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PUBLIC WATER SYSTEM ANALYSIS FOR THE MIDWAY RISING PROJECT IN THE CITY OF SAN DIEGO

June 6, 2024

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IN THE CITY OF SAN DIEGO

June 6, 2024

6-6-2024

Prepared by:
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Job No. 537-018

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June 6, 2024

537-018

Project Design Consultants, a Bowman Company
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San Diego, CA 92101

Attention: Greg Shields, P.E., Principal

Subject: Public Water System Analysis for the Midway Rising Project in the City of San Diego

Introduction

This report provides a public water system analysis for the Midway Rising project in the City of San Diego. The project is in the Midway-Pacific Highway community, north of Sports Arena Boulevard and east of Hancock Street. Figure 1 provides a vicinity map for the project.

Figure 2 presents an image of the Midway Rising property showing the current development on the site. The project encompasses approximately 49.2 gross acres and the existing development presently consists of the Pechanga Arena and multiple other commercial and retail buildings.

The Midway Rising project is preparing a Specific Plan and an EIR. The Midway Rising project proposes to implement the Midway Rising Specific Plan and redevelop the existing Sports Arena Property with a walkable, transit-centric, and modern live-work-play mixed-use neighborhood that provides a destination that offers a mix of uses, active retail experiences, a range of housing choices, and a vibrant public realm.

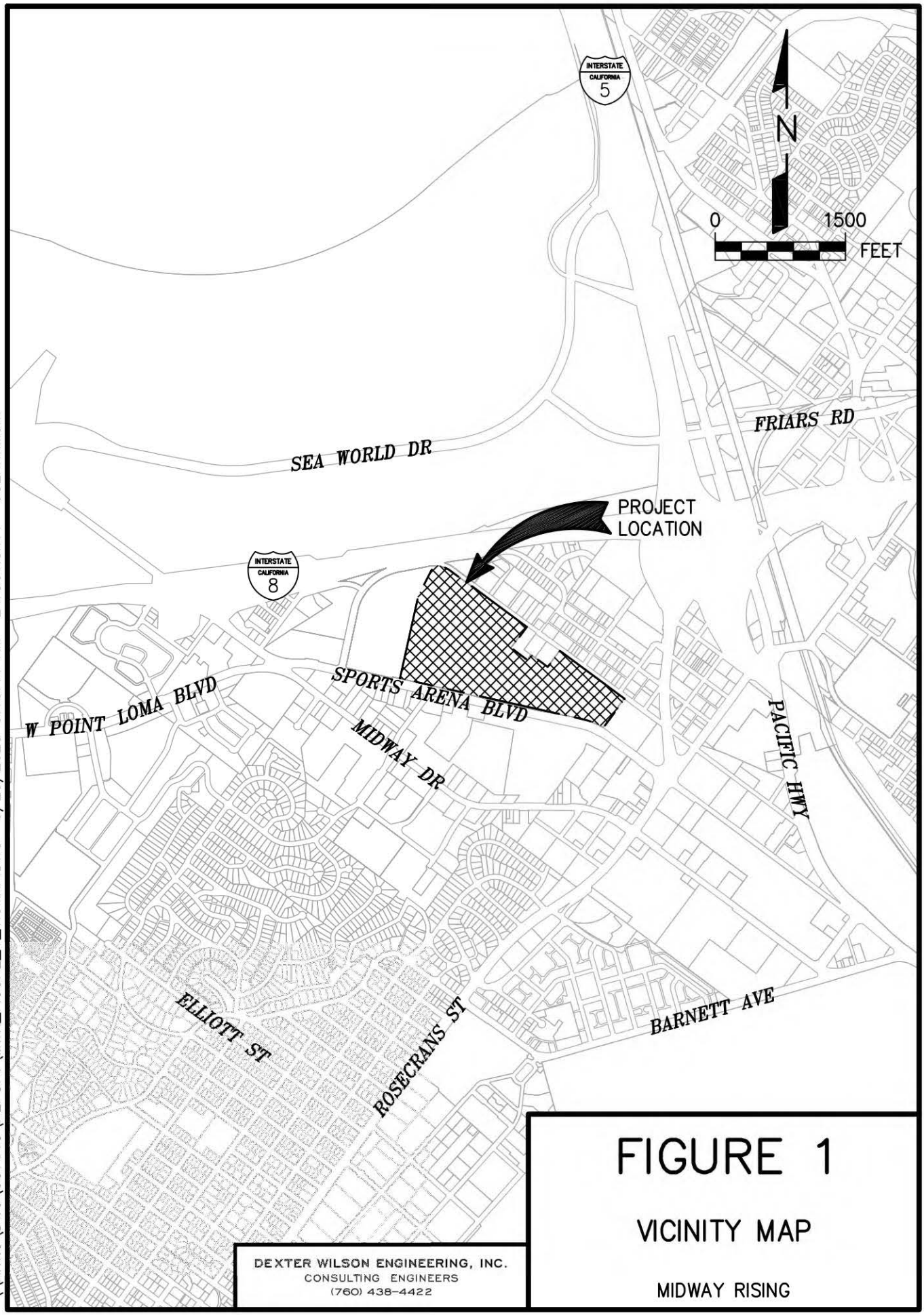

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FIGURE 1

VICINITY MAP

MIDWAY RISING

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FIGURE 2

EXISTING SITE DEVELOPMENT

MIDWAY RISING

The project proposes to construct a new Entertainment Center and 16 multi-family buildings with a total of 4,250 dwelling units. All residential units will have associated amenities and parking.

The existing topography of the site is relatively flat and generally drains from north to south.

Purpose of Study

The purpose of this study is to analyze and determine if the existing public water system in its current size and configuration has sufficient flows and pressures for the Midway Rising project. This report will determine the public water system improvements needed for the proposed development of the project; this determination will be made in conformance with the City of San Diego water system design standards.

This water study will also review the proposed project phasing to ensure that sufficient water lines are constructed in each phase to adequately support each proposed development phase.

The onsite water facilities for the Midway Rising project are proposed to be public and private. Analysis of the proposed public onsite water system and proposed private onsite fire protection system is included in this study. Domestic water meter sizing is not included in this study and will completed once architectural plans for each parcel are prepared. Irrigation demand has been added within the project but irrigation meter sizing is not included in this study and will be determined by the landscape architect during final design.

Water Demands

Residential and the Entertainment Center's water demands were developed in accordance with the City of San Diego Design Guidelines and Standards. Residential water demand is estimated based on population and a unit water demand of 150 gpd/person. Water demands for the Entertainment Center are estimated based on net developed acreage and a unit water demand of 5,000 gal/net acre-day. Water demands for irrigation were provided by the landscape architect.

Table 1 presents the average water demand for each block area within the Midway Rising project and Specific Plan. In order to determine water demands for residential areas, populations were estimated. Populations were estimated by determining dwelling unit densities from net area and dwelling unit data. Net area and dwelling unit data are presented on a Site Plan Exhibit, provided by the project civil engineer, in Appendix A. After determining the dwelling unit density for each block area, the unit density was determined using Table 2-1 from Book 2 of the City of San Diego Design Guidelines and Standards, which is also included in Appendix A. Unit densities and dwelling unit counts were used to estimate population and ultimately water demand for each residential block area.

The net area data and unit water demand factor were used to estimate water demand for the Entertainment Center (nonresidential block area). Figure 3 presents the Midway Rising project's block areas.

Irrigation Water Demands. Irrigation water demands were provided by the landscape architect for the project. Based on the EPA WaterSense Water Budget Tool, the landscape water requirement for the project is an average of 526,245 gal/month (17,280 gpd). Appendix B presents a copy of the Water Budget Tool results. Table 1 presents the irrigation water demands for the Midway Rising Project.

TABLE 1
MIDWAY RISING PROJECT
AVERAGE WATER DEMAND

Parcel Number	Quantity, units	Area, sf	Dwelling Unit Density, DU/Ac	Population per DU	Total Population	Average Water Demand, gpd
Block A1	419	117,400	155.47	1.8	754.2	113,130
Block A2	419	118,967	153.42	1.8	754.2	113,130
Block A3	421	139,908	131.08	1.8	757.8	113,670
Block B1	270	52,069	225.88	1.5	405.0	60,750
Block B2	227	79,764	123.97	1.8	408.6	61,290
Block C1	270	54,675	215.11	1.8	486.0	72,900
Block C2	316	84,086	163.70	1.8	568.8	85,320
Block D1	289	72,083	174.64	1.8	520.2	78,030
Block D2	243	49,458	214.02	1.8	437.4	65,610
Block E1	284	77,614	159.39	1.8	511.2	76,680
Block E2	227	80,271	123.18	1.5	340.5	51,075
Block F	386	124,178	135.40	1.8	694.8	104,220
Block G	241	80,088	131.08	1.8	433.8	65,070
Block H1	130	60,240	94.00	2.2	286.0	42,900
Block H2	108	39,299	119.71	1.8	194.4	29,160
Entertainment Center[1]	-	191,870	-	-	-	22,024
Irrigation[2]	-	-	-	-	-	17,280
TOTAL SPECIFIC PLAN	**4,250**	—			—	**1,172,239 gpd 814 gpm**

[1] Based on 5,000 gpd/ac demand
[2] Based on EPA WaterSense Water Budget Tool provided by the landscape architect

LEGEND

PROJECT BOUNDARY

PROPOSED PUBLIC STREET RIGHT-OF-WAY

N

0 250 FEET

BLOCK A3
BLOCK A2
BLOCK A1
BLOCK E1
BLOCK E2
BLOCK D1
BLOCK D2
BLOCK C1
BLOCK C2
BLOCK B1
BLOCK B2
BLOCK H2
BLOCK H1
BLOCK F
BLOCK G

KURTZ ST
HANCOCK ST
SHERMAN ST
GREENWOOD ST
CAMINO DEL RIO
KEMPER ST (PUBLIC)
FRONTIER DR (PUBLIC)
SPORTS ARENA BLVD
KEMPER ST
MIDWAY DR

ENTERTAINMENT CENTER

MIDWAY RISING PROJECT TENTATIVE MAP BOUNDARY

FIGURE 3

PROPOSED PROJECT BLOCK AREAS

MIDWAY RISING

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From the City of San Diego Guidelines and Standards, Figure 2-2, the maximum day demand to average annual demand ratio is approximately 1.0 for the residential units. The maximum day demand to average annual demand ratio is approximately 1.8 for the Entertainment Center. The maximum day demand to average annual demand ratio is approximately 2.2 for irrigation. Table 2 presents the maximum day demand for each block area within the Midway Rising project and Specific Plan.

From the City of San Diego Guidelines and Standards, Figure 2-1, the peak hour demand to average annual demand ratio is approximately 1.0 times 1.5 for the residential units. The peak hour demand to average annual demand ratio is approximately 3.5 times 1.5 for the Entertainment Center. The peak hour demand to average annual demand ratio is approximately 6.9 times 1.5 for irrigation. Table 2 presents the peak hour demand for each block area within the Midway Rising project and Specific Plan.

Appendix C of this report presents the backup data for determining these peaking factors.

TABLE 2
MIDWAY RISING PROJECT
MAXIMUM DAY DEMAND AND PEAK HOUR DEMAND

Parcel Number	Average Water Demand, gpd	Maximum Day Demand Peaking Factor	Maximum Day Demand, gpd	Peak Hour Demand Peaking Factor	Peak Hour Demand, gpd
Block A1	113,130	1.0	113,130	1.5	169,695
Block A2	113,130	1.0	113,130	1.5	169,695
Block A3	113,670	1.0	113,670	1.5	170,505
Block B1	60,750	1.0	60,750	1.5	91,125
Block B2	61,290	1.0	61,290	1.5	91,935
Block C1	72,900	1.0	72,900	1.5	109,350
Block C2	85,320	1.0	85,320	1.5	127,980
Block D1	78,030	1.0	78,030	1.5	117,045
Block D2	65,610	1.0	65,610	1.5	98,415
Block E1	76,680	1.0	76,680	1.5	115,020
Block E2	51,075	1.0	51,075	1.5	76,613
Block F	104,220	1.0	104,220	1.5	156,330
Block G	65,070	1.0	65,070	1.5	97,605
Block H1	42,900	1.0	42,900	1.5	64,350
Block H2	29,160	1.0	29,160	1.5	43,740
Entertainment Center[1]	22,024	1.8	39,643	5.25	115,626
Irrigation	17,280	2.2	38,016	10.35	178,848
TOTAL SPECIFIC PLAN	**1,172,239 gpd 814 gpm**	—	**1,210,594 gpd 841 gpm**	—	**1,993,877 gpd 1,385 gpm**

City of San Diego Design Criteria

The City of San Diego Guidelines and Standards was used to analyze the water system. A summary of the design criteria is presented as Table 3.

TABLE 3
CITY OF SAN DIEGO
WATER SYSTEM DESIGN CRITERIA

Criteria	Design Requirement
Minimum Static Pressure	65 psi
Maximum Static Pressure	120 psi
Maximum Pressure Drop – Reservoir Out of Service	40 psi
Maximum Pressure Drop – Peak Hour & Max Day plus Fire	25 psi
Minimum Pressure – Peak Hour	40 psi
Minimum Pressure – Max Day plus Fire	20 psi
Maximum Pipeline Velocity (Fire Flow)[1]	15 fps
Maximum Pipeline Velocity (Normal Operating Conditions)[2]	5 fps

[1] Section 3.3.1.5
[2] Section 3.10.1

Fire Flow Requirements

Table 2-3 of the City of San Diego Design Guidelines and Standards was used as a guideline for the planning level fire flows for the analysis of the public water system for the Midway Rising project. The fire flow used for condominiums and apartments (multi-family residential areas) is analyzed at 3,000 gpm and for commercial areas is analyzed at 4,000 gpm.

Existing Water System

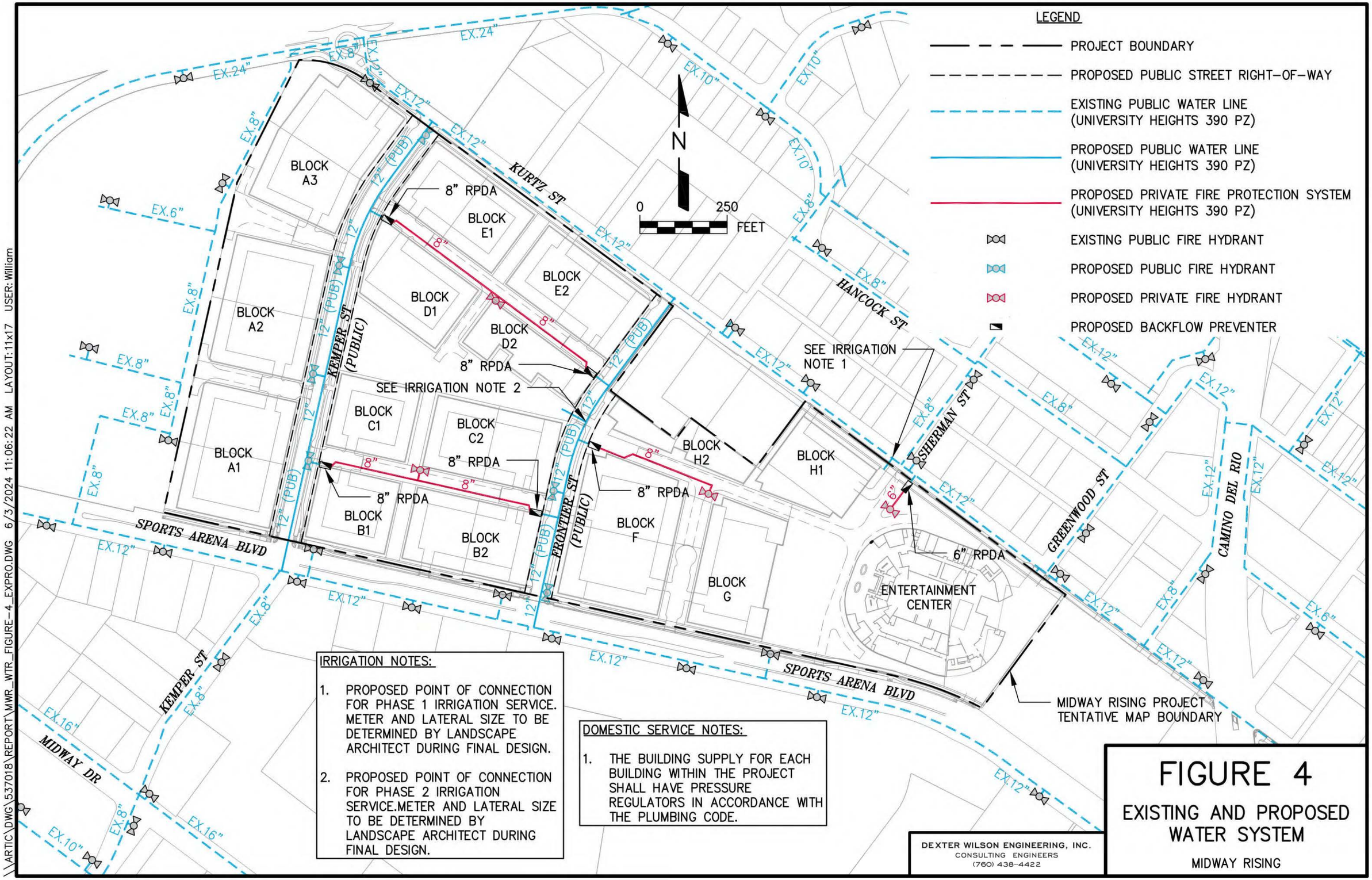
The Midway Rising project is currently identified to be within the University Heights 390 Pressure Zone. The site is bordered by an existing 12-inch 390 Pressure Zone water line in Kurtz Street, an existing 12-inch 390 Pressure Zone water line in Sports Arena Boulevard, and an existing 16-inch 390 Pressure Zone water line in Rosecrans Street. Figure 4 shows the existing water facilities within the near vicinity of the Midway Rising project. Exhibit A shows the existing water facilities used for the water system analysis.

Figure 5 presents a pressure zone map of the existing water system.

Proposed Buildout Water System

Figure 4 shows the proposed public and private water system configuration and pipes sizes for the Midway Rising project. The project includes a proposed onsite public water system and a proposed private onsite fire protection system. The project will be supplied by connections to the existing 12-inch in Kurtz Street and the existing 12-inch in Sports Arena Boulevard. Based on grading plans, elevations within the site range from 9 feet to 13 feet which results in a maximum static pressure range of 163 psi to 165 psi.

When maximum static pressures exceed 80 psi, the California Plumbing code requires the installation of individual pressure regulators for services on all pads in order to limit building supply pressures to a maximum of 80 psi. The domestic and irrigation services for the project will require individual pressure regulators.



IRRIGATION NOTES:

1. PROPOSED POINT OF CONNECTION FOR PHASE 1 IRRIGATION SERVICE. METER AND LATERAL SIZE TO BE DETERMINED BY LANDSCAPE ARCHITECT DURING FINAL DESIGN.
2. PROPOSED POINT OF CONNECTION FOR PHASE 2 IRRIGATION SERVICE.METER AND LATERAL SIZE TO BE DETERMINED BY LANDSCAPE ARCHITECT DURING FINAL DESIGN.

DOMESTIC SERVICE NOTES:

1. THE BUILDING SUPPLY FOR EACH BUILDING WITHIN THE PROJECT SHALL HAVE PRESSURE REGULATORS IN ACCORDANCE WITH THE PLUMBING CODE.

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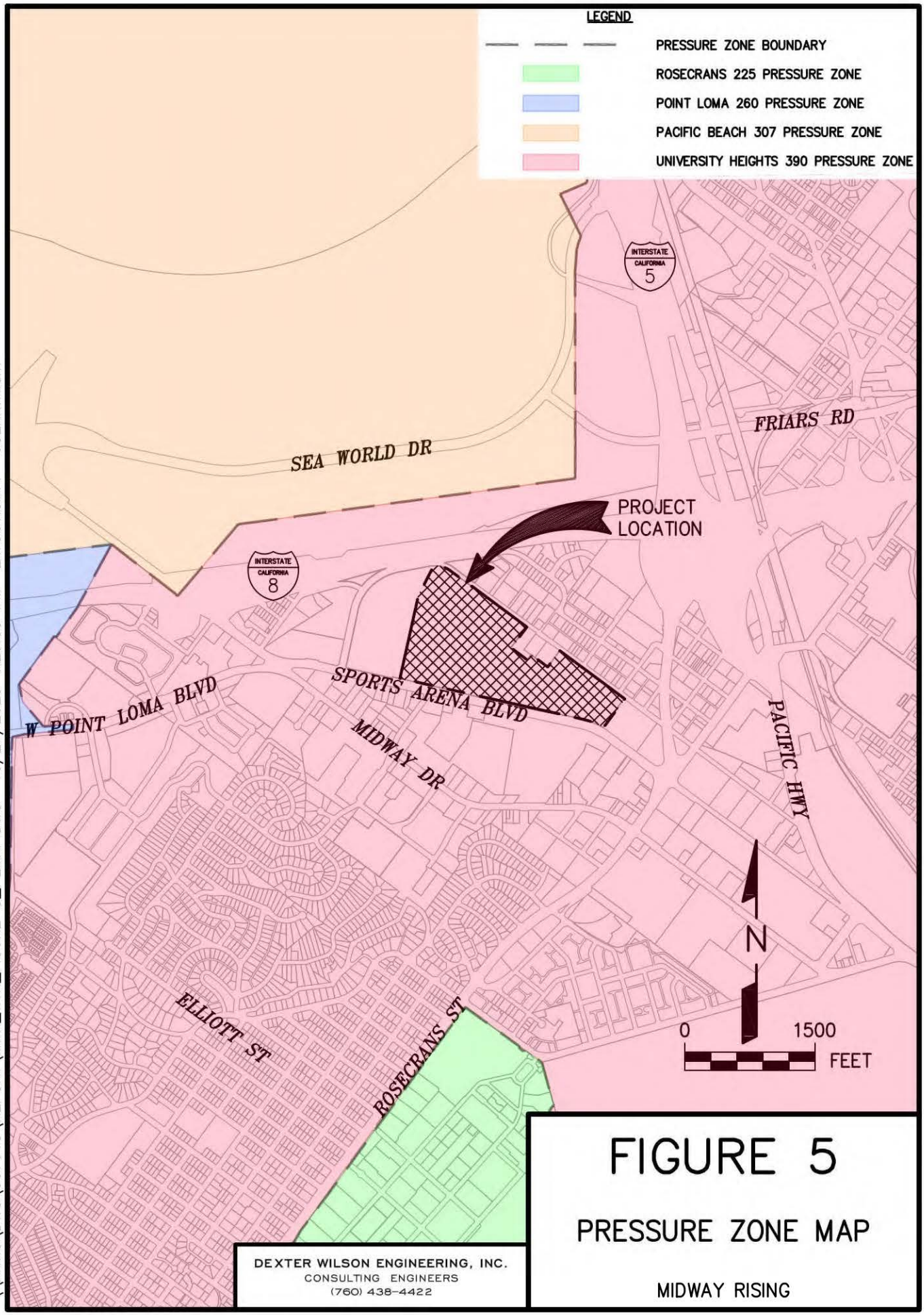
FIGURE 4

EXISTING AND PROPOSED WATER SYSTEM

MIDWAY RISING



\\ARTIC\DWG\537018\REPORT\MWR_WTR_FIGURE-5_PZMAP.DWG 10/27/2023 4:29:05 PM LAYOUT:8x11 USER:William

FIGURE 5

PRESSURE ZONE MAP

MIDWAY RISING

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Water Computer Models

The University of Kentucky KYPipe computer program was used to conduct hydraulic models of the proposed water system. The computer program utilizes the Hazen-Williams equation for determining headloss in pipes; the Hazen-Williams "C" values used for all pipes is 120.

Water system hydraulic modeling was performed to evaluate the ability of the public water system to deliver adequate fire flow and pressure to the proposed project for fire protection service as the fire flow demand will govern the need for offsite improvements.

Available Hydraulic Grade Line. A fire hydrant flow test was in Kurtz Street southeast of Hancock Street (Hydrant 75) to determine the available hydraulic grade line. At a static pressure of 139.8 psi and hydrant elevation of 9 feet, the available hydraulic grade line is calculated to be 331 feet. During a fire flow of 1,714 gpm the residual pressure at the hydrant test location (Hydrant 75) is 126.3 psi. A copy of the fire hydrant flow test and its extrapolated hydraulic grade lines is presented in Appendix D.

The Kurtz Street fire hydrant flow test results were used to determine a static pressure, residual pressure, and available hydraulic grade line northeast of Sherman Street's dead end. At an elevation of 14 feet, the static pressure was calculated to be 137.3 psi using the available hydraulic grade line of 331 feet.

The Hazen-Williams equation was used to determine the headloss in the existing 12-inch in Kurtz Street and through the existing 24-inch in Hancock Street to the Sherman Street dead end. The headloss was calculated to be 3.9 feet (1.7 psi); thus, during a hydrant flow of 1,714 gpm the residual at the pressure at the dead end is 126.3 psi + 1.7 psi = 128.0 psi. This calculation was made so that the hydraulic computer model starting point would be at the Sherman Street dead end in which there is an existing 24-inch transmission main, thus closer to the water system's distribution.

Fittings and Valve Losses. To simulate minor losses through pipe fittings and valves, minor loss coefficients or "k" values for all fittings associated with pipes were included in the hydraulic model.

Backflow Assembly Losses. The pressure losses through the proposed backflow preventers for the private fire protection services was incorporated into the computer model. Appendix E presents a candidate RP detector check backflow preventer. The manufacturer's literature includes charts which show pressure loss through the backflow preventer as a function of flow. These charts were used to incorporate the pressure losses reflected in the computer modeling.

Hydraulic Model Analysis and Results

The water system was sized based on flow and pressure requirements for the proposed project. Fire flow requirements of 3,000 gpm and 4,000 gpm were modeled at two adjacent computer model nodes within multi-family residential and commercial areas, respectively. Maximum day plus fire flow demand scenarios were modeled under normal operating conditions (all pipes open) and broken pipe conditions (one pipe closed).

Under broken pipe conditions, the worst case for each scenario is with Pipe 307 closed. The worst case for each scenario occurs with Pipe 307 closed because the water must flow through the existing 12-inch instead of the existing 24-inch. The existing 12-inch incurs great headloss with Pipe 307 closed because of its smaller diameter and significant length. A multitude of other broken pipe conditions were analyzed to confirm that Pipe 307 closed is the worst case.

Appendix F presents the buildout water system's computer model results. The computer model's corresponding Node and Pipe Diagram is presented as Exhibit A. Appendix F's results include tables that demonstrate the system's compliance with the City's maximum velocity criterion and tables that demonstrate compliance with the City's maximum pressure drop criterion. Table 4 presents a summary of the computer model results.

TABLE 4
BUILDOUT WATER SYSTEM
COMPUTER MODEL RESULTS SUMMARY

Scenario	Condition	Node(s)	Maximum Pipeline Velocity, fps	Minimum Pressure, psi	Maximum ΔP, psi
3,000	Normal	16, 72	7.0	77.4	61.2
3,000	Pipe 307 Closed	16, 72	11.8	65.5	--
3,000	Normal	24, 32	6.7	77.7	60.4
3,000	Pipe 307 Closed	24, 32	11.6	66.4	--
3,000	Normal	40, 60	9.6	69.2	68.9
3,000	Pipe 307 Closed	40, 60	11.6	58.2	--
4,000	Normal	88, 106, 120	17.0	42.0	96.6
4,000	Pipe 307 Closed	88, 106, 120	9.7	27.7	--

As shown on Table 4, fire flows under each scenario are being met with more than 20 psi of residual pressure. The 25 psi drop in pressure for normal operating conditions is not being met. From Appendix D, it can be seen that the current system has a 38.0 psi drop under a 3,000 gpm scenario (not including maximum day demand). The existing system already exceeds this design criterion.

The maximum velocity criteria is being met under all scenarios. The fire hydrant lateral velocities were excluded from the analysis because a 6-inch lateral will have a velocity greater than 15 fps at 1,500 gpm.

Midway Rising Project Phasing

The Midway Rising project is proposed to be in three phases. Figure 6 identifies the current concept for development phasing of the Midway Rising site.

The first phase will be construction of the Entertainment Center at the east end of the project site. This will be followed by two additional phases. The second phase is centered on the construction of Frontier Drive, and the third phase is contingent on the construction of Kemper Street.

The proposed development phases coincide with the public water lines that are required for water service to the Midway Rising project and Specific Plan. The Entertainment Center will construct a 6-inch private fire hydrant lateral off of Kurtz Street. This hydrant provides fire protection service only for the Entertainment Area; therefore, once constructed, the first phase of the Midway Rising project will have adequate water service.

Similarly for phases two and three. Phase 2 will be constructed around the water line proposed in Frontier Drive, and Phase 3 will be constructed around the water line in Kemper Street.

A hydraulic analysis for Phases 1 and 2 will be discussed in the next sections. The hydraulic analysis for Phase 3 was addressed in the previous section's ultimate water system analysis.

Phase 1 Hydraulic Analysis

Appendix G presents the results of the computer model analyses for the Phase 1 portion of the Midway Rising Specific Plan and Exhibit A.1 presents the computer model Node and Pipe Diagram. All demand scenarios are satisfied with all pipes open as well as with pipe breaks. Based on the ultimate onsite distribution pipe sizes, the Phase 1 portion of the water system is adequate.

Phase 2 Hydraulic Analysis

Appendix H presents the results of the computer model analyses for the Phase 2 portion of the Midway Rising Specific Plan and Exhibit A.2 presents the computer model Node and Pipe Diagram. All demand scenarios are satisfied with all pipes open as well as with pipe breaks. Based on the ultimate onsite distribution pipe sizes, the Phase 2 portion of the water system is adequate.

LEGEND

PROJECT BOUNDARY

PROPOSED PUBLIC STREET RIGHT-OF-WAY

PROPOSED PHASE 1

PROPOSED PHASE 2

PROPOSED PHASE 3

N

0 250 FEET

BLOCK A3
BLOCK A2
BLOCK A1
BLOCK B1
BLOCK B2
BLOCK C1
BLOCK C2
BLOCK D1
BLOCK D2
BLOCK E1
BLOCK E2
BLOCK F
BLOCK G
BLOCK H1
BLOCK H2

KURTZ ST
HANCOCK ST
SHERMAN ST
GREENWOOD ST
CAMINO DEL RIO
KEMPER ST (PUBLIC)
FRONTIER DR (PUBLIC)
SPORTS ARENA BLVD
KEMPER ST
MIDWAY DR

ENTERTAINMENT CENTER

MIDWAY RISING PROJECT TENTATIVE MAP BOUNDARY

FIGURE 6

PROPOSED PROJECT PHASING

MIDWAY RISING

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Conclusions and Recommendations

1. The Midway Rising project proposes to construct 4,250 multi-family dwelling units plus a new Entertainment Center on a property that is the current home of the Pechanga Arena.

2. The Midway Rising Specific Plan will be served by the City of San Diego public water system.

3. Maximum static pressures onsite are expected to range from 163 psi to 165 psi. When static pressure exceeds 80 psi, individual pressure regulators need to be installed for services on all pads in order to comply with the California Plumbing Code which limits building supply pressures to a maximum of 80 psi.

4. Onsite public water system improvements are recommended for this project to provide adequate flow and pressure for initial phasing and build-out conditions.

5. The recommended onsite public water system and private fire protection lateral system pipe sizes are shown on Figure 4 in this report.

6. This report presents the sizing and a general schematic layout of the proposed water system. The design engineer for these systems should incorporate valves, fittings, and appurtenances as needed for proper installation and long-term operation of the water systems.

7. If any water lines to be constructed by this development are metallic, a California Licensed Corrosion Engineer will be required to perform a soil corrosivity study and to design a Corrosion Control System.

Thank you for the opportunity to assist you with the water system planning for this project. If you have any questions regarding the information presented in this report, please do not hesitate to call.

Dexter Wilson Engineering, Inc.

Andrew Oven, P.E.

AO:WT:ah

APPENDIX A

SITE PLAN EXHIBIT

EXHIBIT A

Building	MR	Affordable
A1	419	
A2	419	
A3	421	
B1		270
B2		227
C1		270
C2	316	
D1	289	
D2		243
E1		284
E2		227
F	386	
G		241
H1		130
H2		108
PA B	377	0
	2,627	2,000
TOTAL		4,627

LAND USE

- RESIDENTIAL
- RETAIL
- PARKING
- PODIUM
- ROOF
- ENTERTAINMENT CENTER

OPEN SPACES

- THE GREEN, SQUARE, AND THE PLAZA
- LINEAR PARK SPACE
- PASEOS / GREENWAYS

HANCOCK STREET
LINEAR PARK
PASEOS / GREENWAY
PASEOS / GREENWAY
THE PLAZA
KURTZ STREET
SHERMAN STREET
GREENWOOD ST
MR: 421 A3
A: 284 E1
A: 227 E2
MR: 289 D1
MR: 419 A2
A: 243 D2
MR: 377 OUTPARCEL
A: 108 H2
A: 130 H1
MR: 419 A1
KEMPER STREET
A: 270 C1
MR: 316 C2
A: 270 B1
A: 227 B2
FRONTIER DRIVE
BLOCK F
MR: 386
A: 241 G
SAN DIEGO ENTERTAINMENT CENTER
PASEOS / GREENWAY
THE GREEN
SPORTS ARENA BLVD
PASEOS / GREENWAY
THE SQAURE
50' 200'
25' 100' 300'

SAFDIE RABINES ARCHITECTS

DRAFT CONCEPTUAL MASTER PLAN

GROUND PLAN

10/26/23

MIDWAY RISING CONCEPTUAL MASTER PLAN
PRELIMINARY - SUBJECT TO CHANGE

MIDWAY RISING: SPECIFIC PLAN

ILLUSTRATIVE METRICS FOR ENTITLEMENT + EIR

SAFDIE RABINES ARCHITECTS

02/07/2024

PHASE LEGEND

EAST OF FRONTIER (PHASE 1)

WEST OF FRONTIER (PHASE 2)

OUTPARCEL

SUMMARY METRICS OF MODEL

	Land Use	Planning Areas: City Owned	Planning Areas: Privately Owned	Specific Plan
1	Residential			
2	Affordable Dwelling Units (DUs)	2,000	32 (1)	2,000
	Middle Income DUs	250		250
3	Market Rate DUs	2,000	342 (1)	2,342
4	Total DUs	4,250	374 (1)	4,592
5	Parking Spaces			
6	Affordable DU Spaces	1,550	57 (1)	1,607
7	Market Rate DU Spcaces	3,000	609 (1)	3,609
8	Total Spaces	4,550	666 (1)	5,216
9	Entertainment Centers			
10	Seats	16,000	3,500 (2)	19,500
11	Square Feet (SF)	380,550	112,200 (2)	492,750
12	Event/Shared Parking Spaces	2,100	1,033 (2)	3,133
13	Retail & Restaurant Space			
14	Retail & Restaurant SF	126,500	13,500 (3)	140,000
15	Retail & Restaurant Parking Spaces	390	41 (3)	431
16	Open Space			
17	Parks acres	8.25	0.00 (3)	8.25
18	Open Space acres	6.21	0.51 (3)	6.72
19	Total Open Space acres	14.46	0.51 (3)	14.97
20	Total Parking Spaces	7,040	707 (1)	7,747

(1) Privately owned Block X has mixed use zoning which would allow for either residential or commercial uses. These values are for a primarily residential use with the State AHDB law applied.

(2) This is showing an alternative to the residential use of a 3,500 seat theatre, with parking. Other allowable uses include but are not limited to all non-residential uses allowed in the Specific Plan.

(3) This is the minimum use required for either residential or commercial uses on the parcel.

