Date: April 2, 2025

229 NEELYTOWN ROAD
TOWN OF HAMPTONBURGH, ORANGE COUNTY, NY
FIRE PROTECTION WATER SUPPLY ANALYSIS
M/E Reference: 243322.00

The following letter outlines the Fire Protection / Sprinkler system requirements for the proposed Warehouse facility(s) currently being designed for new construction. Two buildings to be built in Neelytown Business Park, 222 Neelytown Road, Montgomery NY. Orange County. Specifically, it relates to the available existing municipal water supply and the new 8" tap that will be required at the new building site.

Municipal Water Supply

A documented flow test was performed on the existing water mains near the proposed building site. Flow test was conducted on 02/15/2023, on the assumed existing water main (size not recorded on flow test) in Neelytown Road. Control hydrant was noted at 497 Neelytown Road, intersection with Beaver Dam Road. Flow hydrant was noted just east before the creek crossing. Documented data: 65 psi static pressure / 35 psi residual pressure / flowing 1920 GPM. Flow test report is included with this document. The data from this flow test was used to generate the ensuing Sprinkler Hydraulic Calculations.

Proposed Building Classification

Per NYS Building Code, the new building Occupancy / Classification will be S-1 Moderate Hazard Storage. Rack type storage is possible with a currently unknown commodity.

Acceptable Sprinkler Systems

With the S-1 classification and warehouse use, (3) three sprinkler system types would meet or exceed the code and NFPA 13 applicable requirements specific to the classification. The three systems are outlined below:

ESFR (Early Suppression Fast Response)

ESFR ceiling mounted sprinklers can be used in warehouses in place of in-rack fire sprinkler systems. ESFR provides protection that exceeds that of in-rack systems.

ESFR Sprinkler Systems employ the use of an Early Suppression Fast Response Sprinkler type and are predominately used for the protection of High Piled Storage. Storage arrangements may include palletized, solid pile, shelf, bin box, or rack storage of materials. The primary advantage associated with ESFR Sprinkler Systems, again, is a protection scheme that does not require the use of in-rack sprinklers in a rack storage configuration.

ESFR sprinklers are intended to operate differently than most other types of sprinklers. While most other sprinklers are intended to control the growth of a fire, an ESFR sprinkler system is designed to suppress a fire. To suppress a fire does not necessarily mean it will extinguish the fire but rather it is meant to "knock" the fire back down to its original point of origin. ESFR sprinklers accomplish this design objective by using large volumes of water, nearly 100 gallons per minute of water per sprinkler.

CMDA (Control Mode Density Area)

The “control-mode” in a control mode density area (CMDA) sprinkler refers to the fact that these heads provide wetting and cooling to control a fire until first responders can arrive. “Density-area” refers to how CMDA systems are designed. A set of density-area curves specifies the amount of water flow required for a given area. The system and its water source are engineered based on them to provide the necessary flow and pressure. The two things separating a CMDA sprinkler from a regular sprinkler are larger **K-factors and higher temperature ratings. The bigger K-factor in CMDA sprinklers (and most storage sprinklers) enables greater water flow.

In-Rack Sprinkler Systems

Traditional Warehouse and Storage sprinklers systems utilize a design where sprinkler heads and the associated piping are installed within each storage rack. With in-rack sprinklers employed an overhead sprinkler system is still required. Cost prohibitive with newer technology of sprinkler heads and system designs specific to our type of building classification as a Storage and Warehouse.

(** *K-Factor is defined as the discharge characteristics of a sprinkler head specific to flow and pressure. Larger the number the greater flow discharge)*

New Warehouse(s) Fire Sprinkler Design

Proposed Warehouse 1 is 850,000 square feet. Proposed Warehouse 2 is 278,270 square feet. Civil Engineering has indicated the installation of (1) one new water service laterals/entrance be extended to the warehouse from Neelytown Road From a fire protection standpoint and the s.f. area of the building we recommend the new service be 8” pipe size. This would be ideal for the fire zoning, but, as you will note in our conclusion, we believe the municipal water supply alone will not support either an ESFR or CDMA type sprinkler design.

