the City of Cocoa, Utilities Engineering Department @ (321) 639-7659.

Revised 1/2008

WATER FLOW TEST

For use of this form, see AR 420-1; the proponent agency is ACSIM.

LOCATION	DATE (YYYYMMDD)

HYDRANT NUMBER	OUTLET DIAMETER (Inches)	PITOT PRESSURES (PSI)	DISCHARGE (Gallons per Minute)	STATIC PSI	RESIDUAL PSI
				65	58
				TOTAL DISCHARGE DURING TEST (Gallons per Minute)	AVAILABLE GALLONS PER MINUTE (at 20 PSI)
				920 gpm	

WATER FLOW CHART

Appendix D
NFF + Max Day WaterCAD Analysis Phase 1

Scenario: Base
Steady State Analysis
Junction Report

Label	Base Flow (gpm)	Elevation (ft)	Type	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-5	3.35	25.00	Demand	3.35	87.87	27.20
J-6	1,003.35	25.00	Demand	1,003.35	87.87	27.20
J-34	3.35	25.00	Demand	3.35	95.57	30.53
J-24	3.35	25.00	Demand	3.35	107.38	35.64
J-32	3.35	25.00	Demand	3.35	107.83	35.84
J-9	3.35	25.00	Demand	3.35	107.83	35.84
J-10	3.35	25.00	Demand	3.35	107.83	35.84
J-25	3.35	25.00	Demand	3.35	107.83	35.84
J-26	3.35	25.00	Demand	3.35	108.44	36.10
J-22	3.35	25.00	Demand	3.35	108.52	36.13
J-13	3.35	25.00	Demand	3.35	108.89	36.30
J-14	3.35	25.00	Demand	3.35	109.15	36.41
J-1	3.35	25.00	Demand	3.35	109.28	36.46
J-2	3.35	25.00	Demand	3.35	109.32	36.48
J-27	3.35	25.00	Demand	3.35	109.53	36.57
J-15	3.35	25.00	Demand	3.35	111.05	37.23
J-20	3.35	25.00	Demand	3.35	111.39	37.38
J-16	3.35	25.00	Demand	3.35	111.39	37.38
J-17	3.35	25.00	Demand	3.35	111.87	37.59
J-31	3.35	25.00	Demand	3.35	111.87	37.59
J-8	3.35	25.00	Demand	3.35	113.35	38.22
J-7	3.35	25.00	Demand	3.35	113.45	38.27
J-18	3.35	25.00	Demand	3.35	116.95	39.78
J-19	3.35	25.00	Demand	3.35	117.53	40.03
J-33	3.35	25.00	Demand	3.35	120.04	41.12
J-30	3.35	25.00	Demand	3.35	120.04	41.12
J-35	3.35	25.00	Demand	3.35	120.56	41.34

