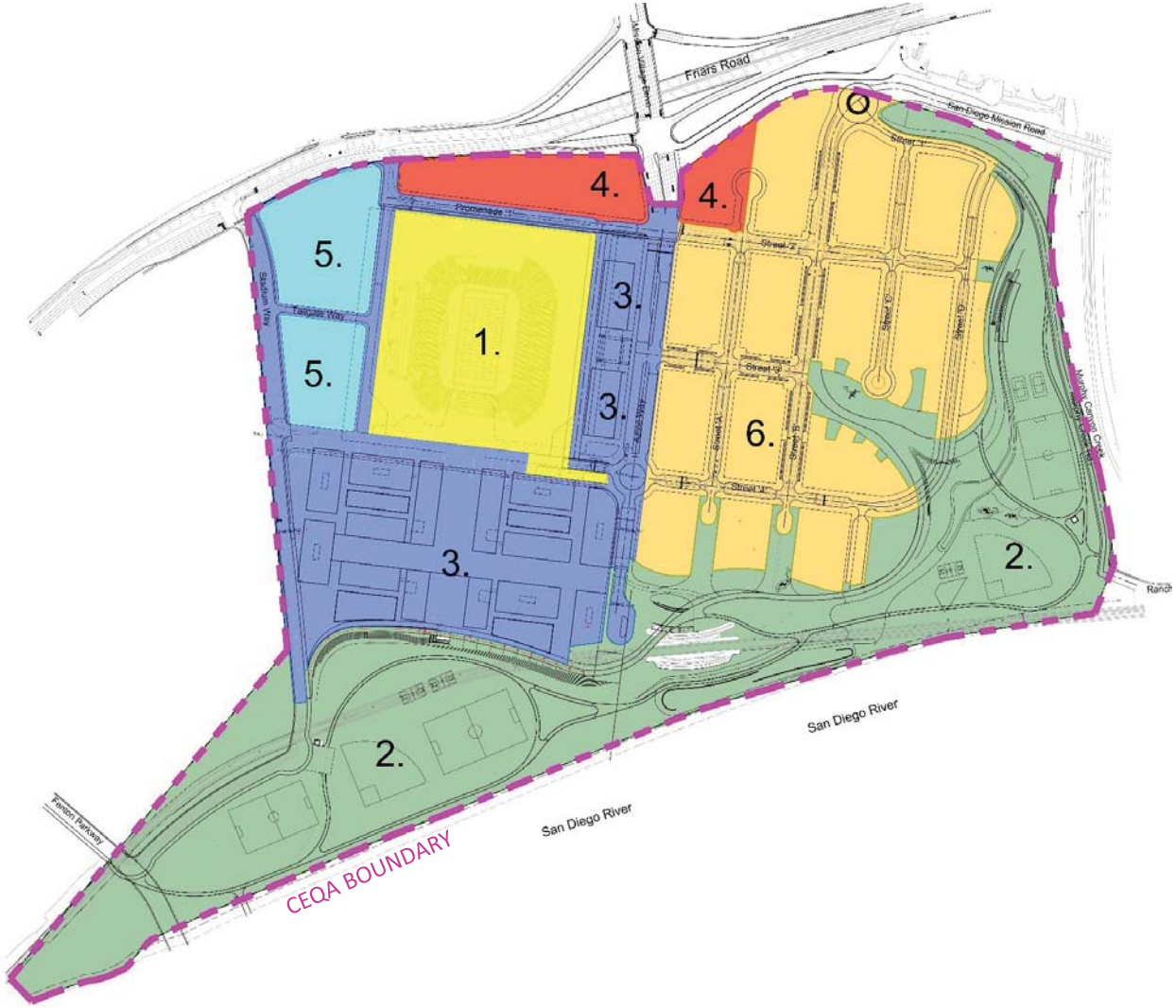
# APPENDIX A

# PRELIMINARY SITE PLAN

# SITE PLAN




1. STADIUM
2. PARK SPACE
3. SDSU CAMPUS EXPANSION
4. HOTEL & CONFERENCE CENTER
5. TAILGATE PARK
6. RESIDENTIAL

# APPENDIX B

# LAND USE BREAKDOWN

**SDSU MISSION VALLEY PROJECT**
**AVERAGE POTABLE WATER DEMAND**

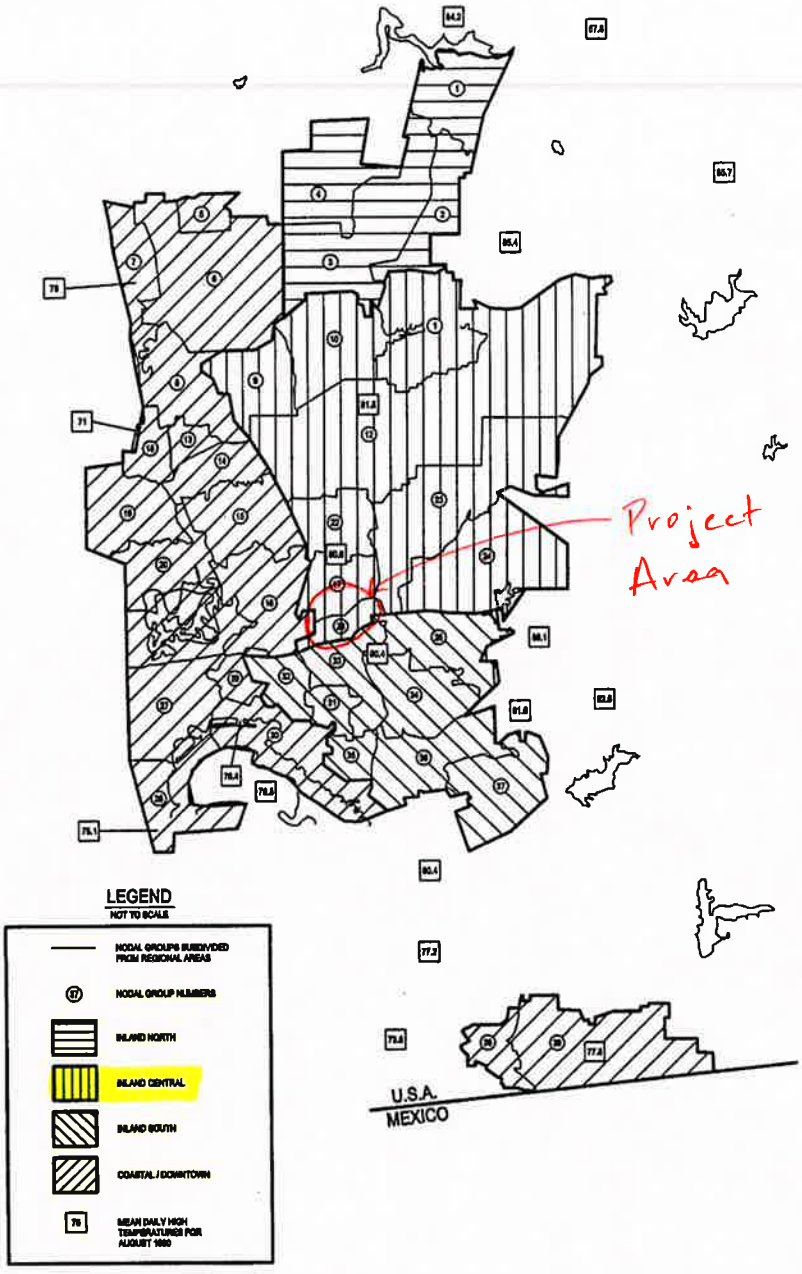
| Area | Net Area, ft2 | Net Area, ac | Dwelling Units | Dwelling Unit Density, DU/ac | Unit Density, Pop./DU | Total Population | Average Water Demand, gpd |
|---|---|---|---|---|---|---|---|
| Campus | | | | | | *Stories* | |
| A1 | 28084 | 0.64 | -- | -- | -- | *5* | 15,086 |
| A2 | 20064 | 0.46 | -- | -- | -- | *3* | 6,467 |
| A3 | 27720 | 0.64 | -- | -- | -- | *3* | 8,935 |
| A4 | 28084 | 0.64 | -- | -- | -- | *4* | 12,069 |
| B1 | 28084 | 0.64 | -- | -- | -- | *5* | 15,086 |
| B2 | 20064 | 0.46 | -- | -- | -- | *3* | 6,467 |
| B3 | 16720 | 0.38 | -- | -- | -- | *3* | 5,389 |
| C1 | 16720 | 0.38 | -- | -- | -- | *3* | 5,389 |
| C2 | 28084 | 0.64 | -- | -- | -- | *3* | 9,052 |
| C3 | 23718 | 0.54 | -- | -- | -- | *5* | 12,741 |
| D1 | 27720 | 0.64 | -- | -- | -- | *3* | 8,935 |
| D2 | 22880 | 0.53 | -- | -- | -- | *3* | 7,375 |
| D3 | 33630 | 0.77 | -- | -- | -- | *3* | 10,839 |
| D4 | 28084 | 0.64 | -- | -- | -- | *4* | 12,069 |
| E1 | 30090 | 0.69 | -- | -- | -- | *5* | 16,164 |
| F1 | 30090 | 0.69 | -- | -- | -- | *5* | 16,164 |
| Sub-Total | 409836.0 | 9.4 | | | | | 168,012 |
| Residential | | | | | | | |
| R1 | 118102 | 2.7 | 302 | 111 | 1.8 | 544 | 81,540 |
| R2 | 81911 | 1.9 | 353 | 188 | 1.6 | 565 | 84,720 |
| R3 | 77895 | 1.8 | 356 | 199 | 1.5 | 534 | 80,100 |
| R4 | 47483 | 1.1 | 29 | 27 | 3.0 | 87 | 13,050 |
| R5 | 76000 | 1.7 | 313 | 179 | 1.6 | 501 | 75,120 |
| R6 | 76000 | 1.7 | 488 | 280 | 1.5 | 732 | 109,800 |
| R7 | 82930 | 1.9 | 485 | 255 | 1.5 | 728 | 109,125 |
| R8 | 101102 | 2.3 | 347 | 150 | 1.7 | 590 | 88,485 |
| R9 | 32351 | 0.7 | 40 | 54 | 2.5 | 100 | 15,000 |
| R10 | 75573 | 1.7 | 319 | 184 | 1.6 | 510 | 76,560 |
| R11 | 76000 | 1.7 | 465 | 267 | 1.5 | 698 | 104,625 |
| R12 | 81240 | 1.9 | 209 | 112 | 1.8 | 376 | 56,430 |
| R13 | 67288 | 1.5 | 311 | 201 | 1.5 | 467 | 69,975 |
| R14 | 52295 | 1.2 | 260 | 217 | 1.5 | 390 | 58,500 |
| R15 | 57935 | 1.3 | 261 | 196 | 1.6 | 418 | 62,640 |
| H1 Res | 108518 | 2.5 | 71 | 28 | 3.0 | 213 | 31,950 |
| Sub-Total | 1212623 | 1.7 | 4609 | 165 | 1.7 | 7451 | 1,117,650 |
| Hotel | | | | | | | |
| H1 | 173934 | 4.0 | 255 | | | | 26,174 |
| H2 | 63644 | 1.5 | 145 | | | | 9,577 |
| Sub-Total | | 5.5 | | | | | 36,053 |
| Parks | | | | | | | |
| SDSU Parks | 1350360 | 31.0 | | | | | 124,000 |
| Stadium | | | | | | | |
| SDSU Stadium | NA | NA | 35000 | | | | 140,000 |
| Retail | 95000 | 2.2 | | | | | 11,000 |
| **TOTAL** | | | | | | | **1,596,715** |

# APPENDIX C

# PEAKING FACTOR GRAPHS

**PEAKING FACTOR ZONES**
(BOUNDARIES BASED ON LAND USE GROUPINGS)

FIGURE 2-3




July 1999

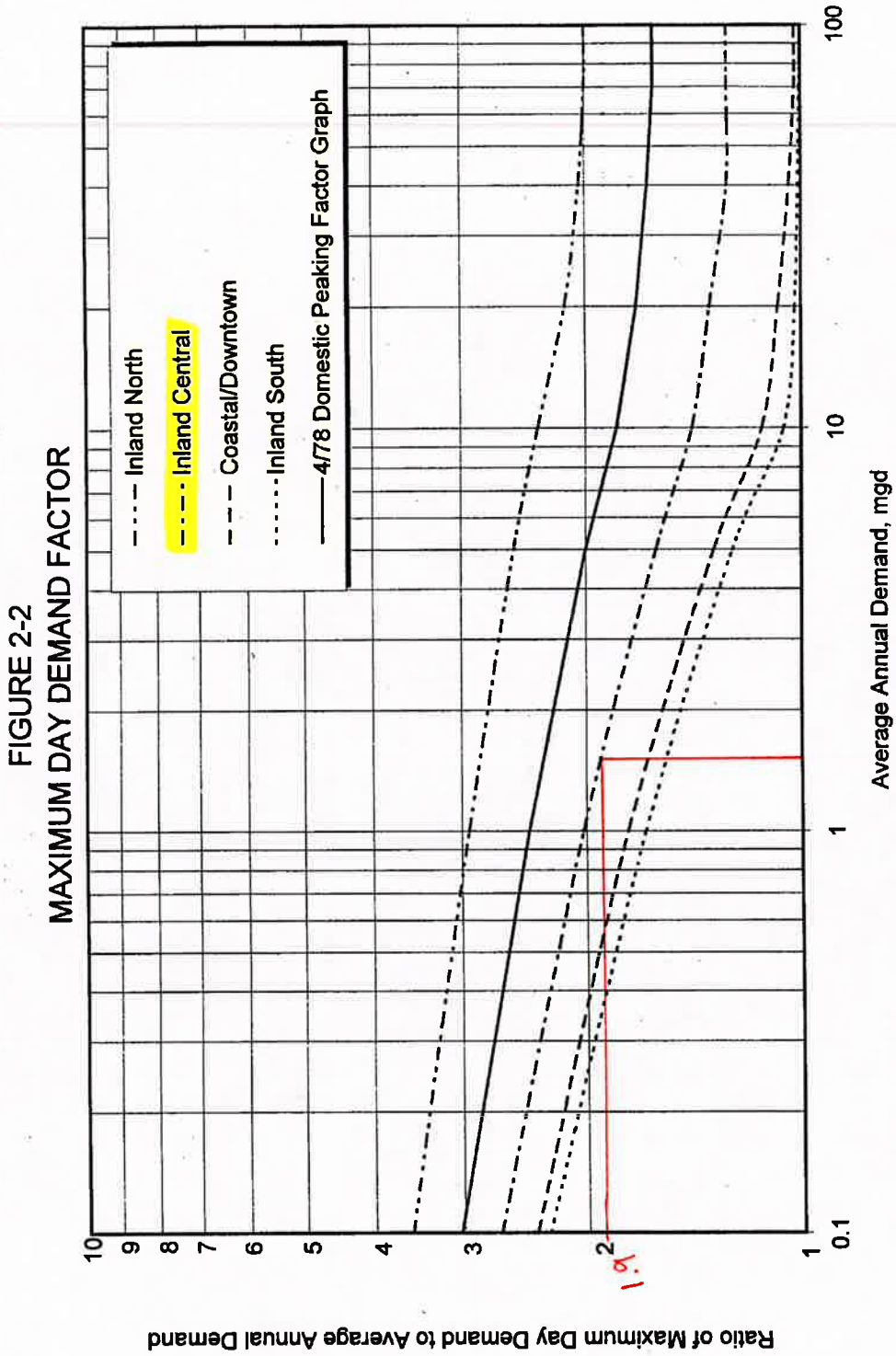
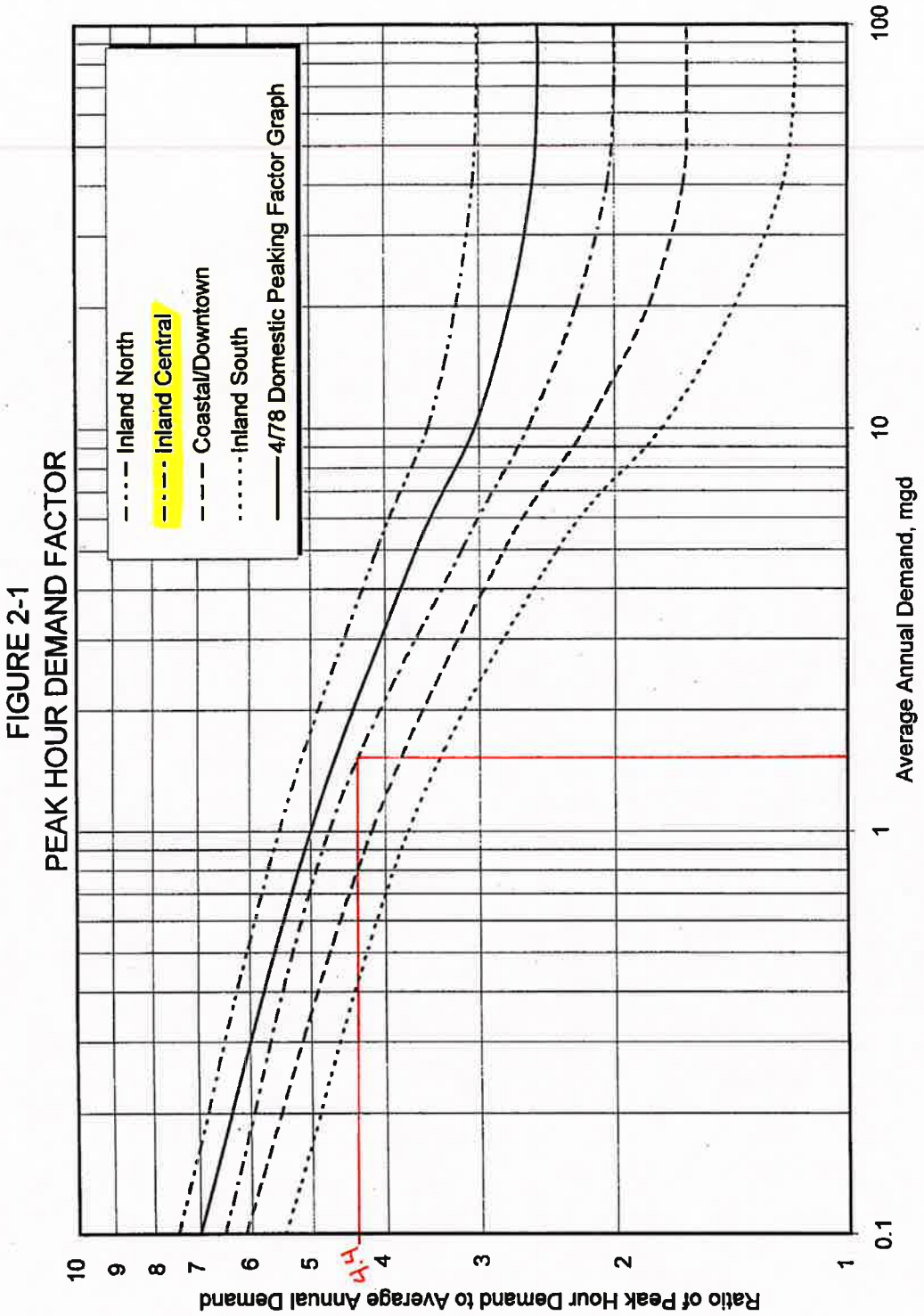



FIGURE 2-2
MAXIMUM DAY DEMAND FACTOR

FIGURE 2-1
PEAK HOUR DEMAND FACTOR



# APPENDIX D

## EMAIL CORRESPONDENCE
## AND
## MANUFACTURER LITERATURE
## FOR FIRE-SERVICE TYPE WATER METERS

## Fernando Fregoso

**From:** Andrew Oven
**Sent:** Thursday, March 28, 2019 4:19 PM
**To:** Fernando Fregoso
**Subject:** FW: SDSU Mission Valley - 8" Domestic Meters

Fernando,

Let me know how this impacts our thinking about meter numbers and sizes.

Andrew Oven, P.E.
Dexter Wilson Engineering, Inc.
(760) 438-4422

---

**From:** Wilson, Leonard <LLWilson@sandiego.gov>
**Sent:** Thursday, March 28, 2019 2:34 PM
**To:** Andrew Oven <Andrew@dwilsoneng.com>
**Subject:** RE: SDSU Mission Valley - 8" Domestic Meters

Andrew,

I confirmed with Lorraine Gain and the meter shop will allow the Badger Recordall Fire Series Assembly (FSAA) meters. The following is the cut sheet web-link:

https://www.badgermeter.com/resources/2504a38c-75e0-4921-b26e-7cfcdd4d67bd/recordall%20fire%20series%20assembly%20with%20turbine%20bypass%20sizes%204%206%208%2010%2012%20inch%20product%20data%20sheet%20fsa-ds-00703-en.pdf/

The meter shop will allow all sizes of FSAA Models (4-inch through 12-inch). The subject meters meet AWWA Standard C703. Allow 3 months for the meter shop to order the meter and for Badger to deliver it.

Let me know if you have any questions.

Thank you,
Leonard

**Leonard L. Wilson, P.E.**
Senior Civil Engineer
City of San Diego
Development Services Department
Water and Sewer Development Review

T (619) 446-5421
LLWilson@sandiego.gov

Visit SanDiego.gov/DSD to pay invoices, schedule inspections, check project status, request a code enforcement investigation and other online services.

---

**From:** Andrew Oven <Andrew@dwilsoneng.com>
**Sent:** Tuesday, March 19, 2019 5:28 PM
**To:** Wilson, Leonard <LLWilson@sandiego.gov>
**Subject:** RE: SDSU Mission Valley - 8" Domestic Meters

Leonard,

We checked with Badger; the largest compound meter they have is 6". Are we talking to the wrong people or asking for the wrong type of meter? Can you confirm with the meter shop that they can get an 8" or 10" Badger compound meter?

Thanks.

Andrew Oven, P.E.
Dexter Wilson Engineering, Inc.
(760) 438-4422

---

**From:** Wilson, Leonard <LLWilson@sandiego.gov>
**Sent:** Tuesday, March 19, 2019 10:18 AM
**To:** Andrew Oven <Andrew@dwilsoneng.com>
**Subject:** RE: SDSU Mission Valley - 8" Domestic Meters

Andrew,

I'm told by the meter shop that the current large meter contract is with Badger and it would be a compound meter.

Let me know if you have any questions.

Thank you,
Leonard

**Leonard L. Wilson, P.E.**
Senior Civil Engineer
City of San Diego
Development Services Department
Water and Sewer Development Review

T (619) 446-5421
LLWilson@sandiego.gov

Visit SanDiego.gov/DSD to pay invoices, schedule inspections, check project status, request a code enforcement investigation and other online services.

**From:** Wilson, Leonard
**Sent:** Monday, March 18, 2019 4:31 PM
**To:** Andrew Oven <Andrew@dwilsoneng.com>
**Subject:** RE: SDSU Mission Valley - 8" Domestic Meters

Andrew,

Let me check and I'll get back to you. Lorraine Gain, the meter shop supervisor, is out of the office until March 28th so I'm tracking another person down who can answer your question.

Thank you,
Leonard

**Leonard L. Wilson, P.E.**
Senior Civil Engineer
City of San Diego
Development Services Department
Water and Sewer Development Review

T (619) 446-5421
LLWilson@sandiego.gov

Visit SanDiego.gov/DSD to pay invoices, schedule inspections, check project status, request a code enforcement investigation and other online services.



**From:** Andrew Oven <Andrew@dwilsoneng.com>
**Sent:** Monday, March 18, 2019 3:20 PM
**To:** Wilson, Leonard <LLWilson@sandiego.gov>
**Subject:** SDSU Mission Valley - 8" Domestic Meters

Leonard,

Is there someone in the Meter Shop with whom I can correspond to get some idea of what manufacturer/model compound meter the Shop would supply for the SDSU Mission Valley campus?

Thank you.

Andrew Oven, P.E.
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
(760) 438-4422

# Recordall® Fire Series Assembly (FSAA)

## Cold Water Meter & Strainer with Turbine Bypass

**UL Certified & FM 1044 Standard Approved for Fire Service Applications**

**NSF/ANSI Standards 61 and 372 Certified**

## DESCRIPTION

Recordall® Fire Series assemblies meet or exceed all pressure and performance requirements as stated in the most recent revision of AWWA Standard C703. The assembly's primary turbine meter features cast iron housing, while the turbine bypass meter is cast in a lead-free bronze alloy. Fire Series assemblies comply with the lead-free provisions of the Safe Drinking Water Act and are also certified to NSF/ANSI Standards 61 and 372. These assemblies carry the NSF-61 Mark, Trade Designation: FSAA-01.

Badger Meter® Fire Series assemblies also conform to UL 327 and FM 1004. The strainer conforms to UL 321 and FM 5551. The valve conforms to UL 312 and FM 1045.

Offered in five sizes, Fire Series assemblies are designed for revenue-generating flexibility and control on high volume fire service water measurement applications and feature:

- Direct coupled turbine based on an exclusive "floating rotor" design that reduces bearing friction—and associated wear and tear
- Turbine meter bypass
- Low head loss for optimum pressure during fire extinguishing
- Integral fire service strainer to protect the meter element from debris and prevent downstream blockage
- Tamper-resistant calibration vane allowing in-line accuracy adjustments while under pressure
- Factory-calibrated and tested measuring elements that are unitized for simplified installation and inventory
- Meters and encoders are compatible with Badger Meter ORION® family of endpoints and other approved technologies

### Applications

Use the Recordall Fire Series assembly for measuring potable cold water in your vital fire protection systems. Select this assembly when the fire service main is used for both high-volume fire applications, such as sprinkler systems, and low-volume domestic services, such as general purpose plumbing.

These assemblies use proven turbine technology to help provide accurate measurement and optimal performance during fire service events.

### Operation & Performance

If water enters the meter at a low flow rate, a spring-loaded check valve on the downstream side holds the clapper assembly in a closed position. Water is diverted through a 2 inch turbine bypass meter. This enables accurate registration of domestic use, leakage or misuse of water intended for stand-by fire protection. When a major flow is required, the resulting water pressure opens the check valve and allows water to flow through the main turbine chamber at full pipe capacity. A small amount of water will continue to flow through the bypass when the clapper assembly is fully open.

Direct magnetic drive is achieved when the magnet carrier is driven by a gear train coupled to the rotor. The gear train consists of two sets of gears connected by a vertical transmission shaft. One gear set is at the magnet carrier, the other is a worm gear set at the rotor shaft. When water enters the main turbine chamber at high volume rates, it contacts a multi-vaned rotor. The resulting rotor rotation is then transmitted by magnetic coupling to a sealed register or encoder. The direct magnetic drive provides a reliable meter-to-registration coupling.

### Construction

The Recordall Fire Series assembly's construction complies with AWWA C703 standards. It consists of the following basic components: meter housing, an AWWA Class II measuring chamber, a check valve with bypass piping, valve assembly, a 2 inch turbine bypass measuring chamber and sealed registers or encoders. The assembly also includes a strainer, which features an open area at least six times the area of the nominal pipe size. The strainer is equipped with a flushing outlet port (or optional valve) for flushing debris from the upstream side of the strainer screen.

To simplify maintenance, the registers or encoders and measuring elements can be removed without removing the meter housing. Interchangeability of certain parts between meters also minimizes spare parts inventory investment

### Tamper-Proof Features

Unauthorized removal of the register or encoder is inhibited by the optional tamper-detection seal wire screw, TORX® tamper-resistant seal screw or the proprietary tamper-resistant keyed seal screw. Each can be installed at the meter site or at the factory.

### Meter Installation

The meter is designed for installations where flow is in one direction only. Companion flanges for installation of meters on various pipe types and sizes are available in cast iron or NL bronze as an option. See the *"Recordall® Fire Series Assemblies (FSAA) User Manual"* for installation guidelines.

FM APPROVED

UL LISTED



# Product Data Sheet

## SPECIFICATIONS

| **FSAA Model**<br>Includes 2 in. (50 mm)<br>Turbine Bypass Meter | **4 in. (100 mm)** | **6 in. (150 mm)** | **8 in. (200 mm)** | **10 in. (250 mm)** | **12 in. (305 mm)** |
|---|---|---|---|---|---|
| **Meter Flanges, AWWA C207 Class D** | 4 in. (100 mm) | 6 in. (150 mm) | 8 in. (200 mm) | 10 in. (250 mm) | 12 in. (305 mm) |
| **Typical Operating Range (100% ± 1.5%)** | 4…1250 gpm (0.91…284 $m^3/h$) | 4…2500 gpm (0.91…568 $m^3/h$) | 4…4500 gpm (0.91…1022 $m^3/h$) | 4…7000 gpm (0.91…1590 $m^3/h$) | 4…7000 gpm (0.908…1590 $m^3/h$) |
| **Typical Low Flow (95% minimum)** | 2.5 gpm (0.57 $m^3/h$) | 2.5 gpm (0.57 $m^3/h$) | 2.5 gpm (0.57 $m^3/h$) | 2.5 gpm (0.57 $m^3/h$) | 2.5 gpm (0.57 $m^3/h$) |
| **Maximum Continuous Flow** | 1000 gpm (227 $m^3/h$) | 2000 gpm (454 $m^3/h$) | 3500 gpm (795 $m^3/h$) | 5500 gpm (1249 $m^3/h$) | 5500 gpm (1249 $m^3/h$) |
| **Maximum Intermittent Flow** | 1250 gpm (284 $m^3/h$) | 2500 gpm (568 $m^3/h$) | 4500 gpm (1022 $m^3/h$) | 7000 gpm (1590 $m^3/h$) | 7000 gpm (1590 $m^3/h$) |
| **Maximum Operating Pressure** | 175 psi (12 bar) | | | | |
| **Maximum Operating Temperature** | 120° F (49° C) | | | | |
| **Pressure Loss at Crossover** | 3 psi (0.28 bar) | | | | |
| **Check Valve** | Valve body conforms to UL 312 and FM 1044. | | | | |
| **Bypass Line** | Specify right-facing (standard, as shown) or left-facing assembly. | | | | |
| **Strainer** | Screen open area is at least six times the area of the nominal pipe size. Equipped with a 2 in. (4 in. model) or 3 in. (all other models) flushing port to flush debris from upstream side of strainer screen. Optional flush valve assembly available. | | | | |
| **Optional Equipment** | Two isolation valves with test tee | | | | |

## MATERIALS

| | |
|---|---|
| **Meter Housing** | Fusion-bonded epoxy coated ductile cast iron |
| **Bypass Meter Housing** | Lead-free bronze alloy |
| **Bypass Measuring Chamber** | Injection-molded thermoplastic |
| **Bypass** | Water works brass piping conforming to AWWA C800 |
| **Nose Cone & Straightening Vanes** | Thermoplastic |
| **Rotor** | Thermoplastic |
| **Rotor Radial Bearings** | Lubricated thermoplastic |
| **Rotor Thruster Bearing** | Sapphire jewels |
| **Rotor Bearing Pivots** | Passivated 316 stainless steel |
| **Calibration Mechanism** | Stainless steel & thermoplastic |
| **Magnet** | Ceramic |
| **Turbine Shaft & Bolts** | Stainless steel |
| **Clapper Assembly (clapper, spring, hinge & pins)** | Stainless steel |
| **Clapper Seal** | Elastomeric, EPDM |
| **Valve Seat** | Stainless steel |
| **Valve & Strainer Cover Plate** | Fusion-bonded epoxy coated steel |
| **Valve & Strainer Cover Plate Gasket** | Elastomeric sheet / O-ring |
| **Valve Body** | Fusion-bonded epoxy coated steel / stainless steel |
| **Strainer Screen & Trim** | Stainless steel |
| **Strainer Body** | Fusion-bonded epoxy coated steel |
| **Trim** | Zinc-plated steel or (optional) all stainless steel |

## REGISTERS / ENCODERS

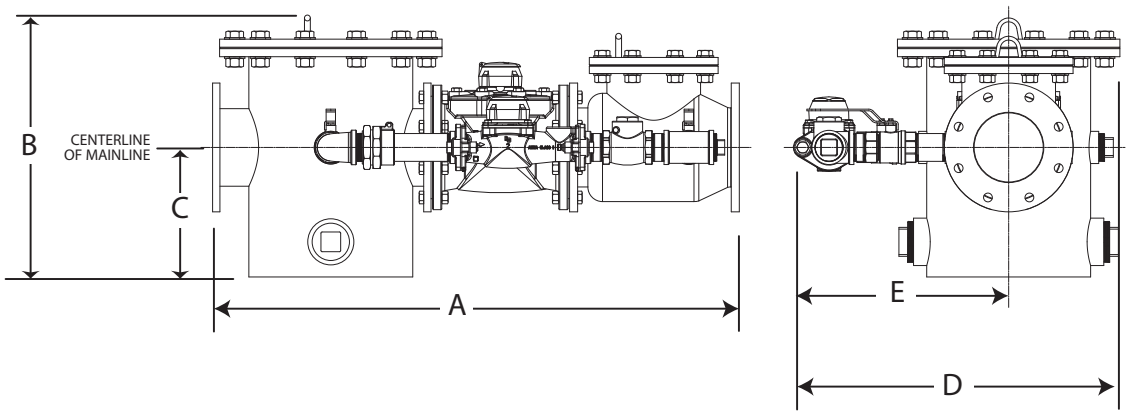
### Standard—Sweep-Hand Registration

The standard register is a straight-reading, permanently sealed magnetic drive register. Dirt, moisture, tampering and lens fogging problems are eliminated. The register has a six-odometer wheel totalization display, 360° test circle with center sweep hand, and flow finder to detect leaks. Register gearing is made of self-lubricating engineered polymer, which minimizes friction and provides long life. The multi-position register simplifies meter installation and reading. The register capacity is 10,000,000 gallons (1,000,000 $ft^3$, 100,000 $m^3$).

## Optional—Encoders for AMR/AMI Reading Solutions

AMR/AMI solutions are available for all Recordall Disc Series meters. All reading options can be removed from the meter without disrupting water service. Badger Meter encoders provide years of reliable, accurate readings for a variety of applications and are also available pre-wired to Badger Meter approved AMR/AMI solutions. See details at *www.badgermeter.com*.

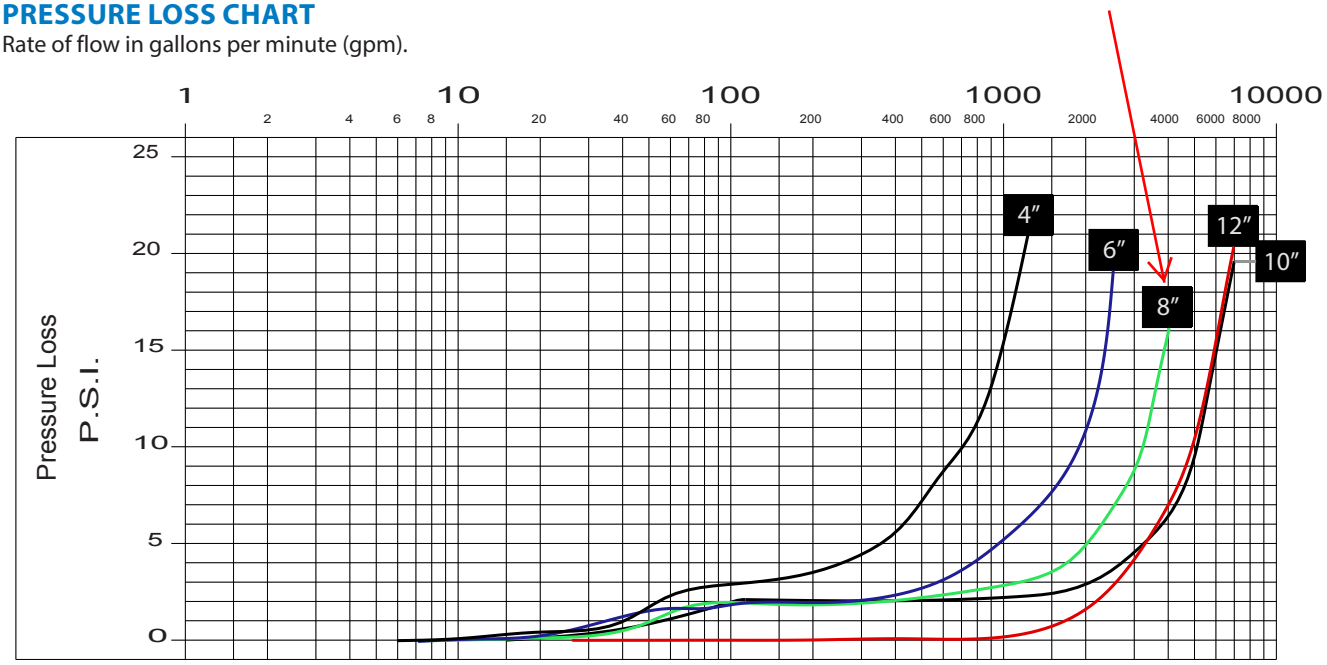
## PHYSICAL DIMENSIONS




| Fire Series FSAA Model | 4 in. (100 mm) | 6 in. (150 mm) | 8 in. (200 mm) | 10 in. (250 mm) | 12 in. (305 mm) |
|---|---|---|---|---|---|
| **Meter & Pipe Size** | 4 in. (100 mm) | 6 in. (150 mm) | 8 in. (200 mm) | 10 in. (250 mm) | 12 in. (305 mm) |
| **Shipping Weight-Fully Assembled** | 312 lb (142 kg) | 507 lb (230 kg) | 767 lb (348 kg) | 1073 lb (487 kg) | 1073 lb (487 kg) |
| **Length (A)** | 33 in. (838 mm) | 45 in. (1143 mm) | 53 in. (1346 mm) | 68 in. (1727 mm) | 68 in. (3727 mm) |
| **Height (B )** | 20-5/8 in. (524 mm) | 22-3/8 in. ( mm) | 25-1/16 in. (637 mm) | 25-5/16 in. (643 mm) | 33 in. (838 mm) |
| **Height (C)** | 10-5/8 in. (270 mm) | 11-1/16 in. ( mm) | 12-1/16 in. (306 mm) | 14-13/16 in. ( mm) | 15-3/4 in. ( mm) |
| **Length (D) Standard Bypass** | 22-7/8 in. (581 mm) | 25-7/8 in. (657 mm) | 29-5/8 in. (752 mm) | 33-7/16 in. (849 mm) | 33-7/16 in. (849 mm) |
| **Length (D) Optional 2nd Bypass** | N/A | 29 in. (737 mm) | 30-1/4 in. (368 mm) | 34-1/16 in. (865 mm) | 34-1/16 in. (865 mm) |
| **Length (E) Standard Bypass** | 16-1/8 in. (410 mm) | 16-3/8 in. (416 mm) | 17-1/8 in. (435 mm) | 19-11/16 in. (500 mm) | 19-11/16 in. (500 mm) |
| **Length (E) Optional 2nd Bypass** | N/A | 19-1/2 in. (241 mm) | 17-3/4 in. (451 mm) | 20-5/16 in. (516 mm) | 20-5/16 in. (516 mm) |

## PRESSURE LOSS CHART

Rate of flow in gallons per minute (gpm).

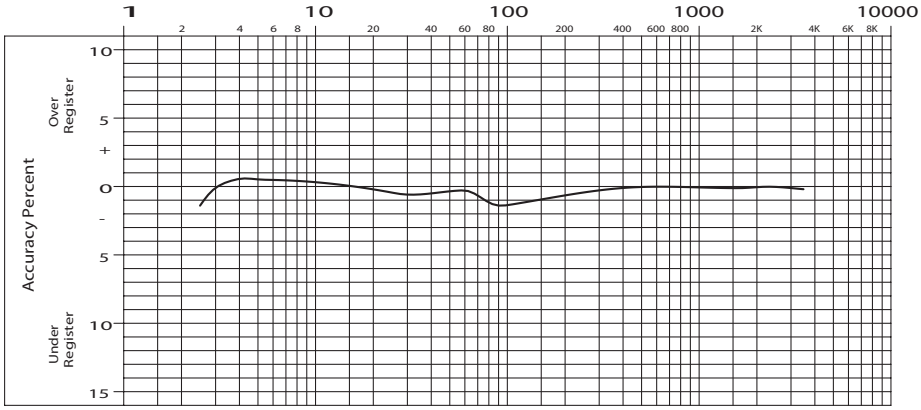


## ACCURACY CHARTS (CONTINUED)

Rate of flow in gallons per minute (gpm).

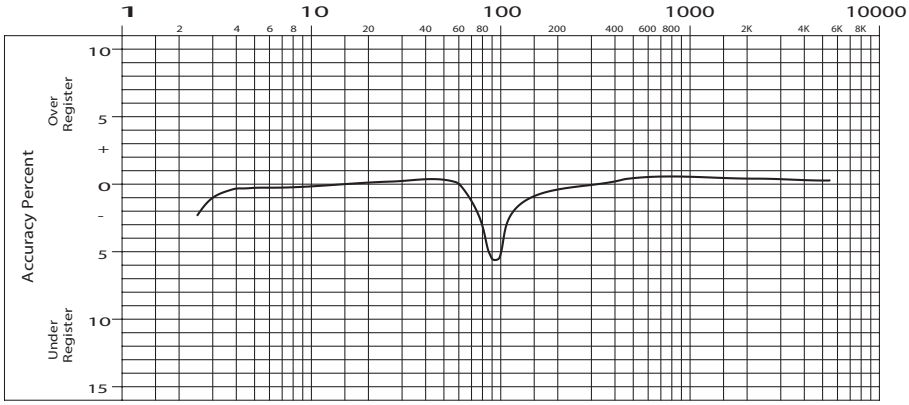
8"

CONSISTS OF CAST IRON TSM MAINLINE, BRONZE 2" TSM BYPASS,
WITH AMES SHORT STRAINER AND CHECK VALVE




10" and 12"

CONSISTS OF CAST IRON TSM MAINLINE, BRONZE 2" TSM BYPASS,
WITH AMES SHORT STRAINER AND CHECK VALVE



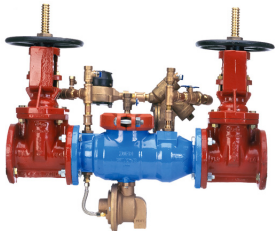
# APPENDIX E

## CANDIDATE REDUCED PRESSURE ZONE BACKFLOW PREVENTER ASSEMBLY

WILKINS
a ZURN company

# Model 375DA
## Reduced Pressure Detector Assembly

# SPECIFICATION SUBMITTAL SHEET



### FEATURES

Sizes: ❑ 2 1/2" ❑ 3" ❑ 4" ❑ 6" ❑ 8" ❑ 10"

| | |
|---|---|
| Maximum working water pressure | 175 PSI |
| Maximum working water temperature | 140°F |
| Hydrostatic test pressure | 350 PSI |
| End connections (Grooved for steel pipe) | AWWA C606 |
| (Flanged) | ANSI B16.1 Class 125 |

### OPTIONS (Suffixes can be combined)

- ❑ - with OS & Y gate valves (standard)
- ❑ L - less shut-off valves (flanged body connections)
- ❑ LM - less water meter
- ❑ - with remote reading meter
- ❑ - with gpm meter (standard)
- ❑ CFM - with cu ft/min meter
- ❑ G - with groove end gate valves
- ❑ FG - with flanged inlet gate connection and grooved outlet gate connection
- ❑ MS - with Integral Relief Valve Monitor Switch
- ❑ PI - with Post Indicator Gate Valve (3"-10")

### ACCESSORIES

- ❑ Air gap (Model AG)
- ❑ Repair kit (rubber only)
- ❑ Thermal expansion tank (Model WXTP)
- ❑ OS & Y Gate valve tamper switch (OSY-40)
- ❑ QT-SET Quick Test Fitting Set
- ❑ Test Cock Lock (Model TCL24)

### APPLICATION

Designed for installation on potable water lines in fire protection systems to protect against both backsiphonage and backpressure of contaminated water into the potable water supply. The Model 375DA shall provide protection where a potential health hazard exists. Incorporates metered by-pass to detect leaks and unauthorized water use.