ILLUSTRATIVE MAP

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (3 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
A1	1A	Market Rate: Residential			1	99,129 GSF	36,017 SF	2,047 SF	3,249 SF	0 SF	2,331 SF				77	55,485 SF	184	0	0	154	184	0						
	1A	Market Rate: Residential			2	85,310 GSF	21,954 SF	1,156 SF	4,995 SF	0 SF	2,359 SF				29	54,846 SF	182	0	0	154	182	0						
	1A	Market Rate: Residential			3	99,322 GSF	35,285 SF	867 SF	0 SF	0 SF	8,035 SF				58	55,135 SF	183	0	0	154	183	0						
	3A	Market Rate: Residential			4	61,914 GSF	49,135 SF	1,350 SF	5,440 SF	0 SF	5,989 SF	37,412 SF			51	0 SF												
	3A	Market Rate: Residential			5	59,495 GSF	49,135 SF	1,350 SF	3,270 SF	0 SF	5,740 SF				51	0 SF												
	3A	Market Rate: Residential			6	56,479 GSF	49,289 SF	1,350 SF	0 SF	0 SF	5,840 SF				51	0 SF												
	3A	Market Rate: Residential			7	56,479 GSF	49,289 SF	1,350 SF	0 SF	0 SF	5,840 SF				51	0 SF												
	3A	Market Rate: Residential			8	52,825 GSF	45,635 SF	1,350 SF	0 SF	0 SF	5,840 SF				51	0 SF												
Block Totals:			**117,400 SF**	**101,928 SF**		**570,953 GSF**	**335,739 SF**	**10,820 SF**	**16,954 SF**	**0 SF**	**41,974 SF**	**37,412 SF**	**52,996 GSF**	**34,447 SF**	**419**	**165,466 SF**	**549**	**0**	**0**	**462**	**549**	**0**	**+ 0**	**+ 87**	**3**	**155.47**	**4.86**	**801 SF**
								Amenity %	**5.05%**											**1.10 Ratio**	**1.31 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (3 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
A2	1A	Market Rate: Residential			1	99,129 GSF	36,017 SF	2,047 SF	3,249 SF	0 SF	2,331 SF				77	55,485 SF	184	0	0	154	184	0						
	1A	Market Rate: Residential			2	85,310 GSF	21,954 SF	1,156 SF	4,995 SF	0 SF	2,359 SF				29	54,846 SF	182	0	0	154	182	0						
	1A	Market Rate: Residential			3	99,322 GSF	35,285 SF	867 SF	0 SF	0 SF	8,035 SF				58	55,135 SF	183	0	0	154	183	0						
	3A	Market Rate: Residential			4	61,914 GSF	49,135 SF	1,350 SF	5,440 SF	0 SF	5,989 SF	37,412 SF			51	0 SF												
	3A	Market Rate: Residential			5	59,495 GSF	49,135 SF	1,350 SF	3,270 SF	0 SF	5,740 SF				51	0 SF												
	3A	Market Rate: Residential			6	56,479 GSF	49,289 SF	1,350 SF	0 SF	0 SF	5,840 SF				51	0 SF												
	3A	Market Rate: Residential			7	56,479 GSF	49,289 SF	1,350 SF	0 SF	0 SF	5,840 SF				51	0 SF												
	3A	Market Rate: Residential			8	52,825 GSF	45,635 SF	1,350 SF	0 SF	0 SF	5,840 SF				51	0 SF												
Block Totals:			**118,967 SF**	**101,928 SF**		**570,953 GSF**	**335,739 SF**	**10,820 SF**	**16,954 SF**	**0 SF**	**41,974 SF**	**37,412 SF**	**52,996 GSF**	**34,447 SF**	**419**	**165,466 SF**	**549**	**0**	**0**	**462**	**549**	**0**	**+ 0**	**+ 87**	**3**	**153.42**	**4.80**	**801 SF**
								Amenity %	**5.05%**											**1.10 Ratio**	**1.31 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (3 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
A3	1A	Market Rate: Residential			1	109,080 GSF	34,224 SF	3,764 SF	6,917 SF	0 SF	2,614 SF				72	61,561 SF	205	0	0	155	205	0						
	1A	Market Rate: Residential			2	94,966 GSF	20,668 SF	3,547 SF	9,392 SF	0 SF	2,542 SF				37	58,817 SF	196	0	0	155	196	0						
	1A	Market Rate: Residential			3	107,906 GSF	35,784 SF	4,286 SF	0 SF	0 SF	9,019 SF				57	58,817 SF	196	0	0	155	196	0						
	3A	Market Rate: Residential			4	66,100 GSF	52,200 SF	1,065 SF	5,897 SF	0 SF	6,938 SF	43,097 SF			51	0 SF												
	3A	Market Rate: Residential			5	63,537 GSF	52,200 SF	1,065 SF	3,576 SF	0 SF	6,696 SF				51	0 SF												
	3A	Market Rate: Residential			6	60,766 GSF	53,192 SF	1,065 SF	0 SF	0 SF	6,509 SF				51	0 SF												
	3A	Market Rate: Residential			7	60,766 GSF	53,192 SF	1,065 SF	0 SF	0 SF	6,509 SF				51	0 SF												
	3A	Market Rate: Residential			8	58,904 GSF	51,330 SF	1,065 SF	0 SF	0 SF	6,509 SF				51	0 SF												
Block Totals:			**139,908 SF**	**112,045 SF**		**622,025 GSF**	**352,790 SF**	**16,922 SF**	**25,782 SF**	**0 SF**	**47,336 SF**	**43,097 SF**	**57,586 GSF**	**37,431 SF**	**421**	**179,195 SF**	**597**	**0**	**0**	**465**	**597**	**0**	**+ 0**	**+ 132**	**3**	**131.08**	**4.45**	**838 SF**
								Amenity %	**7.31%**											**1.10 Ratio**	**1.42 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (3 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
B1	1A	Affordable: Vet / Homeless			1	47,454 GSF	21,769 SF	1,611 SF	2,023 SF	0 SF	1,818 SF				56	20,233 SF	67	0	0	23	67	0						
	1A	Affordable: Vet / Homeless			2	47,381 GSF	23,520 SF	242 SF	2,023 SF	0 SF	1,818 SF				0	19,778 SF	65	0	0	23	65	0						
	1A	Affordable: Vet / Homeless			3	44,800 GSF	19,651 SF	261 SF	0 SF	0 SF	5,129 SF				29	19,759 SF	65	0	0	23	65	0						
	3A	Affordable: Vet / Homeless			4	32,714 GSF	25,943 SF	613 SF	1,985 SF	0 SF	4,173 SF	19,992 SF			37	0 SF												
	3A	Affordable: Vet / Homeless			5	30,729 GSF	25,943 SF	613 SF	0 SF	0 SF	4,173 SF				37	0 SF												
	3A	Affordable: Vet / Homeless			6	30,729 GSF	25,943 SF	613 SF	0 SF	0 SF	4,173 SF				37	0 SF												
	3A	Affordable: Vet / Homeless			7	30,729 GSF	25,943 SF	613 SF	0 SF	0 SF	4,173 SF				37	0 SF												
	3A	Affordable: Vet / Homeless			8	30,729 GSF	25,943 SF	613 SF	0 SF	0 SF	4,173 SF				37	0 SF												
Block Totals:			**52,069 SF**	**49,140 SF**		**295,265 GSF**	**194,655 SF**	**5,179 SF**	**6,031 SF**	**0 SF**	**29,630 SF**	**19,992 SF**	**27,388 GSF**	**17,802 SF**	**270**	**59,770 SF**	**197**	**0**	**0**	**69**	**197**	**0**	**+ 0**	**+ 128**	**3**	**225.88**	**5.67**	**721 SF**
								Amenity %	**3.10%**											**.25 Ratio**	**.73 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (9 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
B2	1A	Affordable: Family / Event Parking			1	75,200 GSF	21,356 SF	1,694 SF	3,050 SF	10,300 SF	2,470 SF				47	36,330 SF	121	31	71	26	50	0						
	1A	Affordable: Family / Event Parking			2	57,821 GSF	17,616 SF	1,182 SF	2,911 SF		1,964 SF				0	34,148 SF	113	0	0	26	0	113						
	1A	Affordable: Family / Event Parking			3	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			4	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF	9,000 SF			30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			5	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			6	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			7	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	113	0						
	3A (Res Only)	Affordable: Family / Event Parking			8	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	113	0						
	1A (Parking)	Affordable: Family / Event Parking			9	36,876 GSF	0 SF	0 SF	0 SF		1,557 SF				0	35,319 SF	117	0	0	26	117	0						
Block Totals:			**79,764 SF**	**76,860 SF**		**566,203 GSF**	**183,686 SF**	**9,770 SF**	**5,961 SF**	**10,300 SF**	**45,669 SF**	**9,000 SF**	**65,572 GSF**	**42,622 SF**	**227**	**310,817 SF**	**1029**	**31**	**71**	**234**	**393**	**565**	**+ 0**	**+ 199**	**3**	**123.97**	**7.10**	**809 SF**
								Amenity %	**3.25%**											**1.0 Ratio**	**1.73 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (3 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
C1	1A	Affordable: Seniors			1	47,454 GSF	21,769 SF	1,611 SF	2,023 SF		1,818 SF				60	20,233 SF	67	0	0	68	67	0						
	1A	Affordable: Seniors			2	47,381 GSF	23,520 SF	242 SF	2,023 SF		1,818 SF				0	19,778 SF	65	0	0	68	65	0						
	1A	Affordable: Seniors			3	44,800 GSF	19,651 SF	261 SF	0 SF		5,129 SF				29	19,759 SF	65	0	0	68	65	0						
	3A	Affordable: Seniors			4	32,714 GSF	25,943 SF	613 SF	1,985 SF		4,173 SF	19,992 SF			37	0 SF												
	3A	Affordable: Seniors			5	30,729 GSF	25,943 SF	613 SF	0 SF		4,173 SF				36	0 SF												
	3A	Affordable: Seniors			6	30,729 GSF	25,943 SF	613 SF	0 SF		4,173 SF				36	0 SF												
	3A	Affordable: Seniors			7	30,729 GSF	25,943 SF	613 SF	0 SF		4,173 SF				36	0 SF												
	3A	Affordable: Seniors			8	30,729 GSF	25,943 SF	613 SF	0 SF		4,173 SF				36	0 SF												
Block Totals:			**54,675 SF**	**49,140 SF**		**295,265 GSF**	**194,655 SF**	**5,179 SF**	**6,031 SF**	**0 SF**	**29,630 SF**	**19,992 SF**	**27,388 GSF**	**17,802 SF**	**270**	**59,770 SF**	**197**	**0**	**0**	**204**	**197**	**0**	**+ 0**	**-7**	**3**	**215.11**	**5.40**	**721 SF**
								Amenity %	**3.10%**											**.75 Ratio**	**.73 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (3 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
C2	1A	Market Rate: Residential			1	75,568 GSF	21,401 SF	2,814 SF	2,781 SF	10,300 SF	2,700 SF				44	35,572 SF	118	31	6	116	112	0						
	1A	Market Rate: Residential			2	56,959 GSF	14,072 SF	1,052 SF	4,551 SF		2,697 SF				28	34,587 SF	115	0	0	116	115	0						
	1A	Market Rate: Residential			3	73,439 GSF	26,180 SF	1,052 SF	4,622 SF		6,998 SF				44	34,587 SF	115	0	0	116	115	0						
	3A	Market Rate: Residential			4	39,688 GSF	32,604 SF	898 SF	0 SF		6,186 SF	26,200 SF			36	0 SF												
	3A	Market Rate: Residential			5	44,308 GSF	37,224 SF	898 SF	0 SF		6,186 SF				41	0 SF												
	3A	Market Rate: Residential			6	44,308 GSF	37,224 SF	898 SF	0 SF		6,186 SF				41	0 SF												
	3A	Market Rate: Residential			7	44,308 GSF	37,224 SF	898 SF	0 SF		6,186 SF				41	0 SF												
	3A	Market Rate: Residential			8	42,328 GSF	35,244 SF	898 SF	0 SF		6,186 SF				41	0 SF												
Block Totals:			**84,086 SF**	**76,860 SF**		**420,906 GSF**	**241,173 SF**	**9,408 SF**	**11,954 SF**	**10,300 SF**	**43,325 SF**	**26,200 SF**	**43,560 GSF**	**28,314 SF**	**316**	**104,746 SF**	**348**	**31**	**6**	**348**	**342**	**0**	**+ 0**	**-31**	**3**	**163.70**	**5.01**	**763 SF**
								Amenity %	**4.96%**											**1.10 Ratio**	**1.08 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF (3 Level's)	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
D1	1A	Market Rate: Residential			1	63,529 GSF	26,946 SF	1,199 SF	1,346 SF		2,688 SF				56	31,350 SF	104	0	0	106	104	0						
	1A	Market Rate: Residential			2	53,663 GSF	16,995 SF	1,197 SF	2,402 SF		2,688 SF				28	30,381 SF	101	0	0	106	101	0						
	1A	Market Rate: Residential			3	63,545 GSF	24,872 SF	1,001 SF	0 SF		6,590 SF				39	31,082 SF	103	0	0	106	103	0						
	3A	Market Rate: Residential			4	41,167 GSF	32,031 SF	676 SF	3,496 SF		4,964 SF	25,775 SF			32	0 SF												
	3A	Market Rate: Residential			5	39,077 GSF	32,060 SF	676 SF	1,380 SF		4,961 SF				32	0 SF												
	3A	Market Rate: Residential			6	39,063 GSF	33,426 SF	676 SF	0 SF		4,961 SF				34	0 SF												
	3A	Market Rate: Residential			7	39,063 GSF	33,426 SF	676 SF	0 SF		4,961 SF				34	0 SF												
	3A	Market Rate: Residential			8	39,066 GSF	33,429 SF	676 SF	0 SF		4,961 SF				34	0 SF												
Block Totals:			**72,083 SF**	**65,808 SF**		**378,173 GSF**	**233,185 SF**	**6,777 SF**	**8,624 SF**	**0 SF**	**36,774 SF**	**25,775 SF**	**37,951 GSF**	**24,668 SF**	**289**	**92,813 SF**	**308**	**0**	**0**	**318**	**308**	**0**	**+ 0**	**-10**	**3**	**174.64**	**5.25**	**807 SF**
								Amenity %	**3.70%**											**1.10 Ratio**	**1.07 Ratio**						

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
																N/A												
D2	1A	Affordable: Vet / Homeless			1	39,812 GSF	26,510 SF	3,944 SF	2,665 SF	4,800 SF	1,893 SF				57	0 SF												
	1A	Affordable: Vet / Homeless			2	30,673 GSF	22,131 SF	3,944 SF	2,665 SF		1,933 SF				0	0 SF												
	1A	Affordable: Vet / Homeless			3	29,512 GSF	24,556 SF	675 SF	0 SF		4,281 SF				31	0 SF												
	3A	Affordable: Vet / Homeless			4	29,512 GSF	24,556 SF	675 SF	0 SF		4,281 SF	10,240 SF			31	0 SF												
	3A	Affordable: Vet / Homeless			5	29,512 GSF	24,556 SF	675 SF	0 SF		4,281 SF				31	0 SF												
	3A	Affordable: Vet / Homeless			6	29,512 GSF	24,556 SF	675 SF	0 SF		4,281 SF				31	0 SF												
	3A	Affordable: Vet / Homeless			7	29,512 GSF	24,556 SF	675 SF	0 SF		4,281 SF				31	0 SF												
	3A	Affordable: Vet / Homeless			8	29,512 GSF	24,556 SF	675 SF	0 SF		4,281 SF				31	0 SF												
Block Totals:			**49,458 SF**	**42,120 SF**		**247,557 GSF**	**195,977 SF**	**11,938 SF**	**5,330 SF**	**4,800 SF**	**29,512 SF**	**10,240 SF**	**29,664 GSF**	**19,282 SF**	**243**	**0 SF**	**0**	15	**0**	**61**	**0**	**0**	**+ 0**	**-76**	**3**	**214.02**	**5.01**	**806 SF**
								Amenity %	**2.72%**											**.25 Ratio**	**N/A**							

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
																(3 Level's)												
E1	1A	Affordable: Family			1	72,100 GSF	28,315 SF	2,989 SF	2,665 SF		2,635 SF				63	35,496 SF	118	0	0	95	118	0						
	1A	Affordable: Family			2	66,240 GSF	22,650 SF	1,052 SF	5,530 SF		2,421 SF				0	34,587 SF	115	0	0	95	115	0						
	1A	Affordable: Family			3	65,807 GSF	23,172 SF	1,052 SF	0 SF		6,996 SF				37	34,587 SF	115	0	0	95	115	0						
	3A	Affordable: Family			4	41,671 GSF	35,293 SF	883 SF	0 SF		5,495 SF	30,328 SF			37	0 SF												
	3A	Affordable: Family			5	41,671 GSF	35,293 SF	883 SF	0 SF		5,495 SF				37	0 SF												
	3A	Affordable: Family			6	41,671 GSF	35,293 SF	883 SF	0 SF		5,495 SF				37	0 SF												
	3A	Affordable: Family			7	41,671 GSF	35,293 SF	883 SF	0 SF		5,495 SF				37	0 SF												
	3A	Affordable: Family			8	41,671 GSF	35,293 SF	883 SF	0 SF		5,495 SF				36	0 SF												
Block Totals:			**77,614 SF**	**74,340 SF**		**412,502 GSF**	**250,602 SF**	**9,508 SF**	**8,195 SF**	**0 SF**	**39,527 SF**	**30,328 SF**	**41,772 GSF**	**27,152 SF**	**284**	**104,670 SF**	**348**	**0**	**0**	**285**	**348**	**0**	**+ 0**	**+ 63**	**3**	**159.39**	**5.31**	**882 SF**
								Amenity %	**3.27%**											**1.0 Ratio**	**1.23 Ratio**							

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values												
																Parking SF	Total Stalls Available	Retail Stalls Required	Retail Stalls Provided	Residential Stalls Required	Residential Stalls Provided	Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
																(9 Level's)												
E2	1A	Affordable: Family / Event Parking			1	75,200 GSF	21,356 SF	1,694 SF	3,050 SF	10,300 SF	2,470 SF				47	36,330 SF	121	31	74	26	47	0						
	1A	Affordable: Family / Event Parking			2	57,821 GSF	17,616 SF	1,182 SF	2,911 SF		1,964 SF				0	34,148 SF	113	0	0	26	0	113						
	1A	Affordable: Family / Event Parking			3	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			4	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF	9,000 SF			30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			5	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			6	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			7	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	0	113						
	3A (Res Only)	Affordable: Family / Event Parking			8	66,051 GSF	24,119 SF	1,149 SF	0 SF		6,613 SF				30	34,170 SF	113	0	0	26	37	76						
	1A (Parking)	Event Parking			9	36,876 GSF	0 SF	0 SF	0 SF		1,557 SF				0	35,319 SF	117	0	0	26	117	0						
Block Totals:			**80,271 SF**	**76,860 SF**		**566,203 GSF**	**183,686 SF**	**9,770 SF**	**5,961 SF**	**10,300 SF**	**45,669 SF**	**9,000 SF**	**65,572 GSF**	**42,622 SF**	**227**	**310,817 SF**	**1029**	**31**	**74**	**234**	**201**	**754**	**+ 0**	**+ 10**	**3**	**123.18**	**7.05**	**809 SF**
								Amenity %	**3.25%**											**1.0 Ratio**	**.89 Ratio**							

Market Rate (West Side of Frontier)			**532,444 SF**	**458,569 SF**	**2,563,010 GSF**	**1,498,626 SF**	**54,747 SF**	**80,268 SF**	**10,300 SF**	**211,383 SF**	**169,896 SF**	**245,089 GSF**	**159,308 SF**	**1,864**	**707,686 SF**	**2,351**	**31**	**6**	**2,055**	**2,345**	**0**	**+ 0**	**+ 265**		**152.50**	**4.81**	**804 SF**
Affordable (West Side of Frontier)			**393,851 SF**	**368,460 SF**	**2,382,995 GSF**	**1,203,261 SF**	**51,344 SF**	**37,509 SF**	**25,400 SF**	**219,637 SF**	**98,552 SF**	**257,356 GSF**	**167,281 SF**	**1,521**	**845,844 SF**	**2,800**	**77**	**145**	**1,087**	**1,336**	**1,319**	**+ 0**	**+ 317**		**168.22**	**6.05**	**791 SF**
Subtotals: (West Side of Frontier)			**926,295 SF**	**827,029 SF**	**4,946,005 GSF**	**2,701,887 SF**	**106,091 SF**	**117,777 SF**	**35,700 SF**	**431,020 SF**	**268,448 SF**	**502,445 GSF**	**326,589 SF**	**3,385**	**1,553,530 SF**	**5,151**	**108**	**151**	**3,142**	**3,681**	**1,319**	**+ 0**	**+ 582**		**159.18**	**5.34**	**798 SF**
																				1.09 Ratio								

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values: Parking SF (3 Level's)	Parking Values: Total Stalls Available	Parking Values: Retail Stalls Required	Parking Values: Retail Stalls Provided	Parking Values: Residential Stalls Required	Parking Values: Residential Stalls Provided	Parking Values: Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
F	1A	Market Rate: Residential			1	120,187 GSF	14,981 SF	3,718 SF	6,489 SF	30,156 SF	5,939 SF				29	58,904 SF	196	91	148	142	48	0						
	1A	Market Rate: Residential			2	80,008 GSF	11,716 SF	3,162 SF	6,489 SF		1,907 SF				27	56,734 SF	189	0	0	142	189	0						
	1A	Market Rate: Residential			3	115,583 GSF	48,907 SF	1,568 SF	0 SF		8,372 SF				85	56,736 SF	189	0	0	142	189	0						
	3A	Market Rate: Residential			4	65,017 GSF	53,215 SF	1,132 SF	2,985 SF		7,685 SF	54,604 SF			49	0 SF												
	3A	Market Rate: Residential			5	63,314 GSF	53,215 SF	1,132 SF	1,577 SF		7,390 SF				49	0 SF												
	3A	Market Rate: Residential			6	63,142 GSF	54,834 SF	1,132 SF	0 SF		7,176 SF				49	0 SF												
	3A	Market Rate: Residential			7	63,142 GSF	54,834 SF	1,132 SF	0 SF		7,176 SF				49	0 SF												
	3A	Market Rate: Residential			8	57,727 GSF	49,419 SF	1,132 SF	0 SF		7,176 SF				49	0 SF												
Block Totals:			**124,178 SF**	**118,688 SF**		**628,120 GSF**	**341,121 SF**	**14,108 SF**	**17,540 SF**	**30,156 SF**	**52,821 SF**	**54,604 SF**	**55,492 GSF**	**36,070 SF**	**386**	**172,374 SF**	**574**	**91**	**148**	**426**	**426**	**0**	**+ 0**	**+ 57**	**3**	**135.40**	**5.06**	**884 SF**
								Amenity %	**5.14%**											**1.10 Ratio**	**1.10 Ratio**							

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values: Parking SF (3 Level's)	Parking Values: Total Stalls Available	Parking Values: Retail Stalls Required	Parking Values: Retail Stalls Provided	Parking Values: Residential Stalls Required	Parking Values: Residential Stalls Provided	Parking Values: Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
G	1A	Affordable: Family			1	74,352 GSF	11,167 SF	4,860 SF	3,268 SF	13,958 SF	2,424 SF				4	38,675 SF	128	42	57	81	71	0						
	1A	Affordable: Family			2	55,796 GSF	9,394 SF	1,405 SF	4,953 SF		2,335 SF				0	37,709 SF	125	0	0	81	125	0						
	1A	Affordable: Family			3	65,738 GSF	23,263 SF	1,405 SF	0 SF		6,973 SF				37	34,097 SF	113	0	0	81	113	0						
	3A	Affordable: Family			4	41,679 GSF	34,925 SF	898 SF	0 SF		5,856 SF	28,276 SF			40	0 SF												
	3A	Affordable: Family			5	41,679 GSF	34,925 SF	898 SF	0 SF		5,856 SF				40	0 SF												
	3A	Affordable: Family			6	41,679 GSF	34,925 SF	898 SF	0 SF		5,856 SF				40	0 SF												
	3A	Affordable: Family			7	41,679 GSF	34,925 SF	898 SF	0 SF		5,856 SF				40	0 SF												
	3A	Affordable: Family			8	41,679 GSF	34,925 SF	898 SF	0 SF		5,856 SF				40	0 SF												
Block Totals:			**80,088 SF**	**76,860 SF**		**404,281 GSF**	**218,449 SF**	**12,160 SF**	**8,221 SF**	**13,958 SF**	**41,012 SF**	**28,276 SF**	**40,380 GSF**	**26,247 SF**	**241**	**110,481 SF**	**366**	**42**	**57**	**243**	**309**	**0**	**+ 0**	**+ 81**	**3**	**131.08**	**5.05**	**906 SF**
								Amenity %	**3.76%**											**1.0 Ratio**	**1.28 Ratio**							

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values: Parking SF (9 Level's)	Parking Values: Total Stalls Available	Parking Values: Retail Stalls Required	Parking Values: Retail Stalls Provided	Parking Values: Residential Stalls Required	Parking Values: Residential Stalls Provided	Parking Values: Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
H1	1A	Affordable: Family / Event Parking			1	56,612 GSF	6,381 SF	775 SF	1,050 SF	10,541 SF	4,148 SF				15	33,717 SF	122	32	34	15	15	73						
	1A	Affordable: Family / Event Parking			2	42,590 GSF	5,261 SF	800 SF	2,049 SF		1,715 SF				0	32,765 SF	109	0	0	15	0	109						
	1A	Affordable: Family / Event Parking			3	57,096 GSF	15,199 SF	800 SF	3,422 SF		5,619 SF				15	32,056 SF	106	0	0	15	0	106						
	3A (Res Only)	Affordable: Family / Event Parking			4	54,631 GSF	17,757 SF	800 SF	0 SF		5,259 SF	8,575 SF			20	30,815 SF	102	0	0	15	0	102						
	3A (Res Only)	Affordable: Family / Event Parking			5	55,205 GSF	18,331 SF	800 SF	0 SF		5,259 SF				20	30,815 SF	102	0	0	15	0	102						
	3A (Res Only)	Affordable: Family / Event Parking			6	55,205 GSF	18,331 SF	800 SF	0 SF		5,259 SF				20	30,815 SF	102	0	0	15	0	102						
	3A (Res Only)	Affordable: Family / Event Parking			7	55,205 GSF	18,331 SF	800 SF	0 SF		5,259 SF				20	30,815 SF	102	0	0	15	0	102						
	3A (Res Only)	Affordable: Family / Event Parking			8	55,205 GSF	18,331 SF	800 SF	0 SF		5,259 SF				20	30,815 SF	102	0	0	15	17	85						
	1A (Parking)	Affordable: Family / Event Parking			9	31,087 GSF	0 SF	0 SF	0 SF		272 SF				0	30,815 SF	102	0	0	15	102	0						
Block Totals:			**60,240 SF**	**56,849 SF**		**462,836 GSF**	**117,922 SF**	**6,375 SF**	**6,521 SF**	**10,541 SF**	**38,049 SF**	**8,575 SF**	**52,673 GSF**	**34,237 SF**	**130**	**283,428 SF**	**949**	**32**	**34**	**135**	**134**	**781**	**+ 0**	**+ 1**	**3**	**94.00**	**7.68**	**907 SF**
								Amenity %	**5.53%**											**1.0 Ratio**	**1.03 Ratio**							

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values: Parking SF (N/A)	Parking Values: Total Stalls Available	Parking Values: Retail Stalls Required	Parking Values: Retail Stalls Provided	Parking Values: Residential Stalls Required	Parking Values: Residential Stalls Provided	Parking Values: Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
H2	1A	Affordable: Vet / Homeless			1	35,741 GSF	0 SF	584 SF	2,174 SF	27,507 SF	5,476 SF				0	0 SF												
	1A	Affordable: Vet / Homeless			2	288 GSF	0 SF	0 SF	0 SF		288 SF				0	0 SF												
	1A	Affordable: Vet / Homeless			3	21,891 GSF	14,756 SF	883 SF	1,463 SF		4,789 SF				18	0 SF												
	3A	Affordable: Vet / Homeless			4	21,756 GSF	14,756 SF	883 SF	1,463 SF		4,654 SF	11,947 SF			18	0 SF												
	3A	Affordable: Vet / Homeless			5	21,756 GSF	14,756 SF	883 SF	1,463 SF		4,654 SF				18	0 SF												
	3A	Affordable: Vet / Homeless			6	21,756 GSF	14,756 SF	883 SF	1,463 SF		4,654 SF				18	0 SF												
	3A	Affordable: Vet / Homeless			7	21,756 GSF	14,756 SF	883 SF	1,463 SF		4,654 SF				18	0 SF												
	3A	Affordable: Vet / Homeless			8	21,756 GSF	14,756 SF	883 SF	1,463 SF		4,654 SF				18	0 SF												
Block Totals:			**39,299 SF**	**33,042 SF**		**166,700 GSF**	**88,536 SF**	**5,882 SF**	**10,952 SF**	**27,507 SF**	**33,823 SF**	**11,947 SF**	**17,486 GSF**	**11,366 SF**	**108**	**0 SF**	**0**	**83**	**0**	**27**	**0**	**0**	**+ 0**	**-110**	**3**	**119.71**	**4.24**	**820 SF**
								Amenity %	**12.37%**											**.25 Ratio**	**N/A**							

San Diego Entertainment Center (Block I)

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values: Parking SF	Parking Values: Total Stalls Available	Parking Values: Retail Stalls Required	Parking Values: Retail Stalls Provided	Parking Values: Residential Stalls Required	Parking Values: Residential Stalls Provided	Parking Values: Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
	1A	Entertainment			1																							
I	1A	Entertainment			2		Information TBD By The Arena Team																					
	1A	Entertainment			3																							
	1A	Entertainment			4																							
Block Totals:			191,870 SF	150,750 SF		380,550 GSF						N/A	170,220 GSF	110,643 SF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.98	N/A

Residential Highrise (Outparcel - Block X)

Block	Construction Type	Type of Use	Site Area	Buidling Footprint	Level	Building GSF	Net Rentable SF	Utility SF	Lobby, Amenity SF	Retail SF	Core and Hallway SF	Podium SF	Roof GSF	65% of Roof GSF for PV Array SF	Residential Units	Parking Values: Parking SF (3 Level's)	Parking Values: Total Stalls Available	Parking Values: Retail Stalls Required	Parking Values: Retail Stalls Provided	Parking Values: Residential Stalls Required	Parking Values: Residential Stalls Provided	Parking Values: Event Stalls Provided	Total Stalls Available - Provided	Total Stalls Provided - Required	Stalls per 1,000 SF Retail	Density DU/AC	FAR	Average SF per DU
	1A	Affordable: Residential			1	97,952 GSF	8,547 SF	1,276 SF	1,137 SF	13,444 SF	1,124 SF				32	72,424 SF	241	41	41	138	200	0						
	1A	Market Rate: Residential			2	84,508 GSF	9,797 SF	534 SF	2,805 SF		1,228 SF				6	70,144 SF	233	0	0	138	233	0						
	1A	Market Rate: Residential			3	94,844 GSF	17,679 SF	918 SF	0 SF		6,103 SF				42	70,144 SF	233	0	0	138	233	0						
	1A	Market Rate: Residential			4	49,312 GSF	34,892 SF	1,553 SF	3,200 SF		9,667 SF	46,172 SF			28	0 SF												
	1A	Market Rate: Residential			5	49,244 GSF	38,023 SF	1,554 SF	0 SF		9,667 SF				28	0 SF												
	1A	Market Rate: Residential			6	47,992 GSF	37,069 SF	1,512 SF	0 SF		9,411 SF				28	0 SF												
	1A	Market Rate: Residential			7	46,672 GSF	36,047 SF	1,471 SF	0 SF		9,154 SF				28	0 SF												
	1A	Market Rate: Residential			8	44,632 GSF	34,466 SF	1,407 SF	0 SF		8,759 SF				28	0 SF												
X	1A	Market Rate: Residential			9	23,100 GSF	17,635 SF	707 SF	0 SF		4,758 SF				21	0 SF												
	1A	Market Rate: Residential			10	23,100 GSF	17,635 SF	707 SF	0 SF		4,758 SF				21	0 SF												
	1A	Market Rate: Residential			11	23,100 GSF	17,635 SF	707 SF	0 SF		4,758 SF				21	0 SF												
	1A	Market Rate: Residential			12	23,100 GSF	17,635 SF	707 SF	0 SF		4,758 SF				21	0 SF												
	1A	Market Rate: Residential			13	15,840 GSF	12,675 SF	407 SF	0 SF		2,758 SF				15	0 SF												
	1A	Market Rate: Residential			14	15,840 GSF	12,675 SF	407 SF	0 SF		2,758 SF				15	0 SF												
	1A	Market Rate: Residential			15	14,520 GSF	11,355 SF	407 SF	0 SF		2,758 SF				15	0 SF												
	1A	Market Rate: Residential			16	13,200 GSF	10,035 SF	407 SF	0 SF		2,758 SF				13	0 SF												
	1A	Market Rate: Residential			17	13,200 GSF	6,835 SF	307 SF	3,300 SF		2,758 SF				12	0 SF												
Block Totals:			123,855 SF	101,052 SF		680,156 GSF	340,635 SF	14,988 SF	10,442 SF	13,444 SF	87,935 SF	46,172 SF	39,192 GSF	25,475 SF	374	212,712 SF	707	41	41	414	666	0	+ 0	+ 252	3	131.54	5.49	911 SF
								Amenity %	3.07%											1.10 Ratio	1.78 Ratio							

Totals Without Outparcel

Market Rate (East of Frontier)	124,178 SF	118,688 SF	628,120 GSF	341,121 SF	14,108 SF	17,540 SF	30,156 SF	52,821 SF	54,604 SF	55,492 GSF	36,070 SF	386	172,374 SF	574	91	148	426	426	0	+ 0	+ 57	135.40	5.06	884 SF
Affordable (East of Frontier)	179,627 SF	166,751 SF	1,033,817 GSF	424,907 SF	24,417 SF	25,694 SF	52,006 SF	112,884 SF	48,798 SF	110,539 GSF	71,850 SF	479	393,909 SF	1315	157	91	405	443	781	+ 0	-28	116.16	5.76	887 SF
Subtotals: (East of Frontier	303,805 SF	285,439 SF	1,661,937 GSF	766,028 SF	38,525 SF	43,234 SF	82,162 SF	165,705 SF	103,402 SF	166,031 GSF	107,920 SF	865	566,283 SF	1,889	248	239	831	869	781	+ 0	+ 29	124.02	5.47	886 SF
Market Rate (Both Phases)	656,622 SF	577,257 SF	3,191,130 GSF	1,839,747 SF	68,855 SF	97,808 SF	40,456 SF	264,204 SF	224,500 SF	300,581 GSF	195,378 SF	2,250	880,060 SF	2,925	122	154	2,481	2,771	0	+ 0	+ 322	149.26	4.86	818 SF
Affordable (Both Phases)	573,478 SF	535,211 SF	3,416,812 GSF	1,628,168 SF	75,761 SF	63,203 SF	77,406 SF	332,521 SF	147,350 SF	367,895 GSF	239,132 SF	2000	1,239,753 SF	4115	234	236	1492	1779	2100	+ 0	+ 289	151.92	5.96	814 SF
Grand Totals: (Both Phases)	2,144,510 SF *	1,263,218 SF **	6,629,698 SF **	3,467,915 SF	144,616 SF	161,011 SF	117,862 SF	596,725 SF	371,850 SF	838,696 GSF **	545,152 SF **	4,250	2,119,813 SF	7,040	356	390	3,973	4,550	2,100	+ 0	+ 611	86.33 ***	3.09 ***	816 SF
																		1.07 Ratio						

Totals With Outparcel

Market Rate (Phase 1)	248,033 SF	219,740 SF	1,308,276 GSF	681,756 SF	29,096 SF	27,982 SF	43,600 SF	140,756 SF	100,776 SF	94,684 GSF	61,545 SF	728	385,086 SF	1,281	132	189	840	1,092	0	+ 0	+ 309	127.85	5.27	936 SF
Affordable (Phase 1)	179,627 SF	166,751 SF	1,033,817 GSF	424,907 SF	24,417 SF	25,694 SF	52,006 SF	112,884 SF	48,798 SF	110,539 GSF	71,850 SF	511	393,909 SF	1,315	157	91	405	443	781	+ 0	-28	123.91879	5.7553542	831.52055
Subtotals: (Phase 1)	427,660 SF	386,491 SF	2,342,093 GSF	1,106,663 SF	53,513 SF	53,676 SF	95,606 SF	253,640 SF	149,574 SF	205,223 GSF	133,395 SF	1,239	778,995 SF	2,596	289	280	1,245	1,535	781	+ 0	+ 281	126.20	5.48	893 SF
Market Rate (Both Phases)	780,477 SF	678,309 SF	3,871,286 GSF	2,180,382 SF	83,843 SF	108,250 SF	53,900 SF	352,139 SF	270,672 SF	339,773 GSF	220,852 SF	2,592	1,092,772 SF	3,632	163	195	2,895	3,437	0	+ 0	+ 574	144.66	4.96	841 SF
Affordable (Both Phases)	573,478 SF	535,211 SF	3,416,812 GSF	1,628,168 SF	75,761 SF	63,203 SF	77,406 SF	332,521 SF	147,350 SF	367,895 GSF	239,132 SF	2,032	1,239,753 SF	4,115	234	236	1,492	1,779	2,100	+ 0	+ 289	154.35	5.96	801 SF
Grand Totals: (Both Phases)	2,268,365 SF *	1,364,270 SF **	7,668,648 SF **	3,808,550 SF	159,604 SF	171,453 SF	131,306 SF	684,660 SF	418,022 SF	877,888 GSF **	570,627 SF **	4,624	2,332,525 SF	7,747	397	431	4,387	5,216	2,100	+ 0	+ 863	88.80 ***	3.38 ***	824 SF
																		1.13 Ratio						

*Includes the entire area of the midway site

** Inlcudes block I (San Diego Entertainment Center) metrics

*** Grand total **DU/AC + FAR** calculations includes the entire area of the site (Indivdual building block DU/AC + FAR calculations includes the area of the "proposed site boundary" for each coresponding block)

Chapter 2

WATER DEMANDS AND SERVICE CRITERIA

2.1 General

This chapter outlines planning procedures to estimate water demands and fire flows. Water system service requirements are also defined in terms of water pressure and reservoir storage.

2.2 Service Area

The DESIGN CONSULTANT defines the project's service area and identifies the pressure zones in which it is located. The Senior Civil Engineer in charge of either Water Planning or new development approves the service area boundaries.

2.3 Land Use and Residential Population

The DESIGN CONSULTANT develops present and future land use maps for the service area to define the following land use categories: residential (by zone in accordance with **Table 2-1**), central business district, commercial and institutional, parks, hospitals, hotels, industrial, office, and schools.

The DESIGN CONSULTANT estimates the residential population in the service area based on present and future allowable land use. Unless more accurate population density estimates are available, the residential population in the service area is estimated based on the figures presented in **Table 2-1**.

Table 2-1
Residential Population Density

Zone	Dwelling Unit Density (dwelling unit/ net acre)	Unit Density (persons/ dwelling unit)	Population Density (persons/ net acre)
AR-1-1	0.1	3.5	0.4
AR-1-1	0.2	3.5	0.7
AR-1-2	1	3.5	3.5
RS-1-1/RS-1-8	1	3.5	3.5
RS-1-2/RS-1-9	2	3.5	7.0
RS-1-4/RS-1-11	4	3.5	14

Zone	Dwelling Unit Density (dwelling unit/ net acre)	Unit Density (persons/ dwelling unit)	Population Density (persons/ net acre)
RS-1-7/RS-1-14	9	3.5	32
RM-1-1	14	3.2	45
RM-2-5	29	3.0	87
RM-3-7	43	2.6	112
RM-3-9	73	2.2	161
RM-4-10	109	1.8	196
RM-4-11	218	1.5	327

Dwelling unit density in **Table 2-1** is based on net area. The net area is measured in acres, and is 80% of the gross area for each residential zone.

2.4 Average Annual Water Demands

For most projects, average annual water demands are determined based on the unit water demand criteria presented in **Table 2-2**.

Table 2-2
Unit Water Demands

Land Use Category	Unit Water Demand
Residential	150 gallons/person-day
Central Business District	6000 gallons/net acre-day
Commercial and Institutional	5000 gallons/net acre-day
Fully Landscaped Park	4000 gallons/net acre-day
Hospitals	22500 gallons/net acre-day
Hotels	6555 gallons/net acre-day
Industrial	6250 gallons/net acre-day
Office	5730 gallons/net acre-day
Schools	4680 gallons/net acre-day

Average annual water demands are calculated as the sum of: (1) the residential water demand, and (2) other water demands for each land use category as follows:

Residential Water Demand (gallons/day) = Residential Population x 150 gallons/person-day

APPENDIX B

EPA WATERSENSE WATER BUDGET TOOL FOR IRRIGATION DEMAND

WaterSense New Home Specification: Water Budget Tool (V 1.04)

This water budget tool shall be used to determine if the designed landscape meets Criteria 4.1.1 of the specification.
Please refer to the WaterSense Water Budget Approach for additional information.

Your Name:	
Builder Name:	Midway Rising
Lot Number/Street Address:	3500 Sports Arena Blvd
City, State, Zip Code:	San Diego, CA
Peak Watering Month:	jul
Is an irrigation system being installed on this site?	Yes

EPA WaterSense

This worksheet determines if the designed landscape meets the water budget.

If the landscape water requirement is LESS than the landscape water allowance, then the water budget criterion is met.
If the landscape water requirement is GREATER than the landscape water allowance, then the landscape and/or irrigation system needs to be redesigned to use less water.

STEP 3A - REVIEW THE LWA AND LWR FROM PART 1 AND PART 2

LWA 704,933 (gallons/month) **LWR** 526,245 (gallons/month)

STEP 3B - REVIEW THE TOTAL AREA OF TURFGRASS* IN THE DESIGNED LANDSCAPE FROM STEP 2B

The designed landscape contains 68,423 square feet of turfgrass.* This is 24% of the landscaped area.

*This includes the area of any pools, spas, and/or water features, designated by WaterSense to be counted as turfgrass.

OUTPUT - DOES THE DESIGNED LANDSCAPE MEET THE WATER BUDGET?

YES If YES, then the water budget criterion is met.
If NO, then the landscape and/or irrigation system needs to be redesigned to use less water.

The designed landscape water requirement is a 48% reduction in water use from the baseline calculated in Part 1.