NFPA requires a single fire zone not exceed 52,000 s.f. Based on this guideline, we are assuming (2) two fire zones on each side of the building. Meaning, two 6” riser assemblies from each of the new underground water supplies. These fire zones would be hydraulically calculated as individual sprinkler systems.

For the purposes of this report, we have generated hydraulic calculations to demonstrate the required water demand for a fully sprinklered building under the design criteria outlined in the NYS Building / Fire Codes and NFPA 13. Not to exclude the requirements for pre-construction approval from the Town of Montgomery Engineer, Town of Montgomery Code and Building Department and the local Water Authority.

Enclosed hydraulic calculations include an ESFR type sprinkler system. In-rack sprinkler system will not be considered for the new warehouse. To determine maximum sprinkler shadow coverage, we calculated an ESFR sprinkler system with ESFR heads at a K-Factor of 25.2. ESFR sprinkler system are designed to suppress a fire in as much as possible until the firefighters arrive on scene. ESFR hydraulic design guidelines, per NFPA, allow the hydraulically remote section of the sprinkler system to be able to discharge 12 ESFR heads for 90 minute duration. Again, referring to the enclosed hydraulic calculation documents, please note that the municipal water supply will not be enough for either an ESFR type system. The sprinkler flow demands are well above the water supply curve as noted.

Proposed Warehouse 1 and Warehouse 2, Neelytown Business Park, will be constructed /classified type 2b, moderate hazard with high piled storage. Buildings will be required to be fitted with a complete automatic fire sprinkler system per NYS Building and Fire Codes. Referencing NFPA 13 “Installation of Sprinkler Systems” as the design guideline. Based on the building classification and listed hazard, the automatic sprinkler system will be required to be designed and fit out with an ESFR (Early Suppression Fast Response) type sprinkler head throughout the building. The ESFR system will be required to be installed as an overhead system covering all floor areas and rooms, including overhead water coverage of any racked storage. The automatic system will need to have water supply duration at a minimum of 90 minutes per NFPA 13 requirements. Preliminary

hydraulic sprinkler calculations resulted in a minimum sprinkler water flow demand at 137 psi @ 1512 gpm. This would be similar in both Warehouses. Basic charting of the available municipal water supply (flow test data) and the minimum sprinkler demand shows the incoming water supply will not be enough to meet the sprinkler demands of the proposed buildings. (see page 1 of the enclosed hydraulic calculation data) Available pressure at the calculated 1512 gpm sprinkler demand (not included is the required 500 gpm hose allowance) is at 32.28 psi. We will need 137 psi as indicated above. Approx. 105 psi short. In addition, the calculations show that at the 32.28 psi available pressure the municipal supply can only flow approx.1495 gpm. Again, showing a deficiency in available water flow to meet the 1512 gpm + 500 hose allowance sprinkler demand. Conclusions warrant the available municipal water supply will need to be supplemented to meet sprinkler requirements. Based on the above data we will propose the following infrastructure to provide the required fire protection needs of the proposed warehouses:

Fire Pump: 2000 gpm with a minimum 150 psi pressure boost.

External Water Storage Tank dedicated to fire protection water supply. Maximum 180,000 gallons (1512 gpm sprinkler demand x 90 minute duration). 500 gpm hose allowance as required by the local AHJ.

Consideration of a smaller tank volume if local authorities allow an offset of incoming water flow to work with in concert with a fire pump discharge event. Initial recommendation is to provide a dedicated tank, fire pump, and sprinkler system.

Local authority approved, NFPA allows multiple buildings with the same owner and on the same property the following: A shared water source with a single fire pump system can serve multiple buildings on the site. This includes a single site storage tank. As long as you meet the most demanding sprinkler location/building anything in between will be ok on the system. Meaning, buildings on the same property would not be cumulative from a water supply standpoint.