Scenario: Base
Steady State Analysis
Pipe Report

Label	Diameter (in)	Length (ft)	Material	Start Node	Stop Node	Hazen-Williams C	Upstream Calculated Pressure (psi)	Downstream Calculated Pressure (psi)	Minor Loss Coefficient	Pressure Pipe Headloss (ft)	Velocity (ft/s)
P-69	8.0	416.00	PVC	J-6	J-34	130.0	27.20	30.53	0.00	7.69	6.43
P-11	10.0	1,882.00	PVC	J-34	J-24	130.0	30.53	35.64	0.00	11.81	4.13
EXISTIN	12.0	114.00	PVC	J-35	R-1	130.0	41.34	0.00	0.00	0.34	3.09
P-66	10.0	2,603.00	PVC	J-31	J-35	130.0	37.59	41.34	0.00	8.69	2.93
P-65	10.0	783.00	PVC	J-2	J-31	130.0	36.48	37.59	0.00	2.55	2.90
P-3	10.0	14.00	PVC	J-1	J-2	130.0	36.46	36.48	0.00	0.05	2.88
P-68	10.0	120.00	PVC	J-13	J-1	130.0	36.30	36.46	0.00	0.38	2.87
P-67	10.0	622.00	PVC	J-24	J-13	130.0	35.64	36.30	0.00	1.52	2.48
P-2	8.0	902.00	PVC	J-19	J-30	130.0	40.03	41.12	0.00	2.51	2.31
P-8	8.0	213.00	PVC	J-18	J-19	130.0	39.78	40.03	0.00	0.58	2.29
P-63	8.0	1,300.00	PVC	J-7	J-18	130.0	38.27	39.78	0.00	3.50	2.27
P-17	8.0	39.00	PVC	J-7	J-8	130.0	38.27	38.22	0.00	0.10	2.25
P-26	8.0	182.00	PVC	J-17	J-16	130.0	37.59	37.38	0.00	0.48	2.24
P-61	8.0	568.00	PVC	J-8	J-17	130.0	38.22	37.59	0.00	1.47	2.23
P-20	8.0	133.00	PVC	J-15	J-16	130.0	37.23	37.38	0.00	0.34	2.20
P-29	8.0	612.00	PVC	J-27	J-15	130.0	36.57	37.23	0.00	1.53	2.18
P-71	8.0	152.00	PVC	J-14	J-27	130.0	36.41	36.57	0.00	0.37	2.16
P-6	8.0	108.00	PVC	J-13	J-14	130.0	36.30	36.41	0.00	0.26	2.14
P-5	10.0	296.00	PVC	J-22	J-13	130.0	36.13	36.30	0.00	0.38	1.75
P-70	10.0	64.00	PVC	J-26	J-22	130.0	36.10	36.13	0.00	0.08	1.73
P-7	10.0	487.00	PVC	J-25	J-26	130.0	35.84	36.10	0.00	0.60	1.72
P-12	10.0	390.00	PVC	J-24	J-25	130.0	35.64	35.84	0.00	0.46	1.66
EXISTIN	12.0	1,301.00	PVC	J-30	J-35	130.0	41.12	41.34	0.00	0.52	1.05
P-57	8.0	894.00	PVC	J-25	J-10	130.0	35.84	35.84	0.00	0.00	0.06
P-62	8.0	441.00	PVC	J-17	J-31	130.0	37.59	37.59	0.00	0.00	0.04
P-27	8.0	270.00	PVC	J-16	J-20	130.0	37.38	37.38	0.00	0.00	0.02
P-58	8.0	52.00	PVC	J-10	J-32	130.0	35.84	35.84	0.00	0.00	0.02
P-9	8.0	32.00	PVC	J-5	J-6	130.0	27.20	27.20	0.00	0.00	0.02
P-10	8.0	52.00	PVC	J-9	J-10	130.0	35.84	35.84	0.00	0.00	0.02
EXISTIN	12.0	936.00	PVC	J-30	J-33	130.0	41.12	41.12	0.00	0.00	0.01

Scenario: Base
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Calculated Hydraulic Grade (ft)	Outflow (gpm)	Description
R-1	120.90	120.90	1,090.45	

Appendix E
NFF + Max Day WaterCAD Analysis Phase 1 & 2

Scenario: Base
Steady State Analysis
Junction Report

Label	Base Flow (gpm)	Elevation (ft)	Type	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-5	5.35	25.00	Demand	5.35	89.32	27.83
J-6	1,005.35	25.00	Demand	1,005.35	89.32	27.83
J-34	5.35	25.00	Demand	5.35	97.07	31.18
J-24	5.35	25.00	Demand	5.35	109.01	36.35
J-32	5.35	25.00	Demand	5.35	109.46	36.54
J-9	5.35	25.00	Demand	5.35	109.46	36.54
J-10	5.35	25.00	Demand	5.35	109.46	36.54
J-25	5.35	25.00	Demand	5.35	109.46	36.54
J-26	5.35	25.00	Demand	5.35	110.09	36.81
J-22	5.35	25.00	Demand	5.35	110.17	36.85
J-13	5.35	25.00	Demand	5.35	110.57	37.02
J-14	5.35	25.00	Demand	5.35	110.86	37.15
J-1	5.35	25.00	Demand	5.35	110.95	37.19
J-2	5.35	25.00	Demand	5.35	110.99	37.20
J-27	5.35	25.00	Demand	5.35	111.29	37.34
J-15	5.35	25.00	Demand	5.35	113.08	38.11
J-16	5.35	25.00	Demand	5.35	113.47	38.28
J-31	5.35	25.00	Demand	5.35	113.55	38.31
J-17	5.35	25.00	Demand	5.35	113.62	38.34
J-20	5.35	25.00	Demand	5.35	113.72	38.38
J-12	5.35	25.00	Demand	5.35	114.41	38.68
J-4	5.35	25.00	Demand	5.35	114.48	38.71
J-3	5.35	25.00	Demand	5.35	114.48	38.71
J-21	5.35	25.00	Demand	5.35	114.50	38.72
J-11	5.58	25.00	Demand	5.58	114.50	38.72
J-8	5.35	25.00	Demand	5.35	114.51	38.73
J-7	5.35	25.00	Demand	5.35	114.59	38.76
J-23	5.35	25.00	Demand	5.35	114.81	38.86
J-28	5.35	25.00	Demand	5.35	116.37	39.53
J-29	5.35	25.00	Demand	5.35	117.01	39.81
J-18	5.35	25.00	Demand	5.35	117.29	39.93
J-19	5.35	25.00	Demand	5.35	117.69	40.10
J-33	5.35	25.00	Demand	5.35	119.43	40.86
J-30	5.35	25.00	Demand	5.35	119.43	40.86
J-35	5.35	25.00	Demand	5.35	120.50	41.32