APPENDIX C

PEAKING FACTOR TABLES

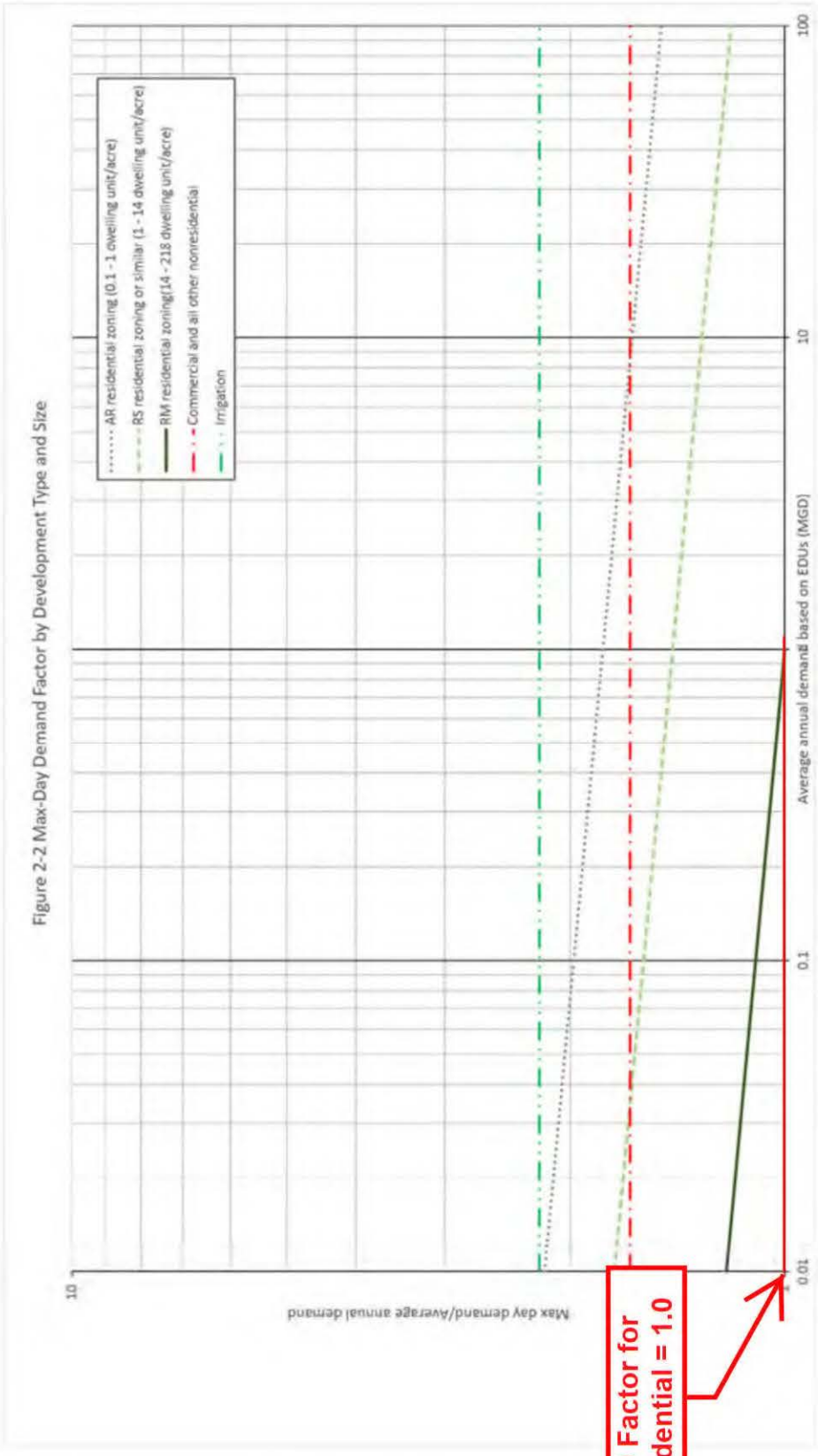


Figure 2-2 Max-Day Demand Factor by Development Type and Size

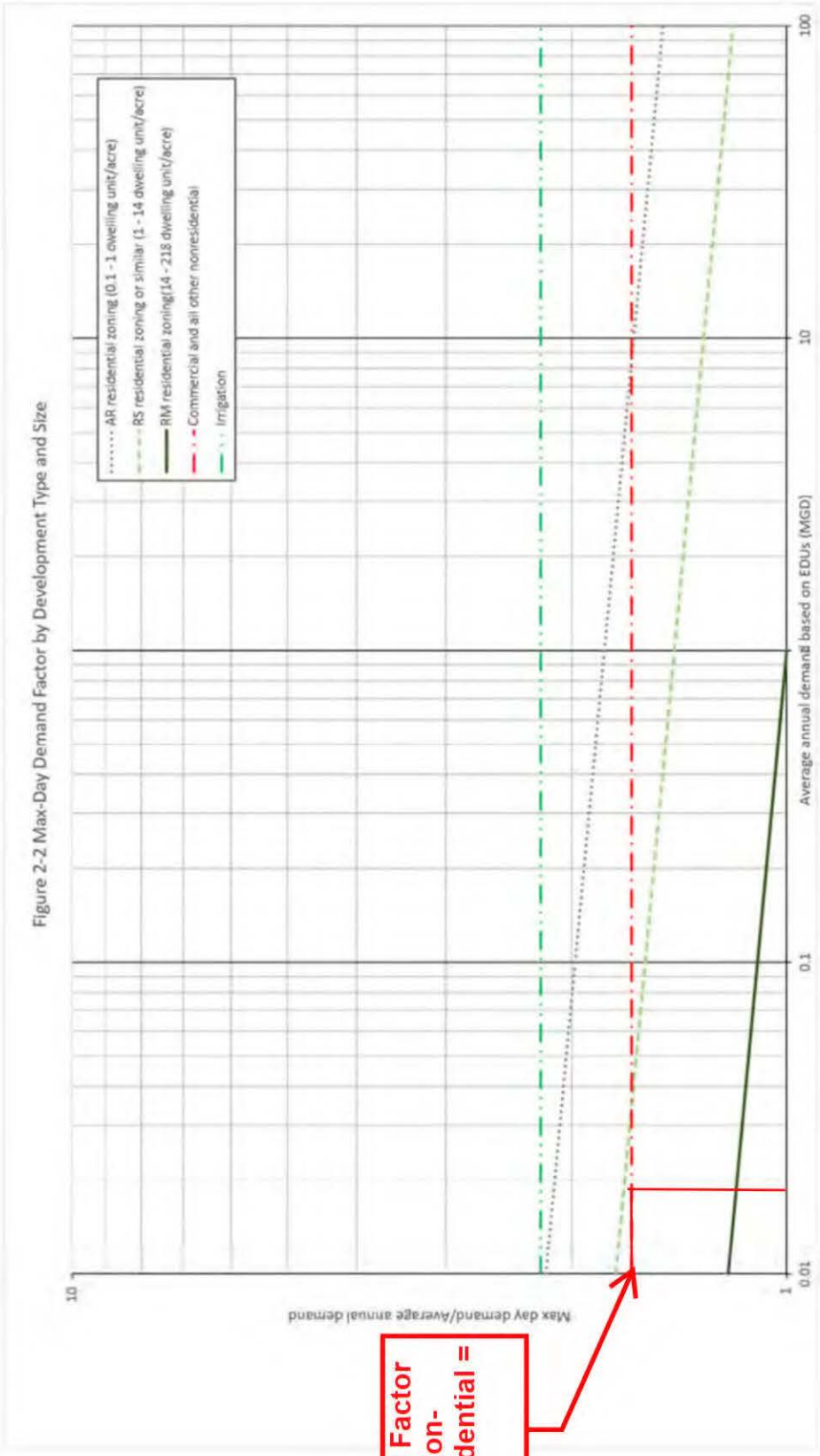


Figure 2-2 Max-Day Demand Factor by Development Type and Size

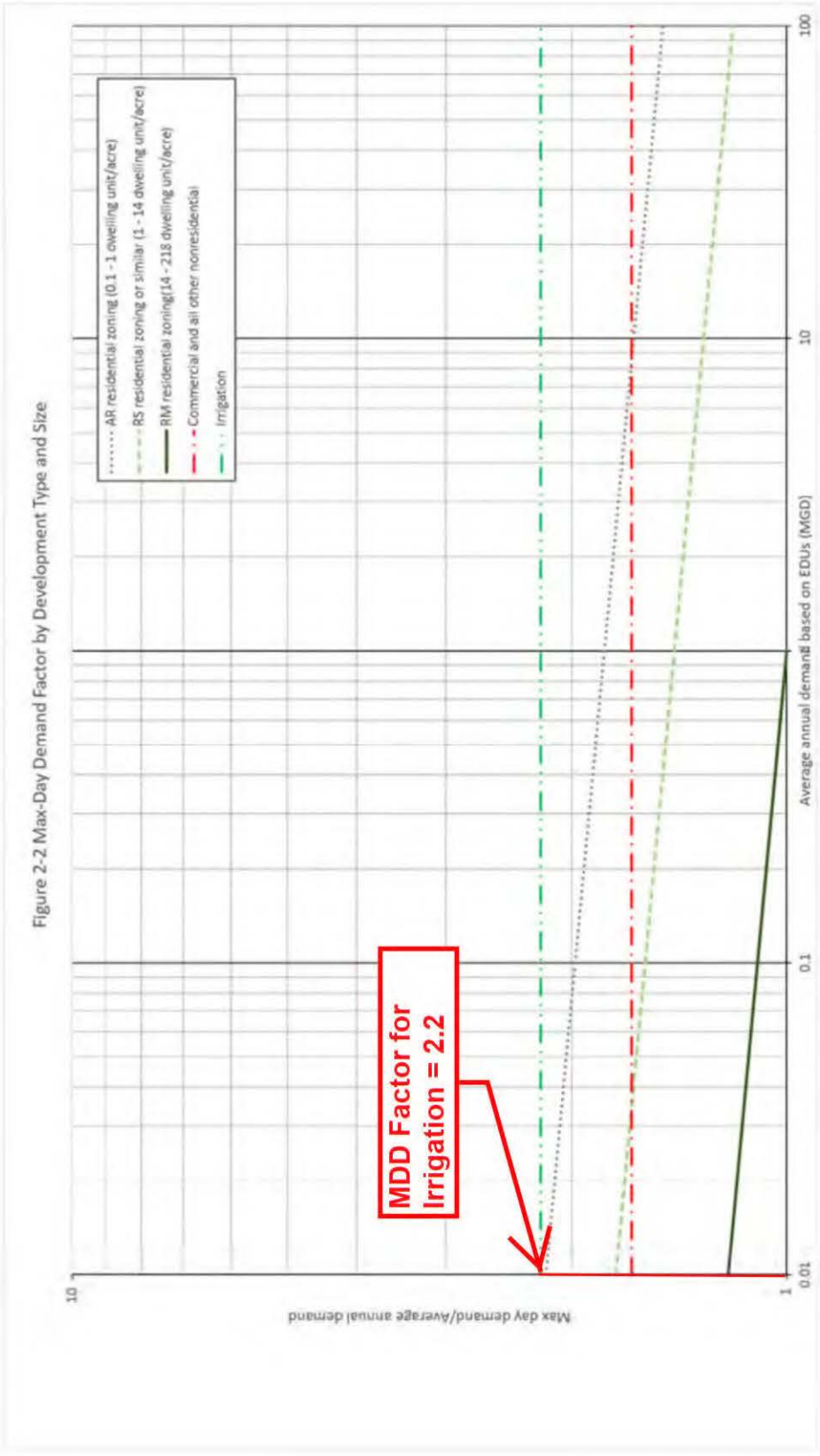


Figure 2-2 Max-Day Demand Factor by Development Type and Size

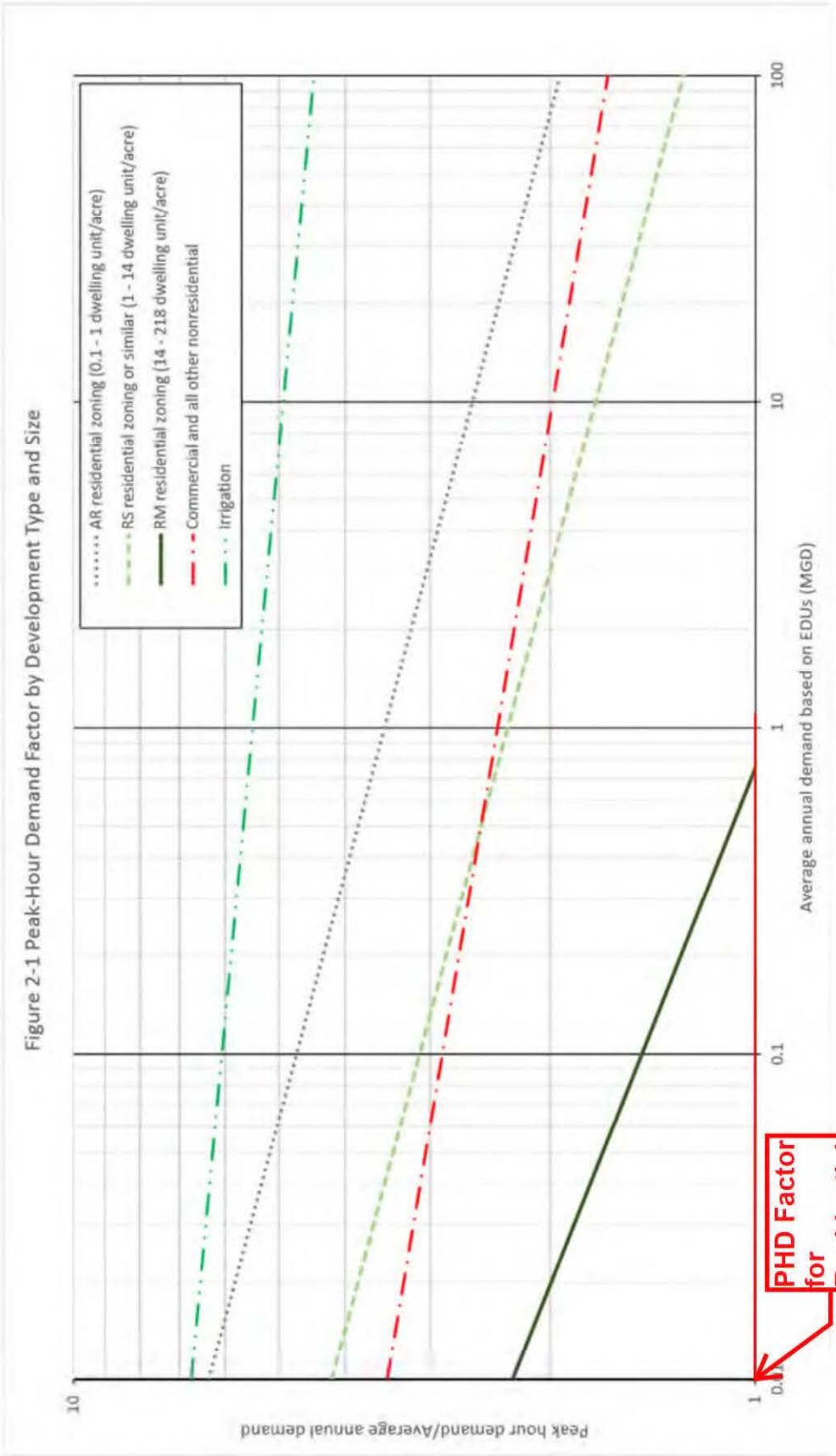


Figure 2-1 Peak-Hour Demand Factor by Development Type and Size

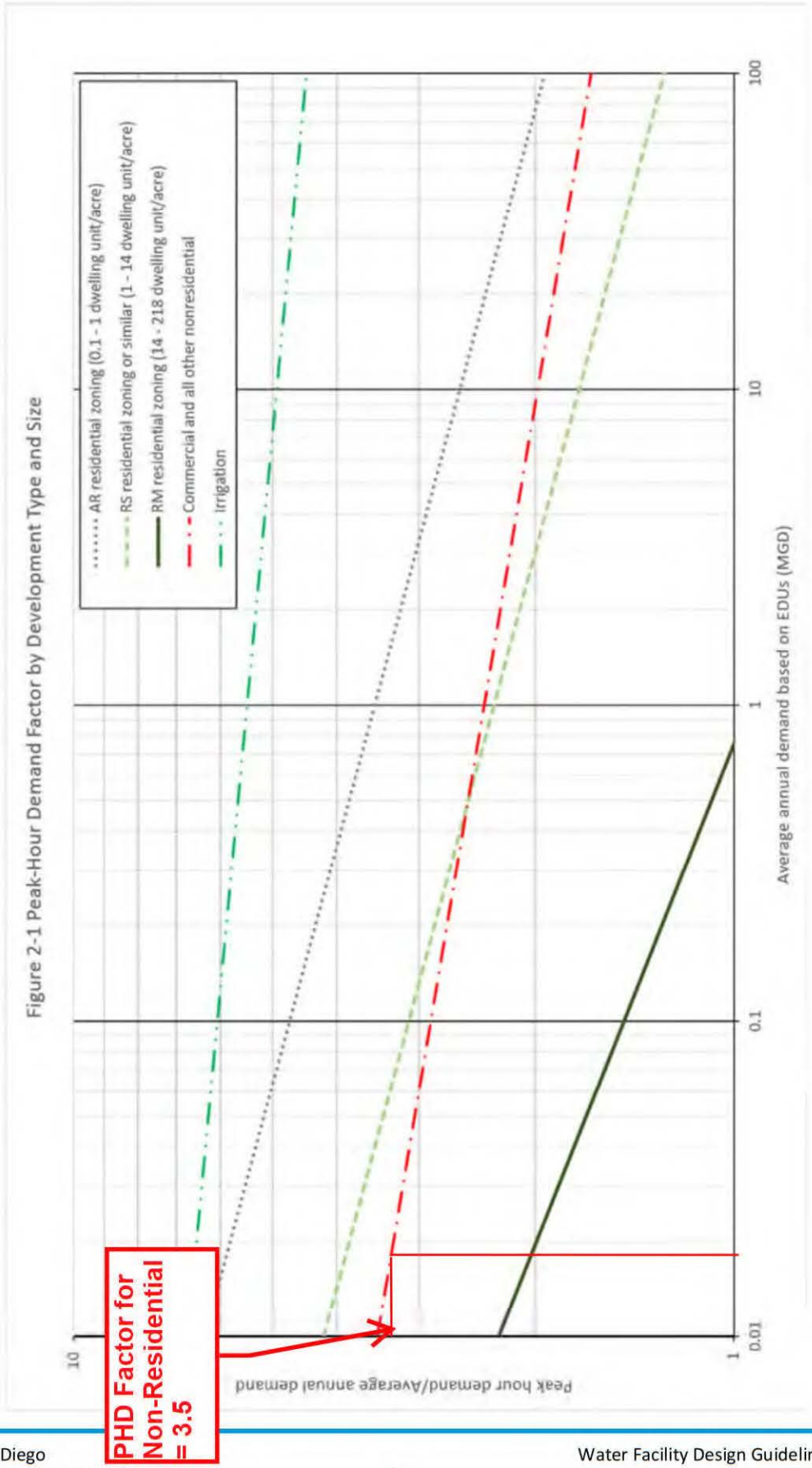


Figure 2-1 Peak-Hour Demand Factor by Development Type and Size

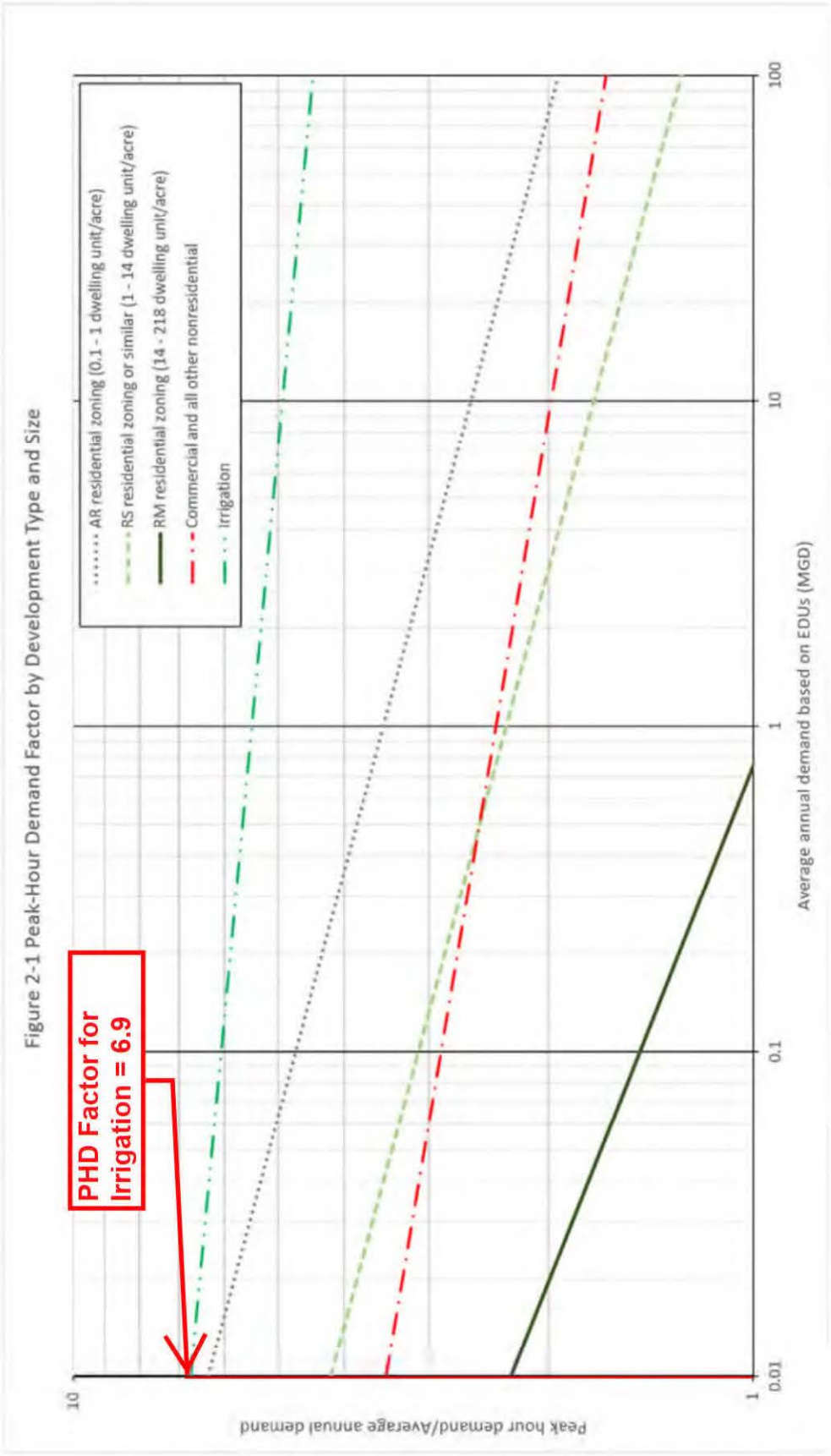


Figure 2-1 Peak-Hour Demand Factor by Development Type and Size

APPENDIX D

FIRE HYDRANT FLOW TEST
AND
EXTRAPOLATION SPREADSHEET

City of San Diego
Development Services
Attention: **Hydrant Flow Request**
1222 First Ave., MS-401
San Diego, CA 92101
(619) 446-5000

Hydrant Flow Request

FORM DS-160
OCTOBER 2016

Fill out the information below completely for all sprinkler system flow requests, including NFPA 13, 13D and 13R systems. E-mail form to: DSDHydrantFlow@sandiego.gov, or mail request to the above address.

Please print or type legibly.

Company Requesting Hydrant Flow:
Dexter Wilson Engineering, Inc.

Telephone No:	Fax No:	E-mail Address:
760-438-4422	760-438-0173	william@dwilsoneng.com

Project Number for the Building Permits:
N/A

Location of Hydrants:
Kurtz Street

Cross Street:	City:	State:	ZIP Code:
Hancock Street	San Diego	CA	92110

FOR CITY USE ONLY

Facility Sequence Number: (FSN): 520940

Static: 125.8 PSI

Elevation: 9 FEET

Pitot: ---------- PSI

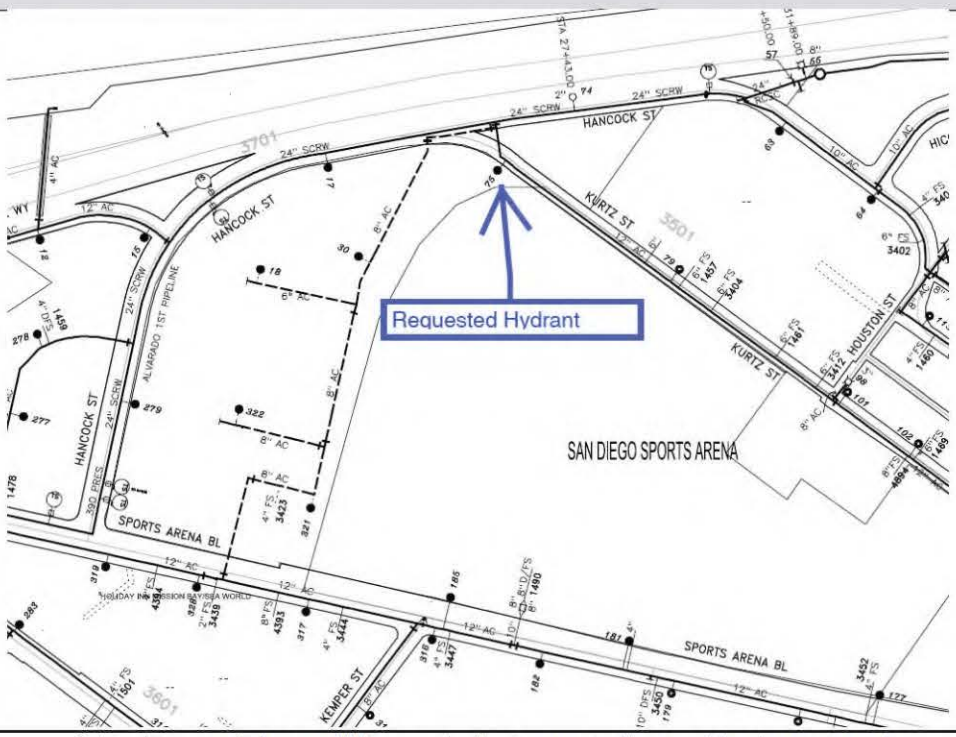
Residual: 112.3 PSI

Date: 10/20/2023

Flow: 1714 GPM

Researched in database by: Anthony Larkins

The information provided above is based upon a water model. It is the contractor's responsibility to confirm the available static pressure at the system point of connection. If a discrepancy is noticed at that time, notify DSDHydrantFlow@sandiego.gov as soon as possible.



Fire Hydrant Flow Test Date 10/20/2023

Input Flow Test Results

Static Pressure	125.8	PSI	Static Pressure no Reduction	139.8	PSI
Residual Pressure	112.3	PSI	Residual Pressure no Reduction	126.3	PSI
Hydrant Flow	1714	GPM	Hydrant Flow	1714	GPM
Actual Hydrant Elevation		Feet	HGL		Feet
Estimated Hydrant Elevation	9	Feet	HGL	331.6	Feet

Equation $\Delta H = k\,Q^{1.85}$

k = 3.24078E-05

Extrapolated Calculations

Q, gpm	Residual Pressure	Available HGL
500	138.4 psi	328.4 ft
700	137.2 psi	325.7 ft
900	135.7 psi	322.1 ft
1100	133.8 psi	317.9 ft
1300	131.7 psi	312.9 ft
1500	129.2 psi	307.3 ft
1700	126.5 psi	300.9 ft
1900	123.4 psi	293.9 ft
2000	121.8 psi	290.2 ft
2100	120.1 psi	286.2 ft
2300	116.5 psi	277.9 ft
2500	112.6 psi	269.0 ft
2700	108.5 psi	259.4 ft
3000	101.8 psi	243.8 ft
3100	99.4 psi	238.4 ft
3300	94.4 psi	226.9 ft
3500	89.2 psi	214.9 ft
3700	83.7 psi	202.2 ft
3900	78.0 psi	189.0 ft
4000	75.0 psi	182.2 ft
4100	72.0 psi	175.2 ft
4300	65.8 psi	160.8 ft
4500	59.3 psi	145.8 ft
4700	52.5 psi	130.2 ft
4900	45.5 psi	114.1 ft
5100	38.3 psi	97.4 ft

Residual Pressure, psi	Available Flow, gpm
0 psi	6,063
10 psi	5,825
20 psi	5,578
30 psi	5,321
40 psi	5,053
50 psi	4,773
60 psi	4,478
70 psi	4,165
80 psi	3,831
90 psi	3,470
100 psi	3,074
110 psi	2,629
120 psi	2,107
130 psi	1,440
140 psi	Residual Pressure Exceeds Static Pressure
150 psi	Residual Pressure Exceeds Static Pressure
160 psi	Residual Pressure Exceeds Static Pressure
170 psi	Residual Pressure Exceeds Static Pressure
180 psi	Residual Pressure Exceeds Static Pressure
190 psi	Residual Pressure Exceeds Static Pressure

APPENDIX E

CANDIDATE BACKFLOW PREVENTER FOR FIRE PROTECTION SERVICE

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Maxim™ Series LFM500 (Maxim 500), LFM500N (Maxim 500N), LFM500Z (Maxim 500Z)

Reduced Pressure Detector Assemblies

Sizes: 2½" – 10"

The Maxim LFM500, LFM500N, LFM500Z Reduced Pressure Detector Assemblies provide protection to the potable water system from contamination in accordance with national plumbing codes. The Maxim LFM500, LFM500N, LFM500Z are normally used in health hazard applications to protect against backsiphonage, backpressure and the fouling of either check valve. The Maxim LFM500, LFM500N, LFM500Z are used to monitor unauthorized use of water from the fire protection system.

LFM500N OSY (Maxim 500V GV)

LFM500 OSY (Maxim 500)

Features

- Extremely Compact Design
- 70% Lighter than Traditional Designs
- 304 (Schedule 40) Stainless Steel Housing & Sleeve
- Groove Fittings Allow Integral Pipeline Adjustment
- Patented Link Check Provides Lowest Pressure Loss
- Unmatched Ease of Serviceability
  Available with Grooved Butterfly Valve Shutoffs
- Available for Horizontal or N Pattern Installations
- Replaceable Check Disc Rubber

Specifications

The Lead Free* Reduced Pressure Detector Assemblies shall consist of two independent Link Check modules, a differential pressure relief valve located between and below the two modules, two drip tight shutoff valves, and required test cocks. Link Check modules and relief valve shall be contained within a sleeve accessible single housing constructed from 304 (Schedule 40) stainless steel pipe with groove end connections. Link Checks shall have reversible elastomer discs and in operation produce drip tight closure against the reverse flow of liquid caused by backpressure or backsiphonage. The bypass assembly consists of a meter registering either gallon or cubic feet measurements, a Reduced Pressure Zone Assembly and required test cocks. Assembly shall be Maxim LFM500, LFM500N, LFM500Z as manufactured by the Ames Fire & Waterworks.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

AMES
FIRE & WATERWORKS
A WATTS Brand

Configurations

- Horizontal
- "Z" pattern horizontal
- "N" pattern horizontal

Materials

Housing & Sleeve:	304 (Schedule 40) Stainless Steel
Elastomers:	EPDM, Silicone and Buna 'N'
Link Checks:	Noryl®, Stainless Steel
Check Discs:	Reversible Silicone or EPDMr
Test Cocks:	Lead Free* Cast Copper Silicon Alloy
Pins & Fasteners:	Series Stainless Steel
Springs:	Stainless Steel

Available Models

OSY — UL/FM outside stem and yoke resilient seated gate valves

BFG — UL/FM grooved gear operated butterfly valves w/tamper switch

†OSY FxG — Flanged inlet gate connection and grooved outlet gate connection

†OSY GxF — Grooved inlet gate connection and flanged outlet gate connection

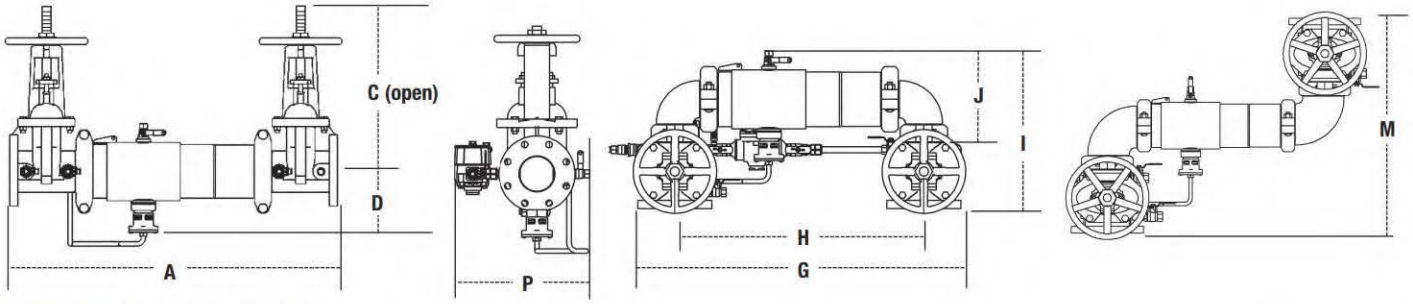
†OSY GxG — Grooved inlet gate connection and grooved outlet gate connection

Available with grooved NRS gate valves – consult factory†
Post indicator plate and operating nut available – consult factory†
†Consult factory for dimensions

Pressure — Temperature

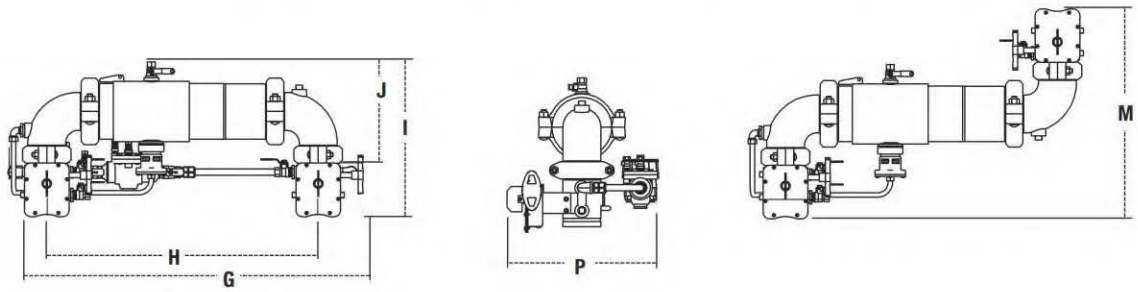
Temperature Range: 33°F – 110°F (5°C – 43°C)
Maximum Working Pressure: 175 psi (12.06 bar)

Dimensions — Weights



LFM500, LFM500N, LFM500Z

SIZE	DIMENSIONS																		WEIGHT			
	A		C (OSY)		D		H		I		P		M		G		J		M500		M500N	
in.	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.	lbs.	kgs.
2½	30¾	781	16⅜	416	6½	165	21½	546	15⁹⁄₁₆	395	13⅜	340	21¼	540	29½	749	8¹³⁄₁₆	223	142	64	150	68
3	31¾	806	18⅞	479	6¹¹⁄₁₆	170	22¼	565	16¼	413	14¹¹⁄₁₆	372	23	584	30½	775	9³⁄₁₆	233	162	73	175	79
4	40½	1029	22¾	578	8	203	30¼	768	19¹¹⁄₁₆	500	15⁵⁄₁₆	389	26¼	667	39¾	1010	11	280	236	107	259	117
6	47¾	1213	30⅛	765	9½	241	37½	953	23¾₁₆	605	19½	495	34¼	870	49	1245	14³⁄₁₆	360	407	185	447	203
8	54¾	1391	37¾	959	10½	267	45⅛	1146	27³⁄₁₆	690	21⅝	549	36⅞	937	59⅛	1502	16¾	425	581	264	657	298
10	57¾	1467	45¾	1162	11³⁄₁₆	284	49½	1257	32½	825	24⁵⁄₁₆	617	44½	1124	66	1676	17⁵⁄₁₆	440	798	362	968	439



LFM500NBFG, LFM500ZBFG

SIZE	DIMENSIONS												WEIGHT	
	H		I		P		M		G		PJ			
in.	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.
2½	23	584	15¹¹⁄₁₆	398	11¹³⁄₁₆	300	19¾	502	31¹⁵⁄₁₆	811	9½	242	81	37
3	24	610	16⁵⁄₁₆	415	12⅛	308	21¼	540	33⁵⁄₁₆	846	10¹⁄₁₆	255	84	38
4	30¼	768	18⁵⁄₁₆	466	13¹⁵⁄₁₆	454	23½	597	42	1067	12	305	159	72.1
6	37½	953	21¾	553	16⁷⁄₁₆	418	27¼	692	50¹³⁄₁₆	1291	15³⁄₁₆	386	268	121.5

Noryl® is a registered trademark of SABIC Innovative Plastics™.

Approvals

- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at The Unversity of Southern California (FCCCHR-USC)
- AWWA C511-97

1047 B64.4 (**BFG & OSY Only)

For additional approval information please contact the factory or visit our website at www.amesfirewater.com

Capacity

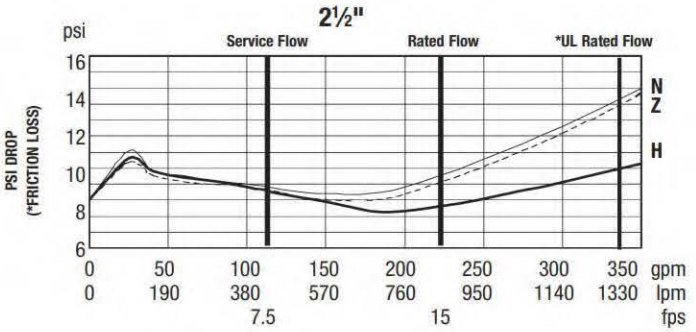
UL/FM Certified Flow Characteristics

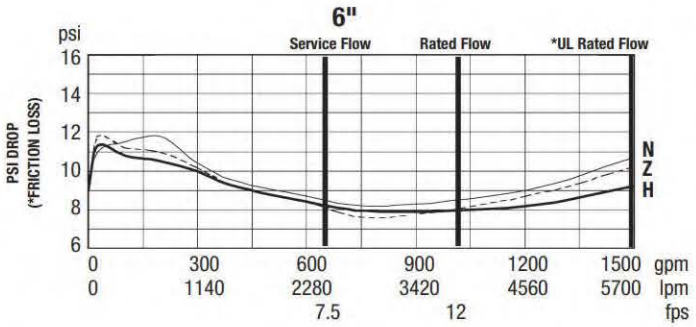
Flow characteristics collected using butterfly shutoff valves.

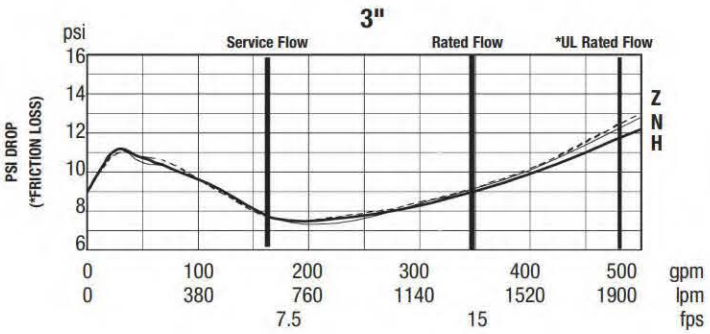
Flow capacity chart identifies valve performance based upon rated water velocity up to 25fps

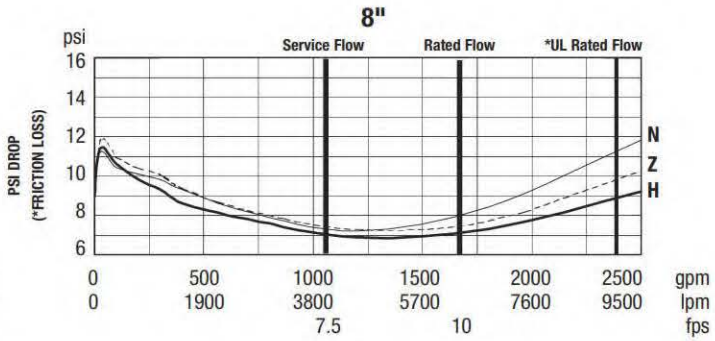
- Service Flow is typically determined by a rated velocity of 7.5fps based upon schedule 40 pipe.
- Rated Flow identifies maximum continuous duty performance determined by AWWA.
- UL Flow Rate is 150% of Rated Flow and is not recommended for continuous duty.
- AWWA Manual M22 [Appendix C] recommends that the maximum water velocity in services be not more than 10fps.

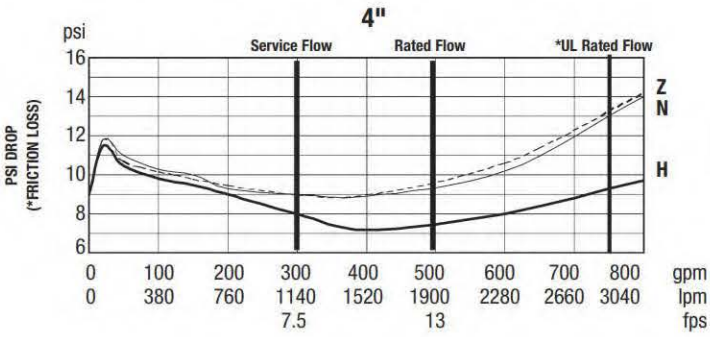
Horizontal N-Pattern Z-Pattern

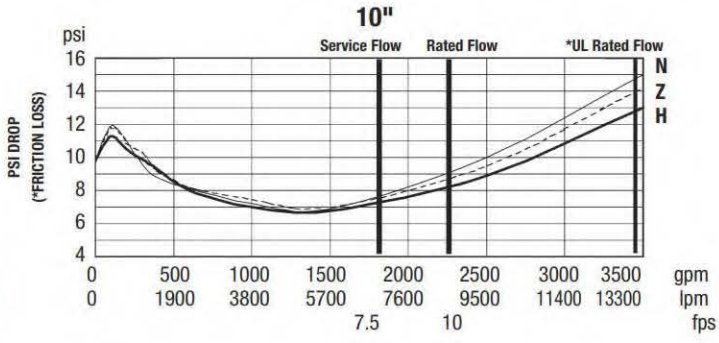












NOTICE

Inquire with governing authorities for local installation requirements

AMES
FIRE & WATERWORKS

A **WATTS** *Brand*

USA: Backflow T: (978) 689-6066 • F: (978) 975-8350 • AmesFireWater.com
USA: Control Valves T: (713) 943-0688 • F: (713) 944-9445 • AmesFireWater.com
Canada: T: (905) 332-4090 • F: (905) 332-7068 • AmesFireWater.ca
Latin America: T: (52) 81-1001-8600 • AmesFireWater.com

APPENDIX F

COMPUTER MODELING OUTPUT
MIDWAY RISING
ULTIMATE WATER SYSTEM

NODE AND PIPE DIAGRAM REFERENCE:

Exhibit A in the back of the report.

CONDITIONS MODELED:

1. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 16 and 72
2. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 16 and 72, Pipe 307 Closed
3. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 24 and 32
4. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 24 and 32, Pipe 307 Closed
5. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 40 and 60
6. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 40 and 60, Pipe 307 Closed
7. Maximum Day Demands plus 4,000 gpm Fire Flow split between Nodes 88, 106, and 120
8. Maximum Day Demands plus 4,000 gpm Fire Flow split between Nodes 88, 106, and 120, Pipe 307 Closed

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 16 and Node 72

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	91.10	48.41
4	9	331	139.51	89.97	49.54
8	9	331	139.51	89.65	49.86
12	11	331	138.65	87.62	51.03
16	12	331	138.21	86.96	51.25
20	12	331	138.21	87.12	51.09
24	12	331	138.21	87.31	50.90
O-28	12	331	138.21	80.02	58.19
32	12	331	138.21	80.02	58.19
I-36	12	331	138.21	87.96	50.25
40	12	331	138.21	87.96	50.25
44	10	331	139.08	88.83	50.25
48	12	331	138.21	87.96	50.25
52	12	331	138.21	87.96	50.25
O-56	12	331	138.21	79.96	58.25
60	12	331	138.21	79.96	58.25
64	12	331	138.21	87.97	50.24
66	12	331	138.21	87.97	50.24
I-68	12	331	138.21	87.48	50.73
72	11	331	138.65	77.46	61.19
O-76	11	331	138.65	79.30	59.35
80	11	331	138.65	89.68	48.97
I-84	11	331	138.65	89.68	48.97
88	11	331	138.65	82.68	55.97
100	10	331	139.08	88.51	50.57
104	11	331	138.65	88.40	50.25
106	11	331	138.65	88.79	49.86
108	10	331	139.08	90.06	49.02
112	10	331	139.08	90.12	48.96
116	8	331	139.95	91.09	48.86
120	9	331	139.51	90.67	48.84
124	11	331	138.65	89.67	48.98
126	11	331	138.65	89.59	49.06
128	9	331	139.51	89.82	49.69
136	11	331	138.65	90.87	47.78
140	11	331	138.65	89.64	49.01
144	11	331	138.65	88.81	49.84
148	11	331	138.65	88.16	50.49
152	11	331	138.65	91.05	47.60
156	9	331	139.51	92.11	47.40
160	11	331	138.65	91.05	47.60
164	13	331	137.78	90.21	47.57
168	13	331	137.78	90.21	47.57
172	11	331	138.65	90.60	48.05
176	10	331	139.08	91.31	47.77
180	11	331	138.65	90.76	47.89
184	11	331	138.65	90.32	48.33
188	11	331	138.65	90.33	48.32
192	11	331	138.65	90.00	48.65
196	12	331	138.21	89.61	48.60
200	13	331	137.78	90.26	47.52
204	13	331	137.78	89.02	48.76
208	13	331	137.78	88.99	48.79
212	13	331	137.78	88.99	48.79
216	12	331	138.21	89.28	48.93
220	11	331	138.65	89.70	48.95
224	12	331	138.21	89.42	48.79
300	11	331	138.65	89.25	49.40
304	14	331	137.35	90.56	46.79
308	13	331	137.78	90.82	46.96
0	14	331	137.35	90.61	46.74
I-28	12	331	138.21	87.31	50.90
O-36	12	331	138.21	80.02	58.19
I-56	12	331	138.21	87.96	50.25
O-68	12	331	138.21	79.45	58.76
I-76	11	331	138.65	87.31	51.34
O-84	11	331	138.65	82.68	55.97

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 16 and Node 72, Pipe 307 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	77.97	61.54
4	9	331	139.51	77.63	61.88
8	9	331	139.51	77.35	62.16
12	11	331	138.65	75.47	63.18
16	12	331	138.21	74.85	63.36
20	12	331	138.21	75.06	63.15
24	12	331	138.21	75.29	62.92
O-28	12	331	138.21	68.32	69.89
32	12	331	138.21	68.32	69.89
I-36	12	331	138.21	76.26	61.95
40	12	331	138.21	76.26	61.95
44	10	331	139.08	77.15	61.93
48	12	331	138.21	76.26	61.95
52	12	331	138.21	76.25	61.96
O-56	12	331	138.21	68.25	69.96
60	12	331	138.21	68.25	69.96
64	12	331	138.21	76.25	61.96
66	12	331	138.21	76.25	61.96
I-68	12	331	138.21	75.72	62.49
72	11	331	138.65	65.51	73.14
O-76	11	331	138.65	67.19	71.46
80	11	331	138.65	79.58	59.07
I-84	11	331	138.65	79.58	59.07
88	11	331	138.65	72.58	66.07
100	10	331	139.08	76.56	62.52
104	11	331	138.65	76.73	61.92
106	11	331	138.65	77.75	60.90
108	10	331	139.08	80.31	58.77
112	10	331	139.08	80.47	58.61
116	8	331	139.95	81.51	58.44
120	9	331	139.51	81.08	58.43
124	11	331	138.65	79.52	59.13
126	11	331	138.65	79.25	59.40
128	9	331	139.51	77.97	61.54
136	11	331	138.65	77.3	61.35
140	11	331	138.65	76.74	61.91
144	11	331	138.65	76.4	62.25
148	11	331	138.65	76.15	62.50
152	11	331	138.65	77.36	61.29
156	9	331	139.51	78.29	61.22
160	11	331	138.65	80.27	58.38
164	13	331	137.78	83.95	53.83
168	13	331	137.78	84.21	53.57
172	11	331	138.65	81.62	57.03
176	10	331	139.08	80.85	58.23
180	11	331	138.65	80.47	58.18
184	11	331	138.65	80.69	57.96
188	11	331	138.65	80.8	57.85
192	11	331	138.65	80.8	57.85
196	12	331	138.21	80.69	57.52
200	13	331	137.78	85.16	52.62
204	13	331	137.78	79.76	58.02
208	13	331	137.78	79.68	58.10
212	13	331	137.78	79.69	58.09
216	12	331	138.21	79.7	58.51
220	11	331	138.65	80.09	58.56
224	12	331	138.21	80.11	58.10
300	11	331	138.65	78.93	59.72
304	14	331	137.35	90.56	46.79
308	13	331	137.78	76.55	61.23
0	14	331	137.35	90.61	46.74
I-28	12	331	138.21	75.29	62.92
O-36	12	331	138.21	68.32	69.89
I-56	12	331	138.21	76.25	61.96
O-68	12	331	138.21	67.69	70.52
I-76	11	331	138.65	75.19	63.46
O-84	11	331	138.65	72.58	66.07