Conclusion / Summary

The new proposed warehouse construction poses a challenge, specifically to fire protection / sprinkler system design to contend with fire events. NFPA 13 establishes stringent guidelines when it comes to storage, racked storage, or commodity type. ESFR sprinkler systems have been developed specifically to meet the storage and warehouse applications. In turn, allowing the owner to have a more cost effective installation that will be flexible for most storage applications. Calculated sprinkler demands based on system noted below:

Most dense water coverage ESFR w/ K-factor 25.2 = 1512 gpm sprinkler demand

Comparing these demands to the available municipal water supply we can safely conclude that we will not be able meet the sprinkler demand with a direct connection to the incoming water supplies. The new building sprinkler design will need to incorporate a fire pump(s) to supplement the incoming water flow. Again, this will require the new incoming water service lateral to be sized at 8” pipe size. 8” ductile iron piping will allow flows up to 1600 gpm. The need for on-site water storage for the sprinkler system will be needed based on correct sizing of the new piping, the current available water supply / flow test data and the calculated sprinkler demand with a supplemental fire pump.

Sincerely,

M/E ENGINEERING, P.C.

Jeff Esposito
Senior Designer

Active FIRE PROTECTION
Fire Sprinklers and standpipe systems

128 Museum Village Road
Monroe, NY 10950
845.782.7494 #401
866.903.9949
www.afpfs.com

Hydrant Flow Test

February 16, 2023

RE: 497 Neelytown Rd, *(Corner of Beaver Dam Rd)*
Montgomery, NY 12549

Following are the results for the flow test:

Date Tested:	02/15/2023
Time Tested:	8:30am
Hydrant Locations:	See Map
Static Pressure (PSI)	65
Residual Pressure (PSI)	35
Hydrant Discharge Observed (GPM)	1920
Pitot Pressure (PSI)	20
AFP Technician	SC
Water Company:	Town of Montgomery Water Dept.
Witnessed by:	Jim Farr

Please feel free to contact our office with any further questions at 845-782-7494.

Thank you.

Active Fire Protection Inc.

Google Maps

Map data ©2023 100 ft

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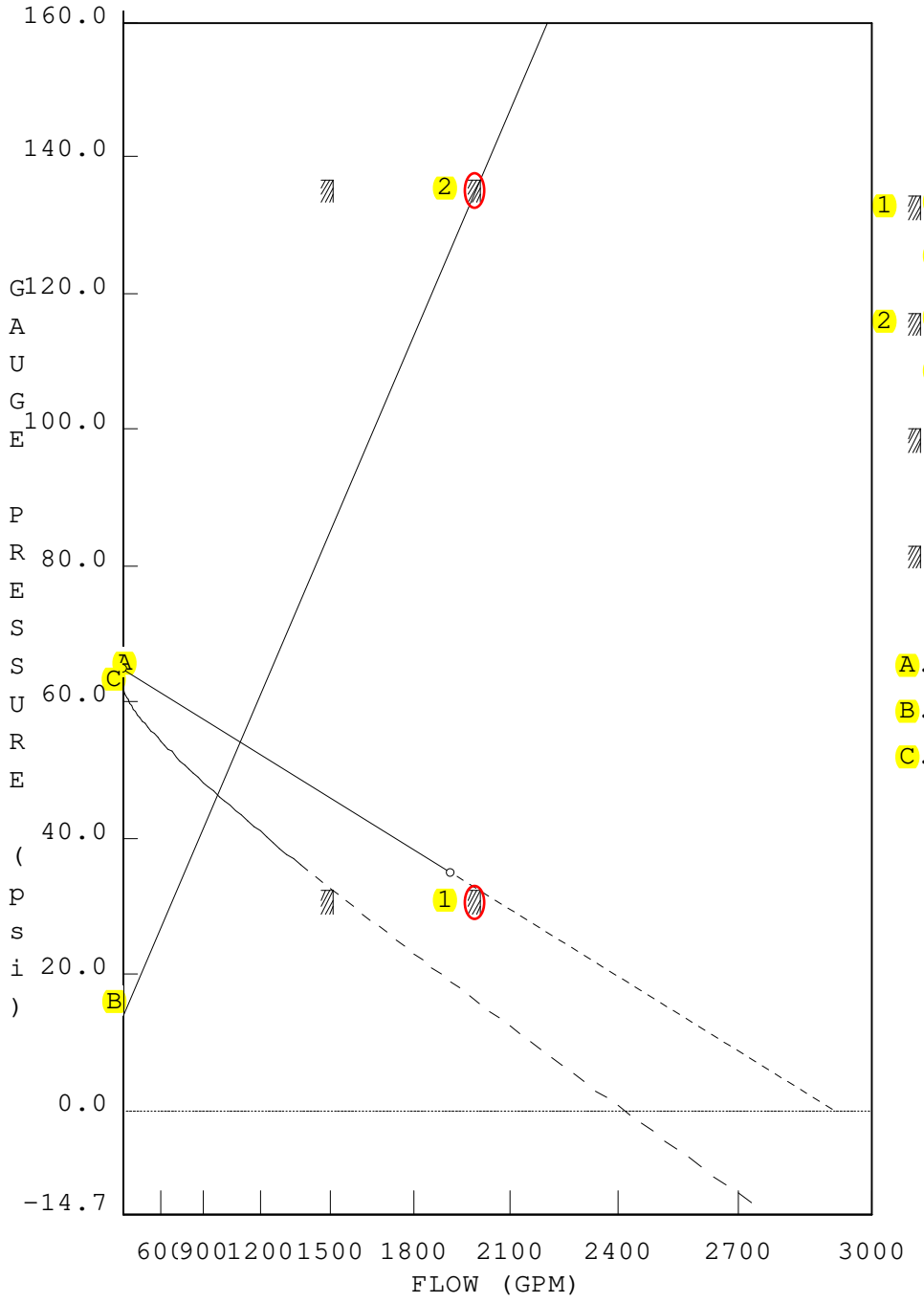
WATER SUPPLY ANALYSIS