Scenario: Base
Steady State Analysis
Pipe Report

Label	Diameter (in)	Length (ft)	Material	Start Node	Stop Node	Hazen-Williams C	Upstream Calculated Pressure (psi)	Downstream Calculated Pressure (psi)	Minor Loss Coefficient	Pressure Pipe Headloss (ft)	Velocity (ft/s)
P-69	8.0	416.00	PVC	J-6	J-34	130.0	27.83	31.18	0.00	7.75	6.45
P-11	10.0	1,882.00	PVC	J-34	J-24	130.0	31.18	36.35	0.00	11.94	4.15
EXISTIN	12.0	114.00	PVC	J-35	R-1	130.0	41.32	0.00	0.00	0.40	3.37
P-65	10.0	783.00	PVC	J-2	J-31	130.0	37.20	38.31	0.00	2.55	2.90
P-3	10.0	14.00	PVC	J-1	J-2	130.0	37.19	37.20	0.00	0.05	2.88
P-68	10.0	120.00	PVC	J-13	J-1	130.0	37.02	37.19	0.00	0.38	2.85
P-66	10.0	2,603.00	PVC	J-31	J-35	130.0	38.31	41.32	0.00	6.96	2.60
P-67	10.0	622.00	PVC	J-24	J-13	130.0	36.35	37.02	0.00	1.56	2.51
P-20	8.0	133.00	PVC	J-15	J-16	130.0	38.11	38.28	0.00	0.40	2.40
P-29	8.0	612.00	PVC	J-27	J-15	130.0	37.34	38.11	0.00	1.78	2.37
P-71	8.0	152.00	PVC	J-14	J-27	130.0	37.15	37.34	0.00	0.43	2.33
P-6	8.0	108.00	PVC	J-13	J-14	130.0	37.02	37.15	0.00	0.30	2.30
P-2	10.0	902.00	PVC	J-19	J-30	130.0	40.10	40.86	0.00	1.74	2.18
P-8	10.0	213.00	PVC	J-18	J-19	130.0	39.93	40.10	0.00	0.40	2.16
P-63	8.0	1,300.00	PVC	J-7	J-18	130.0	38.76	39.93	0.00	2.70	1.97
P-17	8.0	39.00	PVC	J-7	J-8	130.0	38.76	38.73	0.00	0.08	1.94
P-5	10.0	296.00	PVC	J-22	J-13	130.0	36.85	37.02	0.00	0.40	1.79
P-70	10.0	64.00	PVC	J-26	J-22	130.0	36.81	36.85	0.00	0.08	1.77
P-7	10.0	487.00	PVC	J-25	J-26	130.0	36.54	36.81	0.00	0.62	1.75
P-61	8.0	568.00	PVC	J-8	J-17	130.0	38.73	38.34	0.00	0.89	1.70
P-12	10.0	390.00	PVC	J-24	J-25	130.0	36.35	36.54	0.00	0.45	1.66
EXISTIN	12.0	1,301.00	PVC	J-30	J-35	130.0	40.86	41.32	0.00	1.07	1.55
P-64	8.0	259.00	PVC	J-18	J-29	130.0	39.93	39.81	0.00	0.27	1.37
P-19	8.0	634.00	PVC	J-28	J-29	130.0	39.53	39.81	0.00	0.64	1.34
P-60	8.0	72.00	PVC	J-4	J-12	130.0	38.71	38.68	0.00	0.07	1.33
P-21	8.0	1,623.00	PVC	J-23	J-28	130.0	38.86	39.53	0.00	1.56	1.30
P-25	8.0	718.00	PVC	J-20	J-12	130.0	38.38	38.68	0.00	0.69	1.30
P-23	8.0	338.00	PVC	J-11	J-23	130.0	38.72	38.86	0.00	0.31	1.27
P-27	8.0	270.00	PVC	J-16	J-20	130.0	38.28	38.38	0.00	0.25	1.27
P-59	8.0	27.00	PVC	J-11	J-4	130.0	38.72	38.71	0.00	0.02	1.23
P-26	8.0	182.00	PVC	J-17	J-16	130.0	38.34	38.28	0.00	0.14	1.17
P-62	8.0	441.00	PVC	J-17	J-31	130.0	38.34	38.31	0.00	0.07	0.50
P-14	8.0	277.00	PVC	J-21	J-8	130.0	38.72	38.73	0.00	0.01	0.20
P-16	8.0	926.00	PVC	J-21	J-3	130.0	38.72	38.71	0.00	0.02	0.17
P-15	8.0	31.00	PVC	J-3	J-4	130.0	38.71	38.71	0.00	0.00	0.14
P-57	8.0	894.00	PVC	J-25	J-10	130.0	36.54	36.54	0.00	0.01	0.10
P-9	8.0	32.00	PVC	J-5	J-6	130.0	27.83	27.83	0.00	0.00	0.03
P-10	8.0	52.00	PVC	J-9	J-10	130.0	36.54	36.54	0.00	0.00	0.03
P-58	8.0	52.00	PVC	J-10	J-32	130.0	36.54	36.54	0.00	0.00	0.03
EXISTIN	12.0	936.00	PVC	J-30	J-33	130.0	40.86	40.86	0.00	0.00	0.02