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 24 and Node 32

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	92.45	47.06
4	9	331	139.51	91.46	48.05
8	9	331	139.51	91.24	48.27
12	11	331	138.65	89.55	49.10
16	12	331	138.21	88.68	49.53
20	12	331	138.21	87.99	50.22
24	12	331	138.21	87.53	50.68
O-28	12	331	138.21	79.19	59.02
32	12	331	138.21	77.78	60.43
I-36	12	331	138.21	88.16	50.05
40	12	331	138.21	88.63	49.58
44	10	331	139.08	89.5	49.58
48	12	331	138.21	88.72	49.49
52	12	331	138.21	88.96	49.25
O-56	12	331	138.21	80.96	57.25
60	12	331	138.21	80.96	57.25
64	12	331	138.21	89.26	48.95
66	12	331	138.21	89.08	49.13
I-68	12	331	138.21	89.26	48.95
72	11	331	138.65	81.76	56.89
O-76	11	331	138.65	81.76	56.89
80	11	331	138.65	90.9	47.75
I-84	11	331	138.65	90.9	47.75
88	11	331	138.65	83.9	54.75
100	10	331	139.08	88.93	50.15
104	11	331	138.65	89.07	49.58
106	11	331	138.65	89.6	49.05
108	10	331	139.08	91.15	47.93
112	10	331	139.08	91.24	47.84
116	8	331	139.95	92.25	47.70
120	9	331	139.51	91.85	47.66
124	11	331	138.65	90.89	47.76
126	11	331	138.65	90.83	47.82
128	9	331	139.51	91.17	48.34
136	11	331	138.65	92.14	46.51
140	11	331	138.65	90.56	48.09
144	11	331	138.65	89.48	49.17
148	11	331	138.65	88.62	50.03
152	11	331	138.65	92.31	46.34
156	9	331	139.51	93.36	46.15
160	11	331	138.65	92.27	46.38
164	13	331	137.78	91.42	46.36
168	13	331	137.78	91.43	46.35
172	11	331	138.65	91.81	46.84
176	10	331	139.08	92.53	46.55
180	11	331	138.65	91.98	46.67
184	11	331	138.65	91.53	47.12
188	11	331	138.65	91.53	47.12
192	11	331	138.65	91.17	47.48
196	12	331	138.21	90.78	47.43
200	13	331	137.78	91.47	46.31
204	13	331	137.78	90.17	47.61
208	13	331	137.78	90.15	47.63
212	13	331	137.78	90.14	47.64
216	12	331	138.21	90.41	47.80
220	11	331	138.65	90.82	47.83
224	12	331	138.21	90.57	47.64
300	11	331	138.65	90.22	48.43
304	14	331	137.35	91.77	45.58
308	13	331	137.78	92.04	45.74
0	14	331	137.35	91.82	45.53
I-28	12	331	138.21	87.19	51.02
O-36	12	331	138.21	80.14	58.07
I-56	12	331	138.21	88.96	49.25
O-68	12	331	138.21	81.26	56.95
I-76	11	331	138.65	89.55	49.10
O-84	11	331	138.65	83.9	54.75

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 24 and Node 32, Pipe 307 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	79.85	59.66
4	9	331	139.51	79.58	59.93
8	9	331	139.51	79.38	60.13
12	11	331	138.65	77.81	60.84
16	12	331	138.21	77	61.21
20	12	331	138.21	76.41	61.80
24	12	331	138.21	76.03	62.18
O-28	12	331	138.21	67.72	70.49
32	12	331	138.21	66.42	71.79
I-36	12	331	138.21	76.98	61.23
40	12	331	138.21	77.49	60.72
44	10	331	139.08	78.36	60.72
48	12	331	138.21	77.56	60.65
52	12	331	138.21	77.74	60.47
O-56	12	331	138.21	69.74	68.47
60	12	331	138.21	69.74	68.47
64	12	331	138.21	77.97	60.24
66	12	331	138.21	77.83	60.38
I-68	12	331	138.21	77.97	60.24
72	11	331	138.65	70.47	68.18
O-76	11	331	138.65	70.47	68.18
80	11	331	138.65	81.18	57.47
I-84	11	331	138.65	81.18	57.47
88	11	331	138.65	74.18	64.47
100	10	331	139.08	77.51	61.57
104	11	331	138.65	77.94	60.71
106	11	331	138.65	79.04	59.61
108	10	331	139.08	81.79	57.29
112	10	331	139.08	81.97	57.11
116	8	331	139.95	83.04	56.91
120	9	331	139.51	82.61	56.90
124	11	331	138.65	81.12	57.53
126	11	331	138.65	80.88	57.77
128	9	331	139.51	79.76	59.75
136	11	331	138.65	79.13	59.52
140	11	331	138.65	78.21	60.44
144	11	331	138.65	77.6	61.05
148	11	331	138.65	77.13	61.52
152	11	331	138.65	79.19	59.46
156	9	331	139.51	80.11	59.40
160	11	331	138.65	81.9	56.75
164	13	331	137.78	85.39	52.39
168	13	331	137.78	85.64	52.14
172	11	331	138.65	83.14	55.51
176	10	331	139.08	82.46	56.62
180	11	331	138.65	82.07	56.58
184	11	331	138.65	82.24	56.41
188	11	331	138.65	82.34	56.31
192	11	331	138.65	82.33	56.32
196	12	331	138.21	82.2	56.01
200	13	331	137.78	86.56	51.22
204	13	331	137.78	81.28	56.50
208	13	331	137.78	81.2	56.58
212	13	331	137.78	81.2	56.58
216	12	331	138.21	81.2	57.01
220	11	331	138.65	81.59	57.06
224	12	331	138.21	81.63	56.58
300	11	331	138.65	80.33	58.32
304	14	331	137.35	91.77	45.58
308	13	331	137.78	78.38	59.40
0	14	331	137.35	91.82	45.53
I-28	12	331	138.21	75.72	62.49
O-36	12	331	138.21	68.96	69.25
I-56	12	331	138.21	77.74	60.47
O-68	12	331	138.21	69.97	68.24
I-76	11	331	138.65	77.81	60.84
O-84	11	331	138.65	74.18	64.47

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	92.43	47.08
4	9	331	139.51	91.5	48.01
8	9	331	139.51	91.4	48.11
12	11	331	138.65	90.16	48.49
16	12	331	138.21	89.55	48.66
20	12	331	138.21	89.28	48.93
24	12	331	138.21	89.13	49.08
O-28	12	331	138.21	81.13	57.08
32	12	331	138.21	81.13	57.08
I-36	12	331	138.21	87.22	50.99
40	12	331	138.21	87.22	50.99
44	10	331	139.08	88.79	50.29
48	12	331	138.21	87.22	50.99
52	12	331	138.21	87.22	50.99
O-56	12	331	138.21	76.65	61.56
60	12	331	138.21	69.28	68.93
64	12	331	138.21	87.92	50.29
66	12	331	138.21	87.5	50.71
I-68	12	331	138.21	87.92	50.29
72	11	331	138.65	82.16	56.49
O-76	11	331	138.65	82.16	56.49
80	11	331	138.65	90.47	48.18
I-84	11	331	138.65	90.47	48.18
88	11	331	138.65	83.47	55.18
100	10	331	139.08	89.86	49.22
104	11	331	138.65	88.73	49.92
106	11	331	138.65	89.26	49.39
108	10	331	139.08	90.8	48.28
112	10	331	139.08	90.88	48.20
116	8	331	139.95	91.89	48.06
120	9	331	139.51	91.47	48.04
124	11	331	138.65	90.46	48.19
126	11	331	138.65	90.38	48.27
128	9	331	139.51	90.53	48.98
136	11	331	138.65	92.09	46.56
140	11	331	138.65	90.91	47.74
144	11	331	138.65	90.12	48.53
148	11	331	138.65	89.51	49.14
152	11	331	138.65	92.24	46.41
156	9	331	139.51	93.27	46.24
160	11	331	138.65	92.11	46.54
164	13	331	137.78	91.25	46.53
168	13	331	137.78	91.25	46.53
172	11	331	138.65	91.56	47.09
176	10	331	139.08	92.34	46.74
180	11	331	138.65	91.77	46.88
184	11	331	138.65	91.23	47.42
188	11	331	138.65	91.24	47.41
192	11	331	138.65	90.84	47.81
196	12	331	138.21	90.45	47.76
200	13	331	137.78	91.29	46.49
204	13	331	137.78	89.83	47.95
208	13	331	137.78	89.8	47.98
212	13	331	137.78	89.8	47.98
216	12	331	138.21	90.05	48.16
220	11	331	138.65	90.47	48.18
224	12	331	138.21	90.23	47.98
300	11	331	138.65	89.87	48.78
304	14	331	137.35	91.67	45.68
308	13	331	137.78	91.94	45.84
0	14	331	137.35	91.71	45.64
I-28	12	331	138.21	89.13	49.08
O-36	12	331	138.21	81.13	57.08
I-56	12	331	138.21	85.65	52.56
O-68	12	331	138.21	81.79	56.42
I-76	11	331	138.65	90.16	48.49
O-84	11	331	138.65	83.47	55.18

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60, Pipe 307 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	79.86	59.65
4	9	331	139.51	79.56	59.95
8	9	331	139.51	79.5	60.01
12	11	331	138.65	78.4	60.25
16	12	331	138.21	77.86	60.35
20	12	331	138.21	77.71	60.50
24	12	331	138.21	77.63	60.58
O-28	12	331	138.21	69.63	68.58
32	12	331	138.21	69.63	68.58
I-36	12	331	138.21	76.21	62.00
40	12	331	138.21	76.21	62.00
44	10	331	139.08	77.8	61.28
48	12	331	138.21	76.21	62.00
52	12	331	138.21	76.21	62.00
O-56	12	331	138.21	65.64	72.57
60	12	331	138.21	58.27	79.94
64	12	331	138.21	76.89	61.32
66	12	331	138.21	76.48	61.73
I-68	12	331	138.21	76.89	61.32
72	11	331	138.65	70.4	68.25
O-76	11	331	138.65	70.4	68.25
80	11	331	138.65	80.98	57.67
I-84	11	331	138.65	80.98	57.67
88	11	331	138.65	73.98	64.67
100	10	331	139.08	78.45	60.63
104	11	331	138.65	77.76	60.89
106	11	331	138.65	78.86	59.79
108	10	331	139.08	81.62	57.46
112	10	331	139.08	81.8	57.28
116	8	331	139.95	82.87	57.08
120	9	331	139.51	82.44	57.07
124	11	331	138.65	80.92	57.73
126	11	331	138.65	80.66	57.99
128	9	331	139.51	79.46	60.05
136	11	331	138.65	79.16	59.49
140	11	331	138.65	78.62	60.03
144	11	331	138.65	78.28	60.37
148	11	331	138.65	78.04	60.61
152	11	331	138.65	79.22	59.43
156	9	331	139.51	80.14	59.37
160	11	331	138.65	81.82	56.83
164	13	331	137.78	85.27	52.51
168	13	331	137.78	85.52	52.26
172	11	331	138.65	83	55.65
176	10	331	139.08	82.36	56.72
180	11	331	138.65	81.96	56.69
184	11	331	138.65	82.09	56.56
188	11	331	138.65	82.18	56.47
192	11	331	138.65	82.17	56.48
196	12	331	138.21	82.05	56.16
200	13	331	137.78	86.43	51.35
204	13	331	137.78	81.11	56.67
208	13	331	137.78	81.03	56.75
212	13	331	137.78	81.03	56.75
216	12	331	138.21	81.03	57.18
220	11	331	138.65	81.42	57.23
224	12	331	138.21	81.46	56.75
300	11	331	138.65	80.16	58.49
304	14	331	137.35	91.67	45.68
308	13	331	137.78	78.4	59.38
0	14	331	137.35	91.71	45.64
I-28	12	331	138.21	77.63	60.58
O-36	12	331	138.21	69.63	68.58
I-56	12	331	138.21	74.64	63.57
O-68	12	331	138.21	70.03	68.18
I-76	11	331	138.65	78.4	60.25
O-84	11	331	138.65	73.98	64.67

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Nodes 88, 106, and 120

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	72.28	67.23
4	9	331	139.51	71.14	68.37
8	9	331	139.51	71.05	68.46
12	11	331	138.65	69.84	68.81
16	12	331	138.21	69.24	68.97
20	12	331	138.21	68.99	69.22
24	12	331	138.21	68.85	69.36
O-28	12	331	138.21	60.85	77.36
32	12	331	138.21	60.85	77.36
I-36	12	331	138.21	68.09	70.12
40	12	331	138.21	68.09	70.12
44	10	331	139.08	68.95	70.13
48	12	331	138.21	68.1	70.11
52	12	331	138.21	68.14	70.07
O-56	12	331	138.21	60.14	78.07
60	12	331	138.21	60.14	78.07
64	12	331	138.21	68.2	70.01
66	12	331	138.21	68.16	70.05
I-68	12	331	138.21	68.2	70.01
72	11	331	138.65	61.84	76.81
O-76	11	331	138.65	61.84	76.81
80	11	331	138.65	68.2	70.45
I-84	11	331	138.65	62.98	75.67
88	11	331	138.65	42.08	96.57
100	10	331	139.08	69.6	69.48
104	11	331	138.65	68.51	70.14
106	11	331	138.65	67.57	71.08
108	10	331	139.08	68.67	70.41
112	10	331	139.08	68.72	70.36
116	8	331	139.95	69.6	70.35
120	9	331	139.51	69.13	70.38
124	11	331	138.65	68.29	70.36
126	11	331	138.65	68.34	70.31
128	9	331	139.51	69.63	69.88
136	11	331	138.65	72.05	66.60
140	11	331	138.65	70.78	67.87
144	11	331	138.65	69.93	68.72
148	11	331	138.65	69.26	69.39
152	11	331	138.65	72.24	66.41
156	9	331	139.51	73.3	66.21
160	11	331	138.65	71.64	67.01
164	13	331	137.78	70.75	67.03
168	13	331	137.78	70.75	67.03
172	11	331	138.65	70.49	68.16
176	10	331	139.08	71.67	67.41
180	11	331	138.65	70.94	67.71
184	11	331	138.65	69.82	68.83
188	11	331	138.65	69.83	68.82
192	11	331	138.65	68.86	69.79
196	12	331	138.21	68.56	69.65
200	13	331	137.78	70.81	66.97
204	13	331	137.78	67.78	70.00
208	13	331	137.78	67.71	70.07
212	13	331	137.78	67.74	70.04
216	12	331	138.21	67.91	70.30
220	11	331	138.65	68.32	70.33
224	12	331	138.21	68.17	70.04
300	11	331	138.65	67.93	70.72
304	14	331	137.35	71.91	65.44
308	13	331	137.78	72.12	65.66
0	14	331	137.35	71.98	65.37
I-28	12	331	138.21	68.85	69.36
O-36	12	331	138.21	60.85	77.36
I-56	12	331	138.21	68.14	70.07
O-68	12	331	138.21	61.46	76.75
I-76	11	331	138.65	69.84	68.81
O-84	11	331	138.65	48.48	90.17

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Node 88, 106, and 120, Pipe 307 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	55.04	84.47
4	9	331	139.51	54.78	84.73
8	9	331	139.51	54.73	84.78
12	11	331	138.65	53.69	84.96
16	12	331	138.21	53.19	85.02
20	12	331	138.21	53.09	85.12
24	12	331	138.21	53.05	85.16
O-28	12	331	138.21	45.05	93.16
32	12	331	138.21	45.05	93.16
I-36	12	331	138.21	52.96	85.25
40	12	331	138.21	52.96	85.25
44	10	331	139.08	53.79	85.29
48	12	331	138.21	52.98	85.23
52	12	331	138.21	53.04	85.17
O-56	12	331	138.21	45.04	93.17
60	12	331	138.21	45.04	93.17
64	12	331	138.21	53.13	85.08
66	12	331	138.21	53.07	85.14
I-68	12	331	138.21	53.13	85.08
72	11	331	138.65	45.69	92.96
O-76	11	331	138.65	45.69	92.96
80	11	331	138.65	53.9	84.75
I-84	11	331	138.65	48.67	89.98
88	11	331	138.65	27.78	110.87
100	10	331	139.08	53.9	85.18
104	11	331	138.65	53.34	85.31
106	11	331	138.65	52.92	85.73
108	10	331	139.08	55.01	84.07
112	10	331	139.08	55.14	83.94
116	8	331	139.95	56.02	83.93
120	9	331	139.51	55.49	84.02
124	11	331	138.65	53.91	84.74
126	11	331	138.65	53.89	84.76
128	9	331	139.51	54.63	84.88
136	11	331	138.65	54.33	84.32
140	11	331	138.65	53.91	84.74
144	11	331	138.65	53.65	85.00
148	11	331	138.65	53.48	85.17
152	11	331	138.65	54.37	84.28
156	9	331	139.51	55.29	84.22
160	11	331	138.65	56.64	82.01
164	13	331	137.78	61.81	75.97
168	13	331	137.78	62.15	75.63
172	11	331	138.65	57.82	80.83
176	10	331	139.08	57.07	82.01
180	11	331	138.65	56.58	82.07
184	11	331	138.65	56.37	82.28
188	11	331	138.65	56.46	82.19
192	11	331	138.65	55.95	82.70
196	12	331	138.21	56.02	82.19
200	13	331	137.78	63.51	74.27
204	13	331	137.78	54.76	83.02
208	13	331	137.78	54.59	83.19
212	13	331	137.78	54.64	83.14
216	12	331	138.21	54.42	83.79
220	11	331	138.65	54.79	83.86
224	12	331	138.21	55.06	83.15
300	11	331	138.65	53.84	84.81
304	14	331	137.35	71.91	65.44
308	13	331	137.78	53.55	84.23
0	14	331	137.35	71.98	65.37
I-28	12	331	138.21	53.05	85.16
O-36	12	331	138.21	45.05	93.16
I-56	12	331	138.21	53.04	85.17
O-68	12	331	138.21	45.32	92.89
I-76	11	331	138.65	53.69	84.96
O-84	11	331	138.65	34.17	104.48

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 16 and Node 72

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4151.4	2.94
3	12	2070.75	5.87
5	12	1733.58	4.92
9	12	1733.58	4.92
13	12	926.81	2.63
17	12	-573.19	1.63
21	12	-702.19	1.99
25	12	-823.19	2.34
27	8	0	0
29	8	0	0
33	8	0	0
37	8	0	0
41	12	-78.35	0.22
45	12	-78.35	0.22
47	12	-36.65	0.1
49	12	-95.65	0.27
53	8	0	0
57	8	0	0
61	12	-153.85	0.44
63	12	-140.65	0.4
65	12	-1080.08	3.06
67	8	-825.23	5.27
69	8	-825.23	5.27
73	8	674.77	4.31
77	8	674.77	4.31
81	6	0	0
83	12	408.46	1.16
85	6	0	0
101	12	-525.75	1.49
105	12	-604.1	1.71
107	12	-604.1	1.71
109	16	-619.1	0.99
113	12	-290.91	0.83
117	12	-149.02	0.42
121	12	408.46	1.16
123	12	783.1	2.22
125	12	769.9	2.18
129	12	-337.17	0.96
133	12	-2070.75	5.87
137	8	378.44	2.42
141	8	351.44	2.24
145	8	324.44	2.07
149	12	297.44	0.84
151	12	-2449.19	6.95
153	24	-2449.19	1.74
157	10	321.36	1.31
161	10	-69.75	0.28
165	10	-69.75	0.28
169	8	324.34	2.07
173	6	90.08	1.02
177	10	364.11	1.49
179	8	247.02	1.58
181	8	247.02	1.58
185	8	404.64	2.58
187	8	184.62	1.18
189	8	414.43	2.65
191	8	229.81	1.47
193	12	584.49	1.66
195	12	354.67	1.01
197	12	959.75	2.72
201	10	-394.09	1.61
203	12	578.08	1.64
205	12	168.89	0.48
209	8	141.89	0.91
211	12	382.19	1.08
213	12	325.32	0.92
217	16	298.32	0.48
221	6	56.87	0.65
223	16	328.19	0.52
225	12	56.87	0.16
301	12	-619.1	1.76
305	12	-1380.85	3.92
307	24	2770.55	1.96
309	24	2770.55	1.96

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 16 and Node 72, Pipe 307 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4151.4	2.94
3	12	1091.78	3.1
5	12	1614.45	4.58
9	12	1614.45	4.58
13	12	841.38	2.39
17	12	-658.62	1.87
21	12	-787.62	2.23
25	12	-908.62	2.58
27	8	0	0
29	8	0	0
33	8	0	0
37	8	0	0
41	12	-261.07	0.74
45	12	-261.07	0.74
47	12	146.07	0.41
49	12	87.07	0.25
53	8	0	0
57	8	0	0
61	12	28.87	0.08
63	12	42.07	0.12
65	12	-931.06	2.64
67	8	-858.93	5.48
69	8	-858.93	5.48
73	8	641.07	4.09
77	8	641.07	4.09
81	6	0	0
83	12	970.55	2.75
85	6	0	0
101	12	-743.01	2.11
105	12	-1004.08	2.85
107	12	-1004.08	2.85
109	16	-1019.08	1.63
113	12	-383.64	1.09
117	12	-59.48	0.17
121	12	970.55	2.75
123	12	1493.93	4.24
125	12	1480.73	4.2
129	12	522.67	1.48
133	12	-1091.78	3.1
137	8	246.61	1.57
141	8	219.61	1.4
145	8	192.61	1.23
149	12	165.61	0.47
151	12	-1338.39	3.8
153	24	-1338.39	0.95
157	10	-1338.39	5.47
161	10	-1025.73	4.19
165	10	-1025.73	4.19
169	8	942.25	6.01
173	6	-197.55	2.24
177	10	-339.67	1.39
179	8	-169.11	1.08
181	8	-169.11	1.08
185	8	553.38	3.53
187	8	749.49	4.78
189	8	744.69	4.75
191	8	-4.8	0.03
193	12	1057.03	3
195	12	1061.82	3.01
197	12	2156.43	6.12
201	10	-1967.97	8.04
203	12	1067.6	3.03
205	12	351.16	1
209	8	324.16	2.07
211	12	689.44	1.96
213	12	586.51	1.66
217	16	559.51	0.89
221	6	102.93	1.17
223	16	635.44	1.01
225	12	102.93	0.29
301	12	-1019.08	2.89
305	12	-4151.4	11.78
307-XX	24		
309	24	0	0

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 24 and Node 32

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4084.4	2.9
3	12	1925.34	5.46
5	12	1443.28	4.09
9	12	1443.28	4.09
13	12	1311.28	3.72
17	12	1257.28	3.57
21	12	1128.28	3.2
25	12	-1065.87	3.02
27	8	694.15	4.43
29	8	694.15	4.43
33	8	-805.85	5.14
37	8	-805.85	5.14
41	12	4.48	0.01
45	12	4.48	0.01
47	12	-925.33	2.62
49	12	-984.33	2.79
53	8	0	0
57	8	0	0
61	12	-1042.53	2.96
63	12	-1029.33	2.92
65	12	-1143.53	3.24
67	8	0	0
69	8	0	0
73	8	0	0
77	8	0	0
81	6	0	0
83	12	332.08	0.94
85	6	0	0
101	12	-714.11	2.03
105	12	-709.63	2.01
107	12	-709.63	2.01
109	16	-724.63	1.16
113	12	-357.48	1.01
117	12	-221.76	0.63
121	12	332.08	0.94
123	12	701.67	1.99
125	12	688.47	1.95
129	12	-482.06	1.37
133	12	-1925.34	5.46
137	8	432.76	2.76
141	8	405.76	2.59
145	8	378.76	2.42
149	12	351.76	1
151	12	-2358.1	6.69
153	24	-2358.1	1.67
157	10	339.83	1.39
161	10	-56.13	0.23
165	10	-56.13	0.23
169	8	325.61	2.08
173	6	91.82	1.04
177	10	368.96	1.51
179	8	250.14	1.6
181	8	250.14	1.6
185	8	399.59	2.55
187	8	176.45	1.13
189	8	417.43	2.66
191	8	240.98	1.54
193	12	580.85	1.65
195	12	339.87	0.96
197	12	977.74	2.77
201	10	-381.74	1.56
203	12	610.87	1.73
205	12	162.72	0.46
209	8	135.72	0.87
211	12	421.15	1.19
213	12	358.44	1.02
217	16	331.44	0.53
221	6	62.71	0.71
223	16	367.15	0.59
225	12	62.71	0.18
301	12	-724.63	2.06
305	12	-1386.47	3.93
307	24	2697.93	1.91
309	24	2697.93	1.91

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 24 and Node 32, Pipe 307 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4084.4	2.9
3	12	962.13	2.73
5	12	1337.85	3.79
9	12	1337.85	3.79
13	12	1205.85	3.42
17	12	1151.85	3.27
21	12	1022.85	2.9
25	12	-1140.51	3.24
27	8	663.36	4.23
29	8	663.36	4.23
33	8	-836.64	5.34
37	8	-836.64	5.34
41	12	-155.67	0.44
45	12	-155.67	0.44
47	12	-795.97	2.26
49	12	-854.97	2.43
53	8	0	0
57	8	0	0
61	12	-913.17	2.59
63	12	-899.97	2.55
65	12	-1014.17	2.88
67	8	0	0
69	8	0	0
73	8	0	0
77	8	0	0
81	6	0	0
83	12	920.71	2.61
85	6	0	0
101	12	-896.21	2.54
105	12	-1051.88	2.98
107	12	-1051.88	2.98
109	16	-1066.88	1.7
113	12	-422.37	1.2
117	12	-105.7	0.3
121	12	920.71	2.61
123	12	1430.1	4.06
125	12	1416.9	4.02
129	12	375.72	1.07
133	12	-962.13	2.73
137	8	325.3	2.08
141	8	298.3	1.9
145	8	271.3	1.73
149	12	244.3	0.69
151	12	-1287.42	3.65
153	24	-1287.42	0.91
157	10	-1287.42	5.26
161	10	-1002.5	4.09
165	10	-1002.5	4.09
169	8	927.88	5.92
173	6	-190.16	2.16
177	10	-311.93	1.27
179	8	-148.76	0.95
181	8	-148.76	0.95
185	8	539.39	3.44
187	8	715.15	4.56
189	8	737.72	4.71
191	8	22.56	0.14
193	12	1053.41	2.99
195	12	1030.85	2.92
197	12	2127.02	6.03
201	10	-1930.38	7.89
203	12	1069.17	3.03
205	12	343.67	0.97
209	8	316.67	2.02
211	12	698.5	1.98
213	12	594.21	1.69
217	16	567.21	0.91
221	6	104.29	1.18
223	16	644.5	1.03
225	12	104.29	0.3
301	12	-1066.88	3.03
305	12	-4084.4	11.59
307-XX	24		
309	24	0	0

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4090.4	2.9
3	12	1868.17	5.3
5	12	943.75	2.68
9	12	943.75	2.68
13	12	811.75	2.3
17	12	757.75	2.15
21	12	628.75	1.78
25	12	507.75	1.44
27	8	0	0
29	8	0	0
33	8	0	0
37	8	0	0
41	12	-1500.96	4.26
45	12	-1500.96	4.26
47	12	0.96	0
49	12	-58.04	0.16
53	8	1500	9.57
57	8	1500	9.57
61	12	-1616.24	4.58
63	12	-1603.04	4.55
65	12	-1717.24	4.87
67	8	0	0
69	8	0	0
73	8	0	0
77	8	0	0
81	6	0	0
83	12	421.28	1.2
85	6	0	0
101	12	796.37	2.26
105	12	-704.59	2
107	12	-704.59	2
109	16	-719.59	1.15
113	12	-342.28	0.97
117	12	-188.41	0.53
121	12	421.28	1.2
123	12	833.02	2.36
125	12	819.82	2.33
129	12	-924.42	2.62
133	12	-1868.17	5.3
137	8	369.62	2.36
141	8	342.62	2.19
145	8	315.62	2.01
149	12	288.62	0.82
151	12	-2237.79	6.35
153	24	-2237.79	1.59
157	10	399.22	1.63
161	10	-29.39	0.12
165	10	-29.39	0.12
169	8	350.75	2.24
173	6	101.2	1.15
177	10	401.61	1.64
179	8	273.41	1.74
181	8	273.41	1.74
185	8	441.74	2.82
187	8	195.33	1.25
189	8	451.95	2.88
191	8	256.62	1.64
193	12	636.69	1.81
195	12	380.07	1.08
197	12	1046.25	2.97
201	10	-380.14	1.55
203	12	639.18	1.81
205	12	180.87	0.51
209	8	153.87	0.98
211	12	431.31	1.22
213	12	367.08	1.04
217	16	340.08	0.54
221	6	64.23	0.73
223	16	377.31	0.6
225	12	64.23	0.18
301	12	-719.59	2.04
305	12	-1453.39	4.12
307	24	2637.01	1.87
309	24	2637.01	1.87

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60, Pipe 307 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4090.4	2.9
3	12	1014.99	2.88
5	12	743.39	2.11
9	12	743.39	2.11
13	12	611.39	1.73
17	12	557.39	1.58
21	12	428.39	1.22
25	12	307.39	0.87
27	8	0	0
29	8	0	0
33	8	0	0
37	8	0	0
41	12	-1523.85	4.32
45	12	-1523.85	4.32
47	12	23.85	0.07
49	12	-35.15	0.1
53	8	1500	9.57
57	8	1500	9.57
61	12	-1593.35	4.52
63	12	-1580.15	4.48
65	12	-1694.35	4.81
67	8	0	0
69	8	0	0
73	8	0	0
77	8	0	0
81	6	0	0
83	12	940.99	2.67
85	6	0	0
101	12	470.47	1.33
105	12	-1053.38	2.99
107	12	-1053.38	2.99
109	16	-1068.38	1.7
113	12	-420.03	1.19
117	12	-99.84	0.28
121	12	940.99	2.67
123	12	1462.95	4.15
125	12	1449.75	4.11
129	12	-271.6	0.77
133	12	-1014.99	2.88
137	8	244.08	1.56
141	8	217.08	1.39
145	8	190.08	1.21
149	12	163.08	0.46
151	12	-1259.07	3.57
153	24	-1259.07	0.89
157	10	-1259.07	5.14
161	10	-997.82	4.08
165	10	-997.82	4.08
169	8	930.45	5.94
173	6	-186.44	2.12
177	10	-288.25	1.18
179	8	-128.81	0.82
181	8	-128.81	0.82
185	8	551.96	3.52
187	8	707.77	4.52
189	8	744.01	4.75
191	8	36.24	0.23
193	12	1067.83	3.03
195	12	1031.59	2.93
197	12	2135.13	6.06
201	10	-1928.27	7.88
203	12	1076.54	3.05
205	12	347.19	0.98
209	8	320.19	2.04
211	12	702.35	1.99
213	12	597.48	1.69
217	16	570.48	0.91
221	6	104.87	1.19
223	16	648.35	1.03
225	12	104.87	0.3
301	12	-1068.38	3.03
305	12	-4090.4	11.6
307-XX	24		
309	24	0	0

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Nodes 88, 106, and 120

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	5178.4	3.67
3	12	2078.9	5.9
5	12	909.42	2.58
9	12	909.42	2.58
13	12	777.42	2.21
17	12	723.42	2.05
21	12	594.42	1.69
25	12	473.42	1.34
27	8	0	0
29	8	0	0
33	8	0	0
37	8	0	0
41	12	187.38	0.53
45	12	187.38	0.53
47	12	-302.38	0.86
49	12	-361.38	1.03
53	8	0	0
57	8	0	0
61	12	-419.58	1.19
63	12	-406.38	1.15
65	12	-520.58	1.48
67	8	0	0
69	8	0	0
73	8	0	0
77	8	0	0
81	6	-1500	17.02
83	12	-1215.49	3.45
85	6	-1500	17.02
101	12	777.26	2.2
105	12	964.63	2.74
107	12	-535.37	1.52
109	16	-550.37	0.88
113	12	-72.43	0.21
117	12	221.47	0.63
121	12	284.51	0.81
123	12	-608.7	1.73
125	12	-621.9	1.76
129	12	-1169.48	3.32
133	12	-2078.9	5.9
137	8	384.84	2.46
141	8	357.84	2.28
145	8	330.84	2.11
149	12	303.84	0.86
151	12	-2463.73	6.99
153	24	-2463.73	1.75
157	10	674.01	2.75
161	10	59.89	0.24
165	10	59.89	0.24
169	8	513.74	3.28
173	6	152.55	1.73
177	10	587.11	2.4
179	8	407.56	2.6
181	8	407.56	2.6
185	8	636.79	4.06
187	8	256.23	1.64
189	8	666.29	4.25
191	8	410.06	2.62
193	12	1063.04	3.02
195	12	652.98	1.85
197	12	1559.81	4.42
201	10	-453.85	1.85
203	12	879.84	2.5
205	12	320.9	0.91
209	8	293.9	1.88
211	12	531.93	1.51
213	12	452.62	1.28
217	16	425.62	0.68
221	6	79.32	0.9
223	16	477.93	0.76
225	12	79.32	0.22
301	12	-550.37	1.56
305	12	-2040.66	5.79
307	24	3137.74	2.23
309	24	3137.74	2.23

Project: Midway Rising - Phase 3
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Node 88, 106, and 120, Pipe 307 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	5178.4	3.67
3	12	957.55	2.72
5	12	624.66	1.77
9	12	624.66	1.77
13	12	492.66	1.4
17	12	438.66	1.24
21	12	309.66	0.88
25	12	188.66	0.54
27	8	0	0
29	8	0	0
33	8	0	0
37	8	0	0
41	12	303.31	0.86
45	12	303.31	0.86
47	12	-418.31	1.19
49	12	-477.31	1.35
53	8	0	0
57	8	0	0
61	12	-535.51	1.52
63	12	-522.31	1.48
65	12	-636.51	1.81
67	8	0	0
69	8	0	0
73	8	0	0
77	8	0	0
81	6	-1500	17.02
83	12	-450.57	1.28
85	6	-1500	17.02
101	12	320.19	0.91
105	12	623.5	1.77
107	12	-876.5	2.49
109	16	-891.5	1.42
113	12	-74.84	0.21
117	12	415.06	1.18
121	12	1049.43	2.98
123	12	343.82	0.98
125	12	330.62	0.94
129	12	-332.89	0.94
133	12	-957.55	2.72
137	8	212.53	1.36
141	8	185.53	1.18
145	8	158.53	1.01
149	12	131.53	0.37
151	12	-1170.08	3.32
153	24	-1170.08	0.83
157	10	-1170.08	4.78
161	10	-1193.66	4.88
165	10	-1193.66	4.88
169	8	1172.34	7.48
173	6	-195.8	2.22
177	10	-3.42	0.01
179	8	165.39	1.06
181	8	165.39	1.06
185	8	824.39	5.26
187	8	686	4.38
189	8	976.54	6.23
191	8	290.54	1.85
193	12	1634.37	4.64
195	12	1343.83	3.81
197	12	2785.39	7.9
201	10	-2366	9.66
203	12	1414.56	4.01
205	12	516.89	1.47
209	8	489.89	3.13
211	12	870.67	2.47
213	12	740.55	2.1
217	16	713.55	1.14
221	6	130.12	1.48
223	16	816.67	1.3
225	12	130.12	0.37
301	12	-891.5	2.53
305	12	-5178.4	14.69
307-XX	24		
309	24	0	0

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
1	0	304	78.40	24.00	120.0000	0.00
3	2	4	214.20	12.00	120.0000	0.35
5	4	8	42.50	12.00	120.0000	1.05
9	8	12	269.60	12.00	120.0000	1.25
13	12	16	174.30	12.00	120.0000	0.75
17	16	20	319.00	12.00	120.0000	0.90
21	20	24	247.40	12.00	120.0000	0.90
25	24	100	323.90	12.00	120.0000	1.20
27	24	I-28	42.20	8.00	120.0000	1.05
29	O-28	32	291.10	8.00	120.0000	0.36
33	32	O-36	373.20	8.00	120.0000	0.36
37	I-36	40	45.90	8.00	120.0000	1.05
41	40	44	219.30	12.00	120.0000	0.90
45	44	104	105.40	12.00	120.0000	0.75
47	40	48	68.50	12.00	120.0000	0.30
49	48	52	161.10	12.00	120.0000	0.75
53	52	I-56	47.70	8.00	120.0000	1.05
57	O-56	60	367.40	8.00	120.0000	0.36
61	66	64	120.60	12.00	120.0000	0.35
63	52	66	57.40	12.00	120.0000	0.70
65	64	128	314.60	12.00	120.0000	1.35
67	I-68	64	46.40	8.00	120.0000	1.05
69	72	O-68	366.60	8.00	120.0000	0.36
73	O-76	72	406.20	8.00	120.0000	0.36
77	12	I-76	42.00	8.00	120.0000	1.05
81	I-84	80	40.20	6.00	120.0000	1.05
83	80	124	49.40	12.00	120.0000	0.00
85	88	O-84	81.00	6.00	120.0000	0.00
101	100	104	742.30	12.00	120.0000	2.10
105	104	106	679.20	12.00	120.0000	2.58
107	106	300	876.30	12.00	120.0000	1.08
109	108	112	472.60	16.00	120.0000	0.80
113	112	116	726.10	12.00	120.0000	1.10
117	116	120	350.20	12.00	120.0000	0.60
121	120	80	470.80	12.00	120.0000	1.20
123	124	126	32.60	12.00	120.0000	1.50
125	126	128	775.00	12.00	120.0000	0.90
129	128	4	856.80	12.00	120.0000	0.60
133	2	136	106.70	12.00	120.0000	0.48
137	136	140	769.30	8.00	120.0000	1.58
141	140	144	601.50	8.00	120.0000	0.90
145	144	148	528.10	8.00	120.0000	1.55
149	148	100	616.50	12.00	120.0000	0.60
151	136	152	13.00	12.00	120.0000	0.30
153	152	156	774.10	24.00	120.0000	0.78
157	156	160	490.00	10.00	120.0000	1.23
161	160	164	1307.00	10.00	120.0000	2.61
165	164	168	70.30	10.00	120.0000	0.25
169	168	172	403.40	8.00	120.0000	0.60

173	176	172	629.60	6.00	120.0000	1.05
177	160	176	323.70	10.00	120.0000	0.78
179	176	180	151.30	8.00	120.0000	0.80
181	180	184	629.00	8.00	120.0000	0.55
185	184	124	357.50	8.00	120.0000	0.90
187	188	184	10.80	8.00	120.0000	0.30
189	172	188	136.70	8.00	120.0000	0.60
191	188	192	522.00	8.00	120.0000	1.05
193	192	120	378.30	12.00	120.0000	0.90
195	196	192	188.70	12.00	120.0000	0.90
197	200	196	830.70	12.00	120.0000	2.05
201	168	200	45.70	10.00	120.0000	1.05
203	196	204	297.40	12.00	120.0000	1.03
205	204	208	424.80	12.00	120.0000	0.78
209	208	116	272.10	8.00	120.0000	1.05
211	204	212	77.30	12.00	120.0000	1.05
213	212	216	853.90	12.00	120.0000	0.90
217	216	220	347.00	16.00	120.0000	0.60
221	224	220	803.30	6.00	120.0000	1.41
223	220	112	341.70	16.00	120.0000	0.60
225	212	224	238.40	12.00	120.0000	1.23
301	300	108	713.90	12.00	120.0000	0.00
305	200	304	263.00	12.00	120.0000	1.23
307	304	308	541.80	24.00	120.0000	0.75
309	308	156	1421.00	24.00	120.0000	1.09

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE 28 DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)
-18.46	500.00
-18.69	1000.00
-20.77	1500.00
-26.54	2000.00
-33.46	2500.00

THERE IS A DEVICE AT NODE 36 .....> (ID= 2)

THERE IS A DEVICE AT NODE 56 .....> (ID= 2)

THERE IS A DEVICE AT NODE 68 .....> (ID= 2)

THERE IS A DEVICE AT NODE 76 .....> (ID= 2)

THERE IS A DEVICE AT NODE 84 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)
-16.15	450.00
-17.54	600.00
-18.92	750.00
-25.38	1200.00
-33.46	1500.00

THERE IS A DEVICE AT NODE 0 DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)
316.85	0.00
295.38	1714.00
239.37	3428.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
2		0.00	9.00	
4		0.00	9.00	
8		0.00	9.00	
12		132.00	11.00	
16		54.00	12.00	
20		129.00	12.00	
24		121.00	12.00	
O-28	WATTS LF957	0.00	12.00	
32		0.00	12.00	
I-36	WATTS LF957	0.00	12.00	
40		115.00	12.00	
44		0.00	10.00	
48		59.00	12.00	
52		45.00	12.00	
O-56	WATTS LF957	0.00	12.00	
60		0.00	12.00	
64		101.00	12.00	
66		6.00	12.00	
I-68	WATTS LF957	0.00	12.00	
72		0.00	11.00	
O-76	WATTS LF957	0.00	11.00	
80		0.00	11.00	
I-84	AMES LFM500	0.00	11.00	
88		0.00	11.00	
100		0.00	10.00	
104		0.00	11.00	
106		0.00	11.00	
108		0.00	10.00	
112		0.00	10.00	
116		0.00	8.00	
120		15.00	9.00	
124		30.00	11.00	
126		6.00	11.00	
128		15.00	9.00	
136		0.00	11.00	
140		15.00	11.00	
144		15.00	11.00	
148		15.00	11.00	
152		0.00	11.00	
156		0.00	9.00	
160		15.00	11.00	
164		0.00	13.00	
168		0.00	13.00	
172		0.00	11.00	
176		15.00	10.00	
180		0.00	11.00	
184		15.00	11.00	

188		0.00	11.00	
192		0.00	11.00	
196		15.00	12.00	
200		15.00	13.00	
204		15.00	13.00	
208		15.00	13.00	
212		0.00	13.00	
216		15.00	12.00	
220		15.00	11.00	
224		0.00	12.00	
300		15.00	11.00	
304		0.00	14.00	
308		0.00	13.00	
0		----	14.00	14.00
I-28	WATTS LF957	0.00	12.00	
O-36	WATTS LF957	0.00	12.00	
I-56	WATTS LF957	0.00	12.00	
O-68	WATTS LF957	0.00	12.00	
I-76	WATTS LF957	0.00	11.00	
O-84	AMES LFM500	0.00	11.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(P) = 74
NUMBER OF END NODES .....(J) = 60
NUMBER OF PRIMARY LOOPS .....(L) = 14
NUMBER OF SUPPLY NODES .....(F) = 1
NUMBER OF SUPPLY ZONES .....(Z) = 1

