



*Hydraulic Analysis Report for
Howey in the Hills, FL*

*Hillside Groves Common
Howey in the Hills, FL*

Prepared by:

Kimley-Horn and Associates, Inc.
Orlando, Florida
149658038

August 2025

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Kimley»Horn

*Hydraulic Analysis Report for
Howey in the Hills, FL*

*Hillside Groves Common
Howey in the Hills, FL*

Prepared for:

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August 2025

Blake Wagner



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TABLE OF CONTENTS

EXECUTIVE SUMMARY	PAGES 1-2
POTABLE WATER DEMAND CALCULATIONS	APPENDIX A
NEEDED FIRE FLOW CALCULATIONS.....	APPENDIX B
WATERCAD SCHEMATIC DIAGRAM	APPENDIX C
WATERCAD RESULTS	APPENDIX D
• PHF Analysis	
• Fire Flow Analysis	
UTILITY PLAN/SCHEMATIC DIAGRAM.....	APPENDIX E
TIE-IN PRESSURES.....	APPENDIX F

EXECUTIVE SUMMARY

The Hillside Groves Common Amenity Center proposes a community clubhouse, pool, and associated infrastructure on a 1.22-acre tract. The subject property is located north of State Road 19 and southwest of W. Central Ave and S. Florida Ave. in Howey in the Hills, Lake County, Florida (Section 35, Township 20S, Range 25E). The proposed development, Hillside Groves Common, is part of the larger single-family development, Hillside Groves.

The Town of Howey-in-the-Hills will be the utility provider for potable water for this project. All proposed utilities shall be designed per the latest edition of the Howey-in-the-Hills Construction Specifications Manual.

The Hillside Groves Common Amenity Center will provide a water main connection to the existing system along the local subdivision road surrounding the amenity tract. As shown on the Utility Plan within **Appendix E**, we are proposing to make one connection to the existing 8" PVC water main located along the West side of the project. The proposed system is comprised of a wet tap to the existing 8-inch water main with a 2-inch service saddle and corporation stop, a 1-inch meter and RPZ, a 2-inch water service, and a 1.5-inch connection to the clubhouse. The WaterCAD schematic diagram has been provided in **Appendix C**.

A water distribution analysis has been performed for the proposed Hillside Groves Common project. The average daily flow demands were calculated and determined per conservative estimates from the MEP based on water supply fixture units (WSFU).

Estimated potable water Average Daily Flows (ADF), Max Daily Flows (MDF), and Peak Hourly Flows (PHF) for the proposed site are shown in **Appendix A**. The MDF was determined by multiplying the ADF by a factor of 2.0, while the PHF uses a peaking factor of 4.0.

The potable water distribution system has been modeled in WaterCAD CONNECT Edition 3 Update. The model has been analyzed to ensure adequate flows and pressures are provided within the system during potential worst-case scenarios.

The Needed Fire Flow (NFF) for the Hillside Groves Common project was determined per the NFPA 1 Uniform Fire Code Handbook, 2024 Edition. Building square footages and building types were provided by Total Solutions Group. The NFF was determined to be 1,500 GPM. Please see the Needed Fire Flow Calculations included in **Appendix B**.

The hydraulic information was determined by utilizing the Fire Flow Design Report provided by Connelly & Wicker. The design report provided a total head of roughly 254 feet along the existing 8-inch water main at our point of connection. Please see **Appendix F** for the existing hydraulic information from Connelly & Wicker.

Per Howey-in-the-Hills criteria, the water system must maintain a minimum pressure of 20 psi at all points in the distribution system under all conditions of flow. As determined in our analysis, the lowest pressure in the system during PHF is 62 PSI. The minimum system pressure measured during fire flow is 62 PSI. Therefore, the proposed system meets and/or exceeds Howey-in-the-Hills requirements. Please see the WaterCAD results in **Appendix D** for more details regarding the flows and pressures generated during each scenario.

