

**PRELIMINARY
WASTEWATER BASIS OF
DESIGN REPORT
FOR
SKYSONG BUILDING #3**

May 6, 2009
WP# 062663.30

Prepared For:

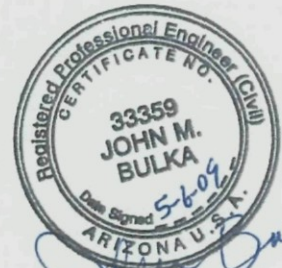
Skysong Building 3, LLC
1475 North Scottsdale Road
Suite 100
Scottsdale, AZ 85257
Phone: (602) 432-5725

Submitted To:

Mr. Douglas L. Mann, P.E.
Water Resources Engineer
City of Scottsdale
9388 East San Salvador Drive
Scottsdale, AZ 85258
Phone: (480) 312-5636
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Prepared By:

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Expires 3-31-11

88-DR-2005#6
2nd: 5/12/09

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LAND DEVELOPMENT • WATER RESOURCES • WATER/WASTEWATER • TRANSPORTATION/TRAFFIC • STRUCTURES • SURVEYING • CONSTRUCTION MANAGEMENT

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Thomas R. Gettings, R.L.S.
Michael T. Young, P.E.
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Scott D. Gookin, P.E.
Carnell Thurman, P.E.

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Water Resources Engineer
City of Scottsdale
9388 East San Salvador Drive
Scottsdale, AZ 85258

Phone: (480) 312-5636
Fax: (480) 312-5615

Re: **Skysong Building #3**
Wastewater Basis of Design
WP# 062663.30

Dear Mr. Mann:

The proposed Skysong Building #3 project will be situated on an 8.8-acre site located at the southwest corner of Innovation Place and Skysong Boulevard, in Scottsdale, Arizona (see attached *Vicinity Map*). The project is part of the Skysong ASU Scottsdale Innovation Center and will consist of approximately 150,000 square feet of office space within one (1) four-story building. The Skysong ASU Scottsdale Innovation Center is a 42.2-acre site that will ultimately consist of 1.2 million square feet of research and general office space, and approximately 600 residential units planned at full buildout. The main roadways and infrastructure have been constructed along with Building #1, Building #2, and a parking garage. The Skysong residential apartment plans have been approved and construction is pending.

This Basis of Design report has been prepared as required by the City of Scottsdale to demonstrate compliance with the *Master Wastewater Collection System Report for Skysong ASU Scottsdale Innovation Center*, by Wood, Patel & Associates, Inc. (Wood/Patel), dated May 11, 2006.

Wastewater from the proposed building will be conveyed by existing 8-, 12-, 18-, and 24-inch public gravity sewer lines that were recently constructed as part of the Skysong ASU Scottsdale Innovation Center infrastructure improvements. These existing sewer lines will connect to an existing 24-inch gravity sewer line in Culver Street that is currently being constructed as part of a City of Scottsdale Capital Improvement Project (see attached *Sewer Exhibit*). The existing sewer lines are part of the City of Scottsdale's public wastewater collection system. Since the entire parcel of land is owned by the City of Scottsdale, it is Wood/Patel's understanding that there are no sewer easements within the Skysong site.

Projected wastewater flows are based on criteria provided in the City of Scottsdale's *Design Standards & Policy Manual*. Specifically, the design criteria utilized are as follows:



Mr. Douglas L. Mann, P.E.
City of Scottsdale
Skysong Building #3
WP# 062663.30

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Page 2 of 2

- Peaking Factor, Apartments: 4.0*
- Peaking Factor, Commercial: 3.5*
- Infiltration / Inflow: 250 gpd per acre**

Abbreviations: gpd = gallons per day

*When a combination of apartments and commercial impacts a sewerline, used 4.0 in model.

**Per the *Master Wastewater Collection System Report for Skysong ASU Scottsdale Innovation Center*.

Preliminary plans for Skysong Building #3 include two (2) sewer building connections. Each building connection is identified on the attached exhibit, with corresponding wastewater flows assigned to each shown in the attached spreadsheets.

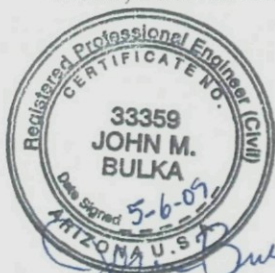
Based on the attached calculations, the Average-Day wastewater preliminary design flow for Skysong Building #3 is approximately 105,000 gallons per day (gpd). The combined peak wet-weather preliminary design flow from Skysong Building #3 plus existing development within the Skysong project is approximately 1.56 million gallons per day (mgd). The proposed wastewater collection system is in compliance with the *Master Wastewater Collection System Report for Skysong ASU Scottsdale Innovation Center*.

Enclosed are a set of drawings and spreadsheets which summarize the design and capacity of the system. The spreadsheets show the proposed sewer slopes, projected peak flow rates, and pipe flow capacities. Please refer to the attached vicinity map and sewer exhibit.

Thank you for your prompt review of the preliminary proposed wastewater collection system provided for the Skysong Building #3 project. Please contact us if you have any questions.

Sincerely,

Wood, Patel & Associates, Inc.



John M. Bulka, P.E.
Senior Project Engineer

JMB/km

CALCULATIONS

WASTEWATER DESIGN FLOWS FROM BUILDING #3 AND ADJACENT BUILDINGS

Project: Skysong Building #3
Location: Scottsdale, AZ
Date: May 6, 2009
References: City of Scottsdale Design Standards and Policies Manual

Project Number: 062063.30
Project Engineer: JB

EXISTING BUILDING 1 AND 2												
BUILDING OR CLUSTER	IMPACTED SEWER SEGMENT (MH TO MH)	AREA / NO. OF UNITS					UNIT WASTEWATER FLOW ¹					AVE. DAILY FLOW (GPD)
		RESTAURANT (SF)	RETAIL (SF)	OFFICE (SF)	APARTMENT (UNITS)	SWIMMING POOL (SF)	RESTAURANT (GPD/SF)	RETAIL (GPD/SF)	OFFICE (GPD/SF)	APARTMENT (GPD/UNIT)	SWIMMING POOL (GPD) ²	
1	4 TO 18	6,000	5,427	28,794			0.7	0.7	0.7	155.0	0	28,155
	18 TO 19		5,428	28,794			0.7	0.7	0.7	155.0	0	23,955
	19 TO 20		5,428	28,794			0.7	0.7	0.7	155.0	0	23,955
	20 TO 5		5,428	28,794			0.7	0.7	0.7	155.0	0	23,955
2	4 TO 18		5,427	28,794			0.7	0.7	0.7	155.0	0	23,955
	18 TO 19		5,428	28,794			0.7	0.7	0.7	155.0	0	23,955
	19 TO 20		5,428	28,794			0.7	0.7	0.7	155.0	0	23,955
	20 TO 5		5,428	28,794			0.7	0.7	0.7	155.0	0	23,955
	5 TO 10	6,000	43,422	238,352	0	0	0.7	0.7	0.7	155.0	0	195,842
	21 TO 22	6,000					0.7	0.7	0.7	155.0	0	4,200

SKYSONG RESIDENTIAL												
BUILDING OR CLUSTER	IMPACTED SEWER SEGMENT (MH TO MH)	AREA / NO. OF UNITS					UNIT WASTEWATER FLOW ¹					AVE. DAILY FLOW (GPD)
		RESTAURANT (SF)	RETAIL (SF)	OFFICE (SF)	APARTMENT (UNITS)	SWIMMING POOL (SF)	RESTAURANT (GPD/SF)	RETAIL (GPD/SF)	OFFICE (GPD/SF)	APARTMENT (GPD/UNIT)	SWIMMING POOL (GPD) ²	
A	21 TO 22				20		0.7	0.7	0.7	155.0		3,100
B	21 TO 22				36		0.7	0.7	0.7	155.0		5,580
C	22 TO 23				21		0.7	0.7	0.7	155.0		3,255
D	11 TO 10				17	1,450	0.7	0.7	0.7	155.0	428	3,063
E	11 TO 10				27		0.7	0.7	0.7	155.0		4,185
F	11 TO 10				27		0.7	0.7	0.7	155.0		4,185
G	11 TO 10				38		0.7	0.7	0.7	155.0		5,890
H	14 TO 13				28		0.7	0.7	0.7	155.0		4,340
I	14 TO 13				12		0.7	0.7	0.7	155.0		1,860
J	8 TO 15				30		0.7	0.7	0.7	155.0		4,650
K	8 TO 15				27		0.7	0.7	0.7	155.0		4,185
L	8 TO 15				26		0.7	0.7	0.7	155.0		4,030
M	8 TO 15				16		0.7	0.7	0.7	155.0		2,480
Total		0	0	0	325	1,450	0.7	0.7	0.7	155	428	50,803

PROPOSED BUILDING 3												
BUILDING	IMPACTED SEWER SEGMENT (MH TO MH)	AREA / NO. OF UNITS					UNIT WASTEWATER FLOW ¹					AVE. DAILY FLOW (GPD)
		RESTAURANT (SF)	RETAIL (SF)	OFFICE (SF)	APARTMENT (UNITS)	SWIMMING POOL (SF)	RESTAURANT (GPD/SF)	RETAIL (GPD/SF)	OFFICE (GPD/SF)	APARTMENT (GPD/UNIT)	SWIMMING POOL (GPD) ²	
3	2 TO 3	0	0	75,000			0.7	0.7	0.7	155.0	0	52,500
	8 TO 15	0	0	75,000			0.7	0.7	0.7	155.0	0	52,500
Total		0	0	150,000	0	0	0.7	0.7	0.7	155	0	105,000

TOTAL												
BUILDING OR CLUSTER	IMPACTED SEWER SEGMENT (MH TO MH)	AREA / NO. OF UNITS					UNIT WASTEWATER FLOW ¹					AVE. DAILY FLOW (GPD)
		RESTAURANT (SF)	RETAIL (SF)	OFFICE (SF)	APARTMENT (UNITS)	SWIMMING POOL (SF)	RESTAURANT (GPD/SF)	RETAIL (GPD/SF)	OFFICE (GPD/SF)	APARTMENT (GPD/UNIT)	SWIMMING POOL (GPD) ²	
-	-	6,000	43,422	380,352	325	1,450	0.7	0.7	0.7	155.0	428	355,845

¹ Per the approved Skysong ASU Scottsdale Innovation Center by Wood, Patel & Associates, dated May 11, 2006.
² Total Average Daily Flow for Pool Back Flush was calculated as follows: (2 filters) * (150 gal/min/filter) * 2 day/week * 5 min/day = 3,000 gal/week * 1 week/ 7 day = 428 gal/day. Peak flow = 150 gpm (see Wastewater Model spreadsheet for instantaneous flow calculations).