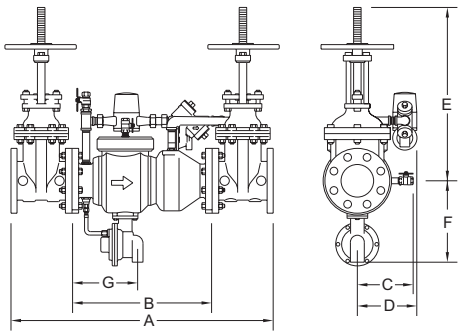
### STANDARDS COMPLIANCE

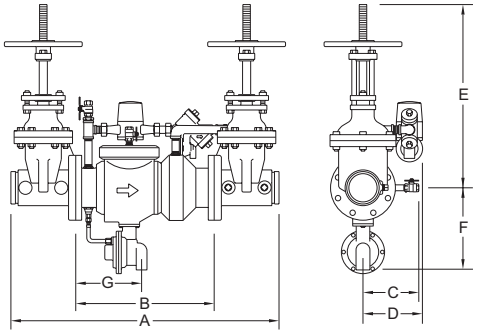
**(Unless otherwise noted, applies to sizes 2 1/2" thru 10")**

- ASSE® Listed 1047 (2 1/2" thru 8")
- UL® Classified
- AWWA Compliant C550
- CSA® Certified (4" & 6")
- C-UL® Classified
- FM® Approved
- NYC MEA 218-01-M VOL 3
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California

### MATERIALS

| | |
|---|---|
| Main valve body | Ductile Iron ASTM A 536 Grade 4 |
| Access covers | Ductile Iron ASTM A 536 Grade 4 |
| Coatings | FDA Approved fusion epoxy finish |
| Internals | Stainless steel, 300 Series<br>NORYL™, NSF Listed |
| Fasteners | Stainless Steel, 300 Series |
| Elastomers | EPDM (FDA approved)<br>Buna Nitrile (FDA approved) |
| Polymers | NORYL™, NSF Listed |
| Springs | Stainless steel, 300 series |
| Sensing line | Stainless steel, braided hose |




MODEL 375DAG SHOWN ABOVE

Attention: Model 375DA (flange body) and Model 375ADA (grooved body) have different lay lengths.

Relief Valve discharge port:
2 1/2" - 6" - 2.75 sq. in.
8" - 10" - 3.69 sq. in.

### DIMENSIONS & WEIGHTS (do not include pkg.)

| MODEL 375DA SIZE | | DIMENSION (approximate) | | | | | | | | | | | | | | | | WEIGHT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | | B LESS GATE VALVES | | C | | D | | E OS&Y OPEN | | E OS&Y CLOSED | | F | | G | | LESS GATE VALVES | | WITH OS&Y GATE VALVES | |
| in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | lbs. | kg | lbs. | kg |
| 2 1/2 | 65 | 31 | 787 | 15 7/8 | 403 | 7 1/4 | 184 | 9 | 229 | 16 3/8 | 416 | 13 7/8 | 352 | 9 1/2 | 241 | 8 3/8 | 213 | 75 | 34 | 185 | 84 |
| 3 | 80 | 32 | 813 | 15 7/8 | 403 | 7 1/4 | 184 | 9 | 229 | 18 7/8 | 479 | 15 5/8 | 397 | 9 1/2 | 241 | 8 3/8 | 213 | 78 | 35.4 | 208 | 94.4 |
| 4 | 100 | 37 5/8 | 956 | 19 1/2 | 495 | 8 | 203 | 9 | 229 | 22 3/4 | 578 | 18 1/4 | 464 | 11 | 279 | 7 1/4 | 184 | 116 | 52.7 | 306 | 138.9 |
| 6 | 150 | 44 3/4 | 1137 | 23 1/2 | 597 | 10 | 254 | 10 1/2 | 267 | 30 1/8 | 765 | 23 3/4 | 603 | 12 3/8 | 314 | 9 1/4 | 235 | 194 | 88 | 494 | 224.3 |
| 8 | 200 | 60 3/4 | 1543 | 37 3/4 | 959 | 11 | 279 | 15 1/2 | 394 | 37 3/4 | 959 | 29 1/4 | 743 | 15 3/8 | 391 | 16 3/4 | 426 | 382 | 173.4 | 858 | 390 |
| 10 | 250 | 63 3/4 | 1619 | 37 3/4 | 959 | 11 | 279 | 15 1/2 | 394 | 45 3/4 | 1162 | 35 3/8 | 899 | 15 3/8 | 391 | 16 3/4 | 426 | 412 | 187 | 1230 | 558.4 |

(Patent No. 5,913,331)

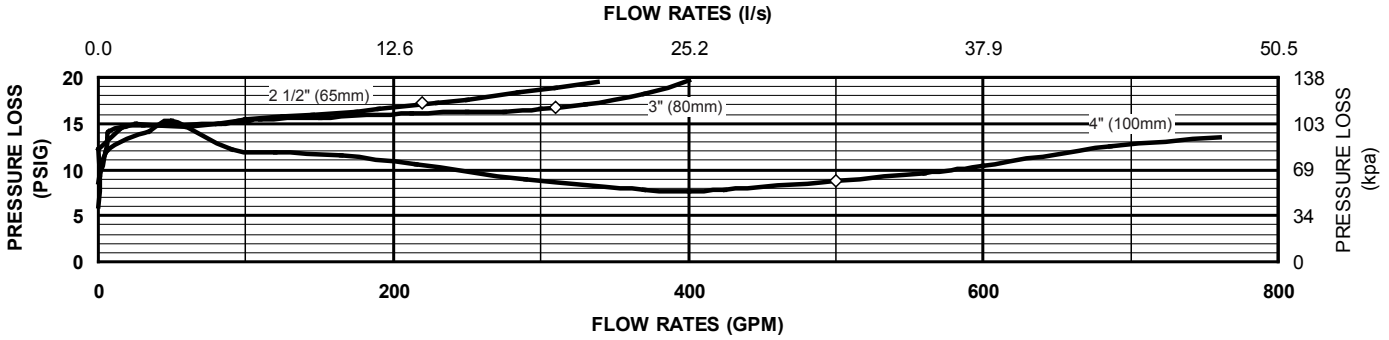
**DOCUMENT #: BF-375DA** **REVISION: 11/12**



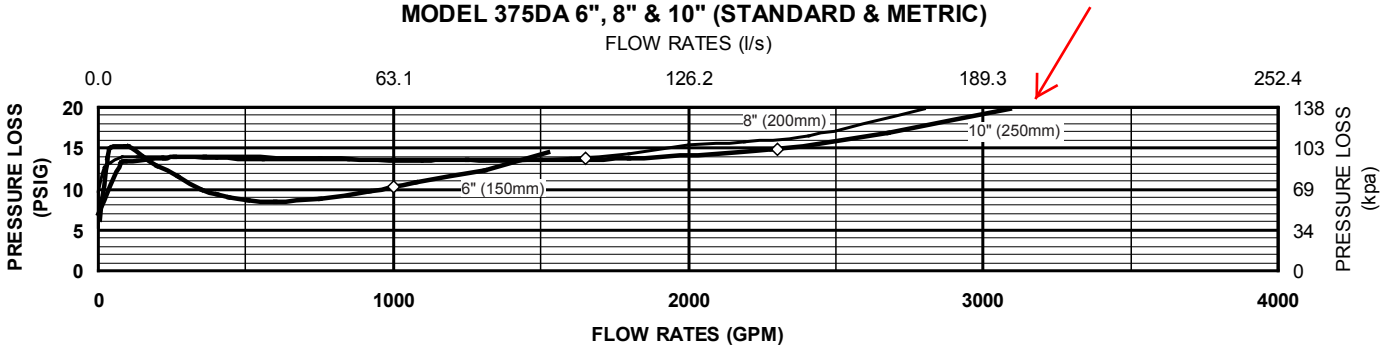
**WILKINS a Zurn Company,** 1747 Commerce Way, Paso Robles, CA 93446 Phone:**805-238-7100** Fax:**805-238-5766**
**In Canada: ZURN INDUSTRIES LIMITED,** 3544 Nashua Dr., Mississauga, Ontario L4V 1L2 Phone:**905-405-8272** Fax:**905-405-1292**
**Product Support Help Line:** 877-BACKFLOW **(877-222-5356)** • **Website: http://www.zurn.com**

## FLOW CHARACTERISTICS

### MODEL 375DA 2 1/2", 3" & 4" (STANDARD & METRIC)




### MODEL 375DA 6", 8" & 10" (STANDARD & METRIC)

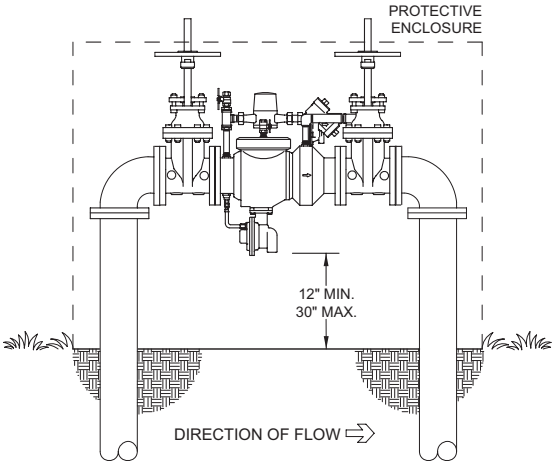



◇ Rated Flow (Established by approval agencies)

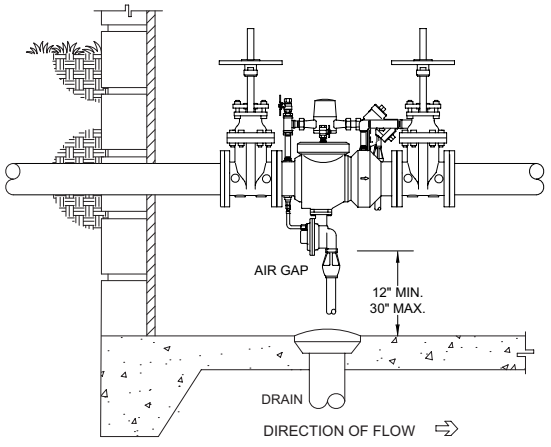
### TYPICAL INSTALLATION

Local codes shall govern installation requirements. To be installed in accordance with the manufacturer's instructions and the latest edition of the Uniform Plumbing Code. Unless otherwise specified, the assembly shall be mounted at a minimum of 12" (305mm) and a maximum of 30" (762mm) above adequate drains with sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged.

| Capacity thru Schedule 40 Pipe (GPM) | | | | |
|---|---|---|---|---|
| Pipe size | 5 ft/sec | 7.5 ft/sec | 10 ft/sec | 15 ft/sec |
| 2 1/2" | 75 | 112 | 149 | 224 |
| 3" | 115 | 173 | 230 | 346 |
| 4" | 198 | 298 | 397 | 595 |
| 6" | 450 | 675 | 900 | 1351 |
| 8" | 780 | 1169 | 1559 | 2339 |
| 10" | 1229 | 1843 | 2458 | 3687 |
| 12" | 1763 | 2644 | 3525 | 5288 |




OUTDOOR INSTALLATION




INDOOR INSTALLATION

### SPECIFICATIONS

The Reduced Pressure Detector Backflow Prevention Assembly shall be ASSE® Listed 1047, and supplied with full port OS & Y gate valves. The main body and access cover shall be epoxy coated ductile iron (ASTM A 536 Grade 4), the seat ring and check valve shall be NORYL™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The checks and the relief valve shall be accessible for maintenance without removing the device from the line. The Reduced Pressure Detector Backflow Prevention Assembly shall be a WILKINS Model 375DA.

## APPENDIX F

## BUILD-OUT WATER SYSTEM
## COMPUTER MODELING OUTPUT

### NODE AND PIPE DIAGRAM REFERENCE:

Exhibit A

### CONDITIONS MODELED:

1. Average Day Demand

2. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820.

3. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 794 and 796.

4. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 784 and 788.

5. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 780 and 800.

6. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 720 and 724.

7. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820 with Pipe 143 closed.

8. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 720 and 724 with Pipe 129 closed.

9. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 720 and 724 with Pipe 125 closed.

10. Peak Hour Demand

**Scenario: All Pipes Open - Average Day Demand**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 0.0 | 0 |
| 41 | 16 | 306.2 | 0.49 |
| 45 | 48 | 306.2 | 0.05 |
| 49 | 16 | 1087.5 | 1.74 |
| 53 | 48 | 1393.7 | 0.25 |
| 101 | 12 | 0.0 | 0 |
| 105 | 12 | -50.0 | 0.14 |
| 109 | 16 | -75.0 | 0.12 |
| 117 | 8 | 269.9 | 1.72 |
| 121 | 16 | 344.9 | 0.55 |
| 125 | 16 | 645.3 | 1.03 |
| 127 | 16 | -1087.5 | 1.74 |
| 129 | 16 | -442.2 | 0.71 |
| 131 | 8 | 300.4 | 1.92 |
| 133 | 16 | 442.2 | 0.71 |
| 135 | 8 | 283.1 | 1.81 |
| 137 | 16 | 159.1 | 0.25 |
| 139 | 12 | -50.9 | 0.14 |
| 141 | 8 | 255.3 | 1.63 |
| 143 | 12 | -306.2 | 0.87 |
| 145 | 16 | -306.2 | 0.49 |

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 321.5 | 0.1 |
| 41 | 16 | 1203.0 | 1.92 |
| 45 | 48 | 1203.0 | 0.21 |
| 49 | 16 | 5123.5 | 8.18 |
| 53 | 48 | 6326.5 | 1.12 |
| 101 | 12 | 321.5 | 0.91 |
| 105 | 12 | 226.5 | 0.64 |
| 109 | 16 | 179.0 | 0.29 |
| 117 | 8 | 1462.4 | 9.33 |
| 121 | 16 | 1283.4 | 2.05 |
| 125 | 16 | 2911.9 | 4.65 |
| 127 | 16 | -5123.5 | 8.18 |
| 129 | 16 | -2211.6 | 3.53 |
| 131 | 8 | 1628.5 | 10.39 |
| 133 | 16 | 2211.6 | 3.53 |
| 135 | 8 | 1477.1 | 9.43 |
| 137 | 16 | 734.6 | 1.17 |
| 139 | 12 | 335.6 | 0.95 |
| 141 | 8 | 1538.6 | 9.82 |
| 143 | 12 | -1203.0 | 3.41 |
| 145 | 16 | -1203.0 | 1.92 |

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 794 and 796**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 328.4 | 0.1 |
| 41 | 16 | 1132.0 | 1.81 |
| 45 | 48 | 1132.0 | 0.2 |
| 49 | 16 | 5116.2 | 8.16 |
| 53 | 48 | 6248.2 | 1.11 |
| 101 | 12 | 328.4 | 0.93 |
| 105 | 12 | 233.4 | 0.66 |
| 109 | 16 | 185.9 | 0.3 |
| 117 | 8 | 1497.4 | 9.56 |
| 121 | 16 | 1311.6 | 2.09 |
| 125 | 16 | 2953.4 | 4.71 |
| 127 | 16 | -5116.2 | 8.16 |
| 129 | 16 | -2162.8 | 3.45 |
| 131 | 8 | 1641.8 | 10.48 |
| 133 | 16 | 2162.8 | 3.45 |
| 135 | 8 | 1507.3 | 9.62 |
| 137 | 16 | 655.5 | 1.05 |
| 139 | 12 | 256.5 | 0.73 |
| 141 | 8 | 1388.5 | 8.86 |
| 143 | 12 | -1132.0 | 3.21 |
| 145 | 16 | -1132.0 | 1.81 |

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 784 and 788**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 327.4 | 0.1 |
| 41 | 16 | 1109.4 | 1.77 |
| 45 | 48 | 1109.4 | 0.2 |
| 49 | 16 | 5102.6 | 8.14 |
| 53 | 48 | 6212.0 | 1.1 |
| 101 | 12 | 327.4 | 0.93 |
| 105 | 12 | 232.4 | 0.66 |
| 109 | 16 | 184.9 | 0.29 |
| 117 | 8 | 1492.2 | 9.52 |
| 121 | 16 | 1307.3 | 2.09 |
| 125 | 16 | 2954.7 | 4.71 |
| 127 | 16 | -5102.6 | 8.14 |
| 129 | 16 | -2147.8 | 3.43 |
| 131 | 8 | 1647.4 | 10.51 |
| 133 | 16 | 2147.8 | 3.43 |
| 135 | 8 | 1520.8 | 9.71 |
| 137 | 16 | 627.0 | 1 |
| 139 | 12 | 228.0 | 0.65 |
| 141 | 8 | 1337.4 | 8.54 |
| 143 | 12 | -1109.4 | 3.15 |
| 145 | 16 | -1109.4 | 1.77 |

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 780 and 800**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 323.4 | 0.1 |
| 41 | 16 | 1129.7 | 1.8 |
| 45 | 48 | 1129.7 | 0.2 |
| 49 | 16 | 5118.2 | 8.17 |
| 53 | 48 | 6247.8 | 1.11 |
| 101 | 12 | 323.4 | 0.92 |
| 105 | 12 | 228.4 | 0.65 |
| 109 | 16 | 180.9 | 0.29 |
| 117 | 8 | 1469.9 | 9.38 |
| 121 | 16 | 1289.0 | 2.06 |
| 125 | 16 | 2944.7 | 4.7 |
| 127 | 16 | -5118.2 | 8.17 |
| 129 | 16 | -2173.5 | 3.47 |
| 131 | 8 | 1655.7 | 10.57 |
| 133 | 16 | 2173.5 | 3.47 |
| 135 | 8 | 1528.9 | 9.76 |
| 137 | 16 | 644.6 | 1.03 |
| 139 | 12 | 245.6 | 0.7 |
| 141 | 8 | 1375.2 | 8.78 |
| 143 | 12 | -1129.7 | 3.2 |
| 145 | 16 | -1129.7 | 1.8 |

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 720 and 724**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 300.2 | 0.09 |
| 41 | 16 | 994.1 | 1.59 |
| 45 | 48 | 994.1 | 0.18 |
| 49 | 16 | 4875.5 | 7.78 |
| 53 | 48 | 5869.6 | 1.04 |
| 101 | 12 | 300.2 | 0.85 |
| 105 | 12 | 205.2 | 0.58 |
| 109 | 16 | 157.7 | 0.25 |
| 117 | 8 | 1358.8 | 8.67 |
| 121 | 16 | 1201.0 | 1.92 |
| 125 | 16 | 2848.4 | 4.54 |
| 127 | 16 | -4875.5 | 7.78 |
| 129 | 16 | -2027.1 | 3.23 |
| 131 | 8 | 1647.3 | 10.51 |
| 133 | 16 | 2027.1 | 3.23 |
| 135 | 8 | 1550.6 | 9.9 |
| 137 | 16 | 476.5 | 0.76 |
| 139 | 12 | 77.5 | 0.22 |
| 141 | 8 | 1071.6 | 6.84 |
| 143 | 12 | -994.1 | 2.82 |
| 145 | 16 | -994.1 | 1.59 |

**Scenario: Pipe Break (143) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 368.4 | 0.12 |
| 41 | 16 | 0.0 | 0 |
| 45 | 48 | 0.0 | 0 |
| 49 | 16 | 6279.6 | 10.02 |
| 53 | 48 | 6279.6 | 1.11 |
| 101 | 12 | 368.4 | 1.05 |
| 105 | 12 | 273.4 | 0.78 |
| 109 | 16 | 225.9 | 0.36 |
| 117 | 8 | 1643.5 | 10.49 |
| 121 | 16 | 1417.6 | 2.26 |
| 125 | 16 | 3243.1 | 5.17 |
| 127 | 16 | -6279.6 | 10.02 |
| 129 | 16 | -3036.5 | 4.84 |
| 131 | 8 | 1825.5 | 11.65 |
| 133 | 16 | 3036.5 | 4.84 |
| 135 | 8 | 1488.5 | 9.5 |
| 137 | 16 | 1548.0 | 2.47 |
| 139 | 12 | 1149.0 | 3.26 |
| 141 | 8 | 1149.0 | 7.33 |
| 143-XX | 12 | | |
| 145 | 16 | 0.0 | 0 |

**Scenario: Pipe Break (129) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 720 and 724**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 400.3 | 0.13 |
| 41 | 16 | 1968.8 | 3.14 |
| 45 | 48 | 1968.8 | 0.35 |
| 49 | 16 | 3800.7 | 6.06 |
| 53 | 48 | 5769.5 | 1.02 |
| 101 | 12 | 400.3 | 1.14 |
| 105 | 12 | 305.3 | 0.87 |
| 109 | 16 | 257.8 | 0.41 |
| 117 | 8 | 1859.0 | 11.86 |
| 121 | 16 | 1601.2 | 2.55 |
| 125 | 16 | 3800.7 | 6.06 |
| 127 | 16 | -3800.7 | 6.06 |
| 129-XX | 16 | | |
| 131 | 8 | 2199.5 | 14.04 |
| 133 | 16 | 0.0 | 0 |
| 135 | 8 | 479.6 | 3.06 |
| 137 | 16 | -479.6 | 0.77 |
| 139 | 12 | -878.6 | 2.49 |
| 141 | 8 | 1090.2 | 6.96 |
| 143 | 12 | -1968.8 | 5.58 |
| 145 | 16 | -1968.8 | 3.14 |

**Scenario: Pipe Break (125) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 720 and 724**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 1489.2 | 0.47 |
| 41 | 16 | 1535.3 | 2.45 |
| 45 | 48 | 1535.3 | 0.27 |
| 49 | 16 | 3145.3 | 5.02 |
| 53 | 48 | 4680.6 | 0.83 |
| 101 | 12 | 1489.2 | 4.22 |
| 105 | 12 | 1394.2 | 3.95 |
| 109 | 16 | 1346.7 | 2.15 |
| 117 | 8 | 636.7 | 4.06 |
| 121 | 16 | -710.0 | 1.13 |
| 125-XX | 16 | | |
| 127 | 16 | -3145.3 | 5.02 |
| 129 | 16 | -3145.3 | 5.02 |
| 131 | 8 | 710.0 | 4.53 |
| 133 | 16 | 3145.3 | 5.02 |
| 135 | 8 | 2447.3 | 15.62 |
| 137 | 16 | 698.0 | 1.11 |
| 139 | 12 | 299.0 | 0.85 |
| 141 | 8 | 1834.4 | 11.71 |
| 143 | 12 | -1535.3 | 4.36 |
| 145 | 16 | -1535.3 | 2.45 |

**Scenario: All Pipes Open - Peak Hour Demand**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 325.4 | 0.1 |
| 41 | 16 | 1050.1 | 1.68 |
| 45 | 48 | 1050.1 | 0.19 |
| 49 | 16 | 4896.1 | 7.81 |
| 53 | 48 | 5946.2 | 1.05 |
| 101 | 12 | 325.4 | 0.92 |
| 105 | 12 | 100.4 | 0.28 |
| 109 | 16 | -12.1 | 0.02 |
| 117 | 8 | 1256.9 | 8.02 |
| 121 | 16 | 1269.0 | 2.02 |
| 125 | 16 | 2751.7 | 4.39 |
| 127 | 16 | -4896.1 | 7.81 |
| 129 | 16 | -2144.4 | 3.42 |
| 131 | 8 | 1482.7 | 9.46 |
| 133 | 16 | 2144.4 | 3.42 |
| 135 | 8 | 1287.4 | 8.22 |
| 137 | 16 | 857.0 | 1.37 |
| 139 | 12 | -88.0 | 0.25 |
| 141 | 8 | 962.1 | 6.14 |
| 143 | 12 | -1050.1 | 2.98 |
| 145 | 16 | -1050.1 | 1.68 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Average Day Demand**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.9 | 0.0 |
| 28 | 56 | 536 | 208.0 | 208.0 | 0.0 |
| 104 | 117 | 390 | 118.3 | 117.8 | 0.5 |
| 108 | 87 | 390 | 131.3 | 130.8 | 0.5 |
| 112 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 116 | 54 | 390 | 145.6 | 145.2 | 0.4 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.4 |
| 124 | 58 | 390 | 143.8 | 143.4 | 0.4 |
| 126 | 69 | 390 | 139.1 | 138.6 | 0.5 |
| 128 | 70 | 390 | 138.6 | 138.2 | 0.5 |
| 130 | 95 | 390 | 127.8 | 127.3 | 0.5 |
| 132 | 100 | 390 | 125.6 | 125.4 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.2 | 1.1 |
| 108 | 87 | 390 | 131.3 | 130.1 | 1.2 |
| 112 | 54 | 390 | 145.6 | 144.4 | 1.2 |
| 116 | 54 | 390 | 145.6 | 144.9 | 0.6 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.7 |
| 126 | 69 | 390 | 139.1 | 137.1 | 2.0 |
| 128 | 70 | 390 | 138.6 | 136.5 | 2.1 |
| 130 | 95 | 390 | 127.8 | 125.3 | 2.5 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 794 and 796**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.1 | 1.1 |
| 108 | 87 | 390 | 131.3 | 130.1 | 1.2 |
| 112 | 54 | 390 | 145.6 | 144.4 | 1.2 |
| 116 | 54 | 390 | 145.6 | 144.9 | 0.6 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.7 |
| 126 | 69 | 390 | 139.1 | 137.1 | 2.0 |
| 128 | 70 | 390 | 138.6 | 136.6 | 2.0 |
| 130 | 95 | 390 | 127.8 | 125.5 | 2.3 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 784 and 788**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.1 | 1.1 |
| 108 | 87 | 390 | 131.3 | 130.1 | 1.2 |
| 112 | 54 | 390 | 145.6 | 144.4 | 1.2 |
| 116 | 54 | 390 | 145.6 | 144.9 | 0.6 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.7 |
| 126 | 69 | 390 | 139.1 | 137.1 | 2.0 |
| 128 | 70 | 390 | 138.6 | 136.6 | 2.0 |
| 130 | 95 | 390 | 127.8 | 125.6 | 2.2 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 780 and 800**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.2 | 1.1 |
| 108 | 87 | 390 | 131.3 | 130.1 | 1.2 |
| 112 | 54 | 390 | 145.6 | 144.4 | 1.2 |
| 116 | 54 | 390 | 145.6 | 144.9 | 0.6 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.7 |
| 126 | 69 | 390 | 139.1 | 137.1 | 2.0 |
| 128 | 70 | 390 | 138.6 | 136.6 | 2.1 |
| 130 | 95 | 390 | 127.8 | 125.5 | 2.3 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 720 and 724**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.2 | 1.1 |
| 108 | 87 | 390 | 131.3 | 130.2 | 1.1 |
| 112 | 54 | 390 | 145.6 | 144.5 | 1.1 |
| 116 | 54 | 390 | 145.6 | 145.0 | 0.6 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.2 | 0.7 |
| 126 | 69 | 390 | 139.1 | 137.3 | 1.8 |
| 128 | 70 | 390 | 138.6 | 136.8 | 1.8 |
| 130 | 95 | 390 | 127.8 | 126.0 | 1.9 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: Pipe Break (143) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.0 | 1.3 |
| 108 | 87 | 390 | 131.3 | 129.9 | 1.3 |
| 112 | 54 | 390 | 145.6 | 144.2 | 1.4 |
| 116 | 54 | 390 | 145.6 | 144.9 | 0.7 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 142.9 | 1.0 |
| 126 | 69 | 390 | 139.1 | 135.8 | 3.3 |
| 128 | 70 | 390 | 138.6 | 135.0 | 3.7 |
| 130 | 95 | 390 | 127.8 | 120.2 | 7.6 |
| 132 | 100 | 536 | 188.9 | 188.7 | 0.2 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: Pipe Break (129) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 720 and 724**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 116.9 | 1.4 |
| 108 | 87 | 390 | 131.3 | 129.8 | 1.5 |
| 112 | 54 | 390 | 145.6 | 144.1 | 1.5 |
| 116 | 54 | 390 | 145.6 | 144.9 | 0.7 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.5 |
| 124 | 58 | 390 | 143.8 | 135.6 | 8.3 |
| 126 | 69 | 390 | 139.1 | 130.8 | 8.3 |
| 128 | 70 | 390 | 138.6 | 130.4 | 8.2 |
| 130 | 95 | 390 | 127.8 | 122.0 | 5.9 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: Pipe Break (125) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 720 and 724**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.8 | 0.1 |
| 28 | 56 | 536 | 208.0 | 207.9 | 0.1 |
| 104 | 117 | 390 | 118.3 | 108.3 | 10.0 |
| 108 | 87 | 390 | 131.3 | 120.0 | 11.3 |
| 112 | 54 | 390 | 145.6 | 133.8 | 11.8 |
| 116 | 54 | 390 | 145.6 | 133.6 | 12.0 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.4 |
| 124 | 58 | 390 | 143.8 | 143.0 | 0.9 |
| 126 | 69 | 390 | 139.1 | 135.7 | 3.4 |
| 128 | 70 | 390 | 138.6 | 135.2 | 3.5 |
| 130 | 95 | 390 | 127.8 | 124.0 | 3.8 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Build-Out Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Peak Hour Demand**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.2 | 1.1 |
| 108 | 87 | 390 | 131.3 | 130.1 | 1.1 |
| 112 | 54 | 390 | 145.6 | 144.4 | 1.1 |
| 116 | 54 | 390 | 145.6 | 145.0 | 0.6 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.7 |
| 126 | 69 | 390 | 139.1 | 137.1 | 1.9 |
| 128 | 70 | 390 | 138.6 | 136.6 | 2.1 |
| 130 | 95 | 390 | 127.8 | 125.8 | 2.0 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

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

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

R E G U L A T I N G  V A L V E  D A T A

| VALVE LABEL | VALVE TYPE | VALVE SETTING (ft or gpm) |
|---|---|---|
| CRPRV | PRV-1 | 388.65 |
| FRPRS | PRV-1 | 389.26 |
| OPRS | PRV-1 | 389.03 |

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. |
|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 860.20 | 36.00 | 120.0000 | 0.00 |
| 41 | 24 | I-FRPRS | 56.50 | 16.00 | 120.0000 | 0.00 |
| 45 | 28 | 24 | 4114.40 | 48.00 | 120.0000 | 0.00 |
| 49 | 28 | I-OPRS | 19.30 | 16.00 | 120.0000 | 0.00 |
| 53 | 0 | 28 | 5084.10 | 48.00 | 120.0000 | 0.00 |
| 101 | O-CRPRV | 104 | 3549.60 | 12.00 | 120.0000 | 0.00 |
| 105 | 104 | 108 | 537.90 | 12.00 | 120.0000 | 0.00 |
| 109 | 108 | 112 | 897.10 | 16.00 | 120.0000 | 0.00 |
| 117 | 112 | I-706 | 94.60 | 8.00 | 120.0000 | 0.00 |
| 121 | 116 | 112 | 1065.20 | 16.00 | 120.0000 | 0.00 |
| 125 | 120 | 116 | 63.90 | 16.00 | 120.0000 | 0.00 |
| 127 | 120 | O-OPRS | 14.80 | 16.00 | 120.0000 | 0.00 |
| 129 | 124 | 120 | 169.50 | 16.00 | 120.0000 | 0.00 |
| 131 | 116 | I-704 | 47.20 | 8.00 | 120.0000 | 0.00 |
| 133 | 124 | 126 | 957.70 | 16.00 | 120.0000 | 0.00 |
| 135 | 126 | I-702 | 51.10 | 8.00 | 120.0000 | 0.00 |
| 137 | 126 | 128 | 531.20 | 16.00 | 120.0000 | 0.00 |
| 139 | 128 | 130 | 2373.60 | 12.00 | 120.0000 | 0.00 |
| 141 | 130 | I-700 | 183.90 | 8.00 | 120.0000 | 0.00 |
| 143 | 130 | 132 | 1236.90 | 12.00 | 120.0000 | 0.00 |
| 145 | 132 | O-FRPRS | 22.10 | 16.00 | 120.0000 | 0.00 |
| 700 | O-700 | I-701 | 49.00 | 10.00 | 120.0000 | 0.00 |
| 701 | O-701 | 804 | 120.90 | 12.00 | 120.0000 | 0.00 |
| 702 | O-702 | I-703 | 39.80 | 10.00 | 120.0000 | 0.00 |
| 703 | O-703 | 708 | 90.60 | 12.00 | 120.0000 | 0.00 |
| 704 | O-704 | I-705 | 45.30 | 10.00 | 120.0000 | 0.00 |
| 705 | O-705 | 714 | 350.30 | 12.00 | 120.0000 | 0.00 |
| 706 | O-706 | I-707 | 75.80 | 10.00 | 120.0000 | 0.00 |
| 707 | O-707 | 744 | 278.30 | 12.00 | 120.0000 | 0.00 |
| 709 | 710 | 708 | 41.50 | 12.00 | 120.0000 | 0.00 |
| 713 | 710 | 712 | 317.30 | 12.00 | 120.0000 | 0.00 |
| 715 | 712 | 714 | 399.80 | 12.00 | 120.0000 | 0.00 |
| 717 | 714 | 716 | 19.20 | 12.00 | 120.0000 | 0.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 721 | 716 | 720 | 256.50 | 12.00 | 120.0000 | 0.00 |
| 725 | 720 | 710 | 449.80 | 8.00 | 120.0000 | 0.00 |
| 729 | 720 | 724 | 473.10 | 8.00 | 120.0000 | 0.00 |
| 733 | 740 | 716 | 1112.30 | 12.00 | 120.0000 | 0.00 |
| 737 | 740 | 744 | 318.40 | 12.00 | 120.0000 | 0.00 |
| 745 | 744 | 752 | 349.40 | 12.00 | 120.0000 | 0.00 |
| 749 | 752 | 756 | 397.60 | 8.00 | 120.0000 | 0.00 |
| 753 | 756 | 736 | 38.60 | 8.00 | 120.0000 | 0.00 |
| 757 | 736 | 740 | 268.50 | 8.00 | 120.0000 | 0.00 |
| 761 | 732 | 736 | 467.90 | 8.00 | 120.0000 | 0.00 |
| 765 | 728 | 732 | 467.90 | 8.00 | 120.0000 | 0.00 |
| 769 | 720 | 728 | 286.50 | 12.00 | 120.0000 | 0.00 |
| 773 | 708 | 728 | 726.40 | 12.00 | 120.0000 | 0.00 |
| 777 | 772 | 728 | 315.90 | 12.00 | 120.0000 | 0.00 |
| 781 | 772 | 776 | 207.80 | 8.00 | 120.0000 | 0.00 |
| 785 | 780 | 772 | 254.70 | 12.00 | 120.0000 | 0.00 |
| 789 | 768 | 772 | 463.00 | 8.00 | 120.0000 | 0.00 |
| 793 | 732 | 768 | 316.60 | 8.00 | 120.0000 | 0.00 |
| 797 | 768 | 784 | 251.60 | 8.00 | 120.0000 | 0.00 |
| 801 | 764 | 768 | 467.60 | 8.00 | 120.0000 | 0.00 |
| 805 | 756 | 764 | 275.50 | 8.00 | 120.0000 | 0.00 |
| 809 | 788 | 764 | 254.00 | 8.00 | 120.0000 | 0.00 |
| 813 | 764 | 760 | 401.50 | 8.00 | 120.0000 | 0.00 |
| 817 | 760 | 752 | 286.20 | 12.00 | 120.0000 | 0.00 |
| 821 | 760 | 792 | 274.00 | 12.00 | 120.0000 | 0.00 |
| 825 | 792 | 794 | 571.30 | 12.00 | 120.0000 | 0.00 |
| 827 | 794 | 796 | 987.60 | 12.00 | 120.0000 | 0.00 |
| 829 | 796 | 816 | 775.40 | 12.00 | 120.0000 | 0.00 |
| 831 | 792 | 788 | 409.80 | 12.00 | 120.0000 | 0.00 |
| 833 | 788 | 798 | 286.20 | 8.00 | 120.0000 | 0.00 |
| 837 | 784 | 788 | 467.90 | 12.00 | 120.0000 | 0.00 |
| 841 | 780 | 784 | 467.60 | 12.00 | 120.0000 | 0.00 |
| 845 | 800 | 780 | 276.40 | 12.00 | 120.0000 | 0.00 |
| 849 | 798 | 800 | 936.80 | 8.00 | 120.0000 | 0.00 |
| 853 | 804 | 800 | 782.00 | 12.00 | 120.0000 | 0.00 |
| 857 | 812 | 798 | 797.00 | 8.00 | 120.0000 | 0.00 |
| 861 | 808 | 812 | 440.70 | 8.00 | 120.0000 | 0.00 |
| 865 | 808 | 804 | 509.80 | 12.00 | 120.0000 | 0.00 |
| 869 | 820 | 808 | 420.20 | 12.00 | 120.0000 | 0.00 |
| 873 | 816 | 820 | 449.10 | 12.00 | 120.0000 | 0.00 |
| 877 | 816 | 812 | 323.30 | 8.00 | 120.0000 | 0.00 |

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 700 DESCRIBED BY THE FOLLOWING DATA: (ID= 8" Badger FSAA)

| HEAD (ft) | FLOWRATE (gpm) |
|---|---|
| 0.00 | 0.00 |
| -4.62 | 100.00 |
| -6.92 | 1500.00 |
| -20.77 | 3000.00 |
| -36.92 | 4000.00 |

THERE IS A DEVICE AT NODE 701 DESCRIBED BY THE FOLLOWING DATA: (ID= 10" Wilkins 375DA)

| HEAD (ft) | FLOWRATE (gpm) |
|---|---|
| -23.08 | 0.00 |
| -31.15 | 100.00 |
| -32.31 | 2000.00 |
| -46.15 | 3100.00 |

THERE IS A DEVICE AT NODE 702 .....> (ID= 8" Badger FSAA)

THERE IS A DEVICE AT NODE 703 .....> (ID= 10" Wilkins 375DA)

THERE IS A DEVICE AT NODE 704 .....> (ID= 8" Badger FSAA)

THERE IS A DEVICE AT NODE 705 .....> (ID= 10" Wilkins 375DA)

THERE IS A DEVICE AT NODE 706 .....> (ID= 8" Badger FSAA)

THERE IS A DEVICE AT NODE 707 .....> (ID= 10" Wilkins 375DA)

N O D E  D A T A

| NODE NAME | NODE TITLE | EXTERNAL DEMAND (gpm) | JUNCTION ELEVATION (ft) | EXTERNAL GRADE (ft) |
|---|---|---|---|---|
| 24 | | 0.00 | 100.00 | |
| 28 | | 0.00 | 56.00 | |
| 104 | | 50.00 | 117.00 | |
| 108 | | 25.00 | 87.00 | |
| 112 | | 0.00 | 54.00 | |
| 116 | | 0.00 | 54.00 | |
| 120 | | 0.00 | 50.00 | |
| 124 | | 0.00 | 58.00 | |
| 126 | | 0.00 | 69.00 | |
| 128 | | 210.00 | 70.00 | |
| 130 | | 0.00 | 95.00 | |
| 132 | | 0.00 | 100.00 | |
| O-700 | | 0.00 | 88.00 | |
| O-701 | | 0.00 | 88.00 | |
| I-702 | | 0.00 | 69.00 | |
| I-703 | | 0.00 | 69.00 | |
| I-704 | | 0.00 | 58.00 | |
| I-705 | | 0.00 | 58.00 | |
| I-706 | | 0.00 | 54.00 | |
| I-707 | | 0.00 | 54.00 | |
| 708 | | 0.00 | 75.00 | |
| 710 | | 0.00 | 75.00 | |
| 712 | | 0.00 | 75.00 | |
| 714 | | 0.00 | 71.00 | |
| 716 | | 19.50 | 71.00 | |
| 720 | | 114.50 | 71.00 | |
| 724 | | 137.20 | 68.00 | |
| 728 | | 0.00 | 71.00 | |
| 732 | | 0.00 | 67.00 | |
| 736 | | 0.00 | 65.00 | |
| 740 | | 0.00 | 65.00 | |

| | | | |
|---|---|---|---|
| 744 | 0.00 | 63.00 | |
| 752 | 43.50 | 63.00 | |
| 756 | 39.20 | 65.00 | |
| 760 | 89.20 | 63.00 | |
| 764 | 0.00 | 65.00 | |
| 768 | 125.80 | 67.00 | |
| 772 | 128.40 | 71.00 | |
| 776 | 63.30 | 74.00 | |
| 780 | 0.00 | 77.00 | |
| 784 | 30.00 | 74.00 | |
| 788 | 27.20 | 71.00 | |
| 792 | 86.10 | 68.00 | |
| 794 | 18.90 | 55.00 | |
| 796 | 18.70 | 56.00 | |
| 798 | 97.20 | 68.00 | |
| 800 | 40.40 | 82.00 | |
| 804 | 0.00 | 84.00 | |
| 808 | 0.00 | 84.00 | |
| 812 | 0.00 | 58.00 | |
| 816 | 29.60 | 64.00 | |
| 820 | 0.00 | 86.00 | |
| 0 | ---- | 0.00 | 536.00 |
| I-CRPRV | 0.00 | 102.50 | |
| O-FRPRS | ---- | 100.80 | 389.26 |
| I-OPRS | 0.00 | 49.80 | |
| I-700 | 0.00 | 88.00 | |
| I-701 | 0.00 | 88.00 | |
| O-702 | 0.00 | 69.00 | |
| O-703 | 0.00 | 69.00 | |
| O-704 | 0.00 | 58.00 | |
| O-705 | 0.00 | 58.00 | |
| O-706 | 0.00 | 54.00 | |
| O-707 | 0.00 | 54.00 | |
| O-CRPRV | ---- | 102.50 | 388.65 |
| I-FRPRS | 0.00 | 100.80 | |
| O-OPRS | ---- | 49.80 | 389.03 |

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) = 55
NUMBER OF PRIMARY LOOPS .....(L) = 19
NUMBER OF SUPPLY NODES .....(F) = 1
NUMBER OF SUPPLY ZONES .....(Z) = 1