APPENDIX A

POTABLE WATER DEMAND CALCULATIONS (ADF, MDD, PHF)



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Orlando, Florida 32827

Made By: NDF
Checked By: BJW
KHA Project Number: 149658038

DATE: 8/26/2025
DATE: 8/27/2025

Hillside Groves Common Potable Water Demand Determination

(per O.C.U. Standards and Construction Specifications October 2021)

Fixture Unit Type	Unit	UNITS / COUNT	ERC per UNIT	TOTAL ERCs	GPD			GPM		
					ADF	MDF	PHF	ADF	MDF	PHF
Water Closet	Per Fixture	5	0.500	2.5	875	1,750	3,500	0.6	1.2	2.4
Urinal	Per Fixture	1	0.333	0.3	117	233	466	0.1	0.2	0.3
Lavoratory	Per Fixture	6	0.167	1.0	351	701	1,403	0.2	0.5	1.0
Service Sink	Per Fixture	1	0.250	0.3	88	175	350	0.1	0.1	0.2
Mop Sink	Per Fixture	1	0.250	0.3	88	175	350	0.1	0.1	0.2
Electric Water Cooler	Per Fixture	1	0.083	0.1	29	58	116	0.0	0.0	0.1
Hose Bib	Per Fixture	2	0.042	0.1	29	59	118	0.0	0.0	0.1
Ice Maker Supply Box	Per Fixture	1	0.083	0.1	29	58	116	0.0	0.0	0.1
Drinking Fountain	Per Fixture	1	0.042	0.04	15	29	59	0.0	0.0	0.0
Subtotal				4.6	1,619	3,239	6,478	1.1	2.2	4.5
Total				4.6	1,619	3,239	6,478	1.1	2.2	4.5

1 ERU = 350 GPD

Average Daily Flow (ADF)

Max Daily Flow (MDF) = ADF x 2.0

Peak Hour Flow (PHF) = ADF x 4.0



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August 27, 2025

To whom it may concern,

We have been informed to provide plumbing fixture unit counts for the proposed Hillside Grove Amenity. This information is provided for the site plan engineering design analysis. Please note that the final plumbing schedule will be submitted with the building plans as part of the permit application and construction documentation.