WOOD/PATEL

CIVIL ENGINEERS • HYDROLOGISTS • LAND SURVEYORS • CONSTRUCTION MANAGERS

WASTEWATER MODEL

Project: Skysong Building #3
 Location: Scottsdale, Az
 Date: 5/6/2009
 References: City of Scottsdale Design Standards and Policies Manual

Proj. Number: 062663.30
 Proj. Engineer: JB

EXISTING SEWER SEGMENT (MH TO MH)	SEWER SEGMENT AVE. DAILY FLOW			CUMULATIVE AVE. DAILY FLOW (GPD)	PEAKING FACTOR	INFILTRATION / INFLOW (GPD)	PEAK WET WEATHER FLOW (GPD) ¹	PEAK INSTANTANEOUS FLOW (GPD) ²	PIPE DIA. (IN)	PIPE SLOPE (FT / FT)	FULL FLOW VELOCITY (FT/S)	PEAK WET WEATHER FLOW CALCULATIONS		
	ONSITE (GPD)	OFFSITE (GPD)	TOTAL (GPD)									d/D	PIPE CAPACITY (GPD)	PERCENT OF CAPACITY
8 TO 15	67,845		67,845	67,845	4.0	116	271,496	271,496	12	0.0033	2.6	0.31	1,325,657	20%
15 TO 14	0		0	67,845	4.0	232	271,612	271,612	12	0.0065	3.7	0.26	1,860,505	15%
14 TO 13	6,200		6,200	74,045	4.0	347	296,527	296,527	12	0.0090	4.3	0.25	2,189,250	14%
13 TO 12	0		0	74,045	4.0	463	296,643	296,643	18	0.0018	2.5	0.22	2,886,993	10%
12 TO 11	0		0	74,045	4.0	579	296,759	296,759	18	0.0018	2.5	0.22	2,886,993	10%
11 TO 10	17,323		17,323	91,368	4.0	695	366,167	582,167	18	0.0018	2.5	0.24	2,886,993	13%
Subtotal	91,368			91,368	4.0	695	366,167	582,167						
21 TO 22	12,880		12,880	12,880	4.0	116	51,636	51,636	12	0.0100	4.5	0.10	2,307,672	2%
22 TO 23	3,255		3,255	16,135	4.0	232	64,772	64,772	12	0.0200	6.4	0.10	3,263,541	2%
23 TO 10	0		0	16,135	4.0	347	64,887	64,887	12	0.0200	6.4	0.10	3,263,541	2%
Subtotal	16,135			16,135	4.0	347	64,887	64,887						
2 TO 3	52,500		52,500	52,500	3.5	116	183,866	183,866	12	0.0050	2.5	0.36	2,886,993	6%
3 TO 4	0		0	52,500	3.5	232	183,982	183,982	18	0.0050	4.5	0.07	2,307,672	8%
4 TO 18	52,109		52,109	104,609	3.5	347	366,480	366,480	18	0.0050	6.4	0.07	3,263,541	11%
18 TO 19	47,911		47,911	152,520	3.5	463	534,284	534,284	18	0.0049	6.4	0.07	3,263,541	16%
19 TO 20	47,911		47,911	200,431	3.5	579	702,087	702,087	18	0.0049	7.8	0.28	8,872,254	8%
20 TO 5	47,911		47,911	248,342	3.5	695	869,891	869,891	18	0.0072	3.1	0.55	6,218,095	14%
5 TO 10	195,842		195,842	444,184	3.5	811	1,555,453	1,555,453	18	0.0170	7.8	0.28	8,872,254	18%
Subtotal	444,184			444,184	3.5	811	1,555,453	1,555,453						
10 TO OS1				551,687	4.0	1,968	2,208,715	2,424,715	24	0.0018	3.1	0.41	6,218,095	36%
Total				551,687		1,968	2,208,715	2,424,715						

Infiltration / Inflow Rate = 250 gal / acre / day
 Project Area = 8.80 acres
 Project Infiltration Flow = 2,200 gal / day
 No. of Pipes = 19 pipes
 Infiltration / Inflow per Pipe = 116 gal / pipe
 Offsite Infiltration Flow = 518
 Total Infiltration Flow = 2,718

¹ Peak Wet Weather Flow = Ave. Daily Flow x Peaking Factor + Infiltration/Inflow.

² Peak Instantaneous Flow includes pool backflush flow at 150 gpm. Impacts segments downstream of MH#11.

WOOD/PATEL

CIVIL ENGINEERS * HYDROLOGISTS * LAND SURVEYORS * CONSTRUCTION MANAGERS

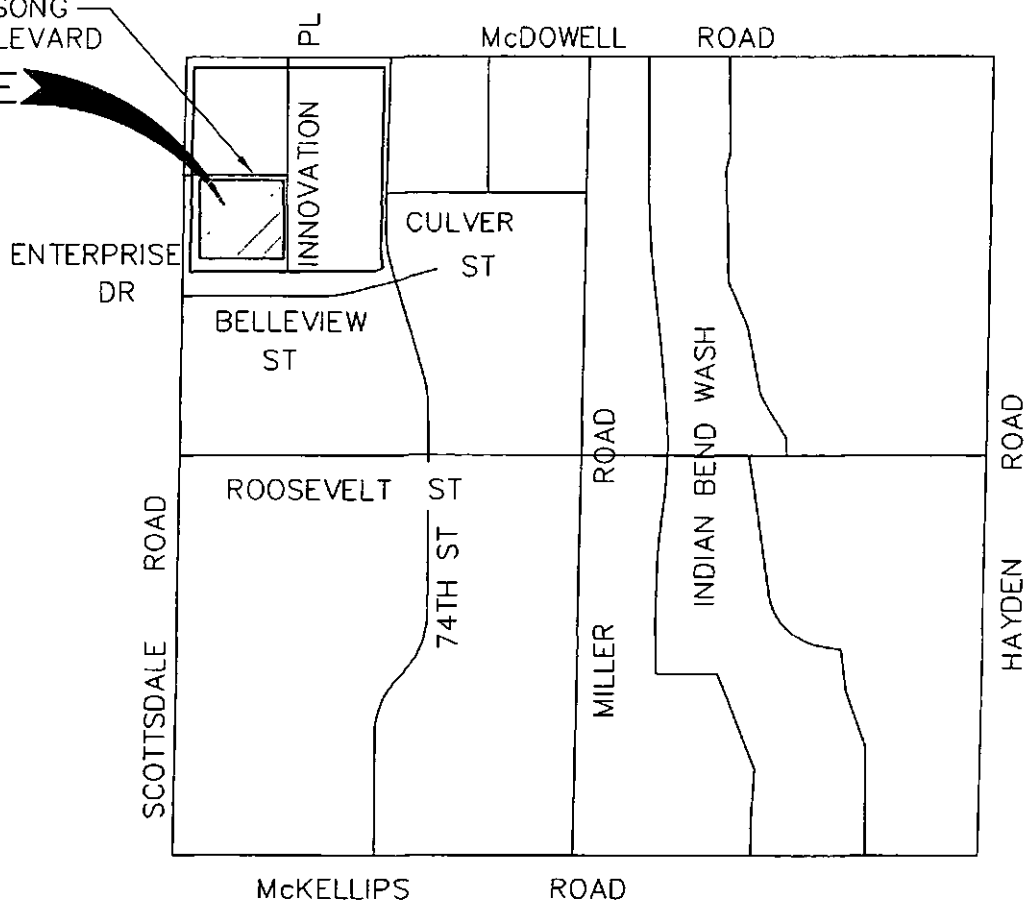
WASTEWATER CALCULATIONS

Project: Skysong Building #3
 Location: Scottsdale, Az
 Date: 5/6/2009
 References: City of Scottsdale Design Standards and Policies Manual

SEGMENT	PIPE SIZE (IN)	MAX DAY FLOW (GPD)	MINIMUM PIPE SLOPE (FT/FT)	DESIGN PIPE SLOPE (FT / FT)	FULL FLOW VELOCITY, V ₀ (FPS)	DEPTH OF FLOW (INCHES)	φ (RADIUS PT - WATER SURFACE) (RADIAN)	FULL FLOW AREA, A ₀ (IN ²)	AREA OF FLOW, A ₁ (IN ²)	WETTED PERIMETER , P (FT)	FULL FLOW HYDRAULIC RADIUS, R ₀ (INCHES)	PARTIAL FLOW HYDRAULIC RADIUS, R ₁ (INCHES)	COMPARISON FLOW (GPD)	PIPE CAPACITY (GPD)	SURPLUS CAPACITY (GPD)	COMPARISON FLOW / ACTUAL FLOW
8 TO 15	12	271,496	0.0033	0.0033	2.6	3.69	2.35	113.10	29.51	14.10	3.00	2.09	271,975	1,325,657	1,054,161	1.00
15 TO 14	12	271,612	0.0033	0.0065	3.7	3.10	2.13	113.10	23.16	12.80	3.00	1.81	271,894	1,860,505	1,588,893	1.00
14 TO 13	12	296,527	0.0033	0.0090	4.3	2.99	2.09	113.10	21.97	12.53	3.00	1.75	297,065	2,189,250	1,892,723	1.00
13 TO 12	18	296,643	0.0033	0.0018	2.5	3.90	1.94	254.47	40.63	17.43	4.50	2.33	297,236	2,886,993	2,590,350	1.00
12 TO 11	18	296,759	0.0033	0.0018	2.5	3.90	1.94	254.47	40.63	17.43	4.50	2.33	297,236	2,886,993	2,590,234	1.00
11 TO 10	18	366,167	0.0033	0.0018	2.5	4.33	2.05	254.47	47.16	18.46	4.50	2.55	366,774	2,886,993	2,520,826	1.00
21 TO 22	12	51,636	0.0033	0.0100	4.5	1.24	1.31	113.10	6.20	7.86	3.00	0.79	51,853	2,307,672	2,256,036	1.00
22 TO 23	12	64,772	0.0033	0.0200	6.4	1.17	1.27	113.10	5.70	7.63	3.00	0.75	65,040	3,263,541	3,198,770	1.00
23 TO 10	12	64,887	0.0033	0.0200	6.4	1.17	1.27	113.10	5.70	7.63	3.00	0.75	65,040	3,263,541	3,198,654	1.00
2 TO 3	12	183,866	0.0033	0.0050	3.2	2.72	1.99	113.10	19.27	11.91	3.00	1.62	184,106	1,631,771	1,447,905	1.00
3 TO 4	18	183,982	0.0033	0.0050	4.2	2.41	1.50	254.47	20.26	13.48	4.50	1.50	184,308	4,811,655	4,627,674	1.00
4 TO 18	18	366,480	0.0033	0.0050	4.2	3.36	1.79	254.47	32.88	16.09	4.50	2.04	367,068	4,811,655	4,445,175	1.00
18 TO 19	18	534,284	0.0033	0.0049	4.2	4.07	1.98	254.47	43.19	17.84	4.50	2.42	534,526	4,763,296	4,229,012	1.00
19 TO 20	18	702,087	0.0033	0.0049	4.2	4.67	2.14	254.47	52.45	19.24	4.50	2.73	702,626	4,763,296	4,061,208	1.00
20 TO 5	18	869,891	0.0033	0.0072	5.1	4.73	2.15	254.47	53.30	19.37	4.50	2.75	871,242	5,773,986	4,904,095	1.00
5 TO 10	18	1,555,453	0.0033	0.0170	7.8	5.10	2.25	254.47	59.36	20.22	4.50	2.94	1,556,895	8,872,254	7,316,801	1.00
10 TO OS1	24	2,208,715	0.0018	0.0018	3.1	9.88	2.79	452.39	175.65	33.44	6.00	5.25	2,209,238	6,218,095	4,009,380	1.00

VICINITY MAP

SKYSONG
BOULEVARD
SITE



VICINITY MAP

N.T.S.