==========
Case: 0

RESULTS OBTAINED AFTER 19 TRIALS: ACCURACY = 0.14110E-05

**SDSU Mission Valley Project**
**Ultimate Water System Analysis**
**Average Day Demand**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 306.22 | 0.00 | 0.00 | 0.49 | 0.08 | 0.08 |
| 45 | 28 | 24 | 306.22 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 1087.48 | 0.02 | 0.00 | 1.74 | 0.85 | 0.85 |
| 53 | 0 | 28 | 1393.70 | 0.03 | 0.00 | 0.25 | 0.01 | 0.01 |
| 101 | O-CRPRV | 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105 | 104 | 108 | -50.00 | 0.01 | 0.00 | 0.14 | 0.01 | 0.01 |
| 109 | 108 | 112 | -75.00 | 0.01 | 0.00 | 0.12 | 0.01 | 0.01 |
| 117 | 112 | I-706 | 269.87 | 0.18 | 0.00 | 1.72 | 1.87 | 1.87 |
| 121 | 116 | 112 | 344.87 | 0.11 | 0.00 | 0.55 | 0.10 | 0.10 |
| 125 | 120 | 116 | 645.27 | 0.02 | 0.00 | 1.03 | 0.32 | 0.32 |
| 127 | 120 | O-OPRS | -1087.48 | 0.01 | 0.00 | 1.74 | 0.85 | 0.85 |
| 129 | 124 | 120 | -442.21 | 0.03 | 0.00 | 0.71 | 0.16 | 0.16 |
| 131 | 116 | I-704 | 300.40 | 0.11 | 0.00 | 1.92 | 2.28 | 2.28 |
| 133 | 124 | 126 | 442.21 | 0.15 | 0.00 | 0.71 | 0.16 | 0.16 |
| 135 | 126 | I-702 | 283.10 | 0.10 | 0.00 | 1.81 | 2.05 | 2.05 |
| 137 | 126 | 128 | 159.11 | 0.01 | 0.00 | 0.25 | 0.02 | 0.02 |
| 139 | 128 | 130 | -50.89 | 0.03 | 0.00 | 0.14 | 0.01 | 0.01 |
| 141 | 130 | I-700 | 255.32 | 0.31 | 0.00 | 1.63 | 1.69 | 1.69 |
| 143 | 130 | 132 | -306.22 | 0.41 | 0.00 | 0.87 | 0.33 | 0.33 |
| 145 | 132 | O-FRPRS | -306.22 | 0.00 | 0.00 | 0.49 | 0.08 | 0.08 |
| 700 | O-700 | I-701 | 255.32 | 0.03 | 0.00 | 1.04 | 0.57 | 0.57 |
| 701 | O-701 | 804 | 255.32 | 0.03 | 0.00 | 0.72 | 0.23 | 0.23 |
| 702 | O-702 | I-703 | 283.10 | 0.03 | 0.00 | 1.16 | 0.69 | 0.69 |
| 703 | O-703 | 708 | 283.10 | 0.03 | 0.00 | 0.80 | 0.28 | 0.28 |
| 704 | O-704 | I-705 | 300.40 | 0.03 | 0.00 | 1.23 | 0.77 | 0.77 |
| 705 | O-705 | 714 | 300.40 | 0.11 | 0.00 | 0.85 | 0.32 | 0.32 |
| 706 | O-706 | I-707 | 269.87 | 0.05 | 0.00 | 1.10 | 0.63 | 0.63 |
| 707 | O-707 | 744 | 269.87 | 0.07 | 0.00 | 0.77 | 0.26 | 0.26 |
| 709 | 710 | 708 | -109.76 | 0.00 | 0.00 | 0.31 | 0.05 | 0.05 |
| 713 | 710 | 712 | 37.40 | 0.00 | 0.00 | 0.11 | 0.01 | 0.01 |
| 715 | 712 | 714 | 37.40 | 0.00 | 0.00 | 0.11 | 0.01 | 0.01 |
| 717 | 714 | 716 | 337.79 | 0.01 | 0.00 | 0.96 | 0.39 | 0.39 |
| 721 | 716 | 720 | 257.74 | 0.06 | 0.00 | 0.73 | 0.24 | 0.24 |
| 725 | 720 | 710 | -72.37 | 0.07 | 0.00 | 0.46 | 0.16 | 0.16 |
| 729 | 720 | 724 | 137.20 | 0.25 | 0.00 | 0.88 | 0.54 | 0.54 |
| 733 | 740 | 716 | -60.55 | 0.02 | 0.00 | 0.17 | 0.02 | 0.02 |
| 737 | 740 | 744 | -32.38 | 0.00 | 0.00 | 0.09 | 0.01 | 0.01 |
| 745 | 744 | 752 | 237.49 | 0.07 | 0.00 | 0.67 | 0.21 | 0.21 |
| 749 | 752 | 756 | 20.40 | 0.01 | 0.00 | 0.13 | 0.02 | 0.02 |
| 753 | 756 | 736 | -73.29 | 0.01 | 0.00 | 0.47 | 0.17 | 0.17 |
| 757 | 736 | 740 | -92.94 | 0.07 | 0.00 | 0.59 | 0.26 | 0.26 |
| 761 | 732 | 736 | -19.65 | 0.01 | 0.00 | 0.13 | 0.01 | 0.01 |
| 765 | 728 | 732 | 40.43 | 0.03 | 0.00 | 0.26 | 0.06 | 0.06 |
| 769 | 720 | 728 | 78.41 | 0.01 | 0.00 | 0.22 | 0.03 | 0.03 |
| 773 | 708 | 728 | 173.34 | 0.08 | 0.00 | 0.49 | 0.11 | 0.11 |
| 777 | 772 | 728 | -211.31 | 0.05 | 0.00 | 0.60 | 0.17 | 0.17 |
| 781 | 772 | 776 | 63.30 | 0.03 | 0.00 | 0.40 | 0.13 | 0.13 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 785 | 780 | 772 | 5.35 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| 789 | 768 | 772 | -24.96 | 0.01 | 0.00 | 0.16 | 0.02 | 0.02 |
| 793 | 732 | 768 | 60.09 | 0.04 | 0.00 | 0.38 | 0.12 | 0.12 |
| 797 | 768 | 784 | -16.06 | 0.00 | 0.00 | 0.10 | 0.01 | 0.01 |
| 801 | 764 | 768 | 24.69 | 0.01 | 0.00 | 0.16 | 0.02 | 0.02 |
| 805 | 756 | 764 | 54.49 | 0.03 | 0.00 | 0.35 | 0.10 | 0.10 |
| 809 | 788 | 764 | -30.87 | 0.01 | 0.00 | 0.20 | 0.03 | 0.03 |
| 813 | 764 | 760 | -1.07 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 817 | 760 | 752 | -173.59 | 0.03 | 0.00 | 0.49 | 0.11 | 0.11 |
| 821 | 760 | 792 | 83.32 | 0.01 | 0.00 | 0.24 | 0.03 | 0.03 |
| 825 | 792 | 794 | -18.12 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 |
| 827 | 794 | 796 | -37.02 | 0.01 | 0.00 | 0.11 | 0.01 | 0.01 |
| 829 | 796 | 816 | -55.72 | 0.01 | 0.00 | 0.16 | 0.01 | 0.01 |
| 831 | 792 | 788 | 15.34 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| 833 | 788 | 798 | 35.31 | 0.01 | 0.00 | 0.23 | 0.04 | 0.04 |
| 837 | 784 | 788 | 16.30 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 |
| 841 | 780 | 784 | 62.37 | 0.01 | 0.00 | 0.18 | 0.02 | 0.02 |
| 845 | 800 | 780 | 67.72 | 0.01 | 0.00 | 0.19 | 0.02 | 0.02 |
| 849 | 798 | 800 | -28.16 | 0.03 | 0.00 | 0.18 | 0.03 | 0.03 |
| 853 | 804 | 800 | 136.28 | 0.06 | 0.00 | 0.39 | 0.07 | 0.07 |
| 857 | 812 | 798 | 33.73 | 0.03 | 0.00 | 0.22 | 0.04 | 0.04 |
| 861 | 808 | 812 | 39.24 | 0.02 | 0.00 | 0.25 | 0.05 | 0.05 |
| 865 | 808 | 804 | -119.05 | 0.03 | 0.00 | 0.34 | 0.06 | 0.06 |
| 869 | 820 | 808 | -79.81 | 0.01 | 0.00 | 0.23 | 0.03 | 0.03 |
| 873 | 816 | 820 | -79.81 | 0.01 | 0.00 | 0.23 | 0.03 | 0.03 |
| 877 | 816 | 812 | -5.52 | 0.00 | 0.00 | 0.04 | 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 |
|---|---|---|---|---|
| 700 | 255.32 | 300.54 | 295.23 | -5.3 |
| 701 | 255.32 | 295.20 | 263.71 | -31.5 |
| 702 | 283.10 | 319.73 | 314.34 | -5.4 |
| 703 | 283.10 | 314.31 | 282.78 | -31.5 |
| 704 | 300.40 | 330.89 | 325.45 | -5.4 |
| 705 | 300.40 | 325.41 | 293.85 | -31.6 |
| 706 | 269.87 | 334.71 | 329.36 | -5.4 |
| 707 | 269.87 | 329.31 | 297.79 | -31.5 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.97 | 100.00 | 435.97 | 188.92 |
| 28 | | 0.00 | 535.97 | 56.00 | 479.97 | 207.99 |
| 104 | | 50.00 | 388.88 | 117.00 | 271.88 | 117.81 |
| 108 | | 25.00 | 388.88 | 87.00 | 301.88 | 130.82 |
| 112 | | 0.00 | 388.89 | 54.00 | 334.89 | 145.12 |
| 116 | | 0.00 | 389.00 | 54.00 | 335.00 | 145.17 |
| 120 | | 0.00 | 389.02 | 50.00 | 339.02 | 146.91 |

| | | | | | |
|---|---|---|---|---|---|
| 124 | 0.00 | 388.99 | 58.00 | 330.99 | 143.43 |
| 126 | 0.00 | 388.84 | 69.00 | 319.84 | 138.60 |
| 128 | 210.00 | 388.83 | 70.00 | 318.83 | 138.16 |
| 130 | 0.00 | 388.85 | 95.00 | 293.85 | 127.34 |
| 132 | 0.00 | 389.26 | 100.00 | 289.26 | 125.35 |
| O-700 | 0.00 | 383.23 | 88.00 | 295.23 | 127.93 |
| O-701 | 0.00 | 351.71 | 88.00 | 263.71 | 114.27 |
| I-702 | 0.00 | 388.73 | 69.00 | 319.73 | 138.55 |
| I-703 | 0.00 | 383.31 | 69.00 | 314.31 | 136.20 |
| I-704 | 0.00 | 388.89 | 58.00 | 330.89 | 143.39 |
| I-705 | 0.00 | 383.41 | 58.00 | 325.41 | 141.01 |
| I-706 | 0.00 | 388.71 | 54.00 | 334.71 | 145.04 |
| I-707 | 0.00 | 383.31 | 54.00 | 329.31 | 142.70 |
| 708 | 0.00 | 351.75 | 75.00 | 276.75 | 119.92 |
| 710 | 0.00 | 351.75 | 75.00 | 276.75 | 119.92 |
| 712 | 0.00 | 351.75 | 75.00 | 276.75 | 119.92 |
| 714 | 0.00 | 351.74 | 71.00 | 280.74 | 121.66 |
| 716 | 19.50 | 351.73 | 71.00 | 280.73 | 121.65 |
| 720 | 114.50 | 351.67 | 71.00 | 280.67 | 121.63 |
| 724 | 137.20 | 351.42 | 68.00 | 283.42 | 122.82 |
| 728 | 0.00 | 351.67 | 71.00 | 280.67 | 121.62 |
| 732 | 0.00 | 351.64 | 67.00 | 284.64 | 123.34 |
| 736 | 0.00 | 351.65 | 65.00 | 286.65 | 124.21 |
| 740 | 0.00 | 351.72 | 65.00 | 286.72 | 124.24 |
| 744 | 0.00 | 351.72 | 63.00 | 288.72 | 125.11 |
| 752 | 43.50 | 351.65 | 63.00 | 288.65 | 125.08 |
| 756 | 39.20 | 351.64 | 65.00 | 286.64 | 124.21 |
| 760 | 89.20 | 351.61 | 63.00 | 288.61 | 125.07 |
| 764 | 0.00 | 351.61 | 65.00 | 286.61 | 124.20 |
| 768 | 125.80 | 351.60 | 67.00 | 284.60 | 123.33 |
| 772 | 128.40 | 351.61 | 71.00 | 280.61 | 121.60 |
| 776 | 63.30 | 351.59 | 74.00 | 277.59 | 120.29 |
| 780 | 0.00 | 351.61 | 77.00 | 274.61 | 119.00 |
| 784 | 30.00 | 351.61 | 74.00 | 277.61 | 120.30 |
| 788 | 27.20 | 351.61 | 71.00 | 280.61 | 121.60 |
| 792 | 86.10 | 351.61 | 68.00 | 283.61 | 122.90 |
| 794 | 18.90 | 351.61 | 55.00 | 296.61 | 128.53 |
| 796 | 18.70 | 351.61 | 56.00 | 295.61 | 128.10 |
| 798 | 97.20 | 351.59 | 68.00 | 283.59 | 122.89 |
| 800 | 40.40 | 351.62 | 82.00 | 269.62 | 116.84 |
| 804 | 0.00 | 351.68 | 84.00 | 267.68 | 115.99 |
| 808 | 0.00 | 351.65 | 84.00 | 267.65 | 115.98 |
| 812 | 0.00 | 351.62 | 58.00 | 293.62 | 127.24 |
| 816 | 29.60 | 351.62 | 64.00 | 287.62 | 124.64 |
| 820 | 0.00 | 351.64 | 86.00 | 265.64 | 115.11 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.95 | 49.80 | 486.15 | 210.67 |
| I-700 | 0.00 | 388.54 | 88.00 | 300.54 | 130.24 |
| I-701 | 0.00 | 383.20 | 88.00 | 295.20 | 127.92 |
| O-702 | 0.00 | 383.34 | 69.00 | 314.34 | 136.21 |
| O-703 | 0.00 | 351.78 | 69.00 | 282.78 | 122.54 |
| O-704 | 0.00 | 383.45 | 58.00 | 325.45 | 141.03 |
| O-705 | 0.00 | 351.85 | 58.00 | 293.85 | 127.34 |
| O-706 | 0.00 | 383.36 | 54.00 | 329.36 | 142.72 |
| O-707 | 0.00 | 351.79 | 54.00 | 297.79 | 129.04 |
| O-CRPRV | ---- | 388.88 | 102.50 | 286.38 | 124.10 |
| I-FRPRS | 0.00 | 535.96 | 100.80 | 435.16 | 188.57 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.67 | O-701 | 114.27 |
| 28 | 207.99 | 820 | 115.11 |
| 24 | 188.92 | 808 | 115.98 |
| I-FRPRS | 188.57 | 804 | 115.99 |
| I-CRPRV | 187.85 | 800 | 116.84 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 1.92 | 813 | 0.01 |
| 135 | 1.81 | 785 | 0.02 |
| 49 | 1.74 | 877 | 0.04 |
| 127 | 1.74 | 831 | 0.04 |
| 117 | 1.72 | 837 | 0.05 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | CLOSED | 187.85 | 124.10 | 0.00 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.57 | 125.00 | 306.22 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.67 | 147.00 | 1087.48 |

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 | 1393.70 | |

NET SYSTEM INFLOW = 1393.70
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1393.70

==========

Case: 1

C H A N G E S  F O R  N E X T  S I M U L A T I O N  (Change Number =  1 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER  9 TRIALS: ACCURACY = 0.50450E-04

**SDSU Mission Valley Project**
**Ultimate Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 808 and 820**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 321.50 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1203.00 | 0.06 | 0.00 | 1.92 | 1.02 | 1.02 |
| 45 | 28 | 24 | 1203.00 | 0.02 | 0.00 | 0.21 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 5123.53 | 0.29 | 0.00 | 8.18 | 14.93 | 14.93 |
| 53 | 0 | 28 | 6326.53 | 0.53 | 0.00 | 1.12 | 0.10 | 0.10 |
| 101 | O-CRPRV | 104 | 321.50 | 1.28 | 0.00 | 0.91 | 0.36 | 0.36 |
| 105 | 104 | 108 | 226.50 | 0.10 | 0.00 | 0.64 | 0.19 | 0.19 |
| 109 | 108 | 112 | 179.00 | 0.03 | 0.00 | 0.29 | 0.03 | 0.03 |
| 117 | 112 | I-706 | 1462.42 | 4.05 | 0.00 | 9.33 | 42.83 | 42.83 |
| 121 | 116 | 112 | 1283.42 | 1.23 | 0.00 | 2.05 | 1.15 | 1.15 |
| 125 | 120 | 116 | 2911.90 | 0.34 | 0.00 | 4.65 | 5.24 | 5.24 |
| 127 | 120 | O-OPRS | -5123.53 | 0.22 | 0.00 | 8.18 | 14.93 | 14.93 |
| 129 | 124 | 120 | -2211.64 | 0.53 | 0.00 | 3.53 | 3.15 | 3.15 |
| 131 | 116 | I-704 | 1628.48 | 2.47 | 0.00 | 10.39 | 52.27 | 52.27 |
| 133 | 124 | 126 | 2211.64 | 3.02 | 0.00 | 3.53 | 3.15 | 3.15 |
| 135 | 126 | I-702 | 1477.06 | 2.23 | 0.00 | 9.43 | 43.63 | 43.63 |
| 137 | 126 | 128 | 734.58 | 0.22 | 0.00 | 1.17 | 0.41 | 0.41 |
| 139 | 128 | 130 | 335.58 | 0.92 | 0.00 | 0.95 | 0.39 | 0.39 |
| 141 | 130 | I-700 | 1538.57 | 8.65 | 0.00 | 9.82 | 47.06 | 47.06 |
| 143 | 130 | 132 | -1203.00 | 5.12 | 0.00 | 3.41 | 4.14 | 4.14 |
| 145 | 132 | O-FRPRS | -1203.00 | 0.02 | 0.00 | 1.92 | 1.02 | 1.02 |
| 700 | O-700 | I-701 | 1538.57 | 0.78 | 0.00 | 6.28 | 15.87 | 15.87 |
| 701 | O-701 | 804 | 1538.57 | 0.79 | 0.00 | 4.36 | 6.53 | 6.53 |
| 702 | O-702 | I-703 | 1477.06 | 0.59 | 0.00 | 6.03 | 14.72 | 14.72 |
| 703 | O-703 | 708 | 1477.06 | 0.55 | 0.00 | 4.19 | 6.06 | 6.06 |
| 704 | O-704 | I-705 | 1628.48 | 0.80 | 0.00 | 6.65 | 17.63 | 17.63 |
| 705 | O-705 | 714 | 1628.48 | 2.54 | 0.00 | 4.62 | 7.26 | 7.26 |
| 706 | O-706 | I-707 | 1462.42 | 1.10 | 0.00 | 5.97 | 14.45 | 14.45 |
| 707 | O-707 | 744 | 1462.42 | 1.65 | 0.00 | 4.15 | 5.95 | 5.95 |
| 709 | 710 | 708 | -474.16 | 0.03 | 0.00 | 1.35 | 0.74 | 0.74 |
| 713 | 710 | 712 | 142.62 | 0.03 | 0.00 | 0.40 | 0.08 | 0.08 |
| 715 | 712 | 714 | 142.62 | 0.03 | 0.00 | 0.40 | 0.08 | 0.08 |
| 717 | 714 | 716 | 1771.10 | 0.16 | 0.00 | 5.02 | 8.48 | 8.48 |
| 721 | 716 | 720 | 1172.80 | 1.01 | 0.00 | 3.33 | 3.95 | 3.95 |
| 725 | 720 | 710 | -331.54 | 1.23 | 0.00 | 2.12 | 2.74 | 2.74 |
| 729 | 720 | 724 | 260.68 | 0.83 | 0.00 | 1.66 | 1.76 | 1.76 |
| 733 | 740 | 716 | -561.26 | 1.12 | 0.00 | 1.59 | 1.01 | 1.01 |
| 737 | 740 | 744 | 1.76 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 745 | 744 | 752 | 1464.18 | 2.08 | 0.00 | 4.15 | 5.96 | 5.96 |
| 749 | 752 | 756 | 65.27 | 0.05 | 0.00 | 0.42 | 0.14 | 0.14 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 753 | 756 | 736 | -461.46 | 0.20 | 0.00 | 2.95 | 5.06 | 5.06 |
| 757 | 736 | 740 | -559.50 | 1.94 | 0.00 | 3.57 | 7.23 | 7.23 |
| 761 | 732 | 736 | -98.04 | 0.13 | 0.00 | 0.63 | 0.29 | 0.29 |
| 765 | 728 | 732 | 333.92 | 1.30 | 0.00 | 2.13 | 2.78 | 2.78 |
| 769 | 720 | 728 | 1026.10 | 0.88 | 0.00 | 2.91 | 3.08 | 3.08 |
| 773 | 708 | 728 | 1002.90 | 2.15 | 0.00 | 2.84 | 2.96 | 2.96 |
| 777 | 772 | 728 | -1695.08 | 2.47 | 0.00 | 4.81 | 7.82 | 7.82 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |
| 785 | 780 | 772 | -1193.45 | 1.04 | 0.00 | 3.39 | 4.08 | 4.08 |
| 789 | 768 | 772 | -137.40 | 0.25 | 0.00 | 0.88 | 0.54 | 0.54 |
| 793 | 732 | 768 | 431.96 | 1.42 | 0.00 | 2.76 | 4.48 | 4.48 |
| 797 | 768 | 784 | 358.85 | 0.80 | 0.00 | 2.29 | 3.18 | 3.18 |
| 801 | 764 | 768 | 28.51 | 0.01 | 0.00 | 0.18 | 0.03 | 0.03 |
| 805 | 756 | 764 | 452.25 | 1.34 | 0.00 | 2.89 | 4.87 | 4.87 |
| 809 | 788 | 764 | -408.17 | 1.02 | 0.00 | 2.61 | 4.03 | 4.03 |
| 813 | 764 | 760 | 15.57 | 0.00 | 0.00 | 0.10 | 0.01 | 0.01 |
| 817 | 760 | 752 | -1316.25 | 1.40 | 0.00 | 3.73 | 4.89 | 4.89 |
| 821 | 760 | 792 | 1162.35 | 1.06 | 0.00 | 3.30 | 3.89 | 3.89 |
| 825 | 792 | 794 | 1168.04 | 2.24 | 0.00 | 3.31 | 3.92 | 3.92 |
| 827 | 794 | 796 | 1132.13 | 3.66 | 0.00 | 3.21 | 3.70 | 3.70 |
| 829 | 796 | 816 | 1096.60 | 2.71 | 0.00 | 3.11 | 3.49 | 3.49 |
| 831 | 792 | 788 | -169.28 | 0.04 | 0.00 | 0.48 | 0.11 | 0.11 |
| 833 | 788 | 798 | 550.69 | 2.01 | 0.00 | 3.51 | 7.02 | 7.02 |
| 837 | 784 | 788 | 363.49 | 0.21 | 0.00 | 1.03 | 0.45 | 0.45 |
| 841 | 780 | 784 | 61.64 | 0.01 | 0.00 | 0.17 | 0.02 | 0.02 |
| 845 | 800 | 780 | -1131.82 | 1.02 | 0.00 | 3.21 | 3.70 | 3.70 |
| 849 | 798 | 800 | -220.33 | 1.21 | 0.00 | 1.41 | 1.29 | 1.29 |
| 853 | 804 | 800 | -834.72 | 1.65 | 0.00 | 2.37 | 2.10 | 2.10 |
| 857 | 812 | 798 | -586.35 | 6.28 | 0.00 | 3.74 | 7.88 | 7.88 |
| 861 | 808 | 812 | -384.36 | 1.59 | 0.00 | 2.45 | 3.61 | 3.61 |
| 865 | 808 | 804 | -2373.30 | 7.43 | 0.00 | 6.73 | 14.58 | 14.58 |
| 869 | 820 | 808 | -757.66 | 0.74 | 0.00 | 2.15 | 1.76 | 1.76 |
| 873 | 816 | 820 | 1242.34 | 1.97 | 0.00 | 3.52 | 4.40 | 4.40 |
| 877 | 816 | 812 | -201.99 | 0.35 | 0.00 | 1.29 | 1.10 | 1.10 |

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 |
|---|---|---|---|---|
| 700 | 1538.57 | 287.46 | 280.37 | -7.1 |
| 701 | 1538.57 | 279.59 | 248.19 | -31.4 |
| 702 | 1477.06 | 314.03 | 307.20 | -6.8 |
| 703 | 1477.06 | 306.62 | 275.28 | -31.3 |
| 704 | 1628.48 | 328.01 | 320.47 | -7.5 |
| 705 | 1628.48 | 319.68 | 288.18 | -31.5 |
| 706 | 1462.42 | 329.20 | 322.44 | -6.8 |
| 707 | 1462.42 | 321.34 | 290.01 | -31.3 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.45 | 100.00 | 435.45 | 188.69 |
| 28 | | 0.00 | 535.47 | 56.00 | 479.47 | 207.77 |
| 104 | | 95.00(1.90) | 387.38 | 117.00 | 270.38 | 117.16 |
| 108 | | 47.50(1.90) | 387.28 | 87.00 | 300.28 | 130.12 |
| 112 | | 0.00 | 387.25 | 54.00 | 333.25 | 144.41 |
| 116 | | 0.00 | 388.47 | 54.00 | 334.47 | 144.94 |
| 120 | | 0.00 | 388.81 | 50.00 | 338.81 | 146.82 |
| 124 | | 0.00 | 388.28 | 58.00 | 330.28 | 143.12 |
| 126 | | 0.00 | 385.26 | 69.00 | 316.26 | 137.05 |
| 128 | | 399.00(1.90) | 385.04 | 70.00 | 315.04 | 136.52 |
| 130 | | 0.00 | 384.12 | 95.00 | 289.12 | 125.28 |
| 132 | | 0.00 | 389.24 | 100.00 | 289.24 | 125.34 |
| O-700 | | 0.00 | 368.37 | 88.00 | 280.37 | 121.49 |
| O-701 | | 0.00 | 336.19 | 88.00 | 248.19 | 107.55 |
| I-702 | | 0.00 | 383.03 | 69.00 | 314.03 | 136.08 |
| I-703 | | 0.00 | 375.62 | 69.00 | 306.62 | 132.87 |
| I-704 | | 0.00 | 386.01 | 58.00 | 328.01 | 142.14 |
| I-705 | | 0.00 | 377.68 | 58.00 | 319.68 | 138.53 |
| I-706 | | 0.00 | 383.20 | 54.00 | 329.20 | 142.65 |
| I-707 | | 0.00 | 375.34 | 54.00 | 321.34 | 139.25 |
| 708 | | 0.00 | 343.73 | 75.00 | 268.73 | 116.45 |
| 710 | | 0.00 | 343.70 | 75.00 | 268.70 | 116.44 |
| 712 | | 0.00 | 343.67 | 75.00 | 268.67 | 116.42 |
| 714 | | 0.00 | 343.64 | 71.00 | 272.64 | 118.14 |
| 716 | | 37.05(1.90) | 343.48 | 71.00 | 272.48 | 118.07 |
| 720 | | 217.55(1.90) | 342.46 | 71.00 | 271.46 | 117.63 |
| 724 | | 260.68(1.90) | 341.63 | 68.00 | 273.63 | 118.57 |
| 728 | | 0.00 | 341.58 | 71.00 | 270.58 | 117.25 |
| 732 | | 0.00 | 340.28 | 67.00 | 273.28 | 118.42 |
| 736 | | 0.00 | 340.41 | 65.00 | 275.41 | 119.35 |
| 740 | | 0.00 | 342.35 | 65.00 | 277.35 | 120.19 |
| 744 | | 0.00 | 342.35 | 63.00 | 279.35 | 121.05 |
| 752 | | 82.65(1.90) | 340.27 | 63.00 | 277.27 | 120.15 |
| 756 | | 74.48(1.90) | 340.22 | 65.00 | 275.22 | 119.26 |
| 760 | | 169.48(1.90) | 338.87 | 63.00 | 275.87 | 119.54 |
| 764 | | 0.00 | 338.88 | 65.00 | 273.88 | 118.68 |
| 768 | | 239.02(1.90) | 338.86 | 67.00 | 271.86 | 117.81 |
| 772 | | 243.96(1.90) | 339.11 | 71.00 | 268.11 | 116.18 |
| 776 | | 120.27(1.90) | 339.02 | 74.00 | 265.02 | 114.84 |
| 780 | | 0.00 | 338.07 | 77.00 | 261.07 | 113.13 |
| 784 | | 57.00(1.90) | 338.06 | 74.00 | 264.06 | 114.43 |
| 788 | | 51.68(1.90) | 337.85 | 71.00 | 266.85 | 115.64 |
| 792 | | 163.59(1.90) | 337.81 | 68.00 | 269.81 | 116.92 |
| 794 | | 35.91(1.90) | 335.57 | 55.00 | 280.57 | 121.58 |
| 796 | | 35.53(1.90) | 331.91 | 56.00 | 275.91 | 119.56 |
| 798 | | 184.68(1.90) | 335.84 | 68.00 | 267.84 | 116.07 |
| 800 | | 76.76(1.90) | 337.05 | 82.00 | 255.05 | 110.52 |
| 804 | | 0.00 | 335.40 | 84.00 | 251.40 | 108.94 |
| 808 | | 2000.00 | 327.97 | 84.00 | 243.97 | 105.72 |
| 812 | | 0.00 | 329.56 | 58.00 | 271.56 | 117.68 |
| 816 | | 56.24(1.90) | 329.21 | 64.00 | 265.21 | 114.92 |
| 820 | | 2000.00 | 327.23 | 86.00 | 241.23 | 104.53 |
| 0 | | ---- | 536.00 | | | |
| I-CRPRV | | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | | ---- | 389.26 | 100.80 | 288.46 | 125.00 |

| | | | | | |
|---|---|---|---|---|---|
| I-OPRS | 0.00 | 535.18 | 49.80 | 485.38 | 210.33 |
| I-700 | 0.00 | 375.46 | 88.00 | 287.46 | 124.57 |
| I-701 | 0.00 | 367.59 | 88.00 | 279.59 | 121.15 |
| O-702 | 0.00 | 376.20 | 69.00 | 307.20 | 133.12 |
| O-703 | 0.00 | 344.28 | 69.00 | 275.28 | 119.29 |
| O-704 | 0.00 | 378.47 | 58.00 | 320.47 | 138.87 |
| O-705 | 0.00 | 346.18 | 58.00 | 288.18 | 124.88 |
| O-706 | 0.00 | 376.44 | 54.00 | 322.44 | 139.72 |
| O-707 | 0.00 | 344.01 | 54.00 | 290.01 | 125.67 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.39 | 100.80 | 434.59 | 188.32 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

## 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 |
|---|---|---|---|
| I-OPRS | 210.33 | 820 | 104.53 |
| 28 | 207.77 | 808 | 105.72 |
| 24 | 188.69 | O-701 | 107.55 |
| I-FRPRS | 188.32 | 804 | 108.94 |
| I-CRPRV | 187.85 | 800 | 110.52 |

### V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 10.39 | 737 | 0.00 |
| 141 | 9.82 | 813 | 0.10 |
| 135 | 9.43 | 21 | 0.10 |
| 117 | 9.33 | 841 | 0.17 |
| 49 | 8.18 | 801 | 0.18 |

## R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 321.50 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.32 | 125.00 | 1203.00 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.33 | 147.00 | 5123.53 |

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 | 6648.03 | |

NET SYSTEM INFLOW = 6648.03
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6648.03

==========

Case: 2

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 2 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.94930E-04

**SDSU Mission Valley Project**
**Ultimate Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 794 and 796**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 328.36 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1132.02 | 0.05 | 0.00 | 1.81 | 0.91 | 0.91 |
| 45 | 28 | 24 | 1132.02 | 0.02 | 0.00 | 0.20 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 5116.21 | 0.29 | 0.00 | 8.16 | 14.89 | 14.89 |
| 53 | 0 | 28 | 6248.23 | 0.52 | 0.00 | 1.11 | 0.10 | 0.10 |
| 101 | O-CRPRV | 104 | 328.36 | 1.33 | 0.00 | 0.93 | 0.37 | 0.37 |
| 105 | 104 | 108 | 233.36 | 0.11 | 0.00 | 0.66 | 0.20 | 0.20 |
| 109 | 108 | 112 | 185.86 | 0.03 | 0.00 | 0.30 | 0.03 | 0.03 |
| 117 | 112 | I-706 | 1497.43 | 4.23 | 0.00 | 9.56 | 44.75 | 44.75 |
| 121 | 116 | 112 | 1311.58 | 1.28 | 0.00 | 2.09 | 1.20 | 1.20 |
| 125 | 120 | 116 | 2953.38 | 0.34 | 0.00 | 4.71 | 5.38 | 5.38 |
| 127 | 120 | O-OPRS | -5116.21 | 0.22 | 0.00 | 8.16 | 14.89 | 14.89 |
| 129 | 124 | 120 | -2162.83 | 0.51 | 0.00 | 3.45 | 3.02 | 3.02 |
| 131 | 116 | I-704 | 1641.80 | 2.50 | 0.00 | 10.48 | 53.07 | 53.07 |
| 133 | 124 | 126 | 2162.83 | 2.90 | 0.00 | 3.45 | 3.02 | 3.02 |
| 135 | 126 | I-702 | 1507.33 | 2.31 | 0.00 | 9.62 | 45.30 | 45.30 |
| 137 | 126 | 128 | 655.50 | 0.18 | 0.00 | 1.05 | 0.33 | 0.33 |
| 139 | 128 | 130 | 256.50 | 0.56 | 0.00 | 0.73 | 0.24 | 0.24 |
| 141 | 130 | I-700 | 1388.53 | 7.16 | 0.00 | 8.86 | 38.91 | 38.91 |
| 143 | 130 | 132 | -1132.02 | 4.58 | 0.00 | 3.21 | 3.70 | 3.70 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 145 | 132 | O-FRPRS | -1132.02 | 0.02 | 0.00 | 1.81 | 0.91 | 0.91 |
| 700 | O-700 | I-701 | 1388.53 | 0.64 | 0.00 | 5.67 | 13.13 | 13.13 |
| 701 | O-701 | 804 | 1388.53 | 0.65 | 0.00 | 3.94 | 5.40 | 5.40 |
| 702 | O-702 | I-703 | 1507.33 | 0.61 | 0.00 | 6.16 | 15.28 | 15.28 |
| 703 | O-703 | 708 | 1507.33 | 0.57 | 0.00 | 4.28 | 6.29 | 6.29 |
| 704 | O-704 | I-705 | 1641.80 | 0.81 | 0.00 | 6.71 | 17.90 | 17.90 |
| 705 | O-705 | 714 | 1641.80 | 2.58 | 0.00 | 4.66 | 7.37 | 7.37 |
| 706 | O-706 | I-707 | 1497.43 | 1.14 | 0.00 | 6.12 | 15.10 | 15.10 |
| 707 | O-707 | 744 | 1497.43 | 1.73 | 0.00 | 4.25 | 6.21 | 6.21 |
| 709 | 710 | 708 | -516.42 | 0.04 | 0.00 | 1.46 | 0.86 | 0.86 |
| 713 | 710 | 712 | 185.36 | 0.04 | 0.00 | 0.53 | 0.13 | 0.13 |
| 715 | 712 | 714 | 185.36 | 0.05 | 0.00 | 0.53 | 0.13 | 0.13 |
| 717 | 714 | 716 | 1827.17 | 0.17 | 0.00 | 5.18 | 8.98 | 8.98 |
| 721 | 716 | 720 | 1141.99 | 0.96 | 0.00 | 3.24 | 3.76 | 3.76 |
| 725 | 720 | 710 | -331.06 | 1.23 | 0.00 | 2.11 | 2.73 | 2.73 |
| 729 | 720 | 724 | 260.68 | 0.83 | 0.00 | 1.66 | 1.76 | 1.76 |
| 733 | 740 | 716 | -648.13 | 1.47 | 0.00 | 1.84 | 1.32 | 1.32 |
| 737 | 740 | 744 | 68.54 | 0.01 | 0.00 | 0.19 | 0.02 | 0.02 |
| 745 | 744 | 752 | 1565.97 | 2.36 | 0.00 | 4.44 | 6.75 | 6.75 |
| 749 | 752 | 756 | -29.50 | 0.01 | 0.00 | 0.19 | 0.03 | 0.03 |
| 753 | 756 | 736 | -561.33 | 0.28 | 0.00 | 3.58 | 7.27 | 7.27 |
| 757 | 736 | 740 | -579.59 | 2.07 | 0.00 | 3.70 | 7.72 | 7.72 |
| 761 | 732 | 736 | -18.26 | 0.01 | 0.00 | 0.12 | 0.01 | 0.01 |
| 765 | 728 | 732 | 391.26 | 1.74 | 0.00 | 2.50 | 3.73 | 3.73 |
| 769 | 720 | 728 | 994.82 | 0.83 | 0.00 | 2.82 | 2.91 | 2.91 |
| 773 | 708 | 728 | 990.91 | 2.10 | 0.00 | 2.81 | 2.89 | 2.89 |
| 777 | 772 | 728 | -1594.46 | 2.20 | 0.00 | 4.52 | 6.98 | 6.98 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |
| 785 | 780 | 772 | -967.88 | 0.71 | 0.00 | 2.75 | 2.77 | 2.77 |
| 789 | 768 | 772 | -262.36 | 0.82 | 0.00 | 1.67 | 1.78 | 1.78 |
| 793 | 732 | 768 | 409.52 | 1.28 | 0.00 | 2.61 | 4.06 | 4.06 |
| 797 | 768 | 784 | 265.46 | 0.46 | 0.00 | 1.69 | 1.82 | 1.82 |
| 801 | 764 | 768 | -167.40 | 0.36 | 0.00 | 1.07 | 0.77 | 0.77 |
| 805 | 756 | 764 | 457.35 | 1.37 | 0.00 | 2.92 | 4.98 | 4.98 |
| 809 | 788 | 764 | -419.39 | 1.08 | 0.00 | 2.68 | 4.24 | 4.24 |
| 813 | 764 | 760 | 205.36 | 0.45 | 0.00 | 1.31 | 1.13 | 1.13 |
| 817 | 760 | 752 | -1512.82 | 1.81 | 0.00 | 4.29 | 6.33 | 6.33 |
| 821 | 760 | 792 | 1548.70 | 1.81 | 0.00 | 4.39 | 6.61 | 6.61 |
| 825 | 792 | 794 | 2377.66 | 8.36 | 0.00 | 6.74 | 14.63 | 14.63 |
| 827 | 794 | 796 | 377.66 | 0.48 | 0.00 | 1.07 | 0.48 | 0.48 |
| 829 | 796 | 816 | -1622.34 | 5.59 | 0.00 | 4.60 | 7.21 | 7.21 |
| 831 | 792 | 788 | -992.55 | 1.19 | 0.00 | 2.82 | 2.90 | 2.90 |
| 833 | 788 | 798 | 208.13 | 0.33 | 0.00 | 1.33 | 1.16 | 1.16 |
| 837 | 784 | 788 | 832.97 | 0.98 | 0.00 | 2.36 | 2.10 | 2.10 |
| 841 | 780 | 784 | 624.51 | 0.58 | 0.00 | 1.77 | 1.23 | 1.23 |
| 845 | 800 | 780 | -343.36 | 0.11 | 0.00 | 0.97 | 0.41 | 0.41 |
| 849 | 798 | 800 | -271.56 | 1.78 | 0.00 | 1.73 | 1.89 | 1.89 |
| 853 | 804 | 800 | 4.96 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 857 | 812 | 798 | -295.01 | 1.76 | 0.00 | 1.88 | 2.21 | 2.21 |
| 861 | 808 | 812 | 265.41 | 0.80 | 0.00 | 1.69 | 1.82 | 1.82 |
| 865 | 808 | 804 | -1383.57 | 2.74 | 0.00 | 3.92 | 5.37 | 5.37 |
| 869 | 820 | 808 | -1118.16 | 1.52 | 0.00 | 3.17 | 3.62 | 3.62 |
| 873 | 816 | 820 | -1118.16 | 1.62 | 0.00 | 3.17 | 3.62 | 3.62 |
| 877 | 816 | 812 | -560.42 | 2.34 | 0.00 | 3.58 | 7.25 | 7.25 |

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 |
|---|---|---|---|---|
| 700 | 1388.53 | 289.51 | 283.04 | -6.5 |
| 701 | 1388.53 | 282.40 | 251.12 | -31.3 |
| 702 | 1507.33 | 314.09 | 307.13 | -7.0 |
| 703 | 1507.33 | 306.52 | 275.16 | -31.4 |
| 704 | 1641.80 | 327.96 | 320.36 | -7.6 |
| 705 | 1641.80 | 319.55 | 288.04 | -31.5 |
| 706 | 1497.43 | 328.96 | 322.05 | -6.9 |
| 707 | 1497.43 | 320.90 | 289.54 | -31.4 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.46 | 100.00 | 435.46 | 188.70 |
| 28 | | 0.00 | 535.48 | 56.00 | 479.48 | 207.77 |
| 104 | | 95.00(1.90) | 387.33 | 117.00 | 270.33 | 117.14 |
| 108 | | 47.50(1.90) | 387.22 | 87.00 | 300.22 | 130.10 |
| 112 | | 0.00 | 387.19 | 54.00 | 333.19 | 144.38 |
| 116 | | 0.00 | 388.47 | 54.00 | 334.47 | 144.94 |
| 120 | | 0.00 | 388.81 | 50.00 | 338.81 | 146.82 |
| 124 | | 0.00 | 388.30 | 58.00 | 330.30 | 143.13 |
| 126 | | 0.00 | 385.40 | 69.00 | 316.40 | 137.11 |
| 128 | | 399.00(1.90) | 385.23 | 70.00 | 315.23 | 136.60 |
| 130 | | 0.00 | 384.66 | 95.00 | 289.66 | 125.52 |
| 132 | | 0.00 | 389.24 | 100.00 | 289.24 | 125.34 |
| O-700 | | 0.00 | 371.04 | 88.00 | 283.04 | 122.65 |
| O-701 | | 0.00 | 339.12 | 88.00 | 251.12 | 108.82 |
| I-702 | | 0.00 | 383.09 | 69.00 | 314.09 | 136.10 |
| I-703 | | 0.00 | 375.52 | 69.00 | 306.52 | 132.83 |
| I-704 | | 0.00 | 385.96 | 58.00 | 327.96 | 142.12 |
| I-705 | | 0.00 | 377.55 | 58.00 | 319.55 | 138.47 |
| I-706 | | 0.00 | 382.96 | 54.00 | 328.96 | 142.55 |
| I-707 | | 0.00 | 374.90 | 54.00 | 320.90 | 139.06 |
| 708 | | 0.00 | 343.59 | 75.00 | 268.59 | 116.39 |
| 710 | | 0.00 | 343.55 | 75.00 | 268.55 | 116.37 |
| 712 | | 0.00 | 343.51 | 75.00 | 268.51 | 116.35 |
| 714 | | 0.00 | 343.46 | 71.00 | 272.46 | 118.06 |
| 716 | | 37.05(1.90) | 343.28 | 71.00 | 272.28 | 117.99 |
| 720 | | 217.55(1.90) | 342.32 | 71.00 | 271.32 | 117.57 |
| 724 | | 260.68(1.90) | 341.49 | 68.00 | 273.49 | 118.51 |
| 728 | | 0.00 | 341.49 | 71.00 | 270.49 | 117.21 |
| 732 | | 0.00 | 339.74 | 67.00 | 272.74 | 118.19 |
| 736 | | 0.00 | 339.75 | 65.00 | 274.75 | 119.06 |
| 740 | | 0.00 | 341.82 | 65.00 | 276.82 | 119.96 |
| 744 | | 0.00 | 341.81 | 63.00 | 278.81 | 120.82 |
| 752 | | 82.65(1.90) | 339.45 | 63.00 | 276.45 | 119.80 |
| 756 | | 74.48(1.90) | 339.47 | 65.00 | 274.47 | 118.94 |
| 760 | | 169.48(1.90) | 337.64 | 63.00 | 274.64 | 119.01 |
| 764 | | 0.00 | 338.10 | 65.00 | 273.10 | 118.34 |

| | | | | | |
|---|---|---|---|---|---|
| 768 | 239.02(1.90) | 338.46 | 67.00 | 271.46 | 117.63 |
| 772 | 243.96(1.90) | 339.28 | 71.00 | 268.28 | 116.26 |
| 776 | 120.27(1.90) | 339.19 | 74.00 | 265.19 | 114.92 |
| 780 | 0.00 | 338.58 | 77.00 | 261.58 | 113.35 |
| 784 | 57.00(1.90) | 338.00 | 74.00 | 264.00 | 114.40 |
| 788 | 51.68(1.90) | 337.02 | 71.00 | 266.02 | 115.28 |
| 792 | 163.59(1.90) | 335.83 | 68.00 | 267.83 | 116.06 |
| 794 | 2000.00( ** ) | 327.48 | 55.00 | 272.48 | 118.07 |
| 796 | 2000.00( ** ) | 327.00 | 56.00 | 271.00 | 117.43 |
| 798 | 184.68(1.90) | 336.69 | 68.00 | 268.69 | 116.43 |
| 800 | 76.76(1.90) | 338.46 | 82.00 | 256.46 | 111.13 |
| 804 | 0.00 | 338.46 | 84.00 | 254.46 | 110.27 |
| 808 | 0.00 | 335.73 | 84.00 | 251.73 | 109.08 |
| 812 | 0.00 | 334.93 | 58.00 | 276.93 | 120.00 |
| 816 | 56.24(1.90) | 332.58 | 64.00 | 268.58 | 116.39 |
| 820 | 0.00 | 334.21 | 86.00 | 248.21 | 107.56 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.19 | 49.80 | 485.39 | 210.34 |
| I-700 | 0.00 | 377.51 | 88.00 | 289.51 | 125.45 |
| I-701 | 0.00 | 370.40 | 88.00 | 282.40 | 122.37 |
| O-702 | 0.00 | 376.13 | 69.00 | 307.13 | 133.09 |
| O-703 | 0.00 | 344.16 | 69.00 | 275.16 | 119.23 |
| O-704 | 0.00 | 378.36 | 58.00 | 320.36 | 138.82 |
| O-705 | 0.00 | 346.04 | 58.00 | 288.04 | 124.82 |
| O-706 | 0.00 | 376.05 | 54.00 | 322.05 | 139.55 |
| O-707 | 0.00 | 343.54 | 54.00 | 289.54 | 125.47 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.41 | 100.80 | 434.61 | 188.33 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.34 | 820 | 107.56 |
| 28 | 207.77 | O-701 | 108.82 |
| 24 | 188.70 | 808 | 109.08 |
| I-FRPRS | 188.33 | 804 | 110.27 |
| I-CRPRV | 187.85 | 800 | 111.13 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 10.48 | 853 | 0.01 |
| 135 | 9.62 | 21 | 0.10 |
| 117 | 9.56 | 761 | 0.12 |
| 141 | 8.86 | 749 | 0.19 |
| 49 | 8.16 | 737 | 0.19 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 328.36 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.33 | 125.00 | 1132.02 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.34 | 147.00 | 5116.21 |