PLUMBING FIXTURE SCHEDULE						
MARK	DESCRIPTION	WASTE	VENT	CW	HW	REMARKS
WC-1 QTY (3)	WATER CLOSET 1.28 GPF LOW CONSUMPTION	3"	2"	½"	----	RIM +15½" FIXTURE: STERLING #402312, TWO-PIECE VITREOUS CHINA BOWL, BOWL & TANK, FLOOR OUTLET W/ BOLT CAPS, ELONGATED BOWL, CHROME PLATED TRIP LEVER, STAINLESS STEEL BRAIDED SUPPLY AND STOP VALVE. SEAT: KOHLER K-4636, ELONGATED SOLID WHITE PLASTIC SEAT WITH COVER.
WC-2 QTY (2)	WATER CLOSET 1.28 GPF LOW CONSUMPTION ADA	3"	2"	½"	----	RIM +16½" FIXTURE: STERLING #402313, TWO-PIECE VITREOUS CHINA BOWL, BOWL & TANK, FLOOR OUTLET W/ BOLT CAPS, ELONGATED BOWL, CHROME PLATED TRIP LEVER, STAINLESS STEEL BRAIDED SUPPLY AND STOP VALVE. SEAT: KOHLER K-4636, ELONGATED SOLID WHITE PLASTIC SEAT WITH COVER.
UR-1 QTY (1)	URINAL ADA	1½"	1½"	¾"	----	WALL HUNG - SEE ARCHITECTURAL DWGS. FOR MOUNTING HEIGHT FIXTURE: AMERICAN STANDARD DECORUM #6045.013.002, 0.125 GPF URINAL, WHITE VITREOUS CHINA, WASHOUT URINAL, ¾" TOP SPUD OPERATED FLUSH VALVE, ZURN #Z1221 URINAL CARRIER MOUNTED TO FLOOR
L-1 QTY (4)	LAVATORY	1½"	1½"	½"	½"	FIXTURE: KOHLER #K-2330-0, UNDERCOUNTER, RECTANGULAR, VITREOUS CHINA, REAR OVERFLOW. FAUCET: MOEN #M-POWER 8558BL, BATTERY OPERATED, MATT BLACK, P-TRAP W/CLEANOUT, GRID STRAINER. PROVIDE ANGLE VALVES, STAINLESS STEEL BRAIDED SUPPLIES AND P-TRAP. SOAP DISPENSER; MOEN #8560BL, BATTERY OPERATED
L-2 QTY (2)	LAVATORY ADA	1½"	1½"	½"	½"	WALL HUNG FIXTURE: AMERICAN STANDARD #9024.021EC, WHITE, W/CONCEALED ARMS, WALL MOUNTED LAVATORY WITH SHROUD. FAUCET: MOEN #M-POWER 8558BL, BATTERY OPERATED, MATT BLACK, P-TRAP W/CLEANOUT, GRID STRAINER. PROVIDE ANGLE VALVES, STAINLESS STEEL BRAIDED SUPPLIES AND P-TRAP. PROVIDE ZURN #1231 LAVATORY CARRIER MOUNTED TO FLOOR. SOAP DISPENSER; MOEN #8560BL, BATTERY OPERATED. INSULATE SUPPLIES, STOPS AND WASTE PIPING
S-1 QTY (1)	SINK ADA	1½"	1½"	½"	½"	COUNTERTOP FIXTURE: ELKAY #ECTSRAD33226TBG, 33"x22"x6", DOUBLE COMPARTMENT, 18 GAUGE STAINLESS STEEL, SOUND DEADENED, SELF-RIMMING WITH CRUMB CUP STRAINER & TAILPIECE, 1½" CHROMIUM-PLATED, CONTINUOUS WASTE & P-TRAP, CHROME-PLATED BRASS ANGLED STOP VALVES AND STAINLESS STEEL BRAIDED SUPPLIES. FAUCET: GIMILI #GM1062-B, TOUCHLESS FAUCET, MATT BLACK, PULL OUT SPRAYER (1.6 GPM)
MS-1 QTY (1)	MOP SINK	1½"	1½"	½"	½"	FIXTURE: PRO-FLO #PFMB2424 FLOOR MOUNTED SERVICE SINK CONSTRUCTED OF MOLDED COMPOSITE WITH STAINLESS STEEL DRAIN & STRAINER/LINT BASKET. FAUCET: T&S BRASS #B-0665-BSTR WITH TOP BRACE, VACUUM BREAKER AND INTEGRAL CHECKS.
HB-1 QTY (2)	HOSE BIBB	----	----	½"	----	OUTLET +24" MODEL: WOODFORD #24-CP, CHROME-PLATED WITH ANTI-SIPHON VACUUM BREAKER. PROVIDE LOOSE TEE KEY
EW-1 QTY (1)	ELECTRIC WATER COOLER ADA ACCESSIBLE	1½"	1½"	½"	----	WALL HUNG. SEE ARCHITECTURAL DWGS. FOR MOUNTING HEIGHT FIXTURE: ELKAY #LZSTLBWSSK, WITH BOTTLE FILLING STATION CAPACITY TO DELIVER 8.0 GPH OF 50° F. WATER WITH INLET TEMP. OF 80° F. AND ROOM TEMP. OF 90° F. WATER FILTER SYSTEM, STAINLESS STEEL BASIN AND GRILL, VANDAL RESISTANT FRONT PUSH BUTTON BUBBLER, AIR COOLED HERMETICALLY SEALED CONDENSING UNIT W/ 1/5 hp., 120 V., 60 CYCLE, 1 PH. W/ OVERLOAD PROTECTION, 1½" P-TRAPS, STOP VALVE, CORD & PLUG
IMB-1 QTY (1)	ICE MAKER SUPPLY BOX	----	----	½"	----	VALVE +24" PROVIDE WATERTITE #AB1201CP ICE MAKER BOX WITH WATER HAMMER ARRESTOR #38684, HIGH IMPACT PLASTIC BOX W/ DIMENSION OF 6" HIGH x 6" WIDE.
NOTES:						
1. INSTALL FIXTURES IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL ACCESSIBILITY CODE REQUIREMENTS FOR INDIVIDUALS WITH PHYSICAL IMPAIRMENTS.						

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FL. # 56126 FL. # 78750 FL. # AR100323

ARCHITECTURE | ENGINEERING

APPENDIX B

NEEDED FIRE FLOW CALCULATIONS

Hillside Groves Common
Pool/Amenity

Needed Fire Flow (NFF)

per NFPA 1 Uniform Fire Code Handbook, 2024 Edition

***Building Fire Area=**

Building Type (per NFPA 220) =

Associated Min. Required Fire Flow=

(per Table 18.4.4.2.1 of the NFPA 1 Uniform Fire Code Handbook)

Fire Sprinkler - Yes or No=

Calculated Fire Flow=

(with 75% fire sprinkler credit, if applicable)