==========

Case: 1

MDD Plus 3,000 gpm Fire Flow split between Node 16 and Node 72

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4151.40	0.11	0.00	2.94	1.40	1.40
3	2	4	2070.75	2.43	0.19	5.87	12.20	11.32
5	4	8	1733.58	0.35	0.39	4.92	17.42	8.15
9	8	12	1733.58	2.20	0.47	4.92	9.89	8.15
13	12	16	926.81	0.45	0.08	2.63	3.02	2.55
17	16	20	-573.19	0.33	0.04	1.63	1.17	1.05
21	20	24	-702.19	0.38	0.06	1.99	1.75	1.53
25	24	100	-823.19	0.66	0.10	2.34	2.36	2.05
27	24	I-28	0.00	0.00	0.00	0.00	0.00	0.00
29	O-28	32	0.00	0.00	0.00	0.00	0.00	0.00
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	-78.35	0.01	0.00	0.22	0.03	0.03
45	44	104	-78.35	0.00	0.00	0.22	0.03	0.03
47	40	48	-36.65	0.00	0.00	0.10	0.01	0.01
49	48	52	-95.65	0.01	0.00	0.27	0.04	0.04
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	-153.85	0.01	0.00	0.44	0.10	0.09
63	52	66	-140.65	0.00	0.00	0.40	0.11	0.08
65	64	128	-1080.08	1.07	0.20	3.06	4.02	3.39
67	I-68	64	-825.23	0.69	0.45	5.27	24.59	14.84
69	72	O-68	-825.23	5.44	0.16	5.27	15.27	14.84
73	O-76	72	674.77	4.15	0.10	4.31	10.48	10.23
77	12	I-76	674.77	0.43	0.30	4.31	17.42	10.23
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	408.46	0.03	0.00	1.16	0.56	0.56
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	-525.75	0.66	0.07	1.49	0.99	0.89
105	104	106	-604.10	0.79	0.12	1.71	1.33	1.16
107	106	300	-604.10	1.01	0.05	1.71	1.21	1.16
109	108	112	-619.10	0.14	0.01	0.99	0.32	0.30
113	112	116	-290.91	0.22	0.01	0.83	0.31	0.30
117	116	120	-149.02	0.03	0.00	0.42	0.09	0.09
121	120	80	408.46	0.26	0.03	1.16	0.61	0.56
123	124	126	783.10	0.06	0.11	2.22	5.40	1.87
125	126	128	769.90	1.40	0.07	2.18	1.90	1.81
129	128	4	-337.17	0.34	0.01	0.96	0.40	0.39
133	2	136	-2070.75	1.21	0.26	5.87	13.73	11.32
137	136	140	378.44	2.70	0.14	2.42	3.69	3.50
141	140	144	351.44	1.84	0.07	2.24	3.17	3.05
145	144	148	324.44	1.39	0.10	2.07	2.83	2.63
149	148	100	297.44	0.19	0.01	0.84	0.32	0.31
151	136	152	-2449.19	0.20	0.22	6.95	32.75	15.45
153	152	156	-2449.19	0.41	0.04	1.74	0.58	0.53
157	156	160	321.36	0.43	0.03	1.31	0.94	0.87
161	160	164	-69.75	0.07	0.00	0.28	0.05	0.05
165	164	168	-69.75	0.00	0.00	0.28	0.06	0.05
169	168	172	324.34	1.06	0.04	2.07	2.73	2.63
173	176	172	90.08	0.63	0.02	1.02	1.02	1.00

177	160	176	364.11	0.36	0.03	1.49	1.18	1.10
179	176	180	247.02	0.24	0.03	1.58	1.79	1.59
181	180	184	247.02	1.00	0.02	1.58	1.62	1.59
185	184	124	404.64	1.42	0.09	2.58	4.23	3.97
187	188	184	184.62	0.01	0.01	1.18	1.53	0.93
189	172	188	414.43	0.57	0.07	2.65	4.62	4.15
191	188	192	229.81	0.73	0.04	1.47	1.46	1.39
193	192	120	584.49	0.41	0.04	1.66	1.19	1.09
195	196	192	354.67	0.08	0.01	1.01	0.51	0.43
197	200	196	959.75	2.26	0.24	2.72	3.01	2.73
201	168	200	-394.09	0.06	0.04	1.61	2.20	1.27
203	196	204	578.08	0.32	0.04	1.64	1.21	1.07
205	204	208	168.89	0.05	0.00	0.48	0.12	0.11
209	208	116	141.89	0.15	0.01	0.91	0.62	0.57
211	204	212	382.19	0.04	0.02	1.08	0.74	0.50
213	212	216	325.32	0.31	0.01	0.92	0.38	0.37
217	216	220	298.32	0.03	0.00	0.48	0.08	0.08
221	224	220	56.87	0.34	0.01	0.65	0.44	0.43
223	220	112	328.19	0.03	0.00	0.52	0.10	0.09
225	212	224	56.87	0.00	0.00	0.16	0.02	0.01
301	300	108	-619.10	0.86	0.00	1.76	1.21	1.21
305	200	304	-1380.85	1.41	0.29	3.92	6.46	5.35
307	304	308	2770.55	0.36	0.04	1.96	0.75	0.66
309	308	156	2770.55	0.94	0.07	1.96	0.71	0.66

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	0.00	201.49	184.67	0.0
36	0.00	202.98	184.67	0.0
56	0.00	202.99	184.53	0.0
68	825.23	201.87	183.35	-18.5
76	674.77	201.48	183.01	-18.5
84	0.00	206.95	190.79	0.0
0	4151.40	0.00	209.09	209.1

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	219.23	9.00	210.23	91.10
4		0.00	216.62	9.00	207.62	89.97
8		0.00	215.88	9.00	206.88	89.65
12		132.00	213.21	11.00	202.21	87.62
16		1500.00(**)	212.69	12.00	200.69	86.96
20		129.00	213.06	12.00	201.06	87.12
24		121.00	213.49	12.00	201.49	87.31
O-28	WATTS LF957	0.00	196.67	12.00	184.67	80.02
32		0.00	196.67	12.00	184.67	80.02
I-36	WATTS LF957	0.00	214.98	12.00	202.98	87.96
40		115.00	214.98	12.00	202.98	87.96
44		0.00	214.99	10.00	204.99	88.83
48		59.00	214.98	12.00	202.98	87.96

52		45.00	214.99	12.00	202.99	87.96
O-56	WATTS LF957	0.00	196.53	12.00	184.53	79.96
60		0.00	196.53	12.00	184.53	79.96
64		101.00	215.01	12.00	203.01	87.97
66		13.20(2.20)	215.00	12.00	203.00	87.97
I-68	WATTS LF957	0.00	213.87	12.00	201.87	87.48
72		1500.00	189.75	11.00	178.75	77.46
O-76	WATTS LF957	0.00	194.01	11.00	183.01	79.30
80		0.00	217.95	11.00	206.95	89.68
I-84	AMES LFM500	0.00	217.95	11.00	206.95	89.68
88		0.00	201.79	11.00	190.79	82.68
100		0.00	214.26	10.00	204.26	88.51
104		0.00	214.99	11.00	203.99	88.40
106		0.00	215.90	11.00	204.90	88.79
108		0.00	217.82	10.00	207.82	90.06
112		0.00	217.98	10.00	207.98	90.12
116		0.00	218.20	8.00	210.20	91.09
120		27.00(1.80)	218.24	9.00	209.24	90.67
124		30.00	217.92	11.00	206.92	89.67
126		13.20(2.20)	217.74	11.00	206.74	89.59
128		27.00(1.80)	216.27	9.00	207.27	89.82
136		0.00	220.70	11.00	209.70	90.87
140		27.00(1.80)	217.86	11.00	206.86	89.64
144		27.00(1.80)	215.95	11.00	204.95	88.81
148		27.00(1.80)	214.46	11.00	203.46	88.16
152		0.00	221.12	11.00	210.12	91.05
156		0.00	221.57	9.00	212.57	92.11
160		27.00(1.80)	221.11	11.00	210.11	91.05
164		0.00	221.18	13.00	208.18	90.21
168		0.00	221.18	13.00	208.18	90.21
172		0.00	220.08	11.00	209.08	90.60
176		27.00(1.80)	220.72	10.00	210.72	91.31
180		0.00	220.45	11.00	209.45	90.76
184		27.00(1.80)	219.43	11.00	208.43	90.32
188		0.00	219.45	11.00	208.45	90.33
192		0.00	218.69	11.00	207.69	90.00
196		27.00(1.80)	218.78	12.00	206.78	89.61
200		27.00(1.80)	221.28	13.00	208.28	90.26
204		27.00(1.80)	218.42	13.00	205.42	89.02
208		27.00(1.80)	218.37	13.00	205.37	88.99
212		0.00	218.36	13.00	205.36	88.99
216		27.00(1.80)	218.04	12.00	206.04	89.28
220		27.00(1.80)	218.01	11.00	207.01	89.70
224		0.00	218.36	12.00	206.36	89.42
300		15.00	216.96	11.00	205.96	89.25
304		0.00	222.98	14.00	208.98	90.56
308		0.00	222.58	13.00	209.58	90.82
0		----	223.09	14.00	209.09	90.61
I-28	WATTS LF957	0.00	213.49	12.00	201.49	87.31
O-36	WATTS LF957	0.00	196.67	12.00	184.67	80.02
I-56	WATTS LF957	0.00	214.99	12.00	202.99	87.96
O-68	WATTS LF957	0.00	195.35	12.00	183.35	79.45
I-76	WATTS LF957	0.00	212.48	11.00	201.48	87.31
O-84	AMES LFM500	0.00	201.79	11.00	190.79	82.68

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
156	92.11	72	77.46
176	91.31	O-76	79.30
2	91.10	O-68	79.45
116	91.09	O-56	79.96
152	91.05	60	79.96

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
151	6.95	47	0.10
3	5.87	225	0.16
133	5.87	41	0.22
67	5.27	45	0.22
69	5.27	49	0.27

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4151.40	

NET SYSTEM INFLOW = 4151.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4151.40

Case: 2

MDD Plus 3,000 gpm Fire Flow split between Node 16 and Node 72, Pipe 307 Closed

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4151.40	0.11	0.00	2.94	1.40	1.40
3	2	4	1091.78	0.74	0.05	3.10	3.70	3.46
5	4	8	1614.45	0.30	0.34	4.58	15.19	7.14
9	8	12	1614.45	1.93	0.41	4.58	8.65	7.14
13	12	16	841.38	0.37	0.07	2.39	2.52	2.14
17	16	20	-658.62	0.43	0.05	1.87	1.51	1.36
21	20	24	-787.62	0.47	0.07	2.23	2.17	1.89
25	24	100	-908.62	0.80	0.12	2.58	2.84	2.46
27	24	I-28	0.00	0.00	0.00	0.00	0.00	0.00
29	O-28	32	0.00	0.00	0.00	0.00	0.00	0.00
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	-261.07	0.05	0.01	0.74	0.28	0.24
45	44	104	-261.07	0.03	0.01	0.74	0.31	0.24
47	40	48	146.07	0.01	0.00	0.41	0.10	0.08
49	48	52	87.07	0.01	0.00	0.25	0.04	0.03
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	28.87	0.00	0.00	0.08	0.00	0.00
63	52	66	42.07	0.00	0.00	0.12	0.01	0.01
65	64	128	-931.06	0.81	0.15	2.64	3.04	2.58
67	I-68	64	-858.93	0.74	0.49	5.48	26.55	15.99
69	72	O-68	-858.93	5.86	0.17	5.48	16.44	15.99
73	O-76	72	641.07	3.78	0.09	4.09	9.53	9.30
77	12	I-76	641.07	0.39	0.27	4.09	15.80	9.30
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	970.55	0.14	0.00	2.75	2.78	2.78
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	-743.01	1.26	0.14	2.11	1.89	1.70
105	104	106	-1004.08	2.01	0.32	2.85	3.44	2.96
107	106	300	-1004.08	2.60	0.14	2.85	3.12	2.96
109	108	112	-1019.08	0.35	0.03	1.63	0.82	0.75
113	112	116	-383.64	0.36	0.02	1.09	0.53	0.50
117	116	120	-59.48	0.01	0.00	0.17	0.02	0.02
121	120	80	970.55	1.31	0.14	2.75	3.08	2.78
123	124	126	1493.93	0.20	0.42	4.24	19.01	6.19
125	126	128	1480.73	4.72	0.25	4.20	6.40	6.08
129	128	4	522.67	0.76	0.02	1.48	0.91	0.88
133	2	136	-1091.78	0.37	0.07	3.10	4.13	3.46
137	136	140	246.61	1.22	0.06	1.57	1.66	1.59
141	140	144	219.61	0.77	0.03	1.40	1.32	1.28
145	144	148	192.61	0.53	0.04	1.23	1.07	1.00
149	148	100	165.61	0.06	0.00	0.47	0.11	0.11
151	136	152	-1338.39	0.07	0.07	3.80	10.21	5.05
153	152	156	-1338.39	0.13	0.01	0.95	0.19	0.17
157	156	160	-1338.39	6.01	0.57	5.47	13.43	12.26
161	160	164	-1025.73	9.79	0.71	4.19	8.04	7.49
165	164	168	-1025.73	0.53	0.07	4.19	8.46	7.49
169	168	172	942.25	7.66	0.34	6.01	19.81	18.98
173	176	172	-197.55	2.69	0.08	2.24	4.40	4.27

177	160	176	-339.67	0.31	0.02	1.39	1.04	0.97
179	176	180	-169.11	0.12	0.01	1.08	0.88	0.79
181	180	184	-169.11	0.50	0.01	1.08	0.80	0.79
185	184	124	553.38	2.53	0.17	3.53	7.57	7.08
187	188	184	749.49	0.13	0.11	4.78	22.29	12.42
189	172	188	744.69	1.68	0.21	4.75	13.81	12.27
191	188	192	-4.80	0.00	0.00	0.03	0.00	0.00
193	192	120	1057.03	1.23	0.13	3.00	3.59	3.26
195	196	192	1061.82	0.62	0.13	3.01	3.96	3.29
197	200	196	2156.43	10.14	1.19	6.12	13.64	12.21
201	168	200	-1967.97	1.14	1.05	8.04	48.09	25.04
203	196	204	1067.60	0.99	0.15	3.03	3.81	3.32
205	204	208	351.16	0.18	0.01	1.00	0.45	0.42
209	208	116	324.16	0.72	0.07	2.07	2.89	2.63
211	204	212	689.44	0.11	0.06	1.96	2.28	1.48
213	212	216	586.51	0.93	0.04	1.66	1.14	1.09
217	216	220	559.51	0.09	0.01	0.89	0.27	0.25
221	224	220	102.93	1.02	0.03	1.17	1.31	1.28
223	220	112	635.44	0.11	0.01	1.01	0.34	0.31
225	212	224	102.93	0.01	0.00	0.29	0.05	0.04
301	300	108	-1019.08	2.17	0.00	2.89	3.05	3.05
305	200	304	-4151.40	10.80	2.65	11.78	51.13	41.06
307-XX	304	308						
309	308	156	0.00	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	0.00	173.75	157.67	0.0
36	0.00	175.98	157.67	0.0
56	0.00	175.97	157.51	0.0
68	858.93	174.74	156.20	-18.5
76	641.07	173.51	155.04	-18.5
84	0.00	183.65	167.49	0.0
0	4151.40	0.00	209.09	209.1

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	188.94	9.00	179.94	77.97
4		0.00	188.15	9.00	179.15	77.63
8		0.00	187.50	9.00	178.50	77.35
12		132.00	185.17	11.00	174.17	75.47
16		1500.00(**)	184.73	12.00	172.73	74.85
20		129.00	185.21	12.00	173.21	75.06
24		121.00	185.75	12.00	173.75	75.29
O-28	WATTS LF957	0.00	169.67	12.00	157.67	68.32
32		0.00	169.67	12.00	157.67	68.32
I-36	WATTS LF957	0.00	187.98	12.00	175.98	76.26
40		115.00	187.98	12.00	175.98	76.26
44		0.00	188.04	10.00	178.04	77.15
48		59.00	187.98	12.00	175.98	76.26

52		45.00	187.97	12.00	175.97	76.25
O-56	WATTS LF957	0.00	169.51	12.00	157.51	68.25
60		0.00	169.51	12.00	157.51	68.25
64		101.00	187.97	12.00	175.97	76.25
66		13.20(2.20)	187.97	12.00	175.97	76.25
I-68	WATTS LF957	0.00	186.74	12.00	174.74	75.72
72		1500.00	162.17	11.00	151.17	65.51
O-76	WATTS LF957	0.00	166.04	11.00	155.04	67.19
80		0.00	194.65	11.00	183.65	79.58
I-84	AMES LFM500	0.00	194.65	11.00	183.65	79.58
88		0.00	178.49	11.00	167.49	72.58
100		0.00	186.67	10.00	176.67	76.56
104		0.00	188.08	11.00	177.08	76.73
106		0.00	190.41	11.00	179.41	77.75
108		0.00	195.32	10.00	185.32	80.31
112		0.00	195.71	10.00	185.71	80.47
116		0.00	196.09	8.00	188.09	81.51
120		27.00(1.80)	196.10	9.00	187.10	81.08
124		30.00	194.51	11.00	183.51	79.52
126		13.20(2.20)	193.89	11.00	182.89	79.25
128		27.00(1.80)	188.93	9.00	179.93	77.97
136		0.00	189.38	11.00	178.38	77.30
140		27.00(1.80)	188.10	11.00	177.10	76.74
144		27.00(1.80)	187.31	11.00	176.31	76.40
148		27.00(1.80)	186.74	11.00	175.74	76.15
152		0.00	189.52	11.00	178.52	77.36
156		0.00	189.66	9.00	180.66	78.29
160		27.00(1.80)	196.24	11.00	185.24	80.27
164		0.00	206.74	13.00	193.74	83.95
168		0.00	207.34	13.00	194.34	84.21
172		0.00	199.34	11.00	188.34	81.62
176		27.00(1.80)	196.58	10.00	186.58	80.85
180		0.00	196.71	11.00	185.71	80.47
184		27.00(1.80)	197.21	11.00	186.21	80.69
188		0.00	197.46	11.00	186.46	80.80
192		0.00	197.46	11.00	186.46	80.80
196		27.00(1.80)	198.20	12.00	186.20	80.69
200		27.00(1.80)	209.53	13.00	196.53	85.16
204		27.00(1.80)	197.07	13.00	184.07	79.76
208		27.00(1.80)	196.88	13.00	183.88	79.68
212		0.00	196.89	13.00	183.89	79.69
216		27.00(1.80)	195.92	12.00	183.92	79.70
220		27.00(1.80)	195.83	11.00	184.83	80.09
224		0.00	196.88	12.00	184.88	80.11
300		15.00	193.15	11.00	182.15	78.93
304		0.00	222.98	14.00	208.98	90.56
308		0.00	189.66	13.00	176.66	76.55
0		----	223.09	14.00	209.09	90.61
I-28	WATTS LF957	0.00	185.75	12.00	173.75	75.29
O-36	WATTS LF957	0.00	169.67	12.00	157.67	68.32
I-56	WATTS LF957	0.00	187.97	12.00	175.97	76.25
O-68	WATTS LF957	0.00	168.20	12.00	156.20	67.69
I-76	WATTS LF957	0.00	184.51	11.00	173.51	75.19
O-84	AMES LFM500	0.00	178.49	11.00	167.49	72.58

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
0	90.61	72	65.51
304	90.56	O-76	67.19
200	85.16	O-68	67.69
168	84.21	O-56	68.25
164	83.95	60	68.25

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
305	11.78	191	0.03
201	8.04	61	0.08
197	6.12	63	0.12
169	6.01	117	0.17
67	5.48	49	0.25

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4151.40	

NET SYSTEM INFLOW = 4151.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4151.40

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Case: 3

MDD Plus 3,000 gpm Fire Flow split between Node 24 and Node 32

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4084.40	0.11	0.00	2.90	1.36	1.36
3	2	4	1925.34	2.12	0.16	5.46	10.65	9.89
5	4	8	1443.28	0.25	0.27	4.09	12.23	5.80
9	8	12	1443.28	1.56	0.33	4.09	7.01	5.80
13	12	16	1311.28	0.85	0.16	3.72	5.78	4.86
17	16	20	1257.28	1.43	0.18	3.57	5.05	4.49
21	20	24	1128.28	0.91	0.14	3.20	4.26	3.68
25	24	100	-1065.87	1.07	0.17	3.02	3.84	3.31
27	24	I-28	694.15	0.45	0.32	4.43	18.36	10.78
29	O-28	32	694.15	3.14	0.11	4.43	11.15	10.78
33	32	O-36	-805.85	5.30	0.15	5.14	14.60	14.21
37	I-36	40	-805.85	0.65	0.43	5.14	23.60	14.21
41	40	44	4.48	0.00	0.00	0.01	0.00	0.00
45	44	104	4.48	0.00	0.00	0.01	0.00	0.00
47	40	48	-925.33	0.17	0.03	2.62	3.02	2.55
49	48	52	-984.33	0.46	0.09	2.79	3.42	2.86
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	-1042.53	0.38	0.05	2.96	3.57	3.18
63	52	66	-1029.33	0.18	0.09	2.92	4.72	3.10
65	64	128	-1143.53	1.19	0.22	3.24	4.47	3.77
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
73	O-76	72	0.00	0.00	0.00	0.00	0.00	0.00
77	12	I-76	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	332.08	0.02	0.00	0.94	0.38	0.38
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	-714.11	1.17	0.13	2.03	1.76	1.58
105	104	106	-709.63	1.06	0.16	2.01	1.80	1.56
107	106	300	-709.63	1.37	0.07	2.01	1.64	1.56
109	108	112	-724.63	0.19	0.02	1.16	0.43	0.40
113	112	116	-357.48	0.32	0.02	1.01	0.46	0.44
117	116	120	-221.76	0.06	0.00	0.63	0.19	0.18
121	120	80	332.08	0.18	0.02	0.94	0.42	0.38
123	124	126	701.67	0.05	0.09	1.99	4.36	1.53
125	126	128	688.47	1.14	0.05	1.95	1.54	1.47
129	128	4	-482.06	0.65	0.02	1.37	0.78	0.76
133	2	136	-1925.34	1.06	0.22	5.46	11.98	9.89
137	136	140	432.76	3.46	0.19	2.76	4.73	4.49
141	140	144	405.76	2.40	0.09	2.59	4.14	3.99
145	144	148	378.76	1.85	0.14	2.42	3.78	3.51
149	148	100	351.76	0.26	0.01	1.00	0.44	0.42
151	136	152	-2358.10	0.19	0.21	6.69	30.44	14.40
153	152	156	-2358.10	0.38	0.03	1.67	0.54	0.49
157	156	160	339.83	0.47	0.04	1.39	1.04	0.97
161	160	164	-56.13	0.05	0.00	0.23	0.04	0.03
165	164	168	-56.13	0.00	0.00	0.23	0.04	0.03
169	168	172	325.61	1.07	0.04	2.08	2.75	2.65
173	176	172	91.82	0.65	0.02	1.04	1.06	1.03

177	160	176	368.96	0.37	0.03	1.51	1.21	1.13
179	176	180	250.14	0.25	0.03	1.60	1.84	1.63
181	180	184	250.14	1.02	0.02	1.60	1.66	1.63
185	184	124	399.59	1.39	0.09	2.55	4.13	3.87
187	188	184	176.45	0.01	0.01	1.13	1.40	0.85
189	172	188	417.43	0.57	0.07	2.66	4.69	4.20
191	188	192	240.98	0.79	0.04	1.54	1.59	1.52
193	192	120	580.85	0.41	0.04	1.65	1.18	1.08
195	196	192	339.87	0.08	0.01	0.96	0.47	0.40
197	200	196	977.74	2.34	0.24	2.77	3.12	2.82
201	168	200	-381.74	0.05	0.04	1.56	2.07	1.20
203	196	204	610.87	0.35	0.05	1.73	1.34	1.18
205	204	208	162.72	0.04	0.00	0.46	0.11	0.10
209	208	116	135.72	0.14	0.01	0.87	0.57	0.52
211	204	212	421.15	0.05	0.02	1.19	0.89	0.59
213	212	216	358.44	0.38	0.01	1.02	0.46	0.44
217	216	220	331.44	0.03	0.00	0.53	0.10	0.09
221	224	220	62.71	0.41	0.01	0.71	0.52	0.51
223	220	112	367.15	0.04	0.00	0.59	0.12	0.11
225	212	224	62.71	0.00	0.00	0.18	0.02	0.02
301	300	108	-724.63	1.16	0.00	2.06	1.62	1.62
305	200	304	-1386.47	1.42	0.30	3.93	6.51	5.39
307	304	308	2697.93	0.34	0.04	1.91	0.71	0.63
309	308	156	2697.93	0.90	0.06	1.91	0.68	0.63

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	694.15	201.22	182.74	-18.5
36	805.85	203.45	184.95	-18.5
56	0.00	205.29	186.83	0.0
68	0.00	206.00	187.53	0.0
76	0.00	206.66	188.68	0.0
84	0.00	209.76	193.60	0.0
0	4084.40	0.00	211.90	211.9

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	222.35	9.00	213.35	92.45
4		0.00	220.07	9.00	211.07	91.46
8		0.00	219.55	9.00	210.55	91.24
12		132.00	217.66	11.00	206.66	89.55
16		54.00	216.66	12.00	204.66	88.68
20		129.00	215.04	12.00	203.04	87.99
24		1500.00(**)	213.99	12.00	201.99	87.53
O-28	WATTS LF957	0.00	194.74	12.00	182.74	79.19
32		1500.00	191.50	12.00	179.50	77.78
I-36	WATTS LF957	0.00	215.45	12.00	203.45	88.16
40		115.00	216.54	12.00	204.54	88.63
44		0.00	216.54	10.00	206.54	89.50
48		59.00	216.74	12.00	204.74	88.72

52		45.00	217.29	12.00	205.29	88.96
O-56	WATTS LF957	0.00	198.83	12.00	186.83	80.96
60		0.00	198.83	12.00	186.83	80.96
64		101.00	218.00	12.00	206.00	89.26
66		13.20(2.20)	217.57	12.00	205.57	89.08
I-68	WATTS LF957	0.00	218.00	12.00	206.00	89.26
72		0.00	199.68	11.00	188.68	81.76
O-76	WATTS LF957	0.00	199.68	11.00	188.68	81.76
80		0.00	220.76	11.00	209.76	90.90
I-84	AMES LFM500	0.00	220.76	11.00	209.76	90.90
88		0.00	204.60	11.00	193.60	83.90
100		0.00	215.23	10.00	205.23	88.93
104		0.00	216.54	11.00	205.54	89.07
106		0.00	217.76	11.00	206.76	89.60
108		0.00	220.35	10.00	210.35	91.15
112		0.00	220.55	10.00	210.55	91.24
116		0.00	220.89	8.00	212.89	92.25
120		27.00(1.80)	220.96	9.00	211.96	91.85
124		30.00	220.74	11.00	209.74	90.89
126		13.20(2.20)	220.60	11.00	209.60	90.83
128		27.00(1.80)	219.40	9.00	210.40	91.17
136		0.00	223.63	11.00	212.63	92.14
140		27.00(1.80)	219.99	11.00	208.99	90.56
144		27.00(1.80)	217.50	11.00	206.50	89.48
148		27.00(1.80)	215.50	11.00	204.50	88.62
152		0.00	224.03	11.00	213.03	92.31
156		0.00	224.44	9.00	215.44	93.36
160		27.00(1.80)	223.93	11.00	212.93	92.27
164		0.00	223.98	13.00	210.98	91.42
168		0.00	223.98	13.00	210.98	91.43
172		0.00	222.87	11.00	211.87	91.81
176		27.00(1.80)	223.54	10.00	213.54	92.53
180		0.00	223.26	11.00	212.26	91.98
184		27.00(1.80)	222.22	11.00	211.22	91.53
188		0.00	222.23	11.00	211.23	91.53
192		0.00	221.40	11.00	210.40	91.17
196		27.00(1.80)	221.49	12.00	209.49	90.78
200		27.00(1.80)	224.08	13.00	211.08	91.47
204		27.00(1.80)	221.09	13.00	208.09	90.17
208		27.00(1.80)	221.04	13.00	208.04	90.15
212		0.00	221.02	13.00	208.02	90.14
216		27.00(1.80)	220.63	12.00	208.63	90.41
220		27.00(1.80)	220.59	11.00	209.59	90.82
224		0.00	221.01	12.00	209.01	90.57
300		15.00	219.19	11.00	208.19	90.22
304		0.00	225.79	14.00	211.79	91.77
308		0.00	225.40	13.00	212.40	92.04
0		----	225.90	14.00	211.90	91.82
I-28	WATTS LF957	0.00	213.22	12.00	201.22	87.19
O-36	WATTS LF957	0.00	196.95	12.00	184.95	80.14
I-56	WATTS LF957	0.00	217.29	12.00	205.29	88.96
O-68	WATTS LF957	0.00	199.53	12.00	187.53	81.26
I-76	WATTS LF957	0.00	217.66	11.00	206.66	89.55
O-84	AMES LFM500	0.00	204.60	11.00	193.60	83.90

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
156	93.36	32	77.78
176	92.53	O-28	79.19
2	92.45	O-36	80.14
152	92.31	O-56	80.96
160	92.27	60	80.96

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
151	6.69	41	0.01
3	5.46	45	0.01
133	5.46	225	0.18
33	5.14	161	0.23
37	5.14	165	0.23

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4084.40	

NET SYSTEM INFLOW = 4084.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4084.40

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Case: 4

MDD Plus 3,000 gpm Fire Flow split between Node 24 and Node 32, Pipe 307 Closed

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4084.40	0.11	0.00	2.90	1.36	1.36
3	2	4	962.13	0.59	0.04	2.73	2.93	2.74
5	4	8	1337.85	0.21	0.23	3.79	10.57	5.04
9	8	12	1337.85	1.36	0.28	3.79	6.08	5.04
13	12	16	1205.85	0.73	0.14	3.42	4.94	4.16
17	16	20	1151.85	1.22	0.15	3.27	4.29	3.82
21	20	24	1022.85	0.76	0.12	2.90	3.54	3.07
25	24	100	-1140.51	1.22	0.20	3.24	4.35	3.75
27	24	I-28	663.36	0.42	0.29	4.23	16.83	9.91
29	O-28	32	663.36	2.88	0.10	4.23	10.25	9.91
33	32	O-36	-836.64	5.68	0.16	5.34	15.65	15.23
37	I-36	40	-836.64	0.70	0.46	5.34	25.35	15.23
41	40	44	-155.67	0.02	0.00	0.44	0.11	0.09
45	44	104	-155.67	0.01	0.00	0.44	0.12	0.09
47	40	48	-795.97	0.13	0.02	2.26	2.27	1.93
49	48	52	-854.97	0.35	0.07	2.43	2.63	2.20
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	-913.17	0.30	0.04	2.59	2.79	2.49
63	52	66	-899.97	0.14	0.07	2.55	3.65	2.42
65	64	128	-1014.17	0.95	0.17	2.88	3.57	3.02
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
73	O-76	72	0.00	0.00	0.00	0.00	0.00	0.00
77	12	I-76	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	920.71	0.12	0.00	2.61	2.52	2.52
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	-896.21	1.78	0.21	2.54	2.68	2.40
105	104	106	-1051.88	2.19	0.36	2.98	3.75	3.23
107	106	300	-1051.88	2.83	0.15	2.98	3.40	3.23
109	108	112	-1066.88	0.39	0.04	1.70	0.89	0.82
113	112	116	-422.37	0.43	0.02	1.20	0.63	0.60
117	116	120	-105.70	0.02	0.00	0.30	0.05	0.05
121	120	80	920.71	1.19	0.13	2.61	2.79	2.52
123	124	126	1430.10	0.19	0.38	4.06	17.46	5.70
125	126	128	1416.90	4.35	0.23	4.02	5.90	5.61
129	128	4	375.72	0.41	0.01	1.07	0.49	0.48
133	2	136	-962.13	0.29	0.06	2.73	3.26	2.74
137	136	140	325.30	2.04	0.11	2.08	2.78	2.65
141	140	144	298.30	1.36	0.05	1.90	2.34	2.25
145	144	148	271.30	1.00	0.07	1.73	2.03	1.89
149	148	100	244.30	0.13	0.00	0.69	0.22	0.22
151	136	152	-1287.42	0.06	0.06	3.65	9.47	4.70
153	152	156	-1287.42	0.12	0.01	0.91	0.17	0.16
157	156	160	-1287.42	5.59	0.53	5.26	12.49	11.41
161	160	164	-1002.50	9.38	0.68	4.09	7.70	7.18
165	164	168	-1002.50	0.50	0.07	4.09	8.11	7.18
169	168	172	927.88	7.44	0.33	5.92	19.25	18.44
173	176	172	-190.16	2.50	0.08	2.16	4.10	3.98

177	160	176	-311.93	0.27	0.02	1.27	0.89	0.83
179	176	180	-148.76	0.09	0.01	0.95	0.70	0.62
181	180	184	-148.76	0.39	0.01	0.95	0.63	0.62
185	184	124	539.39	2.41	0.17	3.44	7.22	6.75
187	188	184	715.15	0.12	0.10	4.56	20.37	11.39
189	172	188	737.72	1.65	0.21	4.71	13.57	12.06
191	188	192	22.56	0.01	0.00	0.14	0.02	0.02
193	192	120	1053.41	1.23	0.12	2.99	3.57	3.24
195	196	192	1030.85	0.59	0.12	2.92	3.74	3.11
197	200	196	2127.02	9.89	1.16	6.03	13.29	11.90
201	168	200	-1930.38	1.10	1.01	7.89	46.34	24.16
203	196	204	1069.17	0.99	0.15	3.03	3.82	3.33
205	204	208	343.67	0.17	0.01	0.97	0.43	0.41
209	208	116	316.67	0.69	0.07	2.02	2.76	2.52
211	204	212	698.50	0.12	0.06	1.98	2.34	1.51
213	212	216	594.21	0.96	0.04	1.69	1.17	1.12
217	216	220	567.21	0.09	0.01	0.91	0.28	0.25
221	224	220	104.29	1.05	0.03	1.18	1.35	1.31
223	220	112	644.50	0.11	0.01	1.03	0.35	0.32
225	212	224	104.29	0.01	0.00	0.30	0.05	0.04
301	300	108	-1066.88	2.37	0.00	3.03	3.32	3.32
305	200	304	-4084.40	10.48	2.56	11.59	49.59	39.84
307-XX	304	308						
309	308	156	0.00	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	663.36	174.74	156.27	-18.5
36	836.64	177.65	159.13	-18.5
56	0.00	179.40	160.93	0.0
68	0.00	179.94	161.48	0.0
76	0.00	179.56	162.63	0.0
84	0.00	187.33	171.18	0.0
0	4084.40	0.00	211.90	211.9

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	193.27	9.00	184.27	79.85
4		0.00	192.64	9.00	183.64	79.58
8		0.00	192.19	9.00	183.19	79.38
12		132.00	190.56	11.00	179.56	77.81
16		54.00	189.69	12.00	177.69	77.00
20		129.00	188.33	12.00	176.33	76.41
24		1500.00(**)	187.45	12.00	175.45	76.03
O-28	WATTS LF957	0.00	168.27	12.00	156.27	67.72
32		1500.00	165.29	12.00	153.29	66.42
I-36	WATTS LF957	0.00	189.65	12.00	177.65	76.98
40		115.00	190.82	12.00	178.82	77.49
44		0.00	190.84	10.00	180.84	78.36
48		59.00	190.97	12.00	178.97	77.56

52		45.00	191.40	12.00	179.40	77.74
O-56	WATTS LF957	0.00	172.93	12.00	160.93	69.74
60		0.00	172.93	12.00	160.93	69.74
64		101.00	191.94	12.00	179.94	77.97
66		13.20(2.20)	191.61	12.00	179.61	77.83
I-68	WATTS LF957	0.00	191.94	12.00	179.94	77.97
72		0.00	173.63	11.00	162.63	70.47
O-76	WATTS LF957	0.00	173.63	11.00	162.63	70.47
80		0.00	198.33	11.00	187.33	81.18
I-84	AMES LFM500	0.00	198.33	11.00	187.33	81.18
88		0.00	182.18	11.00	171.18	74.18
100		0.00	188.86	10.00	178.86	77.51
104		0.00	190.85	11.00	179.85	77.94
106		0.00	193.40	11.00	182.40	79.04
108		0.00	198.75	10.00	188.75	81.79
112		0.00	199.17	10.00	189.17	81.97
116		0.00	199.63	8.00	191.63	83.04
120		27.00(1.80)	199.65	9.00	190.65	82.61
124		30.00	198.21	11.00	187.21	81.12
126		13.20(2.20)	197.64	11.00	186.64	80.88
128		27.00(1.80)	193.07	9.00	184.07	79.76
136		0.00	193.62	11.00	182.62	79.13
140		27.00(1.80)	191.48	11.00	180.48	78.21
144		27.00(1.80)	190.07	11.00	179.07	77.60
148		27.00(1.80)	189.00	11.00	178.00	77.13
152		0.00	193.74	11.00	182.74	79.19
156		0.00	193.88	9.00	184.88	80.11
160		27.00(1.80)	200.00	11.00	189.00	81.90
164		0.00	210.06	13.00	197.06	85.39
168		0.00	210.63	13.00	197.63	85.64
172		0.00	202.86	11.00	191.86	83.14
176		27.00(1.80)	200.28	10.00	190.28	82.46
180		0.00	200.39	11.00	189.39	82.07
184		27.00(1.80)	200.79	11.00	189.79	82.24
188		0.00	201.01	11.00	190.01	82.34
192		0.00	201.00	11.00	190.00	82.33
196		27.00(1.80)	201.70	12.00	189.70	82.20
200		27.00(1.80)	212.75	13.00	199.75	86.56
204		27.00(1.80)	200.57	13.00	187.57	81.28
208		27.00(1.80)	200.38	13.00	187.38	81.20
212		0.00	200.38	13.00	187.38	81.20
216		27.00(1.80)	199.39	12.00	187.39	81.20
220		27.00(1.80)	199.29	11.00	188.29	81.59
224		0.00	200.37	12.00	188.37	81.63
300		15.00	196.38	11.00	185.38	80.33
304		0.00	225.79	14.00	211.79	91.77
308		0.00	193.88	13.00	180.88	78.38
0		----	225.90	14.00	211.90	91.82
I-28	WATTS LF957	0.00	186.74	12.00	174.74	75.72
O-36	WATTS LF957	0.00	171.13	12.00	159.13	68.96
I-56	WATTS LF957	0.00	191.40	12.00	179.40	77.74
O-68	WATTS LF957	0.00	173.48	12.00	161.48	69.97
I-76	WATTS LF957	0.00	190.56	11.00	179.56	77.81
O-84	AMES LFM500	0.00	182.18	11.00	171.18	74.18

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
0	91.82	32	66.42
304	91.77	O-28	67.72
200	86.56	O-36	68.96
168	85.64	O-56	69.74
164	85.39	60	69.74

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
305	11.59	191	0.14
201	7.89	225	0.30
197	6.03	117	0.30
169	5.92	41	0.44
33	5.34	45	0.44

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4084.40	

NET SYSTEM INFLOW = 4084.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4084.40

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Case: 5

MDD Plus 3,000 gpm Fire Flow split between Node 40 and Node 60

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4090.40	0.11	0.00	2.90	1.37	1.37
3	2	4	1868.17	2.00	0.15	5.30	10.07	9.36
5	4	8	943.75	0.11	0.12	2.68	5.39	2.64
9	8	12	943.75	0.71	0.14	2.68	3.16	2.64
13	12	16	811.75	0.35	0.06	2.30	2.35	2.00
17	16	20	757.75	0.56	0.06	2.15	1.96	1.76
21	20	24	628.75	0.31	0.04	1.78	1.43	1.25
25	24	100	507.75	0.27	0.04	1.44	0.96	0.84
27	24	I-28	0.00	0.00	0.00	0.00	0.00	0.00
29	O-28	32	0.00	0.00	0.00	0.00	0.00	0.00
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	-1500.96	1.37	0.25	4.26	7.39	6.24
45	44	104	-1500.96	0.66	0.21	4.26	8.24	6.24
47	40	48	0.96	0.00	0.00	0.00	0.00	0.00
49	48	52	-58.04	0.00	0.00	0.16	0.02	0.02
53	52	I-56	1500.00	2.14	1.49	9.57	76.22	44.89
57	O-56	60	1500.00	16.49	0.51	9.57	46.29	44.89
61	66	64	-1616.24	0.86	0.11	4.58	8.10	7.16
63	52	66	-1603.04	0.40	0.22	4.55	10.96	7.05
65	64	128	-1717.24	2.52	0.50	4.87	9.59	8.01
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
73	O-76	72	0.00	0.00	0.00	0.00	0.00	0.00
77	12	I-76	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	421.28	0.03	0.00	1.20	0.59	0.59
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	796.37	1.43	0.17	2.26	2.15	1.93
105	104	106	-704.59	1.04	0.16	2.00	1.77	1.54
107	106	300	-704.59	1.35	0.07	2.00	1.61	1.54
109	108	112	-719.59	0.19	0.02	1.15	0.43	0.39
113	112	116	-342.28	0.29	0.02	0.97	0.43	0.40
117	116	120	-188.41	0.05	0.00	0.53	0.14	0.13
121	120	80	421.28	0.28	0.03	1.20	0.65	0.59
123	124	126	833.02	0.07	0.13	2.36	6.09	2.10
125	126	128	819.82	1.58	0.08	2.33	2.13	2.04
129	128	4	-924.42	2.18	0.06	2.62	2.62	2.54
133	2	136	-1868.17	1.00	0.21	5.30	11.32	9.36
137	136	140	369.62	2.58	0.14	2.36	3.53	3.35
141	140	144	342.62	1.75	0.07	2.19	3.03	2.91
145	144	148	315.62	1.32	0.10	2.01	2.69	2.50
149	148	100	288.62	0.18	0.01	0.82	0.30	0.29
151	136	152	-2237.79	0.17	0.19	6.35	27.51	13.07
153	152	156	-2237.79	0.35	0.03	1.59	0.49	0.45
157	156	160	399.22	0.64	0.05	1.63	1.41	1.30
161	160	164	-29.39	0.01	0.00	0.12	0.01	0.01
165	164	168	-29.39	0.00	0.00	0.12	0.01	0.01
169	168	172	350.75	1.23	0.05	2.24	3.16	3.04
173	176	172	101.20	0.78	0.02	1.15	1.27	1.24