Scenario: Base
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Calculated Hydraulic Grade (ft)	Outflow (gpm)	Description
R-1	120.90	120.90	1,187.48	

Appendix F
Peak Hour WaterCAD Analysis Phase 1

Scenario: Base
Steady State Analysis
Junction Report

Label	Base Flow (gpm)	Elevation (ft)	Type	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-32	7.21	25.00	Demand	7.21	169.77	62.64
J-9	7.21	25.00	Demand	7.21	169.77	62.64
J-10	7.21	25.00	Demand	7.21	169.77	62.64
J-5	7.21	25.00	Demand	7.21	169.77	62.64
J-6	7.21	25.00	Demand	7.21	169.77	62.64
J-34	7.21	25.00	Demand	7.21	169.78	62.64
J-25	7.21	25.00	Demand	7.21	169.79	62.64
J-24	7.21	25.00	Demand	7.21	169.79	62.64
J-26	7.21	25.00	Demand	7.21	169.79	62.64
J-22	7.21	25.00	Demand	7.21	169.79	62.64
J-13	7.21	25.00	Demand	7.21	169.79	62.65
J-14	7.21	25.00	Demand	7.21	169.79	62.65
J-27	7.21	25.00	Demand	7.21	169.80	62.65
J-1	7.21	25.00	Demand	7.21	169.80	62.65
J-15	7.21	25.00	Demand	7.21	169.80	62.65
J-2	7.21	25.00	Demand	7.21	169.80	62.65
J-20	7.21	25.00	Demand	7.21	169.80	62.65
J-16	7.21	25.00	Demand	7.21	169.80	62.65
J-7	7.21	25.00	Demand	7.21	169.81	62.65
J-8	7.21	25.00	Demand	7.21	169.81	62.65
J-17	7.21	25.00	Demand	7.21	169.81	62.65
J-31	7.21	25.00	Demand	7.21	169.86	62.67
J-33	7.21	25.00	Demand	7.21	170.39	62.90
J-30	7.21	25.00	Demand	7.21	170.39	62.90
J-35	7.21	25.00	Demand	7.21	170.39	62.90