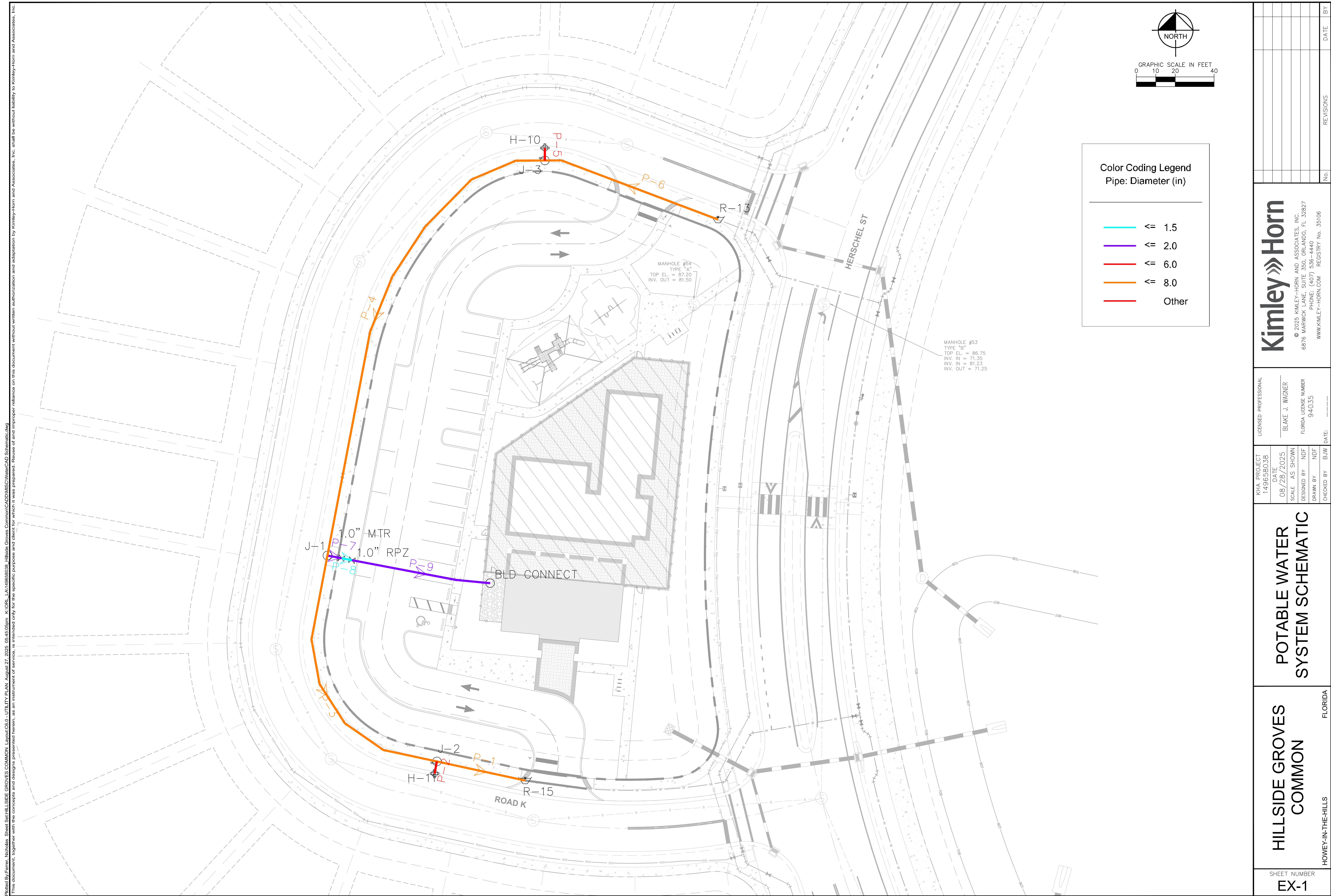
Minimum Fire Flow Required=

2,827	SF
V (000)	
1,500	GPM
No	
1,500	GPM
1,500	GPM

Fire Flow Provided=	1,500 GPM
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APPENDIX C

WATERCAD SCHEMATIC DIAGRAM



APPENDIX D

WATERCAD RESULTS

“PHF”
PEAK HOURLY FLOW ANALYSIS

Hillside Groves Common

Scenario: PHF

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Hydraulic Grade (ft)	Notes
R-13	254.04	254.04	(J-13 from Hillside Grove Hydraulic Report)
R-15	254.03	254.03	(J-15 from Hillside Grove Hydraulic Report)

Hydrant Table - Time: 0.00 hours

Label	Hydrant Status	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
H-10	Closed	20	87.00	254.04	0.0	72
H-11	Closed	20	87.00	254.03	0.0	72