Static: 65.00 psi Resid: 35.00 psi Flow: 1920.0 gpm



LEGEND

1 Available pressure
32.28 psi @ 2012.4 gpm

2 Required pressure
136.81 psi @ 2012.4 gpm

Avail. OnSite Demand Press.
32.28 psi @ 1512.4 gpm

Req. OnSite Demand Press.
136.81 psi @ 1512.4 gpm

A. Source Supply Curve
B. System Demand Curve
C. Available at Source

Note: (1) Dashed Lines indicate extrapolated values from Test Results

(2) On Site pressures are based on hose stream deduction at the source

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NFPA WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	@ FLOW (GPM)	AVAIL. PRESS. (PSI)	@ TOTAL DEMAND (GPM)	REQ'D PRESS. (PSI)
TEST	65.0	35.0	1920.0	32.3	2012.4	136.8

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	2012.4 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	500.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	1512.4 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
S1	35.0	K=25.20	15.0	97.6
S2	35.0	K=25.20	15.7	99.9
S3	35.0	K=25.20	18.4	108.2
S4	35.0	K=25.20	24.5	124.6
S5	35.0	K=25.20	35.8	150.8
S6	35.0	K=25.20	15.0	97.7
S7	35.0	K=25.20	15.7	100.0
S8	35.0	K=25.20	18.4	108.2
S9	35.0	K=25.20	24.5	124.7
S10	35.0	K=25.20	35.9	150.9
S11	35.0	K=25.20	47.1	173.0
S12	35.0	K=25.20	49.2	176.8
S13	35.0	- - - -	57.0	- - -
S14	35.0	- - - -	64.7	- - -
S15	35.0	- - - -	72.5	- - -
101	35.0	- - - -	37.8	- - -
102	30.0	- - - -	97.4	- - -
103	35.0	- - - -	37.8	- - -
104	30.0	- - - -	97.5	- - -
105	35.0	- - - -	73.2	- - -
106	30.0	- - - -	97.9	- - -
108	30.0	- - - -	98.5	- - -
109	30.0	- - - -	99.1	- - -
110	30.0	- - - -	99.7	- - -
111	30.0	- - - -	100.3	- - -
112	30.0	- - - -	100.9	- - -
113	30.0	- - - -	101.5	- - -
114	30.0	- - - -	102.1	- - -
115	30.0	- - - -	104.9	- - -
116	30.0	- - - -	106.3	- - -
117	30.0	- - - -	109.1	- - -
118	30.0	- - - -	110.5	- - -

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NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
119	30.0	- - - -	111.3	- - -
120	30.0	- - - -	112.6	- - -
TOR1	30.0	- - - -	113.1	- - -
BOR1	5.5	- - - -	127.3	- - -
BFP	3.0	- - - -	130.4	- - -
UG1	1.0	- - - -	133.8	- - -
UG2	-3.0	- - - -	137.7	- - -
TEST	3.0	SOURCE	136.8	1512.4