VICINITY MAP

SKYSONG BUILDING #3
SCOTTSDALE, AZ

ENGINEER
J. BULKA
DESIGNER
J. PENROD
CAD TECHNICIAN
J. SANCHEZ

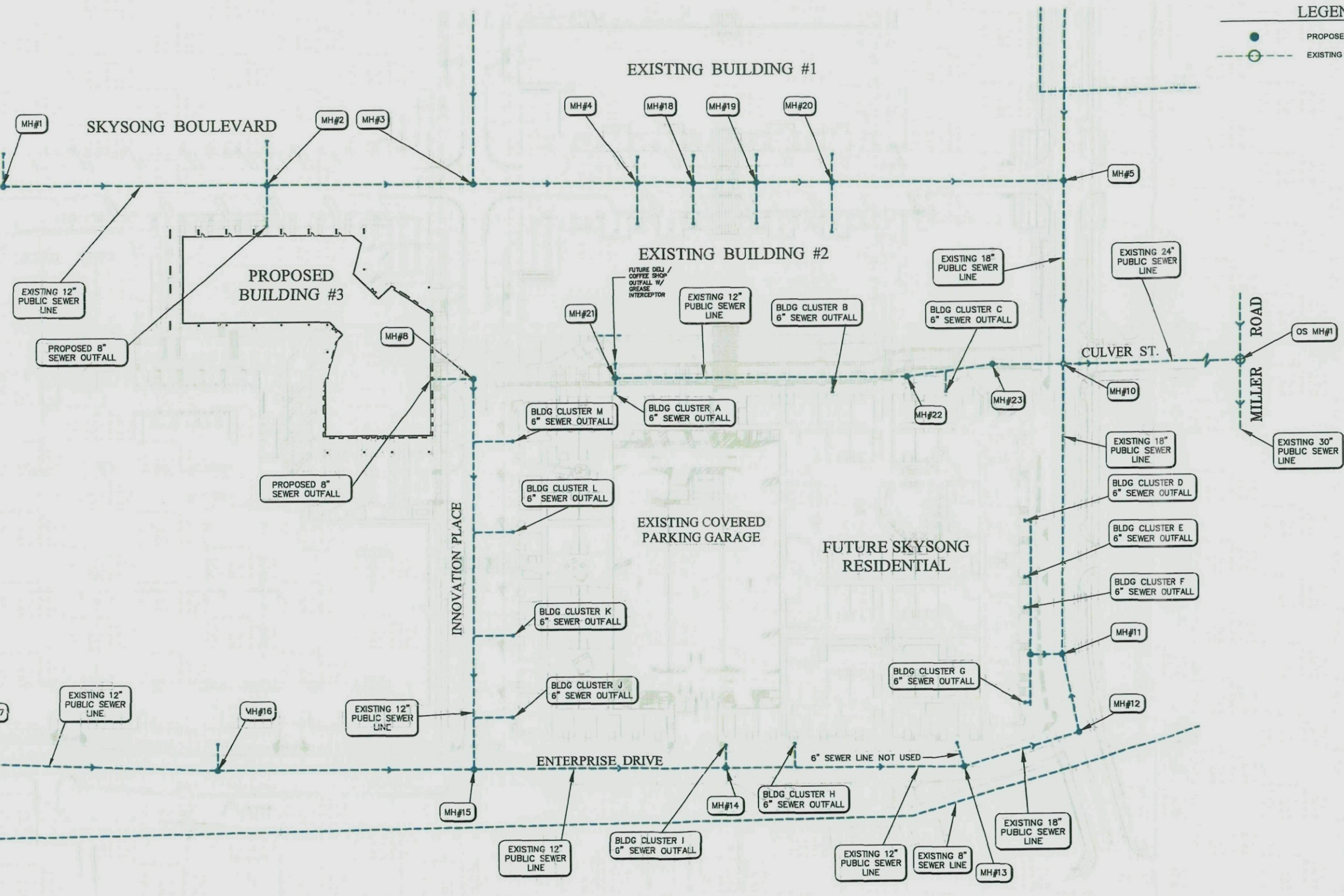
SCALE
NTS
DATE
5/6/09
JOB NUMBER
062663.30
REF. SHEET
1 OF 1

WOOD/PATEL

LAND DEVELOPMENT • WATER RESOURCES
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1855 N. Stapley Drive
Mesa, AZ 85203
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www.woodpatel.com
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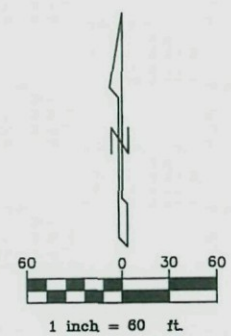
SEWER EXHIBIT

SCOTTSDALE ROAD



LEGEND

- PROPOSED CLEANOUT
- EXISTING SEWER LINE W/ MANHOLE



SKYSONG BUILDING 3
PRELIMINARY WASTEWATER BASIS OF DESIGN
SEWER EXHIBIT

NOT
FOR
CONSTRUCTION
OR RECORDING

WOOD/PATEL
CIVIL ENGINEERS
HYDROLOGISTS
LAND SURVEYORS
CONSTRUCTION MANAGERS
2061 W. NORTHERN AVE.
PHOENIX, AZ 85021
(602) 335-8500
www.woodpatel.com

ENGINEER: J. BULKA
DESIGNER: J. PENROD
CAD TECHNICIAN: J. PENROD
SCALE (HORIZ): 1"=40'
SCALE (VERT): 1"=40'
DATE: 5/6/09
JOB NUMBER: 062863.3Q
SHEET: 1 OF 1

CALL TWO WEEKS BEFORE YOU GO
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

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FOR
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Dear Mr. Mann:

The proposed Skysong Building #3 project will be situated on an 8.8-acre site located at the southwest corner of Innovation Place and Skysong Boulevard in Scottsdale, Arizona (see attached *Vicinity Map*). The project is part of the Skysong ASU Scottsdale Innovation Center, and will consist of approximately 150,000 square feet of office space within one (1) four-story building. The Skysong ASU Scottsdale Innovation Center is a 42.2-acre site that will ultimately consist of 1.2 million square feet of research and general office space and approximately 600 residential units planned at full buildout. The main roadways and infrastructure have been constructed along with Building #1, Building #2, and a parking garage. The Skysong residential apartment plans have been approved and construction is pending. This Preliminary Basis of Design report has been prepared as required by the City of Scottsdale to demonstrate compliance with the *Master Water Distribution System Report for Skysong ASU Scottsdale Innovation Center*, by Wood, Patel & Associates, Inc. (Wood/Patel), dated May 11, 2006.

Potable water service for the proposed development will be provided through an existing 12-inch public waterline located in Innovation Place (see attached *Water Exhibit*). The existing 12-inch waterlines were installed as part of the Skysong Infrastructure project. It is Wood/Patel's understanding Skysong Building 3 will have automatic fire sprinkler systems. Approximate locations of water meters and backflow prevention assemblies are shown on the attached exhibit. For additional details, please refer to the conceptual improvement plans.

Water-demand projections are based primarily on criteria provided in the *City of Scottsdale Design Standards and Policy Manual*. Specifically, the criteria utilized are as follows:

- Office/Business Building Average-Day Demand: 0.8 gpd per sq. ft.
- Maximum-Day Demand: 2.0 x Avg. Day Demand
- Peak-Hour Demand: 3.5 x Avg. Day Demand
- Modeled Fire Hydrant Flow: 3,500 gpm during Max Day Demand
- Minimum Residual Pressure, Fire Flows: 30 psi
- Minimum Residual Pressure, Peak-Hour: 50 psi
- Maximum Head Loss during Peak-Hour Flows: 10 ft/1000 ft

MISSION:
CLIENT SERVICE

Wood, Patel & Associates, Inc.

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1855 North Stapley Drive • Mesa, Arizona 85203 • (480) 834-3300 • Fax (480) 834-3320

www.woodpatel.com

Mr. Douglas L. Mann, P.E.
City of Scottsdale
Skysong Building #3
WP# 062663.30

May 6, 2009
Page 2 of 2

One water service building connection is anticipated for the building.

The Average-Day water demand design flow for Skysong Building 3 is approximately 120,000 gallons per day (gpd), or 83 gallons per minute (gpm). The projected Peak-Hour demand is approximately 290 gpm (see attached calculations).

WaterCAD Version 7.0 by Haestad Methods was utilized to analyze the proposed potable water system. A fire hydrant flow test by Western States Fire Protection Co. was performed on February 15, 2008 on the existing 12-inch waterline installed in Enterprise Drive, between Scottsdale Road and 72nd Street, in order to verify/calibrate the hydraulic model. The static pressure from the test was used to establish a hydraulic grade line for the hydraulic model within the Skysong distribution grid. The static conditions determined by the hydrant test represent the baseline pressure with existing flows on the system. Therefore, no additional flows are entered into the model for the calibration scenarios. A 'reservoir' and 'pump' were used in the water model to represent the City of Scottsdale water supply, with the point of calibration located at the 'residual' hydrant. The pressures and flows during static and flowed conditions, and the projected available flow at 20 pounds per square inch (psi) were used to represent a 3-point pump curve. Due to a minimal pressure drop in the system during the actual flow test, a mainline flow in excess of 12,000 gpm was projected with a 20 psi residual per Western States Fire Protection Co. In order to represent more realistic and conservative conditions in the modeled system, the maximum flow at 20 psi was reduced to 6,000 gpm.

The minimum preliminary required fire hydrant flow for the proposed Skysong Building 3 was estimated to be 3,500 gallons per minute based on the International Fire Code, 2006 Building type VA and 150,000 square feet. The hydraulic-modeling results indicate that the system is capable of delivering Peak-Hour demands totaling 290 gallons per minute (gpm) to Skysong Building 3, with pressures ranging from 76 to 85 psi. Fire-flow results from the model indicate that residual pressures exceed 30 psi within the proposed Skysong Building 3 with fire flows during Maximum-Day demand. In accordance with section 604.8 of the International Plumbing Code and City of Scottsdale amendments, pressure regulators will be required at all building service connections within the site where the pressure exceeds 80 psi.

Thank you for your prompt review of the preliminary water system provided for Skysong Building #3. Please contact us if you have any questions.

Sincerely,

Wood, Patel & Associates, Inc.