Scenario: Base
Steady State Analysis
Pipe Report

Label	Diameter (in)	Length (ft)	Material	Start Node	Stop Node	Hazen-Williams C	Upstream Calculated Pressure (psi)	Downstream Calculated Pressure (psi)	Minor Loss Coefficient	Pressure Pipe Headloss (ft)	Velocity (ft/s)
P-66	10.0	2,603.00	PVC	J-31	J-35	130.0	62.67	62.90	0.00	0.53	0.65
EXISTIN	12.0	114.00	PVC	J-35	R-1	130.0	62.90	0.00	0.00	0.01	0.51
P-62	8.0	441.00	PVC	J-17	J-31	130.0	62.65	62.67	0.00	0.05	0.39
P-65	10.0	783.00	PVC	J-2	J-31	130.0	62.65	62.67	0.00	0.06	0.37
P-3	10.0	14.00	PVC	J-1	J-2	130.0	62.65	62.65	0.00	0.00	0.34
P-68	10.0	120.00	PVC	J-13	J-1	130.0	62.65	62.65	0.00	0.01	0.31
P-26	8.0	182.00	PVC	J-17	J-16	130.0	62.65	62.65	0.00	0.01	0.25
P-20	8.0	133.00	PVC	J-15	J-16	130.0	62.65	62.65	0.00	0.00	0.16
P-5	10.0	296.00	PVC	J-22	J-13	130.0	62.64	62.65	0.00	0.00	0.15
P-67	10.0	622.00	PVC	J-24	J-13	130.0	62.64	62.65	0.00	0.01	0.14
P-57	8.0	894.00	PVC	J-25	J-10	130.0	62.64	62.64	0.00	0.01	0.14
P-70	10.0	64.00	PVC	J-26	J-22	130.0	62.64	62.64	0.00	0.00	0.12
P-29	8.0	612.00	PVC	J-27	J-15	130.0	62.65	62.65	0.00	0.01	0.11
P-7	10.0	487.00	PVC	J-25	J-26	130.0	62.64	62.64	0.00	0.00	0.09
P-61	8.0	568.00	PVC	J-8	J-17	130.0	62.65	62.65	0.00	0.00	0.09
P-69	8.0	416.00	PVC	J-6	J-34	130.0	62.64	62.64	0.00	0.00	0.09
P-11	10.0	1,882.00	PVC	J-34	J-24	130.0	62.64	62.64	0.00	0.01	0.09
P-71	8.0	152.00	PVC	J-14	J-27	130.0	62.65	62.65	0.00	0.00	0.07
P-17	8.0	39.00	PVC	J-7	J-8	130.0	62.65	62.65	0.00	0.00	0.05
P-10	8.0	52.00	PVC	J-9	J-10	130.0	62.64	62.64	0.00	0.00	0.05
P-27	8.0	270.00	PVC	J-16	J-20	130.0	62.65	62.65	0.00	0.00	0.05
P-58	8.0	52.00	PVC	J-10	J-32	130.0	62.64	62.64	0.00	0.00	0.05
P-9	8.0	32.00	PVC	J-5	J-6	130.0	62.64	62.64	0.00	0.00	0.05
EXISTIN	12.0	1,301.00	PVC	J-30	J-35	130.0	62.90	62.90	0.00	0.00	0.04
P-12	10.0	390.00	PVC	J-24	J-25	130.0	62.64	62.64	0.00	0.00	0.02
P-6	8.0	108.00	PVC	J-13	J-14	130.0	62.65	62.65	0.00	0.00	0.02
EXISTIN	12.0	936.00	PVC	J-30	J-33	130.0	62.90	62.90	0.00	0.00	0.02

Scenario: Base
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Calculated Hydraulic Grade (ft)	Outflow (gpm)	Description
R-1	170.40	170.40	180.25	

Appendix G
Peak Hour WaterCAD Analysis Phase 1 & 2

Scenario: Base
Steady State Analysis
Junction Report

Label	Base Flow (gpm)	Elevation (ft)	Type	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-32	10.71	25.00	Demand	10.71	169.60	62.56
J-9	10.71	25.00	Demand	10.71	169.60	62.56
J-10	10.71	25.00	Demand	10.71	169.60	62.56
J-5	10.71	25.00	Demand	10.71	169.60	62.56
J-6	10.71	25.00	Demand	10.71	169.60	62.56
J-34	10.71	25.00	Demand	10.71	169.61	62.56
J-25	10.71	25.00	Demand	10.71	169.63	62.57
J-24	10.71	25.00	Demand	10.71	169.63	62.57
J-26	10.71	25.00	Demand	10.71	169.63	62.58
J-22	10.71	25.00	Demand	10.71	169.63	62.58
J-13	10.71	25.00	Demand	10.71	169.64	62.58
J-14	10.71	25.00	Demand	10.71	169.64	62.58
J-27	10.71	25.00	Demand	10.71	169.65	62.58
J-1	10.71	25.00	Demand	10.71	169.65	62.58
J-2	10.71	25.00	Demand	10.71	169.65	62.58
J-15	10.71	25.00	Demand	10.71	169.68	62.60
J-16	10.71	25.00	Demand	10.71	169.70	62.60
J-20	10.71	25.00	Demand	10.71	169.70	62.60
J-12	10.71	25.00	Demand	10.71	169.70	62.61
J-4	10.71	25.00	Demand	10.71	169.71	62.61
J-3	10.71	25.00	Demand	10.71	169.71	62.61
J-11	10.81	25.00	Demand	10.81	169.71	62.61
J-17	10.71	25.00	Demand	10.71	169.71	62.61
J-21	10.71	25.00	Demand	10.71	169.72	62.61
J-23	10.71	25.00	Demand	10.71	169.72	62.61
J-8	10.71	25.00	Demand	10.71	169.73	62.62
J-7	10.71	25.00	Demand	10.71	169.73	62.62
J-31	10.71	25.00	Demand	10.71	169.74	62.62
J-28	10.71	25.00	Demand	10.71	169.84	62.67
J-29	10.71	25.00	Demand	10.71	169.90	62.69
J-18	10.71	25.00	Demand	10.71	169.94	62.71
J-19	10.71	25.00	Demand	10.71	169.99	62.73
J-33	10.71	25.00	Demand	10.71	170.20	62.82
J-30	10.71	25.00	Demand	10.71	170.20	62.82
J-35	10.71	25.00	Demand	10.71	170.35	62.89