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 | 6576.59 | |

NET SYSTEM INFLOW = 6576.59
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6576.59

==========

Case: 3

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 3 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.55656E-06

**SDSU Mission Valley Project**
**Ultimate Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 784 and 788**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 327.37 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1109.41 | 0.05 | 0.00 | 1.77 | 0.88 | 0.88 |
| 45 | 28 | 24 | 1109.41 | 0.02 | 0.00 | 0.20 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 5102.57 | 0.29 | 0.00 | 8.14 | 14.82 | 14.82 |
| 53 | 0 | 28 | 6211.98 | 0.51 | 0.00 | 1.10 | 0.10 | 0.10 |
| 101 | O-CRPRV | 104 | 327.37 | 1.32 | 0.00 | 0.93 | 0.37 | 0.37 |
| 105 | 104 | 108 | 232.37 | 0.11 | 0.00 | 0.66 | 0.20 | 0.20 |
| 109 | 108 | 112 | 184.87 | 0.03 | 0.00 | 0.29 | 0.03 | 0.03 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 117 | 112 | I-706 | 1492.18 | 4.21 | 0.00 | 9.52 | 44.46 | 44.46 |
| 121 | 116 | 112 | 1307.31 | 1.27 | 0.00 | 2.09 | 1.19 | 1.19 |
| 125 | 120 | 116 | 2954.72 | 0.34 | 0.00 | 4.71 | 5.39 | 5.39 |
| 127 | 120 | O-OPRS | -5102.57 | 0.22 | 0.00 | 8.14 | 14.82 | 14.82 |
| 129 | 124 | 120 | -2147.84 | 0.51 | 0.00 | 3.43 | 2.98 | 2.98 |
| 131 | 116 | I-704 | 1647.41 | 2.52 | 0.00 | 10.51 | 53.41 | 53.41 |
| 133 | 124 | 126 | 2147.84 | 2.86 | 0.00 | 3.43 | 2.98 | 2.98 |
| 135 | 126 | I-702 | 1520.82 | 2.35 | 0.00 | 9.71 | 46.06 | 46.06 |
| 137 | 126 | 128 | 627.02 | 0.16 | 0.00 | 1.00 | 0.31 | 0.31 |
| 139 | 128 | 130 | 228.02 | 0.45 | 0.00 | 0.65 | 0.19 | 0.19 |
| 141 | 130 | I-700 | 1337.43 | 6.68 | 0.00 | 8.54 | 36.30 | 36.30 |
| 143 | 130 | 132 | -1109.41 | 4.41 | 0.00 | 3.15 | 3.56 | 3.56 |
| 145 | 132 | O-FRPRS | -1109.41 | 0.02 | 0.00 | 1.77 | 0.88 | 0.88 |
| 700 | O-700 | I-701 | 1337.43 | 0.60 | 0.00 | 5.46 | 12.25 | 12.25 |
| 701 | O-701 | 804 | 1337.43 | 0.61 | 0.00 | 3.79 | 5.04 | 5.04 |
| 702 | O-702 | I-703 | 1520.82 | 0.62 | 0.00 | 6.21 | 15.54 | 15.54 |
| 703 | O-703 | 708 | 1520.82 | 0.58 | 0.00 | 4.31 | 6.39 | 6.39 |
| 704 | O-704 | I-705 | 1647.41 | 0.82 | 0.00 | 6.73 | 18.02 | 18.02 |
| 705 | O-705 | 714 | 1647.41 | 2.60 | 0.00 | 4.67 | 7.41 | 7.41 |
| 706 | O-706 | I-707 | 1492.18 | 1.14 | 0.00 | 6.10 | 15.00 | 15.00 |
| 707 | O-707 | 744 | 1492.18 | 1.72 | 0.00 | 4.23 | 6.17 | 6.17 |
| 709 | 710 | 708 | -508.36 | 0.03 | 0.00 | 1.44 | 0.84 | 0.84 |
| 713 | 710 | 712 | 172.53 | 0.04 | 0.00 | 0.49 | 0.11 | 0.11 |
| 715 | 712 | 714 | 172.53 | 0.05 | 0.00 | 0.49 | 0.11 | 0.11 |
| 717 | 714 | 716 | 1819.94 | 0.17 | 0.00 | 5.16 | 8.92 | 8.92 |
| 721 | 716 | 720 | 1171.04 | 1.01 | 0.00 | 3.32 | 3.94 | 3.94 |
| 725 | 720 | 710 | -335.84 | 1.26 | 0.00 | 2.14 | 2.81 | 2.81 |
| 729 | 720 | 724 | 260.68 | 0.83 | 0.00 | 1.66 | 1.76 | 1.76 |
| 733 | 740 | 716 | -611.85 | 1.32 | 0.00 | 1.74 | 1.18 | 1.18 |
| 737 | 740 | 744 | 26.17 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 |
| 745 | 744 | 752 | 1518.35 | 2.23 | 0.00 | 4.31 | 6.37 | 6.37 |
| 749 | 752 | 756 | 90.39 | 0.10 | 0.00 | 0.58 | 0.25 | 0.25 |
| 753 | 756 | 736 | -485.15 | 0.21 | 0.00 | 3.10 | 5.55 | 5.55 |
| 757 | 736 | 740 | -585.68 | 2.11 | 0.00 | 3.74 | 7.87 | 7.87 |
| 761 | 732 | 736 | -100.53 | 0.14 | 0.00 | 0.64 | 0.30 | 0.30 |
| 765 | 728 | 732 | 382.42 | 1.67 | 0.00 | 2.44 | 3.57 | 3.57 |
| 769 | 720 | 728 | 1028.65 | 0.89 | 0.00 | 2.92 | 3.10 | 3.10 |
| 773 | 708 | 728 | 1012.46 | 2.19 | 0.00 | 2.87 | 3.01 | 3.01 |
| 777 | 772 | 728 | -1658.68 | 2.37 | 0.00 | 4.71 | 7.51 | 7.51 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |
| 785 | 780 | 772 | -996.42 | 0.74 | 0.00 | 2.83 | 2.92 | 2.92 |
| 789 | 768 | 772 | -298.03 | 1.04 | 0.00 | 1.90 | 2.25 | 2.25 |
| 793 | 732 | 768 | 482.95 | 1.74 | 0.00 | 3.08 | 5.50 | 5.50 |
| 797 | 768 | 784 | 596.81 | 2.05 | 0.00 | 3.81 | 8.15 | 8.15 |
| 801 | 764 | 768 | 54.84 | 0.05 | 0.00 | 0.35 | 0.10 | 0.10 |
| 805 | 756 | 764 | 501.06 | 1.62 | 0.00 | 3.20 | 5.89 | 5.89 |
| 809 | 788 | 764 | -599.40 | 2.09 | 0.00 | 3.83 | 8.21 | 8.21 |
| 813 | 764 | 760 | -153.18 | 0.26 | 0.00 | 0.98 | 0.66 | 0.66 |
| 817 | 760 | 752 | -1345.31 | 1.46 | 0.00 | 3.82 | 5.09 | 5.09 |
| 821 | 760 | 792 | 1022.65 | 0.84 | 0.00 | 2.90 | 3.07 | 3.07 |
| 825 | 792 | 794 | -270.01 | 0.15 | 0.00 | 0.77 | 0.26 | 0.26 |
| 827 | 794 | 796 | -305.92 | 0.32 | 0.00 | 0.87 | 0.33 | 0.33 |
| 829 | 796 | 816 | -341.45 | 0.31 | 0.00 | 0.97 | 0.40 | 0.40 |
| 831 | 792 | 788 | 1129.07 | 1.51 | 0.00 | 3.20 | 3.68 | 3.68 |
| 833 | 788 | 798 | -339.99 | 0.82 | 0.00 | 2.17 | 2.87 | 2.87 |
| 837 | 784 | 788 | -68.46 | 0.01 | 0.00 | 0.19 | 0.02 | 0.02 |
| 841 | 780 | 784 | 1334.73 | 2.35 | 0.00 | 3.79 | 5.02 | 5.02 |
| 845 | 800 | 780 | 338.31 | 0.11 | 0.00 | 0.96 | 0.40 | 0.40 |
| 849 | 798 | 800 | -258.90 | 1.62 | 0.00 | 1.65 | 1.73 | 1.73 |
| 853 | 804 | 800 | 673.97 | 1.11 | 0.00 | 1.91 | 1.42 | 1.42 |
| 857 | 812 | 798 | 265.77 | 1.45 | 0.00 | 1.70 | 1.82 | 1.82 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 861 | 808 | 812 | 223.03 | 0.58 | 0.00 | 1.42 | 1.32 | 1.32 |
| 865 | 808 | 804 | -663.46 | 0.70 | 0.00 | 1.88 | 1.38 | 1.38 |
| 869 | 820 | 808 | -440.44 | 0.27 | 0.00 | 1.25 | 0.64 | 0.64 |
| 873 | 816 | 820 | -440.44 | 0.29 | 0.00 | 1.25 | 0.64 | 0.64 |
| 877 | 816 | 812 | 42.75 | 0.02 | 0.00 | 0.27 | 0.06 | 0.06 |

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 |
|---|---|---|---|---|
| 700 | 1337.43 | 290.16 | 283.88 | -6.3 |
| 701 | 1337.43 | 283.28 | 252.02 | -31.3 |
| 702 | 1520.82 | 314.09 | 307.08 | -7.0 |
| 703 | 1520.82 | 306.46 | 275.08 | -31.4 |
| 704 | 1647.41 | 327.95 | 320.32 | -7.6 |
| 705 | 1647.41 | 319.50 | 287.98 | -31.5 |
| 706 | 1492.18 | 328.99 | 322.10 | -6.9 |
| 707 | 1492.18 | 320.97 | 289.61 | -31.4 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.47 | 100.00 | 435.47 | 188.70 |
| 28 | | 0.00 | 535.49 | 56.00 | 479.49 | 207.78 |
| 104 | | 95.00(1.90) | 387.33 | 117.00 | 270.33 | 117.14 |
| 108 | | 47.50(1.90) | 387.23 | 87.00 | 300.23 | 130.10 |
| 112 | | 0.00 | 387.20 | 54.00 | 333.20 | 144.39 |
| 116 | | 0.00 | 388.47 | 54.00 | 334.47 | 144.94 |
| 120 | | 0.00 | 388.81 | 50.00 | 338.81 | 146.82 |
| 124 | | 0.00 | 388.31 | 58.00 | 330.31 | 143.13 |
| 126 | | 0.00 | 385.45 | 69.00 | 316.45 | 137.13 |
| 128 | | 399.00(1.90) | 385.28 | 70.00 | 315.28 | 136.62 |
| 130 | | 0.00 | 384.83 | 95.00 | 289.83 | 125.59 |
| 132 | | 0.00 | 389.24 | 100.00 | 289.24 | 125.34 |
| O-700 | | 0.00 | 371.88 | 88.00 | 283.88 | 123.02 |
| O-701 | | 0.00 | 340.02 | 88.00 | 252.02 | 109.21 |
| I-702 | | 0.00 | 383.09 | 69.00 | 314.09 | 136.11 |
| I-703 | | 0.00 | 375.46 | 69.00 | 306.46 | 132.80 |
| I-704 | | 0.00 | 385.95 | 58.00 | 327.95 | 142.11 |
| I-705 | | 0.00 | 377.50 | 58.00 | 319.50 | 138.45 |
| I-706 | | 0.00 | 382.99 | 54.00 | 328.99 | 142.56 |
| I-707 | | 0.00 | 374.97 | 54.00 | 320.97 | 139.09 |
| 708 | | 0.00 | 343.50 | 75.00 | 268.50 | 116.35 |
| 710 | | 0.00 | 343.47 | 75.00 | 268.47 | 116.34 |
| 712 | | 0.00 | 343.43 | 75.00 | 268.43 | 116.32 |
| 714 | | 0.00 | 343.38 | 71.00 | 272.38 | 118.03 |
| 716 | | 37.05(1.90) | 343.21 | 71.00 | 272.21 | 117.96 |
| 720 | | 217.55(1.90) | 342.20 | 71.00 | 271.20 | 117.52 |
| 724 | | 260.68(1.90) | 341.37 | 68.00 | 273.37 | 118.46 |
| 728 | | 0.00 | 341.31 | 71.00 | 270.31 | 117.14 |

| | | | | | |
|---|---|---|---|---|---|
| 732 | 0.00 | 339.64 | 67.00 | 272.64 | 118.15 |
| 736 | 0.00 | 339.78 | 65.00 | 274.78 | 119.07 |
| 740 | 0.00 | 341.90 | 65.00 | 276.90 | 119.99 |
| 744 | 0.00 | 341.89 | 63.00 | 278.89 | 120.85 |
| 752 | 82.65(1.90) | 339.67 | 63.00 | 276.67 | 119.89 |
| 756 | 74.48(1.90) | 339.57 | 65.00 | 274.57 | 118.98 |
| 760 | 169.48(1.90) | 338.21 | 63.00 | 275.21 | 119.26 |
| 764 | 0.00 | 337.95 | 65.00 | 272.95 | 118.28 |
| 768 | 239.02(1.90) | 337.90 | 67.00 | 270.90 | 117.39 |
| 772 | 243.96(1.90) | 338.94 | 71.00 | 267.94 | 116.11 |
| 776 | 120.27(1.90) | 338.86 | 74.00 | 264.86 | 114.77 |
| 780 | 0.00 | 338.20 | 77.00 | 261.20 | 113.19 |
| 784 | 2000.00( ** ) | 335.85 | 74.00 | 261.85 | 113.47 |
| 788 | 2000.00( ** ) | 335.86 | 71.00 | 264.86 | 114.77 |
| 792 | 163.59(1.90) | 337.37 | 68.00 | 269.37 | 116.73 |
| 794 | 35.91(1.90) | 337.52 | 55.00 | 282.52 | 122.42 |
| 796 | 35.53(1.90) | 337.84 | 56.00 | 281.84 | 122.13 |
| 798 | 184.68(1.90) | 336.68 | 68.00 | 268.68 | 116.43 |
| 800 | 76.76(1.90) | 338.31 | 82.00 | 256.31 | 111.07 |
| 804 | 0.00 | 339.42 | 84.00 | 255.42 | 110.68 |
| 808 | 0.00 | 338.71 | 84.00 | 254.71 | 110.38 |
| 812 | 0.00 | 338.13 | 58.00 | 280.13 | 121.39 |
| 816 | 56.24(1.90) | 338.15 | 64.00 | 274.15 | 118.80 |
| 820 | 0.00 | 338.44 | 86.00 | 252.44 | 109.39 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.20 | 49.80 | 485.40 | 210.34 |
| I-700 | 0.00 | 378.16 | 88.00 | 290.16 | 125.73 |
| I-701 | 0.00 | 371.28 | 88.00 | 283.28 | 122.76 |
| O-702 | 0.00 | 376.08 | 69.00 | 307.08 | 133.07 |
| O-703 | 0.00 | 344.08 | 69.00 | 275.08 | 119.20 |
| O-704 | 0.00 | 378.32 | 58.00 | 320.32 | 138.80 |
| O-705 | 0.00 | 345.98 | 58.00 | 287.98 | 124.79 |
| O-706 | 0.00 | 376.10 | 54.00 | 322.10 | 139.58 |
| O-707 | 0.00 | 343.61 | 54.00 | 289.61 | 125.50 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.42 | 100.80 | 434.62 | 188.33 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.34 | O-701 | 109.21 |
| 28 | 207.78 | 820 | 109.39 |
| 24 | 188.70 | 808 | 110.38 |
| I-FRPRS | 188.33 | 804 | 110.68 |
| I-CRPRV | 187.85 | 800 | 111.07 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 10.51 | 737 | 0.07 |
| 135 | 9.71 | 21 | 0.10 |
| 117 | 9.52 | 837 | 0.19 |
| 141 | 8.54 | 45 | 0.20 |
| 49 | 8.14 | 877 | 0.27 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 327.37 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.33 | 125.00 | 1109.41 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.34 | 147.00 | 5102.57 |

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 | 6539.35 | |

NET SYSTEM INFLOW = 6539.35
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6539.35

==========

Case: 4

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 4 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.49918E-06

**SDSU Mission Valley Project**
**Ultimate Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 780 and 800**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 323.43 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1129.68 | 0.05 | 0.00 | 1.80 | 0.91 | 0.91 |
| 45 | 28 | 24 | 1129.68 | 0.02 | 0.00 | 0.20 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 5118.16 | 0.29 | 0.00 | 8.17 | 14.91 | 14.91 |
| 53 | 0 | 28 | 6247.84 | 0.52 | 0.00 | 1.11 | 0.10 | 0.10 |
| 101 | O-CRPRV | 104 | 323.43 | 1.29 | 0.00 | 0.92 | 0.36 | 0.36 |
| 105 | 104 | 108 | 228.43 | 0.10 | 0.00 | 0.65 | 0.19 | 0.19 |
| 109 | 108 | 112 | 180.93 | 0.03 | 0.00 | 0.29 | 0.03 | 0.03 |
| 117 | 112 | I-706 | 1469.89 | 4.09 | 0.00 | 9.38 | 43.24 | 43.24 |
| 121 | 116 | 112 | 1288.96 | 1.23 | 0.00 | 2.06 | 1.16 | 1.16 |
| 125 | 120 | 116 | 2944.69 | 0.34 | 0.00 | 4.70 | 5.35 | 5.35 |
| 127 | 120 | O-OPRS | -5118.16 | 0.22 | 0.00 | 8.17 | 14.91 | 14.91 |
| 129 | 124 | 120 | -2173.47 | 0.52 | 0.00 | 3.47 | 3.05 | 3.05 |
| 131 | 116 | I-704 | 1655.73 | 2.54 | 0.00 | 10.57 | 53.91 | 53.91 |
| 133 | 124 | 126 | 2173.47 | 2.92 | 0.00 | 3.47 | 3.05 | 3.05 |
| 135 | 126 | I-702 | 1528.90 | 2.38 | 0.00 | 9.76 | 46.51 | 46.51 |
| 137 | 126 | 128 | 644.57 | 0.17 | 0.00 | 1.03 | 0.32 | 0.32 |
| 139 | 128 | 130 | 245.57 | 0.52 | 0.00 | 0.70 | 0.22 | 0.22 |
| 141 | 130 | I-700 | 1375.24 | 7.03 | 0.00 | 8.78 | 38.23 | 38.23 |
| 143 | 130 | 132 | -1129.68 | 4.56 | 0.00 | 3.20 | 3.69 | 3.69 |
| 145 | 132 | O-FRPRS | -1129.68 | 0.02 | 0.00 | 1.80 | 0.91 | 0.91 |
| 700 | O-700 | I-701 | 1375.24 | 0.63 | 0.00 | 5.62 | 12.89 | 12.89 |
| 701 | O-701 | 804 | 1375.24 | 0.64 | 0.00 | 3.90 | 5.31 | 5.31 |
| 702 | O-702 | I-703 | 1528.90 | 0.62 | 0.00 | 6.25 | 15.69 | 15.69 |
| 703 | O-703 | 708 | 1528.90 | 0.58 | 0.00 | 4.34 | 6.46 | 6.46 |
| 704 | O-704 | I-705 | 1655.73 | 0.82 | 0.00 | 6.76 | 18.18 | 18.18 |
| 705 | O-705 | 714 | 1655.73 | 2.62 | 0.00 | 4.70 | 7.48 | 7.48 |
| 706 | O-706 | I-707 | 1469.89 | 1.11 | 0.00 | 6.00 | 14.59 | 14.59 |
| 707 | O-707 | 744 | 1469.89 | 1.67 | 0.00 | 4.17 | 6.00 | 6.00 |
| 709 | 710 | 708 | -465.48 | 0.03 | 0.00 | 1.32 | 0.71 | 0.71 |
| 713 | 710 | 712 | 119.22 | 0.02 | 0.00 | 0.34 | 0.06 | 0.06 |
| 715 | 712 | 714 | 119.22 | 0.02 | 0.00 | 0.34 | 0.06 | 0.06 |
| 717 | 714 | 716 | 1774.96 | 0.16 | 0.00 | 5.03 | 8.51 | 8.51 |
| 721 | 716 | 720 | 1245.16 | 1.13 | 0.00 | 3.53 | 4.41 | 4.41 |
| 725 | 720 | 710 | -346.26 | 1.34 | 0.00 | 2.21 | 2.97 | 2.97 |
| 729 | 720 | 724 | 260.68 | 0.83 | 0.00 | 1.66 | 1.76 | 1.76 |
| 733 | 740 | 716 | -492.74 | 0.88 | 0.00 | 1.40 | 0.79 | 0.79 |
| 737 | 740 | 744 | -69.04 | 0.01 | 0.00 | 0.20 | 0.02 | 0.02 |
| 745 | 744 | 752 | 1400.85 | 1.92 | 0.00 | 3.97 | 5.49 | 5.49 |
| 749 | 752 | 756 | 126.78 | 0.18 | 0.00 | 0.81 | 0.46 | 0.46 |
| 753 | 756 | 736 | -385.96 | 0.14 | 0.00 | 2.46 | 3.63 | 3.63 |
| 757 | 736 | 740 | -561.79 | 1.96 | 0.00 | 3.59 | 7.28 | 7.28 |
| 761 | 732 | 736 | -175.83 | 0.40 | 0.00 | 1.12 | 0.85 | 0.85 |
| 765 | 728 | 732 | 301.13 | 1.07 | 0.00 | 1.92 | 2.29 | 2.29 |
| 769 | 720 | 728 | 1113.19 | 1.03 | 0.00 | 3.16 | 3.59 | 3.59 |
| 773 | 708 | 728 | 1063.42 | 2.39 | 0.00 | 3.02 | 3.30 | 3.30 |
| 777 | 772 | 728 | -1875.48 | 2.98 | 0.00 | 5.32 | 9.43 | 9.43 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 785 | 780 | 772 | -1633.85 | 1.86 | 0.00 | 4.63 | 7.30 | 7.30 |
| 789 | 768 | 772 | 122.60 | 0.20 | 0.00 | 0.78 | 0.43 | 0.43 |
| 793 | 732 | 768 | 476.96 | 1.70 | 0.00 | 3.04 | 5.38 | 5.38 |
| 797 | 768 | 784 | 353.00 | 0.77 | 0.00 | 2.25 | 3.08 | 3.08 |
| 801 | 764 | 768 | 237.65 | 0.69 | 0.00 | 1.52 | 1.48 | 1.48 |
| 805 | 756 | 764 | 438.26 | 1.27 | 0.00 | 2.80 | 4.60 | 4.60 |
| 809 | 788 | 764 | -360.80 | 0.81 | 0.00 | 2.30 | 3.21 | 3.21 |
| 813 | 764 | 760 | -160.19 | 0.29 | 0.00 | 1.02 | 0.71 | 0.71 |
| 817 | 760 | 752 | -1191.42 | 1.16 | 0.00 | 3.38 | 4.07 | 4.07 |
| 821 | 760 | 792 | 861.75 | 0.61 | 0.00 | 2.44 | 2.23 | 2.23 |
| 825 | 792 | 794 | 83.66 | 0.02 | 0.00 | 0.24 | 0.03 | 0.03 |
| 827 | 794 | 796 | 47.75 | 0.01 | 0.00 | 0.14 | 0.01 | 0.01 |
| 829 | 796 | 816 | 12.22 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 |
| 831 | 792 | 788 | 614.49 | 0.49 | 0.00 | 1.74 | 1.19 | 1.19 |
| 833 | 788 | 798 | 255.29 | 0.48 | 0.00 | 1.63 | 1.69 | 1.69 |
| 837 | 784 | 788 | -668.32 | 0.65 | 0.00 | 1.90 | 1.39 | 1.39 |
| 841 | 780 | 784 | -964.32 | 1.29 | 0.00 | 2.74 | 2.75 | 2.75 |
| 845 | 800 | 780 | -598.17 | 0.31 | 0.00 | 1.70 | 1.14 | 1.14 |
| 849 | 798 | 800 | 271.00 | 1.77 | 0.00 | 1.73 | 1.89 | 1.89 |
| 853 | 804 | 800 | 1130.84 | 2.89 | 0.00 | 3.21 | 3.69 | 3.69 |
| 857 | 812 | 798 | 200.39 | 0.86 | 0.00 | 1.28 | 1.08 | 1.08 |
| 861 | 808 | 812 | 107.16 | 0.15 | 0.00 | 0.68 | 0.34 | 0.34 |
| 865 | 808 | 804 | -244.41 | 0.11 | 0.00 | 0.69 | 0.22 | 0.22 |
| 869 | 820 | 808 | -137.25 | 0.03 | 0.00 | 0.39 | 0.07 | 0.07 |
| 873 | 816 | 820 | -137.25 | 0.03 | 0.00 | 0.39 | 0.07 | 0.07 |
| 877 | 816 | 812 | 93.23 | 0.08 | 0.00 | 0.60 | 0.26 | 0.26 |

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 |
|---|---|---|---|---|
| 700 | 1375.24 | 289.65 | 283.24 | -6.4 |
| 701 | 1375.24 | 282.61 | 251.33 | -31.3 |
| 702 | 1528.90 | 313.99 | 306.94 | -7.1 |
| 703 | 1528.90 | 306.32 | 274.93 | -31.4 |
| 704 | 1655.73 | 327.92 | 320.25 | -7.7 |
| 705 | 1655.73 | 319.43 | 287.90 | -31.5 |
| 706 | 1469.89 | 329.14 | 322.35 | -6.8 |
| 707 | 1469.89 | 321.24 | 289.91 | -31.3 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.46 | 100.00 | 435.46 | 188.70 |
| 28 | | 0.00 | 535.48 | 56.00 | 479.48 | 207.77 |
| 104 | | 95.00(1.90) | 387.36 | 117.00 | 270.36 | 117.16 |
| 108 | | 47.50(1.90) | 387.26 | 87.00 | 300.26 | 130.11 |
| 112 | | 0.00 | 387.23 | 54.00 | 333.23 | 144.40 |
| 116 | | 0.00 | 388.47 | 54.00 | 334.47 | 144.94 |
| 120 | | 0.00 | 388.81 | 50.00 | 338.81 | 146.82 |

| | | | | | |
|---|---|---|---|---|---|
| 124 | 0.00 | 388.29 | 58.00 | 330.29 | 143.13 |
| 126 | 0.00 | 385.37 | 69.00 | 316.37 | 137.09 |
| 128 | 399.00(1.90) | 385.20 | 70.00 | 315.20 | 136.59 |
| 130 | 0.00 | 384.68 | 95.00 | 289.68 | 125.53 |
| 132 | 0.00 | 389.24 | 100.00 | 289.24 | 125.34 |
| O-700 | 0.00 | 371.24 | 88.00 | 283.24 | 122.74 |
| O-701 | 0.00 | 339.33 | 88.00 | 251.33 | 108.91 |
| I-702 | 0.00 | 382.99 | 69.00 | 313.99 | 136.06 |
| I-703 | 0.00 | 375.32 | 69.00 | 306.32 | 132.74 |
| I-704 | 0.00 | 385.92 | 58.00 | 327.92 | 142.10 |
| I-705 | 0.00 | 377.43 | 58.00 | 319.43 | 138.42 |
| I-706 | 0.00 | 383.14 | 54.00 | 329.14 | 142.63 |
| I-707 | 0.00 | 375.24 | 54.00 | 321.24 | 139.21 |
| 708 | 0.00 | 343.35 | 75.00 | 268.35 | 116.28 |
| 710 | 0.00 | 343.32 | 75.00 | 268.32 | 116.27 |
| 712 | 0.00 | 343.30 | 75.00 | 268.30 | 116.26 |
| 714 | 0.00 | 343.27 | 71.00 | 272.27 | 117.99 |
| 716 | 37.05(1.90) | 343.11 | 71.00 | 272.11 | 117.91 |
| 720 | 217.55(1.90) | 341.98 | 71.00 | 270.98 | 117.42 |
| 724 | 260.68(1.90) | 341.15 | 68.00 | 273.15 | 118.36 |
| 728 | 0.00 | 340.95 | 71.00 | 269.95 | 116.98 |
| 732 | 0.00 | 339.88 | 67.00 | 272.88 | 118.25 |
| 736 | 0.00 | 340.27 | 65.00 | 275.27 | 119.29 |
| 740 | 0.00 | 342.23 | 65.00 | 277.23 | 120.13 |
| 744 | 0.00 | 342.24 | 63.00 | 279.24 | 121.00 |
| 752 | 82.65(1.90) | 340.32 | 63.00 | 277.32 | 120.17 |
| 756 | 74.48(1.90) | 340.13 | 65.00 | 275.13 | 119.22 |
| 760 | 169.48(1.90) | 339.15 | 63.00 | 276.15 | 119.67 |
| 764 | 0.00 | 338.87 | 65.00 | 273.87 | 118.68 |
| 768 | 239.02(1.90) | 338.17 | 67.00 | 271.17 | 117.51 |
| 772 | 243.96(1.90) | 337.97 | 71.00 | 266.97 | 115.69 |
| 776 | 120.27(1.90) | 337.89 | 74.00 | 263.89 | 114.35 |
| 780 | 2000.00 | 336.11 | 77.00 | 259.11 | 112.28 |
| 784 | 57.00(1.90) | 337.40 | 74.00 | 263.40 | 114.14 |
| 788 | 51.68(1.90) | 338.05 | 71.00 | 267.05 | 115.72 |
| 792 | 163.59(1.90) | 338.54 | 68.00 | 270.54 | 117.23 |
| 794 | 35.91(1.90) | 338.52 | 55.00 | 283.52 | 122.86 |
| 796 | 35.53(1.90) | 338.51 | 56.00 | 282.51 | 122.42 |
| 798 | 184.68(1.90) | 337.57 | 68.00 | 269.57 | 116.81 |
| 800 | 2000.00( ** ) | 335.80 | 82.00 | 253.80 | 109.98 |
| 804 | 0.00 | 338.69 | 84.00 | 254.69 | 110.37 |
| 808 | 0.00 | 338.58 | 84.00 | 254.58 | 110.32 |
| 812 | 0.00 | 338.43 | 58.00 | 280.43 | 121.52 |
| 816 | 56.24(1.90) | 338.51 | 64.00 | 274.51 | 118.96 |
| 820 | 0.00 | 338.55 | 86.00 | 252.55 | 109.44 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.19 | 49.80 | 485.39 | 210.34 |
| I-700 | 0.00 | 377.65 | 88.00 | 289.65 | 125.52 |
| I-701 | 0.00 | 370.61 | 88.00 | 282.61 | 122.46 |
| O-702 | 0.00 | 375.94 | 69.00 | 306.94 | 133.01 |
| O-703 | 0.00 | 343.93 | 69.00 | 274.93 | 119.14 |
| O-704 | 0.00 | 378.25 | 58.00 | 320.25 | 138.77 |
| O-705 | 0.00 | 345.90 | 58.00 | 287.90 | 124.75 |
| O-706 | 0.00 | 376.35 | 54.00 | 322.35 | 139.68 |
| O-707 | 0.00 | 343.91 | 54.00 | 289.91 | 125.63 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.41 | 100.80 | 434.61 | 188.33 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.34 | O-701 | 108.91 |
| 28 | 207.77 | 820 | 109.44 |
| 24 | 188.70 | 800 | 109.98 |
| I-FRPRS | 188.33 | 808 | 110.32 |
| I-CRPRV | 187.85 | 804 | 110.37 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 10.57 | 829 | 0.03 |
| 135 | 9.76 | 21 | 0.10 |
| 117 | 9.38 | 827 | 0.14 |
| 141 | 8.78 | 737 | 0.20 |
| 49 | 8.17 | 45 | 0.20 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 323.43 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.33 | 125.00 | 1129.68 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.34 | 147.00 | 5118.16 |

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 | 6571.27 | |

NET SYSTEM INFLOW = 6571.27
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6571.27

==========

Case: 5

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 5 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.81331E-05

**SDSU Mission Valley Project**
**Ultimate Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 720 and 724**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 300.23 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 994.07 | 0.04 | 0.00 | 1.59 | 0.72 | 0.72 |
| 45 | 28 | 24 | 994.07 | 0.01 | 0.00 | 0.18 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 4875.50 | 0.26 | 0.00 | 7.78 | 13.62 | 13.62 |
| 53 | 0 | 28 | 5869.57 | 0.46 | 0.00 | 1.04 | 0.09 | 0.09 |
| 101 | O-CRPRV | 104 | 300.23 | 1.12 | 0.00 | 0.85 | 0.32 | 0.32 |
| 105 | 104 | 108 | 205.23 | 0.08 | 0.00 | 0.58 | 0.16 | 0.16 |
| 109 | 108 | 112 | 157.73 | 0.02 | 0.00 | 0.25 | 0.02 | 0.02 |
| 117 | 112 | I-706 | 1358.77 | 3.54 | 0.00 | 8.67 | 37.38 | 37.38 |
| 121 | 116 | 112 | 1201.04 | 1.08 | 0.00 | 1.92 | 1.02 | 1.02 |
| 125 | 120 | 116 | 2848.38 | 0.32 | 0.00 | 4.54 | 5.03 | 5.03 |
| 127 | 120 | O-OPRS | -4875.50 | 0.20 | 0.00 | 7.78 | 13.62 | 13.62 |
| 129 | 124 | 120 | -2027.12 | 0.45 | 0.00 | 3.23 | 2.68 | 2.68 |
| 131 | 116 | I-704 | 1647.34 | 2.52 | 0.00 | 10.51 | 53.40 | 53.40 |
| 133 | 124 | 126 | 2027.12 | 2.57 | 0.00 | 3.23 | 2.68 | 2.68 |
| 135 | 126 | I-702 | 1550.63 | 2.44 | 0.00 | 9.90 | 47.74 | 47.74 |
| 137 | 126 | 128 | 476.49 | 0.10 | 0.00 | 0.76 | 0.18 | 0.18 |
| 139 | 128 | 130 | 77.49 | 0.06 | 0.00 | 0.22 | 0.03 | 0.03 |
| 141 | 130 | I-700 | 1071.56 | 4.43 | 0.00 | 6.84 | 24.08 | 24.08 |
| 143 | 130 | 132 | -994.07 | 3.60 | 0.00 | 2.82 | 2.91 | 2.91 |
| 145 | 132 | O-FRPRS | -994.07 | 0.02 | 0.00 | 1.59 | 0.72 | 0.72 |
| 700 | O-700 | I-701 | 1071.56 | 0.40 | 0.00 | 4.38 | 8.12 | 8.12 |
| 701 | O-701 | 804 | 1071.56 | 0.40 | 0.00 | 3.04 | 3.34 | 3.34 |
| 702 | O-702 | I-703 | 1550.63 | 0.64 | 0.00 | 6.33 | 16.10 | 16.10 |
| 703 | O-703 | 708 | 1550.63 | 0.60 | 0.00 | 4.40 | 6.63 | 6.63 |
| 704 | O-704 | I-705 | 1647.34 | 0.82 | 0.00 | 6.73 | 18.01 | 18.01 |
| 705 | O-705 | 714 | 1647.34 | 2.60 | 0.00 | 4.67 | 7.41 | 7.41 |
| 706 | O-706 | I-707 | 1358.77 | 0.96 | 0.00 | 5.55 | 12.61 | 12.61 |
| 707 | O-707 | 744 | 1358.77 | 1.44 | 0.00 | 3.85 | 5.19 | 5.19 |
| 709 | 710 | 708 | -708.93 | 0.06 | 0.00 | 2.01 | 1.56 | 1.56 |
| 713 | 710 | 712 | 165.23 | 0.03 | 0.00 | 0.47 | 0.10 | 0.10 |
| 715 | 712 | 714 | 165.23 | 0.04 | 0.00 | 0.47 | 0.10 | 0.10 |
| 717 | 714 | 716 | 1812.57 | 0.17 | 0.00 | 5.14 | 8.85 | 8.85 |
| 721 | 716 | 720 | 2045.01 | 2.84 | 0.00 | 5.80 | 11.06 | 11.06 |
| 725 | 720 | 710 | -543.70 | 3.08 | 0.00 | 3.47 | 6.85 | 6.85 |
| 729 | 720 | 724 | 2000.00 | 36.19 | 0.00 | 12.76 | 76.49 | 76.49 |
| 733 | 740 | 716 | 269.49 | 0.29 | 0.00 | 0.76 | 0.26 | 0.26 |
| 737 | 740 | 744 | -562.94 | 0.32 | 0.00 | 1.60 | 1.01 | 1.01 |
| 745 | 744 | 752 | 795.84 | 0.67 | 0.00 | 2.26 | 1.93 | 1.93 |
| 749 | 752 | 756 | 148.07 | 0.25 | 0.00 | 0.95 | 0.62 | 0.62 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 753 | 756 | 736 | -81.34 | 0.01 | 0.00 | 0.52 | 0.20 | 0.20 |
| 757 | 736 | 740 | -293.44 | 0.59 | 0.00 | 1.87 | 2.19 | 2.19 |
| 761 | 732 | 736 | -212.11 | 0.56 | 0.00 | 1.35 | 1.20 | 1.20 |
| 765 | 728 | 732 | -172.63 | 0.38 | 0.00 | 1.10 | 0.82 | 0.82 |
| 769 | 720 | 728 | -1411.30 | 1.59 | 0.00 | 4.00 | 5.57 | 5.57 |
| 773 | 708 | 728 | 841.70 | 1.55 | 0.00 | 2.39 | 2.14 | 2.14 |
| 777 | 772 | 728 | 396.96 | 0.17 | 0.00 | 1.13 | 0.53 | 0.53 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |
| 785 | 780 | 772 | 639.49 | 0.33 | 0.00 | 1.81 | 1.29 | 1.29 |
| 789 | 768 | 772 | 121.70 | 0.20 | 0.00 | 0.78 | 0.43 | 0.43 |
| 793 | 732 | 768 | 39.48 | 0.02 | 0.00 | 0.25 | 0.05 | 0.05 |
| 797 | 768 | 784 | -147.99 | 0.15 | 0.00 | 0.94 | 0.62 | 0.62 |
| 801 | 764 | 768 | 173.25 | 0.39 | 0.00 | 1.11 | 0.82 | 0.82 |
| 805 | 756 | 764 | 154.93 | 0.18 | 0.00 | 0.99 | 0.67 | 0.67 |
| 809 | 788 | 764 | -89.35 | 0.06 | 0.00 | 0.57 | 0.24 | 0.24 |
| 813 | 764 | 760 | -107.68 | 0.14 | 0.00 | 0.69 | 0.34 | 0.34 |
| 817 | 760 | 752 | -565.11 | 0.29 | 0.00 | 1.60 | 1.02 | 1.02 |
| 821 | 760 | 792 | 287.96 | 0.08 | 0.00 | 0.82 | 0.29 | 0.29 |
| 825 | 792 | 794 | -161.13 | 0.06 | 0.00 | 0.46 | 0.10 | 0.10 |
| 827 | 794 | 796 | -197.04 | 0.14 | 0.00 | 0.56 | 0.15 | 0.15 |
| 829 | 796 | 816 | -232.57 | 0.15 | 0.00 | 0.66 | 0.20 | 0.20 |
| 831 | 792 | 788 | 285.50 | 0.12 | 0.00 | 0.81 | 0.29 | 0.29 |
| 833 | 788 | 798 | 0.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 837 | 784 | 788 | -322.40 | 0.17 | 0.00 | 0.91 | 0.36 | 0.36 |
| 841 | 780 | 784 | -117.41 | 0.03 | 0.00 | 0.33 | 0.06 | 0.06 |
| 845 | 800 | 780 | 522.08 | 0.24 | 0.00 | 1.48 | 0.88 | 0.88 |
| 849 | 798 | 800 | -39.00 | 0.05 | 0.00 | 0.25 | 0.05 | 0.05 |
| 853 | 804 | 800 | 637.85 | 1.00 | 0.00 | 1.81 | 1.28 | 1.28 |
| 857 | 812 | 798 | 144.91 | 0.47 | 0.00 | 0.92 | 0.59 | 0.59 |
| 861 | 808 | 812 | 143.97 | 0.26 | 0.00 | 0.92 | 0.59 | 0.59 |
| 865 | 808 | 804 | -433.72 | 0.32 | 0.00 | 1.23 | 0.63 | 0.63 |
| 869 | 820 | 808 | -289.74 | 0.12 | 0.00 | 0.82 | 0.30 | 0.30 |
| 873 | 816 | 820 | -289.74 | 0.13 | 0.00 | 0.82 | 0.30 | 0.30 |
| 877 | 816 | 812 | 0.93 | 0.00 | 0.00 | 0.01 | 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 |
|---|---|---|---|---|
| 700 | 1071.56 | 293.22 | 287.73 | -5.5 |
| 701 | 1071.56 | 287.34 | 256.16 | -31.2 |
| 702 | 1550.63 | 314.37 | 307.21 | -7.2 |
| 703 | 1550.63 | 306.57 | 275.17 | -31.4 |
| 704 | 1647.34 | 327.99 | 320.36 | -7.6 |
| 705 | 1647.34 | 319.54 | 288.02 | -31.5 |
| 706 | 1358.77 | 329.89 | 323.54 | -6.4 |
| 707 | 1358.77 | 322.58 | 291.31 | -31.3 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.52 | 100.00 | 435.52 | 188.73 |
| 28 | | 0.00 | 535.54 | 56.00 | 479.54 | 207.80 |
| 104 | | 95.00(1.90) | 387.53 | 117.00 | 270.53 | 117.23 |
| 108 | | 47.50(1.90) | 387.45 | 87.00 | 300.45 | 130.19 |
| 112 | | 0.00 | 387.42 | 54.00 | 333.42 | 144.48 |
| 116 | | 0.00 | 388.51 | 54.00 | 334.51 | 144.95 |
| 120 | | 0.00 | 388.83 | 50.00 | 338.83 | 146.83 |
| 124 | | 0.00 | 388.37 | 58.00 | 330.37 | 143.16 |
| 126 | | 0.00 | 385.81 | 69.00 | 316.81 | 137.28 |
| 128 | | 399.00(1.90) | 385.71 | 70.00 | 315.71 | 136.81 |
| 130 | | 0.00 | 385.65 | 95.00 | 290.65 | 125.95 |
| 132 | | 0.00 | 389.25 | 100.00 | 289.25 | 125.34 |
| O-700 | | 0.00 | 375.73 | 88.00 | 287.73 | 124.68 |
| O-701 | | 0.00 | 344.16 | 88.00 | 256.16 | 111.00 |
| I-702 | | 0.00 | 383.37 | 69.00 | 314.37 | 136.23 |
| I-703 | | 0.00 | 375.57 | 69.00 | 306.57 | 132.85 |
| I-704 | | 0.00 | 385.99 | 58.00 | 327.99 | 142.13 |
| I-705 | | 0.00 | 377.54 | 58.00 | 319.54 | 138.47 |
| I-706 | | 0.00 | 383.89 | 54.00 | 329.89 | 142.95 |
| I-707 | | 0.00 | 376.58 | 54.00 | 322.58 | 139.78 |
| 708 | | 0.00 | 343.57 | 75.00 | 268.57 | 116.38 |
| 710 | | 0.00 | 343.50 | 75.00 | 268.50 | 116.35 |
| 712 | | 0.00 | 343.47 | 75.00 | 268.47 | 116.34 |
| 714 | | 0.00 | 343.43 | 71.00 | 272.43 | 118.05 |
| 716 | | 37.05(1.90) | 343.26 | 71.00 | 272.26 | 117.98 |
| 720 | | 2000.00( ** ) | 340.42 | 71.00 | 269.42 | 116.75 |
| 724 | | 2000.00( ** ) | 304.23 | 68.00 | 236.23 | 102.37 |
| 728 | | 0.00 | 342.01 | 71.00 | 271.01 | 117.44 |
| 732 | | 0.00 | 342.40 | 67.00 | 275.40 | 119.34 |
| 736 | | 0.00 | 342.96 | 65.00 | 277.96 | 120.45 |
| 740 | | 0.00 | 343.54 | 65.00 | 278.54 | 120.70 |
| 744 | | 0.00 | 343.87 | 63.00 | 280.87 | 121.71 |
| 752 | | 82.65(1.90) | 343.19 | 63.00 | 280.19 | 121.42 |
| 756 | | 74.48(1.90) | 342.95 | 65.00 | 277.95 | 120.44 |
| 760 | | 169.48(1.90) | 342.90 | 63.00 | 279.90 | 121.29 |
| 764 | | 0.00 | 342.76 | 65.00 | 277.76 | 120.36 |
| 768 | | 239.02(1.90) | 342.38 | 67.00 | 275.38 | 119.33 |
| 772 | | 243.96(1.90) | 342.18 | 71.00 | 271.18 | 117.51 |
| 776 | | 120.27(1.90) | 342.09 | 74.00 | 268.09 | 116.17 |
| 780 | | 0.00 | 342.51 | 77.00 | 265.51 | 115.05 |
| 784 | | 57.00(1.90) | 342.53 | 74.00 | 268.53 | 116.36 |
| 788 | | 51.68(1.90) | 342.70 | 71.00 | 271.70 | 117.74 |
| 792 | | 163.59(1.90) | 342.82 | 68.00 | 274.82 | 119.09 |
| 794 | | 35.91(1.90) | 342.88 | 55.00 | 287.88 | 124.75 |
| 796 | | 35.53(1.90) | 343.02 | 56.00 | 287.02 | 124.38 |
| 798 | | 184.68(1.90) | 342.70 | 68.00 | 274.70 | 119.04 |
| 800 | | 76.76(1.90) | 342.75 | 82.00 | 260.75 | 112.99 |
| 804 | | 0.00 | 343.75 | 84.00 | 259.75 | 112.56 |
| 808 | | 0.00 | 343.43 | 84.00 | 259.43 | 112.42 |
| 812 | | 0.00 | 343.17 | 58.00 | 285.17 | 123.58 |
| 816 | | 56.24(1.90) | 343.17 | 64.00 | 279.17 | 120.98 |
| 820 | | 0.00 | 343.31 | 86.00 | 257.31 | 111.50 |
| 0 | | ---- | 536.00 | | | |
| I-CRPRV | | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | | ---- | 389.26 | 100.80 | 288.46 | 125.00 |

| | | | | | |
|---|---|---|---|---|---|
| I-OPRS | 0.00 | 535.27 | 49.80 | 485.47 | 210.37 |
| I-700 | 0.00 | 381.22 | 88.00 | 293.22 | 127.06 |
| I-701 | 0.00 | 375.34 | 88.00 | 287.34 | 124.51 |
| O-702 | 0.00 | 376.21 | 69.00 | 307.21 | 133.13 |
| O-703 | 0.00 | 344.17 | 69.00 | 275.17 | 119.24 |
| O-704 | 0.00 | 378.36 | 58.00 | 320.36 | 138.82 |
| O-705 | 0.00 | 346.02 | 58.00 | 288.02 | 124.81 |
| O-706 | 0.00 | 377.54 | 54.00 | 323.54 | 140.20 |
| O-707 | 0.00 | 345.31 | 54.00 | 291.31 | 126.23 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.48 | 100.80 | 434.68 | 188.36 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.37 | 724 | 102.37 |
| 28 | 207.80 | O-701 | 111.00 |
| 24 | 188.73 | 820 | 111.50 |
| I-FRPRS | 188.36 | 808 | 112.42 |
| I-CRPRV | 187.85 | 804 | 112.56 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 729 | 12.76 | 833 | 0.00 |
| 131 | 10.51 | 877 | 0.01 |
| 135 | 9.90 | 21 | 0.09 |
| 117 | 8.67 | 45 | 0.18 |
| 49 | 7.78 | 139 | 0.22 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 300.23 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.36 | 125.00 | 994.07 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.37 | 147.00 | 4875.50 |