John M. Bulka, P.E.
Senior Project Engineer

JMB/km

CALCULATIONS AND HYDRAULIC MODELING RESULTS

Scenario: Calibration Normal Pressure to Flow
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	0.00	0.00	1,408.11	81
FH2	1,221.00	Zone	Demand	0.00	0.00	1,408.11	81
FH3	1,225.00	Zone	Demand	0.00	0.00	1,408.11	79
FH4	1,224.00	Zone	Demand	0.00	0.00	1,408.11	80
J-1	1,230.00	Zone	Demand	0.00	0.00	1,408.11	77
J-2	1,225.00	Zone	Demand	0.00	0.00	1,408.11	79
J-3	1,220.00	Zone	Demand	0.00	0.00	1,408.11	81
J-4	1,217.00	Zone	Demand	0.00	0.00	1,408.11	83
J-5	1,216.00	Zone	Demand	0.00	0.00	1,408.11	83
J-7	1,215.00	Zone	Demand	0.00	0.00	1,408.11	84
J-10	1,227.00	Zone	Demand	0.00	0.00	1,408.11	78
J-11	1,228.00	Zone	Demand	0.00	0.00	1,408.11	78
J-19	1,225.00	Zone	Demand	0.00	0.00	1,408.11	79
J-20	1,231.00	Zone	Demand	0.00	0.00	1,408.11	77
J-21	1,220.00	Zone	Demand	0.00	0.00	1,408.11	81
J-22	1,220.00	Zone	Demand	0.00	0.00	1,408.11	81
J-23	1,225.00	Zone	Demand	0.00	0.00	1,408.11	79
J-24	1,225.00	Zone	Demand	0.00	0.00	1,408.11	79
J-25	1,220.00	Zone	Demand	0.00	0.00	1,408.11	81
J-26	1,221.00	Zone	Demand	0.00	0.00	1,408.11	81
J-29	1,216.00	Zone	Demand	0.00	0.00	1,408.11	83
J-30	1,221.00	Zone	Demand	0.00	0.00	1,408.11	81
J-33	1,216.00	Zone	Demand	0.00	0.00	1,408.11	83
J-34	1,217.00	Zone	Demand	0.00	0.00	1,408.11	83
J-35	1,221.00	Zone	Demand	0.00	0.00	1,408.11	81
J-37	1,217.00	Zone	Demand	0.00	0.00	1,408.11	83
J-38	1,216.00	Zone	Demand	0.00	0.00	1,408.11	83
J-40	1,219.00	Zone	Demand	0.00	0.00	1,408.11	82
J-45	1,221.00	Zone	Demand	0.00	0.00	1,408.11	81
J-50	1,225.00	Zone	Demand	0.00	0.00	1,408.11	79
J-60	1,227.00	Zone	Demand	0.00	0.00	1,408.11	78
J-70	1,210.00	Zone	Demand	0.00	0.00	1,408.11	86
J-80	1,223.00	Zone	Demand	0.00	0.00	1,408.11	80
J-90	1,226.00	Zone	Demand	0.00	0.00	1,408.11	79
J-100	1,224.00	Zone	Demand	0.00	0.00	1,408.11	80
TEST HYDRANT	1,223.00	Zone	Demand	0.00	0.00	1,408.11	80

Scenario: Calibration from Fire Flow Test X1 & X2
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	0.00	0.00	1,406.83	81
FH2	1,221.00	Zone	Demand	0.00	0.00	1,406.87	80
FH3	1,225.00	Zone	Demand	0.00	0.00	1,406.80	79
FH4	1,224.00	Zone	Demand	0.00	0.00	1,406.82	79
J-1	1,230.00	Zone	Demand	0.00	0.00	1,406.81	76
J-2	1,225.00	Zone	Demand	0.00	0.00	1,406.82	79
J-3	1,220.00	Zone	Demand	0.00	0.00	1,406.82	81
J-4	1,217.00	Zone	Demand	0.00	0.00	1,406.83	82
J-5	1,216.00	Zone	Demand	0.00	0.00	1,406.84	83
J-7	1,215.00	Zone	Demand	0.00	0.00	1,406.83	83
J-10	1,227.00	Zone	Demand	0.00	0.00	1,406.03	77
J-11	1,228.00	Zone	Demand	0.00	0.00	1,406.75	77
J-19	1,225.00	Zone	Demand	0.00	0.00	1,406.81	79
J-20	1,231.00	Zone	Demand	0.00	0.00	1,406.81	76
J-21	1,220.00	Zone	Demand	0.00	0.00	1,406.82	81
J-22	1,220.00	Zone	Demand	0.00	0.00	1,406.83	81
J-23	1,225.00	Zone	Demand	0.00	0.00	1,406.81	79
J-24	1,225.00	Zone	Demand	0.00	0.00	1,406.82	79
J-25	1,220.00	Zone	Demand	0.00	0.00	1,406.82	81
J-26	1,221.00	Zone	Demand	0.00	0.00	1,406.37	80
J-29	1,216.00	Zone	Demand	0.00	0.00	1,406.83	83
J-30	1,221.00	Zone	Demand	0.00	0.00	1,406.83	80
J-33	1,216.00	Zone	Demand	0.00	0.00	1,406.83	83
J-34	1,217.00	Zone	Demand	0.00	0.00	1,406.84	82
J-35	1,221.00	Zone	Demand	0.00	0.00	1,406.85	80
J-37	1,217.00	Zone	Demand	0.00	0.00	1,406.83	82
J-38	1,216.00	Zone	Demand	0.00	0.00	1,406.84	83
J-40	1,219.00	Zone	Demand	0.00	0.00	1,406.87	81
J-45	1,221.00	Zone	Demand	0.00	0.00	1,406.42	80
J-50	1,225.00	Zone	Demand	0.00	0.00	1,406.07	78
J-60	1,227.00	Zone	Demand	0.00	0.00	1,406.00	77
J-70	1,210.00	Zone	Demand	0.00	0.00	1,406.77	85
J-80	1,223.00	Zone	Demand	0.00	0.00	1,406.82	80
J-90	1,226.00	Zone	Demand	0.00	0.00	1,406.77	78
J-100	1,224.00	Zone	Demand	0.00	0.00	1,406.82	79
TEST HYDRANT	1,223.00	Zone	Demand	1,403.90	1,403.90	1,405.92	79

Steady State Analysis

Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	0.00	0.00	1,266.55	20
FH2	1,221.00	Zone	Demand	0.00	0.00	1,267.14	20
FH3	1,225.00	Zone	Demand	0.00	0.00	1,266.01	18
FH4	1,224.00	Zone	Demand	0.00	0.00	1,266.35	18
J-1	1,230.00	Zone	Demand	0.00	0.00	1,266.24	16
J-2	1,225.00	Zone	Demand	0.00	0.00	1,266.34	18
J-3	1,220.00	Zone	Demand	0.00	0.00	1,266.40	20
J-4	1,217.00	Zone	Demand	0.00	0.00	1,266.43	21
J-5	1,216.00	Zone	Demand	0.00	0.00	1,266.57	22
J-7	1,215.00	Zone	Demand	0.00	0.00	1,266.44	22
J-10	1,227.00	Zone	Demand	0.00	0.00	1,254.67	12
J-11	1,228.00	Zone	Demand	0.00	0.00	1,265.38	16
J-19	1,225.00	Zone	Demand	0.00	0.00	1,266.25	18
J-20	1,231.00	Zone	Demand	0.00	0.00	1,266.25	15
J-21	1,220.00	Zone	Demand	0.00	0.00	1,266.40	20
J-22	1,220.00	Zone	Demand	0.00	0.00	1,266.42	20
J-23	1,225.00	Zone	Demand	0.00	0.00	1,266.25	18
J-24	1,225.00	Zone	Demand	0.00	0.00	1,266.40	18
J-25	1,220.00	Zone	Demand	0.00	0.00	1,266.40	20
J-26	1,221.00	Zone	Demand	0.00	0.00	1,259.71	17
J-29	1,216.00	Zone	Demand	0.00	0.00	1,266.51	22
J-30	1,221.00	Zone	Demand	0.00	0.00	1,266.55	20
J-33	1,216.00	Zone	Demand	0.00	0.00	1,266.53	22
J-34	1,217.00	Zone	Demand	0.00	0.00	1,266.67	21
J-35	1,221.00	Zone	Demand	0.00	0.00	1,266.77	20
J-37	1,217.00	Zone	Demand	0.00	0.00	1,266.46	21
J-38	1,216.00	Zone	Demand	0.00	0.00	1,266.59	22
J-40	1,219.00	Zone	Demand	0.00	0.00	1,267.09	21
J-45	1,221.00	Zone	Demand	0.00	0.00	1,260.41	17
J-50	1,225.00	Zone	Demand	0.00	0.00	1,255.26	13
J-60	1,227.00	Zone	Demand	0.00	0.00	1,254.20	12
J-70	1,210.00	Zone	Demand	0.00	0.00	1,265.60	24
J-80	1,223.00	Zone	Demand	0.00	0.00	1,266.39	19
J-90	1,226.00	Zone	Demand	0.00	0.00	1,265.65	17
J-100	1,224.00	Zone	Demand	0.00	0.00	1,266.35	18
TEST HYDRANT	1,223.00	Zone	Demand	6,000.00	6,000.00	1,253.10	13

Scenario: AVG DAY DEMAND SKYSONG BUILDING 3
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	0.00	0.00	1,408.07	81
FH2	1,221.00	Zone	Demand	0.00	0.00	1,408.10	81
FH3	1,225.00	Zone	Demand	0.00	0.00	1,408.07	79
FH4	1,224.00	Zone	Demand	0.00	0.00	1,408.07	80
J-1	1,230.00	Zone	Demand	0.00	0.00	1,408.07	77
J-2	1,225.00	Zone	Demand	0.00	0.00	1,408.07	79
J-3	1,220.00	Zone	Demand	0.00	0.00	1,408.07	81
J-4	1,217.00	Zone	Demand	0.00	0.00	1,408.07	83
J-5	1,216.00	Zone	Demand	0.00	0.00	1,408.08	83
J-7	1,215.00	Zone	Demand	0.00	0.00	1,408.08	84
J-10	1,227.00	Zone	Demand	0.00	0.00	1,408.09	78
J-11	1,228.00	Zone	Demand	0.00	0.00	1,408.07	78
J-19	1,225.00	Zone	Demand	0.00	0.00	1,408.07	79
J-20	1,231.00	Zone	Demand	0.00	0.00	1,408.07	77
J-21	1,220.00	Zone	Demand	0.00	0.00	1,408.07	81
J-22	1,220.00	Zone	Demand	0.00	0.00	1,408.07	81
J-23	1,225.00	Zone	Demand	0.00	0.00	1,408.07	79
J-24	1,225.00	Zone	Demand	0.00	0.00	1,408.07	79
J-25	1,220.00	Zone	Demand	0.00	0.00	1,408.07	81
J-26	1,221.00	Zone	Demand	0.00	0.00	1,408.09	81
J-29	1,216.00	Zone	Demand	0.00	0.00	1,408.07	83
J-30	1,221.00	Zone	Demand	8.00	8.00	1,408.07	81
J-33	1,216.00	Zone	Demand	13.00	13.00	1,408.07	83
J-34	1,217.00	Zone	Demand	12.00	12.00	1,408.08	83
J-35	1,221.00	Zone	Demand	83.00	83.00	1,408.08	81
J-37	1,217.00	Zone	Demand	0.00	0.00	1,408.07	83
J-38	1,216.00	Zone	Demand	0.00	0.00	1,408.08	83
J-40	1,219.00	Zone	Demand	9.00	9.00	1,408.10	82
J-45	1,221.00	Zone	Demand	0.00	0.00	1,408.10	81
J-50	1,225.00	Zone	Demand	0.00	0.00	1,408.09	79
J-60	1,227.00	Zone	Demand	0.00	0.00	1,408.09	78
J-70	1,210.00	Zone	Demand	0.00	0.00	1,408.08	86
J-80	1,223.00	Zone	Demand	161.00	161.00	1,408.06	80
J-90	1,226.00	Zone	Demand	0.00	0.00	1,408.07	79
J-100	1,224.00	Zone	Demand	0.00	0.00	1,408.07	80
TEST HYDRANT	1,223.00	Zone	Demand	0.00	0.00	1,408.10	80