Scenario: Base
Steady State Analysis
Pipe Report

Label	Diameter (in)	Length (ft)	Material	Start Node	Stop Node	Hazen-Williams C	Upstream Calculated Pressure (psi)	Downstream Calculated Pressure (psi)	Minor Loss Coefficient	Pressure Pipe Headloss (ft)	Velocity (ft/s)
EXISTIN	12.0	114.00	PVC	J-35	R-1	130.0	62.89	0.00	0.00	0.05	1.06
P-66	10.0	2,603.00	PVC	J-31	J-35	130.0	62.62	62.89	0.00	0.61	0.70
P-2	10.0	902.00	PVC	J-19	J-30	130.0	62.73	62.82	0.00	0.21	0.70
P-8	10.0	213.00	PVC	J-18	J-19	130.0	62.71	62.73	0.00	0.04	0.66
EXISTIN	12.0	1,301.00	PVC	J-30	J-35	130.0	62.82	62.89	0.00	0.16	0.55
P-63	8.0	1,300.00	PVC	J-7	J-18	130.0	62.62	62.71	0.00	0.21	0.50
P-65	10.0	783.00	PVC	J-2	J-31	130.0	62.58	62.62	0.00	0.09	0.47
P-64	8.0	259.00	PVC	J-18	J-29	130.0	62.71	62.69	0.00	0.04	0.46
P-17	8.0	39.00	PVC	J-7	J-8	130.0	62.62	62.62	0.00	0.00	0.43
P-3	10.0	14.00	PVC	J-1	J-2	130.0	62.58	62.58	0.00	0.00	0.43
P-19	8.0	634.00	PVC	J-28	J-29	130.0	62.67	62.69	0.00	0.07	0.39
P-68	10.0	120.00	PVC	J-13	J-1	130.0	62.58	62.58	0.00	0.01	0.38
P-26	8.0	182.00	PVC	J-17	J-16	130.0	62.61	62.60	0.00	0.02	0.38
P-20	8.0	133.00	PVC	J-15	J-16	130.0	62.60	62.60	0.00	0.01	0.36
P-21	8.0	1,623.00	PVC	J-23	J-28	130.0	62.61	62.67	0.00	0.12	0.32
P-62	8.0	441.00	PVC	J-17	J-31	130.0	62.61	62.62	0.00	0.03	0.29
P-29	8.0	612.00	PVC	J-27	J-15	130.0	62.58	62.60	0.00	0.04	0.29
P-23	8.0	338.00	PVC	J-11	J-23	130.0	62.61	62.61	0.00	0.02	0.25
P-5	10.0	296.00	PVC	J-22	J-13	130.0	62.58	62.58	0.00	0.01	0.23
P-71	8.0	152.00	PVC	J-14	J-27	130.0	62.58	62.58	0.00	0.01	0.22
P-67	10.0	622.00	PVC	J-24	J-13	130.0	62.57	62.58	0.00	0.02	0.21
P-57	8.0	894.00	PVC	J-25	J-10	130.0	62.57	62.56	0.00	0.03	0.21
P-14	8.0	277.00	PVC	J-21	J-8	130.0	62.61	62.62	0.00	0.01	0.20
P-59	8.0	27.00	PVC	J-11	J-4	130.0	62.61	62.61	0.00	0.00	0.18
P-70	10.0	64.00	PVC	J-26	J-22	130.0	62.58	62.58	0.00	0.00	0.18
P-60	8.0	72.00	PVC	J-4	J-12	130.0	62.61	62.61	0.00	0.00	0.18
P-61	8.0	568.00	PVC	J-8	J-17	130.0	62.62	62.61	0.00	0.01	0.16
P-6	8.0	108.00	PVC	J-13	J-14	130.0	62.58	62.58	0.00	0.00	0.15
P-7	10.0	487.00	PVC	J-25	J-26	130.0	62.57	62.58	0.00	0.01	0.14
P-69	8.0	416.00	PVC	J-6	J-34	130.0	62.56	62.56	0.00	0.01	0.14
P-11	10.0	1,882.00	PVC	J-34	J-24	130.0	62.56	62.57	0.00	0.02	0.13
P-16	8.0	926.00	PVC	J-21	J-3	130.0	62.61	62.61	0.00	0.01	0.13
P-25	8.0	718.00	PVC	J-20	J-12	130.0	62.60	62.61	0.00	0.01	0.11
P-10	8.0	52.00	PVC	J-9	J-10	130.0	62.56	62.56	0.00	0.00	0.07
P-9	8.0	32.00	PVC	J-5	J-6	130.0	62.56	62.56	0.00	0.00	0.07
P-58	8.0	52.00	PVC	J-10	J-32	130.0	62.56	62.56	0.00	0.00	0.07
P-15	8.0	31.00	PVC	J-3	J-4	130.0	62.61	62.61	0.00	0.00	0.06
P-27	8.0	270.00	PVC	J-16	J-20	130.0	62.60	62.60	0.00	0.00	0.04
P-12	10.0	390.00	PVC	J-24	J-25	130.0	62.57	62.57	0.00	0.00	0.03
EXISTIN	12.0	936.00	PVC	J-30	J-33	130.0	62.82	62.82	0.00	0.00	0.03