177	160	176	401.61	0.43	0.03	1.64	1.42	1.32
179	176	180	273.41	0.29	0.04	1.74	2.17	1.92
181	180	184	273.41	1.21	0.03	1.74	1.96	1.92
185	184	124	441.74	1.67	0.11	2.82	4.98	4.67
187	188	184	195.33	0.01	0.01	1.25	1.70	1.03
189	172	188	451.95	0.67	0.08	2.88	5.43	4.87
191	188	192	256.62	0.89	0.04	1.64	1.79	1.71
193	192	120	636.69	0.48	0.05	1.81	1.40	1.27
195	196	192	380.07	0.09	0.02	1.08	0.58	0.49
197	200	196	1046.25	2.66	0.28	2.97	3.54	3.20
201	168	200	-380.14	0.05	0.04	1.55	2.05	1.19
203	196	204	639.18	0.38	0.05	1.81	1.46	1.28
205	204	208	180.87	0.05	0.00	0.51	0.13	0.12
209	208	116	153.87	0.18	0.02	0.98	0.72	0.66
211	204	212	431.31	0.05	0.02	1.22	0.94	0.62
213	212	216	367.08	0.39	0.02	1.04	0.48	0.46
217	216	220	340.08	0.03	0.00	0.54	0.11	0.10
221	224	220	64.23	0.43	0.01	0.73	0.55	0.53
223	220	112	377.31	0.04	0.00	0.60	0.13	0.12
225	212	224	64.23	0.00	0.00	0.18	0.02	0.02
301	300	108	-719.59	1.14	0.00	2.04	1.60	1.60
305	200	304	-1453.39	1.55	0.32	4.12	7.11	5.88
307	304	308	2637.01	0.33	0.04	1.87	0.68	0.61
309	308	156	2637.01	0.86	0.06	1.87	0.65	0.61

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	0.00	205.68	187.22	0.0
36	0.00	201.28	187.22	0.0
56	1500.00	197.65	176.88	-20.8
68	0.00	202.89	188.75	0.0
76	0.00	208.07	189.61	0.0
84	0.00	208.79	192.63	0.0
0	4090.40	0.00	211.64	211.6

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	222.31	9.00	213.31	92.43
4		0.00	220.15	9.00	211.15	91.50
8		0.00	219.92	9.00	210.92	91.40
12		132.00	219.07	11.00	208.07	90.16
16		54.00	218.66	12.00	206.66	89.55
20		129.00	218.03	12.00	206.03	89.28
24		121.00	217.68	12.00	205.68	89.13
O-28	WATTS LF957	0.00	199.22	12.00	187.22	81.13
32		0.00	199.22	12.00	187.22	81.13
I-36	WATTS LF957	0.00	213.28	12.00	201.28	87.22
40		1500.00(**)	213.28	12.00	201.28	87.22
44		0.00	214.90	10.00	204.90	88.79
48		59.00	213.28	12.00	201.28	87.22

52		45.00	213.28	12.00	201.28	87.22
O-56	WATTS LF957	0.00	188.88	12.00	176.88	76.65
60		1500.00	171.87	12.00	159.87	69.28
64		101.00	214.89	12.00	202.89	87.92
66		13.20(2.20)	213.91	12.00	201.91	87.50
I-68	WATTS LF957	0.00	214.89	12.00	202.89	87.92
72		0.00	200.61	11.00	189.61	82.16
O-76	WATTS LF957	0.00	200.61	11.00	189.61	82.16
80		0.00	219.79	11.00	208.79	90.47
I-84	AMES LFM500	0.00	219.79	11.00	208.79	90.47
88		0.00	203.63	11.00	192.63	83.47
100		0.00	217.37	10.00	207.37	89.86
104		0.00	215.77	11.00	204.77	88.73
106		0.00	216.98	11.00	205.98	89.26
108		0.00	219.53	10.00	209.53	90.80
112		0.00	219.73	10.00	209.73	90.88
116		0.00	220.04	8.00	212.04	91.89
120		27.00(1.80)	220.09	9.00	211.09	91.47
124		30.00	219.76	11.00	208.76	90.46
126		13.20(2.20)	219.56	11.00	208.56	90.38
128		27.00(1.80)	217.91	9.00	208.91	90.53
136		0.00	223.51	11.00	212.51	92.09
140		27.00(1.80)	220.80	11.00	209.80	90.91
144		27.00(1.80)	218.98	11.00	207.98	90.12
148		27.00(1.80)	217.56	11.00	206.56	89.51
152		0.00	223.87	11.00	212.87	92.24
156		0.00	224.25	9.00	215.25	93.27
160		27.00(1.80)	223.56	11.00	212.56	92.11
164		0.00	223.57	13.00	210.57	91.25
168		0.00	223.57	13.00	210.57	91.25
172		0.00	222.30	11.00	211.30	91.56
176		27.00(1.80)	223.10	10.00	213.10	92.34
180		0.00	222.77	11.00	211.77	91.77
184		27.00(1.80)	221.54	11.00	210.54	91.23
188		0.00	221.56	11.00	210.56	91.24
192		0.00	220.62	11.00	209.62	90.84
196		27.00(1.80)	220.73	12.00	208.73	90.45
200		27.00(1.80)	223.67	13.00	210.67	91.29
204		27.00(1.80)	220.29	13.00	207.29	89.83
208		27.00(1.80)	220.24	13.00	207.24	89.80
212		0.00	220.22	13.00	207.22	89.80
216		27.00(1.80)	219.82	12.00	207.82	90.05
220		27.00(1.80)	219.78	11.00	208.78	90.47
224		0.00	220.22	12.00	208.22	90.23
300		15.00	218.39	11.00	207.39	89.87
304		0.00	225.54	14.00	211.54	91.67
308		0.00	225.17	13.00	212.17	91.94
0		----	225.64	14.00	211.64	91.71
I-28	WATTS LF957	0.00	217.68	12.00	205.68	89.13
O-36	WATTS LF957	0.00	199.22	12.00	187.22	81.13
I-56	WATTS LF957	0.00	209.65	12.00	197.65	85.65
O-68	WATTS LF957	0.00	200.75	12.00	188.75	81.79
I-76	WATTS LF957	0.00	219.07	11.00	208.07	90.16
O-84	AMES LFM500	0.00	203.63	11.00	192.63	83.47

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
156	93.27	60	69.28
2	92.43	O-56	76.65
176	92.34	O-28	81.13
152	92.24	32	81.13
160	92.11	O-36	81.13

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
53	9.57	47	0.00
57	9.57	161	0.12
151	6.35	165	0.12
3	5.30	49	0.16
133	5.30	225	0.18

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4090.40	

NET SYSTEM INFLOW = 4090.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4090.40

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Case: 6

MDD Plus 3,000 gpm Fire Flow split between Node 40 and Node 60, Pipe 307 Closed

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4090.40	0.11	0.00	2.90	1.37	1.37
3	2	4	1014.99	0.65	0.05	2.88	3.23	3.02
5	4	8	743.39	0.07	0.07	2.11	3.40	1.70
9	8	12	743.39	0.46	0.09	2.11	2.02	1.70
13	12	16	611.39	0.21	0.04	1.73	1.38	1.18
17	16	20	557.39	0.32	0.03	1.58	1.11	1.00
21	20	24	428.39	0.15	0.02	1.22	0.70	0.61
25	24	100	307.39	0.11	0.01	0.87	0.37	0.33
27	24	I-28	0.00	0.00	0.00	0.00	0.00	0.00
29	O-28	32	0.00	0.00	0.00	0.00	0.00	0.00
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	-1523.85	1.41	0.26	4.32	7.61	6.42
45	44	104	-1523.85	0.68	0.22	4.32	8.48	6.42
47	40	48	23.85	0.00	0.00	0.07	0.00	0.00
49	48	52	-35.15	0.00	0.00	0.10	0.01	0.01
53	52	I-56	1500.00	2.14	1.49	9.57	76.22	44.89
57	O-56	60	1500.00	16.49	0.51	9.57	46.29	44.89
61	66	64	-1593.35	0.84	0.11	4.52	7.89	6.97
63	52	66	-1580.15	0.39	0.22	4.48	10.67	6.86
65	64	128	-1694.35	2.46	0.48	4.81	9.35	7.81
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
73	O-76	72	0.00	0.00	0.00	0.00	0.00	0.00
77	12	I-76	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	940.99	0.13	0.00	2.67	2.63	2.63
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	470.47	0.54	0.06	1.33	0.81	0.73
105	104	106	-1053.38	2.20	0.36	2.99	3.77	3.24
107	106	300	-1053.38	2.84	0.15	2.99	3.41	3.24
109	108	112	-1068.38	0.39	0.04	1.70	0.90	0.82
113	112	116	-420.03	0.43	0.02	1.19	0.62	0.59
117	116	120	-99.84	0.01	0.00	0.28	0.04	0.04
121	120	80	940.99	1.24	0.13	2.67	2.91	2.63
123	124	126	1462.95	0.19	0.40	4.15	18.25	5.95
125	126	128	1449.75	4.53	0.24	4.11	6.16	5.85
129	128	4	-271.60	0.23	0.01	0.77	0.27	0.26
133	2	136	-1014.99	0.32	0.06	2.88	3.60	3.02
137	136	140	244.08	1.20	0.06	1.56	1.63	1.56
141	140	144	217.08	0.75	0.03	1.39	1.30	1.25
145	144	148	190.08	0.52	0.04	1.21	1.05	0.98
149	148	100	163.08	0.06	0.00	0.46	0.11	0.10
151	136	152	-1259.07	0.06	0.06	3.57	9.08	4.51
153	152	156	-1259.07	0.12	0.01	0.89	0.17	0.15
157	156	160	-1259.07	5.37	0.51	5.14	11.98	10.95
161	160	164	-997.82	9.30	0.67	4.08	7.63	7.12
165	164	168	-997.82	0.50	0.06	4.08	8.04	7.12
169	168	172	930.45	7.48	0.33	5.94	19.35	18.54
173	176	172	-186.44	2.41	0.07	2.12	3.95	3.83

177	160	176	-288.25	0.23	0.02	1.18	0.77	0.71
179	176	180	-128.81	0.07	0.01	0.82	0.53	0.48
181	180	184	-128.81	0.30	0.01	0.82	0.49	0.48
185	184	124	551.96	2.52	0.17	3.52	7.53	7.05
187	188	184	707.77	0.12	0.10	4.52	19.97	11.17
189	172	188	744.01	1.67	0.21	4.75	13.79	12.25
191	188	192	36.24	0.02	0.00	0.23	0.05	0.05
193	192	120	1067.83	1.26	0.13	3.03	3.66	3.32
195	196	192	1031.59	0.59	0.12	2.93	3.75	3.12
197	200	196	2135.13	9.96	1.17	6.06	13.39	11.98
201	168	200	-1928.27	1.10	1.01	7.88	46.24	24.11
203	196	204	1076.54	1.00	0.15	3.05	3.87	3.37
205	204	208	347.19	0.18	0.01	0.98	0.44	0.41
209	208	116	320.19	0.70	0.07	2.04	2.82	2.57
211	204	212	702.35	0.12	0.06	1.99	2.37	1.53
213	212	216	597.48	0.97	0.04	1.69	1.18	1.13
217	216	220	570.48	0.09	0.01	0.91	0.28	0.26
221	224	220	104.87	1.06	0.03	1.19	1.36	1.32
223	220	112	648.35	0.11	0.01	1.03	0.35	0.32
225	212	224	104.87	0.01	0.00	0.30	0.05	0.05
301	300	108	-1068.38	2.37	0.00	3.03	3.32	3.32
305	200	304	-4090.40	10.51	2.57	11.60	49.72	39.95
307-XX	304	308						
309	308	156	0.00	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	0.00	179.16	160.69	0.0
36	0.00	175.87	160.69	0.0
56	1500.00	172.24	151.47	-20.8
68	0.00	177.44	161.60	0.0
76	0.00	180.92	162.46	0.0
84	0.00	186.87	170.72	0.0
0	4090.40	0.00	211.64	211.6

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	193.30	9.00	184.30	79.86
4		0.00	192.61	9.00	183.61	79.56
8		0.00	192.47	9.00	183.47	79.50
12		132.00	191.92	11.00	180.92	78.40
16		54.00	191.68	12.00	179.68	77.86
20		129.00	191.33	12.00	179.33	77.71
24		121.00	191.16	12.00	179.16	77.63
O-28	WATTS LF957	0.00	172.69	12.00	160.69	69.63
32		0.00	172.69	12.00	160.69	69.63
I-36	WATTS LF957	0.00	187.87	12.00	175.87	76.21
40		1500.00(**)	187.87	12.00	175.87	76.21
44		0.00	189.54	10.00	179.54	77.80
48		59.00	187.87	12.00	175.87	76.21

52		45.00	187.87	12.00	175.87	76.21
O-56	WATTS LF957	0.00	163.47	12.00	151.47	65.64
60		1500.00	146.46	12.00	134.46	58.27
64		101.00	189.44	12.00	177.44	76.89
66		13.20(2.20)	188.49	12.00	176.49	76.48
I-68	WATTS LF957	0.00	189.44	12.00	177.44	76.89
72		0.00	173.46	11.00	162.46	70.40
O-76	WATTS LF957	0.00	173.46	11.00	162.46	70.40
80		0.00	197.87	11.00	186.87	80.98
I-84	AMES LFM500	0.00	197.87	11.00	186.87	80.98
88		0.00	181.72	11.00	170.72	73.98
100		0.00	191.03	10.00	181.03	78.45
104		0.00	190.44	11.00	179.44	77.76
106		0.00	192.99	11.00	181.99	78.86
108		0.00	198.35	10.00	188.35	81.62
112		0.00	198.78	10.00	188.78	81.80
116		0.00	199.23	8.00	191.23	82.87
120		27.00(1.80)	199.24	9.00	190.24	82.44
124		30.00	197.74	11.00	186.74	80.92
126		13.20(2.20)	197.15	11.00	186.15	80.66
128		27.00(1.80)	192.38	9.00	183.38	79.46
136		0.00	193.69	11.00	182.69	79.16
140		27.00(1.80)	192.43	11.00	181.43	78.62
144		27.00(1.80)	191.65	11.00	180.65	78.28
148		27.00(1.80)	191.10	11.00	180.10	78.04
152		0.00	193.81	11.00	182.81	79.22
156		0.00	193.93	9.00	184.93	80.14
160		27.00(1.80)	199.80	11.00	188.80	81.82
164		0.00	209.78	13.00	196.78	85.27
168		0.00	210.35	13.00	197.35	85.52
172		0.00	202.54	11.00	191.54	83.00
176		27.00(1.80)	200.05	10.00	190.05	82.36
180		0.00	200.13	11.00	189.13	81.96
184		27.00(1.80)	200.44	11.00	189.44	82.09
188		0.00	200.65	11.00	189.65	82.18
192		0.00	200.63	11.00	189.63	82.17
196		27.00(1.80)	201.34	12.00	189.34	82.05
200		27.00(1.80)	212.46	13.00	199.46	86.43
204		27.00(1.80)	200.18	13.00	187.18	81.11
208		27.00(1.80)	200.00	13.00	187.00	81.03
212		0.00	200.00	13.00	187.00	81.03
216		27.00(1.80)	198.99	12.00	186.99	81.03
220		27.00(1.80)	198.90	11.00	187.90	81.42
224		0.00	199.99	12.00	187.99	81.46
300		15.00	195.98	11.00	184.98	80.16
304		0.00	225.54	14.00	211.54	91.67
308		0.00	193.93	13.00	180.93	78.40
0		----	225.64	14.00	211.64	91.71
I-28	WATTS LF957	0.00	191.16	12.00	179.16	77.63
O-36	WATTS LF957	0.00	172.69	12.00	160.69	69.63
I-56	WATTS LF957	0.00	184.24	12.00	172.24	74.64
O-68	WATTS LF957	0.00	173.60	12.00	161.60	70.03
I-76	WATTS LF957	0.00	191.92	11.00	180.92	78.40
O-84	AMES LFM500	0.00	181.72	11.00	170.72	73.98

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
0	91.71	60	58.27
304	91.67	O-56	65.64
200	86.43	O-28	69.63
168	85.52	32	69.63
164	85.27	O-36	69.63

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
305	11.60	47	0.07
53	9.57	49	0.10
57	9.57	191	0.23
201	7.88	117	0.28
197	6.06	225	0.30

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4090.40	

NET SYSTEM INFLOW = 4090.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4090.40

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Case: 7

MDD Plus 4,000 gpm Fire Flow split between Nodes 88, 106, and 120

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	5178.40	0.17	0.00	3.67	2.11	2.11
3	2	4	2078.90	2.44	0.19	5.90	12.29	11.41
5	4	8	909.42	0.10	0.11	2.58	5.02	2.47
9	8	12	909.42	0.67	0.13	2.58	2.95	2.47
13	12	16	777.42	0.32	0.06	2.21	2.17	1.85
17	16	20	723.42	0.52	0.06	2.05	1.80	1.61
21	20	24	594.42	0.28	0.04	1.69	1.28	1.12
25	24	100	473.42	0.24	0.03	1.34	0.84	0.74
27	24	I-28	0.00	0.00	0.00	0.00	0.00	0.00
29	O-28	32	0.00	0.00	0.00	0.00	0.00	0.00
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	187.38	0.03	0.00	0.53	0.15	0.13
45	44	104	187.38	0.01	0.00	0.53	0.16	0.13
47	40	48	-302.38	0.02	0.00	0.86	0.37	0.32
49	48	52	-361.38	0.07	0.01	1.03	0.52	0.45
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	-419.58	0.07	0.01	1.19	0.65	0.59
63	52	66	-406.38	0.03	0.01	1.15	0.81	0.55
65	64	128	-520.58	0.28	0.05	1.48	1.02	0.88
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
73	O-76	72	0.00	0.00	0.00	0.00	0.00	0.00
77	12	I-76	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	-1500.00	7.33	4.72	17.02	299.71	182.24
83	80	124	-1215.49	0.21	0.00	3.45	4.22	4.22
85	88	O-84	-1500.00	14.76	0.00	17.02	182.24	182.24
101	100	104	777.26	1.37	0.16	2.20	2.06	1.84
105	104	106	964.63	1.87	0.30	2.74	3.19	2.75
107	106	300	-535.37	0.81	0.04	1.52	0.97	0.92
109	108	112	-550.37	0.11	0.01	0.88	0.26	0.24
113	112	116	-72.43	0.02	0.00	0.21	0.02	0.02
117	116	120	221.47	0.06	0.00	0.63	0.19	0.18
121	120	80	284.51	0.13	0.01	0.81	0.31	0.29
123	124	126	-608.70	0.04	0.07	1.73	3.30	1.17
125	126	128	-621.90	0.95	0.04	1.76	1.28	1.22
129	128	4	-1169.48	3.37	0.10	3.32	4.05	3.93
133	2	136	-2078.90	1.22	0.26	5.90	13.83	11.41
137	136	140	384.84	2.78	0.15	2.46	3.81	3.61
141	140	144	357.84	1.90	0.07	2.28	3.28	3.16
145	144	148	330.84	1.44	0.11	2.11	2.93	2.73
149	148	100	303.84	0.20	0.01	0.86	0.34	0.32
151	136	152	-2463.73	0.20	0.23	6.99	33.12	15.62
153	152	156	-2463.73	0.41	0.04	1.75	0.58	0.53
157	156	160	674.01	1.69	0.14	2.75	3.74	3.44
161	160	164	59.89	0.05	0.00	0.24	0.04	0.04
165	164	168	59.89	0.00	0.00	0.24	0.04	0.04
169	168	172	513.74	2.49	0.10	3.28	6.42	6.17
173	176	172	152.55	1.66	0.05	1.73	2.72	2.64

177	160	176	587.11	0.86	0.07	2.40	2.88	2.67
179	176	180	407.56	0.61	0.08	2.60	4.57	4.02
181	180	184	407.56	2.53	0.06	2.60	4.11	4.02
185	184	124	636.79	3.28	0.23	4.06	9.83	9.18
187	188	184	256.23	0.02	0.01	1.64	2.86	1.70
189	172	188	666.29	1.37	0.17	4.25	11.22	9.99
191	188	192	410.06	2.12	0.11	2.62	4.28	4.07
193	192	120	1063.04	1.25	0.13	3.02	3.63	3.29
195	196	192	652.98	0.25	0.05	1.85	1.59	1.34
197	200	196	1559.81	5.57	0.62	4.42	7.45	6.70
201	168	200	-453.85	0.08	0.06	1.85	2.88	1.65
203	196	204	879.84	0.69	0.10	2.50	2.66	2.32
205	204	208	320.90	0.15	0.01	0.91	0.38	0.36
209	208	116	293.90	0.60	0.06	1.88	2.40	2.19
211	204	212	531.93	0.07	0.04	1.51	1.39	0.91
213	212	216	452.62	0.58	0.02	1.28	0.70	0.68
217	216	220	425.62	0.05	0.00	0.68	0.16	0.15
221	224	220	79.32	0.63	0.02	0.90	0.81	0.79
223	220	112	477.93	0.06	0.01	0.76	0.20	0.18
225	212	224	79.32	0.01	0.00	0.22	0.03	0.03
301	300	108	-550.37	0.69	0.00	1.56	0.97	0.97
305	200	304	-2040.66	2.90	0.64	5.79	13.45	11.02
307	304	308	3137.74	0.45	0.06	2.23	0.94	0.84
309	308	156	3137.74	1.19	0.08	2.23	0.90	0.84

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	0.00	158.89	140.43	0.0
36	0.00	157.14	140.43	0.0
56	0.00	157.25	138.79	0.0
68	0.00	157.37	141.84	0.0
76	0.00	161.16	142.70	0.0
84	1500.00	145.34	111.88	-33.5
0	5178.40	0.00	166.10	166.1

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	175.80	9.00	166.80	72.28
4		0.00	173.17	9.00	164.17	71.14
8		0.00	172.95	9.00	163.95	71.05
12		132.00	172.16	11.00	161.16	69.84
16		54.00	171.78	12.00	159.78	69.24
20		129.00	171.21	12.00	159.21	68.99
24		121.00	170.89	12.00	158.89	68.85
O-28	WATTS LF957	0.00	152.43	12.00	140.43	60.85
32		0.00	152.43	12.00	140.43	60.85
I-36	WATTS LF957	0.00	169.14	12.00	157.14	68.09
40		115.00	169.14	12.00	157.14	68.09
44		0.00	169.11	10.00	159.11	68.95
48		59.00	169.16	12.00	157.16	68.10

52		45.00	169.25	12.00	157.25	68.14
O-56	WATTS LF957	0.00	150.79	12.00	138.79	60.14
60		0.00	150.79	12.00	138.79	60.14
64		101.00	169.37	12.00	157.37	68.20
66		13.20(2.20)	169.30	12.00	157.30	68.16
I-68	WATTS LF957	0.00	169.37	12.00	157.37	68.20
72		0.00	153.70	11.00	142.70	61.84
O-76	WATTS LF957	0.00	153.70	11.00	142.70	61.84
80		0.00	168.39	11.00	157.39	68.20
I-84	AMES LFM500	0.00	156.34	11.00	145.34	62.98
88		1500.00	108.12	11.00	97.12	42.08
100		0.00	170.62	10.00	160.62	69.60
104		0.00	169.09	11.00	158.09	68.51
106		1500.00	166.92	11.00	155.92	67.57
108		0.00	168.46	10.00	158.46	68.67
112		0.00	168.59	10.00	158.59	68.72
116		0.00	168.60	8.00	160.60	69.60
120		1000.00(**)	168.54	9.00	159.54	69.13
124		30.00	168.60	11.00	157.60	68.29
126		13.20(2.20)	168.71	11.00	157.71	68.34
128		27.00(1.80)	169.70	9.00	160.70	69.63
136		0.00	177.27	11.00	166.27	72.05
140		27.00(1.80)	174.35	11.00	163.35	70.78
144		27.00(1.80)	172.37	11.00	161.37	69.93
148		27.00(1.80)	170.82	11.00	159.82	69.26
152		0.00	177.70	11.00	166.70	72.24
156		0.00	178.16	9.00	169.16	73.30
160		27.00(1.80)	176.32	11.00	165.32	71.64
164		0.00	176.27	13.00	163.27	70.75
168		0.00	176.27	13.00	163.27	70.75
172		0.00	173.68	11.00	162.68	70.49
176		27.00(1.80)	175.39	10.00	165.39	71.67
180		0.00	174.70	11.00	163.70	70.94
184		27.00(1.80)	172.11	11.00	161.11	69.82
188		0.00	172.14	11.00	161.14	69.83
192		0.00	169.91	11.00	158.91	68.86
196		27.00(1.80)	170.21	12.00	158.21	68.56
200		27.00(1.80)	176.40	13.00	163.40	70.81
204		27.00(1.80)	169.42	13.00	156.42	67.78
208		27.00(1.80)	169.26	13.00	156.26	67.71
212		0.00	169.31	13.00	156.31	67.74
216		27.00(1.80)	168.71	12.00	156.71	67.91
220		27.00(1.80)	168.66	11.00	157.66	68.32
224		0.00	169.31	12.00	157.31	68.17
300		15.00	167.77	11.00	156.77	67.93
304		0.00	179.94	14.00	165.94	71.91
308		0.00	179.43	13.00	166.43	72.12
0		----	180.10	14.00	166.10	71.98
I-28	WATTS LF957	0.00	170.89	12.00	158.89	68.85
O-36	WATTS LF957	0.00	152.43	12.00	140.43	60.85
I-56	WATTS LF957	0.00	169.25	12.00	157.25	68.14
O-68	WATTS LF957	0.00	153.84	12.00	141.84	61.46
I-76	WATTS LF957	0.00	172.16	11.00	161.16	69.84
O-84	AMES LFM500	0.00	122.88	11.00	111.88	48.48

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
156	73.30	88	42.08
2	72.28	O-84	48.48
152	72.24	O-56	60.14
308	72.12	60	60.14
136	72.05	O-28	60.85

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
81	17.02	113	0.21
85	17.02	225	0.22
151	6.99	161	0.24
3	5.90	165	0.24
133	5.90	41	0.53

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	5178.40	

NET SYSTEM INFLOW = 5178.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5178.40

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Case: 8

MDD Plus 4,000 gpm Fire Flow split between Nodes 88,106, and 120, Pipe 307 Closed

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	5178.40	0.17	0.00	3.67	2.11	2.11
3	2	4	957.55	0.58	0.04	2.72	2.90	2.71
5	4	8	624.66	0.05	0.05	1.77	2.43	1.23
9	8	12	624.66	0.33	0.06	1.77	1.46	1.23
13	12	16	492.66	0.14	0.02	1.40	0.92	0.79
17	16	20	438.66	0.20	0.02	1.24	0.71	0.64
21	20	24	309.66	0.08	0.01	0.88	0.38	0.34
25	24	100	188.66	0.04	0.01	0.54	0.15	0.13
27	24	I-28	0.00	0.00	0.00	0.00	0.00	0.00
29	O-28	32	0.00	0.00	0.00	0.00	0.00	0.00
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	303.31	0.07	0.01	0.86	0.37	0.32
45	44	104	303.31	0.03	0.01	0.86	0.40	0.32
47	40	48	-418.31	0.04	0.01	1.19	0.68	0.59
49	48	52	-477.31	0.12	0.02	1.35	0.88	0.75
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	-535.51	0.11	0.01	1.52	1.03	0.93
63	52	66	-522.31	0.05	0.02	1.48	1.30	0.88
65	64	128	-636.51	0.40	0.07	1.81	1.49	1.27
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
73	O-76	72	0.00	0.00	0.00	0.00	0.00	0.00
77	12	I-76	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	-1500.00	7.33	4.72	17.02	299.71	182.24
83	80	124	-450.57	0.03	0.00	1.28	0.67	0.67
85	88	O-84	-1500.00	14.76	0.00	17.02	182.24	182.24
101	100	104	320.19	0.26	0.03	0.91	0.39	0.36
105	104	106	623.50	0.83	0.13	1.77	1.41	1.23
107	106	300	-876.50	2.02	0.10	2.49	2.42	2.30
109	108	112	-891.50	0.28	0.03	1.42	0.64	0.59
113	112	116	-74.84	0.02	0.00	0.21	0.03	0.02
117	116	120	415.06	0.20	0.01	1.18	0.61	0.58
121	120	80	1049.43	1.51	0.17	2.98	3.57	3.22
123	124	126	343.82	0.01	0.02	0.98	1.09	0.41
125	126	128	330.62	0.29	0.01	0.94	0.39	0.38
129	128	4	-332.89	0.33	0.01	0.94	0.39	0.38
133	2	136	-957.55	0.29	0.05	2.72	3.23	2.71
137	136	140	212.53	0.93	0.05	1.36	1.26	1.20
141	140	144	185.53	0.56	0.02	1.18	0.97	0.94
145	144	148	158.53	0.37	0.02	1.01	0.75	0.70
149	148	100	131.53	0.04	0.00	0.37	0.07	0.07
151	136	152	-1170.08	0.05	0.05	3.32	7.88	3.93
153	152	156	-1170.08	0.10	0.01	0.83	0.15	0.13
157	156	160	-1170.08	4.68	0.44	4.78	10.45	9.56
161	160	164	-1193.66	12.97	0.96	4.88	10.66	9.92
165	164	168	-1193.66	0.70	0.09	4.88	11.23	9.92
169	168	172	1172.34	11.47	0.52	7.48	29.73	28.44
173	176	172	-195.80	2.64	0.08	2.22	4.33	4.20

177	160	176	-3.42	0.00	0.00	0.01	0.00	0.00
179	176	180	165.39	0.11	0.01	1.06	0.85	0.76
181	180	184	165.39	0.48	0.01	1.06	0.77	0.76
185	184	124	824.39	5.30	0.39	5.26	15.90	14.82
187	188	184	686.00	0.11	0.09	4.38	18.81	10.54
189	172	188	976.54	2.77	0.36	6.23	22.92	20.28
191	188	192	290.54	1.12	0.06	1.85	2.25	2.15
193	192	120	1634.37	2.76	0.30	4.64	8.10	7.31
195	196	192	1343.83	0.96	0.20	3.81	6.16	5.08
197	200	196	2785.39	16.29	1.99	7.90	22.00	19.61
201	168	200	-2366.00	1.61	1.52	9.66	68.54	35.22
203	196	204	1414.56	1.66	0.26	4.01	6.46	5.59
205	204	208	516.89	0.37	0.03	1.47	0.93	0.87
209	208	116	489.89	1.54	0.16	3.13	6.24	5.65
211	204	212	870.67	0.18	0.10	2.47	3.56	2.28
213	212	216	740.55	1.44	0.06	2.10	1.76	1.69
217	216	220	713.55	0.13	0.01	1.14	0.42	0.39
221	224	220	130.12	1.58	0.05	1.48	2.03	1.97
223	220	112	816.67	0.17	0.02	1.30	0.54	0.50
225	212	224	130.12	0.02	0.00	0.37	0.08	0.07
301	300	108	-891.50	1.70	0.00	2.53	2.38	2.38
305	200	304	-5178.40	16.26	4.12	14.69	77.50	61.83
307-XX	304	308						
309	308	156	0.00	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
28	0.00	122.43	103.97	0.0
36	0.00	122.21	103.97	0.0
56	0.00	122.40	103.94	0.0
68	0.00	122.60	104.59	0.0
76	0.00	123.91	105.45	0.0
84	1500.00	112.33	78.87	-33.5
0	5178.40	0.00	166.10	166.1

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	136.03	9.00	127.03	55.04
4		0.00	135.40	9.00	126.40	54.78
8		0.00	135.30	9.00	126.30	54.73
12		132.00	134.91	11.00	123.91	53.69
16		54.00	134.75	12.00	122.75	53.19
20		129.00	134.52	12.00	122.52	53.09
24		121.00	134.43	12.00	122.43	53.05
O-28	WATTS LF957	0.00	115.97	12.00	103.97	45.05
32		0.00	115.97	12.00	103.97	45.05
I-36	WATTS LF957	0.00	134.21	12.00	122.21	52.96
40		115.00	134.21	12.00	122.21	52.96
44		0.00	134.13	10.00	124.13	53.79
48		59.00	134.26	12.00	122.26	52.98

52		45.00	134.40	12.00	122.40	53.04
O-56	WATTS LF957	0.00	115.94	12.00	103.94	45.04
60		0.00	115.94	12.00	103.94	45.04
64		101.00	134.60	12.00	122.60	53.13
66		13.20(2.20)	134.47	12.00	122.47	53.07
I-68	WATTS LF957	0.00	134.60	12.00	122.60	53.13
72		0.00	116.45	11.00	105.45	45.69
O-76	WATTS LF957	0.00	116.45	11.00	105.45	45.69
80		0.00	135.37	11.00	124.37	53.90
I-84	AMES LFM500	0.00	123.33	11.00	112.33	48.67
88		1500.00	75.10	11.00	64.10	27.78
100		0.00	134.38	10.00	124.38	53.90
104		0.00	134.09	11.00	123.09	53.34
106		1500.00	133.13	11.00	122.13	52.92
108		0.00	136.95	10.00	126.95	55.01
112		0.00	137.25	10.00	127.25	55.14
116		0.00	137.27	8.00	129.27	56.02
120		1000.00(**)	137.05	9.00	128.05	55.49
124		30.00	135.41	11.00	124.41	53.91
126		13.20(2.20)	135.37	11.00	124.37	53.89
128		27.00(1.80)	135.07	9.00	126.07	54.63
136		0.00	136.37	11.00	125.37	54.33
140		27.00(1.80)	135.40	11.00	124.40	53.91
144		27.00(1.80)	134.82	11.00	123.82	53.65
148		27.00(1.80)	134.42	11.00	123.42	53.48
152		0.00	136.47	11.00	125.47	54.37
156		0.00	136.58	9.00	127.58	55.29
160		27.00(1.80)	141.71	11.00	130.71	56.64
164		0.00	155.63	13.00	142.63	61.81
168		0.00	156.42	13.00	143.42	62.15
172		0.00	144.43	11.00	133.43	57.82
176		27.00(1.80)	141.71	10.00	131.71	57.07
180		0.00	141.58	11.00	130.58	56.58
184		27.00(1.80)	141.09	11.00	130.09	56.37
188		0.00	141.30	11.00	130.30	56.46
192		0.00	140.12	11.00	129.12	55.95
196		27.00(1.80)	141.28	12.00	129.28	56.02
200		27.00(1.80)	159.56	13.00	146.56	63.51
204		27.00(1.80)	139.36	13.00	126.36	54.76
208		27.00(1.80)	138.97	13.00	125.97	54.59
212		0.00	139.08	13.00	126.08	54.64
216		27.00(1.80)	137.58	12.00	125.58	54.42
220		27.00(1.80)	137.44	11.00	126.44	54.79
224		0.00	139.07	12.00	127.07	55.06
300		15.00	135.25	11.00	124.25	53.84
304		0.00	179.94	14.00	165.94	71.91
308		0.00	136.58	13.00	123.58	53.55
0		----	180.10	14.00	166.10	71.98
I-28	WATTS LF957	0.00	134.43	12.00	122.43	53.05
O-36	WATTS LF957	0.00	115.97	12.00	103.97	45.05
I-56	WATTS LF957	0.00	134.40	12.00	122.40	53.04
O-68	WATTS LF957	0.00	116.59	12.00	104.59	45.32
I-76	WATTS LF957	0.00	134.91	11.00	123.91	53.69
O-84	AMES LFM500	0.00	89.87	11.00	78.87	34.17

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
0	71.98	88	27.78
304	71.91	O-84	34.17
200	63.51	O-56	45.04
168	62.15	60	45.04
164	61.81	O-28	45.05

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
81	17.02	177	0.01
85	17.02	113	0.21
305	14.69	225	0.37
201	9.66	149	0.37
197	7.90	25	0.54

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	5178.40	

NET SYSTEM INFLOW = 5178.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5178.40

APPENDIX G

COMPUTER MODELING OUTPUT
MIDWAY RISING
PHASE 1 WATER SYSTEM

NODE AND PIPE DIAGRAM REFERENCE:

Exhibit A.1 in the back of the report.

CONDITIONS MODELED:

1. Maximum Day Demands plus 4,000 gpm Fire Flow split between Nodes 88, 106, and 120

2. Maximum Day Demands plus 4,000 gpm Fire Flow split between Nodes 88, 106, and 120, Pipe 307 Closed

Project: Midway Rising
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Node 88, Node 106, and Node 120

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	143.41	87.39	56.02
4	9	331	143.41	86.99	56.42
80	11	331	143.41	82.83	60.58
I-84	11	331	143.41	77.57	65.84
88	11	331	143.41	56.78	86.63
100	10	331	143.41	81.15	62.26
104	11	331	143.41	80.44	62.97
106	11	331	143.41	80.19	63.22
108	10	331	143.41	82.81	60.60
112	10	331	143.41	82.98	60.43
116	8	331	143.41	84.08	59.33
120	9	331	143.41	83.67	59.74
124	11	331	143.41	83.11	60.30
126	11	331	143.41	83.23	60.18
128	9	331	143.41	85.45	57.96
136	11	331	143.41	86.74	56.67
140	11	331	143.41	84.19	59.22
144	11	331	143.41	82.40	61.01
148	11	331	143.41	80.92	62.49
152	11	331	143.41	86.86	56.55
156	9	331	143.41	87.83	55.58
160	11	331	143.41	86.09	57.32
164	13	331	143.41	85.16	58.25
168	13	331	143.41	85.14	58.27
172	11	331	143.41	85.00	58.41
176	10	331	143.41	86.14	57.27
180	11	331	143.41	85.43	57.98
184	11	331	143.41	84.38	59.03
188	11	331	143.41	84.39	59.02
192	11	331	143.41	83.34	60.07
196	12	331	143.41	83.00	60.41
200	13	331	143.41	85.18	58.23
204	13	331	143.41	82.18	61.23
208	13	331	143.41	82.13	61.28
212	13	331	143.41	82.12	61.29
216	12	331	143.41	82.19	61.22
220	11	331	143.41	82.59	60.82
224	12	331	143.41	82.55	60.86
300	11	331	143.41	81.41	62.00
304	14	331	143.41	86.15	57.26
308	13	331	143.41	86.44	56.97
0	14	331	143.41	86.20	57.21
O-84	11	331	143.41	63.07	80.34

Project: Midway Rising
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Node 88, Node 106, and Node 120, Pipe 307 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	143.41	74.90	68.51
4	9	331	143.41	74.83	68.58
80	11	331	143.41	73.36	70.05
I-84	11	331	143.41	68.09	75.32
88	11	331	143.41	47.30	96.11
100	10	331	143.41	71.05	72.36
104	11	331	143.41	70.47	72.94
106	11	331	143.41	70.34	73.07
108	10	331	143.41	73.54	69.87
112	10	331	143.41	73.76	69.65
116	8	331	143.41	74.80	68.61
120	9	331	143.41	74.37	69.04
124	11	331	143.41	73.47	69.94
126	11	331	143.41	73.49	69.92
128	9	331	143.41	74.57	68.84
136	11	331	143.41	74.07	69.34
140	11	331	143.41	72.56	70.85
144	11	331	143.41	71.54	71.87
148	11	331	143.41	70.73	72.68
152	11	331	143.41	74.10	69.31
156	9	331	143.41	74.99	68.42
160	11	331	143.41	75.42	67.99
164	13	331	143.41	78.51	64.90
168	13	331	143.41	79.16	64.25
172	11	331	143.41	76.19	67.22
176	10	331	143.41	75.85	67.56
180	11	331	143.41	75.36	68.05
184	11	331	143.41	75.12	68.29
188	11	331	143.41	75.17	68.24
192	11	331	143.41	74.53	68.88
196	12	331	143.41	74.44	68.97
200	13	331	143.41	80.10	63.31
204	13	331	143.41	73.30	70.11
208	13	331	143.41	73.17	70.24
212	13	331	143.41	73.19	70.22
216	12	331	143.41	73.02	70.39
220	11	331	143.41	73.40	70.01
224	12	331	143.41	73.61	69.80
300	11	331	143.41	71.89	71.52
304	14	331	143.41	86.15	57.26
308	13	331	143.41	73.26	70.15
0	14	331	143.41	86.20	57.21
O-84	11	331	143.41	53.59	89.82

Project: Midway Rising
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Node 88, Node 106, and Node 120

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4394.2	3.12
3	12	1183.5	3.36
81	6	-1500	17.02
83	12	-1703.28	4.83
85	6	-1500	17.02
101	12	479.98	1.36
105	12	479.98	1.36
107	12	-1020.02	2.89
109	16	-1035.02	1.65
113	12	-456.51	1.29
117	12	-201.74	0.57
121	12	-203.28	0.58
123	12	-1143.3	3.24
125	12	-1156.5	3.28
129	12	-1183.5	3.36
133	12	-1183.5	3.36
137	8	560.98	3.58
141	8	533.98	3.41
145	8	506.98	3.24
149	12	479.98	1.36
151	12	-1744.48	4.95
153	24	-1744.48	1.24
157	10	707.07	2.89
161	10	109.62	0.45
165	8	109.62	0.7
169	8	486.8	3.11
173	6	149.48	1.7
177	10	570.45	2.33
179	8	393.97	2.51
181	8	393.97	2.51
185	8	574.98	3.67
187	8	208.01	1.33
189	8	636.28	4.06
191	8	428.27	2.73
193	12	998.46	2.83
195	12	570.19	1.62
197	12	1538.47	4.36
201	10	-377.18	1.54
203	12	941.28	2.67
205	12	281.77	0.8
209	8	254.77	1.63
211	12	632.51	1.79
213	12	538.11	1.53
217	16	511.11	0.82
221	6	94.4	1.07
223	16	578.51	0.92
225	12	94.4	0.27
301	12	-1035.02	2.94
305	12	-1942.65	5.51
307	24	2451.55	1.74
309	24	2451.55	1.74

Project: Midway Rising
Date: June 4, 2024
Job Number: 537-018

Scenario: 4,000 gpm Fire Flow split between Node 88, Node 106, and Node 120, Pipe 307 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	4394.2	3.12
3	12	455.21	1.29
81	6	-1500	17.02
83	12	-1062.12	3.01
85	6	-1500	17.02
101	12	340.98	0.97
105	12	340.98	0.97
107	12	-1159.02	3.29
109	16	-1174.02	1.87
113	12	-396.22	1.12
117	12	17.92	0.05
121	12	437.88	1.24
123	12	-415.01	1.18
125	12	-428.21	1.21
129	12	-455.21	1.29
133	12	-455.21	1.29
137	8	421.98	2.69
141	8	394.98	2.52
145	8	367.98	2.35
149	12	340.98	0.97
151	12	-877.18	2.49
153	24	-877.18	0.62
157	10	-877.18	3.58
161	10	-951.6	3.89
165	8	-951.6	6.07
169	8	995.78	6.36
173	6	-156.07	1.77
177	10	47.41	0.19
179	8	176.48	1.13
181	8	176.48	1.13
185	8	662.12	4.23
187	8	512.64	3.27
189	8	839.71	5.36
191	8	327.07	2.09
193	12	1419.95	4.03
195	12	1092.89	3.1
197	12	2419.83	6.86
201	10	-1947.37	7.95
203	12	1299.94	3.69
205	12	441.14	1.25
209	8	414.14	2.64
211	12	831.81	2.36
213	12	707.52	2.01
217	16	680.52	1.09
221	6	124.29	1.41
223	16	777.81	1.24
225	12	124.29	0.35
301	12	-1174.02	3.33
305	12	-4394.2	12.46
307-XX	24		
309	24	0	0