NFPA PIPE DATA 5

Pipe Tag Frm Node To Node	El (ft) El (ft)	K-fac PT PT	Add Fl (q) Tot.(Q)	Add Fl To Node/ Disch	Nom ID Act ID	Fit: Eq.Ln. (ft.)	L F T	C Pf/ft.	(Pt (Pe) (Pf)
Pipe: 1		25.20	97.6	Disch			10.00	120	0.7
S2	35.0	15.7	0.0		B2.000	----	0.00		-0.0
S1	35.0	15.0	97.6		2.157		10.00	0.073	0.7
Pipe: 2		25.20	99.9	Disch			10.00	120	2.7
S3	35.0	18.4	97.6		B2.000	----	0.00		-0.0
S2	35.0	15.7	197.5		2.157		10.00	0.269	2.7
Pipe: 3		25.20	108.2	Disch			10.00	120	6.0
S4	35.0	24.5	197.5	S2	B2.000	----	0.00		-0.0
S3	35.0	18.4	305.7		2.157		10.00	0.603	6.0
Pipe: 4		25.20	124.6	Disch			10.00	120	11.4
S5	35.0	35.8	305.7	S3	B2.000	----	0.00		-0.0
S4	35.0	24.5	430.3		2.157		10.00	1.136	11.4
Pipe: 5		25.20	150.8	Disch			1.00	120	2.0
101	35.0	37.8	430.3	S4	B2.000	----	0.00		-0.0
S5	35.0	35.8	581.1		2.157		1.00	1.980	2.0
Pipe: 6		0.0	0.0				11.00	120	59.6
102	30.0	97.4	581.1	S5	B2.000	E: 6.0	18.00		2.2
101	35.0	37.8	581.1		2.157	T:12.0	29.00	1.980	57.4
Pipe: 7		0.0	0.0				10.00	120	0.1
104	30.0	97.5	581.1	101	B6.000	----	0.00		-0.0
102	30.0	97.4	581.1		6.357		10.00	0.010	0.1
Pipe: 8		25.20	97.7	Disch			10.00	120	0.7
S7	35.0	15.7	0.0		B2.000	----	0.00		-0.0
S6	35.0	15.0	97.7		2.157		10.00	0.073	0.7
Pipe: 9		25.20	100.0	Disch			10.00	120	2.7
S8	35.0	18.4	97.7		B2.000	----	0.00		-0.0
S7	35.0	15.7	197.7		2.157		10.00	0.269	2.7
Pipe: 10		25.20	108.2	Disch			10.00	120	6.0
S9	35.0	24.5	197.7	S7	B2.000	----	0.00		-0.0
S8	35.0	18.4	305.9		2.157		10.00	0.604	6.0
Pipe: 11		25.20	124.7	Disch			10.00	120	11.4
S10	35.0	35.9	305.9	S8	B2.000	----	0.00		-0.0
S9	35.0	24.5	430.6		2.157		10.00	1.137	11.4
Pipe: 12		25.20	150.9	Disch			1.00	120	2.0
103	35.0	37.8	430.6	S9	B2.000	----	0.00		-0.0
S10	35.0	35.9	581.4		2.157		1.00	1.982	2.0