Scenario: Base
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Calculated Hydraulic Grade (ft)	Outflow (gpm)	Description
R-1	170.40	170.40	374.95	

Appendix H
NFF for Amenity Center

Scenario: NFF AMENITY FULL
Steady State Analysis
Junction Report

Label	Base Flow (gpm)	Elevation (ft)	Type	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	0.00	25.00	Demand	0.00	109.62	36.61
J-2	0.00	25.00	Demand	0.00	109.63	36.61
J-3	0.00	25.00	Demand	0.00	109.79	36.69
J-4	0.00	25.00	Demand	0.00	109.79	36.69
J-5	0.00	25.00	Demand	0.00	109.57	36.59
J-6	0.00	25.00	Demand	0.00	109.57	36.59
J-7	0.00	25.00	Demand	0.00	109.91	36.74
J-8	0.00	25.00	Demand	0.00	109.77	36.67
J-9	0.00	25.00	Demand	0.00	109.57	36.59
J-10	0.00	25.00	Demand	0.00	109.57	36.59
J-11	0.00	25.00	Demand	0.00	109.84	36.71
J-12	0.00	25.00	Demand	0.00	109.69	36.64
J-13	0.00	25.00	Demand	0.00	109.57	36.59
J-14	0.00	25.00	Demand	0.00	109.42	36.53
J-15	0.00	25.00	Demand	0.00	108.42	36.09
J-16	0.00	25.00	Demand	0.00	108.25	36.02
J-17	1,500.00	25.00	Demand	1,500.00	107.34	35.62
J-18	0.00	25.00	Demand	0.00	114.87	38.88
J-19	0.00	25.00	Demand	0.00	115.57	39.18
J-20	0.00	25.00	Demand	0.00	108.64	36.19
J-21	0.00	25.00	Demand	0.00	109.77	36.68
J-22	0.00	25.00	Demand	0.00	109.57	36.59
J-23	0.00	25.00	Demand	0.00	110.44	36.96
J-24	0.00	25.00	Demand	0.00	109.57	36.59
J-25	0.00	25.00	Demand	0.00	109.57	36.59
J-26	0.00	25.00	Demand	0.00	109.57	36.59
J-27	0.00	25.00	Demand	0.00	109.22	36.44
J-28	0.00	25.00	Demand	0.00	113.30	38.20
J-29	0.00	25.00	Demand	0.00	114.41	38.68
J-30	0.00	25.00	Demand	0.00	118.53	40.47
J-31	0.00	25.00	Demand	0.00	109.97	36.76
J-32	0.00	25.00	Demand	0.00	109.57	36.59
J-33	0.00	25.00	Demand	0.00	118.53	40.47
J-34	0.00	25.00	Demand	0.00	109.57	36.59
J-35	0.00	25.00	Demand	0.00	120.29	41.23