Scenario: MAX DAY DEMAND SKYSONG BUILDING 3

Steady State Analysis

Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	0.00	0.00	1,407.94	81
FH2	1,221.00	Zone	Demand	0.00	0.00	1,408.03	81
FH3	1,225.00	Zone	Demand	0.00	0.00	1,407.93	79
FH4	1,224.00	Zone	Demand	0.00	0.00	1,407.93	80
J-1	1,230.00	Zone	Demand	0.00	0.00	1,407.93	77
J-2	1,225.00	Zone	Demand	0.00	0.00	1,407.93	79
J-3	1,220.00	Zone	Demand	0.00	0.00	1,407.93	81
J-4	1,217.00	Zone	Demand	0.00	0.00	1,407.93	83
J-5	1,216.00	Zone	Demand	0.00	0.00	1,407.97	83
J-7	1,215.00	Zone	Demand	0.00	0.00	1,407.97	83
J-10	1,227.00	Zone	Demand	0.00	0.00	1,408.01	78
J-11	1,228.00	Zone	Demand	0.00	0.00	1,407.94	78
J-19	1,225.00	Zone	Demand	0.00	0.00	1,407.93	79
J-20	1,231.00	Zone	Demand	0.00	0.00	1,407.93	77
J-21	1,220.00	Zone	Demand	0.00	0.00	1,407.93	81
J-22	1,220.00	Zone	Demand	0.00	0.00	1,407.93	81
J-23	1,225.00	Zone	Demand	0.00	0.00	1,407.93	79
J-24	1,225.00	Zone	Demand	0.00	0.00	1,407.93	79
J-25	1,220.00	Zone	Demand	0.00	0.00	1,407.93	81
J-26	1,221.00	Zone	Demand	0.00	0.00	1,408.00	81
J-29	1,216.00	Zone	Demand	0.00	0.00	1,407.94	83
J-30	1,221.00	Zone	Demand	8.00	16.00	1,407.94	81
J-33	1,216.00	Zone	Demand	13.00	26.00	1,407.95	83
J-34	1,217.00	Zone	Demand	12.00	24.00	1,407.98	83
J-35	1,221.00	Zone	Demand	83.00	166.00	1,407.95	81
J-37	1,217.00	Zone	Demand	0.00	0.00	1,407.93	83
J-38	1,216.00	Zone	Demand	0.00	0.00	1,407.97	83
J-40	1,219.00	Zone	Demand	9.00	18.00	1,408.02	82
J-45	1,221.00	Zone	Demand	0.00	0.00	1,408.03	81
J-50	1,225.00	Zone	Demand	0.00	0.00	1,408.01	79
J-60	1,227.00	Zone	Demand	0.00	0.00	1,408.02	78
J-70	1,210.00	Zone	Demand	0.00	0.00	1,407.98	86
J-80	1,223.00	Zone	Demand	161.00	322.00	1,407.90	80
J-90	1,226.00	Zone	Demand	0.00	0.00	1,407.94	79
J-100	1,224.00	Zone	Demand	0.00	0.00	1,407.93	80
TEST HYDRANT	1,223.00	Zone	Demand	0.00	0.00	1,408.02	80

Scenario: PEAK HOUR DEMAND SKYSON BUILDING 3
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	0.00	0.00	1,407.43	81
FH2	1,221.00	Zone	Demand	0.00	0.00	1,407.68	81
FH3	1,225.00	Zone	Demand	0.00	0.00	1,407.41	79
FH4	1,224.00	Zone	Demand	0.00	0.00	1,407.40	79
J-1	1,230.00	Zone	Demand	0.00	0.00	1,407.40	77
J-2	1,225.00	Zone	Demand	0.00	0.00	1,407.40	79
J-3	1,220.00	Zone	Demand	0.00	0.00	1,407.40	81
J-4	1,217.00	Zone	Demand	0.00	0.00	1,407.40	82
J-5	1,216.00	Zone	Demand	0.00	0.00	1,407.50	83
J-7	1,215.00	Zone	Demand	0.00	0.00	1,407.52	83
J-10	1,227.00	Zone	Demand	0.00	0.00	1,407.63	78
J-11	1,228.00	Zone	Demand	0.00	0.00	1,407.42	78
J-19	1,225.00	Zone	Demand	0.00	0.00	1,407.40	79
J-20	1,231.00	Zone	Demand	0.00	0.00	1,407.40	76
J-21	1,220.00	Zone	Demand	0.00	0.00	1,407.40	81
J-22	1,220.00	Zone	Demand	0.00	0.00	1,407.40	81
J-23	1,225.00	Zone	Demand	0.00	0.00	1,407.40	79
J-24	1,225.00	Zone	Demand	0.00	0.00	1,407.40	79
J-25	1,220.00	Zone	Demand	0.00	0.00	1,407.40	81
J-26	1,221.00	Zone	Demand	0.00	0.00	1,407.59	81
J-29	1,216.00	Zone	Demand	0.00	0.00	1,407.43	83
J-30	1,221.00	Zone	Demand	8.00	28.00	1,407.43	81
J-33	1,216.00	Zone	Demand	13.00	45.50	1,407.45	83
J-34	1,217.00	Zone	Demand	12.00	42.00	1,407.54	82
J-35	1,221.00	Zone	Demand	83.00	290.50	1,407.46	81
J-37	1,217.00	Zone	Demand	0.00	0.00	1,407.41	82
J-38	1,216.00	Zone	Demand	0.00	0.00	1,407.52	83
J-40	1,219.00	Zone	Demand	9.00	31.50	1,407.66	82
J-45	1,221.00	Zone	Demand	0.00	0.00	1,407.67	81
J-50	1,225.00	Zone	Demand	0.00	0.00	1,407.63	79
J-60	1,227.00	Zone	Demand	0.00	0.00	1,407.64	78
J-70	1,210.00	Zone	Demand	0.00	0.00	1,407.53	85
J-80	1,223.00	Zone	Demand	161.00	563.50	1,407.32	80
J-90	1,226.00	Zone	Demand	0.00	0.00	1,407.42	78
J-100	1,224.00	Zone	Demand	0.00	0.00	1,407.40	79
TEST HYDRANT	1,223.00	Zone	Demand	0.00	0.00	1,407.66	80

Scenario: MAX DAY + FH1 & F

Fire Flow Analysis

Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	875.00	1,750.00	1,364.50	63
FH2	1,221.00	Zone	Demand	0.00	0.00	1,368.88	64
FH3	1,225.00	Zone	Demand	875.00	1,750.00	1,363.50	60
FH4	1,224.00	Zone	Demand	0.00	0.00	1,364.23	61
J-1	1,230.00	Zone	Demand	0.00	0.00	1,364.28	58
J-2	1,225.00	Zone	Demand	0.00	0.00	1,364.30	60
J-3	1,220.00	Zone	Demand	0.00	0.00	1,364.44	62
J-4	1,217.00	Zone	Demand	0.00	0.00	1,364.52	64
J-5	1,216.00	Zone	Demand	0.00	0.00	1,366.18	65
J-7	1,215.00	Zone	Demand	0.00	0.00	1,366.53	66
J-10	1,227.00	Zone	Demand	0.00	0.00	1,368.03	61
J-11	1,228.00	Zone	Demand	0.00	0.00	1,364.07	59
J-19	1,225.00	Zone	Demand	0.00	0.00	1,364.29	60
J-20	1,231.00	Zone	Demand	0.00	0.00	1,364.28	58
J-21	1,220.00	Zone	Demand	0.00	0.00	1,364.44	62
J-22	1,220.00	Zone	Demand	0.00	0.00	1,364.51	63
J-23	1,225.00	Zone	Demand	0.00	0.00	1,364.29	60
J-24	1,225.00	Zone	Demand	0.00	0.00	1,364.44	60
J-25	1,220.00	Zone	Demand	0.00	0.00	1,364.45	62
J-26	1,221.00	Zone	Demand	0.00	0.00	1,367.39	63
J-29	1,216.00	Zone	Demand	0.00	0.00	1,364.86	64
J-30	1,221.00	Zone	Demand	8.00	16.00	1,364.54	62
J-33	1,216.00	Zone	Demand	13.00	26.00	1,365.24	65
J-34	1,217.00	Zone	Demand	12.00	24.00	1,366.85	65
J-35	1,221.00	Zone	Demand	83.00	166.00	1,366.00	63
J-37	1,217.00	Zone	Demand	0.00	0.00	1,364.66	64
J-38	1,216.00	Zone	Demand	0.00	0.00	1,366.51	65
J-40	1,219.00	Zone	Demand	9.00	18.00	1,368.65	65
J-45	1,221.00	Zone	Demand	0.00	0.00	1,368.70	64
J-50	1,225.00	Zone	Demand	0.00	0.00	1,367.96	62
J-60	1,227.00	Zone	Demand	0.00	0.00	1,368.18	61
J-70	1,210.00	Zone	Demand	0.00	0.00	1,366.64	68
J-80	1,223.00	Zone	Demand	161.00	322.00	1,364.25	61
J-90	1,226.00	Zone	Demand	0.00	0.00	1,363.83	60
J-100	1,224.00	Zone	Demand	0.00	0.00	1,364.22	61
TEST HYDRANT	1,223.00	Zone	Demand	0.00	0.00	1,368.51	63