Hillside Groves Common

Scenario: PHF

Junction Table - Time: 0.00 hours

Label	Demand (gpm)	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)
BLD CONNECT	4.5	84.50	228.08	62
J-1	0.0	84.62	254.03	73
J-2	0.0	86.60	254.03	72
J-3	0.0	86.60	254.04	72

Hillside Groves Common

Scenario: PHF

Pipe Table - Time: 0.00 hours

Label	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Hydraulic Grade (Start) (ft)	Hydraulic Grade (Stop) (ft)	Headloss (ft)
P-1	46	8.0	PVC	140.0	21.9	0.14	254.03	254.03	0.00
P-2	6	6.0	PVC	140.0	0.0	0.00	254.03	254.03	0.00
P-3	144	8.0	PVC	140.0	21.9	0.14	254.03	254.03	0.00
P-4	252	8.0	PVC	140.0	26.4	0.17	254.04	254.03	0.01
P-5	6	6.0	PVC	140.0	0.0	0.00	254.04	254.04	0.00
P-6	95	8.0	PVC	140.0	26.4	0.17	254.04	254.04	0.00
P-7	7	2.0	PVC	140.0	-4.5	0.46	254.02	254.03	0.01
P-8	5	1.0	PVC	140.0	4.5	1.84	253.93	253.75	0.18
P-9	72	2.0	PVC	140.0	4.5	0.46	228.13	228.08	0.05

**“NFF + MDF”
FIRE FLOW ANALYSIS**

Hillside Groves Common

Scenario: NFF

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Hydraulic Grade (ft)	Notes
R-13	254.04	254.04	(J-13 from Hillside Grove Hydraulic Report)
R-15	254.03	254.03	(J-15 from Hillside Grove Hydraulic Report)

Hydrant Table - Time: 0.00 hours

Label	Hydrant Status	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
H-10	Open	20	87.00	250.22	750.0	71
H-11	Open	20	87.00	250.38	750.0	71

Hillside Groves Common

Scenario: NFF

Junction Table - Time: 0.00 hours

Label	Demand (gpm)	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)
BLD CONNECT	2.2	84.50	228.87	62
J-1	0.0	84.62	253.39	73
J-2	0.0	86.60	253.45	72
J-3	0.0	86.60	253.30	72

Hillside Groves Common

Scenario: NFF

Pipe Table - Time: 0.00 hours

Label	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Hydraulic Grade (Start) (ft)	Hydraulic Grade (Stop) (ft)	Headloss (ft)
P-1	46	8.0	PVC	140.0	-877.0	5.60	253.45	254.03	0.58
P-2	6	6.0	PVC	140.0	-750.0	8.51	250.38	253.45	3.07
P-3	144	8.0	PVC	140.0	-127.0	0.81	253.39	253.45	0.06
P-4	252	8.0	PVC	140.0	-124.8	0.80	253.30	253.39	0.09
P-5	6	6.0	PVC	140.0	-750.0	8.51	250.22	253.30	3.08
P-6	95	8.0	PVC	140.0	625.2	3.99	254.04	253.30	0.74
P-7	7	2.0	PVC	140.0	-2.2	0.22	253.39	253.39	0.00
P-8	5	1.0	PVC	140.0	2.2	0.90	253.38	253.33	0.05
P-9	72	2.0	PVC	140.0	2.2	0.22	228.88	228.87	0.01

APPENDIX E

UTILITY PLAN/SCHEMATIC DIAGRAM

1. ALL UNDERGROUND MAINS SERVING FIRE HYDRANTS OR FIRE PROTECTION SPRINKLER SYSTEMS ON PRIVATE PROPERTY MUST BE PERMITTED PRIOR TO INSTALLATION. THE DRAINING SHALL INDICATE THAT ALL UNDERGROUND MAINS WILL BE INSTALLED IN CONFORMANCE WITH AFRS-100, 2008 EDITION, STANDARD FOR THE INSTALLATION OF FIRE SERVICE MAINS AND THEIR APPURTENANCES". [F.A.C. 69A-60.005(2)]
2. ALL FIRE SERVICE MAIN LOCATED DOWNSTREAM OF THE FIRE POINT OF SERVICE SHALL BE INSTALLED BY A QUALIFIED AND LICENSED CONTRACTOR. CONSTRUCTION AND MATERIALS SHALL COMPLY WITH APPLICABLE FIRE CODE. CONTRACTOR TO VERIFY REQUIREMENTS WITH THE TOWN OF HOWEY-IN-THE-HILLS PRIOR TO SHOP DRAWING REVIEW.