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Pipe Tag / Frm Node / To Node	El (ft)	K-fac PT	Add Fl (q) Tot.(Q)	Add Fl To Node/ Disch	Nom ID Act ID	Fit: Eq.Ln. (ft.)	L F T	C Pf/ft.	(Pt (Pe) (Pf)
Pipe: 13		0.0	0.0				11.00	120	59.7
104	30.0	97.5	581.4	S10	B2.000	E: 6.0	18.00		2.2
103	35.0	37.8	581.4		2.157	T:12.0	29.00	1.982	57.5
Pipe: 25		0.0	581.4	103			10.00	120	0.4
106	30.0	97.9	581.1	102	B6.000	----	0.00		-0.0
104	30.0	97.5	1162.6		6.357		10.00	0.037	0.4
Pipe: 26		25.20	173.0	Disch			10.00	120	2.1
S12	35.0	49.2	0.0		B2.000	----	0.00		-0.0
S11	35.0	47.1	173.0		2.157		10.00	0.210	2.1
Pipe: 27		25.20	176.8	Disch			10.00	120	7.7
S13	35.0	57.0	173.0		B2.000	----	0.00		-0.0
S12	35.0	49.2	349.8		2.157		10.00	0.774	7.7
Pipe: 28		0.0	0.0				10.00	120	7.7
S14	35.0	64.7	349.8	S12	B2.000	----	0.00		-0.0
S13	35.0	57.0	349.8		2.157		10.00	0.774	7.7
Pipe: 29		0.0	0.0				10.00	120	7.7
S15	35.0	72.5	349.8	S13	B2.000	----	0.00		-0.0
S14	35.0	64.7	349.8		2.157		10.00	0.774	7.7
Pipe: 30		0.0	0.0				1.00	120	0.8
105	35.0	73.2	349.8	S14	B2.000	----	0.00		-0.0
S15	35.0	72.5	349.8		2.157		1.00	0.774	0.8
Pipe: 31		0.0	0.0				11.00	120	24.6
106	30.0	97.9	349.8	S15	B2.000	E: 6.0	18.00		2.2
105	35.0	73.2	349.8		2.157	T:12.0	29.00	0.774	22.5
Pipe: 32		0.0	349.8	105			10.00	120	0.6
108	30.0	98.5	1162.6	104	B6.000	----	0.00		-0.0
106	30.0	97.9	1512.4		6.357		10.00	0.060	0.6
Pipe: 33		0.0	0.0				10.00	120	0.6
109	30.0	99.1	1512.4	106	B6.000	----	0.00		-0.0
108	30.0	98.5	1512.4		6.357		10.00	0.060	0.6
Pipe: 34		0.0	0.0				10.00	120	0.6
110	30.0	99.7	1512.4	108	B6.000	----	0.00		-0.0
109	30.0	99.1	1512.4		6.357		10.00	0.060	0.6
Pipe: 35		0.0	0.0				10.00	120	0.6
111	30.0	100.3	1512.4	109	B6.000	----	0.00		-0.0
110	30.0	99.7	1512.4		6.357		10.00	0.060	0.6

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Pipe Tag Frm Node El (ft) To Node El (ft)	K-fac PT PT	Add Fl (q) Tot.(Q)	Add Fl To Node/ Disch	Nom ID Act ID	Fit: Eq.Ln. (ft.)	L F T	C Pf/ft.	(Pt (Pe) (Pf)
Pipe: 36	0.0	0.0				10.00	120	0.6
112 30.0	100.9	1512.4	110	B6.000	----	0.00		-0.0
111 30.0	100.3	1512.4		6.357		10.00	0.060	0.6
Pipe: 37	0.0	0.0				10.00	120	0.6
113 30.0	101.5	1512.4	111	B6.000	----	0.00		-0.0
112 30.0	100.9	1512.4		6.357		10.00	0.060	0.6
Pipe: 38	0.0	0.0				10.00	120	0.6
114 30.0	102.1	1512.4	112	B6.000	----	0.00		-0.0
113 30.0	101.5	1512.4		6.357		10.00	0.060	0.6
Pipe: 39	0.0	0.0				10.00	120	2.9
115 30.0	104.9	1512.4	113	B6.000	T:38.0	38.00		-0.0
114 30.0	102.1	1512.4		6.357		48.00	0.060	2.9
Pipe: 40	0.0	0.0				50.00	100	1.4
116 30.0	106.3	1512.4	114	8.000	----	0.00		-0.0
115 30.0	104.9	1512.4		7.981		50.00	0.028	1.4
Pipe: 41	0.0	0.0				100.00	100	2.8
117 30.0	109.1	1512.4	115	8.000	----	0.00		-0.0
116 30.0	106.3	1512.4		7.981		100.00	0.028	2.8
Pipe: 42	0.0	0.0				50.00	100	1.4
118 30.0	110.5	1512.4	116	8.000	----	0.00		-0.0
117 30.0	109.1	1512.4		7.981		50.00	0.028	1.4
Pipe: 43	0.0	0.0				25.00	120	0.8
119 30.0	111.3	1512.4	117	B8.000	E:21.0	21.00		-0.0
118 30.0	110.5	1512.4		8.249		46.00	0.017	0.8
Pipe: 44	0.0	0.0				80.00	120	1.4
120 30.0	112.6	1512.4	118	B8.000	----	0.00		-0.0
119 30.0	111.3	1512.4		8.249		80.00	0.017	1.4
Pipe: 45	0.0	0.0				4.00	120	0.4
TOR1 30.0	113.1	1512.4	119	B8.000	E:21.0	21.00		-0.0
120 30.0	112.6	1512.4		8.249		25.00	0.017	0.4
Pipe: 46	0.0	0.0			TCGA	80.00	120	14.3
BOR1 5.5	127.3	1512.4	120	B8.000		136.00		10.6
TOR1 30.0	113.1	1512.4		8.249		216.00	0.017	3.7
Pipe: 47	0.0	0.0			3E:63.0	10.00	120	3.0
BFP 3.0	130.4	1512.4	TOR1	B8.000	G: 5.0	105.00		1.1
BOR1 5.5	127.3	1512.4		8.249	A:37.0	115.00	0.017	1.9