Scenario: MAX DAY + FH3 & F1

Fire Flow Analysis Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	0.00	0.00	1,364.79	63
FH2	1,221.00	Zone	Demand	0.00	0.00	1,368.88	64
FH3	1,225.00	Zone	Demand	875.00	1,750.00	1,362.43	59
FH4	1,224.00	Zone	Demand	875.00	1,750.00	1,362.86	60
J-1	1,230.00	Zone	Demand	0.00	0.00	1,363.21	58
J-2	1,225.00	Zone	Demand	0.00	0.00	1,363.22	60
J-3	1,220.00	Zone	Demand	0.00	0.00	1,363.64	62
J-4	1,217.00	Zone	Demand	0.00	0.00	1,363.89	64
J-5	1,216.00	Zone	Demand	0.00	0.00	1,366.11	65
J-7	1,215.00	Zone	Demand	0.00	0.00	1,366.47	66
J-10	1,227.00	Zone	Demand	0.00	0.00	1,367.89	61
J-11	1,228.00	Zone	Demand	0.00	0.00	1,363.06	58
J-19	1,225.00	Zone	Demand	0.00	0.00	1,363.23	60
J-20	1,231.00	Zone	Demand	0.00	0.00	1,363.22	57
J-21	1,220.00	Zone	Demand	0.00	0.00	1,363.64	62
J-22	1,220.00	Zone	Demand	0.00	0.00	1,363.85	62
J-23	1,225.00	Zone	Demand	0.00	0.00	1,363.23	60
J-24	1,225.00	Zone	Demand	0.00	0.00	1,363.65	60
J-25	1,220.00	Zone	Demand	0.00	0.00	1,363.67	62
J-26	1,221.00	Zone	Demand	0.00	0.00	1,367.28	63
J-29	1,216.00	Zone	Demand	0.00	0.00	1,364.77	64
J-30	1,221.00	Zone	Demand	8.00	16.00	1,364.79	62
J-33	1,216.00	Zone	Demand	13.00	26.00	1,365.15	65
J-34	1,217.00	Zone	Demand	12.00	24.00	1,366.80	65
J-35	1,221.00	Zone	Demand	83.00	166.00	1,366.18	63
J-37	1,217.00	Zone	Demand	0.00	0.00	1,364.24	64
J-38	1,216.00	Zone	Demand	0.00	0.00	1,366.45	65
J-40	1,219.00	Zone	Demand	9.00	18.00	1,368.64	65
J-45	1,221.00	Zone	Demand	0.00	0.00	1,368.67	64
J-50	1,225.00	Zone	Demand	0.00	0.00	1,367.82	62
J-60	1,227.00	Zone	Demand	0.00	0.00	1,368.05	61
J-70	1,210.00	Zone	Demand	0.00	0.00	1,366.57	68
J-80	1,223.00	Zone	Demand	161.00	322.00	1,363.28	61
J-90	1,226.00	Zone	Demand	0.00	0.00	1,362.79	59
J-100	1,224.00	Zone	Demand	0.00	0.00	1,363.10	60
TEST HYDRANT	1,223.00	Zone	Demand	0.00	0.00	1,368.45	63

Scenario: MAX DAY + FH1 & F

Fire Flow Analysis

Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
FH1	1,220.00	Zone	Demand	875.00	1,750.00	1,364.44	62
FH2	1,221.00	Zone	Demand	0.00	0.00	1,368.88	64
FH3	1,225.00	Zone	Demand	0.00	0.00	1,364.27	60
FH4	1,224.00	Zone	Demand	875.00	1,750.00	1,363.90	61
J-1	1,230.00	Zone	Demand	0.00	0.00	1,364.26	58
J-2	1,225.00	Zone	Demand	0.00	0.00	1,364.22	60
J-3	1,220.00	Zone	Demand	0.00	0.00	1,364.36	62
J-4	1,217.00	Zone	Demand	0.00	0.00	1,364.45	64
J-5	1,216.00	Zone	Demand	0.00	0.00	1,366.14	65
J-7	1,215.00	Zone	Demand	0.00	0.00	1,366.50	66
J-10	1,227.00	Zone	Demand	0.00	0.00	1,368.09	61
J-11	1,228.00	Zone	Demand	0.00	0.00	1,364.50	59
J-19	1,225.00	Zone	Demand	0.00	0.00	1,364.26	60
J-20	1,231.00	Zone	Demand	0.00	0.00	1,364.26	58
J-21	1,220.00	Zone	Demand	0.00	0.00	1,364.36	62
J-22	1,220.00	Zone	Demand	0.00	0.00	1,364.44	62
J-23	1,225.00	Zone	Demand	0.00	0.00	1,364.26	60
J-24	1,225.00	Zone	Demand	0.00	0.00	1,364.37	60
J-25	1,220.00	Zone	Demand	0.00	0.00	1,364.37	62
J-26	1,221.00	Zone	Demand	0.00	0.00	1,367.41	63
J-29	1,216.00	Zone	Demand	0.00	0.00	1,364.80	64
J-30	1,221.00	Zone	Demand	8.00	16.00	1,364.47	62
J-33	1,216.00	Zone	Demand	13.00	26.00	1,365.18	65
J-34	1,217.00	Zone	Demand	12.00	24.00	1,366.82	65
J-35	1,221.00	Zone	Demand	83.00	166.00	1,365.96	63
J-37	1,217.00	Zone	Demand	0.00	0.00	1,364.59	64
J-38	1,216.00	Zone	Demand	0.00	0.00	1,366.48	65
J-40	1,219.00	Zone	Demand	9.00	18.00	1,368.65	65
J-45	1,221.00	Zone	Demand	0.00	0.00	1,368.71	64
J-50	1,225.00	Zone	Demand	0.00	0.00	1,368.02	62
J-60	1,227.00	Zone	Demand	0.00	0.00	1,368.23	61
J-70	1,210.00	Zone	Demand	0.00	0.00	1,366.61	68
J-80	1,223.00	Zone	Demand	161.00	322.00	1,364.18	61
J-90	1,226.00	Zone	Demand	0.00	0.00	1,364.40	60
J-100	1,224.00	Zone	Demand	0.00	0.00	1,364.15	61
TEST HYDRANT	1,223.00	Zone	Demand	0.00	0.00	1,368.54	63

Scenario: AVG DAY DEMAND SKYSONG BUILDING 3
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Discharge (gpm)	Velocity (ft/s)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-2	705.00	12	140.0	7.79	0.02	0.00	0.00
P-3	644.00	12	140.0	7.41	0.02	0.00	0.00
P-4	675.00	12	130.0	5.13	0.01	0.00	0.00
P-6	83.00	12	130.0	-77.06	0.22	0.00	0.02
P-7	74.00	8	130.0	-7.07	0.05	0.00	0.00
P-8	119.00	6	140.0	-7.07	0.08	0.00	0.01
P-10	291.00	8	130.0	-7.07	0.05	0.00	0.00
P-11	630.00	8	130.0	33.17	0.21	0.02	0.03
P-12	649.00	8	130.0	8.44	0.05	0.00	0.00
P-20	199.00	12	130.0	24.73	0.07	0.00	0.00
P-22	280.00	12	130.0	86.81	0.25	0.01	0.03
P-23	362.00	12	130.0	-74.19	0.21	0.01	0.02
P-24	62.00	12	130.0	90.99	0.26	0.00	0.03
P-27	149.00	12	130.0	-40.24	0.11	0.00	0.01
P-31	992.00	18	140.0	-0.65	0.00	0.00	0.00
P-32	4,200.00	12	130.0	-0.65	0.00	0.00	0.00
P-34	44.00	12	140.0	2.28	0.01	0.00	0.00
P-35	673.00	8	140.0	1.73	0.01	0.00	0.00
P-36	47.00	8	140.0	2.93	0.02	0.00	0.00
P-37	1,668.00	18	140.0	0.65	0.00	0.00	0.00
P-38	4,200.00	6	140.0	0.65	0.01	0.00	0.00
P-39	1,268.00	12	140.0	-0.55	0.00	0.00	0.00
P-40	1,267.00	8	140.0	-1.21	0.01	0.00	0.00
P-41	674.00	12	140.0	-1.21	0.00	0.00	0.00
P-42	831.00	6	140.0	-7.07	0.08	0.01	0.01
P-43	629.00	6	140.0	-7.07	0.08	0.00	0.01
P-44	120.00	12	130.0	-40.24	0.11	0.00	0.01
P-45	283.00	12	130.0	-40.24	0.11	0.00	0.01
P-46	162.00	12	130.0	-40.24	0.11	0.00	0.01
P-49	579.00	12	130.0	-2.06	0.01	0.00	0.00
P-51	214.00	12	130.0	61.70	0.18	0.00	0.01
P-52	63.00	12	130.0	10.06	0.03	0.00	0.00
P-53	81.00	12	130.0	-66.12	0.19	0.00	0.02
P-54	120.00	12	130.0	-66.12	0.19	0.00	0.02
P-56	97.00	12	130.0	-64.06	0.18	0.00	0.02
P-57	234.00	12	130.0	-77.06	0.22	0.01	0.02
P-58	502.00	12	130.0	81.99	0.23	0.01	0.02
P-59	97.00	12	130.0	69.99	0.20	0.00	0.02
P-60	51.00	16	130.0	286.00	0.46	0.00	0.06
P-61	57.00	16	130.0	286.00	0.46	0.00	0.06
P-62	267.00	12	130.0	154.76	0.44	0.02	0.08
P-63	161.00	12	130.0	71.76	0.20	0.00	0.02
P-64	264.00	12	130.0	24.73	0.07	0.00	0.00
P-65	249.00	12	130.0	24.73	0.07	0.00	0.00
P-66	58.00	12	130.0	-0.38	0.00	0.00	0.00
P-67	604.00	12	130.0	-0.38	0.00	0.00	0.00