per NFPA 1 Uniform Fire Code Handbook, 2021 Edition

Fire Flow Provided=	1,500 GPM
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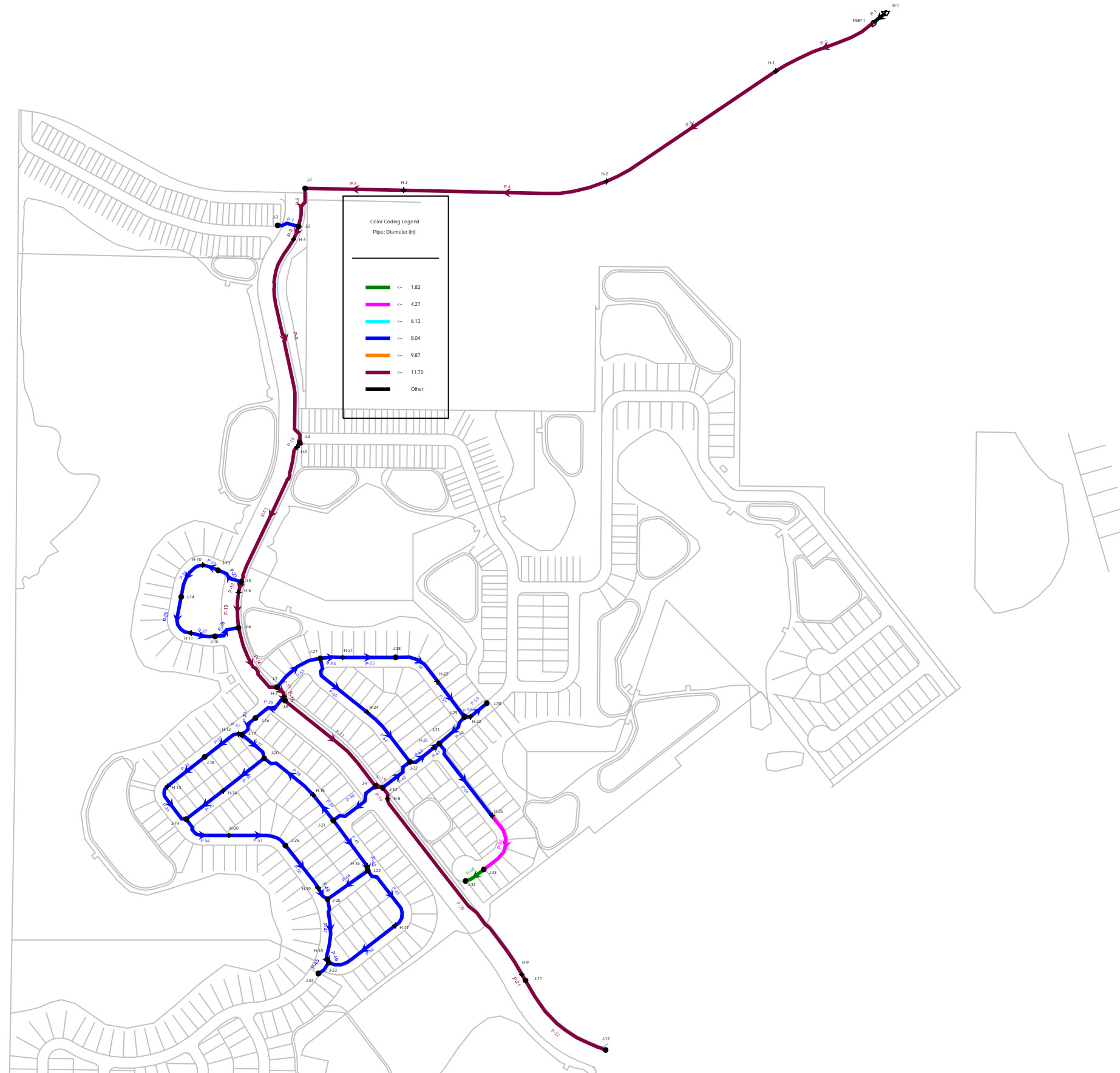


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APPENDIX E

TIE-IN PRESSURES (BASED ON FIRE FLOW DESIGN REPORT FROM CONNELLY & WICKER)