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
1	0	304	78.40	24.00	120.0000	0.00
3	2	4	214.20	12.00	120.0000	0.35
81	I-84	80	40.80	6.00	120.0000	1.05
83	80	124	52.70	12.00	120.0000	0.60
85	88	O-84	79.60	6.00	120.0000	0.00
101	100	104	742.30	12.00	120.0000	2.10
105	104	106	679.20	12.00	120.0000	2.58
107	106	300	876.30	12.00	120.0000	1.08
109	108	112	462.30	16.00	120.0000	0.80
113	112	116	728.40	12.00	120.0000	1.10
117	116	120	347.60	12.00	120.0000	0.60
121	120	80	468.40	12.00	120.0000	1.20
123	124	126	33.00	12.00	120.0000	0.90
125	126	128	775.70	12.00	120.0000	0.90
129	128	4	856.40	12.00	120.0000	0.60
133	2	136	106.70	12.00	120.0000	0.48
137	136	140	769.30	8.00	120.0000	1.58
141	140	144	596.90	8.00	120.0000	0.90
145	144	148	525.50	8.00	120.0000	1.55
149	148	100	616.50	12.00	120.0000	0.60
151	136	152	18.20	12.00	120.0000	0.30
153	152	156	774.10	24.00	120.0000	0.78
157	156	160	490.00	10.00	120.0000	1.23
161	160	164	1307.00	10.00	120.0000	2.61
165	164	168	70.30	8.00	120.0000	0.25
169	168	172	403.40	8.00	120.0000	0.60
173	176	172	629.60	6.00	120.0000	1.05
177	160	176	323.70	10.00	120.0000	0.78
179	176	180	151.30	8.00	120.0000	0.80
181	180	184	629.00	8.00	120.0000	0.55
185	184	124	360.10	8.00	120.0000	0.90
187	188	184	10.80	8.00	120.0000	0.30
189	172	188	136.70	8.00	120.0000	0.60
191	188	192	522.00	8.00	120.0000	1.05
193	192	120	383.30	12.00	120.0000	0.90
195	196	192	188.70	12.00	120.0000	0.90
197	200	196	830.70	12.00	120.0000	2.05
201	168	200	45.70	10.00	120.0000	1.05
203	196	204	297.40	12.00	120.0000	1.03
205	204	208	435.00	12.00	120.0000	0.78
209	208	116	270.40	8.00	120.0000	1.05
211	204	212	77.30	12.00	120.0000	1.05
213	212	216	853.90	12.00	120.0000	0.90
217	216	220	347.00	16.00	120.0000	0.60
221	224	220	803.30	6.00	120.0000	1.41
223	220	112	352.10	16.00	120.0000	0.60
225	212	224	238.40	12.00	120.0000	1.23
301	300	108	713.90	12.00	120.0000	0.00
305	200	304	263.00	12.00	120.0000	1.23
307	304	308	541.80	24.00	120.0000	0.75
309	308	156	1421.00	24.00	120.0000	1.09

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE 84 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)
-16.15	450.00
-17.54	600.00
-18.92	750.00
-25.38	1200.00
-33.46	1500.00

THERE IS A DEVICE AT NODE 0 DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)
316.85	0.00
295.38	1714.00
239.37	3428.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
2		0.00	9.00	
4		0.00	9.00	
80		0.00	11.00	
I-84	WATTS LF957	0.00	11.00	
88		0.00	11.00	
100		0.00	10.00	
104		0.00	11.00	
106		117.00	11.00	
108		0.00	10.00	
112		0.00	10.00	
116		0.00	8.00	
120		15.00	9.00	
124		15.00	11.00	
126		6.00	11.00	
128		15.00	9.00	
136		0.00	11.00	
140		15.00	11.00	
144		15.00	11.00	
148		15.00	11.00	
152		0.00	11.00	
156		0.00	9.00	
160		15.00	11.00	
164		0.00	13.00	
168		0.00	13.00	
172		0.00	11.00	
176		15.00	10.00	
180		0.00	11.00	
184		15.00	11.00	
188		0.00	11.00	
192		0.00	11.00	
196		15.00	12.00	
200		15.00	13.00	
204		15.00	13.00	

208		15.00	13.00	
212		0.00	13.00	
216		15.00	12.00	
220		15.00	11.00	
224		0.00	12.00	
300		15.00	11.00	
304		0.00	14.00	
308		0.00	13.00	
0		----	14.00	14.00
O-84	WATTS LF957	0.00	11.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(P) = 51
NUMBER OF END NODES .....(J) = 41
NUMBER OF PRIMARY LOOPS .....(L) = 10
NUMBER OF SUPPLY NODES .....(F) = 1
NUMBER OF SUPPLY ZONES .....(Z) = 1

Case: 1

MDD Plus 4,000 gpm Fire Flow split between Nodes 88, 106, and 120

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4394.20	0.12	0.00	3.12	1.56	1.56
3	2	4	1183.50	0.86	0.06	3.36	4.30	4.02
81	I-84	80	-1500.00	7.44	4.72	17.02	297.98	182.24
83	80	124	-1703.28	0.42	0.22	4.83	12.01	7.89
85	88	O-84	-1500.00	14.51	0.00	17.02	182.24	182.24
101	100	104	479.98	0.56	0.06	1.36	0.84	0.76
105	104	106	479.98	0.51	0.07	1.36	0.86	0.76
107	106	300	-1020.02	2.67	0.14	2.89	3.21	3.05
109	108	112	-1035.02	0.36	0.03	1.65	0.85	0.77
113	112	116	-456.51	0.50	0.03	1.29	0.73	0.69
117	116	120	-201.74	0.05	0.00	0.57	0.16	0.15
121	120	80	-203.28	0.07	0.01	0.58	0.17	0.15
123	124	126	-1143.30	0.12	0.15	3.24	8.22	3.77
125	126	128	-1156.50	2.99	0.15	3.28	4.04	3.85
129	128	4	-1183.50	3.44	0.10	3.36	4.14	4.02
133	2	136	-1183.50	0.43	0.08	3.36	4.81	4.02
137	136	140	560.98	5.59	0.31	3.58	7.67	7.26
141	140	144	533.98	3.96	0.16	3.41	6.90	6.63
145	144	148	506.98	3.16	0.25	3.24	6.50	6.02
149	148	100	479.98	0.47	0.02	1.36	0.78	0.76
151	136	152	-1744.48	0.15	0.11	4.95	14.51	8.24
153	152	156	-1744.48	0.22	0.02	1.24	0.31	0.28
157	156	160	707.07	1.84	0.16	2.89	4.09	3.76
161	160	164	109.62	0.16	0.01	0.45	0.13	0.12
165	164	168	109.62	0.02	0.00	0.70	0.38	0.35
169	168	172	486.80	2.25	0.09	3.11	5.81	5.59
173	176	172	149.48	1.60	0.05	1.70	2.62	2.55
177	160	176	570.45	0.82	0.07	2.33	2.73	2.53
179	176	180	393.97	0.57	0.08	2.51	4.29	3.77
181	180	184	393.97	2.37	0.05	2.51	3.86	3.77
185	184	124	574.98	2.74	0.19	3.67	8.12	7.60
187	188	184	208.01	0.01	0.01	1.33	1.92	1.16
189	172	188	636.28	1.25	0.15	4.06	10.30	9.17
191	188	192	428.27	2.30	0.12	2.73	4.64	4.41
193	192	120	998.46	1.12	0.11	2.83	3.23	2.93
195	196	192	570.19	0.20	0.04	1.62	1.23	1.04
197	200	196	1538.47	5.43	0.61	4.36	7.26	6.53
201	168	200	-377.18	0.05	0.04	1.54	2.02	1.17
203	196	204	941.28	0.78	0.11	2.67	3.01	2.63
205	204	208	281.77	0.12	0.01	0.80	0.30	0.28
209	208	116	254.77	0.46	0.04	1.63	1.84	1.68
211	204	212	632.51	0.10	0.05	1.79	1.94	1.26
213	212	216	538.11	0.80	0.03	1.53	0.97	0.93
217	216	220	511.11	0.07	0.01	0.82	0.23	0.21
221	224	220	94.40	0.87	0.03	1.07	1.12	1.09
223	220	112	578.51	0.09	0.01	0.92	0.29	0.26
225	212	224	94.40	0.01	0.00	0.27	0.04	0.04
301	300	108	-1035.02	2.24	0.00	2.94	3.13	3.13
305	200	304	-1942.65	2.65	0.58	5.51	12.27	10.06
307	304	308	2451.55	0.29	0.04	1.74	0.59	0.53
309	308	156	2451.55	0.75	0.05	1.74	0.57	0.53

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
84	1500.00	179.00	145.54	-33.5
0	4394.20	0.00	198.93	198.9

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	210.67	9.00	201.67	87.39
4		0.00	209.74	9.00	200.74	86.99
80		0.00	202.16	11.00	191.16	82.83
I-84	WATTS LF957	0.00	190.00	11.00	179.00	77.57
88		1500.00	142.03	11.00	131.03	56.78
100		0.00	197.26	10.00	187.26	81.15
104		0.00	196.64	11.00	185.64	80.44
106		1500.00(**)	196.05	11.00	185.05	80.19
108		0.00	201.10	10.00	191.10	82.81
112		0.00	201.49	10.00	191.49	82.98
116		0.00	202.02	8.00	194.02	84.08
120		1000.00(**)	202.08	9.00	193.08	83.67
124		15.00	202.79	11.00	191.79	83.11
126		13.20(2.20)	203.06	11.00	192.06	83.23
128		27.00(1.80)	206.20	9.00	197.20	85.45
136		0.00	211.18	11.00	200.18	86.74
140		27.00(1.80)	205.28	11.00	194.28	84.19
144		27.00(1.80)	201.16	11.00	190.16	82.40
148		27.00(1.80)	197.74	11.00	186.74	80.92
152		0.00	211.44	11.00	200.44	86.86
156		0.00	211.68	9.00	202.68	87.83
160		27.00(1.80)	209.68	11.00	198.68	86.09
164		0.00	209.51	13.00	196.51	85.16
168		0.00	209.49	13.00	196.49	85.14
172		0.00	207.14	11.00	196.14	85.00
176		27.00(1.80)	208.79	10.00	198.79	86.14
180		0.00	208.14	11.00	197.14	85.43
184		27.00(1.80)	205.72	11.00	194.72	84.38
188		0.00	205.74	11.00	194.74	84.39
192		0.00	203.32	11.00	192.32	83.34
196		27.00(1.80)	203.55	12.00	191.55	83.00
200		27.00(1.80)	209.58	13.00	196.58	85.18
204		27.00(1.80)	202.65	13.00	189.65	82.18
208		27.00(1.80)	202.52	13.00	189.52	82.13
212		0.00	202.50	13.00	189.50	82.12
216		27.00(1.80)	201.67	12.00	189.67	82.19
220		27.00(1.80)	201.59	11.00	190.59	82.59
224		0.00	202.49	12.00	190.49	82.55
300		15.00	198.86	11.00	187.86	81.41
304		0.00	212.81	14.00	198.81	86.15
308		0.00	212.48	13.00	199.48	86.44
0		----	212.93	14.00	198.93	86.20
O-84	WATTS LF957	0.00	156.54	11.00	145.54	63.07

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
156	87.83	88	56.78
2	87.39	O-84	63.07
4	86.99	I-84	77.57
152	86.86	106	80.19
136	86.74	104	80.44

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
81	17.02	225	0.27
85	17.02	161	0.45
305	5.51	117	0.57
151	4.95	121	0.58
83	4.83	165	0.70

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4394.20	

NET SYSTEM INFLOW = 4394.20
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4394.20

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Case: 2

MDD Plus 4,000 gpm Fire Flow split between Nodes 88, 106, and 120, Pipe 307 Closed

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	4394.20	0.12	0.00	3.12	1.56	1.56
3	2	4	455.21	0.15	0.01	1.29	0.73	0.68
81	I-84	80	-1500.00	7.44	4.72	17.02	297.98	182.24
83	80	124	-1062.12	0.17	0.08	3.01	4.89	3.29
85	88	O-84	-1500.00	14.51	0.00	17.02	182.24	182.24
101	100	104	340.98	0.30	0.03	0.97	0.44	0.40
105	104	106	340.98	0.27	0.04	0.97	0.46	0.40
107	106	300	-1159.02	3.39	0.18	3.29	4.07	3.87
109	108	112	-1174.02	0.45	0.04	1.87	1.07	0.98
113	112	116	-396.22	0.39	0.02	1.12	0.56	0.53
117	116	120	17.92	0.00	0.00	0.05	0.00	0.00
121	120	80	437.88	0.30	0.03	1.24	0.70	0.64
123	124	126	-415.01	0.02	0.02	1.18	1.16	0.58
125	126	128	-428.21	0.47	0.02	1.21	0.64	0.61
129	128	4	-455.21	0.59	0.02	1.29	0.70	0.68
133	2	136	-455.21	0.07	0.01	1.29	0.80	0.68
137	136	140	421.98	3.30	0.18	2.69	4.52	4.29
141	140	144	394.98	2.26	0.09	2.52	3.94	3.79
145	144	148	367.98	1.75	0.13	2.35	3.58	3.33
149	148	100	340.98	0.25	0.01	0.97	0.42	0.40
151	136	152	-877.18	0.04	0.03	2.49	3.89	2.31
153	152	156	-877.18	0.06	0.00	0.62	0.08	0.08
157	156	160	-877.18	2.75	0.25	3.58	6.11	5.61
161	160	164	-951.60	8.52	0.61	3.89	6.99	6.52
165	164	168	-951.60	1.36	0.14	6.07	21.36	19.33
169	168	172	995.78	8.48	0.38	6.36	21.95	21.02
173	176	172	-156.07	1.74	0.05	1.77	2.84	2.76
177	160	176	47.41	0.01	0.00	0.19	0.03	0.03
179	176	180	176.48	0.13	0.02	1.13	0.96	0.85
181	180	184	176.48	0.54	0.01	1.13	0.87	0.85
185	184	124	662.12	3.56	0.25	4.23	10.57	9.87
187	188	184	512.64	0.07	0.05	3.27	10.76	6.15
189	172	188	839.71	2.10	0.27	5.36	17.29	15.33
191	188	192	327.07	1.40	0.07	2.09	2.81	2.67
193	192	120	1419.95	2.16	0.23	4.03	6.22	5.63
195	196	192	1092.89	0.65	0.13	3.10	4.18	3.47
197	200	196	2419.83	12.55	1.50	6.86	16.92	15.11
201	168	200	-1947.37	1.12	1.03	7.95	47.13	24.56
203	196	204	1299.94	1.42	0.22	3.69	5.51	4.78
205	204	208	441.14	0.28	0.02	1.25	0.69	0.65
209	208	116	414.14	1.12	0.11	2.64	4.56	4.14
211	204	212	831.81	0.16	0.09	2.36	3.27	2.09
213	212	216	707.52	1.32	0.06	2.01	1.62	1.55
217	216	220	680.52	0.12	0.01	1.09	0.39	0.36
221	224	220	124.29	1.45	0.04	1.41	1.86	1.81
223	220	112	777.81	0.16	0.01	1.24	0.50	0.45
225	212	224	124.29	0.01	0.00	0.35	0.07	0.06
301	300	108	-1174.02	2.83	0.00	3.33	3.96	3.96
305	200	304	-4394.20	12.00	2.97	12.46	56.90	45.62
307-XX	304	308						
309	308	156	0.00	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
84	1500.00	157.13	123.67	-33.5
0	4394.20	0.00	198.93	198.9

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	181.84	9.00	172.84	74.90
4		0.00	181.68	9.00	172.68	74.83
80		0.00	180.29	11.00	169.29	73.36
I-84	WATTS LF957	0.00	168.13	11.00	157.13	68.09
88		1500.00	120.16	11.00	109.16	47.30
100		0.00	173.96	10.00	163.96	71.05
104		0.00	173.63	11.00	162.63	70.47
106		1500.00(**)	173.32	11.00	162.32	70.34
108		0.00	179.72	10.00	169.72	73.54
112		0.00	180.21	10.00	170.21	73.76
116		0.00	180.62	8.00	172.62	74.80
120		1000.00(**)	180.62	9.00	171.62	74.37
124		15.00	180.55	11.00	169.55	73.47
126		13.20(2.20)	180.59	11.00	169.59	73.49
128		27.00(1.80)	181.08	9.00	172.08	74.57
136		0.00	181.92	11.00	170.92	74.07
140		27.00(1.80)	178.45	11.00	167.45	72.56
144		27.00(1.80)	176.10	11.00	165.10	71.54
148		27.00(1.80)	174.21	11.00	163.21	70.73
152		0.00	181.99	11.00	170.99	74.10
156		0.00	182.06	9.00	173.06	74.99
160		27.00(1.80)	185.05	11.00	174.05	75.42
164		0.00	194.19	13.00	181.19	78.51
168		0.00	195.69	13.00	182.69	79.16
172		0.00	186.83	11.00	175.83	76.19
176		27.00(1.80)	185.04	10.00	175.04	75.85
180		0.00	184.90	11.00	173.90	75.36
184		27.00(1.80)	184.35	11.00	173.35	75.12
188		0.00	184.47	11.00	173.47	75.17
192		0.00	183.00	11.00	172.00	74.53
196		27.00(1.80)	183.79	12.00	171.79	74.44
200		27.00(1.80)	197.84	13.00	184.84	80.10
204		27.00(1.80)	182.15	13.00	169.15	73.30
208		27.00(1.80)	181.85	13.00	168.85	73.17
212		0.00	181.90	13.00	168.90	73.19
216		27.00(1.80)	180.52	12.00	168.52	73.02
220		27.00(1.80)	180.38	11.00	169.38	73.40
224		0.00	181.88	12.00	169.88	73.61
300		15.00	176.89	11.00	165.89	71.89
304		0.00	212.81	14.00	198.81	86.15
308		0.00	182.06	13.00	169.06	73.26
0		----	212.93	14.00	198.93	86.20
O-84	WATTS LF957	0.00	134.67	11.00	123.67	53.59

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
0	86.20	88	47.30
304	86.15	O-84	53.59
200	80.10	I-84	68.09
168	79.16	106	70.34
164	78.51	104	70.47

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
81	17.02	117	0.05
85	17.02	177	0.19
305	12.46	225	0.35
201	7.95	153	0.62
197	6.86	101	0.97

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	4394.20	

NET SYSTEM INFLOW = 4394.20
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4394.20

APPENDIX H

COMPUTER MODELING OUTPUT
MIDWAY RISING
PHASE 2 WATER SYSTEM

NODE AND PIPE DIAGRAM REFERENCE:

Exhibit A.2 in the back of the report.

CONDITIONS MODELED:

1. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 40 and 60

2. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 40 and 60, Pipe 307 Closed

3. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 32 and 40

4. Maximum Day Demands plus 3,000 gpm Fire Flow split between Nodes 32 and 40, Pipe 307 Closed

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	100.59	38.92
4	9	331	139.51	100.12	39.39
32	12	331	138.21	86.30	51.91
I-36	12	331	138.21	94.30	43.91
40	12	331	138.21	94.30	43.91
44	10	331	139.08	95.65	43.43
48	12	331	138.21	94.31	43.90
52	12	331	138.21	94.33	43.88
O-56	12	331	138.21	83.76	54.45
60	12	331	138.21	76.39	61.82
64	12	331	138.21	95.32	42.89
66	12	331	138.21	94.70	43.51
I-68	12	331	138.21	95.32	42.89
72	11	331	138.65	87.75	50.90
80	11	331	138.65	98.11	40.54
I-84	11	331	138.65	98.11	40.54
88	11	331	138.65	91.11	47.54
100	10	331	139.08	96.10	42.98
104	11	331	138.65	95.48	43.17
106	11	331	138.65	96.21	42.44
108	10	331	139.08	98.24	40.84
112	10	331	139.08	98.36	40.72
116	8	331	139.95	99.44	40.51
120	9	331	139.51	99.05	40.46
124	11	331	138.65	98.09	40.56
126	12	331	138.21	97.59	40.62
128	9	331	139.51	98.32	41.19
136	11	331	138.65	99.98	38.67
140	11	331	138.65	98.12	40.53
144	11	331	138.65	96.84	41.81
148	11	331	138.65	95.81	42.84
152	11	331	138.65	100.10	38.55
156	9	331	139.51	101.07	38.44
160	11	331	138.65	99.79	38.86
164	13	331	137.78	98.92	38.86
168	13	331	137.78	98.92	38.86
172	11	331	138.65	99.21	39.44
176	10	331	139.08	100.02	39.06
180	11	331	138.65	99.43	39.22
184	11	331	138.65	98.87	39.78
188	11	331	138.65	98.88	39.77
192	11	331	138.65	98.42	40.23
196	12	331	138.21	98.03	40.18
200	13	331	137.78	98.95	38.83
204	13	331	137.78	97.37	40.41
208	13	331	137.78	97.35	40.43
212	13	331	137.78	97.33	40.45
216	12	331	138.21	97.54	40.67
220	11	331	138.65	97.95	40.70
224	12	331	138.21	97.76	40.45
300	11	331	138.65	97.10	41.55
304	14	331	137.35	99.31	38.04
308	13	331	137.78	99.63	38.15
0	14	331	137.35	99.35	38.00
O-36	12	331	138.21	86.30	51.91
I-56	12	331	138.21	92.76	45.45
O-68	12	331	138.21	87.32	50.89
O-84	11	331	138.65	91.11	47.54

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60, Pipe 307 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	90.49	49.02
4	9	331	139.51	90.34	49.17
32	12	331	138.21	77.99	60.22
I-36	12	331	138.21	85.99	52.22
40	12	331	138.21	85.99	52.22
44	10	331	139.08	87.40	51.68
48	12	331	138.21	85.99	52.22
52	12	331	138.21	86.01	52.20
O-56	12	331	138.21	75.43	62.78
60	12	331	138.21	68.06	70.15
64	12	331	138.21	86.91	51.30
66	12	331	138.21	86.34	51.87
I-68	12	331	138.21	86.91	51.30
72	11	331	138.65	79.35	59.30
80	11	331	138.65	90.76	47.89
I-84	11	331	138.65	90.76	47.89
88	11	331	138.65	83.76	54.89
100	10	331	139.08	87.79	51.29
104	11	331	138.65	87.27	51.38
106	11	331	138.65	88.37	50.28
108	10	331	139.08	91.18	47.90
112	10	331	139.08	91.36	47.72
116	8	331	139.95	92.46	47.49
120	9	331	139.51	92.05	47.46
124	11	331	138.65	90.68	47.97
126	12	331	138.21	90.06	48.15
128	9	331	139.51	89.78	49.73
136	11	331	138.65	89.70	48.95
140	11	331	138.65	88.65	50.00
144	11	331	138.65	87.96	50.69
148	11	331	138.65	87.43	51.22
152	11	331	138.65	89.74	48.91
156	9	331	139.51	90.65	48.86
160	11	331	138.65	91.55	47.10
164	13	331	137.78	93.88	43.90
168	13	331	137.78	94.41	43.37
172	11	331	138.65	92.44	46.21
176	10	331	139.08	92.04	47.04
180	11	331	138.65	91.62	47.03
184	11	331	138.65	91.67	46.98
188	11	331	138.65	91.74	46.91
192	11	331	138.65	91.70	46.95
196	12	331	138.21	91.50	46.71
200	13	331	137.78	95.12	42.66
204	13	331	137.78	90.62	47.16
208	13	331	137.78	90.56	47.22
212	13	331	137.78	90.55	47.23
216	12	331	138.21	90.58	47.63
220	11	331	138.65	90.98	47.67
224	12	331	138.21	90.98	47.23
300	11	331	138.65	89.69	48.96
304	14	331	137.35	99.31	38.04
308	13	331	137.78	88.92	48.86
0	14	331	137.35	99.35	38.00
O-36	12	331	138.21	77.99	60.22
I-56	12	331	138.21	84.43	53.78
O-68	12	331	138.21	78.91	59.30
O-84	11	331	138.65	83.76	54.89

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 32 and Node 40

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	100.60	38.91
4	9	331	139.51	100.15	39.36
32	12	331	138.21	75.71	62.50
I-36	12	331	138.21	92.19	46.02
40	12	331	138.21	93.73	44.48
44	10	331	139.08	95.16	43.92
48	12	331	138.21	94.00	44.21
52	12	331	138.21	94.69	43.52
O-56	12	331	138.21	86.69	51.52
60	12	331	138.21	86.69	51.52
64	12	331	138.21	95.58	42.63
66	12	331	138.21	95.02	43.19
I-68	12	331	138.21	95.58	42.63
72	11	331	138.65	88.02	50.63
80	11	331	138.65	98.12	40.53
I-84	11	331	138.65	98.12	40.53
88	11	331	138.65	91.12	47.53
100	10	331	139.08	95.66	43.42
104	11	331	138.65	95.02	43.63
106	11	331	138.65	95.87	42.78
108	10	331	139.08	98.15	40.93
112	10	331	139.08	98.29	40.79
116	8	331	139.95	99.41	40.54
120	9	331	139.51	99.04	40.47
124	11	331	138.65	98.11	40.54
126	12	331	138.21	97.62	40.59
128	9	331	139.51	98.44	41.07
136	11	331	138.65	99.98	38.67
140	11	331	138.65	97.94	40.71
144	11	331	138.65	96.54	42.11
148	11	331	138.65	95.39	43.26
152	11	331	138.65	100.10	38.55
156	9	331	139.51	101.07	38.44
160	11	331	138.65	99.79	38.86
164	13	331	137.78	98.92	38.86
168	13	331	137.78	98.92	38.86
172	11	331	138.65	99.21	39.44
176	10	331	139.08	100.01	39.07
180	11	331	138.65	99.43	39.22
184	11	331	138.65	98.87	39.78
188	11	331	138.65	98.87	39.78
192	11	331	138.65	98.40	40.25
196	12	331	138.21	98.00	40.21
200	13	331	137.78	98.95	38.83
204	13	331	137.78	97.34	40.44
208	13	331	137.78	97.32	40.46
212	13	331	137.78	97.29	40.49
216	12	331	138.21	97.48	40.73
220	11	331	138.65	97.89	40.76
224	12	331	138.21	97.72	40.49
300	11	331	138.65	96.90	41.75
304	14	331	137.35	99.31	38.04
308	13	331	137.78	99.63	38.15
0	14	331	137.35	99.35	38.00
O-36	12	331	138.21	83.19	55.02
I-56	12	331	138.21	94.69	43.52
O-68	12	331	138.21	87.58	50.63
O-84	11	331	138.65	91.12	47.53

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 32 and Node 40, Pipe 307 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
2	9	331	139.51	90.56	48.95
4	9	331	139.51	90.43	49.08
32	12	331	138.21	67.46	70.75
I-36	12	331	138.21	83.94	54.27
40	12	331	138.21	85.48	52.73
44	10	331	139.08	86.96	52.12
48	12	331	138.21	85.73	52.48
52	12	331	138.21	86.36	51.85
O-56	12	331	138.21	78.36	59.85
60	12	331	138.21	78.36	59.85
64	12	331	138.21	87.19	51.02
66	12	331	138.21	86.67	51.54
I-68	12	331	138.21	87.19	51.02
72	11	331	138.65	79.62	59.03
80	11	331	138.65	90.79	47.86
I-84	11	331	138.65	90.79	47.86
88	11	331	138.65	83.79	54.86
100	10	331	139.08	87.41	51.67
104	11	331	138.65	86.86	51.79
106	11	331	138.65	88.07	50.58
108	10	331	139.08	91.10	47.98
112	10	331	139.08	91.31	47.77
116	8	331	139.95	92.44	47.51
120	9	331	139.51	92.04	47.47
124	11	331	138.65	90.72	47.93
126	12	331	138.21	90.10	48.11
128	9	331	139.51	89.93	49.58
136	11	331	138.65	89.76	48.89
140	11	331	138.65	88.53	50.12
144	11	331	138.65	87.71	50.94
148	11	331	138.65	87.06	51.59
152	11	331	138.65	89.80	48.85
156	9	331	139.51	90.71	48.80
160	11	331	138.65	91.57	47.08
164	13	331	137.78	93.89	43.89
168	13	331	137.78	94.41	43.37
172	11	331	138.65	92.45	46.20
176	10	331	139.08	92.06	47.02
180	11	331	138.65	91.64	47.01
184	11	331	138.65	91.68	46.97
188	11	331	138.65	91.75	46.90
192	11	331	138.65	91.69	46.96
196	12	331	138.21	91.49	46.72
200	13	331	137.78	95.12	42.66
204	13	331	137.78	90.60	47.18
208	13	331	137.78	90.53	47.25
212	13	331	137.78	90.52	47.26
216	12	331	138.21	90.53	47.68
220	11	331	138.65	90.92	47.73
224	12	331	138.21	90.95	47.26
300	11	331	138.65	89.52	49.13
304	14	331	137.35	99.31	38.04
308	13	331	137.78	88.97	48.81
0	14	331	137.35	99.35	38.00
O-36	12	331	138.21	74.94	63.27
I-56	12	331	138.21	86.36	51.85
O-68	12	331	138.21	79.19	59.02
O-84	11	331	138.65	83.79	54.86

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	3669.4	2.6
3	12	1288.17	3.65
33	8	0	0
37	8	0	0
41	12	-1235.69	3.51
45	12	-1235.69	3.51
47	12	-264.31	0.75
49	12	-323.31	0.92
53	8	1500	9.57
57	8	1500	9.57
61	12	-1881.51	5.34
63	12	-1868.31	5.3
65	12	-1982.51	5.62
67	8	0	0
69	8	0	0
81	6	0	0
83	12	321.67	0.91
85	6	0	0
101	12	391.77	1.11
105	12	-843.92	2.39
107	12	-858.92	2.44
109	16	-873.92	1.39
113	12	-436.51	1.24
117	12	-288.28	0.82
121	12	321.67	0.91
123	12	734.54	2.08
125	12	721.34	2.05
129	12	-1288.17	3.65
133	12	-1288.17	3.65
137	8	472.77	3.02
141	8	445.77	2.85
145	8	418.77	2.67
149	12	391.77	1.11
151	12	-1760.94	5
153	24	-1760.94	1.25
157	10	471.15	1.92
161	10	30.55	0.12
165	8	30.55	0.19
169	8	357.95	2.28
173	6	104.95	1.19
177	10	413.6	1.69
179	8	281.65	1.8
181	8	281.65	1.8
185	8	442.87	2.83
187	8	188.22	1.2
189	8	462.9	2.95
191	8	274.68	1.75
193	12	636.95	1.81
195	12	362.27	1.03
197	12	1082.91	3.07
201	10	-327.4	1.34
203	12	693.64	1.97
205	12	175.24	0.5
209	8	148.24	0.95
211	12	491.4	1.39
213	12	418.16	1.19
217	16	391.16	0.62
221	6	73.24	0.83
223	16	437.4	0.7
225	12	73.24	0.21
301	12	-873.92	2.48
305	12	-1437.31	4.08
307	24	2232.09	1.58
309	24	2232.09	1.58

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 40 and Node 60, Pipe 307 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	3669.4	2.6
3	12	686.44	1.95
33	8	0	0
37	8	0	0
41	12	-1317.43	3.74
45	12	-182.57	0.52
47	12	-241.57	0.69
49	8	1500	9.57
53	8	1500	9.57
57	12	-1799.77	5.11
61	12	-1786.57	5.07
63	12	-1900.77	5.39
65	8	0	0
67	8	0	0
69	6	0	0
81	12	780.68	2.21
83	6	0	0
85	12	266.58	0.76
101	12	-1050.85	2.98
105	12	-1065.85	3.02
107	16	-1080.85	1.72
109	12	-461.58	1.31
113	12	-176.18	0.5
117	12	780.68	2.21
121	12	1254.54	3.56
123	12	1241.34	3.52
125	12	-686.44	1.95
129	12	-686.44	1.95
133	8	347.58	2.22
137	8	320.58	2.05
141	8	293.58	1.87
145	12	266.58	0.76
149	12	-1034.01	2.93
151	24	-1034.01	0.73
153	10	-1034.01	4.22
157	10	-849.46	3.47
161	8	-849.46	5.42
165	8	846.51	5.4
169	6	-162.17	1.84
173	10	-211.56	0.86
177	8	-76.38	0.49
179	8	-76.38	0.49
181	8	503.86	3.22
185	8	607.24	3.88
187	8	684.34	4.37
189	8	77.1	0.49
191	12	983.85	2.79
193	12	906.76	2.57
195	12	1946.43	5.52
197	10	-1695.97	6.93
201	12	1012.67	2.87
203	12	312.4	0.89
205	8	285.4	1.82
209	12	673.27	1.91
211	12	572.76	1.62
213	16	545.76	0.87
217	6	100.51	1.14
221	16	619.27	0.99
223	12	100.51	0.29
225	12	-1080.85	3.07
301	12	-3669.4	10.41
305	24		
307-XX	24	0	0
309			

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 32 and Node 40

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	3669.4	2.6
3	12	1257.04	3.57
33	8	-1500	9.57
37	8	-1500	9.57
41	12	-1329.68	3.77
45	12	-1329.68	3.77
47	12	-1670.32	4.74
49	12	-1729.32	4.91
53	8	0	0
57	8	0	0
61	12	-1787.52	5.07
63	12	-1774.32	5.03
65	12	-1888.52	5.36
67	8	0	0
69	8	0	0
81	6	0	0
83	12	264.38	0.75
85	6	0	0
101	12	415.58	1.18
105	12	-914.1	2.59
107	12	-929.1	2.64
109	16	-944.1	1.51
113	12	-479.32	1.36
117	12	-336.5	0.95
121	12	264.38	0.75
123	12	671.68	1.91
125	12	658.48	1.87
129	12	-1257.04	3.57
133	12	-1257.04	3.57
137	8	496.58	3.17
141	8	469.58	3
145	8	442.58	2.82
149	12	415.58	1.18
151	12	-1753.62	4.97
153	24	-1753.62	1.24
157	10	473.89	1.94
161	10	33.3	0.14
165	8	33.3	0.21
169	8	357.65	2.28
173	6	105.01	1.19
177	10	413.6	1.69
179	8	281.58	1.8
181	8	281.58	1.8
185	8	437.3	2.79
187	8	182.71	1.17
189	8	462.66	2.95
191	8	279.95	1.79
193	12	627.88	1.78
195	12	347.93	0.99
197	12	1090.54	3.09
201	10	-324.35	1.32
203	12	715.6	2.03
205	12	169.82	0.48
209	8	142.82	0.91
211	12	518.78	1.47
213	12	441.44	1.25
217	16	414.44	0.66
221	6	77.34	0.88
223	16	464.78	0.74
225	12	77.34	0.22
301	12	-944.1	2.68
305	12	-1441.88	4.09
307	24	2227.52	1.58
309	24	2227.52	1.58

Project: Midway Rising - Phase 2
Date: June 4, 2024
Job Number: 537-018

Scenario: 3,000 gpm Fire Flow split between Node 32 and Node 40, Pipe 307 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	24	3669.4	2.6
3	12	644.55	1.83
33	8	-1500	9.57
37	8	-1500	9.57
41	12	-1402.34	3.98
45	12	-1402.34	3.98
47	12	-1597.66	4.53
49	12	-1656.66	4.7
53	8	0	0
57	8	0	0
61	12	-1714.86	4.86
63	12	-1701.66	4.83
65	12	-1815.86	5.15
67	8	0	0
69	8	0	0
81	6	0	0
83	12	743.94	2.11
85	6	0	0
101	12	297.94	0.85
105	12	-1104.4	3.13
107	12	-1119.4	3.18
109	16	-1134.4	1.81
113	12	-497.44	1.41
117	12	-215.2	0.61
121	12	743.94	2.11
123	12	1211.5	3.44
125	12	1198.3	3.4
129	12	-644.55	1.83
133	12	-644.55	1.83
137	8	378.94	2.42
141	8	351.94	2.25
145	8	324.94	2.07
149	12	297.94	0.85
151	12	-1023.5	2.9
153	24	-1023.5	0.73
157	10	-1023.5	4.18
161	10	-846.86	3.46
165	8	-846.86	5.4
169	8	845.68	5.4
173	6	-160.92	1.83
177	10	-203.64	0.83
179	8	-69.72	0.44
181	8	-69.72	0.44
185	8	497.56	3.18
187	8	594.28	3.79
189	8	684.76	4.37
191	8	90.48	0.58
193	12	986.15	2.8
195	12	895.66	2.54
197	12	1949.86	5.53
201	10	-1692.54	6.91
203	12	1027.2	2.91
205	12	309.23	0.88
209	8	282.23	1.8
211	12	690.96	1.96
213	12	587.8	1.67
217	16	560.8	0.89
221	6	103.16	1.17
223	16	636.96	1.02
225	12	103.16	0.29
301	12	-1134.4	3.22
305	12	-3669.4	10.41
307-XX	24		
309	24	0	0

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
1	0	304	78.40	24.00	120.0000	0.00
3	2	4	214.20	12.00	120.0000	0.35
33	32	O-36	373.20	8.00	120.0000	0.36
37	I-36	40	45.90	8.00	120.0000	1.05
41	40	44	219.30	12.00	120.0000	0.90
45	44	104	105.40	12.00	120.0000	0.75
47	40	48	68.50	12.00	120.0000	0.30
49	48	52	161.10	12.00	120.0000	0.75
53	52	I-56	47.70	8.00	120.0000	1.05
57	O-56	60	367.40	8.00	120.0000	0.36
61	66	64	121.10	12.00	120.0000	0.65
63	52	66	57.00	12.00	120.0000	0.70
65	64	128	311.90	12.00	120.0000	1.35
67	I-68	64	46.40	8.00	120.0000	1.05
69	72	O-68	366.60	8.00	120.0000	0.36
81	I-84	80	42.20	6.00	120.0000	1.05
83	80	124	51.00	12.00	120.0000	1.20
85	88	O-84	79.60	6.00	120.0000	0.00
101	100	104	742.30	12.00	120.0000	2.10
105	104	106	679.20	12.00	120.0000	2.58
107	106	300	876.30	12.00	120.0000	1.08
109	108	112	462.30	16.00	120.0000	0.80
113	112	116	727.90	12.00	120.0000	1.10
117	116	120	352.20	12.00	120.0000	0.60
121	120	80	467.00	12.00	120.0000	1.20
123	124	126	33.10	12.00	120.0000	1.50
125	126	128	774.20	12.00	120.0000	1.20
129	128	4	856.80	12.00	120.0000	0.60
133	2	136	106.70	12.00	120.0000	0.48
137	136	140	769.30	8.00	120.0000	1.58
141	140	144	596.90	8.00	120.0000	0.90
145	144	148	525.50	8.00	120.0000	1.55
149	148	100	616.50	12.00	120.0000	0.60
151	136	152	18.20	12.00	120.0000	0.30
153	152	156	774.10	24.00	120.0000	0.78
157	156	160	490.00	10.00	120.0000	1.23
161	160	164	1307.00	10.00	120.0000	2.61
165	164	168	70.30	8.00	120.0000	0.25
169	168	172	403.40	8.00	120.0000	0.60
173	176	172	629.60	6.00	120.0000	1.05
177	160	176	323.70	10.00	120.0000	0.78
179	176	180	151.30	8.00	120.0000	0.80
181	180	184	629.00	8.00	120.0000	0.55
185	184	124	358.00	8.00	120.0000	0.90
187	188	184	10.80	8.00	120.0000	0.30
189	172	188	136.70	8.00	120.0000	0.60
191	188	192	522.00	8.00	120.0000	1.05
193	192	120	379.10	12.00	120.0000	0.90
195	196	192	188.70	12.00	120.0000	0.90

197	200	196	830.70	12.00	120.0000	2.05
201	168	200	45.70	10.00	120.0000	1.05
203	196	204	297.40	12.00	120.0000	1.03
205	204	208	435.00	12.00	120.0000	0.78
209	208	116	265.10	8.00	120.0000	1.05
211	204	212	77.30	12.00	120.0000	1.05
213	212	216	853.90	12.00	120.0000	0.90
217	216	220	347.00	16.00	120.0000	0.60
221	224	220	803.30	6.00	120.0000	1.41
223	220	112	352.10	16.00	120.0000	0.60
225	212	224	238.40	12.00	120.0000	1.23
301	300	108	713.90	12.00	120.0000	0.00
305	200	304	263.00	12.00	120.0000	1.23
307-XX	304	308	541.80	24.00	120.0000	0.75
309	308	156	1421.00	24.00	120.0000	1.09

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE 36 DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)
-18.46	500.00
-18.69	1000.00
-20.77	1500.00
-26.54	2000.00
-33.46	2500.00

THERE IS A DEVICE AT NODE 56 ....> (ID= 2)

THERE IS A DEVICE AT NODE 68 ....> (ID= 2)

THERE IS A DEVICE AT NODE 84 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)
-16.15	450.00
-17.54	600.00
-18.92	750.00
-25.38	1200.00
-33.46	1500.00

THERE IS A DEVICE AT NODE 0 DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)
316.85	0.00
295.38	1714.00
239.37	3428.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
2		0.00	9.00	
4		0.00	9.00	
32		0.00	12.00	
I-36	WATTS LF957	0.00	12.00	
40		115.00	12.00	
44		0.00	10.00	
48		59.00	12.00	
52		45.00	12.00	
O-56	WATTS LF957	0.00	12.00	
60		0.00	12.00	
64		101.00	12.00	
66		6.00	12.00	
I-68	WATTS LF957	0.00	12.00	
72		0.00	11.00	
80		0.00	11.00	
I-84	WATTS LF957	0.00	11.00	
88		0.00	11.00	
100		0.00	10.00	
104		0.00	11.00	
106		15.00	11.00	
108		0.00	10.00	
112		0.00	10.00	
116		0.00	8.00	
120		15.00	9.00	
124		30.00	11.00	
126		6.00	12.00	
128		15.00	9.00	
136		0.00	11.00	
140		15.00	11.00	
144		15.00	11.00	
148		15.00	11.00	
152		0.00	11.00	
156		0.00	9.00	
160		15.00	11.00	
164		0.00	13.00	
168		0.00	13.00	
172		0.00	11.00	
176		15.00	10.00	
180		0.00	11.00	
184		15.00	11.00	
188		0.00	11.00	
192		0.00	11.00	
196		15.00	12.00	
200		15.00	13.00	
204		15.00	13.00	
208		15.00	13.00	
212		0.00	13.00	
216		15.00	12.00	
220		15.00	11.00	
224		0.00	12.00	
300		15.00	11.00	
304		0.00	14.00	
308		0.00	13.00	
0		----	14.00	14.00
O-36	WATTS LF957	0.00	12.00	
I-56	WATTS LF957	0.00	12.00	
O-68	WATTS LF957	0.00	12.00	
O-84	WATTS LF957	0.00	11.00	