Scenario: MAX DAY DEMAND SKYSONG BUILDING 3

Steady State Analysis

Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Discharge (gpm)	Velocity (ft/s)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-2	705.00	12	140.0	15.58	0.04	0.00	0.00
P-3	644.00	12	140.0	14.81	0.04	0.00	0.00
P-4	675.00	12	130.0	10.29	0.03	0.00	0.00
P-6	83.00	12	130.0	-154.13	0.44	0.01	0.08
P-7	74.00	8	130.0	-14.14	0.09	0.00	0.01
P-8	119.00	6	140.0	-14.14	0.16	0.00	0.02
P-10	291.00	8	130.0	-14.14	0.09	0.00	0.01
P-11	630.00	8	130.0	66.34	0.42	0.08	0.12
P-12	649.00	8	130.0	16.89	0.11	0.01	0.01
P-20	199.00	12	130.0	49.46	0.14	0.00	0.01
P-22	280.00	12	130.0	173.63	0.49	0.03	0.10
P-23	362.00	12	130.0	-148.37	0.42	0.03	0.07
P-24	62.00	12	130.0	181.99	0.52	0.01	0.11
P-27	149.00	12	130.0	-80.48	0.23	0.00	0.02
P-31	992.00	18	140.0	-1.31	0.00	0.00	0.00
P-32	4,200.00	12	130.0	-1.31	0.00	0.00	0.00
P-34	44.00	12	140.0	4.52	0.01	0.00	0.00
P-35	673.00	8	140.0	3.47	0.02	0.00	0.00
P-36	47.00	8	140.0	5.82	0.04	0.00	0.00
P-37	1,668.00	18	140.0	1.31	0.00	0.00	0.00
P-38	4,200.00	6	140.0	1.31	0.01	0.00	0.00
P-39	1,268.00	12	140.0	-1.05	0.00	0.00	0.00
P-40	1,267.00	8	140.0	-2.36	0.02	0.00	0.00
P-41	674.00	12	140.0	-2.36	0.01	0.00	0.00
P-42	831.00	6	140.0	-14.14	0.16	0.02	0.02
P-43	629.00	6	140.0	-14.14	0.16	0.02	0.02
P-44	120.00	12	130.0	-80.48	0.23	0.00	0.02
P-45	283.00	12	130.0	-80.48	0.23	0.01	0.02
P-46	162.00	12	130.0	-80.48	0.23	0.00	0.02
P-49	579.00	12	130.0	-4.13	0.01	0.00	0.00
P-51	214.00	12	130.0	123.40	0.35	0.01	0.05
P-52	63.00	12	130.0	20.13	0.06	0.00	0.00
P-53	81.00	12	130.0	-132.25	0.38	0.00	0.06
P-54	120.00	12	130.0	-132.25	0.38	0.01	0.06
P-56	97.00	12	130.0	-128.13	0.36	0.01	0.06
P-57	234.00	12	130.0	-154.13	0.44	0.02	0.08
P-58	502.00	12	130.0	163.99	0.47	0.04	0.09
P-59	97.00	12	130.0	139.99	0.40	0.01	0.07
P-60	51.00	16	130.0	572.00	0.91	0.01	0.22
P-61	57.00	16	130.0	572.00	0.91	0.01	0.22
P-62	267.00	12	130.0	309.53	0.88	0.08	0.29
P-63	161.00	12	130.0	143.53	0.41	0.01	0.07
P-64	264.00	12	130.0	49.46	0.14	0.00	0.01
P-65	249.00	12	130.0	49.46	0.14	0.00	0.01
P-66	58.00	12	130.0	-0.77	0.00	0.00	0.00
P-67	604.00	12	130.0	-0.77	0.00	0.00	0.00

Scenario: PEAK HOUR DEMAND SKYSON BUILDING 3
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Discharge (gpm)	Velocity (ft/s)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-2	705.00	12	140.0	27.26	0.08	0.00	0.00
P-3	644.00	12	140.0	25.91	0.07	0.00	0.00
P-4	675.00	12	130.0	18.01	0.05	0.00	0.00
P-6	83.00	12	130.0	-269.72	0.77	0.02	0.23
P-7	74.00	8	130.0	-24.74	0.16	0.00	0.02
P-8	119.00	6	140.0	-24.74	0.28	0.01	0.07
P-10	291.00	8	130.0	-24.74	0.16	0.01	0.02
P-11	630.00	8	130.0	116.10	0.74	0.21	0.34
P-12	649.00	8	130.0	29.55	0.19	0.02	0.03
P-20	199.00	12	130.0	86.55	0.25	0.01	0.03
P-22	280.00	12	130.0	303.85	0.86	0.08	0.28
P-23	362.00	12	130.0	-259.65	0.74	0.08	0.21
P-24	62.00	12	130.0	318.48	0.90	0.02	0.31
P-27	149.00	12	130.0	-140.85	0.40	0.01	0.07
P-31	992.00	18	140.0	-2.29	0.00	0.00	0.00
P-32	4,200.00	12	130.0	-2.29	0.01	0.00	0.00
P-34	44.00	12	140.0	7.90	0.02	0.00	0.00
P-35	673.00	8	140.0	6.07	0.04	0.00	0.00
P-36	47.00	8	140.0	10.19	0.07	0.00	0.01
P-37	1,668.00	18	140.0	2.29	0.00	0.00	0.00
P-38	4,200.00	6	140.0	2.29	0.03	0.00	0.00
P-39	1,268.00	12	140.0	-1.83	0.01	0.00	0.00
P-40	1,267.00	8	140.0	-4.12	0.03	0.00	0.00
P-41	674.00	12	140.0	-4.12	0.01	0.00	0.00
P-42	831.00	6	140.0	-24.74	0.28	0.06	0.07
P-43	629.00	6	140.0	-24.74	0.28	0.04	0.07
P-44	120.00	12	130.0	-140.85	0.40	0.01	0.07
P-45	283.00	12	130.0	-140.85	0.40	0.02	0.07
P-46	162.00	12	130.0	-140.85	0.40	0.01	0.07
P-49	579.00	12	130.0	-7.22	0.02	0.00	0.00
P-51	214.00	12	130.0	215.95	0.61	0.03	0.15
P-52	63.00	12	130.0	35.22	0.10	0.00	0.01
P-53	81.00	12	130.0	-231.45	0.66	0.01	0.17
P-54	120.00	12	130.0	-231.45	0.66	0.02	0.17
P-56	97.00	12	130.0	-224.22	0.64	0.02	0.16
P-57	234.00	12	130.0	-269.72	0.77	0.05	0.22
P-58	502.00	12	130.0	286.98	0.81	0.13	0.25
P-59	97.00	12	130.0	244.98	0.69	0.02	0.19
P-60	51.00	16	130.0	1,001.00	1.60	0.03	0.62
P-61	57.00	16	130.0	1,001.00	1.60	0.04	0.63
P-62	267.00	12	130.0	541.67	1.54	0.22	0.81
P-63	161.00	12	130.0	251.17	0.71	0.03	0.20
P-64	264.00	12	130.0	86.55	0.25	0.01	0.03
P-65	249.00	12	130.0	86.55	0.25	0.01	0.03
P-66	58.00	12	130.0	-1.35	0.00	0.00	0.00
P-67	604.00	12	130.0	-1.35	0.00	0.00	0.00

Scenario: MAX DAY + FH1 & F2

Fire Flow Analysis

Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Discharge (gpm)	Velocity (ft/s)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-2	705.00	12	140.0	-95.21	0.27	0.02	0.03
P-3	644.00	12	140.0	-283.49	0.80	0.14	0.21
P-4	675.00	12	130.0	-192.97	0.55	0.08	0.12
P-6	83.00	12	130.0	-1,282.49	3.64	0.33	4.02
P-7	74.00	8	130.0	-99.76	0.64	0.02	0.26
P-8	119.00	6	140.0	-99.76	1.13	0.11	0.90
P-10	291.00	8	130.0	-99.76	0.64	0.07	0.26
P-11	630.00	8	130.0	562.55	3.59	3.97	6.29
P-12	649.00	8	130.0	-113.07	0.72	0.21	0.32
P-20	199.00	12	130.0	675.62	1.92	0.24	1.23
P-22	280.00	12	130.0	-187.58	0.53	0.03	0.11
P-23	362.00	12	130.0	-509.58	1.45	0.26	0.73
P-24	62.00	12	130.0	1,224.73	3.47	0.23	3.69
P-27	149.00	12	130.0	-662.31	1.88	0.18	1.18
P-31	992.00	18	140.0	17.87	0.02	0.00	0.00
P-32	4,200.00	12	130.0	17.87	0.05	0.01	0.00
P-34	44.00	12	140.0	-90.52	0.26	0.00	0.02
P-35	673.00	8	140.0	-65.03	0.42	0.07	0.10
P-36	47.00	8	140.0	-108.39	0.69	0.01	0.26
P-37	1,668.00	18	140.0	-17.87	0.02	0.00	0.00
P-38	4,200.00	6	140.0	-17.87	0.20	0.16	0.04
P-39	1,268.00	12	140.0	25.49	0.07	0.00	0.00
P-40	1,267.00	8	140.0	43.36	0.28	0.06	0.05
P-41	674.00	12	140.0	43.36	0.12	0.00	0.01
P-42	831.00	6	140.0	-99.76	1.13	0.75	0.91
P-43	629.00	6	140.0	-99.76	1.13	0.57	0.90
P-44	120.00	12	130.0	-662.31	1.88	0.14	1.18
P-45	283.00	12	130.0	-662.31	1.88	0.33	1.18
P-46	162.00	12	130.0	-662.31	1.88	0.19	1.18
P-49	579.00	12	130.0	445.55	1.26	0.33	0.57
P-51	214.00	12	130.0	698.51	1.98	0.28	1.30
P-52	63.00	12	130.0	-429.55	1.22	0.03	0.53
P-53	81.00	12	130.0	-810.94	2.30	0.14	1.72
P-54	120.00	12	130.0	-810.94	2.30	0.21	1.72
P-56	97.00	12	130.0	-1,256.49	3.56	0.38	3.87
P-57	234.00	12	130.0	-1,282.49	3.64	0.94	4.02
P-58	502.00	12	130.0	1,206.73	3.42	1.80	3.59
P-59	97.00	12	130.0	1,182.73	3.36	0.34	3.46
P-60	51.00	16	130.0	4,072.00	6.50	0.43	8.41
P-61	57.00	16	130.0	4,072.00	6.50	0.48	8.41
P-62	267.00	12	130.0	2,184.96	6.20	2.88	10.78
P-63	161.00	12	130.0	2,018.96	5.73	1.50	9.31
P-64	264.00	12	130.0	675.62	1.92	0.32	1.23
P-65	249.00	12	130.0	-1,074.38	3.05	0.72	2.89
P-66	58.00	12	130.0	-188.29	0.53	0.01	0.12
P-67	604.00	12	130.0	-188.29	0.53	0.07	0.11