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 | 6169.80 | |

NET SYSTEM INFLOW = 6169.80
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6169.80

==========

Case: 6

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 6 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 143 is CLOSED

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.62377E-06

**SDSU Mission Valley Project**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 808 and 820**
**Pipe 143 Out of Service**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 368.41 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 45 | 28 | 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 6279.61 | 0.42 | 0.00 | 10.02 | 21.77 | 21.77 |
| 53 | 0 | 28 | 6279.61 | 0.53 | 0.00 | 1.11 | 0.10 | 0.10 |
| 101 | O-CRPRV | 104 | 368.41 | 1.64 | 0.00 | 1.05 | 0.46 | 0.46 |
| 105 | 104 | 108 | 273.41 | 0.14 | 0.00 | 0.78 | 0.27 | 0.27 |
| 109 | 108 | 112 | 225.91 | 0.04 | 0.00 | 0.36 | 0.05 | 0.05 |
| 117 | 112 | I-706 | 1643.52 | 5.03 | 0.00 | 10.49 | 53.17 | 53.17 |
| 121 | 116 | 112 | 1417.61 | 1.47 | 0.00 | 2.26 | 1.38 | 1.38 |
| 125 | 120 | 116 | 3243.13 | 0.41 | 0.00 | 5.17 | 6.40 | 6.40 |
| 127 | 120 | O-OPRS | -6279.61 | 0.32 | 0.00 | 10.02 | 21.77 | 21.77 |
| 129 | 124 | 120 | -3036.49 | 0.96 | 0.00 | 4.84 | 5.67 | 5.67 |
| 131 | 116 | I-704 | 1825.52 | 3.05 | 0.00 | 11.65 | 64.59 | 64.59 |
| 133 | 124 | 126 | 3036.49 | 5.43 | 0.00 | 4.84 | 5.67 | 5.67 |
| 135 | 126 | I-702 | 1488.45 | 2.26 | 0.00 | 9.50 | 44.26 | 44.26 |
| 137 | 126 | 128 | 1548.04 | 0.86 | 0.00 | 2.47 | 1.63 | 1.63 |
| 139 | 128 | 130 | 1149.04 | 9.03 | 0.00 | 3.26 | 3.80 | 3.80 |
| 141 | 130 | I-700 | 1149.04 | 5.04 | 0.00 | 7.33 | 27.40 | 27.40 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 143-XX | 130 | 132 | | | | | | |
| 145 | 132 | O-FRPRS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 700 | O-700 | I-701 | 1149.04 | 0.45 | 0.00 | 4.69 | 9.24 | 9.24 |
| 701 | O-701 | 804 | 1149.04 | 0.46 | 0.00 | 3.26 | 3.80 | 3.80 |
| 702 | O-702 | I-703 | 1488.45 | 0.59 | 0.00 | 6.08 | 14.93 | 14.93 |
| 703 | O-703 | 708 | 1488.45 | 0.56 | 0.00 | 4.22 | 6.14 | 6.14 |
| 704 | O-704 | I-705 | 1825.52 | 0.99 | 0.00 | 7.46 | 21.79 | 21.79 |
| 705 | O-705 | 714 | 1825.52 | 3.14 | 0.00 | 5.18 | 8.97 | 8.97 |
| 706 | O-706 | I-707 | 1643.52 | 1.36 | 0.00 | 6.71 | 17.94 | 17.94 |
| 707 | O-707 | 744 | 1643.52 | 2.05 | 0.00 | 4.66 | 7.38 | 7.38 |
| 709 | 710 | 708 | -410.69 | 0.02 | 0.00 | 1.16 | 0.57 | 0.57 |
| 713 | 710 | 712 | 60.96 | 0.01 | 0.00 | 0.17 | 0.02 | 0.02 |
| 715 | 712 | 714 | 60.96 | 0.01 | 0.00 | 0.17 | 0.02 | 0.02 |
| 717 | 714 | 716 | 1886.48 | 0.18 | 0.00 | 5.35 | 9.53 | 9.53 |
| 721 | 716 | 720 | 1265.60 | 1.17 | 0.00 | 3.59 | 4.55 | 4.55 |
| 725 | 720 | 710 | -349.73 | 1.36 | 0.00 | 2.23 | 3.03 | 3.03 |
| 729 | 720 | 724 | 260.68 | 0.83 | 0.00 | 1.66 | 1.76 | 1.76 |
| 733 | 740 | 716 | -583.83 | 1.21 | 0.00 | 1.66 | 1.09 | 1.09 |
| 737 | 740 | 744 | -32.88 | 0.00 | 0.00 | 0.09 | 0.01 | 0.01 |
| 745 | 744 | 752 | 1610.64 | 2.48 | 0.00 | 4.57 | 7.11 | 7.11 |
| 749 | 752 | 756 | 74.15 | 0.07 | 0.00 | 0.47 | 0.17 | 0.17 |
| 753 | 756 | 736 | -500.06 | 0.23 | 0.00 | 3.19 | 5.87 | 5.87 |
| 757 | 736 | 740 | -616.71 | 2.32 | 0.00 | 3.94 | 8.66 | 8.66 |
| 761 | 732 | 736 | -116.65 | 0.19 | 0.00 | 0.74 | 0.40 | 0.40 |
| 765 | 728 | 732 | 358.24 | 1.48 | 0.00 | 2.29 | 3.17 | 3.17 |
| 769 | 720 | 728 | 1137.10 | 1.07 | 0.00 | 3.23 | 3.73 | 3.73 |
| 773 | 708 | 728 | 1077.76 | 2.45 | 0.00 | 3.06 | 3.38 | 3.38 |
| 777 | 772 | 728 | -1856.62 | 2.92 | 0.00 | 5.27 | 9.25 | 9.25 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |
| 785 | 780 | 772 | -1355.23 | 1.32 | 0.00 | 3.84 | 5.16 | 5.16 |
| 789 | 768 | 772 | -137.16 | 0.25 | 0.00 | 0.88 | 0.53 | 0.53 |
| 793 | 732 | 768 | 474.89 | 1.69 | 0.00 | 3.03 | 5.33 | 5.33 |
| 797 | 768 | 784 | 418.62 | 1.06 | 0.00 | 2.67 | 4.22 | 4.22 |
| 801 | 764 | 768 | 45.59 | 0.03 | 0.00 | 0.29 | 0.07 | 0.07 |
| 805 | 756 | 764 | 499.73 | 1.62 | 0.00 | 3.19 | 5.86 | 5.86 |
| 809 | 788 | 764 | -455.76 | 1.26 | 0.00 | 2.91 | 4.94 | 4.94 |
| 813 | 764 | 760 | -1.61 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 817 | 760 | 752 | -1453.84 | 1.68 | 0.00 | 4.12 | 5.88 | 5.88 |
| 821 | 760 | 792 | 1282.75 | 1.28 | 0.00 | 3.64 | 4.66 | 4.66 |
| 825 | 792 | 794 | 1235.00 | 2.48 | 0.00 | 3.50 | 4.35 | 4.35 |
| 827 | 794 | 796 | 1199.09 | 4.07 | 0.00 | 3.40 | 4.12 | 4.12 |
| 829 | 796 | 816 | 1163.56 | 3.02 | 0.00 | 3.30 | 3.89 | 3.89 |
| 831 | 792 | 788 | -115.84 | 0.02 | 0.00 | 0.33 | 0.05 | 0.05 |
| 833 | 788 | 798 | 601.68 | 2.37 | 0.00 | 3.84 | 8.27 | 8.27 |
| 837 | 784 | 788 | 313.44 | 0.16 | 0.00 | 0.89 | 0.34 | 0.34 |
| 841 | 780 | 784 | -48.18 | 0.01 | 0.00 | 0.14 | 0.01 | 0.01 |
| 845 | 800 | 780 | -1403.40 | 1.52 | 0.00 | 3.98 | 5.51 | 5.51 |
| 849 | 798 | 800 | -199.13 | 1.00 | 0.00 | 1.27 | 1.07 | 1.07 |
| 853 | 804 | 800 | -1127.51 | 2.87 | 0.00 | 3.20 | 3.67 | 3.67 |
| 857 | 812 | 798 | -616.13 | 6.89 | 0.00 | 3.93 | 8.64 | 8.64 |
| 861 | 808 | 812 | -419.24 | 1.87 | 0.00 | 2.68 | 4.24 | 4.24 |
| 865 | 808 | 804 | -2276.55 | 6.88 | 0.00 | 6.46 | 13.50 | 13.50 |
| 869 | 820 | 808 | -695.80 | 0.63 | 0.00 | 1.97 | 1.50 | 1.50 |
| 873 | 816 | 820 | 1304.20 | 2.16 | 0.00 | 3.70 | 4.81 | 4.81 |
| 877 | 816 | 812 | -196.88 | 0.34 | 0.00 | 1.26 | 1.04 | 1.04 |

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 |
|---|---|---|---|---|
| 700 | 1149.04 | 279.39 | 273.70 | -5.7 |
| 701 | 1149.04 | 273.25 | 242.06 | -31.2 |
| 702 | 1488.45 | 311.06 | 304.19 | -6.9 |
| 703 | 1488.45 | 303.59 | 272.24 | -31.4 |
| 704 | 1825.52 | 327.25 | 318.60 | -8.6 |
| 705 | 1825.52 | 317.61 | 285.79 | -31.8 |
| 706 | 1643.52 | 327.80 | 320.19 | -7.6 |
| 707 | 1643.52 | 318.83 | 287.31 | -31.5 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.47 | 100.00 | 435.47 | 188.71 |
| 28 | | 0.00 | 535.47 | 56.00 | 479.47 | 207.77 |
| 104 | | 95.00(1.90) | 387.01 | 117.00 | 270.01 | 117.00 |
| 108 | | 47.50(1.90) | 386.87 | 87.00 | 299.87 | 129.94 |
| 112 | | 0.00 | 386.83 | 54.00 | 332.83 | 144.22 |
| 116 | | 0.00 | 388.30 | 54.00 | 334.30 | 144.86 |
| 120 | | 0.00 | 388.71 | 50.00 | 338.71 | 146.77 |
| 124 | | 0.00 | 387.75 | 58.00 | 329.75 | 142.89 |
| 126 | | 0.00 | 382.32 | 69.00 | 313.32 | 135.77 |
| 128 | | 399.00(1.90) | 381.46 | 70.00 | 311.46 | 134.96 |
| 130 | | 0.00 | 372.43 | 95.00 | 277.43 | 120.22 |
| 132 | | 0.00 | 535.47 | 100.00 | 435.47 | 188.71 |
| O-700 | | 0.00 | 361.70 | 88.00 | 273.70 | 118.61 |
| O-701 | | 0.00 | 330.06 | 88.00 | 242.06 | 104.89 |
| I-702 | | 0.00 | 380.06 | 69.00 | 311.06 | 134.79 |
| I-703 | | 0.00 | 372.59 | 69.00 | 303.59 | 131.56 |
| I-704 | | 0.00 | 385.25 | 58.00 | 327.25 | 141.81 |
| I-705 | | 0.00 | 375.61 | 58.00 | 317.61 | 137.63 |
| I-706 | | 0.00 | 381.80 | 54.00 | 327.80 | 142.05 |
| I-707 | | 0.00 | 372.83 | 54.00 | 318.83 | 138.16 |
| 708 | | 0.00 | 340.68 | 75.00 | 265.68 | 115.13 |
| 710 | | 0.00 | 340.66 | 75.00 | 265.66 | 115.12 |
| 712 | | 0.00 | 340.65 | 75.00 | 265.65 | 115.12 |
| 714 | | 0.00 | 340.65 | 71.00 | 269.65 | 116.85 |
| 716 | | 37.05(1.90) | 340.46 | 71.00 | 269.46 | 116.77 |
| 720 | | 217.55(1.90) | 339.30 | 71.00 | 268.30 | 116.26 |
| 724 | | 260.68(1.90) | 338.47 | 68.00 | 270.47 | 117.20 |
| 728 | | 0.00 | 338.23 | 71.00 | 267.23 | 115.80 |
| 732 | | 0.00 | 336.75 | 67.00 | 269.75 | 116.89 |
| 736 | | 0.00 | 336.93 | 65.00 | 271.93 | 117.84 |
| 740 | | 0.00 | 339.26 | 65.00 | 274.26 | 118.84 |
| 744 | | 0.00 | 339.26 | 63.00 | 276.26 | 119.71 |
| 752 | | 82.65(1.90) | 336.77 | 63.00 | 273.77 | 118.64 |
| 756 | | 74.48(1.90) | 336.71 | 65.00 | 271.71 | 117.74 |
| 760 | | 169.48(1.90) | 335.09 | 63.00 | 272.09 | 117.91 |
| 764 | | 0.00 | 335.09 | 65.00 | 270.09 | 117.04 |

| | | | | | |
|---|---|---|---|---|---|
| 768 | 239.02(1.90) | 335.06 | 67.00 | 268.06 | 116.16 |
| 772 | 243.96(1.90) | 335.31 | 71.00 | 264.31 | 114.53 |
| 776 | 120.27(1.90) | 335.22 | 74.00 | 261.22 | 113.20 |
| 780 | 0.00 | 333.99 | 77.00 | 256.99 | 111.36 |
| 784 | 57.00(1.90) | 334.00 | 74.00 | 260.00 | 112.67 |
| 788 | 51.68(1.90) | 333.84 | 71.00 | 262.84 | 113.90 |
| 792 | 163.59(1.90) | 333.81 | 68.00 | 265.81 | 115.19 |
| 794 | 35.91(1.90) | 331.33 | 55.00 | 276.33 | 119.74 |
| 796 | 35.53(1.90) | 327.26 | 56.00 | 271.26 | 117.55 |
| 798 | 184.68(1.90) | 331.47 | 68.00 | 263.47 | 114.17 |
| 800 | 76.76(1.90) | 332.47 | 82.00 | 250.47 | 108.54 |
| 804 | 0.00 | 329.60 | 84.00 | 245.60 | 106.42 |
| 808 | 2000.00 | 322.72 | 84.00 | 238.72 | 103.44 |
| 812 | 0.00 | 324.58 | 58.00 | 266.58 | 115.52 |
| 816 | 56.24(1.90) | 324.24 | 64.00 | 260.24 | 112.77 |
| 820 | 2000.00 | 322.08 | 86.00 | 236.08 | 102.30 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 535.47 | 100.80 | 434.67 | 188.36 |
| I-OPRS | 0.00 | 535.05 | 49.80 | 485.25 | 210.28 |
| I-700 | 0.00 | 367.39 | 88.00 | 279.39 | 121.07 |
| I-701 | 0.00 | 361.25 | 88.00 | 273.25 | 118.41 |
| O-702 | 0.00 | 373.19 | 69.00 | 304.19 | 131.81 |
| O-703 | 0.00 | 341.24 | 69.00 | 272.24 | 117.97 |
| O-704 | 0.00 | 376.60 | 58.00 | 318.60 | 138.06 |
| O-705 | 0.00 | 343.79 | 58.00 | 285.79 | 123.84 |
| O-706 | 0.00 | 374.19 | 54.00 | 320.19 | 138.75 |
| O-707 | 0.00 | 341.31 | 54.00 | 287.31 | 124.50 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.47 | 100.80 | 434.67 | 188.36 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.28 | 820 | 102.30 |
| 28 | 207.77 | 808 | 103.44 |
| 132 | 188.71 | O-701 | 104.89 |
| 24 | 188.71 | 804 | 106.42 |
| O-FRPRS | 188.36 | 800 | 108.54 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 11.65 | 813 | 0.01 |
| 117 | 10.49 | 737 | 0.09 |
| 49 | 10.02 | 21 | 0.12 |
| 127 | 10.02 | 841 | 0.14 |
| 135 | 9.50 | 713 | 0.17 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 368.41 |
| FRPRS | PRV-1 | 125.00 | WIDE OPEN | 188.36 | 188.36 | 0.00 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.28 | 147.00 | 6279.61 |

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 | 6648.03 | |

NET SYSTEM INFLOW = 6648.03
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6648.03

==========

Case: 7

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 7 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 129 is CLOSED
Pipe 143 is OPENED

RESULTS OBTAINED AFTER 16 TRIALS: ACCURACY = 0.82015E-05

**SDSU Mission Valley Project**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 720 and 724**
**Pipe 129 Out of Service**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 400.34 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1968.79 | 0.14 | 0.00 | 3.14 | 2.54 | 2.54 |
| 45 | 28 | 24 | 1968.79 | 0.05 | 0.00 | 0.35 | 0.01 | 0.01 |
| 49 | 28 | I-OPRS | 3800.68 | 0.17 | 0.00 | 6.06 | 8.59 | 8.59 |
| 53 | 0 | 28 | 5769.47 | 0.45 | 0.00 | 1.02 | 0.09 | 0.09 |
| 101 | O-CRPRV | 104 | 400.34 | 1.92 | 0.00 | 1.14 | 0.54 | 0.54 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 105 | 104 | 108 | 305.34 | 0.18 | 0.00 | 0.87 | 0.33 | 0.33 |
| 109 | 108 | 112 | 257.84 | 0.05 | 0.00 | 0.41 | 0.06 | 0.06 |
| 117 | 112 | I-706 | 1859.03 | 6.32 | 0.00 | 11.86 | 66.80 | 66.80 |
| 121 | 116 | 112 | 1601.19 | 1.85 | 0.00 | 2.55 | 1.73 | 1.73 |
| 125 | 120 | 116 | 3800.68 | 0.55 | 0.00 | 6.06 | 8.59 | 8.59 |
| 127 | 120 | O-OPRS | -3800.68 | 0.13 | 0.00 | 6.06 | 8.59 | 8.59 |
| 129-XX | 124 | 120 | | | | | | |
| 131 | 116 | I-704 | 2199.49 | 4.31 | 0.00 | 14.04 | 91.21 | 91.21 |
| 133 | 124 | 126 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 135 | 126 | I-702 | 479.60 | 0.28 | 0.00 | 3.06 | 5.43 | 5.43 |
| 137 | 126 | 128 | -479.60 | 0.10 | 0.00 | 0.77 | 0.19 | 0.19 |
| 139 | 128 | 130 | -878.60 | 5.49 | 0.00 | 2.49 | 2.31 | 2.31 |
| 141 | 130 | I-700 | 1090.18 | 4.57 | 0.00 | 6.96 | 24.86 | 24.86 |
| 143 | 130 | 132 | -1968.79 | 12.76 | 0.00 | 5.58 | 10.31 | 10.31 |
| 145 | 132 | O-FRPRS | -1968.79 | 0.06 | 0.00 | 3.14 | 2.54 | 2.54 |
| 700 | O-700 | I-701 | 1090.18 | 0.41 | 0.00 | 4.45 | 8.39 | 8.39 |
| 701 | O-701 | 804 | 1090.18 | 0.42 | 0.00 | 3.09 | 3.45 | 3.45 |
| 702 | O-702 | I-703 | 479.60 | 0.07 | 0.00 | 1.96 | 1.83 | 1.83 |
| 703 | O-703 | 708 | 479.60 | 0.07 | 0.00 | 1.36 | 0.75 | 0.75 |
| 704 | O-704 | I-705 | 2199.49 | 1.39 | 0.00 | 8.98 | 30.77 | 30.77 |
| 705 | O-705 | 714 | 2199.49 | 4.44 | 0.00 | 6.24 | 12.66 | 12.66 |
| 706 | O-706 | I-707 | 1859.03 | 1.71 | 0.00 | 7.59 | 22.53 | 22.53 |
| 707 | O-707 | 744 | 1859.03 | 2.58 | 0.00 | 5.27 | 9.27 | 9.27 |
| 709 | 710 | 708 | 98.39 | 0.00 | 0.00 | 0.28 | 0.04 | 0.04 |
| 713 | 710 | 712 | -572.04 | 0.33 | 0.00 | 1.62 | 1.05 | 1.05 |
| 715 | 712 | 714 | -572.04 | 0.42 | 0.00 | 1.62 | 1.05 | 1.05 |
| 717 | 714 | 716 | 1627.45 | 0.14 | 0.00 | 4.62 | 7.25 | 7.25 |
| 721 | 716 | 720 | 2106.71 | 3.00 | 0.00 | 5.98 | 11.69 | 11.69 |
| 725 | 720 | 710 | -473.66 | 2.39 | 0.00 | 3.02 | 5.31 | 5.31 |
| 729 | 720 | 724 | 2000.00 | 36.19 | 0.00 | 12.76 | 76.49 | 76.49 |
| 733 | 740 | 716 | 516.31 | 0.96 | 0.00 | 1.46 | 0.86 | 0.86 |
| 737 | 740 | 744 | -853.45 | 0.70 | 0.00 | 2.42 | 2.19 | 2.19 |
| 745 | 744 | 752 | 1005.57 | 1.04 | 0.00 | 2.85 | 2.97 | 2.97 |
| 749 | 752 | 756 | 199.45 | 0.43 | 0.00 | 1.27 | 1.07 | 1.07 |
| 753 | 756 | 736 | -69.59 | 0.01 | 0.00 | 0.44 | 0.15 | 0.15 |
| 757 | 736 | 740 | -337.14 | 0.76 | 0.00 | 2.15 | 2.83 | 2.83 |
| 761 | 732 | 736 | -267.55 | 0.86 | 0.00 | 1.71 | 1.84 | 1.84 |
| 765 | 728 | 732 | -243.75 | 0.73 | 0.00 | 1.56 | 1.55 | 1.55 |
| 769 | 720 | 728 | -1419.64 | 1.61 | 0.00 | 4.03 | 5.63 | 5.63 |
| 773 | 708 | 728 | 577.99 | 0.77 | 0.00 | 1.64 | 1.07 | 1.07 |
| 777 | 772 | 728 | 597.89 | 0.36 | 0.00 | 1.70 | 1.13 | 1.13 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |
| 785 | 780 | 772 | 794.04 | 0.49 | 0.00 | 2.25 | 1.92 | 1.92 |
| 789 | 768 | 772 | 168.08 | 0.36 | 0.00 | 1.07 | 0.78 | 0.78 |
| 793 | 732 | 768 | 23.80 | 0.01 | 0.00 | 0.15 | 0.02 | 0.02 |
| 797 | 768 | 784 | -166.93 | 0.19 | 0.00 | 1.07 | 0.77 | 0.77 |
| 801 | 764 | 768 | 216.37 | 0.58 | 0.00 | 1.38 | 1.24 | 1.24 |
| 805 | 756 | 764 | 194.56 | 0.28 | 0.00 | 1.24 | 1.02 | 1.02 |
| 809 | 788 | 764 | -125.40 | 0.12 | 0.00 | 0.80 | 0.45 | 0.45 |
| 813 | 764 | 760 | -147.20 | 0.24 | 0.00 | 0.94 | 0.61 | 0.61 |
| 817 | 760 | 752 | -723.47 | 0.46 | 0.00 | 2.05 | 1.61 | 1.61 |
| 821 | 760 | 792 | 406.78 | 0.15 | 0.00 | 1.15 | 0.56 | 0.56 |
| 825 | 792 | 794 | -143.56 | 0.05 | 0.00 | 0.41 | 0.08 | 0.08 |
| 827 | 794 | 796 | -179.47 | 0.12 | 0.00 | 0.51 | 0.12 | 0.12 |
| 829 | 796 | 816 | -215.00 | 0.13 | 0.00 | 0.61 | 0.17 | 0.17 |
| 831 | 792 | 788 | 386.76 | 0.21 | 0.00 | 1.10 | 0.51 | 0.51 |
| 833 | 788 | 798 | 42.91 | 0.02 | 0.00 | 0.27 | 0.06 | 0.06 |
| 837 | 784 | 788 | -417.56 | 0.27 | 0.00 | 1.18 | 0.58 | 0.58 |
| 841 | 780 | 784 | -193.63 | 0.07 | 0.00 | 0.55 | 0.14 | 0.14 |
| 845 | 800 | 780 | 600.42 | 0.32 | 0.00 | 1.70 | 1.14 | 1.14 |
| 849 | 798 | 800 | 11.34 | 0.00 | 0.00 | 0.07 | 0.01 | 0.01 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 853 | 804 | 800 | 665.83 | 1.08 | 0.00 | 1.89 | 1.38 | 1.38 |
| 857 | 812 | 798 | 153.11 | 0.52 | 0.00 | 0.98 | 0.66 | 0.66 |
| 861 | 808 | 812 | 141.24 | 0.25 | 0.00 | 0.90 | 0.56 | 0.56 |
| 865 | 808 | 804 | -424.35 | 0.31 | 0.00 | 1.20 | 0.60 | 0.60 |
| 869 | 820 | 808 | -283.11 | 0.12 | 0.00 | 0.80 | 0.28 | 0.28 |
| 873 | 816 | 820 | -283.11 | 0.13 | 0.00 | 0.80 | 0.28 | 0.28 |
| 877 | 816 | 812 | 11.87 | 0.00 | 0.00 | 0.08 | 0.01 | 0.01 |

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 |
|---|---|---|---|---|
| 700 | 1090.18 | 283.88 | 278.35 | -5.5 |
| 701 | 1090.18 | 277.94 | 246.75 | -31.2 |
| 702 | 479.60 | 301.58 | 295.74 | -5.8 |
| 703 | 479.60 | 295.67 | 263.93 | -31.7 |
| 704 | 2199.49 | 326.05 | 314.62 | -11.4 |
| 705 | 2199.49 | 313.23 | 280.05 | -33.2 |
| 706 | 1859.03 | 326.19 | 317.33 | -8.9 |
| 707 | 1859.03 | 315.62 | 283.72 | -31.9 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.50 | 100.00 | 435.50 | 188.72 |
| 28 | | 0.00 | 535.55 | 56.00 | 479.55 | 207.81 |
| 104 | | 95.00(1.90) | 386.74 | 117.00 | 269.74 | 116.89 |
| 108 | | 47.50(1.90) | 386.56 | 87.00 | 299.56 | 129.81 |
| 112 | | 0.00 | 386.51 | 54.00 | 332.51 | 144.09 |
| 116 | | 0.00 | 388.35 | 54.00 | 334.35 | 144.89 |
| 120 | | 0.00 | 388.90 | 50.00 | 338.90 | 146.86 |
| 124 | | 0.00 | 370.86 | 58.00 | 312.86 | 135.57 |
| 126 | | 0.00 | 370.86 | 69.00 | 301.86 | 130.81 |
| 128 | | 399.00(1.90) | 370.96 | 70.00 | 300.96 | 130.41 |
| 130 | | 0.00 | 376.45 | 95.00 | 281.45 | 121.96 |
| 132 | | 0.00 | 389.21 | 100.00 | 289.21 | 125.32 |
| O-700 | | 0.00 | 366.35 | 88.00 | 278.35 | 120.62 |
| O-701 | | 0.00 | 334.75 | 88.00 | 246.75 | 106.93 |
| I-702 | | 0.00 | 370.58 | 69.00 | 301.58 | 130.68 |
| I-703 | | 0.00 | 364.67 | 69.00 | 295.67 | 128.12 |
| I-704 | | 0.00 | 384.05 | 58.00 | 326.05 | 141.29 |
| I-705 | | 0.00 | 371.23 | 58.00 | 313.23 | 135.73 |
| I-706 | | 0.00 | 380.19 | 54.00 | 326.19 | 141.35 |
| I-707 | | 0.00 | 369.62 | 54.00 | 315.62 | 136.77 |
| 708 | | 0.00 | 332.86 | 75.00 | 257.86 | 111.74 |
| 710 | | 0.00 | 332.87 | 75.00 | 257.87 | 111.74 |
| 712 | | 0.00 | 333.20 | 75.00 | 258.20 | 111.89 |
| 714 | | 0.00 | 333.62 | 71.00 | 262.62 | 113.80 |
| 716 | | 37.05(1.90) | 333.48 | 71.00 | 262.48 | 113.74 |
| 720 | | 2000.00( ** ) | 330.48 | 71.00 | 259.48 | 112.44 |

| | | | | | |
|---|---|---|---|---|---|
| 724 | 2000.00( ** ) | 294.29 | 68.00 | 226.29 | 98.06 |
| 728 | 0.00 | 332.09 | 71.00 | 261.09 | 113.14 |
| 732 | 0.00 | 332.82 | 67.00 | 265.82 | 115.19 |
| 736 | 0.00 | 333.68 | 65.00 | 268.68 | 116.43 |
| 740 | 0.00 | 334.44 | 65.00 | 269.44 | 116.76 |
| 744 | 0.00 | 335.14 | 63.00 | 272.14 | 117.93 |
| 752 | 82.65(1.90) | 334.10 | 63.00 | 271.10 | 117.48 |
| 756 | 74.48(1.90) | 333.67 | 65.00 | 268.67 | 116.42 |
| 760 | 169.48(1.90) | 333.64 | 63.00 | 270.64 | 117.28 |
| 764 | 0.00 | 333.39 | 65.00 | 268.39 | 116.30 |
| 768 | 239.02(1.90) | 332.81 | 67.00 | 265.81 | 115.18 |
| 772 | 243.96(1.90) | 332.45 | 71.00 | 261.45 | 113.29 |
| 776 | 120.27(1.90) | 332.36 | 74.00 | 258.36 | 111.96 |
| 780 | 0.00 | 332.94 | 77.00 | 255.94 | 110.91 |
| 784 | 57.00(1.90) | 333.00 | 74.00 | 259.00 | 112.23 |
| 788 | 51.68(1.90) | 333.28 | 71.00 | 262.28 | 113.65 |
| 792 | 163.59(1.90) | 333.48 | 68.00 | 265.48 | 115.04 |
| 794 | 35.91(1.90) | 333.53 | 55.00 | 278.53 | 120.70 |
| 796 | 35.53(1.90) | 333.65 | 56.00 | 277.65 | 120.32 |
| 798 | 184.68(1.90) | 333.26 | 68.00 | 265.26 | 114.95 |
| 800 | 76.76(1.90) | 333.25 | 82.00 | 251.25 | 108.88 |
| 804 | 0.00 | 334.34 | 84.00 | 250.34 | 108.48 |
| 808 | 0.00 | 334.03 | 84.00 | 250.03 | 108.35 |
| 812 | 0.00 | 333.78 | 58.00 | 275.78 | 119.50 |
| 816 | 56.24(1.90) | 333.78 | 64.00 | 269.78 | 116.91 |
| 820 | 0.00 | 333.91 | 86.00 | 247.91 | 107.43 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.39 | 49.80 | 485.59 | 210.42 |
| I-700 | 0.00 | 371.88 | 88.00 | 283.88 | 123.01 |
| I-701 | 0.00 | 365.94 | 88.00 | 277.94 | 120.44 |
| O-702 | 0.00 | 364.74 | 69.00 | 295.74 | 128.16 |
| O-703 | 0.00 | 332.93 | 69.00 | 263.93 | 114.37 |
| O-704 | 0.00 | 372.62 | 58.00 | 314.62 | 136.34 |
| O-705 | 0.00 | 338.05 | 58.00 | 280.05 | 121.36 |
| O-706 | 0.00 | 371.33 | 54.00 | 317.33 | 137.51 |
| O-707 | 0.00 | 337.72 | 54.00 | 283.72 | 122.94 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.36 | 100.80 | 434.56 | 188.31 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.42 | 724 | 98.06 |
| 28 | 207.81 | O-701 | 106.93 |
| 24 | 188.72 | 820 | 107.43 |
| I-FRPRS | 188.31 | 808 | 108.35 |
| I-CRPRV | 187.85 | 804 | 108.48 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 14.04 | 849 | 0.07 |
| 729 | 12.76 | 877 | 0.08 |
| 117 | 11.86 | 21 | 0.13 |
| 704 | 8.98 | 793 | 0.15 |
| 706 | 7.59 | 833 | 0.27 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 400.34 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.31 | 125.00 | 1968.79 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.42 | 147.00 | 3800.68 |

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 | 6169.81 | |

NET SYSTEM INFLOW = 6169.81
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6169.80

==========

Case: 8

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 8 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 125 is CLOSED
Pipe 129 is OPENED