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Pipe Tag Frm Node To Node	El (ft) El (ft)	K-fac PT PT	Add Fl (q) Tot.(Q)	Add Fl To Node/ Disch	Nom ID Act ID	Fit: Eq.Ln. (ft.)	L F T	C Pf/ft.	(Pt (Pe) (Pf)
Pipe: 50		0.0	0.0			2L:34.6	10.00	140	3.5
UG1	1.0	133.8	1512.4	BOR1	8.000	2C119.7	164.92		0.9
BFP	3.0	130.4	1512.4		7.981	2G:10.6	174.92	0.015	2.6
Pipe: 51		0.0	0.0			2E:62.0	50.00	140	3.8
UG2	-3.0	137.7	1512.4	BFP	D8.000	T:59.0	128.00		1.7
UG1	1.0	133.8	1512.4		8.390	G: 7.0	178.00	0.012	2.1
Pipe: 52		Source	0.0				150.00	140	-0.
TEST	3.0	136.8	1512.4	UG1	D8.000	----	0.00		-2.6
UG2	-3.0	137.7	1512.4		8.390		150.00	0.012	1.8

NOTES (HASS):

(1) Calculations were performed by the HASS 2023 D computer program in accordance with NFPA (2020) under license no. 64621593 granted by

HRS Systems, Inc.
208 Southside Square
Petersburg, TN 37144
(931) 659-9760

(2) The system has been calculated to provide an average imbalance at each node of 0.001 gpm and a maximum imbalance at any node of 0.053 gpm.

(3) Total pressure at each node is used in balancing the system. Maximum water velocity is 51.1 ft/sec at pipe 12.

(4) Items listed in bold print on the cover sheet

are automatically transferred from the calculation report.

(5) Fullflow calculations are not done for systems with variable speed pumps.

(6) PIPE FITTINGS TABLE

HASS Pipe Table Name: standard

DATE: 3/25/2025M E ENGINEERING\DOCUMENTS\NEELYTOWN\NTP229_ 24-03-04FF.SDF
JOB TITLE: 243322.00 Neelytown

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NTee
	F F45Ell								
7.981	18.00 9.00	35.00	13.00	45.00	12.00	4.00	31.00	31.00	35.00

PAGE: B MATERIAL: THNWL HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	A AlmChk	D DPVlv	N NPTee
	F F45Ell								
2.157	6.00 3.00	12.00	3.00	14.00	8.00	1.00	12.00	12.00	12.00
6.357	18.00 9.00	38.00	11.00	40.00	13.00	4.00	35.00	35.00	38.00
8.249	21.00 10.50	41.00	15.00	53.00	14.00	5.00	37.00	37.00	41.00

PAGE: D MATERIAL: DIRON HWC: 140

Diameter (in)	Equivalent Fitting Lengths in Feet							
	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv	N NPTee	F F45Ell
8.390	31.00	59.00	22.00	76.00	20.00	7.00	59.00	15.50