Scenario: Base



FlexTable: Hydrant Table

Label	Elevation (ft)	Pressure (psi)	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Satisfies Fire Flow Constraints?
H-1	83.80	73.7	500.00	725.73	20.0	True
H-2	85.20	73.1	500.00	714.86	20.0	True
H-3	84.50	73.4	500.00	711.47	20.0	True
H-4	87.50	72.1	500.00	696.02	20.0	True
H-5	86.90	72.3	500.00	691.11	20.0	True
H-6	87.10	72.2	500.00	685.18	20.0	True
H-7	87.00	72.3	500.00	681.90	20.0	True
H-8	86.40	72.5	500.00	682.19	20.0	True
H-9	87.70	72.0	500.00	672.83	20.1	True
H-10	87.00	72.3	500.00	682.60	20.0	True
H-11	87.00	72.3	500.00	682.07	20.0	True
H-12	87.60	72.0	500.00	674.09	20.1	True
H-13	87.40	72.1	500.00	672.72	20.1	True
H-14	88.60	71.6	500.00	669.10	20.1	True
H-15	88.10	71.8	500.00	671.92	20.1	True
H-16	90.00	71.0	500.00	663.06	20.0	True
H-17	96.70	68.1	500.00	636.31	20.0	True
H-18	93.60	69.4	500.00	647.16	20.0	True
H-19	92.60	69.8	500.00	652.81	20.0	True
H-20	88.80	71.5	500.00	666.59	20.1	True
H-21	86.90	72.3	500.00	677.05	20.1	True
H-22	86.10	72.6	500.00	677.19	20.1	True
H-23	85.30	73.0	500.00	678.61	20.1	True
H-24	87.00	72.3	500.00	676.23	20.1	True
H-25	86.10	72.6	500.00	679.51	20.0	True
H-26	89.40	71.2	500.00	655.17	20.0	True

FlexTable: Junction Table

Label	Demand (gpm)	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Pressure Head (ft)	Pressure (Residual Lower Limit) (psi)
J-1	0.00	86.20	254.13	72.7	167.93	20.0
J-2	0.00	87.20	254.12	72.2	166.92	20.0
J-3	0.00	87.10	254.12	72.3	167.02	20.0
J-4	0.00	86.70	254.07	72.4	167.37	20.0
J-5	0.00	86.80	254.04	72.4	167.24	20.0
J-6	0.00	86.90	254.03	72.3	167.13	20.0
J-7	0.00	86.60	254.02	72.4	167.42	20.0
J-8	0.00	87.00	254.02	72.3	167.02	20.0
J-9	0.00	87.00	254.01	72.3	167.01	20.0
J-10	0.00	87.00	254.01	72.3	167.01	20.0
J-11	0.00	87.70	254.01	72.0	166.31	20.0
J-12	0.00	86.40	254.01	72.5	167.61	20.0
J-13	1.00	86.60	254.04	72.4	167.44	20.0
J-14	6.00	87.60	254.03	72.0	166.43	20.0
J-15	1.50	86.60	254.03	72.4	167.43	20.0
J-16	1.00	87.20	254.01	72.2	166.81	20.0
J-17	0.00	87.60	254.01	72.0	166.41	20.0
J-18	9.00	88.20	254.01	71.7	165.81	20.0
J-19	8.50	87.90	254.00	71.9	166.10	20.0
J-20	9.00	88.30	254.01	71.7	165.71	20.0
J-21	7.50	87.50	254.01	72.0	166.51	20.0
J-22	5.00	90.80	254.00	70.6	163.20	20.0
J-23	6.00	93.50	254.00	69.4	160.50	20.0
J-24	0.00	93.70	254.00	69.4	160.30	20.0
J-25	4.50	92.80	254.00	69.7	161.20	20.0
J-26	7.00	90.70	254.00	70.7	163.30	20.0
J-27	9.00	87.20	254.01	72.2	166.81	20.0
J-28	6.50	86.50	254.01	72.5	167.51	20.0
J-29	3.50	85.30	254.01	73.0	168.71	20.0
J-30	1.00	85.70	254.01	72.8	168.31	20.0
J-31	5.50	86.10	254.01	72.6	167.91	20.0
J-32	8.50	85.70	254.01	72.8	168.31	20.0
J-33	6.00	91.30	254.00	70.4	162.70	20.0
J-34	1.50	91.90	253.98	70.1	162.08	20.0