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O U T P U T   O P T I O N   D A T A

OUTPUT SELECTION:  ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
        MAXIMUM AND MINIMUM PRESSURES       =    5
        MAXIMUM AND MINIMUM VELOCITIES      =    5


S Y S T E M   C O N F I G U R A T I O N

    NUMBER OF PIPES ..................(P) =    64
    NUMBER OF END NODES ..............(J) =    53
    NUMBER OF PRIMARY LOOPS ..........(L) =    11
    NUMBER OF SUPPLY NODES ...........(F) =     1
    NUMBER OF SUPPLY ZONES ...........(Z) =     1
```

Case: 1

MDD Plus 3,000 gpm Fire Flow split between Node 40 and Node 60

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	3669.40	0.09	0.00	2.60	1.12	1.12
3	2	4	1288.17	1.01	0.07	3.65	5.04	4.70
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	-1235.69	0.95	0.17	3.51	5.14	4.35
45	44	104	-1235.69	0.46	0.14	3.51	5.71	4.35
47	40	48	-264.31	0.02	0.00	0.75	0.29	0.25
49	48	52	-323.31	0.06	0.01	0.92	0.42	0.36
53	52	I-56	1500.00	2.14	1.49	9.57	76.22	44.89
57	O-56	60	1500.00	16.49	0.51	9.57	46.29	44.89
61	66	64	-1881.51	1.15	0.29	5.34	11.86	9.48
63	52	66	-1868.31	0.53	0.31	5.30	14.71	9.36
65	64	128	-1982.51	3.26	0.66	5.62	12.57	10.45
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	321.67	0.02	0.02	0.91	0.66	0.36
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	391.77	0.38	0.04	1.11	0.57	0.52
105	104	106	-843.92	1.46	0.23	2.39	2.49	2.15
107	106	300	-858.92	1.94	0.10	2.44	2.33	2.22
109	108	112	-873.92	0.26	0.02	1.39	0.62	0.56
113	112	116	-436.51	0.46	0.03	1.24	0.67	0.63
117	116	120	-288.28	0.10	0.01	0.82	0.31	0.29
121	120	80	321.67	0.17	0.02	0.91	0.39	0.36
123	124	126	734.54	0.05	0.10	2.08	4.72	1.66
125	126	128	721.34	1.24	0.08	2.05	1.71	1.61
129	128	4	-1288.17	4.03	0.12	3.65	4.85	4.70
133	2	136	-1288.17	0.50	0.10	3.65	5.63	4.70
137	136	140	472.77	4.07	0.22	3.02	5.58	5.29
141	140	144	445.77	2.83	0.11	2.85	4.93	4.74
145	144	148	418.77	2.22	0.17	2.67	4.55	4.23
149	148	100	391.77	0.32	0.01	1.11	0.54	0.52
151	136	152	-1760.94	0.15	0.12	5.00	14.77	8.39
153	152	156	-1760.94	0.22	0.02	1.25	0.31	0.29
157	156	160	471.15	0.87	0.07	1.92	1.92	1.77
161	160	164	30.55	0.01	0.00	0.12	0.01	0.01
165	164	168	30.55	0.00	0.00	0.19	0.04	0.03
169	168	172	357.95	1.27	0.05	2.28	3.28	3.16
173	176	172	104.95	0.83	0.02	1.19	1.36	1.32
177	160	176	413.60	0.45	0.03	1.69	1.50	1.39
179	176	180	281.65	0.31	0.04	1.80	2.29	2.03
181	180	184	281.65	1.28	0.03	1.80	2.07	2.03
185	184	124	442.87	1.68	0.11	2.83	5.00	4.69
187	188	184	188.22	0.01	0.01	1.20	1.58	0.96
189	172	188	462.90	0.70	0.08	2.95	5.68	5.09
191	188	192	274.68	1.01	0.05	1.75	2.03	1.94
193	192	120	636.95	0.48	0.05	1.81	1.40	1.28
195	196	192	362.27	0.08	0.01	1.03	0.53	0.45
197	200	196	1082.91	2.83	0.30	3.07	3.77	3.41
201	168	200	-327.40	0.04	0.03	1.34	1.54	0.90

203	196	204	693.64	0.44	0.06	1.97	1.70	1.49
205	204	208	175.24	0.05	0.00	0.50	0.12	0.12
209	208	116	148.24	0.16	0.01	0.95	0.67	0.62
211	204	212	491.40	0.06	0.03	1.39	1.20	0.79
213	212	216	418.16	0.50	0.02	1.19	0.61	0.59
217	216	220	391.16	0.04	0.00	0.62	0.14	0.13
221	224	220	73.24	0.55	0.02	0.83	0.70	0.68
223	220	112	437.40	0.06	0.00	0.70	0.17	0.16
225	212	224	73.24	0.01	0.00	0.21	0.03	0.02
301	300	108	-873.92	1.64	0.00	2.48	2.29	2.29
305	200	304	-1437.31	1.51	0.32	4.08	6.97	5.76
307	304	308	2232.09	0.24	0.03	1.58	0.50	0.44
309	308	156	2232.09	0.63	0.04	1.58	0.47	0.44

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
36	0.00	217.61	199.15	0.0
56	1500.00	214.06	193.29	-20.8
68	0.00	219.97	201.51	0.0
84	0.00	226.40	210.25	0.0
0	3669.40	0.00	229.27	229.3

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	241.12	9.00	232.12	100.59
4		0.00	240.04	9.00	231.04	100.12
32		0.00	211.15	12.00	199.15	86.30
I-36	WATTS LF957	0.00	229.61	12.00	217.61	94.30
40		1500.00(**)	229.61	12.00	217.61	94.30
44		0.00	230.73	10.00	220.73	95.65
48		59.00	229.63	12.00	217.63	94.31
52		45.00	229.70	12.00	217.70	94.33
O-56	WATTS LF957	0.00	205.29	12.00	193.29	83.76
60		1500.00	188.28	12.00	176.28	76.39
64		101.00	231.97	12.00	219.97	95.32
66		13.20(2.20)	230.53	12.00	218.53	94.70
I-68	WATTS LF957	0.00	231.97	12.00	219.97	95.32
72		0.00	213.51	11.00	202.51	87.75
80		0.00	237.40	11.00	226.40	98.11
I-84	WATTS LF957	0.00	237.40	11.00	226.40	98.11
88		0.00	221.25	11.00	210.25	91.11
100		0.00	231.76	10.00	221.76	96.10
104		0.00	231.34	11.00	220.34	95.48
106		15.00	233.02	11.00	222.02	96.21
108		0.00	236.70	10.00	226.70	98.24
112		0.00	236.99	10.00	226.99	98.36
116		0.00	237.48	8.00	229.48	99.44
120		27.00(1.80)	237.59	9.00	228.59	99.05
124		30.00	237.37	11.00	226.37	98.09
126		13.20(2.20)	237.21	12.00	225.21	97.59

128		27.00(1.80)	235.89	9.00	226.89	98.32
136		0.00	241.72	11.00	230.72	99.98
140		27.00(1.80)	237.43	11.00	226.43	98.12
144		27.00(1.80)	234.48	11.00	223.48	96.84
148		27.00(1.80)	232.09	11.00	221.09	95.81
152		0.00	241.99	11.00	230.99	100.10
156		0.00	242.23	9.00	233.23	101.07
160		27.00(1.80)	241.29	11.00	230.29	99.79
164		0.00	241.28	13.00	228.28	98.92
168		0.00	241.28	13.00	228.28	98.92
172		0.00	239.95	11.00	228.95	99.21
176		27.00(1.80)	240.81	10.00	230.81	100.02
180		0.00	240.46	11.00	229.46	99.43
184		27.00(1.80)	239.16	11.00	228.16	98.87
188		0.00	239.18	11.00	228.18	98.88
192		0.00	238.12	11.00	227.12	98.42
196		27.00(1.80)	238.21	12.00	226.21	98.03
200		27.00(1.80)	241.35	13.00	228.35	98.95
204		27.00(1.80)	237.71	13.00	224.71	97.37
208		27.00(1.80)	237.65	13.00	224.65	97.35
212		0.00	237.62	13.00	224.62	97.33
216		27.00(1.80)	237.10	12.00	225.10	97.54
220		27.00(1.80)	237.05	11.00	226.05	97.95
224		0.00	237.61	12.00	225.61	97.76
300		15.00	235.07	11.00	224.07	97.10
304		0.00	243.18	14.00	229.18	99.31
308		0.00	242.91	13.00	229.91	99.63
0		----	243.27	14.00	229.27	99.35
O-36	WATTS LF957	0.00	211.15	12.00	199.15	86.30
I-56	WATTS LF957	0.00	226.06	12.00	214.06	92.76
O-68	WATTS LF957	0.00	213.51	12.00	201.51	87.32
O-84	WATTS LF957	0.00	221.25	11.00	210.25	91.11

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
156	101.07	60	76.39
2	100.59	O-56	83.76
4	100.12	32	86.30
152	100.10	O-36	86.30
176	100.02	O-68	87.32

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
53	9.57	161	0.12
57	9.57	165	0.19
65	5.62	225	0.21
61	5.34	205	0.50
63	5.30	217	0.62

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	3669.40	

NET SYSTEM INFLOW = 3669.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3669.40

Case: 2

MDD Plus 3,000 gpm Fire Flow split between Node 40 and Node 60, Pipe 307 Closed

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	3669.40	0.09	0.00	2.60	1.12	1.12
3	2	4	686.44	0.31	0.02	1.95	1.56	1.47
33	32	O-36	0.00	0.00	0.00	0.00	0.00	0.00
37	I-36	40	0.00	0.00	0.00	0.00	0.00	0.00
41	40	44	-1317.43	1.07	0.20	3.74	5.79	4.90
45	44	104	-1317.43	0.52	0.16	3.74	6.44	4.90
47	40	48	-182.57	0.01	0.00	0.52	0.14	0.13
49	48	52	-241.57	0.03	0.01	0.69	0.25	0.21
53	52	I-56	1500.00	2.14	1.49	9.57	76.22	44.89
57	O-56	60	1500.00	16.49	0.51	9.57	46.29	44.89
61	66	64	-1799.77	1.06	0.26	5.11	10.91	8.73
63	52	66	-1786.57	0.49	0.28	5.07	13.51	8.61
65	64	128	-1900.77	3.01	0.61	5.39	11.62	9.66
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	780.68	0.09	0.09	2.21	3.65	1.86
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	266.58	0.19	0.02	0.76	0.28	0.25
105	104	106	-1050.85	2.19	0.36	2.98	3.75	3.22
107	106	300	-1065.85	2.90	0.15	3.02	3.48	3.31
109	108	112	-1080.85	0.39	0.04	1.72	0.92	0.84
113	112	116	-461.58	0.51	0.03	1.31	0.74	0.70
117	116	120	-176.18	0.04	0.00	0.50	0.12	0.12
121	120	80	780.68	0.87	0.09	2.21	2.06	1.86
123	124	126	1254.54	0.15	0.29	3.56	13.39	4.48
125	126	128	1241.34	3.40	0.23	3.52	4.69	4.39
129	128	4	-686.44	1.26	0.04	1.95	1.51	1.47
133	2	136	-686.44	0.16	0.03	1.95	1.73	1.47
137	136	140	347.58	2.30	0.12	2.22	3.15	2.99
141	140	144	320.58	1.54	0.06	2.05	2.67	2.58
145	144	148	293.58	1.15	0.08	1.87	2.35	2.19
149	148	100	266.58	0.16	0.01	0.76	0.26	0.25
151	136	152	-1034.01	0.06	0.04	2.93	5.33	3.13
153	152	156	-1034.01	0.08	0.01	0.73	0.12	0.11
157	156	160	-1034.01	3.73	0.34	4.22	8.30	7.60
161	160	164	-849.46	6.91	0.49	3.47	5.66	5.28
165	164	168	-849.46	1.10	0.11	5.42	17.28	15.66
169	168	172	846.51	6.28	0.27	5.40	16.24	15.56
173	176	172	-162.17	1.86	0.06	1.84	3.05	2.96
177	160	176	-211.56	0.13	0.01	0.86	0.43	0.40
179	176	180	-76.38	0.03	0.00	0.49	0.20	0.18
181	180	184	-76.38	0.11	0.00	0.49	0.18	0.18
185	184	124	503.86	2.13	0.14	3.22	6.36	5.95
187	188	184	607.24	0.09	0.07	3.88	14.89	8.41
189	172	188	684.34	1.43	0.18	4.37	11.80	10.50
191	188	192	77.10	0.10	0.00	0.49	0.19	0.18
193	192	120	983.85	1.08	0.11	2.79	3.14	2.85
195	196	192	906.76	0.46	0.09	2.57	2.94	2.45
197	200	196	1946.43	8.39	0.97	5.52	11.26	10.10

201	168	200	-1695.97	0.87	0.78	6.93	36.13	19.01
203	196	204	1012.67	0.90	0.13	2.87	3.45	3.01
205	204	208	312.40	0.15	0.01	0.89	0.36	0.34
209	208	116	285.40	0.55	0.05	1.82	2.28	2.08
211	204	212	673.27	0.11	0.06	1.91	2.18	1.41
213	212	216	572.76	0.89	0.04	1.62	1.09	1.05
217	216	220	545.76	0.08	0.01	0.87	0.26	0.24
221	224	220	100.51	0.98	0.03	1.14	1.26	1.22
223	220	112	619.27	0.11	0.01	0.99	0.32	0.30
225	212	224	100.51	0.01	0.00	0.29	0.05	0.04
301	300	108	-1080.85	2.42	0.00	3.07	3.40	3.40
305	200	304	-3669.40	8.59	2.07	10.41	40.54	32.67
307-XX	304	308						
309	308	156	0.00	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
36	0.00	198.43	179.97	0.0
56	1500.00	194.85	174.08	-20.8
68	0.00	200.57	182.11	0.0
84	0.00	209.45	193.30	0.0
0	3669.40	0.00	229.27	229.3

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	217.82	9.00	208.82	90.49
4		0.00	217.49	9.00	208.49	90.34
32		0.00	191.97	12.00	179.97	77.99
I-36	WATTS LF957	0.00	210.43	12.00	198.43	85.99
40		1500.00(**)	210.43	12.00	198.43	85.99
44		0.00	211.70	10.00	201.70	87.40
48		59.00	210.44	12.00	198.44	85.99
52		45.00	210.48	12.00	198.48	86.01
O-56	WATTS LF957	0.00	186.08	12.00	174.08	75.43
60		1500.00	169.07	12.00	157.07	68.06
64		101.00	212.57	12.00	200.57	86.91
66		13.20(2.20)	211.25	12.00	199.25	86.34
I-68	WATTS LF957	0.00	212.57	12.00	200.57	86.91
72		0.00	194.11	11.00	183.11	79.35
80		0.00	220.45	11.00	209.45	90.76
I-84	WATTS LF957	0.00	220.45	11.00	209.45	90.76
88		0.00	204.30	11.00	193.30	83.76
100		0.00	212.59	10.00	202.59	87.79
104		0.00	212.38	11.00	201.38	87.27
106		15.00	214.93	11.00	203.93	88.37
108		0.00	220.41	10.00	210.41	91.18
112		0.00	220.83	10.00	210.83	91.36
116		0.00	221.37	8.00	213.37	92.46
120		27.00(1.80)	221.41	9.00	212.41	92.05
124		30.00	220.27	11.00	209.27	90.68

126		13.20(2.20)	219.82	12.00	207.82	90.06
128		27.00(1.80)	216.20	9.00	207.20	89.78
136		0.00	218.01	11.00	207.01	89.70
140		27.00(1.80)	215.58	11.00	204.58	88.65
144		27.00(1.80)	213.99	11.00	202.99	87.96
148		27.00(1.80)	212.75	11.00	201.75	87.43
152		0.00	218.10	11.00	207.10	89.74
156		0.00	218.19	9.00	209.19	90.65
160		27.00(1.80)	222.26	11.00	211.26	91.55
164		0.00	229.65	13.00	216.65	93.88
168		0.00	230.87	13.00	217.87	94.41
172		0.00	224.32	11.00	213.32	92.44
176		27.00(1.80)	222.40	10.00	212.40	92.04
180		0.00	222.43	11.00	211.43	91.62
184		27.00(1.80)	222.54	11.00	211.54	91.67
188		0.00	222.70	11.00	211.70	91.74
192		0.00	222.60	11.00	211.60	91.70
196		27.00(1.80)	223.16	12.00	211.16	91.50
200		27.00(1.80)	232.52	13.00	219.52	95.12
204		27.00(1.80)	222.13	13.00	209.13	90.62
208		27.00(1.80)	221.97	13.00	208.97	90.56
212		0.00	221.96	13.00	208.96	90.55
216		27.00(1.80)	221.03	12.00	209.03	90.58
220		27.00(1.80)	220.94	11.00	209.94	90.98
224		0.00	221.95	12.00	209.95	90.98
300		15.00	217.98	11.00	206.98	89.69
304		0.00	243.18	14.00	229.18	99.31
308		0.00	218.19	13.00	205.19	88.92
0		----	243.27	14.00	229.27	99.35
O-36	WATTS LF957	0.00	191.97	12.00	179.97	77.99
I-56	WATTS LF957	0.00	206.85	12.00	194.85	84.43
O-68	WATTS LF957	0.00	194.11	12.00	182.11	78.91
O-84	WATTS LF957	0.00	204.30	11.00	193.30	83.76

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
0	99.35	60	68.06
304	99.31	O-56	75.43
200	95.12	32	77.99
168	94.41	O-36	77.99
164	93.88	O-68	78.91

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
305	10.41	225	0.29
53	9.57	179	0.49
57	9.57	181	0.49
201	6.93	191	0.49
197	5.52	117	0.50

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	3669.40	

NET SYSTEM INFLOW = 3669.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3669.40

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Case: 3

MDD Plus 3,000 gpm Fire Flow split between Node 32 and Node 40

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	3669.40	0.09	0.00	2.60	1.12	1.12
3	2	4	1257.04	0.96	0.07	3.57	4.82	4.49
33	32	O-36	-1500.00	16.75	0.51	9.57	46.27	44.89
37	I-36	40	-1500.00	2.06	1.49	9.57	77.45	44.89
41	40	44	-1329.68	1.09	0.20	3.77	5.89	4.99
45	44	104	-1329.68	0.53	0.17	3.77	6.56	4.99
47	40	48	-1670.32	0.52	0.10	4.74	9.13	7.61
49	48	52	-1729.32	1.31	0.28	4.91	9.85	8.11
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	-1787.52	1.04	0.26	5.07	10.77	8.62
63	52	66	-1774.32	0.48	0.28	5.03	13.34	8.51
65	64	128	-1888.52	2.98	0.60	5.36	11.48	9.55
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	264.38	0.01	0.01	0.75	0.46	0.25
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	415.58	0.43	0.05	1.18	0.64	0.58
105	104	106	-914.10	1.69	0.27	2.59	2.89	2.49
107	106	300	-929.10	2.25	0.12	2.64	2.70	2.57
109	108	112	-944.10	0.30	0.03	1.51	0.71	0.65
113	112	116	-479.32	0.55	0.03	1.36	0.80	0.75
117	116	120	-336.50	0.14	0.01	0.95	0.42	0.39
121	120	80	264.38	0.12	0.01	0.75	0.27	0.25
123	124	126	671.68	0.05	0.08	1.91	3.96	1.41
125	126	128	658.48	1.05	0.07	1.87	1.44	1.36
129	128	4	-1257.04	3.85	0.12	3.57	4.63	4.49
133	2	136	-1257.04	0.48	0.09	3.57	5.38	4.49
137	136	140	496.58	4.46	0.25	3.17	6.12	5.79
141	140	144	469.58	3.12	0.13	3.00	5.44	5.23
145	144	148	442.58	2.46	0.19	2.82	5.05	4.68
149	148	100	415.58	0.36	0.01	1.18	0.60	0.58
151	136	152	-1753.62	0.15	0.12	4.97	14.66	8.32
153	152	156	-1753.62	0.22	0.02	1.24	0.31	0.28
157	156	160	473.89	0.88	0.07	1.94	1.94	1.79
161	160	164	33.30	0.02	0.00	0.14	0.01	0.01
165	164	168	33.30	0.00	0.00	0.21	0.04	0.04
169	168	172	357.65	1.27	0.05	2.28	3.28	3.16
173	176	172	105.01	0.83	0.02	1.19	1.36	1.32
177	160	176	413.60	0.45	0.03	1.69	1.50	1.39
179	176	180	281.58	0.31	0.04	1.80	2.29	2.03
181	180	184	281.58	1.27	0.03	1.80	2.07	2.03
185	184	124	437.30	1.64	0.11	2.79	4.88	4.58
187	188	184	182.71	0.01	0.01	1.17	1.50	0.91
189	172	188	462.66	0.69	0.08	2.95	5.68	5.08
191	188	192	279.95	1.05	0.05	1.79	2.10	2.00
193	192	120	627.88	0.47	0.04	1.78	1.36	1.24
195	196	192	347.93	0.08	0.01	0.99	0.49	0.42
197	200	196	1090.54	2.87	0.30	3.09	3.82	3.45

201	168	200	-324.35	0.04	0.03	1.32	1.51	0.89
203	196	204	715.60	0.47	0.07	2.03	1.80	1.58
205	204	208	169.82	0.05	0.00	0.48	0.12	0.11
209	208	116	142.82	0.15	0.01	0.91	0.63	0.58
211	204	212	518.78	0.07	0.04	1.47	1.33	0.87
213	212	216	441.44	0.55	0.02	1.25	0.67	0.65
217	216	220	414.44	0.05	0.00	0.66	0.15	0.14
221	224	220	77.34	0.60	0.02	0.88	0.77	0.75
223	220	112	464.78	0.06	0.01	0.74	0.19	0.18
225	212	224	77.34	0.01	0.00	0.22	0.03	0.03
301	300	108	-944.10	1.89	0.00	2.68	2.64	2.64
305	200	304	-1441.88	1.52	0.32	4.09	7.01	5.79
307	304	308	2227.52	0.24	0.03	1.58	0.50	0.44
309	308	156	2227.52	0.63	0.04	1.58	0.47	0.44

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
36	1500.00	212.75	191.98	-20.8
56	0.00	218.51	200.05	0.0
68	0.00	220.58	202.12	0.0
84	0.00	226.43	210.27	0.0
0	3669.40	0.00	229.27	229.3

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	241.16	9.00	232.16	100.60
4		0.00	240.13	9.00	231.13	100.15
32		1500.00	186.71	12.00	174.71	75.71
I-36	WATTS LF957	0.00	224.75	12.00	212.75	92.19
40		1500.00(**)	228.30	12.00	216.30	93.73
44		0.00	229.59	10.00	219.59	95.16
48		59.00	228.93	12.00	216.93	94.00
52		45.00	230.51	12.00	218.51	94.69
O-56	WATTS LF957	0.00	212.05	12.00	200.05	86.69
60		0.00	212.05	12.00	200.05	86.69
64		101.00	232.58	12.00	220.58	95.58
66		13.20(2.20)	231.27	12.00	219.27	95.02
I-68	WATTS LF957	0.00	232.58	12.00	220.58	95.58
72		0.00	214.12	11.00	203.12	88.02
80		0.00	237.43	11.00	226.43	98.12
I-84	WATTS LF957	0.00	237.43	11.00	226.43	98.12
88		0.00	221.27	11.00	210.27	91.12
100		0.00	230.76	10.00	220.76	95.66
104		0.00	230.29	11.00	219.29	95.02
106		15.00	232.25	11.00	221.25	95.87
108		0.00	236.50	10.00	226.50	98.15
112		0.00	236.83	10.00	226.83	98.29
116		0.00	237.41	8.00	229.41	99.41
120		27.00(1.80)	237.55	9.00	228.55	99.04
124		30.00	237.40	11.00	226.40	98.11

126		13.20(2.20)	237.27	12.00	225.27	97.62
128		27.00(1.80)	236.16	9.00	227.16	98.44
136		0.00	241.73	11.00	230.73	99.98
140		27.00(1.80)	237.03	11.00	226.03	97.94
144		27.00(1.80)	233.78	11.00	222.78	96.54
148		27.00(1.80)	231.13	11.00	220.13	95.39
152		0.00	242.00	11.00	231.00	100.10
156		0.00	242.24	9.00	233.24	101.07
160		27.00(1.80)	241.29	11.00	230.29	99.79
164		0.00	241.27	13.00	228.27	98.92
168		0.00	241.27	13.00	228.27	98.92
172		0.00	239.94	11.00	228.94	99.21
176		27.00(1.80)	240.80	10.00	230.80	100.01
180		0.00	240.45	11.00	229.45	99.43
184		27.00(1.80)	239.15	11.00	228.15	98.87
188		0.00	239.17	11.00	228.17	98.87
192		0.00	238.07	11.00	227.07	98.40
196		27.00(1.80)	238.16	12.00	226.16	98.00
200		27.00(1.80)	241.34	13.00	228.34	98.95
204		27.00(1.80)	237.63	13.00	224.63	97.34
208		27.00(1.80)	237.57	13.00	224.57	97.32
212		0.00	237.52	13.00	224.52	97.29
216		27.00(1.80)	236.95	12.00	224.95	97.48
220		27.00(1.80)	236.90	11.00	225.90	97.89
224		0.00	237.52	12.00	225.52	97.72
300		15.00	234.61	11.00	223.61	96.90
304		0.00	243.18	14.00	229.18	99.31
308		0.00	242.91	13.00	229.91	99.63
0		----	243.27	14.00	229.27	99.35
O-36	WATTS LF957	0.00	203.98	12.00	191.98	83.19
I-56	WATTS LF957	0.00	230.51	12.00	218.51	94.69
O-68	WATTS LF957	0.00	214.12	12.00	202.12	87.58
O-84	WATTS LF957	0.00	221.27	11.00	210.27	91.12

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
156	101.07	32	75.71
2	100.60	O-36	83.19
4	100.15	O-56	86.69
152	100.10	60	86.69
176	100.01	O-68	87.58

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
33	9.57	161	0.14
37	9.57	165	0.21
65	5.36	225	0.22
61	5.07	205	0.48
63	5.03	217	0.66

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S U M M A R Y   O F   I N F L O W S   A N D   O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

       NODE        FLOWRATE        NODE
       NAME         gpm            TITLE
    -----------------------------------------
     0               3669.40

NET SYSTEM INFLOW  =   3669.40
NET SYSTEM OUTFLOW =      0.00
NET SYSTEM DEMAND  =   3669.40
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Case: 4

MDD Plus 3,000 gpm Fire Flow split between Node 32 and Node 40, Pipe 307 Closed

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
1	0	304	3669.40	0.09	0.00	2.60	1.12	1.12
3	2	4	644.55	0.28	0.02	1.83	1.39	1.30
33	32	O-36	-1500.00	16.75	0.51	9.57	46.27	44.89
37	I-36	40	-1500.00	2.06	1.49	9.57	77.45	44.89
41	40	44	-1402.34	1.21	0.22	3.98	6.51	5.50
45	44	104	-1402.34	0.58	0.18	3.98	7.25	5.50
47	40	48	-1597.66	0.48	0.10	4.53	8.40	7.00
49	48	52	-1656.66	1.21	0.26	4.70	9.09	7.49
53	52	I-56	0.00	0.00	0.00	0.00	0.00	0.00
57	O-56	60	0.00	0.00	0.00	0.00	0.00	0.00
61	66	64	-1714.86	0.97	0.24	4.86	9.96	7.99
63	52	66	-1701.66	0.45	0.25	4.83	12.31	7.87
65	64	128	-1815.86	2.77	0.56	5.15	10.66	8.88
67	I-68	64	0.00	0.00	0.00	0.00	0.00	0.00
69	72	O-68	0.00	0.00	0.00	0.00	0.00	0.00
81	I-84	80	0.00	0.00	0.00	0.00	0.00	0.00
83	80	124	743.94	0.09	0.08	2.11	3.33	1.70
85	88	O-84	0.00	0.00	0.00	0.00	0.00	0.00
101	100	104	297.94	0.23	0.02	0.85	0.34	0.31
105	104	106	-1104.40	2.40	0.39	3.13	4.11	3.53
107	106	300	-1119.40	3.18	0.17	3.18	3.82	3.62
109	108	112	-1134.40	0.42	0.04	1.81	1.00	0.92
113	112	116	-497.44	0.59	0.03	1.41	0.85	0.81
117	116	120	-215.20	0.06	0.00	0.61	0.18	0.17
121	120	80	743.94	0.79	0.08	2.11	1.88	1.70
123	124	126	1211.50	0.14	0.28	3.44	12.51	4.20
125	126	128	1198.30	3.18	0.22	3.40	4.39	4.11
129	128	4	-644.55	1.12	0.03	1.83	1.34	1.30
133	2	136	-644.55	0.14	0.02	1.83	1.54	1.30
137	136	140	378.94	2.70	0.14	2.42	3.70	3.51
141	140	144	351.94	1.83	0.07	2.25	3.18	3.06
145	144	148	324.94	1.39	0.10	2.07	2.84	2.64
149	148	100	297.94	0.19	0.01	0.85	0.32	0.31
151	136	152	-1023.50	0.06	0.04	2.90	5.23	3.07
153	152	156	-1023.50	0.08	0.01	0.73	0.11	0.10
157	156	160	-1023.50	3.66	0.33	4.18	8.14	7.46
161	160	164	-846.86	6.87	0.48	3.46	5.62	5.25
165	164	168	-846.86	1.09	0.11	5.40	17.19	15.57
169	168	172	845.68	6.27	0.27	5.40	16.21	15.53
173	176	172	-160.92	1.84	0.05	1.83	3.00	2.92
177	160	176	-203.64	0.12	0.01	0.83	0.40	0.38
179	176	180	-69.72	0.02	0.00	0.44	0.17	0.15
181	180	184	-69.72	0.10	0.00	0.44	0.16	0.15
185	184	124	497.56	2.08	0.14	3.18	6.21	5.82
187	188	184	594.28	0.09	0.07	3.79	14.29	8.08
189	172	188	684.76	1.44	0.18	4.37	11.81	10.51
191	188	192	90.48	0.13	0.01	0.58	0.26	0.25
193	192	120	986.15	1.09	0.11	2.80	3.15	2.87
195	196	192	895.66	0.45	0.09	2.54	2.88	2.40
197	200	196	1949.86	8.41	0.97	5.53	11.30	10.13

201	168	200	-1692.54	0.87	0.78	6.91	35.99	18.94
203	196	204	1027.20	0.92	0.14	2.91	3.55	3.09
205	204	208	309.23	0.15	0.01	0.88	0.36	0.33
209	208	116	282.23	0.54	0.05	1.80	2.23	2.04
211	204	212	690.96	0.11	0.06	1.96	2.29	1.48
213	212	216	587.80	0.94	0.04	1.67	1.14	1.10
217	216	220	560.80	0.09	0.01	0.89	0.27	0.25
221	224	220	103.16	1.03	0.03	1.17	1.32	1.28
223	220	112	636.96	0.11	0.01	1.02	0.34	0.31
225	212	224	103.16	0.01	0.00	0.29	0.05	0.04
301	300	108	-1134.40	2.65	0.00	3.22	3.71	3.71
305	200	304	-3669.40	8.59	2.07	10.41	40.54	32.67
307-XX	304	308						
309	308	156	0.00	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft
36	1500.00	193.70	172.93	-20.8
56	0.00	199.30	180.84	0.0
68	0.00	201.21	182.74	0.0
84	0.00	209.51	193.36	0.0
0	3669.40	0.00	229.27	229.3

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
2		0.00	217.98	9.00	208.98	90.56
4		0.00	217.68	9.00	208.68	90.43
32		1500.00	167.67	12.00	155.67	67.46
I-36	WATTS LF957	0.00	205.70	12.00	193.70	83.94
40		1500.00(**)	209.26	12.00	197.26	85.48
44		0.00	210.69	10.00	200.69	86.96
48		59.00	209.83	12.00	197.83	85.73
52		45.00	211.30	12.00	199.30	86.36
O-56	WATTS LF957	0.00	192.84	12.00	180.84	78.36
60		0.00	192.84	12.00	180.84	78.36
64		101.00	213.21	12.00	201.21	87.19
66		13.20(2.20)	212.00	12.00	200.00	86.67
I-68	WATTS LF957	0.00	213.21	12.00	201.21	87.19
72		0.00	194.74	11.00	183.74	79.62
80		0.00	220.51	11.00	209.51	90.79
I-84	WATTS LF957	0.00	220.51	11.00	209.51	90.79
88		0.00	204.36	11.00	193.36	83.79
100		0.00	211.71	10.00	201.71	87.41
104		0.00	211.45	11.00	200.45	86.86
106		15.00	214.24	11.00	203.24	88.07
108		0.00	220.24	10.00	210.24	91.10
112		0.00	220.71	10.00	210.71	91.31
116		0.00	221.33	8.00	213.33	92.44
120		27.00(1.80)	221.39	9.00	212.39	92.04
124		30.00	220.34	11.00	209.34	90.72

126		13.20(2.20)	219.93	12.00	207.93	90.10
128		27.00(1.80)	216.53	9.00	207.53	89.93
136		0.00	218.14	11.00	207.14	89.76
140		27.00(1.80)	215.30	11.00	204.30	88.53
144		27.00(1.80)	213.40	11.00	202.40	87.71
148		27.00(1.80)	211.90	11.00	200.90	87.06
152		0.00	218.24	11.00	207.24	89.80
156		0.00	218.32	9.00	209.32	90.71
160		27.00(1.80)	222.31	11.00	211.31	91.57
164		0.00	229.66	13.00	216.66	93.89
168		0.00	230.87	13.00	217.87	94.41
172		0.00	224.33	11.00	213.33	92.45
176		27.00(1.80)	222.44	10.00	212.44	92.06
180		0.00	222.47	11.00	211.47	91.64
184		27.00(1.80)	222.57	11.00	211.57	91.68
188		0.00	222.72	11.00	211.72	91.75
192		0.00	222.59	11.00	211.59	91.69
196		27.00(1.80)	223.13	12.00	211.13	91.49
200		27.00(1.80)	232.52	13.00	219.52	95.12
204		27.00(1.80)	222.07	13.00	209.07	90.60
208		27.00(1.80)	221.92	13.00	208.92	90.53
212		0.00	221.90	13.00	208.90	90.52
216		27.00(1.80)	220.92	12.00	208.92	90.53
220		27.00(1.80)	220.83	11.00	209.83	90.92
224		0.00	221.88	12.00	209.88	90.95
300		15.00	217.59	11.00	206.59	89.52
304		0.00	243.18	14.00	229.18	99.31
308		0.00	218.32	13.00	205.32	88.97
0		----	243.27	14.00	229.27	99.35
O-36	WATTS LF957	0.00	184.93	12.00	172.93	74.94
I-56	WATTS LF957	0.00	211.30	12.00	199.30	86.36
O-68	WATTS LF957	0.00	194.74	12.00	182.74	79.19
O-84	WATTS LF957	0.00	204.36	11.00	193.36	83.79

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
0	99.35	32	67.46
304	99.31	O-36	74.94
200	95.12	O-56	78.36
168	94.41	60	78.36
164	93.89	O-68	79.19

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
305	10.41	225	0.29
33	9.57	179	0.44
37	9.57	181	0.44
201	6.91	191	0.58
197	5.53	117	0.61

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0	3669.40	

NET SYSTEM INFLOW = 3669.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3669.40

EXHIBIT A

BUILDOUT WATER SYSTEM
NODE AND PIPE DIAGRAM

LEGEND

- PROJECT BOUNDARY
- PROPOSED PUBLIC STREET RIGHT-OF-WAY
- EXISTING PUBLIC WATER LINE (UNIVERSITY HEIGHTS 390 PZ)
- PROPOSED PUBLIC WATER LINE (UNIVERSITY HEIGHTS 390 PZ)
- PROPOSED PRIVATE FIRE PROTECTION SYSTEM (UNIVERSITY HEIGHTS 390 PZ)
- EXISTING PUBLIC FIRE HYDRANT
- PROPOSED PUBLIC FIRE HYDRANT
- PROPOSED PRIVATE FIRE HYDRANT
- PROPOSED BACKFLOW PREVENTER
- (4) COMPUTER MODEL NODE NUMBER
- [5] COMPUTER MODEL PIPE NUMBER

N

0 150 FEET

HANCOCK ST
KURTZ ST
SPORTS ARENA BLVD
KEMPER ST
MIDWAY DR
SHERMAN ST
GREENWOOD ST
MOORE ST
GAINES ST
ROSECRANS ST
CAMINO DEL RIO
FRONTIER ST (PUBLIC)
KEMPER ST (PUBLIC)

BLOCK A1
BLOCK A2
BLOCK A3
BLOCK B1
BLOCK B2
BLOCK C1
BLOCK C2
BLOCK D1
BLOCK D2
BLOCK E1
BLOCK E2
BLOCK F
BLOCK G
BLOCK H1
BLOCK H2

ENTERTAINMENT CENTER

SEE IRRIGATION NOTE 1
SEE IRRIGATION NOTE 2

MIDWAY RISING PROJECT TENTATIVE MAP BOUNDARY

IRRIGATION NOTES:

1. PROPOSED POINT OF CONNECTION FOR PHASE 1 IRRIGATION SERVICE. METER AND LATERAL SIZE TO BE DETERMINED BY LANDSCAPE ARCHITECT DURING FINAL DESIGN.
2. PROPOSED POINT OF CONNECTION FOR PHASE 2 IRRIGATION SERVICE.METER AND LATERAL SIZE TO BE DETERMINED BY LANDSCAPE ARCHITECT DURING FINAL DESIGN.

DOMESTIC SERVICE NOTES:

1. THE BUILDING SUPPLY FOR EACH BUILDING WITHIN THE PROJECT SHALL HAVE PRESSURE REGULATORS IN ACCORDANCE WITH THE PLUMBING CODE.

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008
(760) 438-4422

EXHIBIT A
NODE AND PIPE DIAGRAM
PHASE 3 (BUILDOUT)

MIDWAY RISING

EXHIBIT A.1

PHASE 1 WATER SYSTEM
NODE AND PIPE DIAGRAM

LEGEND

- PROJECT BOUNDARY
- PROPOSED PUBLIC STREET RIGHT-OF-WAY
- EXISTING PUBLIC WATER LINE (UNIVERSITY HEIGHTS 390 PZ)
- PROPOSED PUBLIC WATER LINE (UNIVERSITY HEIGHTS 390 PZ)
- PROPOSED PRIVATE FIRE PROTECTION SYSTEM (UNIVERSITY HEIGHTS 390 PZ)
- EXISTING PUBLIC FIRE HYDRANT
- PROPOSED PUBLIC FIRE HYDRANT
- PROPOSED PRIVATE FIRE HYDRANT
- PROPOSED BACKFLOW PREVENTER
- (4) COMPUTER MODEL NODE NUMBER
- [5] COMPUTER MODEL PIPE NUMBER

N

0 150 FEET

HANCOCK ST
KURTZ ST
SPORTS ARENA BLVD
KEMPER ST (PUBLIC)
FRONTIER ST (PUBLIC)
SHERMAN ST
GREENWOOD ST
CAMINO DEL RIO
GAINES ST
MOORE ST
ROSECRANS ST
MIDWAY DR

BLOCK A1
BLOCK A2
BLOCK A3
BLOCK B1
BLOCK B2
BLOCK C1
BLOCK C2
BLOCK D1
BLOCK D2
BLOCK E1
BLOCK E2
BLOCK F
BLOCK G
BLOCK H1
BLOCK H2

ENTERTAINMENT CENTER

MIDWAY RISING PROJECT TENTATIVE MAP BOUNDARY

SEE IRRIGATION NOTE 1

IRRIGATION NOTES:

1. PROPOSED POINT OF CONNECTION FOR PHASE 1 IRRIGATION SERVICE. METER AND LATERAL SIZE TO BE DETERMINED BY LANDSCAPE ARCHITECT DURING FINAL DESIGN.

DOMESTIC SERVICE NOTES:

1. THE BUILDING SUPPLY FOR EACH BUILDING WITHIN THE PROJECT SHALL HAVE PRESSURE REGULATORS IN ACCORDANCE WITH THE PLUMBING CODE.

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EXHIBIT A.1

NODE AND PIPE DIAGRAM PHASE 1

MIDWAY RISING

EXHIBIT A.2

PHASE 2 WATER SYSTEM
NODE AND PIPE DIAGRAM

LEGEND

- PROJECT BOUNDARY
- PROPOSED PUBLIC STREET RIGHT-OF-WAY
- EXISTING PUBLIC WATER LINE (UNIVERSITY HEIGHTS 390 PZ)
- PROPOSED PUBLIC WATER LINE (UNIVERSITY HEIGHTS 390 PZ)
- PROPOSED PRIVATE FIRE PROTECTION SYSTEM (UNIVERSITY HEIGHTS 390 PZ)
- EXISTING PUBLIC FIRE HYDRANT
- PROPOSED PUBLIC FIRE HYDRANT
- PROPOSED PRIVATE FIRE HYDRANT
- PROPOSED BACKFLOW PREVENTER
- (4) COMPUTER MODEL NODE NUMBER
- [5] COMPUTER MODEL PIPE NUMBER

N

0 150 FEET

HANCOCK ST
KURTZ ST
SPORTS ARENA BLVD
KEMPER ST
MIDWAY DR
KEMPER ST (PUBLIC)
FRONTIER ST (PUBLIC)
SHERMAN ST
GREENWOOD ST
CAMINO DEL RIO
GAINES ST
MOORE ST
ROSECRANS ST
BLOCK A1
BLOCK A2
BLOCK A3
BLOCK B1
BLOCK B2
BLOCK C1
BLOCK C2
BLOCK D1
BLOCK D2
BLOCK E1
BLOCK E2
BLOCK F
BLOCK G
BLOCK H1
BLOCK H2
ENTERTAINMENT CENTER
SEE NOTE 2
SEE IRRIGATION NOTE 1
MIDWAY RISING PROJECT TENTATIVE MAP BOUNDARY

IRRIGATION NOTES:

1. PROPOSED POINT OF CONNECTION FOR PHASE 1 IRRIGATION SERVICE. METER AND LATERAL SIZE TO BE DETERMINED BY LANDSCAPE ARCHITECT DURING FINAL DESIGN.
2. PROPOSED POINT OF CONNECTION FOR PHASE 2 IRRIGATION SERVICE.METER AND LATERAL SIZE TO BE DETERMINED BY LANDSCAPE ARCHITECT DURING FINAL DESIGN.

DOMESTIC SERVICE NOTES:

1. THE BUILDING SUPPLY FOR EACH BUILDING WITHIN THE PROJECT SHALL HAVE PRESSURE REGULATORS IN ACCORDANCE WITH THE PLUMBING CODE.

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EXHIBIT A.2

NODE AND PIPE DIAGRAM PHASE 2

MIDWAY RISING