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.32148E-05

**SDSU Mission Valley Project**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 720 and 724**
**Pipe 125 Out of Service**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 1489.19 | 0.03 | 0.00 | 0.47 | 0.03 | 0.03 |
| 41 | 24 | I-FRPRS | 1535.33 | 0.09 | 0.00 | 2.45 | 1.60 | 1.60 |
| 45 | 28 | 24 | 1535.33 | 0.03 | 0.00 | 0.27 | 0.01 | 0.01 |
| 49 | 28 | I-OPRS | 3145.28 | 0.12 | 0.00 | 5.02 | 6.05 | 6.05 |
| 53 | 0 | 28 | 4680.61 | 0.30 | 0.00 | 0.83 | 0.06 | 0.06 |
| 101 | O-CRPRV | 104 | 1489.19 | 21.83 | 0.00 | 4.22 | 6.15 | 6.15 |
| 105 | 104 | 108 | 1394.19 | 2.93 | 0.00 | 3.95 | 5.44 | 5.44 |
| 109 | 108 | 112 | 1346.69 | 1.13 | 0.00 | 2.15 | 1.26 | 1.26 |
| 117 | 112 | I-706 | 636.73 | 0.87 | 0.00 | 4.06 | 9.18 | 9.18 |
| 121 | 116 | 112 | -709.96 | 0.41 | 0.00 | 1.13 | 0.38 | 0.38 |
| 125-XX | 120 | 116 | | | | | | |
| 127 | 120 | O-OPRS | -3145.28 | 0.09 | 0.00 | 5.02 | 6.05 | 6.05 |
| 129 | 124 | 120 | -3145.28 | 1.03 | 0.00 | 5.02 | 6.05 | 6.05 |
| 131 | 116 | I-704 | 709.96 | 0.53 | 0.00 | 4.53 | 11.23 | 11.23 |
| 133 | 124 | 126 | 3145.28 | 5.79 | 0.00 | 5.02 | 6.05 | 6.05 |
| 135 | 126 | I-702 | 2447.26 | 5.68 | 0.00 | 15.62 | 111.15 | 111.15 |
| 137 | 126 | 128 | 698.02 | 0.20 | 0.00 | 1.11 | 0.37 | 0.37 |
| 139 | 128 | 130 | 299.02 | 0.75 | 0.00 | 0.85 | 0.31 | 0.31 |
| 141 | 130 | I-700 | 1834.35 | 11.98 | 0.00 | 11.71 | 65.17 | 65.17 |
| 143 | 130 | 132 | -1535.33 | 8.05 | 0.00 | 4.36 | 6.51 | 6.51 |
| 145 | 132 | O-FRPRS | -1535.33 | 0.04 | 0.00 | 2.45 | 1.60 | 1.60 |
| 700 | O-700 | I-701 | 1834.35 | 1.08 | 0.00 | 7.49 | 21.98 | 21.98 |
| 701 | O-701 | 804 | 1834.35 | 1.09 | 0.00 | 5.20 | 9.05 | 9.05 |
| 702 | O-702 | I-703 | 2447.26 | 1.49 | 0.00 | 10.00 | 37.49 | 37.49 |
| 703 | O-703 | 708 | 2447.26 | 1.40 | 0.00 | 6.94 | 15.43 | 15.43 |
| 704 | O-704 | I-705 | 709.96 | 0.17 | 0.00 | 2.90 | 3.79 | 3.79 |
| 705 | O-705 | 714 | 709.96 | 0.55 | 0.00 | 2.01 | 1.56 | 1.56 |
| 706 | O-706 | I-707 | 636.73 | 0.23 | 0.00 | 2.60 | 3.10 | 3.10 |
| 707 | O-707 | 744 | 636.73 | 0.35 | 0.00 | 1.81 | 1.27 | 1.27 |
| 709 | 710 | 708 | -1450.24 | 0.24 | 0.00 | 4.11 | 5.85 | 5.85 |
| 713 | 710 | 712 | 835.57 | 0.67 | 0.00 | 2.37 | 2.11 | 2.11 |
| 715 | 712 | 714 | 835.57 | 0.84 | 0.00 | 2.37 | 2.11 | 2.11 |
| 717 | 714 | 716 | 1545.54 | 0.13 | 0.00 | 4.38 | 6.59 | 6.59 |
| 721 | 716 | 720 | 1795.79 | 2.23 | 0.00 | 5.09 | 8.70 | 8.70 |
| 725 | 720 | 710 | -614.67 | 3.87 | 0.00 | 3.92 | 8.60 | 8.60 |
| 729 | 720 | 724 | 2000.00 | 36.19 | 0.00 | 12.76 | 76.49 | 76.49 |
| 733 | 740 | 716 | 287.30 | 0.32 | 0.00 | 0.81 | 0.29 | 0.29 |
| 737 | 740 | 744 | -363.36 | 0.14 | 0.00 | 1.03 | 0.45 | 0.45 |
| 745 | 744 | 752 | 273.37 | 0.09 | 0.00 | 0.78 | 0.27 | 0.27 |
| 749 | 752 | 756 | 88.84 | 0.10 | 0.00 | 0.57 | 0.24 | 0.24 |
| 753 | 756 | 736 | 53.66 | 0.00 | 0.00 | 0.34 | 0.09 | 0.09 |
| 757 | 736 | 740 | -76.06 | 0.05 | 0.00 | 0.49 | 0.18 | 0.18 |
| 761 | 732 | 736 | -129.72 | 0.23 | 0.00 | 0.83 | 0.48 | 0.48 |
| 765 | 728 | 732 | -149.60 | 0.29 | 0.00 | 0.95 | 0.63 | 0.63 |
| 769 | 720 | 728 | -1589.54 | 1.99 | 0.00 | 4.51 | 6.94 | 6.94 |
| 773 | 708 | 728 | 997.02 | 2.12 | 0.00 | 2.83 | 2.92 | 2.92 |
| 777 | 772 | 728 | 442.93 | 0.21 | 0.00 | 1.26 | 0.65 | 0.65 |
| 781 | 772 | 776 | 120.27 | 0.09 | 0.00 | 0.77 | 0.42 | 0.42 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 785 | 780 | 772 | 726.34 | 0.41 | 0.00 | 2.06 | 1.63 | 1.63 |
| 789 | 768 | 772 | 80.83 | 0.09 | 0.00 | 0.52 | 0.20 | 0.20 |
| 793 | 732 | 768 | -19.88 | 0.00 | 0.00 | 0.13 | 0.01 | 0.01 |
| 797 | 768 | 784 | -205.84 | 0.29 | 0.00 | 1.31 | 1.13 | 1.13 |
| 801 | 764 | 768 | 133.89 | 0.24 | 0.00 | 0.85 | 0.51 | 0.51 |
| 805 | 756 | 764 | -39.30 | 0.01 | 0.00 | 0.25 | 0.05 | 0.05 |
| 809 | 788 | 764 | 99.27 | 0.07 | 0.00 | 0.63 | 0.29 | 0.29 |
| 813 | 764 | 760 | -73.91 | 0.07 | 0.00 | 0.47 | 0.17 | 0.17 |
| 817 | 760 | 752 | -101.88 | 0.01 | 0.00 | 0.29 | 0.04 | 0.04 |
| 821 | 760 | 792 | -141.52 | 0.02 | 0.00 | 0.40 | 0.08 | 0.08 |
| 825 | 792 | 794 | -399.56 | 0.31 | 0.00 | 1.13 | 0.54 | 0.54 |
| 827 | 794 | 796 | -435.47 | 0.62 | 0.00 | 1.24 | 0.63 | 0.63 |
| 829 | 796 | 816 | -471.00 | 0.57 | 0.00 | 1.34 | 0.73 | 0.73 |
| 831 | 792 | 788 | 94.45 | 0.02 | 0.00 | 0.27 | 0.04 | 0.04 |
| 833 | 788 | 798 | -179.52 | 0.25 | 0.00 | 1.15 | 0.88 | 0.88 |
| 837 | 784 | 788 | -123.02 | 0.03 | 0.00 | 0.35 | 0.06 | 0.06 |
| 841 | 780 | 784 | 139.82 | 0.04 | 0.00 | 0.40 | 0.08 | 0.08 |
| 845 | 800 | 780 | 866.15 | 0.62 | 0.00 | 2.46 | 2.25 | 2.25 |
| 849 | 798 | 800 | -117.90 | 0.38 | 0.00 | 0.75 | 0.40 | 0.40 |
| 853 | 804 | 800 | 1060.81 | 2.57 | 0.00 | 3.01 | 3.28 | 3.28 |
| 857 | 812 | 798 | 246.30 | 1.26 | 0.00 | 1.57 | 1.58 | 1.58 |
| 861 | 808 | 812 | 256.60 | 0.75 | 0.00 | 1.64 | 1.71 | 1.71 |
| 865 | 808 | 804 | -773.54 | 0.93 | 0.00 | 2.19 | 1.83 | 1.83 |
| 869 | 820 | 808 | -516.94 | 0.36 | 0.00 | 1.47 | 0.87 | 0.87 |
| 873 | 816 | 820 | -516.94 | 0.39 | 0.00 | 1.47 | 0.87 | 0.87 |
| 877 | 816 | 812 | -10.30 | 0.00 | 0.00 | 0.07 | 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 |
|---|---|---|---|---|
| 700 | 1834.35 | 281.19 | 272.49 | -8.7 |
| 701 | 1834.35 | 271.41 | 239.57 | -31.8 |
| 702 | 2447.26 | 307.44 | 293.61 | -13.8 |
| 703 | 2447.26 | 292.12 | 257.19 | -34.9 |
| 704 | 709.96 | 303.83 | 297.64 | -6.2 |
| 705 | 709.96 | 297.47 | 265.58 | -31.9 |
| 706 | 636.73 | 307.90 | 301.81 | -6.1 |
| 707 | 636.73 | 301.58 | 269.73 | -31.8 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.66 | 100.00 | 435.66 | 188.79 |
| 28 | | 0.00 | 535.70 | 56.00 | 479.70 | 207.87 |
| 104 | | 95.00(1.90) | 366.83 | 117.00 | 249.83 | 108.26 |
| 108 | | 47.50(1.90) | 363.90 | 87.00 | 276.90 | 119.99 |
| 112 | | 0.00 | 362.77 | 54.00 | 308.77 | 133.80 |
| 116 | | 0.00 | 362.36 | 54.00 | 308.36 | 133.62 |
| 120 | | 0.00 | 388.94 | 50.00 | 338.94 | 146.87 |

| | | | | | |
|---|---|---|---|---|---|
| 124 | 0.00 | 387.92 | 58.00 | 329.92 | 142.96 |
| 126 | 0.00 | 382.12 | 69.00 | 313.12 | 135.69 |
| 128 | 399.00(1.90) | 381.92 | 70.00 | 311.92 | 135.17 |
| 130 | 0.00 | 381.18 | 95.00 | 286.18 | 124.01 |
| 132 | 0.00 | 389.23 | 100.00 | 289.23 | 125.33 |
| O-700 | 0.00 | 360.49 | 88.00 | 272.49 | 118.08 |
| O-701 | 0.00 | 327.57 | 88.00 | 239.57 | 103.81 |
| I-702 | 0.00 | 376.44 | 69.00 | 307.44 | 133.23 |
| I-703 | 0.00 | 361.12 | 69.00 | 292.12 | 126.59 |
| I-704 | 0.00 | 361.83 | 58.00 | 303.83 | 131.66 |
| I-705 | 0.00 | 355.47 | 58.00 | 297.47 | 128.90 |
| I-706 | 0.00 | 361.90 | 54.00 | 307.90 | 133.42 |
| I-707 | 0.00 | 355.58 | 54.00 | 301.58 | 130.68 |
| 708 | 0.00 | 324.79 | 75.00 | 249.79 | 108.24 |
| 710 | 0.00 | 324.55 | 75.00 | 249.55 | 108.14 |
| 712 | 0.00 | 323.88 | 75.00 | 248.88 | 107.85 |
| 714 | 0.00 | 323.03 | 71.00 | 252.03 | 109.21 |
| 716 | 37.05(1.90) | 322.91 | 71.00 | 251.91 | 109.16 |
| 720 | 2000.00( ** ) | 320.68 | 71.00 | 249.68 | 108.19 |
| 724 | 2000.00( ** ) | 284.49 | 68.00 | 216.49 | 93.81 |
| 728 | 0.00 | 322.66 | 71.00 | 251.66 | 109.05 |
| 732 | 0.00 | 322.96 | 67.00 | 255.96 | 110.91 |
| 736 | 0.00 | 323.18 | 65.00 | 258.18 | 111.88 |
| 740 | 0.00 | 323.23 | 65.00 | 258.23 | 111.90 |
| 744 | 0.00 | 323.38 | 63.00 | 260.38 | 112.83 |
| 752 | 82.65(1.90) | 323.28 | 63.00 | 260.28 | 112.79 |
| 756 | 74.48(1.90) | 323.19 | 65.00 | 258.19 | 111.88 |
| 760 | 169.48(1.90) | 323.27 | 63.00 | 260.27 | 112.78 |
| 764 | 0.00 | 323.20 | 65.00 | 258.20 | 111.89 |
| 768 | 239.02(1.90) | 322.96 | 67.00 | 255.96 | 110.92 |
| 772 | 243.96(1.90) | 322.87 | 71.00 | 251.87 | 109.14 |
| 776 | 120.27(1.90) | 322.78 | 74.00 | 248.78 | 107.81 |
| 780 | 0.00 | 323.28 | 77.00 | 246.28 | 106.72 |
| 784 | 57.00(1.90) | 323.25 | 74.00 | 249.25 | 108.01 |
| 788 | 51.68(1.90) | 323.28 | 71.00 | 252.28 | 109.32 |
| 792 | 163.59(1.90) | 323.29 | 68.00 | 255.29 | 110.63 |
| 794 | 35.91(1.90) | 323.60 | 55.00 | 268.60 | 116.39 |
| 796 | 35.53(1.90) | 324.22 | 56.00 | 268.22 | 116.23 |
| 798 | 184.68(1.90) | 323.53 | 68.00 | 255.53 | 110.73 |
| 800 | 76.76(1.90) | 323.91 | 82.00 | 241.91 | 104.83 |
| 804 | 0.00 | 326.47 | 84.00 | 242.47 | 105.07 |
| 808 | 0.00 | 325.54 | 84.00 | 241.54 | 104.67 |
| 812 | 0.00 | 324.79 | 58.00 | 266.79 | 115.61 |
| 816 | 56.24(1.90) | 324.79 | 64.00 | 260.79 | 113.01 |
| 820 | 0.00 | 325.18 | 86.00 | 239.18 | 103.64 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 535.97 | 102.50 | 433.47 | 187.84 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.58 | 49.80 | 485.78 | 210.50 |
| I-700 | 0.00 | 369.19 | 88.00 | 281.19 | 121.85 |
| I-701 | 0.00 | 359.41 | 88.00 | 271.41 | 117.61 |
| O-702 | 0.00 | 362.61 | 69.00 | 293.61 | 127.23 |
| O-703 | 0.00 | 326.19 | 69.00 | 257.19 | 111.45 |
| O-704 | 0.00 | 355.64 | 58.00 | 297.64 | 128.98 |
| O-705 | 0.00 | 323.58 | 58.00 | 265.58 | 115.08 |
| O-706 | 0.00 | 355.81 | 54.00 | 301.81 | 130.79 |
| O-707 | 0.00 | 323.73 | 54.00 | 269.73 | 116.88 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.57 | 100.80 | 434.77 | 188.40 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.50 | 724 | 93.81 |
| 28 | 207.87 | 820 | 103.64 |
| 24 | 188.79 | O-701 | 103.81 |
| I-FRPRS | 188.40 | 808 | 104.67 |
| I-CRPRV | 187.84 | 800 | 104.83 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 135 | 15.62 | 877 | 0.07 |
| 729 | 12.76 | 793 | 0.13 |
| 141 | 11.71 | 805 | 0.25 |
| 702 | 10.00 | 831 | 0.27 |
| 700 | 7.49 | 45 | 0.27 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.84 | 124.00 | 1489.19 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.40 | 125.00 | 1535.33 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.50 | 147.00 | 3145.28 |

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 | 6169.80 | |

NET SYSTEM INFLOW = 6169.80
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 6169.80

==========

Case: 9

C H A N G E S  F O R  N E X T  S I M U L A T I O N  (Change Number =  9 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe  125 is OPENED

RESULTS OBTAINED AFTER  13 TRIALS: ACCURACY = 0.72117E-06

**SDSU Mission Valley Project**
**Ultimate Water System Analysis**
**Peak Hour Demand**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 325.44 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1050.12 | 0.04 | 0.00 | 1.68 | 0.79 | 0.79 |
| 45 | 28 | 24 | 1050.12 | 0.02 | 0.00 | 0.19 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 4896.09 | 0.26 | 0.00 | 7.81 | 13.73 | 13.73 |
| 53 | 0 | 28 | 5946.21 | 0.47 | 0.00 | 1.05 | 0.09 | 0.09 |
| 101 | O-CRPRV | 104 | 325.44 | 1.31 | 0.00 | 0.92 | 0.37 | 0.37 |
| 105 | 104 | 108 | 100.44 | 0.02 | 0.00 | 0.28 | 0.04 | 0.04 |
| 109 | 108 | 112 | -12.06 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| 117 | 112 | I-706 | 1256.91 | 3.06 | 0.00 | 8.02 | 32.36 | 32.36 |
| 121 | 116 | 112 | 1268.97 | 1.20 | 0.00 | 2.02 | 1.13 | 1.13 |
| 125 | 120 | 116 | 2751.71 | 0.30 | 0.00 | 4.39 | 4.72 | 4.72 |
| 127 | 120 | O-OPRS | -4896.09 | 0.20 | 0.00 | 7.81 | 13.73 | 13.73 |
| 129 | 124 | 120 | -2144.38 | 0.50 | 0.00 | 3.42 | 2.98 | 2.98 |
| 131 | 116 | I-704 | 1482.74 | 2.07 | 0.00 | 9.46 | 43.94 | 43.94 |
| 133 | 124 | 126 | 2144.38 | 2.85 | 0.00 | 3.42 | 2.98 | 2.98 |
| 135 | 126 | I-702 | 1287.37 | 1.73 | 0.00 | 8.22 | 33.83 | 33.83 |
| 137 | 126 | 128 | 857.01 | 0.29 | 0.00 | 1.37 | 0.54 | 0.54 |
| 139 | 128 | 130 | -87.99 | 0.08 | 0.00 | 0.25 | 0.03 | 0.03 |
| 141 | 130 | I-700 | 962.13 | 3.63 | 0.00 | 6.14 | 19.73 | 19.73 |
| 143 | 130 | 132 | -1050.12 | 3.98 | 0.00 | 2.98 | 3.22 | 3.22 |
| 145 | 132 | O-FRPRS | -1050.12 | 0.02 | 0.00 | 1.68 | 0.79 | 0.79 |
| 700 | O-700 | I-701 | 962.13 | 0.33 | 0.00 | 3.93 | 6.65 | 6.65 |
| 701 | O-701 | 804 | 962.13 | 0.33 | 0.00 | 2.73 | 2.74 | 2.74 |
| 702 | O-702 | I-703 | 1287.37 | 0.45 | 0.00 | 5.26 | 11.41 | 11.41 |
| 703 | O-703 | 708 | 1287.37 | 0.43 | 0.00 | 3.65 | 4.70 | 4.70 |
| 704 | O-704 | I-705 | 1482.74 | 0.67 | 0.00 | 6.06 | 14.82 | 14.82 |
| 705 | O-705 | 714 | 1482.74 | 2.14 | 0.00 | 4.21 | 6.10 | 6.10 |
| 706 | O-706 | I-707 | 1256.91 | 0.83 | 0.00 | 5.13 | 10.92 | 10.92 |
| 707 | O-707 | 744 | 1256.91 | 1.25 | 0.00 | 3.57 | 4.49 | 4.49 |
| 709 | 710 | 708 | -469.04 | 0.03 | 0.00 | 1.33 | 0.72 | 0.72 |
| 713 | 710 | 712 | 131.80 | 0.02 | 0.00 | 0.37 | 0.07 | 0.07 |
| 715 | 712 | 714 | 131.80 | 0.03 | 0.00 | 0.37 | 0.07 | 0.07 |
| 717 | 714 | 716 | 1614.54 | 0.14 | 0.00 | 4.58 | 7.14 | 7.14 |
| 721 | 716 | 720 | 1217.69 | 1.09 | 0.00 | 3.45 | 4.24 | 4.24 |
| 725 | 720 | 710 | -337.24 | 1.27 | 0.00 | 2.15 | 2.83 | 2.83 |
| 729 | 720 | 724 | 617.40 | 4.10 | 0.00 | 3.94 | 8.67 | 8.67 |
| 733 | 740 | 716 | -309.10 | 0.37 | 0.00 | 0.88 | 0.33 | 0.33 |
| 737 | 740 | 744 | -131.59 | 0.02 | 0.00 | 0.37 | 0.07 | 0.07 |
| 745 | 744 | 752 | 1125.31 | 1.28 | 0.00 | 3.19 | 3.66 | 3.66 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 749 | 752 | 756 | 94.05 | 0.11 | 0.00 | 0.60 | 0.27 | 0.27 |
| 753 | 756 | 736 | -347.27 | 0.12 | 0.00 | 2.22 | 2.99 | 2.99 |
| 757 | 736 | 740 | -440.69 | 1.25 | 0.00 | 2.81 | 4.65 | 4.65 |
| 761 | 732 | 736 | -93.43 | 0.12 | 0.00 | 0.60 | 0.26 | 0.26 |
| 765 | 728 | 732 | 196.04 | 0.48 | 0.00 | 1.25 | 1.04 | 1.04 |
| 769 | 720 | 728 | 422.28 | 0.17 | 0.00 | 1.20 | 0.60 | 0.60 |
| 773 | 708 | 728 | 818.33 | 1.47 | 0.00 | 2.32 | 2.03 | 2.03 |
| 777 | 772 | 728 | -1044.57 | 1.01 | 0.00 | 2.96 | 3.19 | 3.19 |
| 781 | 772 | 776 | 284.85 | 0.43 | 0.00 | 1.82 | 2.07 | 2.07 |
| 785 | 780 | 772 | -76.21 | 0.01 | 0.00 | 0.22 | 0.03 | 0.03 |
| 789 | 768 | 772 | -105.72 | 0.15 | 0.00 | 0.67 | 0.33 | 0.33 |
| 793 | 732 | 768 | 289.46 | 0.68 | 0.00 | 1.85 | 2.13 | 2.13 |
| 797 | 768 | 784 | -54.67 | 0.02 | 0.00 | 0.35 | 0.10 | 0.10 |
| 801 | 764 | 768 | 116.25 | 0.18 | 0.00 | 0.74 | 0.39 | 0.39 |
| 805 | 756 | 764 | 264.92 | 0.50 | 0.00 | 1.69 | 1.81 | 1.81 |
| 809 | 788 | 764 | -156.11 | 0.17 | 0.00 | 1.00 | 0.68 | 0.68 |
| 813 | 764 | 760 | -7.44 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 |
| 817 | 760 | 752 | -835.51 | 0.60 | 0.00 | 2.37 | 2.11 | 2.11 |
| 821 | 760 | 792 | 426.67 | 0.17 | 0.00 | 1.21 | 0.61 | 0.61 |
| 825 | 792 | 794 | -23.74 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 |
| 827 | 794 | 796 | -108.79 | 0.05 | 0.00 | 0.31 | 0.05 | 0.05 |
| 829 | 796 | 816 | -192.94 | 0.11 | 0.00 | 0.55 | 0.14 | 0.14 |
| 831 | 792 | 788 | 62.97 | 0.01 | 0.00 | 0.18 | 0.02 | 0.02 |
| 833 | 788 | 798 | 177.40 | 0.25 | 0.00 | 1.13 | 0.86 | 0.86 |
| 837 | 784 | 788 | 80.73 | 0.01 | 0.00 | 0.23 | 0.03 | 0.03 |
| 841 | 780 | 784 | 270.39 | 0.12 | 0.00 | 0.77 | 0.26 | 0.26 |
| 845 | 800 | 780 | 194.19 | 0.04 | 0.00 | 0.55 | 0.14 | 0.14 |
| 849 | 798 | 800 | -124.79 | 0.42 | 0.00 | 0.80 | 0.45 | 0.45 |
| 853 | 804 | 800 | 500.78 | 0.64 | 0.00 | 1.42 | 0.82 | 0.82 |
| 857 | 812 | 798 | 135.21 | 0.42 | 0.00 | 0.86 | 0.52 | 0.52 |
| 861 | 808 | 812 | 152.43 | 0.29 | 0.00 | 0.97 | 0.65 | 0.65 |
| 865 | 808 | 804 | -461.35 | 0.36 | 0.00 | 1.31 | 0.70 | 0.70 |
| 869 | 820 | 808 | -308.92 | 0.14 | 0.00 | 0.88 | 0.33 | 0.33 |
| 873 | 816 | 820 | -308.92 | 0.15 | 0.00 | 0.88 | 0.33 | 0.33 |
| 877 | 816 | 812 | -17.23 | 0.00 | 0.00 | 0.11 | 0.01 | 0.01 |

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 |
|---|---|---|---|---|
| 700 | 962.13 | 293.63 | 288.39 | -5.2 |
| 701 | 962.13 | 288.06 | 256.05 | -32.0 |
| 702 | 1287.37 | 314.74 | 308.64 | -6.1 |
| 703 | 1287.37 | 308.19 | 276.95 | -31.2 |
| 704 | 1482.74 | 328.45 | 321.60 | -6.8 |
| 705 | 1482.74 | 320.93 | 289.58 | -31.3 |
| 706 | 1256.91 | 330.26 | 324.26 | -6.0 |
| 707 | 1256.91 | 323.44 | 292.21 | -31.2 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.51 | 100.00 | 435.51 | 188.72 |
| 28 | | 0.00 | 535.53 | 56.00 | 479.53 | 207.79 |
| 104 | | 225.00(4.50) | 387.35 | 117.00 | 270.35 | 117.15 |
| 108 | | 112.50(4.50) | 387.33 | 87.00 | 300.33 | 130.14 |
| 112 | | 0.00 | 387.33 | 54.00 | 333.33 | 144.44 |
| 116 | | 0.00 | 388.53 | 54.00 | 334.53 | 144.96 |
| 120 | | 0.00 | 388.83 | 50.00 | 338.83 | 146.83 |
| 124 | | 0.00 | 388.32 | 58.00 | 330.32 | 143.14 |
| 126 | | 0.00 | 385.47 | 69.00 | 316.47 | 137.14 |
| 128 | | 945.00(4.50) | 385.18 | 70.00 | 315.18 | 136.58 |
| 130 | | 0.00 | 385.26 | 95.00 | 290.26 | 125.78 |
| 132 | | 0.00 | 389.24 | 100.00 | 289.24 | 125.34 |
| O-700 | | 0.00 | 376.39 | 88.00 | 288.39 | 124.97 |
| O-701 | | 0.00 | 344.05 | 88.00 | 256.05 | 110.95 |
| I-702 | | 0.00 | 383.74 | 69.00 | 314.74 | 136.39 |
| I-703 | | 0.00 | 377.19 | 69.00 | 308.19 | 133.55 |
| I-704 | | 0.00 | 386.45 | 58.00 | 328.45 | 142.33 |
| I-705 | | 0.00 | 378.93 | 58.00 | 320.93 | 139.07 |
| I-706 | | 0.00 | 384.26 | 54.00 | 330.26 | 143.11 |
| I-707 | | 0.00 | 377.44 | 54.00 | 323.44 | 140.16 |
| 708 | | 0.00 | 345.53 | 75.00 | 270.53 | 117.23 |
| 710 | | 0.00 | 345.50 | 75.00 | 270.50 | 117.22 |
| 712 | | 0.00 | 345.48 | 75.00 | 270.48 | 117.21 |
| 714 | | 0.00 | 345.45 | 71.00 | 274.45 | 118.93 |
| 716 | | 87.75(4.50) | 345.31 | 71.00 | 274.31 | 118.87 |
| 720 | | 515.25(4.50) | 344.22 | 71.00 | 273.22 | 118.40 |
| 724 | | 617.40(4.50) | 340.12 | 68.00 | 272.12 | 117.92 |
| 728 | | 0.00 | 344.05 | 71.00 | 273.05 | 118.32 |
| 732 | | 0.00 | 343.57 | 67.00 | 276.57 | 119.85 |
| 736 | | 0.00 | 343.69 | 65.00 | 278.69 | 120.77 |
| 740 | | 0.00 | 344.94 | 65.00 | 279.94 | 121.31 |
| 744 | | 0.00 | 344.96 | 63.00 | 281.96 | 122.18 |
| 752 | | 195.75(4.50) | 343.68 | 63.00 | 280.68 | 121.63 |
| 756 | | 176.40(4.50) | 343.58 | 65.00 | 278.58 | 120.72 |
| 760 | | 401.40(4.50) | 343.08 | 63.00 | 280.08 | 121.37 |
| 764 | | 0.00 | 343.08 | 65.00 | 278.08 | 120.50 |
| 768 | | 566.10(4.50) | 342.89 | 67.00 | 275.89 | 119.55 |
| 772 | | 577.80(4.50) | 343.05 | 71.00 | 272.05 | 117.89 |
| 776 | | 284.85(4.50) | 342.62 | 74.00 | 268.62 | 116.40 |
| 780 | | 0.00 | 343.04 | 77.00 | 266.04 | 115.28 |
| 784 | | 135.00(4.50) | 342.92 | 74.00 | 268.92 | 116.53 |
| 788 | | 122.40(4.50) | 342.91 | 71.00 | 271.91 | 117.83 |
| 792 | | 387.45(4.50) | 342.91 | 68.00 | 274.91 | 119.13 |
| 794 | | 85.05(4.50) | 342.91 | 55.00 | 287.91 | 124.76 |
| 796 | | 84.15(4.50) | 342.96 | 56.00 | 286.96 | 124.35 |
| 798 | | 437.40(4.50) | 342.66 | 68.00 | 274.66 | 119.02 |
| 800 | | 181.80(4.50) | 343.08 | 82.00 | 261.08 | 113.13 |
| 804 | | 0.00 | 343.72 | 84.00 | 259.72 | 112.54 |
| 808 | | 0.00 | 343.36 | 84.00 | 259.36 | 112.39 |
| 812 | | 0.00 | 343.07 | 58.00 | 285.07 | 123.53 |
| 816 | | 133.20(4.50) | 343.07 | 64.00 | 279.07 | 120.93 |
| 820 | | 0.00 | 343.22 | 86.00 | 257.22 | 111.46 |
| 0 | | ---- | 536.00 | | | |
| I-CRPRV | | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | | ---- | 389.26 | 100.80 | 288.46 | 125.00 |

| | | | | | |
|---|---|---|---|---|---|
| I-OPRS | 0.00 | 535.26 | 49.80 | 485.46 | 210.37 |
| I-700 | 0.00 | 381.63 | 88.00 | 293.63 | 127.24 |
| I-701 | 0.00 | 376.06 | 88.00 | 288.06 | 124.83 |
| O-702 | 0.00 | 377.64 | 69.00 | 308.64 | 133.75 |
| O-703 | 0.00 | 345.95 | 69.00 | 276.95 | 120.01 |
| O-704 | 0.00 | 379.60 | 58.00 | 321.60 | 139.36 |
| O-705 | 0.00 | 347.58 | 58.00 | 289.58 | 125.49 |
| O-706 | 0.00 | 378.26 | 54.00 | 324.26 | 140.51 |
| O-707 | 0.00 | 346.21 | 54.00 | 292.21 | 126.62 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.46 | 100.80 | 434.66 | 188.35 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.37 | O-701 | 110.95 |
| 28 | 207.79 | 820 | 111.46 |
| 24 | 188.72 | 808 | 112.39 |
| I-FRPRS | 188.35 | 804 | 112.54 |
| I-CRPRV | 187.85 | 800 | 113.13 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 131 | 9.46 | 109 | 0.02 |
| 135 | 8.22 | 813 | 0.05 |
| 117 | 8.02 | 825 | 0.07 |
| 49 | 7.81 | 21 | 0.10 |
| 127 | 7.81 | 877 | 0.11 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 325.44 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.35 | 125.00 | 1050.12 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.37 | 147.00 | 4896.09 |

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 | 6271.65 | |

NET SYSTEM INFLOW  =  6271.65
NET SYSTEM OUTFLOW =  0.00
NET SYSTEM DEMAND  =  6271.65

# APPENDIX G

## BUILD-OUT WATER SYSTEM
## DETAILED COMPUTER MODEL RESULTS SUMMARY
## FOR PUBLIC SYSTEM CONNECTION POINTS

**SDSU MISSION VALLEY**
**BUILD-OUT WATER SYSTEM**
**DETAILED COMPUTER MODEL RESULTS SUMMARY FOR PUBLIC SYSTEM**

| Meter | Lateral Flow, gpm | Lateral Velocity, fps | Residual Pressure at Connection Point, psi | Pressure Drop at Connection Point, psi |
|---|---|---|---|---|
| Average Day Demand | | | | |
| A | 255.3 | 1.6 | 127.3 | 0.5 |
| B | 283.1 | 1.8 | 138.6 | 0.5 |
| C | 300.4 | 1.9 | 145.2 | 0.4 |
| D | 269.9 | 1.7 | 145.1 | 0.5 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820 | | | | |
| A | 1538.6 | 9.8 | 125.3 | 2.5 |
| B | 1477.1 | 9.4 | 137.1 | 2.0 |
| C | 1628.5 | 10.4 | 144.9 | 0.6 |
| D | 1462.4 | 9.3 | 144.4 | 1.2 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 794 and 796 | | | | |
| A | 1388.5 | 8.9 | 125.5 | 2.3 |
| B | 1507.3 | 9.6 | 137.1 | 2.0 |
| C | 1641.8 | 10.5 | 144.9 | 0.6 |
| D | 1497.4 | 9.6 | 144.4 | 1.2 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 784 and 788 | | | | |
| A | 1337.4 | 8.5 | 125.6 | 2.2 |
| B | 1520.8 | 9.7 | 137.1 | 2.0 |
| C | 1647.4 | 10.5 | 144.9 | 0.6 |
| D | 1492.2 | 9.5 | 144.4 | 1.2 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 780 and 800 | | | | |
| A | 1375.2 | 8.8 | 125.5 | 2.3 |
| B | 1528.9 | 9.8 | 137.1 | 2.0 |
| C | 1655.7 | 10.6 | 144.9 | 0.6 |
| D | 1469.9 | 9.4 | 144.4 | 1.2 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 720 and 724 | | | | |
| A | 1071.6 | 6.8 | 126.0 | 1.9 |
| B | 1550.6 | 9.9 | 137.3 | 1.8 |
| C | 1647.3 | 10.5 | 145.0 | 0.6 |
| D | 1358.8 | 8.7 | 144.5 | 1.1 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820 with Pipe 143 closed | | | | |
| A | 1149.0 | 7.3 | 120.2 | 7.6 |
| B | 1488.5 | 9.5 | 135.8 | 3.3 |
| C | 1825.5 | 11.7 | 144.9 | 0.7 |
| D | 1643.5 | 10.5 | 144.2 | 1.4 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 720 and 724 with Pipe 129 closed | | | | |
| A | 1090.2 | 7.0 | 122.0 | 5.9 |
| B | 479.6 | 3.1 | 130.8 | 8.3 |
| C | 2199.5 | 14.0 | 144.9 | 0.7 |
| D | 1859.0 | 11.9 | 144.1 | 1.5 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 720 and 724 with Pipe 125 closed | | | | |
| A | 1834.4 | 11.7 | 124.0 | 3.8 |
| B | 2447.3 | 15.6 | 135.7 | 3.4 |
| C | 710.0 | 4.5 | 133.6 | 12.0 |
| D | 636.7 | 4.1 | 133.8 | 11.8 |
| Peak Hour Demand | | | | |
| A | 962.1 | 6.1 | 125.8 | 2.0 |
| B | 1287.4 | 8.2 | 137.1 | 1.9 |
| C | 1482.7 | 9.5 | 145.0 | 0.6 |
| D | 1256.9 | 8.0 | 144.4 | 1.1 |

## APPENDIX H

## PHASE 1 WATER SYSTEM
## COMPUTER MODELING OUTPUT

### NODE AND PIPE DIAGRAM REFERENCE:

Exhibit B

### CONDITIONS MODELED:

1. Average Day Demand

2. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820.

3. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 788 and 798.

4. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 728 and 772.

5. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820 with Pipe 143 closed.

6. Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 788 and 798 with Pipe 125 closed.

7. Peak Hour Demand

**Project: SDSU Mission Valley** **Phase 1 Water System** **Pipe Data**
**Date: 04/18/19**
**Job Number: 505-166**

**Scenario: All Pipes Open - Average Day Demand**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 0 | 0 |
| 41 | 16 | 219.09 | 0.35 |
| 45 | 48 | 219.09 | 0.04 |
| 49 | 16 | 417.31 | 0.67 |
| 53 | 48 | 636.4 | 0.11 |
| 101 | 12 | 0 | 0 |
| 105 | 12 | -50 | 0.14 |
| 109 | 16 | -75 | 0.12 |
| 121 | 16 | 75 | 0.12 |
| 125 | 16 | 184.87 | 0.29 |
| 127 | 16 | -417.31 | 0.67 |
| 129 | 16 | -232.44 | 0.37 |
| 131 | 8 | 109.87 | 0.7 |
| 133 | 16 | 232.44 | 0.37 |
| 135 | 8 | 109.54 | 0.7 |
| 137 | 16 | 122.9 | 0.2 |
| 139 | 12 | -87.1 | 0.25 |
| 141 | 8 | 131.99 | 0.84 |
| 143 | 12 | -219.09 | 0.62 |
| 145 | 16 | -219.09 | 0.35 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Pipe Data**
**Date: 04/18/19**
**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 0 | 0 |
| 41 | 16 | 1544.34 | 2.46 |
| 45 | 48 | 1544.34 | 0.27 |
| 49 | 16 | 3919.38 | 6.25 |
| 53 | 48 | 5463.72 | 0.97 |
| 101 | 12 | 0 | 0 |
| 105 | 12 | -115 | 0.33 |
| 109 | 16 | -172.5 | 0.28 |
| 121 | 16 | 172.5 | 0.28 |
| 125 | 16 | 1457.7 | 2.33 |
| 127 | 16 | -3919.38 | 6.25 |
| 129 | 16 | -2461.68 | 3.93 |
| 131 | 8 | 1285.2 | 8.2 |
| 133 | 16 | 2461.68 | 3.93 |
| 135 | 8 | 1344.61 | 8.58 |
| 137 | 16 | 1117.07 | 1.78 |
| 139 | 12 | 634.07 | 1.8 |
| 141 | 8 | 2178.41 | 13.9 |
| 143 | 12 | -1544.34 | 4.38 |
| 145 | 16 | -1544.34 | 2.46 |

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 788 and 798**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 0 | 0 |
| 41 | 16 | 1431.25 | 2.28 |
| 45 | 48 | 1431.25 | 0.25 |
| 49 | 16 | 3808.91 | 6.08 |
| 53 | 48 | 5240.16 | 0.93 |
| 101 | 12 | 0 | 0 |
| 105 | 12 | -115 | 0.33 |
| 109 | 16 | -172.5 | 0.28 |
| 121 | 16 | 172.5 | 0.28 |
| 125 | 16 | 1436.26 | 2.29 |
| 127 | 16 | -3808.91 | 6.08 |
| 129 | 16 | -2372.65 | 3.79 |
| 131 | 8 | 1263.76 | 8.07 |
| 133 | 16 | 2372.65 | 3.79 |
| 135 | 8 | 1342.23 | 8.57 |
| 137 | 16 | 1030.42 | 1.64 |
| 139 | 12 | 547.42 | 1.55 |
| 141 | 8 | 1978.67 | 12.63 |
| 143 | 12 | -1431.25 | 4.06 |
| 145 | 16 | -1431.25 | 2.28 |

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 728 and 772**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 0 | 0 |
| 41 | 16 | 1356.67 | 2.16 |
| 45 | 48 | 1356.67 | 0.24 |
| 49 | 16 | 4107.05 | 6.55 |
| 53 | 48 | 5463.72 | 0.97 |
| 101 | 12 | 0 | 0 |
| 105 | 12 | -115 | 0.33 |
| 109 | 16 | -172.5 | 0.28 |
| 121 | 16 | 172.5 | 0.28 |
| 125 | 16 | 1617.1 | 2.58 |
| 127 | 16 | -4107.05 | 6.55 |
| 129 | 16 | -2489.94 | 3.97 |
| 131 | 8 | 1444.6 | 9.22 |
| 133 | 16 | 2489.94 | 3.97 |
| 135 | 8 | 1600.58 | 10.22 |
| 137 | 16 | 889.37 | 1.42 |
| 139 | 12 | 406.37 | 1.15 |
| 141 | 8 | 1763.04 | 11.25 |
| 143 | 12 | -1356.67 | 3.85 |
| 145 | 16 | -1356.67 | 2.16 |

**Scenario: Pipe Break (143) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 47.4 | 0.01 |
| 41 | 16 | 0 | 0 |
| 45 | 48 | 0 | 0 |
| 49 | 16 | 5416.32 | 8.64 |
| 53 | 48 | 5416.32 | 0.96 |
| 101 | 12 | 47.4 | 0.13 |
| 105 | 12 | -67.6 | 0.19 |
| 109 | 16 | -125.1 | 0.2 |
| 121 | 16 | 125.1 | 0.2 |
| 125 | 16 | 1729.59 | 2.76 |
| 127 | 16 | -5416.32 | 8.64 |
| 129 | 16 | -3686.74 | 5.88 |
| 131 | 8 | 1604.48 | 10.24 |
| 133 | 16 | 3686.74 | 5.88 |
| 135 | 8 | 1401.7 | 8.95 |
| 137 | 16 | 2285.03 | 3.65 |
| 139 | 12 | 1802.03 | 5.11 |
| 141 | 8 | 1802.03 | 11.5 |
| 143-XX | 12 | | |
| 145 | 16 | 0 | 0 |

**Scenario: Pipe Break (125) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 788 and 798**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 875.53 | 0.28 |
| 41 | 16 | 1559.24 | 2.49 |
| 45 | 48 | 1559.24 | 0.28 |
| 49 | 16 | 2805.39 | 4.48 |
| 53 | 48 | 4364.63 | 0.77 |
| 101 | 12 | 875.53 | 2.48 |
| 105 | 12 | 760.53 | 2.16 |
| 109 | 16 | 703.03 | 1.12 |
| 121 | 16 | -703.03 | 1.12 |
| 125-XX | 16 | | |
| 127 | 16 | -2805.39 | 4.48 |
| 129 | 16 | -2805.39 | 4.48 |
| 131 | 8 | 703.03 | 4.49 |
| 133 | 16 | 2805.39 | 4.48 |
| 135 | 8 | 1798.58 | 11.48 |
| 137 | 16 | 1006.8 | 1.61 |
| 139 | 12 | 523.8 | 1.49 |
| 141 | 8 | 2083.04 | 13.29 |
| 143 | 12 | -1559.24 | 4.42 |
| 145 | 16 | -1559.24 | 2.49 |

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Peak Hour Demand**

| Pipe No. | Pipe Size (inches) | Model Run Flow (gpm) | Model Run Velocity (fps) |
|---|---|---|---|
| 21 | 36 | 42.99 | 0.01 |
| 41 | 16 | 823.58 | 1.31 |
| 45 | 48 | 823.58 | 0.15 |
| 49 | 16 | 2506.35 | 4 |
| 53 | 48 | 3329.93 | 0.59 |
| 101 | 12 | 42.99 | 0.12 |
| 105 | 12 | -222.01 | 0.63 |
| 109 | 16 | -354.51 | 0.57 |
| 121 | 16 | 354.51 | 0.57 |
| 125 | 16 | 962.19 | 1.54 |
| 127 | 16 | -2506.35 | 4 |
| 129 | 16 | -1544.16 | 2.46 |
| 131 | 8 | 607.68 | 3.88 |
| 133 | 16 | 1544.16 | 2.46 |
| 135 | 8 | 461.6 | 2.95 |
| 137 | 16 | 1082.56 | 1.73 |
| 139 | 12 | -30.44 | 0.09 |
| 141 | 8 | 793.14 | 5.06 |
| 143 | 12 | -823.58 | 2.34 |
| 145 | 16 | -823.58 | 1.31 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Average Day Demand**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.9 | 0.0 |
| 28 | 56 | 536 | 208.0 | 208.0 | 0.0 |
| 104 | 117 | 390 | 118.3 | 117.9 | 0.4 |
| 108 | 87 | 390 | 131.3 | 130.9 | 0.4 |
| 112 | 54 | 390 | 145.6 | 145.2 | 0.4 |
| 116 | 54 | 390 | 145.6 | 145.2 | 0.4 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.4 |
| 124 | 58 | 390 | 143.8 | 143.4 | 0.4 |
| 126 | 69 | 390 | 139.1 | 138.7 | 0.4 |
| 128 | 70 | 390 | 138.6 | 138.2 | 0.4 |
| 130 | 95 | 390 | 127.8 | 127.4 | 0.4 |
| 132 | 100 | 390 | 125.6 | 125.4 | 0.3 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.7 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.8 | 0.5 |
| 108 | 87 | 390 | 131.3 | 130.8 | 0.5 |
| 112 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 116 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.7 |
| 126 | 69 | 390 | 139.1 | 136.7 | 2.3 |
| 128 | 70 | 390 | 138.6 | 136.1 | 2.5 |
| 130 | 95 | 390 | 127.8 | 124.0 | 3.8 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 788 and 798**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.8 | 0.1 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.1 |
| 104 | 117 | 390 | 118.3 | 117.8 | 0.5 |
| 108 | 87 | 390 | 131.3 | 130.8 | 0.5 |
| 112 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 116 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.7 |
| 126 | 69 | 390 | 139.1 | 136.9 | 2.2 |
| 128 | 70 | 390 | 138.6 | 136.3 | 2.4 |
| 130 | 95 | 390 | 127.8 | 124.4 | 3.4 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 728 and 772**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.8 | 0.2 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.2 |
| 104 | 117 | 390 | 118.3 | 117.7 | 0.6 |
| 108 | 87 | 390 | 131.3 | 130.7 | 0.5 |
| 112 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 116 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.5 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.8 |
| 126 | 69 | 390 | 139.1 | 136.7 | 2.4 |
| 128 | 70 | 390 | 138.6 | 136.1 | 2.5 |
| 130 | 95 | 390 | 127.8 | 124.7 | 3.1 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: Pipe Break (143) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 808 and 820**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.8 | 0.1 |
| 28 | 56 | 536 | 208.0 | 207.8 | 0.1 |
| 104 | 117 | 390 | 118.3 | 117.7 | 0.6 |
| 108 | 87 | 390 | 131.3 | 130.7 | 0.6 |
| 112 | 54 | 390 | 145.6 | 145.0 | 0.6 |
| 116 | 54 | 390 | 145.6 | 145.0 | 0.6 |
| 120 | 50 | 390 | 147.3 | 146.8 | 0.5 |
| 124 | 58 | 390 | 143.8 | 142.7 | 1.1 |
| 126 | 69 | 390 | 139.1 | 134.6 | 4.5 |
| 128 | 70 | 390 | 138.6 | 133.4 | 5.2 |
| 130 | 95 | 390 | 127.8 | 113.6 | 14.2 |
| 132 | 100 | 536 | 188.9 | 188.8 | 0.1 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: Pipe Break (125) - Max Day Demand Plus 4000 gpm Fire Flow split between Nodes 788 and 798**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.8 | 0.1 |
| 28 | 56 | 536 | 208.0 | 207.9 | 0.1 |
| 104 | 117 | 390 | 118.3 | 114.2 | 4.1 |
| 108 | 87 | 390 | 131.3 | 126.8 | 4.5 |
| 112 | 54 | 390 | 145.6 | 140.9 | 4.7 |
| 116 | 54 | 390 | 145.6 | 140.8 | 4.8 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.4 |
| 124 | 58 | 390 | 143.8 | 143.1 | 0.8 |
| 126 | 69 | 390 | 139.1 | 136.3 | 2.8 |
| 128 | 70 | 390 | 138.6 | 135.7 | 3.0 |
| 130 | 95 | 390 | 127.8 | 123.9 | 3.9 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

**Project: SDSU Mission Valley** **Phase 1 Water System** **Node Data**

**Date: 04/18/19**

**Job Number: 505-166**

**Scenario: All Pipes Open - Peak Hour Demand**

| Node No. | Node El. Ft. | HGL Zone Ft. (Static) | Static P psi | Model Run P, psi | Delta P from Static |
|---|---|---|---|---|---|
| 24 | 100 | 536 | 188.9 | 188.9 | 0.0 |
| 28 | 56 | 536 | 208.0 | 207.9 | 0.0 |
| 104 | 117 | 390 | 118.3 | 117.7 | 0.6 |
| 108 | 87 | 390 | 131.3 | 130.8 | 0.5 |
| 112 | 54 | 390 | 145.6 | 145.1 | 0.5 |
| 116 | 54 | 390 | 145.6 | 145.1 | 0.4 |
| 120 | 50 | 390 | 147.3 | 146.9 | 0.4 |
| 124 | 58 | 390 | 143.8 | 143.3 | 0.5 |
| 126 | 69 | 390 | 139.1 | 137.9 | 1.2 |
| 128 | 70 | 390 | 138.6 | 137.2 | 1.4 |
| 130 | 95 | 390 | 127.8 | 126.4 | 1.4 |
| 132 | 100 | 390 | 125.6 | 125.3 | 0.3 |

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

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

R E G U L A T I N G  V A L V E  D A T A

| VALVE LABEL | VALVE TYPE | VALVE SETTING (ft or gpm) |
|---|---|---|
| CRPRV | PRV-1 | 388.65 |
| FRPRS | PRV-1 | 389.26 |
| OPRS | PRV-1 | 389.03 |