Scenario: NFF AMENITY FULL
Steady State Analysis
Pipe Report

Label	Diameter (in)	Length (ft)	Material	Start Node	Stop Node	Hazen-Williams C	Upstream Calculated Pressure (psi)	Downstream Calculated Pressure (psi)	Minor Loss Coefficient	Pressure Pipe Headloss (ft)	Velocity (ft/s)
P-17	8.0	39.00	PVC	J-7	J-8	130.0	36.74	36.67	0.00	0.15	2.74
P-10	8.0	52.00	PVC	J-9	J-10	130.0	36.59	36.59	0.00	0.00	0.00
P-20	8.0	133.00	PVC	J-15	J-16	130.0	36.09	36.02	0.00	0.17	1.54
P-9	8.0	32.00	PVC	J-5	J-6	130.0	36.59	36.59	0.00	0.00	0.00
P-26	8.0	182.00	PVC	J-17	J-16	130.0	35.62	36.02	0.00	0.91	3.17
P-21	8.0	1,623.00	PVC	J-23	J-28	130.0	36.96	38.20	0.00	2.86	1.81
P-27	8.0	270.00	PVC	J-16	J-20	130.0	36.02	36.19	0.00	0.39	1.63
P-6	8.0	108.00	PVC	J-13	J-14	130.0	36.59	36.53	0.00	0.14	1.54
P-19	8.0	634.00	PVC	J-28	J-29	130.0	38.20	38.68	0.00	1.12	1.81
P-15	8.0	31.00	PVC	J-3	J-4	130.0	36.69	36.69	0.00	0.00	0.17
P-25	8.0	718.00	PVC	J-20	J-12	130.0	36.19	36.64	0.00	1.05	1.63
P-29	8.0	612.00	PVC	J-27	J-15	130.0	36.44	36.09	0.00	0.80	1.54
P-14	8.0	277.00	PVC	J-21	J-8	130.0	36.68	36.67	0.00	0.01	0.17
P-63	8.0	1,300.00	PVC	J-7	J-18	130.0	36.74	38.88	0.00	4.96	2.74
P-62	8.0	441.00	PVC	J-17	J-31	130.0	35.62	36.76	0.00	2.63	3.49
P-61	8.0	568.00	PVC	J-8	J-17	130.0	36.67	35.62	0.00	2.43	2.91
P-71	8.0	152.00	PVC	J-14	J-27	130.0	36.53	36.44	0.00	0.20	1.54
P-69	8.0	416.00	PVC	J-6	J-34	130.0	36.59	36.59	0.00	0.00	0.00
P-64	8.0	259.00	PVC	J-18	J-29	130.0	38.88	38.68	0.00	0.46	1.81
P-57	8.0	894.00	PVC	J-25	J-10	130.0	36.59	36.59	0.00	0.00	0.00
P-23	8.0	338.00	PVC	J-11	J-23	130.0	36.71	36.96	0.00	0.60	1.81
P-16	8.0	926.00	PVC	J-21	J-3	130.0	36.68	36.69	0.00	0.02	0.17
P-60	8.0	72.00	PVC	J-4	J-12	130.0	36.69	36.64	0.00	0.11	1.63
P-59	8.0	27.00	PVC	J-11	J-4	130.0	36.71	36.69	0.00	0.05	1.81
P-58	8.0	52.00	PVC	J-10	J-32	130.0	36.59	36.59	0.00	0.00	0.00
P-7	10.0	487.00	PVC	J-25	J-26	130.0	36.59	36.59	0.00	0.00	0.01
P-3	10.0	14.00	PVC	J-1	J-2	130.0	36.61	36.61	0.00	0.01	0.99
P-5	10.0	296.00	PVC	J-22	J-13	130.0	36.59	36.59	0.00	0.00	0.01
P-11	10.0	1,882.00	PVC	J-34	J-24	130.0	36.59	36.59	0.00	0.00	0.00
P-12	10.0	390.00	PVC	J-24	J-25	130.0	36.59	36.59	0.00	0.00	0.01
P-2	10.0	902.00	PVC	J-19	J-30	130.0	39.18	40.47	0.00	2.96	2.91
P-8	10.0	213.00	PVC	J-18	J-19	130.0	38.88	39.18	0.00	0.70	2.91
P-68	10.0	120.00	PVC	J-13	J-1	130.0	36.59	36.61	0.00	0.05	0.99
P-70	10.0	64.00	PVC	J-26	J-22	130.0	36.59	36.59	0.00	0.00	0.01
P-67	10.0	622.00	PVC	J-24	J-13	130.0	36.59	36.59	0.00	0.00	0.01
P-65	10.0	783.00	PVC	J-2	J-31	130.0	36.61	36.76	0.00	0.35	0.99
P-66	10.0	2,603.00	PVC	J-31	J-35	130.0	36.76	41.23	0.00	10.32	3.22
EXISTIN	12.0	114.00	PVC	J-35	R-1	130.0	41.23	0.00	0.00	0.61	4.26
EXISTIN	12.0	1,301.00	PVC	J-30	J-35	130.0	40.47	41.23	0.00	1.76	2.02
EXISTIN	12.0	936.00	PVC	J-30	J-33	130.0	40.47	40.47	0.00	0.00	0.00

Scenario: NFF AMENITY FULL
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Calculated Hydraulic Grade (ft)	Outflow (gpm)	Description
R-1	120.90	120.90	1,500.00	