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. |
|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 860.20 | 36.00 | 120.0000 | 0.00 |
| 41 | 24 | I-FRPRS | 56.50 | 16.00 | 120.0000 | 0.00 |
| 45 | 28 | 24 | 4114.40 | 48.00 | 120.0000 | 0.00 |
| 49 | 28 | I-OPRS | 19.30 | 16.00 | 120.0000 | 0.00 |
| 53 | 0 | 28 | 5084.10 | 48.00 | 120.0000 | 0.00 |
| 101 | O-CRPRV | 104 | 3549.60 | 12.00 | 120.0000 | 0.00 |
| 105 | 104 | 108 | 537.90 | 12.00 | 120.0000 | 0.00 |
| 109 | 108 | 112 | 897.10 | 16.00 | 120.0000 | 0.00 |
| 121 | 116 | 112 | 1065.20 | 16.00 | 120.0000 | 0.00 |
| 125 | 120 | 116 | 63.90 | 16.00 | 120.0000 | 0.00 |
| 127 | 120 | O-OPRS | 14.80 | 16.00 | 120.0000 | 0.00 |
| 129 | 124 | 120 | 169.50 | 16.00 | 120.0000 | 0.00 |
| 131 | 116 | I-704 | 47.20 | 8.00 | 120.0000 | 0.00 |
| 133 | 124 | 126 | 957.70 | 16.00 | 120.0000 | 0.00 |
| 135 | 126 | I-702 | 51.10 | 8.00 | 120.0000 | 0.00 |
| 137 | 126 | 128 | 531.20 | 16.00 | 120.0000 | 0.00 |
| 139 | 128 | 130 | 2373.60 | 12.00 | 120.0000 | 0.00 |
| 141 | 130 | I-700 | 183.90 | 8.00 | 120.0000 | 0.00 |
| 143 | 130 | 132 | 1236.90 | 12.00 | 120.0000 | 0.00 |
| 145 | 132 | O-FRPRS | 22.10 | 16.00 | 120.0000 | 0.00 |
| 700 | O-700 | I-701 | 49.00 | 10.00 | 120.0000 | 0.00 |
| 701 | O-701 | 804 | 120.90 | 12.00 | 120.0000 | 0.00 |
| 702 | O-702 | I-703 | 39.80 | 10.00 | 120.0000 | 0.00 |
| 703 | O-703 | 708 | 90.60 | 12.00 | 120.0000 | 0.00 |
| 704 | O-704 | I-705 | 45.30 | 10.00 | 120.0000 | 0.00 |
| 705 | O-705 | 714 | 350.30 | 12.00 | 120.0000 | 0.00 |
| 709 | 710 | 708 | 41.50 | 12.00 | 120.0000 | 0.00 |
| 713 | 710 | 712 | 317.30 | 12.00 | 120.0000 | 0.00 |
| 715 | 712 | 714 | 399.80 | 12.00 | 120.0000 | 0.00 |
| 773 | 708 | 728 | 726.40 | 12.00 | 120.0000 | 0.00 |
| 777 | 772 | 728 | 315.90 | 12.00 | 120.0000 | 0.00 |
| 785 | 780 | 772 | 258.40 | 12.00 | 120.0000 | 0.00 |
| 833 | 788 | 798 | 286.20 | 8.00 | 120.0000 | 0.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 837 | 784 | 788 | 467.90 | 12.00 | 120.0000 | 0.00 |
| 841 | 780 | 784 | 467.20 | 12.00 | 120.0000 | 0.00 |
| 845 | 800 | 780 | 272.70 | 12.00 | 120.0000 | 0.00 |
| 853 | 804 | 800 | 782.00 | 12.00 | 120.0000 | 0.00 |
| 857 | 812 | 798 | 797.00 | 8.00 | 120.0000 | 0.00 |
| 861 | 808 | 812 | 440.70 | 8.00 | 120.0000 | 0.00 |
| 865 | 808 | 804 | 509.80 | 12.00 | 120.0000 | 0.00 |
| 869 | 820 | 808 | 420.20 | 12.00 | 120.0000 | 0.00 |
| 873 | 816 | 820 | 449.10 | 12.00 | 120.0000 | 0.00 |
| 877 | 816 | 812 | 323.30 | 8.00 | 120.0000 | 0.00 |

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 700 DESCRIBED BY THE FOLLOWING DATA: (ID= 8" Badger FSAA)

| HEAD (ft) | FLOWRATE (gpm) |
|---|---|
| 0.00 | 0.00 |
| -4.62 | 100.00 |
| -6.92 | 1500.00 |
| -20.77 | 3000.00 |
| -36.92 | 4000.00 |

THERE IS A DEVICE AT NODE 701 DESCRIBED BY THE FOLLOWING DATA: (ID= 10" Wilkins 375DA)

| HEAD (ft) | FLOWRATE (gpm) |
|---|---|
| -23.08 | 0.00 |
| -31.15 | 100.00 |
| -32.31 | 2000.00 |
| -46.15 | 3100.00 |

THERE IS A DEVICE AT NODE 702 .....> (ID= 8" Badger FSAA)

THERE IS A DEVICE AT NODE 703 .....> (ID= 10" Wilkins 375DA)

THERE IS A DEVICE AT NODE 704 .....> (ID= 8" Badger FSAA)

THERE IS A DEVICE AT NODE 705 .....> (ID= 10" Wilkins 375DA)

N O D E  D A T A

| NODE NAME | NODE TITLE | EXTERNAL DEMAND (gpm) | JUNCTION ELEVATION (ft) | EXTERNAL GRADE (ft) |
|---|---|---|---|---|
| 24 | | 0.00 | 100.00 | |
| 28 | | 0.00 | 56.00 | |
| 104 | | 50.00 | 117.00 | |
| 108 | | 25.00 | 87.00 | |
| 112 | | 0.00 | 54.00 | |
| 116 | | 0.00 | 54.00 | |
| 120 | | 0.00 | 50.00 | |
| 124 | | 0.00 | 58.00 | |
| 126 | | 0.00 | 69.00 | |

| | | | |
|---|---|---|---|
| 128 | 210.00 | 70.00 | |
| 130 | 0.00 | 95.00 | |
| 132 | 0.00 | 100.00 | |
| O-700 | 0.00 | 88.00 | |
| O-701 | 0.00 | 88.00 | |
| I-702 | 0.00 | 69.00 | |
| I-703 | 0.00 | 69.00 | |
| I-704 | 0.00 | 58.00 | |
| I-705 | 0.00 | 58.00 | |
| 708 | 0.00 | 75.00 | |
| 710 | 0.00 | 75.00 | |
| 712 | 0.00 | 75.00 | |
| 714 | 0.00 | 71.00 | |
| 728 | 0.00 | 71.00 | |
| 772 | 0.00 | 71.00 | |
| 780 | 0.00 | 77.00 | |
| 784 | 254.20 | 74.00 | |
| 788 | 0.00 | 71.00 | |
| 798 | 97.20 | 68.00 | |
| 800 | 0.00 | 82.00 | |
| 804 | 0.00 | 84.00 | |
| 808 | 0.00 | 84.00 | |
| 812 | 0.00 | 58.00 | |
| 816 | 0.00 | 64.00 | |
| 820 | 0.00 | 86.00 | |
| 0 | ---- | 0.00 | 536.00 |
| I-CRPRV | 0.00 | 102.50 | |
| O-FRPRS | ---- | 100.80 | 389.26 |
| I-OPRS | 0.00 | 49.80 | |
| I-700 | 0.00 | 88.00 | |
| I-701 | 0.00 | 88.00 | |
| O-702 | 0.00 | 69.00 | |
| O-703 | 0.00 | 69.00 | |
| O-704 | 0.00 | 58.00 | |
| O-705 | 0.00 | 58.00 | |
| O-CRPRV | ---- | 102.50 | 388.65 |
| I-FRPRS | 0.00 | 100.80 | |
| O-OPRS | ---- | 49.80 | 389.03 |

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) = 43
NUMBER OF END NODES .....(J) = 37
NUMBER OF PRIMARY LOOPS .....(L) = 6
NUMBER OF SUPPLY NODES .....(F) = 1
NUMBER OF SUPPLY ZONES .....(Z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 20 TRIALS: ACCURACY = 0.11958E-05

**SDSU Mission Valley Project**
**Phase 1 Water System Analysis**
**Average Day Demand**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 219.09 | 0.00 | 0.00 | 0.35 | 0.04 | 0.04 |
| 45 | 28 | 24 | 219.09 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 417.31 | 0.00 | 0.00 | 0.67 | 0.14 | 0.14 |
| 53 | 0 | 28 | 636.40 | 0.01 | 0.00 | 0.11 | 0.00 | 0.00 |
| 101 | O-CRPRV | 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105 | 104 | 108 | -50.00 | 0.01 | 0.00 | 0.14 | 0.01 | 0.01 |
| 109 | 108 | 112 | -75.00 | 0.01 | 0.00 | 0.12 | 0.01 | 0.01 |
| 121 | 116 | 112 | 75.00 | 0.01 | 0.00 | 0.12 | 0.01 | 0.01 |
| 125 | 120 | 116 | 184.87 | 0.00 | 0.00 | 0.29 | 0.03 | 0.03 |
| 127 | 120 | O-OPRS | -417.31 | 0.00 | 0.00 | 0.67 | 0.14 | 0.14 |
| 129 | 124 | 120 | -232.44 | 0.01 | 0.00 | 0.37 | 0.05 | 0.05 |
| 131 | 116 | I-704 | 109.87 | 0.02 | 0.00 | 0.70 | 0.35 | 0.35 |
| 133 | 124 | 126 | 232.44 | 0.05 | 0.00 | 0.37 | 0.05 | 0.05 |
| 135 | 126 | I-702 | 109.54 | 0.02 | 0.00 | 0.70 | 0.35 | 0.35 |
| 137 | 126 | 128 | 122.90 | 0.01 | 0.00 | 0.20 | 0.01 | 0.01 |
| 139 | 128 | 130 | -87.10 | 0.08 | 0.00 | 0.25 | 0.03 | 0.03 |
| 141 | 130 | I-700 | 131.99 | 0.09 | 0.00 | 0.84 | 0.50 | 0.50 |
| 143 | 130 | 132 | -219.09 | 0.22 | 0.00 | 0.62 | 0.18 | 0.18 |
| 145 | 132 | O-FRPRS | -219.09 | 0.00 | 0.00 | 0.35 | 0.04 | 0.04 |
| 700 | O-700 | I-701 | 131.99 | 0.01 | 0.00 | 0.54 | 0.17 | 0.17 |
| 701 | O-701 | 804 | 131.99 | 0.01 | 0.00 | 0.37 | 0.07 | 0.07 |
| 702 | O-702 | I-703 | 109.54 | 0.00 | 0.00 | 0.45 | 0.12 | 0.12 |
| 703 | O-703 | 708 | 109.54 | 0.00 | 0.00 | 0.31 | 0.05 | 0.05 |
| 704 | O-704 | I-705 | 109.87 | 0.01 | 0.00 | 0.45 | 0.12 | 0.12 |
| 705 | O-705 | 714 | 109.87 | 0.02 | 0.00 | 0.31 | 0.05 | 0.05 |
| 709 | 710 | 708 | 109.87 | 0.00 | 0.00 | 0.31 | 0.05 | 0.05 |
| 713 | 710 | 712 | -109.87 | 0.02 | 0.00 | 0.31 | 0.05 | 0.05 |
| 715 | 712 | 714 | -109.87 | 0.02 | 0.00 | 0.31 | 0.05 | 0.05 |
| 773 | 708 | 728 | 219.41 | 0.13 | 0.00 | 0.62 | 0.18 | 0.18 |
| 777 | 772 | 728 | -219.41 | 0.06 | 0.00 | 0.62 | 0.18 | 0.18 |
| 785 | 780 | 772 | -219.41 | 0.05 | 0.00 | 0.62 | 0.18 | 0.18 |
| 833 | 788 | 798 | 26.17 | 0.01 | 0.00 | 0.17 | 0.02 | 0.02 |
| 837 | 784 | 788 | 26.17 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 |
| 841 | 780 | 784 | 280.37 | 0.13 | 0.00 | 0.80 | 0.28 | 0.28 |
| 845 | 800 | 780 | 60.96 | 0.00 | 0.00 | 0.17 | 0.02 | 0.02 |
| 853 | 804 | 800 | 60.96 | 0.01 | 0.00 | 0.17 | 0.02 | 0.02 |
| 857 | 812 | 798 | 71.03 | 0.13 | 0.00 | 0.45 | 0.16 | 0.16 |
| 861 | 808 | 812 | 35.58 | 0.02 | 0.00 | 0.23 | 0.04 | 0.04 |
| 865 | 808 | 804 | -71.03 | 0.01 | 0.00 | 0.20 | 0.02 | 0.02 |
| 869 | 820 | 808 | -35.44 | 0.00 | 0.00 | 0.10 | 0.01 | 0.01 |
| 873 | 816 | 820 | -35.44 | 0.00 | 0.00 | 0.10 | 0.01 | 0.01 |
| 877 | 816 | 812 | 35.44 | 0.01 | 0.00 | 0.23 | 0.04 | 0.04 |

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 |
|---|---|---|---|---|
| 700 | 131.99 | 300.95 | 296.14 | -4.8 |
| 701 | 131.99 | 296.13 | 264.88 | -31.3 |
| 702 | 109.54 | 319.96 | 315.28 | -4.7 |
| 703 | 109.54 | 315.27 | 284.09 | -31.2 |
| 704 | 109.87 | 331.01 | 326.33 | -4.7 |
| 705 | 109.87 | 326.32 | 295.14 | -31.2 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.99 | 100.00 | 435.99 | 188.93 |
| 28 | | 0.00 | 535.99 | 56.00 | 479.99 | 208.00 |
| 104 | | 50.00 | 389.01 | 117.00 | 272.01 | 117.87 |
| 108 | | 25.00 | 389.01 | 87.00 | 302.01 | 130.87 |
| 112 | | 0.00 | 389.02 | 54.00 | 335.02 | 145.18 |
| 116 | | 0.00 | 389.03 | 54.00 | 335.03 | 145.18 |
| 120 | | 0.00 | 389.03 | 50.00 | 339.03 | 146.91 |
| 124 | | 0.00 | 389.02 | 58.00 | 331.02 | 143.44 |
| 126 | | 0.00 | 388.97 | 69.00 | 319.97 | 138.66 |
| 128 | | 210.00 | 388.97 | 70.00 | 318.97 | 138.22 |
| 130 | | 0.00 | 389.04 | 95.00 | 294.04 | 127.42 |
| 132 | | 0.00 | 389.26 | 100.00 | 289.26 | 125.35 |
| O-700 | | 0.00 | 384.14 | 88.00 | 296.14 | 128.33 |
| O-701 | | 0.00 | 352.88 | 88.00 | 264.88 | 114.78 |
| I-702 | | 0.00 | 388.96 | 69.00 | 319.96 | 138.65 |
| I-703 | | 0.00 | 384.27 | 69.00 | 315.27 | 136.62 |
| I-704 | | 0.00 | 389.01 | 58.00 | 331.01 | 143.44 |
| I-705 | | 0.00 | 384.32 | 58.00 | 326.32 | 141.41 |
| 708 | | 0.00 | 353.08 | 75.00 | 278.08 | 120.50 |
| 710 | | 0.00 | 353.08 | 75.00 | 278.08 | 120.50 |
| 712 | | 0.00 | 353.10 | 75.00 | 278.10 | 120.51 |
| 714 | | 0.00 | 353.12 | 71.00 | 282.12 | 122.25 |
| 728 | | 0.00 | 352.95 | 71.00 | 281.95 | 122.18 |
| 772 | | 0.00 | 352.90 | 71.00 | 281.90 | 122.16 |
| 780 | | 0.00 | 352.85 | 77.00 | 275.85 | 119.54 |
| 784 | | 254.20 | 352.72 | 74.00 | 278.72 | 120.78 |
| 788 | | 0.00 | 352.72 | 71.00 | 281.72 | 122.08 |
| 798 | | 97.20 | 352.71 | 68.00 | 284.71 | 123.37 |
| 800 | | 0.00 | 352.86 | 82.00 | 270.86 | 117.37 |
| 804 | | 0.00 | 352.87 | 84.00 | 268.87 | 116.51 |
| 808 | | 0.00 | 352.86 | 84.00 | 268.86 | 116.50 |
| 812 | | 0.00 | 352.84 | 58.00 | 294.84 | 127.76 |
| 816 | | 0.00 | 352.85 | 64.00 | 288.85 | 125.17 |
| 820 | | 0.00 | 352.85 | 86.00 | 266.85 | 115.64 |
| 0 | | ---- | 536.00 | | | |
| I-CRPRV | | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | | 0.00 | 535.99 | 49.80 | 486.19 | 210.68 |

| | | | | | |
|---|---|---|---|---|---|
| I-700 | 0.00 | 388.95 | 88.00 | 300.95 | 130.41 |
| I-701 | 0.00 | 384.13 | 88.00 | 296.13 | 128.32 |
| O-702 | 0.00 | 384.28 | 69.00 | 315.28 | 136.62 |
| O-703 | 0.00 | 353.09 | 69.00 | 284.09 | 123.10 |
| O-704 | 0.00 | 384.33 | 58.00 | 326.33 | 141.41 |
| O-705 | 0.00 | 353.14 | 58.00 | 295.14 | 127.89 |
| O-CRPRV | ---- | 389.01 | 102.50 | 286.51 | 124.15 |
| I-FRPRS | 0.00 | 535.99 | 100.80 | 435.19 | 188.58 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.68 | O-701 | 114.78 |
| 28 | 208.00 | 820 | 115.64 |
| 24 | 188.93 | 808 | 116.50 |
| I-FRPRS | 188.58 | 804 | 116.51 |
| I-CRPRV | 187.85 | 800 | 117.37 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 141 | 0.84 | 45 | 0.04 |
| 841 | 0.80 | 837 | 0.07 |
| 131 | 0.70 | 869 | 0.10 |
| 135 | 0.70 | 873 | 0.10 |
| 49 | 0.67 | 53 | 0.11 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | CLOSED | 187.85 | 124.15 | 0.00 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.58 | 125.00 | 219.09 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.68 | 147.00 | 417.31 |

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 | 636.40 | |

NET SYSTEM INFLOW = 636.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 636.40

==========

Case: 1

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 1 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 15 TRIALS: ACCURACY = 0.25969E-06

**SDSU Mission Valley Project**
**Phase 1 Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 808 and 820**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1544.34 | 0.09 | 0.00 | 2.46 | 1.62 | 1.62 |
| 45 | 28 | 24 | 1544.34 | 0.03 | 0.00 | 0.27 | 0.01 | 0.01 |
| 49 | 28 | I-OPRS | 3919.38 | 0.18 | 0.00 | 6.25 | 9.09 | 9.09 |
| 53 | 0 | 28 | 5463.72 | 0.41 | 0.00 | 0.97 | 0.08 | 0.08 |
| 101 | O-CRPRV | 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105 | 104 | 108 | -115.00 | 0.03 | 0.00 | 0.33 | 0.05 | 0.05 |
| 109 | 108 | 112 | -172.50 | 0.03 | 0.00 | 0.28 | 0.03 | 0.03 |
| 121 | 116 | 112 | 172.50 | 0.03 | 0.00 | 0.28 | 0.03 | 0.03 |
| 125 | 120 | 116 | 1457.70 | 0.09 | 0.00 | 2.33 | 1.46 | 1.46 |
| 127 | 120 | O-OPRS | -3919.38 | 0.13 | 0.00 | 6.25 | 9.09 | 9.09 |
| 129 | 124 | 120 | -2461.68 | 0.65 | 0.00 | 3.93 | 3.84 | 3.84 |
| 131 | 116 | I-704 | 1285.20 | 1.59 | 0.00 | 8.20 | 33.72 | 33.72 |
| 133 | 124 | 126 | 2461.68 | 3.68 | 0.00 | 3.93 | 3.84 | 3.84 |
| 135 | 126 | I-702 | 1344.61 | 1.87 | 0.00 | 8.58 | 36.66 | 36.66 |
| 137 | 126 | 128 | 1117.07 | 0.47 | 0.00 | 1.78 | 0.89 | 0.89 |
| 139 | 128 | 130 | 634.07 | 3.00 | 0.00 | 1.80 | 1.26 | 1.26 |
| 141 | 130 | I-700 | 2178.41 | 16.48 | 0.00 | 13.90 | 89.60 | 89.60 |
| 143 | 130 | 132 | -1544.34 | 8.14 | 0.00 | 4.38 | 6.58 | 6.58 |
| 145 | 132 | O-FRPRS | -1544.34 | 0.04 | 0.00 | 2.46 | 1.62 | 1.62 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 700 | O-700 | I-701 | 2178.41 | 1.48 | 0.00 | 8.90 | 30.22 | 30.22 |
| 701 | O-701 | 804 | 2178.41 | 1.50 | 0.00 | 6.18 | 12.44 | 12.44 |
| 702 | O-702 | I-703 | 1344.61 | 0.49 | 0.00 | 5.49 | 12.37 | 12.37 |
| 703 | O-703 | 708 | 1344.61 | 0.46 | 0.00 | 3.81 | 5.09 | 5.09 |
| 704 | O-704 | I-705 | 1285.20 | 0.52 | 0.00 | 5.25 | 11.37 | 11.37 |
| 705 | O-705 | 714 | 1285.20 | 1.64 | 0.00 | 3.65 | 4.68 | 4.68 |
| 709 | 710 | 708 | 1285.20 | 0.19 | 0.00 | 3.65 | 4.68 | 4.68 |
| 713 | 710 | 712 | -1285.20 | 1.49 | 0.00 | 3.65 | 4.68 | 4.68 |
| 715 | 712 | 714 | -1285.20 | 1.87 | 0.00 | 3.65 | 4.68 | 4.68 |
| 773 | 708 | 728 | 2629.81 | 12.81 | 0.00 | 7.46 | 17.63 | 17.63 |
| 777 | 772 | 728 | -2629.81 | 5.57 | 0.00 | 7.46 | 17.63 | 17.63 |
| 785 | 780 | 772 | -2629.81 | 4.56 | 0.00 | 7.46 | 17.63 | 17.63 |
| 833 | 788 | 798 | 908.62 | 5.08 | 0.00 | 5.80 | 17.74 | 17.74 |
| 837 | 784 | 788 | 908.62 | 1.15 | 0.00 | 2.58 | 2.46 | 2.46 |
| 841 | 780 | 784 | 1493.28 | 2.89 | 0.00 | 4.24 | 6.18 | 6.18 |
| 845 | 800 | 780 | -1136.53 | 1.02 | 0.00 | 3.22 | 3.73 | 3.73 |
| 853 | 804 | 800 | -1136.53 | 2.92 | 0.00 | 3.22 | 3.73 | 3.73 |
| 857 | 812 | 798 | -685.06 | 8.38 | 0.00 | 4.37 | 10.52 | 10.52 |
| 861 | 808 | 812 | -135.83 | 0.23 | 0.00 | 0.87 | 0.53 | 0.53 |
| 865 | 808 | 804 | -3314.94 | 13.80 | 0.00 | 9.40 | 27.07 | 27.07 |
| 869 | 820 | 808 | -1450.77 | 2.46 | 0.00 | 4.12 | 5.86 | 5.86 |
| 873 | 816 | 820 | 549.23 | 0.44 | 0.00 | 1.56 | 0.97 | 0.97 |
| 877 | 816 | 812 | -549.23 | 2.26 | 0.00 | 3.51 | 6.98 | 6.98 |

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 |
|---|---|---|---|---|
| 700 | 2178.41 | 276.61 | 265.36 | -11.2 |
| 701 | 2178.41 | 263.88 | 230.82 | -33.1 |
| 702 | 1344.61 | 313.69 | 307.39 | -6.3 |
| 703 | 1344.61 | 306.90 | 275.64 | -31.3 |
| 704 | 1285.20 | 329.21 | 323.12 | -6.1 |
| 705 | 1285.20 | 322.60 | 291.37 | -31.2 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.56 | 100.00 | 435.56 | 188.74 |
| 28 | | 0.00 | 535.59 | 56.00 | 479.59 | 207.82 |
| 104 | | 115.00(2.30) | 388.72 | 117.00 | 271.72 | 117.75 |
| 108 | | 57.50(2.30) | 388.75 | 87.00 | 301.75 | 130.76 |
| 112 | | 0.00 | 388.77 | 54.00 | 334.77 | 145.07 |
| 116 | | 0.00 | 388.80 | 54.00 | 334.80 | 145.08 |
| 120 | | 0.00 | 388.90 | 50.00 | 338.90 | 146.86 |
| 124 | | 0.00 | 388.24 | 58.00 | 330.24 | 143.11 |
| 126 | | 0.00 | 384.56 | 69.00 | 315.56 | 136.74 |
| 128 | | 483.00(2.30) | 384.09 | 70.00 | 314.09 | 136.11 |
| 130 | | 0.00 | 381.09 | 95.00 | 286.09 | 123.97 |
| 132 | | 0.00 | 389.23 | 100.00 | 289.23 | 125.33 |

| | | | | | |
|---|---|---|---|---|---|
| O-700 | 0.00 | 353.36 | 88.00 | 265.36 | 114.99 |
| O-701 | 0.00 | 318.82 | 88.00 | 230.82 | 100.02 |
| I-702 | 0.00 | 382.69 | 69.00 | 313.69 | 135.93 |
| I-703 | 0.00 | 375.90 | 69.00 | 306.90 | 132.99 |
| I-704 | 0.00 | 387.21 | 58.00 | 329.21 | 142.66 |
| I-705 | 0.00 | 380.60 | 58.00 | 322.60 | 139.79 |
| 708 | 0.00 | 344.18 | 75.00 | 269.18 | 116.64 |
| 710 | 0.00 | 344.37 | 75.00 | 269.37 | 116.73 |
| 712 | 0.00 | 345.86 | 75.00 | 270.86 | 117.37 |
| 714 | 0.00 | 347.73 | 71.00 | 276.73 | 119.92 |
| 728 | 0.00 | 331.37 | 71.00 | 260.37 | 112.83 |
| 772 | 0.00 | 325.80 | 71.00 | 254.80 | 110.41 |
| 780 | 0.00 | 321.25 | 77.00 | 244.25 | 105.84 |
| 784 | 584.66(2.30) | 318.36 | 74.00 | 244.36 | 105.89 |
| 788 | 0.00 | 317.21 | 71.00 | 246.21 | 106.69 |
| 798 | 223.56(2.30) | 312.13 | 68.00 | 244.13 | 105.79 |
| 800 | 0.00 | 320.23 | 82.00 | 238.23 | 103.23 |
| 804 | 0.00 | 317.32 | 84.00 | 233.32 | 101.10 |
| 808 | 2000.00 | 303.52 | 84.00 | 219.52 | 95.12 |
| 812 | 0.00 | 303.75 | 58.00 | 245.75 | 106.49 |
| 816 | 0.00 | 301.49 | 64.00 | 237.49 | 102.91 |
| 820 | 2000.00 | 301.06 | 86.00 | 215.06 | 93.19 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.42 | 49.80 | 485.62 | 210.43 |
| I-700 | 0.00 | 364.61 | 88.00 | 276.61 | 119.87 |
| I-701 | 0.00 | 351.88 | 88.00 | 263.88 | 114.35 |
| O-702 | 0.00 | 376.39 | 69.00 | 307.39 | 133.20 |
| O-703 | 0.00 | 344.64 | 69.00 | 275.64 | 119.44 |
| O-704 | 0.00 | 381.12 | 58.00 | 323.12 | 140.02 |
| O-705 | 0.00 | 349.37 | 58.00 | 291.37 | 126.26 |
| O-CRPRV | ---- | 388.72 | 102.50 | 286.22 | 124.03 |
| I-FRPRS | 0.00 | 535.47 | 100.80 | 434.67 | 188.36 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.43 | 820 | 93.19 |
| 28 | 207.82 | 808 | 95.12 |
| 24 | 188.74 | O-701 | 100.02 |
| I-FRPRS | 188.36 | 804 | 101.10 |
| I-CRPRV | 187.85 | 816 | 102.91 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 141 | 13.90 | 45 | 0.27 |
| 865 | 9.40 | 109 | 0.28 |
| 700 | 8.90 | 121 | 0.28 |
| 135 | 8.58 | 105 | 0.33 |
| 131 | 8.20 | 861 | 0.87 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | CLOSED | 187.85 | 124.03 | 0.00 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.36 | 125.00 | 1544.34 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.43 | 147.00 | 3919.38 |

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 | 5463.72 | |

NET SYSTEM INFLOW = 5463.72
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5463.72

==========

Case: 2

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 2 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 15 TRIALS: ACCURACY = 0.21172E-06

**SDSU Mission Valley Project**
**Phase 1 Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 788 and 798**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1431.25 | 0.08 | 0.00 | 2.28 | 1.41 | 1.41 |
| 45 | 28 | 24 | 1431.25 | 0.03 | 0.00 | 0.25 | 0.01 | 0.01 |
| 49 | 28 | I-OPRS | 3808.91 | 0.17 | 0.00 | 6.08 | 8.62 | 8.62 |
| 53 | 0 | 28 | 5240.16 | 0.38 | 0.00 | 0.93 | 0.07 | 0.07 |
| 101 | O-CRPRV | 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105 | 104 | 108 | -115.00 | 0.03 | 0.00 | 0.33 | 0.05 | 0.05 |
| 109 | 108 | 112 | -172.50 | 0.03 | 0.00 | 0.28 | 0.03 | 0.03 |
| 121 | 116 | 112 | 172.50 | 0.03 | 0.00 | 0.28 | 0.03 | 0.03 |
| 125 | 120 | 116 | 1436.26 | 0.09 | 0.00 | 2.29 | 1.42 | 1.42 |
| 127 | 120 | O-OPRS | -3808.91 | 0.13 | 0.00 | 6.08 | 8.62 | 8.62 |
| 129 | 124 | 120 | -2372.65 | 0.61 | 0.00 | 3.79 | 3.59 | 3.59 |
| 131 | 116 | I-704 | 1263.76 | 1.54 | 0.00 | 8.07 | 32.69 | 32.69 |
| 133 | 124 | 126 | 2372.65 | 3.44 | 0.00 | 3.79 | 3.59 | 3.59 |
| 135 | 126 | I-702 | 1342.23 | 1.87 | 0.00 | 8.57 | 36.54 | 36.54 |
| 137 | 126 | 128 | 1030.42 | 0.41 | 0.00 | 1.64 | 0.77 | 0.77 |
| 139 | 128 | 130 | 547.42 | 2.29 | 0.00 | 1.55 | 0.96 | 0.96 |
| 141 | 130 | I-700 | 1978.67 | 13.79 | 0.00 | 12.63 | 74.98 | 74.98 |
| 143 | 130 | 132 | -1431.25 | 7.07 | 0.00 | 4.06 | 5.71 | 5.71 |
| 145 | 132 | O-FRPRS | -1431.25 | 0.03 | 0.00 | 2.28 | 1.41 | 1.41 |
| 700 | O-700 | I-701 | 1978.67 | 1.24 | 0.00 | 8.08 | 25.29 | 25.29 |
| 701 | O-701 | 804 | 1978.67 | 1.26 | 0.00 | 5.61 | 10.41 | 10.41 |
| 702 | O-702 | I-703 | 1342.23 | 0.49 | 0.00 | 5.48 | 12.33 | 12.33 |
| 703 | O-703 | 708 | 1342.23 | 0.46 | 0.00 | 3.81 | 5.07 | 5.07 |
| 704 | O-704 | I-705 | 1263.76 | 0.50 | 0.00 | 5.16 | 11.03 | 11.03 |
| 705 | O-705 | 714 | 1263.76 | 1.59 | 0.00 | 3.58 | 4.54 | 4.54 |
| 709 | 710 | 708 | 1263.76 | 0.19 | 0.00 | 3.58 | 4.54 | 4.54 |
| 713 | 710 | 712 | -1263.76 | 1.44 | 0.00 | 3.58 | 4.54 | 4.54 |
| 715 | 712 | 714 | -1263.76 | 1.81 | 0.00 | 3.58 | 4.54 | 4.54 |
| 773 | 708 | 728 | 2605.99 | 12.59 | 0.00 | 7.39 | 17.33 | 17.33 |
| 777 | 772 | 728 | -2605.99 | 5.48 | 0.00 | 7.39 | 17.33 | 17.33 |
| 785 | 780 | 772 | -2605.99 | 4.48 | 0.00 | 7.39 | 17.33 | 17.33 |
| 833 | 788 | 798 | 814.34 | 4.15 | 0.00 | 5.20 | 14.48 | 14.48 |
| 837 | 784 | 788 | 2814.34 | 9.35 | 0.00 | 7.98 | 19.99 | 19.99 |
| 841 | 780 | 784 | 3399.00 | 13.25 | 0.00 | 9.64 | 28.35 | 28.35 |
| 845 | 800 | 780 | 793.00 | 0.52 | 0.00 | 2.25 | 1.91 | 1.91 |
| 853 | 804 | 800 | 793.00 | 1.50 | 0.00 | 2.25 | 1.91 | 1.91 |
| 857 | 812 | 798 | 1185.66 | 23.15 | 0.00 | 7.57 | 29.04 | 29.04 |
| 861 | 808 | 812 | 594.02 | 3.56 | 0.00 | 3.79 | 8.08 | 8.08 |
| 865 | 808 | 804 | -1185.66 | 2.06 | 0.00 | 3.36 | 4.03 | 4.03 |
| 869 | 820 | 808 | -591.65 | 0.47 | 0.00 | 1.68 | 1.11 | 1.11 |
| 873 | 816 | 820 | -591.65 | 0.50 | 0.00 | 1.68 | 1.11 | 1.11 |
| 877 | 816 | 812 | 591.65 | 2.59 | 0.00 | 3.78 | 8.02 | 8.02 |

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 |
|---|---|---|---|---|
| 700 | 1978.67 | 280.37 | 270.70 | -9.7 |
| 701 | 1978.67 | 269.46 | 237.22 | -32.2 |
| 702 | 1342.23 | 313.99 | 307.70 | -6.3 |
| 703 | 1342.23 | 307.21 | 275.95 | -31.3 |
| 704 | 1263.76 | 329.27 | 323.25 | -6.0 |
| 705 | 1263.76 | 322.75 | 291.52 | -31.2 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.60 | 100.00 | 435.60 | 188.76 |
| 28 | | 0.00 | 535.62 | 56.00 | 479.62 | 207.84 |
| 104 | | 115.00(2.30) | 388.73 | 117.00 | 271.73 | 117.75 |
| 108 | | 57.50(2.30) | 388.76 | 87.00 | 301.76 | 130.76 |
| 112 | | 0.00 | 388.78 | 54.00 | 334.78 | 145.07 |
| 116 | | 0.00 | 388.81 | 54.00 | 334.81 | 145.09 |
| 120 | | 0.00 | 388.90 | 50.00 | 338.90 | 146.86 |
| 124 | | 0.00 | 388.29 | 58.00 | 330.29 | 143.13 |
| 126 | | 0.00 | 384.86 | 69.00 | 315.86 | 136.87 |
| 128 | | 483.00(2.30) | 384.45 | 70.00 | 314.45 | 136.26 |
| 130 | | 0.00 | 382.16 | 95.00 | 287.16 | 124.44 |
| 132 | | 0.00 | 389.23 | 100.00 | 289.23 | 125.33 |
| O-700 | | 0.00 | 358.70 | 88.00 | 270.70 | 117.30 |
| O-701 | | 0.00 | 325.22 | 88.00 | 237.22 | 102.80 |
| I-702 | | 0.00 | 382.99 | 69.00 | 313.99 | 136.06 |
| I-703 | | 0.00 | 376.21 | 69.00 | 307.21 | 133.12 |
| I-704 | | 0.00 | 387.27 | 58.00 | 329.27 | 142.68 |
| I-705 | | 0.00 | 380.75 | 58.00 | 322.75 | 139.86 |
| 708 | | 0.00 | 344.49 | 75.00 | 269.49 | 116.78 |
| 710 | | 0.00 | 344.68 | 75.00 | 269.68 | 116.86 |
| 712 | | 0.00 | 346.12 | 75.00 | 271.12 | 117.48 |
| 714 | | 0.00 | 347.93 | 71.00 | 276.93 | 120.00 |
| 728 | | 0.00 | 331.90 | 71.00 | 260.90 | 113.06 |
| 772 | | 0.00 | 326.42 | 71.00 | 255.42 | 110.68 |
| 780 | | 0.00 | 321.94 | 77.00 | 244.94 | 106.14 |
| 784 | | 584.66(2.30) | 308.70 | 74.00 | 234.70 | 101.70 |
| 788 | | 2000.00 | 299.34 | 71.00 | 228.34 | 98.95 |
| 798 | | 2000.00( ** ) | 295.20 | 68.00 | 227.20 | 98.45 |
| 800 | | 0.00 | 322.46 | 82.00 | 240.46 | 104.20 |
| 804 | | 0.00 | 323.96 | 84.00 | 239.96 | 103.98 |
| 808 | | 0.00 | 321.91 | 84.00 | 237.91 | 103.09 |
| 812 | | 0.00 | 318.35 | 58.00 | 260.35 | 112.82 |
| 816 | | 0.00 | 320.94 | 64.00 | 256.94 | 111.34 |
| 820 | | 0.00 | 321.44 | 86.00 | 235.44 | 102.02 |
| 0 | | ---- | 536.00 | | | |
| I-CRPRV | | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | | 0.00 | 535.46 | 49.80 | 485.66 | 210.45 |

| | | | | | |
|---|---|---|---|---|---|
| I-700 | 0.00 | 368.37 | 88.00 | 280.37 | 121.50 |
| I-701 | 0.00 | 357.46 | 88.00 | 269.46 | 116.76 |
| O-702 | 0.00 | 376.70 | 69.00 | 307.70 | 133.34 |
| O-703 | 0.00 | 344.95 | 69.00 | 275.95 | 119.58 |
| O-704 | 0.00 | 381.25 | 58.00 | 323.25 | 140.07 |
| O-705 | 0.00 | 349.52 | 58.00 | 291.52 | 126.33 |
| O-CRPRV | ---- | 388.73 | 102.50 | 286.23 | 124.03 |
| I-FRPRS | 0.00 | 535.52 | 100.80 | 434.72 | 188.38 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.45 | 798 | 98.45 |
| 28 | 207.84 | 788 | 98.95 |
| 24 | 188.76 | 784 | 101.70 |
| I-FRPRS | 188.38 | 820 | 102.02 |
| I-CRPRV | 187.85 | O-701 | 102.80 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 141 | 12.63 | 45 | 0.25 |
| 841 | 9.64 | 109 | 0.28 |
| 135 | 8.57 | 121 | 0.28 |
| 700 | 8.08 | 105 | 0.33 |
| 131 | 8.07 | 53 | 0.93 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | CLOSED | 187.85 | 124.03 | 0.00 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.38 | 125.00 | 1431.25 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.45 | 147.00 | 3808.91 |

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 | 5240.16 | |

NET SYSTEM INFLOW = 5240.16
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5240.16

==========

Case: 3

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 3 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 12 TRIALS: ACCURACY = 0.52366E-04

**SDSU Mission Valley Project**
**Phase 1 Water System Analysis**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 728 and 772**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 1356.67 | 0.07 | 0.00 | 2.16 | 1.27 | 1.27 |
| 45 | 28 | 24 | 1356.67 | 0.02 | 0.00 | 0.24 | 0.01 | 0.01 |
| 49 | 28 | I-OPRS | 4107.05 | 0.19 | 0.00 | 6.55 | 9.92 | 9.92 |
| 53 | 0 | 28 | 5463.72 | 0.41 | 0.00 | 0.97 | 0.08 | 0.08 |
| 101 | O-CRPRV | 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105 | 104 | 108 | -115.00 | 0.03 | 0.00 | 0.33 | 0.05 | 0.05 |
| 109 | 108 | 112 | -172.50 | 0.03 | 0.00 | 0.28 | 0.03 | 0.03 |
| 121 | 116 | 112 | 172.50 | 0.03 | 0.00 | 0.28 | 0.03 | 0.03 |
| 125 | 120 | 116 | 1617.10 | 0.11 | 0.00 | 2.58 | 1.76 | 1.76 |
| 127 | 120 | O-OPRS | -4107.05 | 0.15 | 0.00 | 6.55 | 9.92 | 9.92 |
| 129 | 124 | 120 | -2489.94 | 0.67 | 0.00 | 3.97 | 3.92 | 3.92 |
| 131 | 116 | I-704 | 1444.60 | 1.98 | 0.00 | 9.22 | 41.87 | 41.87 |
| 133 | 124 | 126 | 2489.94 | 3.76 | 0.00 | 3.97 | 3.92 | 3.92 |
| 135 | 126 | I-702 | 1600.58 | 2.59 | 0.00 | 10.22 | 50.63 | 50.63 |
| 137 | 126 | 128 | 889.37 | 0.31 | 0.00 | 1.42 | 0.58 | 0.58 |
| 139 | 128 | 130 | 406.37 | 1.32 | 0.00 | 1.15 | 0.55 | 0.55 |
| 141 | 130 | I-700 | 1763.04 | 11.14 | 0.00 | 11.25 | 60.56 | 60.56 |
| 143 | 130 | 132 | -1356.67 | 6.40 | 0.00 | 3.85 | 5.17 | 5.17 |
| 145 | 132 | O-FRPRS | -1356.67 | 0.03 | 0.00 | 2.16 | 1.27 | 1.27 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 700 | O-700 | I-701 | 1763.04 | 1.00 | 0.00 | 7.20 | 20.43 | 20.43 |
| 701 | O-701 | 804 | 1763.04 | 1.02 | 0.00 | 5.00 | 8.41 | 8.41 |
| 702 | O-702 | I-703 | 1600.58 | 0.68 | 0.00 | 6.54 | 17.08 | 17.08 |
| 703 | O-703 | 708 | 1600.58 | 0.64 | 0.00 | 4.54 | 7.03 | 7.03 |
| 704 | O-704 | I-705 | 1444.60 | 0.64 | 0.00 | 5.90 | 14.12 | 14.12 |
| 705 | O-705 | 714 | 1444.60 | 2.04 | 0.00 | 4.10 | 5.81 | 5.81 |
| 709 | 710 | 708 | 1444.60 | 0.24 | 0.00 | 4.10 | 5.81 | 5.81 |
| 713 | 710 | 712 | -1444.60 | 1.84 | 0.00 | 4.10 | 5.81 | 5.81 |
| 715 | 712 | 714 | -1444.60 | 2.32 | 0.00 | 4.10 | 5.81 | 5.81 |
| 773 | 708 | 728 | 3045.18 | 16.80 | 0.00 | 8.64 | 23.13 | 23.13 |
| 777 | 772 | 728 | -1045.18 | 1.01 | 0.00 | 2.96 | 3.19 | 3.19 |
| 785 | 780 | 772 | 954.82 | 0.70 | 0.00 | 2.71 | 2.70 | 2.70 |
| 833 | 788 | 798 | -229.10 | 0.40 | 0.00 | 1.46 | 1.38 | 1.38 |
| 837 | 784 | 788 | -229.10 | 0.09 | 0.00 | 0.65 | 0.19 | 0.19 |
| 841 | 780 | 784 | 355.56 | 0.20 | 0.00 | 1.01 | 0.43 | 0.43 |
| 845 | 800 | 780 | 1310.38 | 1.32 | 0.00 | 3.72 | 4.85 | 4.85 |
| 853 | 804 | 800 | 1310.38 | 3.79 | 0.00 | 3.72 | 4.85 | 4.85 |
| 857 | 812 | 798 | 452.66 | 3.89 | 0.00 | 2.89 | 4.88 | 4.88 |
| 861 | 808 | 812 | 226.78 | 0.60 | 0.00 | 1.45 | 1.36 | 1.36 |
| 865 | 808 | 804 | -452.66 | 0.35 | 0.00 | 1.28 | 0.68 | 0.68 |
| 869 | 820 | 808 | -225.88 | 0.08 | 0.00 | 0.64 | 0.19 | 0.19 |
| 873 | 816 | 820 | -225.88 | 0.08 | 0.00 | 0.64 | 0.19 | 0.19 |
| 877 | 816 | 812 | 225.88 | 0.44 | 0.00 | 1.44 | 1.35 | 1.35 |

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 |
|---|---|---|---|---|
| 700 | 1763.04 | 283.70 | 275.43 | -8.3 |
| 701 | 1763.04 | 274.43 | 242.73 | -31.7 |
| 702 | 1600.58 | 312.87 | 305.48 | -7.4 |
| 703 | 1600.58 | 304.80 | 273.34 | -31.5 |
| 704 | 1444.60 | 328.79 | 322.11 | -6.7 |
| 705 | 1444.60 | 321.47 | 290.15 | -31.3 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.57 | 100.00 | 435.57 | 188.75 |
| 28 | | 0.00 | 535.59 | 56.00 | 479.59 | 207.82 |
| 104 | | 115.00(2.30) | 388.69 | 117.00 | 271.69 | 117.73 |
| 108 | | 57.50(2.30) | 388.72 | 87.00 | 301.72 | 130.74 |
| 112 | | 0.00 | 388.74 | 54.00 | 334.74 | 145.05 |
| 116 | | 0.00 | 388.77 | 54.00 | 334.77 | 145.07 |
| 120 | | 0.00 | 388.88 | 50.00 | 338.88 | 146.85 |
| 124 | | 0.00 | 388.22 | 58.00 | 330.22 | 143.09 |
| 126 | | 0.00 | 384.46 | 69.00 | 315.46 | 136.70 |
| 128 | | 483.00(2.30) | 384.15 | 70.00 | 314.15 | 136.13 |
| 130 | | 0.00 | 382.83 | 95.00 | 287.83 | 124.73 |
| 132 | | 0.00 | 389.23 | 100.00 | 289.23 | 125.33 |

| | | | | | |
|---|---|---|---|---|---|
| O-700 | 0.00 | 363.43 | 88.00 | 275.43 | 119.35 |
| O-701 | 0.00 | 330.73 | 88.00 | 242.73 | 105.18 |
| I-702 | 0.00 | 381.87 | 69.00 | 312.87 | 135.58 |
| I-703 | 0.00 | 373.80 | 69.00 | 304.80 | 132.08 |
| I-704 | 0.00 | 386.79 | 58.00 | 328.79 | 142.48 |
| I-705 | 0.00 | 379.47 | 58.00 | 321.47 | 139.30 |
| 708 | 0.00 | 341.70 | 75.00 | 266.70 | 115.57 |
| 710 | 0.00 | 341.94 | 75.00 | 266.94 | 115.68 |
| 712 | 0.00 | 343.79 | 75.00 | 268.79 | 116.48 |
| 714 | 0.00 | 346.11 | 71.00 | 275.11 | 119.22 |
| 728 | 2000.00 | 324.90 | 71.00 | 253.90 | 110.02 |
| 772 | 2000.00 | 323.89 | 71.00 | 252.89 | 109.59 |
| 780 | 0.00 | 324.59 | 77.00 | 247.59 | 107.29 |
| 784 | 584.66(2.30) | 324.39 | 74.00 | 250.39 | 108.50 |
| 788 | 0.00 | 324.48 | 71.00 | 253.48 | 109.84 |
| 798 | 223.56(2.30) | 324.87 | 68.00 | 256.87 | 111.31 |
| 800 | 0.00 | 325.91 | 82.00 | 243.91 | 105.70 |
| 804 | 0.00 | 329.71 | 84.00 | 245.71 | 106.47 |
| 808 | 0.00 | 329.36 | 84.00 | 245.36 | 106.32 |
| 812 | 0.00 | 328.77 | 58.00 | 270.77 | 117.33 |
| 816 | 0.00 | 329.20 | 64.00 | 265.20 | 114.92 |
| 820 | 0.00 | 329.28 | 86.00 | 243.28 | 105.42 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.40 | 49.80 | 485.60 | 210.43 |
| I-700 | 0.00 | 371.70 | 88.00 | 283.70 | 122.94 |
| I-701 | 0.00 | 362.43 | 88.00 | 274.43 | 118.92 |
| O-702 | 0.00 | 374.48 | 69.00 | 305.48 | 132.37 |
| O-703 | 0.00 | 342.34 | 69.00 | 273.34 | 118.45 |
| O-704 | 0.00 | 380.11 | 58.00 | 322.11 | 139.58 |
| O-705 | 0.00 | 348.15 | 58.00 | 290.15 | 125.73 |
| O-CRPRV | ---- | 388.69 | 102.50 | 286.19 | 124.01 |
| I-FRPRS | 0.00 | 535.50 | 100.80 | 434.70 | 188.37 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.43 | O-701 | 105.18 |
| 28 | 207.82 | 820 | 105.42 |
| 24 | 188.75 | 800 | 105.70 |
| I-FRPRS | 188.37 | 808 | 106.32 |
| I-CRPRV | 187.85 | 804 | 106.47 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 141 | 11.25 | 45 | 0.24 |
| 135 | 10.22 | 109 | 0.28 |
| 131 | 9.22 | 121 | 0.28 |
| 773 | 8.64 | 105 | 0.33 |
| 700 | 7.20 | 869 | 0.64 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | CLOSED | 187.85 | 124.01 | 0.00 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.37 | 125.00 | 1356.67 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.43 | 147.00 | 4107.05 |

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 | 5463.72 | |

NET SYSTEM INFLOW = 5463.72
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5463.72

==========

Case: 4

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 4 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 143 is CLOSED

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.54088E-04

**SDSU Mission Valley Project**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 808 and 820**
**Pipe 143 Out of Service**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 47.40 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 45 | 28 | 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 5416.32 | 0.32 | 0.00 | 8.64 | 16.55 | 16.55 |
| 53 | 0 | 28 | 5416.32 | 0.40 | 0.00 | 0.96 | 0.08 | 0.08 |
| 101 | O-CRPRV | 104 | 47.40 | 0.04 | 0.00 | 0.13 | 0.01 | 0.01 |
| 105 | 104 | 108 | -67.60 | 0.01 | 0.00 | 0.19 | 0.02 | 0.02 |
| 109 | 108 | 112 | -125.10 | 0.01 | 0.00 | 0.20 | 0.02 | 0.02 |
| 121 | 116 | 112 | 125.10 | 0.02 | 0.00 | 0.20 | 0.02 | 0.02 |
| 125 | 120 | 116 | 1729.59 | 0.13 | 0.00 | 2.76 | 2.00 | 2.00 |
| 127 | 120 | O-OPRS | -5416.32 | 0.24 | 0.00 | 8.64 | 16.55 | 16.55 |
| 129 | 124 | 120 | -3686.74 | 1.38 | 0.00 | 5.88 | 8.12 | 8.12 |
| 131 | 116 | I-704 | 1604.48 | 2.40 | 0.00 | 10.24 | 50.86 | 50.86 |
| 133 | 124 | 126 | 3686.74 | 7.78 | 0.00 | 5.88 | 8.12 | 8.12 |
| 135 | 126 | I-702 | 1401.70 | 2.02 | 0.00 | 8.95 | 39.60 | 39.60 |
| 137 | 126 | 128 | 2285.03 | 1.78 | 0.00 | 3.65 | 3.35 | 3.35 |
| 139 | 128 | 130 | 1802.03 | 20.78 | 0.00 | 5.11 | 8.75 | 8.75 |
| 141 | 130 | I-700 | 1802.03 | 11.60 | 0.00 | 11.50 | 63.06 | 63.06 |
| 143-XX | 130 | 132 | | | | | | |
| 145 | 132 | O-FRPRS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 700 | O-700 | I-701 | 1802.03 | 1.04 | 0.00 | 7.36 | 21.27 | 21.27 |
| 701 | O-701 | 804 | 1802.03 | 1.06 | 0.00 | 5.11 | 8.75 | 8.75 |
| 702 | O-702 | I-703 | 1401.70 | 0.53 | 0.00 | 5.73 | 13.36 | 13.36 |
| 703 | O-703 | 708 | 1401.70 | 0.50 | 0.00 | 3.98 | 5.50 | 5.50 |
| 704 | O-704 | I-705 | 1604.48 | 0.78 | 0.00 | 6.55 | 17.16 | 17.16 |
| 705 | O-705 | 714 | 1604.48 | 2.47 | 0.00 | 4.55 | 7.06 | 7.06 |
| 709 | 710 | 708 | 1604.48 | 0.29 | 0.00 | 4.55 | 7.06 | 7.06 |
| 713 | 710 | 712 | -1604.48 | 2.24 | 0.00 | 4.55 | 7.06 | 7.06 |
| 715 | 712 | 714 | -1604.48 | 2.82 | 0.00 | 4.55 | 7.06 | 7.06 |
| 773 | 708 | 728 | 3006.19 | 16.40 | 0.00 | 8.53 | 22.58 | 22.58 |
| 777 | 772 | 728 | -3006.19 | 7.13 | 0.00 | 8.53 | 22.58 | 22.58 |
| 785 | 780 | 772 | -3006.19 | 5.84 | 0.00 | 8.53 | 22.58 | 22.58 |
| 833 | 788 | 798 | 955.66 | 5.58 | 0.00 | 6.10 | 19.48 | 19.48 |
| 837 | 784 | 788 | 955.66 | 1.27 | 0.00 | 2.71 | 2.70 | 2.70 |
| 841 | 780 | 784 | 1540.32 | 3.06 | 0.00 | 4.37 | 6.55 | 6.55 |
| 845 | 800 | 780 | -1465.87 | 1.63 | 0.00 | 4.16 | 5.97 | 5.97 |
| 853 | 804 | 800 | -1465.87 | 4.67 | 0.00 | 4.16 | 5.97 | 5.97 |
| 857 | 812 | 798 | -732.10 | 9.48 | 0.00 | 4.67 | 11.89 | 11.89 |
| 861 | 808 | 812 | -172.41 | 0.36 | 0.00 | 1.10 | 0.82 | 0.82 |
| 865 | 808 | 804 | -3267.90 | 13.44 | 0.00 | 9.27 | 26.36 | 26.36 |
| 869 | 820 | 808 | -1440.31 | 2.43 | 0.00 | 4.09 | 5.78 | 5.78 |
| 873 | 816 | 820 | 559.69 | 0.45 | 0.00 | 1.59 | 1.00 | 1.00 |
| 877 | 816 | 812 | -559.69 | 2.34 | 0.00 | 3.57 | 7.23 | 7.23 |

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 |
|---|---|---|---|---|
| 700 | 1802.03 | 257.48 | 248.98 | -8.5 |
| 701 | 1802.03 | 247.94 | 216.16 | -31.8 |
| 702 | 1401.70 | 308.61 | 302.10 | -6.5 |
| 703 | 1401.70 | 301.56 | 270.27 | -31.3 |
| 704 | 1604.48 | 328.26 | 320.85 | -7.4 |
| 705 | 1604.48 | 320.07 | 288.60 | -31.5 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.60 | 100.00 | 435.60 | 188.76 |
| 28 | | 0.00 | 535.60 | 56.00 | 479.60 | 207.83 |
| 104 | | 115.00(2.30) | 388.62 | 117.00 | 271.62 | 117.70 |
| 108 | | 57.50(2.30) | 388.63 | 87.00 | 301.63 | 130.71 |
| 112 | | 0.00 | 388.64 | 54.00 | 334.64 | 145.01 |
| 116 | | 0.00 | 388.66 | 54.00 | 334.66 | 145.02 |
| 120 | | 0.00 | 388.79 | 50.00 | 338.79 | 146.81 |
| 124 | | 0.00 | 387.41 | 58.00 | 329.41 | 142.74 |
| 126 | | 0.00 | 379.63 | 69.00 | 310.63 | 134.61 |
| 128 | | 483.00(2.30) | 377.86 | 70.00 | 307.86 | 133.40 |
| 130 | | 0.00 | 357.08 | 95.00 | 262.08 | 113.57 |
| 132 | | 0.00 | 535.60 | 100.00 | 435.60 | 188.76 |
| O-700 | | 0.00 | 336.98 | 88.00 | 248.98 | 107.89 |
| O-701 | | 0.00 | 304.16 | 88.00 | 216.16 | 93.67 |
| I-702 | | 0.00 | 377.61 | 69.00 | 308.61 | 133.73 |
| I-703 | | 0.00 | 370.56 | 69.00 | 301.56 | 130.68 |
| I-704 | | 0.00 | 386.26 | 58.00 | 328.26 | 142.24 |
| I-705 | | 0.00 | 378.07 | 58.00 | 320.07 | 138.70 |
| 708 | | 0.00 | 338.77 | 75.00 | 263.77 | 114.30 |
| 710 | | 0.00 | 339.07 | 75.00 | 264.07 | 114.43 |
| 712 | | 0.00 | 341.31 | 75.00 | 266.31 | 115.40 |
| 714 | | 0.00 | 344.13 | 71.00 | 273.13 | 118.36 |
| 728 | | 0.00 | 322.37 | 71.00 | 251.37 | 108.93 |
| 772 | | 0.00 | 315.24 | 71.00 | 244.24 | 105.84 |
| 780 | | 0.00 | 309.40 | 77.00 | 232.40 | 100.71 |
| 784 | | 584.66(2.30) | 306.34 | 74.00 | 232.34 | 100.68 |
| 788 | | 0.00 | 305.08 | 71.00 | 234.08 | 101.43 |
| 798 | | 223.56(2.30) | 299.50 | 68.00 | 231.50 | 100.32 |
| 800 | | 0.00 | 307.77 | 82.00 | 225.77 | 97.83 |
| 804 | | 0.00 | 303.10 | 84.00 | 219.10 | 94.94 |
| 808 | | 2000.00 | 289.66 | 84.00 | 205.66 | 89.12 |
| 812 | | 0.00 | 290.02 | 58.00 | 232.02 | 100.54 |
| 816 | | 0.00 | 287.69 | 64.00 | 223.69 | 96.93 |
| 820 | | 2000.00 | 287.23 | 86.00 | 201.23 | 87.20 |
| 0 | | ---- | 536.00 | | | |
| I-CRPRV | | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | | ---- | 535.60 | 100.80 | 434.80 | 188.41 |
| I-OPRS | | 0.00 | 535.28 | 49.80 | 485.48 | 210.38 |

| | | | | | |
|---|---|---|---|---|---|
| I-700 | 0.00 | 345.48 | 88.00 | 257.48 | 111.58 |
| I-701 | 0.00 | 335.94 | 88.00 | 247.94 | 107.44 |
| O-702 | 0.00 | 371.10 | 69.00 | 302.10 | 130.91 |
| O-703 | 0.00 | 339.27 | 69.00 | 270.27 | 117.12 |
| O-704 | 0.00 | 378.85 | 58.00 | 320.85 | 139.03 |
| O-705 | 0.00 | 346.60 | 58.00 | 288.60 | 125.06 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.60 | 100.80 | 434.80 | 188.41 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.38 | 820 | 87.20 |
| 28 | 207.83 | 808 | 89.12 |
| 24 | 188.76 | O-701 | 93.67 |
| 132 | 188.76 | 804 | 94.94 |
| O-FRPRS | 188.41 | 816 | 96.93 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 141 | 11.50 | 21 | 0.01 |
| 131 | 10.24 | 101 | 0.13 |
| 865 | 9.27 | 105 | 0.19 |
| 135 | 8.95 | 109 | 0.20 |
| 49 | 8.64 | 121 | 0.20 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 47.40 |
| FRPRS | PRV-1 | 125.00 | WIDE OPEN | 188.41 | 188.41 | 0.00 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.38 | 147.00 | 5416.32 |

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 | 5463.72 | |

NET SYSTEM INFLOW = 5463.72
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5463.72

==========

Case: 5

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 5 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 125 is CLOSED
Pipe 143 is OPENED

RESULTS OBTAINED AFTER 13 TRIALS: ACCURACY = 0.83475E-06

**SDSU Mission Valley Project**
**Maximum Day Demand plus 4,000 GPM Fire Flow split between Nodes 788 and 798**
**Pipe 125 Out of Service**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 875.53 | 0.01 | 0.00 | 0.28 | 0.01 | 0.01 |
| 41 | 24 | I-FRPRS | 1559.24 | 0.09 | 0.00 | 2.49 | 1.65 | 1.65 |
| 45 | 28 | 24 | 1559.24 | 0.03 | 0.00 | 0.28 | 0.01 | 0.01 |
| 49 | 28 | I-OPRS | 2805.39 | 0.09 | 0.00 | 4.48 | 4.89 | 4.89 |
| 53 | 0 | 28 | 4364.63 | 0.27 | 0.00 | 0.77 | 0.05 | 0.05 |
| 101 | O-CRPRV | 104 | 875.53 | 8.16 | 0.00 | 2.48 | 2.30 | 2.30 |
| 105 | 104 | 108 | 760.53 | 0.95 | 0.00 | 2.16 | 1.77 | 1.77 |
| 109 | 108 | 112 | 703.03 | 0.34 | 0.00 | 1.12 | 0.38 | 0.38 |
| 121 | 116 | 112 | -703.03 | 0.40 | 0.00 | 1.12 | 0.38 | 0.38 |
| 125-XX | 120 | 116 | | | | | | |
| 127 | 120 | O-OPRS | -2805.39 | 0.07 | 0.00 | 4.48 | 4.89 | 4.89 |
| 129 | 124 | 120 | -2805.39 | 0.83 | 0.00 | 4.48 | 4.89 | 4.89 |
| 131 | 116 | I-704 | 703.03 | 0.52 | 0.00 | 4.49 | 11.03 | 11.03 |
| 133 | 124 | 126 | 2805.39 | 4.69 | 0.00 | 4.48 | 4.89 | 4.89 |
| 135 | 126 | I-702 | 1798.58 | 3.21 | 0.00 | 11.48 | 62.84 | 62.84 |
| 137 | 126 | 128 | 1006.80 | 0.39 | 0.00 | 1.61 | 0.73 | 0.73 |
| 139 | 128 | 130 | 523.80 | 2.11 | 0.00 | 1.49 | 0.89 | 0.89 |
| 141 | 130 | I-700 | 2083.04 | 15.17 | 0.00 | 13.29 | 82.47 | 82.47 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 143 | 130 | 132 | -1559.24 | 8.28 | 0.00 | 4.42 | 6.70 | 6.70 |
| 145 | 132 | O-FRPRS | -1559.24 | 0.04 | 0.00 | 2.49 | 1.65 | 1.65 |
| 700 | O-700 | I-701 | 2083.04 | 1.36 | 0.00 | 8.51 | 27.82 | 27.82 |
| 701 | O-701 | 804 | 2083.04 | 1.38 | 0.00 | 5.91 | 11.45 | 11.45 |
| 702 | O-702 | I-703 | 1798.58 | 0.84 | 0.00 | 7.35 | 21.20 | 21.20 |
| 703 | O-703 | 708 | 1798.58 | 0.79 | 0.00 | 5.10 | 8.72 | 8.72 |
| 704 | O-704 | I-705 | 703.03 | 0.17 | 0.00 | 2.87 | 3.72 | 3.72 |
| 705 | O-705 | 714 | 703.03 | 0.54 | 0.00 | 1.99 | 1.53 | 1.53 |
| 709 | 710 | 708 | 703.03 | 0.06 | 0.00 | 1.99 | 1.53 | 1.53 |
| 713 | 710 | 712 | -703.03 | 0.49 | 0.00 | 1.99 | 1.53 | 1.53 |
| 715 | 712 | 714 | -703.03 | 0.61 | 0.00 | 1.99 | 1.53 | 1.53 |
| 773 | 708 | 728 | 2501.62 | 11.67 | 0.00 | 7.10 | 16.07 | 16.07 |
| 777 | 772 | 728 | -2501.62 | 5.08 | 0.00 | 7.10 | 16.07 | 16.07 |
| 785 | 780 | 772 | -2501.62 | 4.15 | 0.00 | 7.10 | 16.07 | 16.07 |
| 833 | 788 | 798 | 807.22 | 4.08 | 0.00 | 5.15 | 14.25 | 14.25 |
| 837 | 784 | 788 | 2807.22 | 9.31 | 0.00 | 7.96 | 19.89 | 19.89 |
| 841 | 780 | 784 | 3391.88 | 13.19 | 0.00 | 9.62 | 28.24 | 28.24 |
| 845 | 800 | 780 | 890.26 | 0.65 | 0.00 | 2.53 | 2.37 | 2.37 |
| 853 | 804 | 800 | 890.26 | 1.85 | 0.00 | 2.53 | 2.37 | 2.37 |
| 857 | 812 | 798 | 1192.78 | 23.41 | 0.00 | 7.61 | 29.37 | 29.37 |
| 861 | 808 | 812 | 597.58 | 3.60 | 0.00 | 3.81 | 8.17 | 8.17 |
| 865 | 808 | 804 | -1192.78 | 2.08 | 0.00 | 3.38 | 4.08 | 4.08 |
| 869 | 820 | 808 | -595.20 | 0.47 | 0.00 | 1.69 | 1.13 | 1.13 |
| 873 | 816 | 820 | -595.20 | 0.51 | 0.00 | 1.69 | 1.13 | 1.13 |
| 877 | 816 | 812 | 595.20 | 2.62 | 0.00 | 3.80 | 8.10 | 8.10 |

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 |
|---|---|---|---|---|
| 700 | 2083.04 | 277.78 | 267.31 | -10.5 |
| 701 | 2083.04 | 265.95 | 233.33 | -32.6 |
| 702 | 1798.58 | 311.23 | 302.75 | -8.5 |
| 703 | 1798.58 | 301.90 | 270.13 | -31.8 |
| 704 | 703.03 | 320.28 | 314.10 | -6.2 |
| 705 | 703.03 | 313.93 | 282.04 | -31.9 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.70 | 100.00 | 435.70 | 188.80 |
| 28 | | 0.00 | 535.73 | 56.00 | 479.73 | 207.88 |
| 104 | | 115.00(2.30) | 380.49 | 117.00 | 263.49 | 114.18 |
| 108 | | 57.50(2.30) | 379.54 | 87.00 | 292.54 | 126.77 |
| 112 | | 0.00 | 379.20 | 54.00 | 325.20 | 140.92 |
| 116 | | 0.00 | 378.80 | 54.00 | 324.80 | 140.75 |
| 120 | | 0.00 | 388.96 | 50.00 | 338.96 | 146.88 |
| 124 | | 0.00 | 388.13 | 58.00 | 330.13 | 143.06 |
| 126 | | 0.00 | 383.44 | 69.00 | 314.44 | 136.26 |
| 128 | | 483.00(2.30) | 383.05 | 70.00 | 313.05 | 135.66 |

| | | | | | |
|---|---|---|---|---|---|
| 130 | 0.00 | 380.94 | 95.00 | 285.94 | 123.91 |
| 132 | 0.00 | 389.23 | 100.00 | 289.23 | 125.33 |
| O-700 | 0.00 | 355.31 | 88.00 | 267.31 | 115.83 |
| O-701 | 0.00 | 321.33 | 88.00 | 233.33 | 101.11 |
| I-702 | 0.00 | 380.23 | 69.00 | 311.23 | 134.87 |
| I-703 | 0.00 | 370.90 | 69.00 | 301.90 | 130.82 |
| I-704 | 0.00 | 378.28 | 58.00 | 320.28 | 138.79 |
| I-705 | 0.00 | 371.93 | 58.00 | 313.93 | 136.04 |
| 708 | 0.00 | 338.34 | 75.00 | 263.34 | 114.12 |
| 710 | 0.00 | 338.41 | 75.00 | 263.41 | 114.14 |
| 712 | 0.00 | 338.89 | 75.00 | 263.89 | 114.35 |
| 714 | 0.00 | 339.51 | 71.00 | 268.51 | 116.35 |
| 728 | 0.00 | 326.67 | 71.00 | 255.67 | 110.79 |
| 772 | 0.00 | 321.59 | 71.00 | 250.59 | 108.59 |
| 780 | 0.00 | 317.44 | 77.00 | 240.44 | 104.19 |
| 784 | 584.66(2.30) | 304.25 | 74.00 | 230.25 | 99.77 |
| 788 | 2000.00 | 294.94 | 71.00 | 223.94 | 97.04 |
| 798 | 2000.00( ** ) | 290.86 | 68.00 | 222.86 | 96.57 |
| 800 | 0.00 | 318.09 | 82.00 | 236.09 | 102.30 |
| 804 | 0.00 | 319.94 | 84.00 | 235.94 | 102.24 |
| 808 | 0.00 | 317.86 | 84.00 | 233.86 | 101.34 |
| 812 | 0.00 | 314.27 | 58.00 | 256.27 | 111.05 |
| 816 | 0.00 | 316.89 | 64.00 | 252.89 | 109.58 |
| 820 | 0.00 | 317.39 | 86.00 | 231.39 | 100.27 |
| 0 | ---- | 536.00 | | | |
| I-CRPRV | 0.00 | 535.99 | 102.50 | 433.49 | 187.85 |
| O-FRPRS | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | 0.00 | 535.64 | 49.80 | 485.84 | 210.53 |
| I-700 | 0.00 | 365.78 | 88.00 | 277.78 | 120.37 |
| I-701 | 0.00 | 353.95 | 88.00 | 265.95 | 115.24 |
| O-702 | 0.00 | 371.75 | 69.00 | 302.75 | 131.19 |
| O-703 | 0.00 | 339.13 | 69.00 | 270.13 | 117.06 |
| O-704 | 0.00 | 372.10 | 58.00 | 314.10 | 136.11 |
| O-705 | 0.00 | 340.04 | 58.00 | 282.04 | 122.22 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.61 | 100.80 | 434.81 | 188.42 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.53 | 798 | 96.57 |
| 28 | 207.88 | 788 | 97.04 |
| 24 | 188.80 | 784 | 99.77 |
| I-FRPRS | 188.42 | 820 | 100.27 |
| I-CRPRV | 187.85 | O-701 | 101.11 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 141 | 13.29 | 21 | 0.28 |
| 135 | 11.48 | 45 | 0.28 |
| 841 | 9.62 | 53 | 0.77 |
| 700 | 8.51 | 109 | 1.12 |
| 837 | 7.96 | 121 | 1.12 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 875.53 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.42 | 125.00 | 1559.24 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.53 | 147.00 | 2805.39 |

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 | 5240.16 | |

NET SYSTEM INFLOW = 5240.16
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5240.16

==========

Case: 6

C H A N G E S  F O R  N E X T  S I M U L A T I O N (Change Number = 6 )

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 125 is OPENED

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.40068E-05

**SDSU Mission Valley Project**
**Phase 1 Water System Analysis**
**Peak Hour Demand**

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 |
|---|---|---|---|---|---|---|---|---|
| 21 | 0 | I-CRPRV | 42.99 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 41 | 24 | I-FRPRS | 823.58 | 0.03 | 0.00 | 1.31 | 0.51 | 0.51 |
| 45 | 28 | 24 | 823.58 | 0.01 | 0.00 | 0.15 | 0.00 | 0.00 |
| 49 | 28 | I-OPRS | 2506.35 | 0.08 | 0.00 | 4.00 | 3.97 | 3.97 |
| 53 | 0 | 28 | 3329.93 | 0.16 | 0.00 | 0.59 | 0.03 | 0.03 |
| 101 | O-CRPRV | 104 | 42.99 | 0.03 | 0.00 | 0.12 | 0.01 | 0.01 |
| 105 | 104 | 108 | -222.01 | 0.10 | 0.00 | 0.63 | 0.18 | 0.18 |
| 109 | 108 | 112 | -354.51 | 0.10 | 0.00 | 0.57 | 0.11 | 0.11 |
| 121 | 116 | 112 | 354.51 | 0.11 | 0.00 | 0.57 | 0.11 | 0.11 |
| 125 | 120 | 116 | 962.19 | 0.04 | 0.00 | 1.54 | 0.67 | 0.67 |
| 127 | 120 | O-OPRS | -2506.35 | 0.06 | 0.00 | 4.00 | 3.97 | 3.97 |
| 129 | 124 | 120 | -1544.16 | 0.27 | 0.00 | 2.46 | 1.62 | 1.62 |
| 131 | 116 | I-704 | 607.68 | 0.40 | 0.00 | 3.88 | 8.42 | 8.42 |
| 133 | 124 | 126 | 1544.16 | 1.55 | 0.00 | 2.46 | 1.62 | 1.62 |
| 135 | 126 | I-702 | 461.60 | 0.26 | 0.00 | 2.95 | 5.06 | 5.06 |
| 137 | 126 | 128 | 1082.56 | 0.45 | 0.00 | 1.73 | 0.84 | 0.84 |
| 139 | 128 | 130 | -30.44 | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| 141 | 130 | I-700 | 793.14 | 2.54 | 0.00 | 5.06 | 13.79 | 13.79 |
| 143 | 130 | 132 | -823.58 | 2.54 | 0.00 | 2.34 | 2.05 | 2.05 |
| 145 | 132 | O-FRPRS | -823.58 | 0.01 | 0.00 | 1.31 | 0.51 | 0.51 |
| 700 | O-700 | I-701 | 793.14 | 0.23 | 0.00 | 3.24 | 4.65 | 4.65 |
| 701 | O-701 | 804 | 793.14 | 0.23 | 0.00 | 2.25 | 1.91 | 1.91 |
| 702 | O-702 | I-703 | 461.60 | 0.07 | 0.00 | 1.89 | 1.71 | 1.71 |
| 703 | O-703 | 708 | 461.60 | 0.06 | 0.00 | 1.31 | 0.70 | 0.70 |
| 704 | O-704 | I-705 | 607.68 | 0.13 | 0.00 | 2.48 | 2.84 | 2.84 |
| 705 | O-705 | 714 | 607.68 | 0.41 | 0.00 | 1.72 | 1.17 | 1.17 |
| 709 | 710 | 708 | 607.68 | 0.05 | 0.00 | 1.72 | 1.17 | 1.17 |
| 713 | 710 | 712 | -607.68 | 0.37 | 0.00 | 1.72 | 1.17 | 1.17 |
| 715 | 712 | 714 | -607.68 | 0.47 | 0.00 | 1.72 | 1.17 | 1.17 |
| 773 | 708 | 728 | 1069.28 | 2.42 | 0.00 | 3.03 | 3.33 | 3.33 |
| 777 | 772 | 728 | -1069.28 | 1.05 | 0.00 | 3.03 | 3.33 | 3.33 |
| 785 | 780 | 772 | -1069.28 | 0.86 | 0.00 | 3.03 | 3.33 | 3.33 |
| 833 | 788 | 798 | 129.79 | 0.14 | 0.00 | 0.83 | 0.48 | 0.48 |
| 837 | 784 | 788 | 129.79 | 0.03 | 0.00 | 0.37 | 0.07 | 0.07 |
| 841 | 780 | 784 | 1477.05 | 2.83 | 0.00 | 4.19 | 6.06 | 6.06 |
| 845 | 800 | 780 | 407.77 | 0.15 | 0.00 | 1.16 | 0.56 | 0.56 |
| 853 | 804 | 800 | 407.77 | 0.44 | 0.00 | 1.16 | 0.56 | 0.56 |
| 857 | 812 | 798 | 385.37 | 2.89 | 0.00 | 2.46 | 3.62 | 3.62 |
| 861 | 808 | 812 | 193.07 | 0.44 | 0.00 | 1.23 | 1.01 | 1.01 |
| 865 | 808 | 804 | -385.37 | 0.26 | 0.00 | 1.09 | 0.50 | 0.50 |
| 869 | 820 | 808 | -192.30 | 0.06 | 0.00 | 0.55 | 0.14 | 0.14 |
| 873 | 816 | 820 | -192.30 | 0.06 | 0.00 | 0.55 | 0.14 | 0.14 |
| 877 | 816 | 812 | 192.30 | 0.32 | 0.00 | 1.23 | 1.00 | 1.00 |

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 |
|---|---|---|---|---|
| 700 | 793.14 | 296.17 | 289.88 | -6.3 |
| 701 | 793.14 | 289.65 | 257.72 | -31.9 |
| 702 | 461.60 | 317.89 | 312.08 | -5.8 |
| 703 | 461.60 | 312.02 | 280.29 | -31.7 |
| 704 | 607.68 | 330.53 | 324.48 | -6.0 |
| 705 | 607.68 | 324.36 | 292.53 | -31.8 |

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 |
|---|---|---|---|---|---|---|
| 24 | | 0.00 | 535.83 | 100.00 | 435.83 | 188.86 |
| 28 | | 0.00 | 535.84 | 56.00 | 479.84 | 207.93 |
| 104 | | 265.00(5.30) | 388.62 | 117.00 | 271.62 | 117.70 |
| 108 | | 132.50(5.30) | 388.72 | 87.00 | 301.72 | 130.75 |
| 112 | | 0.00 | 388.82 | 54.00 | 334.82 | 145.09 |
| 116 | | 0.00 | 388.93 | 54.00 | 334.93 | 145.14 |
| 120 | | 0.00 | 388.97 | 50.00 | 338.97 | 146.89 |
| 124 | | 0.00 | 388.70 | 58.00 | 330.70 | 143.30 |
| 126 | | 0.00 | 387.15 | 69.00 | 318.15 | 137.86 |
| 128 | | 1113.00(5.30) | 386.70 | 70.00 | 316.70 | 137.24 |
| 130 | | 0.00 | 386.71 | 95.00 | 291.71 | 126.41 |
| 132 | | 0.00 | 389.25 | 100.00 | 289.25 | 125.34 |
| O-700 | | 0.00 | 377.88 | 88.00 | 289.88 | 125.62 |
| O-701 | | 0.00 | 345.72 | 88.00 | 257.72 | 111.68 |
| I-702 | | 0.00 | 386.89 | 69.00 | 317.89 | 137.75 |
| I-703 | | 0.00 | 381.02 | 69.00 | 312.02 | 135.21 |
| I-704 | | 0.00 | 388.53 | 58.00 | 330.53 | 143.23 |
| I-705 | | 0.00 | 382.36 | 58.00 | 324.36 | 140.55 |
| 708 | | 0.00 | 349.23 | 75.00 | 274.23 | 118.83 |
| 710 | | 0.00 | 349.28 | 75.00 | 274.28 | 118.85 |
| 712 | | 0.00 | 349.65 | 75.00 | 274.65 | 119.01 |
| 714 | | 0.00 | 350.12 | 71.00 | 279.12 | 120.95 |
| 728 | | 0.00 | 346.81 | 71.00 | 275.81 | 119.52 |
| 772 | | 0.00 | 345.76 | 71.00 | 274.76 | 119.06 |
| 780 | | 0.00 | 344.90 | 77.00 | 267.90 | 116.09 |
| 784 | | 1347.26(5.30) | 342.07 | 74.00 | 268.07 | 116.16 |
| 788 | | 0.00 | 342.04 | 71.00 | 271.04 | 117.45 |
| 798 | | 515.16(5.30) | 341.90 | 68.00 | 273.90 | 118.69 |
| 800 | | 0.00 | 345.05 | 82.00 | 263.05 | 113.99 |
| 804 | | 0.00 | 345.49 | 84.00 | 261.49 | 113.31 |
| 808 | | 0.00 | 345.23 | 84.00 | 261.23 | 113.20 |
| 812 | | 0.00 | 344.79 | 58.00 | 286.79 | 124.27 |
| 816 | | 0.00 | 345.11 | 64.00 | 281.11 | 121.81 |
| 820 | | 0.00 | 345.17 | 86.00 | 259.17 | 112.31 |
| 0 | | ---- | 536.00 | | | |
| I-CRPRV | | 0.00 | 536.00 | 102.50 | 433.50 | 187.85 |
| O-FRPRS | | ---- | 389.26 | 100.80 | 288.46 | 125.00 |
| I-OPRS | | 0.00 | 535.76 | 49.80 | 485.96 | 210.58 |

| | | | | | |
|---|---|---|---|---|---|
| I-700 | 0.00 | 384.17 | 88.00 | 296.17 | 128.34 |
| I-701 | 0.00 | 377.65 | 88.00 | 289.65 | 125.52 |
| O-702 | 0.00 | 381.08 | 69.00 | 312.08 | 135.24 |
| O-703 | 0.00 | 349.29 | 69.00 | 280.29 | 121.46 |
| O-704 | 0.00 | 382.48 | 58.00 | 324.48 | 140.61 |
| O-705 | 0.00 | 350.53 | 58.00 | 292.53 | 126.76 |
| O-CRPRV | ---- | 388.65 | 102.50 | 286.15 | 124.00 |
| I-FRPRS | 0.00 | 535.80 | 100.80 | 435.00 | 188.50 |
| O-OPRS | ---- | 389.03 | 49.80 | 339.23 | 147.00 |

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 |
|---|---|---|---|
| I-OPRS | 210.58 | O-701 | 111.68 |
| 28 | 207.93 | 820 | 112.31 |
| 24 | 188.86 | 808 | 113.20 |
| I-FRPRS | 188.50 | 804 | 113.31 |
| I-CRPRV | 187.85 | 800 | 113.99 |

V E L O C I T I E S

| PIPE NUMBER | MAXIMUM VELOCITY (ft/s) | PIPE NUMBER | MINIMUM VELOCITY (ft/s) |
|---|---|---|---|
| 141 | 5.06 | 21 | 0.01 |
| 841 | 4.19 | 139 | 0.09 |
| 49 | 4.00 | 101 | 0.12 |
| 127 | 4.00 | 45 | 0.15 |
| 131 | 3.88 | 837 | 0.37 |

R E G U L A T I N G  V A L V E  R E P O R T

| VALVE LABEL | VALVE TYPE | VALVE SETTING psi or gpm | VALVE STATUS | UPSTREAM PRESSURE psi | DOWNSTREAM PRESSURE psi | THROUGH FLOW gpm |
|---|---|---|---|---|---|---|
| CRPRV | PRV-1 | 124.00 | ACTIVATED | 187.85 | 124.00 | 42.99 |
| FRPRS | PRV-1 | 125.00 | ACTIVATED | 188.50 | 125.00 | 823.58 |
| OPRS | PRV-1 | 147.00 | ACTIVATED | 210.58 | 147.00 | 2506.35 |

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 | 3372.92 | |

NET SYSTEM INFLOW = 3372.92
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3372.92

# APPENDIX I

## PHASE 1 WATER SYSTEM
## DETAILED COMPUTER MODEL RESULTS SUMMARY
## FOR PUBLIC SYSTEM CONNECTION POINTS

**SDSU MISSION VALLEY**
**PHASE 1 WATER SYSTEM**
**DETAILED COMPUTER MODEL RESULTS SUMMARY FOR PUBLIC SYSTEM**

| Meter | Lateral Flow, gpm | Lateral Velocity, fps | Residual Pressure at Connection Point, psi | Pressure Drop at Connection Point, psi |
|---|---|---|---|---|
| Average Day Demand | | | | |
| A | 132.0 | 0.8 | 127.4 | 0.4 |
| B | 109.5 | 0.7 | 138.7 | 0.4 |
| C | 109.9 | 0.7 | 145.2 | 0.4 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820 | | | | |
| A | 2178.4 | 13.9 | 124.0 | 3.8 |
| B | 1344.6 | 8.6 | 136.7 | 2.3 |
| C | 1285.2 | 8.2 | 145.1 | 0.5 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 788 and 798 | | | | |
| A | 1978.7 | 12.6 | 124.4 | 3.4 |
| B | 1342.2 | 8.6 | 136.9 | 2.2 |
| C | 1263.8 | 8.1 | 145.1 | 0.5 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 728 and 772 | | | | |
| A | 1763.0 | 11.3 | 124.7 | 3.1 |
| B | 1600.6 | 10.2 | 136.7 | 2.4 |
| C | 1444.6 | 9.2 | 145.1 | 0.5 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 808 and 820 with Pipe 143 closed | | | | |
| A | 1802.0 | 11.5 | 113.6 | 14.2 |
| B | 1401.7 | 9.0 | 134.6 | 4.5 |
| C | 1604.5 | 10.2 | 145.0 | 0.6 |
| Maximum Day Demand plus 4,000 gpm Fire Flow split between Nodes 788 and 798 with Pipe 125 closed | | | | |
| A | 2083.0 | 13.3 | 123.9 | 3.9 |
| B | 1798.6 | 11.5 | 136.3 | 2.8 |
| C | 703.0 | 4.5 | 140.8 | 4.8 |
| Peak Hour Demand | | | | |
| A | 793.1 | 5.1 | 126.4 | 1.4 |
| B | 461.6 | 3.0 | 137.9 | 1.2 |
| C | 607.7 | 3.9 | 145.1 | 0.4 |

**LEGEND**

- PROJECT BOUNDARY
- EXISTING 536 ZONE PIPELINE
- EXISTING 390 ZONE PIPELINE
- PROPOSED 536 ZONE PIPELINE
- PROPOSED 390 ZONE PIPELINE
- PROPOSED PRIVATE PIPELINE
- PRESSURE ZONE BOUNDARY
- (768) NODE PIPE COMPUTER MODEL NUMBER
- PIPE COMPUTER MODEL NUMBER
- EXISTING PRESSURE REDUCING STATION
- [M] PROPOSED WATER METER
- PROPOSED BACKFLOW PREVENTER

N

0 250 FEET

PROPOSED RELOCATION OF THE EXISTING 48" 536 ZONE ALVARADO PIPELINE

MISSION VILLAGE DR.

GOODWICK CT.

NORTHWEST MESA 559

UNIVERSITY HEIGHTS 390

MISSION CITY 430

SAN DIEGO MISSION RD.

STADIUM WAY

NORTHSIDE DR.

FRIARS RD.

FENTON PWKY

CAMINO DEL RIO NORTH

NORMAL HEIGHTS 536

FRPRV

CRPRV

OPRV

EX.48" (536 ZONE)

EX. 36"

EX. 12"

EX.16"

EX.12"

EX.10"

EX.8"


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


# EXHIBIT A

## NODE AND PIPE DIAGRAM
## BUILD-OUT WATER SYSTEM
SDSU MISSION VALLEY

LEGEND

- PROJECT BOUNDARY
- EXISTING 536 ZONE PIPELINE
- EXISTING 390 ZONE PIPELINE
- PROPOSED 536 ZONE PIPELINE
- PROPOSED 390 ZONE PIPELINE
- PROPOSED PRIVATE PIPELINE
- PRESSURE ZONE BOUNDARY
- (768) NODE PIPE COMPUTER MODEL NUMBER
- [765] PIPE COMPUTER MODEL NUMBER
- EXISTING PRESSURE REDUCING STATION
- [M] PROPOSED WATER METER
- PROPOSED BACKFLOW PREVENTER

N

0 250 FEET

MISSION VILLAGE DR.

GOODWICK CT.

NORTHWEST MESA 559

UNIVERSITY HEIGHTS 390

MISSION CITY 430

UNIVERSITY HEIGHTS 390

PROPOSED RELOCATION OF THE EXISTING 48" 536 ZONE ALVARADO PIPELINE

SAN DIEGO MISSION RD.

STADIUM WAY

NORTHSIDE DR.

FRIARS RD.

FENTON PWKY

CAMINO DEL RIO NORTH

UNIVERSITY HEIGHTS 390

NORMAL HEIGHTS 536

EX.48" (536 ZONE)

FRPRV

OPRV

CRPRV


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


# EXHIBIT B

## NODE AND PIPE DIAGRAM
## PHASE 1 WATER SYSTEM
SDSU MISSION VALLEY