Scenario: MAX DAY + FH3 & F

Fire Flow Analysis Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Discharge (gpm)	Velocity (ft/s)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-2	705.00	12	140.0	-62.11	0.18	0.01	0.01
P-3	644.00	12	140.0	-518.12	1.47	0.42	0.65
P-4	675.00	12	130.0	-351.46	1.00	0.25	0.37
P-6	83.00	12	130.0	-1,295.70	3.68	0.34	4.10
P-7	74.00	8	130.0	-96.65	0.62	0.02	0.24
P-8	119.00	6	140.0	-96.65	1.10	0.10	0.85
P-10	291.00	8	130.0	-96.65	0.62	0.07	0.24
P-11	630.00	8	130.0	625.42	3.99	4.82	7.66
P-12	649.00	8	130.0	-92.70	0.59	0.14	0.22
P-20	199.00	12	130.0	718.13	2.04	0.27	1.37
P-22	280.00	12	130.0	-478.27	1.36	0.18	0.65
P-23	362.00	12	130.0	-800.27	2.27	0.61	1.68
P-24	62.00	12	130.0	1,241.05	3.52	0.23	3.78
P-27	149.00	12	130.0	-722.07	2.05	0.21	1.39
P-31	992.00	18	140.0	30.59	0.04	0.00	0.00
P-32	4,200.00	12	130.0	30.59	0.09	0.02	0.00
P-34	44.00	12	140.0	-166.66	0.47	0.00	0.08
P-35	673.00	8	140.0	-118.44	0.76	0.21	0.31
P-36	47.00	8	140.0	-197.25	1.26	0.04	0.79
P-37	1,668.00	18	140.0	-30.59	0.04	0.00	0.00
P-38	4,200.00	6	140.0	-30.59	0.35	0.43	0.10
P-39	1,268.00	12	140.0	48.21	0.14	0.01	0.01
P-40	1,267.00	8	140.0	78.81	0.50	0.18	0.14
P-41	674.00	12	140.0	78.81	0.22	0.01	0.02
P-42	831.00	6	140.0	-96.65	1.10	0.71	0.85
P-43	629.00	6	140.0	-96.65	1.10	0.54	0.85
P-44	120.00	12	130.0	-722.07	2.05	0.17	1.39
P-45	283.00	12	130.0	-722.07	2.05	0.39	1.39
P-46	162.00	12	130.0	-722.07	2.05	0.22	1.39
P-49	579.00	12	130.0	-79.28	0.22	0.01	0.02
P-51	214.00	12	130.0	1,847.60	5.24	1.69	7.90
P-52	63.00	12	130.0	95.28	0.27	0.00	0.03
P-53	81.00	12	130.0	-1,348.98	3.83	0.36	4.41
P-54	120.00	12	130.0	-1,348.98	3.83	0.53	4.41
P-56	97.00	12	130.0	-1,269.70	3.60	0.38	3.94
P-57	234.00	12	130.0	-1,295.70	3.68	0.96	4.10
P-58	502.00	12	130.0	1,223.05	3.47	1.85	3.68
P-59	97.00	12	130.0	1,199.05	3.40	0.34	3.55
P-60	51.00	16	130.0	4,072.00	6.50	0.43	8.41
P-61	57.00	16	130.0	4,072.00	6.50	0.48	8.41
P-62	267.00	12	130.0	2,108.88	5.98	2.70	10.09
P-63	161.00	12	130.0	1,942.88	5.51	1.40	8.67
P-64	264.00	12	130.0	718.13	2.04	0.36	1.37
P-65	249.00	12	130.0	-1,031.87	2.93	0.67	2.69
P-66	58.00	12	130.0	1,293.99	3.67	0.24	4.09
P-67	604.00	12	130.0	-456.01	1.29	0.36	0.59

Fire Flow Analysis

Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Discharge (gpm)	Velocity (ft/s)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)
P-2	705.00	12	140.0	136.07	0.39	0.04	0.06
P-3	644.00	12	140.0	-292.28	0.83	0.15	0.23
P-4	675.00	12	130.0	-196.68	0.56	0.08	0.12
P-6	83.00	12	130.0	-1,294.60	3.67	0.34	4.09
P-7	74.00	8	130.0	-102.96	0.66	0.02	0.27
P-8	119.00	6	140.0	-102.96	1.17	0.11	0.96
P-10	291.00	8	130.0	-102.96	0.66	0.08	0.27
P-11	630.00	8	130.0	533.83	3.41	3.60	5.71
P-12	649.00	8	130.0	121.49	0.78	0.24	0.37
P-20	199.00	12	130.0	412.34	1.17	0.10	0.49
P-22	280.00	12	130.0	-192.89	0.55	0.03	0.12
P-23	362.00	12	130.0	-514.89	1.46	0.27	0.74
P-24	62.00	12	130.0	1,233.64	3.50	0.23	3.74
P-27	149.00	12	130.0	-636.79	1.81	0.16	1.10
P-31	992.00	18	140.0	14.57	0.02	0.00	0.00
P-32	4,200.00	12	130.0	14.57	0.04	0.00	0.00
P-34	44.00	12	140.0	-95.59	0.27	0.00	0.03
P-35	673.00	8	140.0	-66.28	0.42	0.07	0.10
P-36	47.00	8	140.0	-110.17	0.70	0.01	0.27
P-37	1,668.00	18	140.0	-14.57	0.02	0.00	0.00
P-38	4,200.00	6	140.0	-14.57	0.17	0.11	0.03
P-39	1,268.00	12	140.0	29.32	0.08	0.00	0.00
P-40	1,267.00	8	140.0	43.89	0.28	0.06	0.05
P-41	674.00	12	140.0	43.89	0.12	0.00	0.01
P-42	831.00	6	140.0	-102.96	1.17	0.80	0.96
P-43	629.00	6	140.0	-102.96	1.17	0.60	0.96
P-44	120.00	12	130.0	-636.79	1.81	0.13	1.10
P-45	283.00	12	130.0	-636.79	1.81	0.31	1.10
P-46	162.00	12	130.0	-636.79	1.81	0.18	1.10
P-49	579.00	12	130.0	446.86	1.27	0.33	0.57
P-51	214.00	12	130.0	716.43	2.03	0.29	1.37
P-52	63.00	12	130.0	-430.86	1.22	0.03	0.53
P-53	81.00	12	130.0	-821.74	2.33	0.14	1.76
P-54	120.00	12	130.0	-821.74	2.33	0.21	1.76
P-56	97.00	12	130.0	-1,268.60	3.60	0.38	3.94
P-57	234.00	12	130.0	-1,294.60	3.67	0.96	4.09
P-58	502.00	12	130.0	1,215.64	3.45	1.83	3.64
P-59	97.00	12	130.0	1,191.64	3.38	0.34	3.51
P-60	51.00	16	130.0	4,072.00	6.50	0.43	8.41
P-61	57.00	16	130.0	4,072.00	6.50	0.48	8.41
P-62	267.00	12	130.0	2,201.57	6.25	2.92	10.93
P-63	161.00	12	130.0	2,035.57	5.77	1.52	9.45
P-64	264.00	12	130.0	412.34	1.17	0.13	0.49
P-65	249.00	12	130.0	412.34	1.17	0.12	0.49
P-66	58.00	12	130.0	1,321.66	3.75	0.25	4.25
P-67	604.00	12	130.0	-428.34	1.22	0.32	0.53

Scenario: Calibration Normal Pressure Flow
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	0.00	Zone	1,221.00

Scenario: Calibration from Fire Flow Test X1 & X2
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	1,403.90	Zone	1,221.00

Scenario: Calibration Available Flow 20 PSI
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	6,000.00	Zone	1,221.00

Scenario: AVG DAY DEMAND SKYSONG BUILDING 3
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	286.00	Zone	1,221.00

Scenario: MAX DAY DEMAND SKYSONG BUILDING 3
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	572.00	Zone	1,221.00

Scenario: PEAK HOUR DEMAND SKYSON BUILDING 3
 Steady State Analysis
 Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	1,001.00	Zone	1,221.00

Scenario: MAX DAY + FH1 & F
Fire Flow Analysis
Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	4,072.00	Zone	1,221.00

Fire Flow Analysis

Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	4,072.00	Zone	1,221.00

Scenario: MAX DAY + FH1 & F
Fire Flow Analysis
Reservoir Report

Label	Elevation (ft)	Outflow (gpm)	Zone	Calculated Hydraulic Grade (ft)
COS WATER SYS1	1,221.00	4,072.00	Zone	1,221.00

Scenario: Calibration Normal Pressure No Flow

Steady State Analysis

Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,221.00	1,408.11	0.00	81	0.00

Scenario: Calibration from Fire Flow Test X1 & X2
Steady State Analysis
Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,220.94	1,406.94	1,403.90	80	1,403.90

Scenario: Calibration Available Flow 20 PSI
Steady State Analysis
Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,220.12	1,268.12	6,000.00	20	6,000.00

Scenario: AVG DAY DEMAND SKYSONG BUILDING 3
Steady State Analysis
Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,221.00	1,408.10	286.00	81	286.00

Scenario: MAX DAY DEMAND SKYSONG BUILDING 3
Steady State Analysis
Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,220.99	1,408.04	572.00	81	572.00

Scenario: PEAK HOUR DEMAND SKYSON BUILDING 3
Steady State Analysis
Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,220.97	1,407.72	1,001.00	81	1,001.00

Scenario: MAX DAY + FH1 & F

Fire Flow Analysis

Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,220.57	1,369.36	4,072.00	64	4,072.00

Scenario: MAX DAY + FH3 & F

Fire Flow Analysis

Pump Report

Label	Elevation (ft)	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Discharge Pump Pressure (psi)	Discharge (Absolute Value) (gpm)
COS WATER SYS2	1,221.00	1,220.57	1,369.36	4,072.00	64	4,072.00

From:

02/18/2008 09:53

#794 P.003/003



WESTERN STATES FIRE PROTECTION CO.

2026 West Lone Cactus Drive
Phoenix, AZ 85027

Phone: (502) 272-2200
Fax: (502) 272-7972

LOCATION Wood, Patel, & Associates Inc

1855 N. Stapley Dr.

Mesa, Az. 85203

Sky Vista (Scottsdale Rd. & Enterprise Dr.) Job # 083117

DATE: 02/15/08

TIME: 9:00AM

Report: 2

Technician: BW/PK

Static Hydrant Number: X2

Elevation: 0

Flowing Hydrant Number: X1

Elevation: 0

Dist. Between Hydrants: 200'

Diameter of Main: 6"

Outlet Diameter: 2.5"

Type of Supply: CITY WATER

Number Flowing: 1

Coeff. of Discharge: 0.90

Static Pressure: 81.00

Residual Pressure: 80

Pitot Reading: 70.00

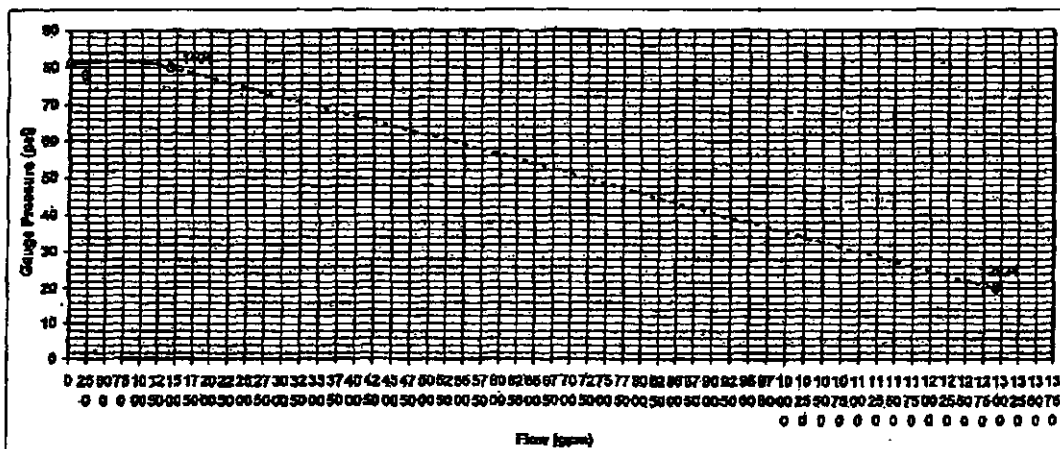
Flow: 1403.9 gpm

Pump Present: N/A

Tank Present: N/A

Flow at 20 psi: 12824.2 gpm

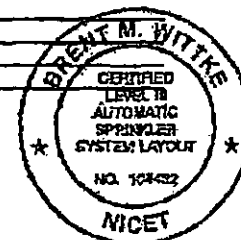
Static pressure of 81 psi @ 0 gpm
Residual pressure of 80 psi @ 1403.9 gpm
Available flow @ 20 psi - ##### gpm



Comments:

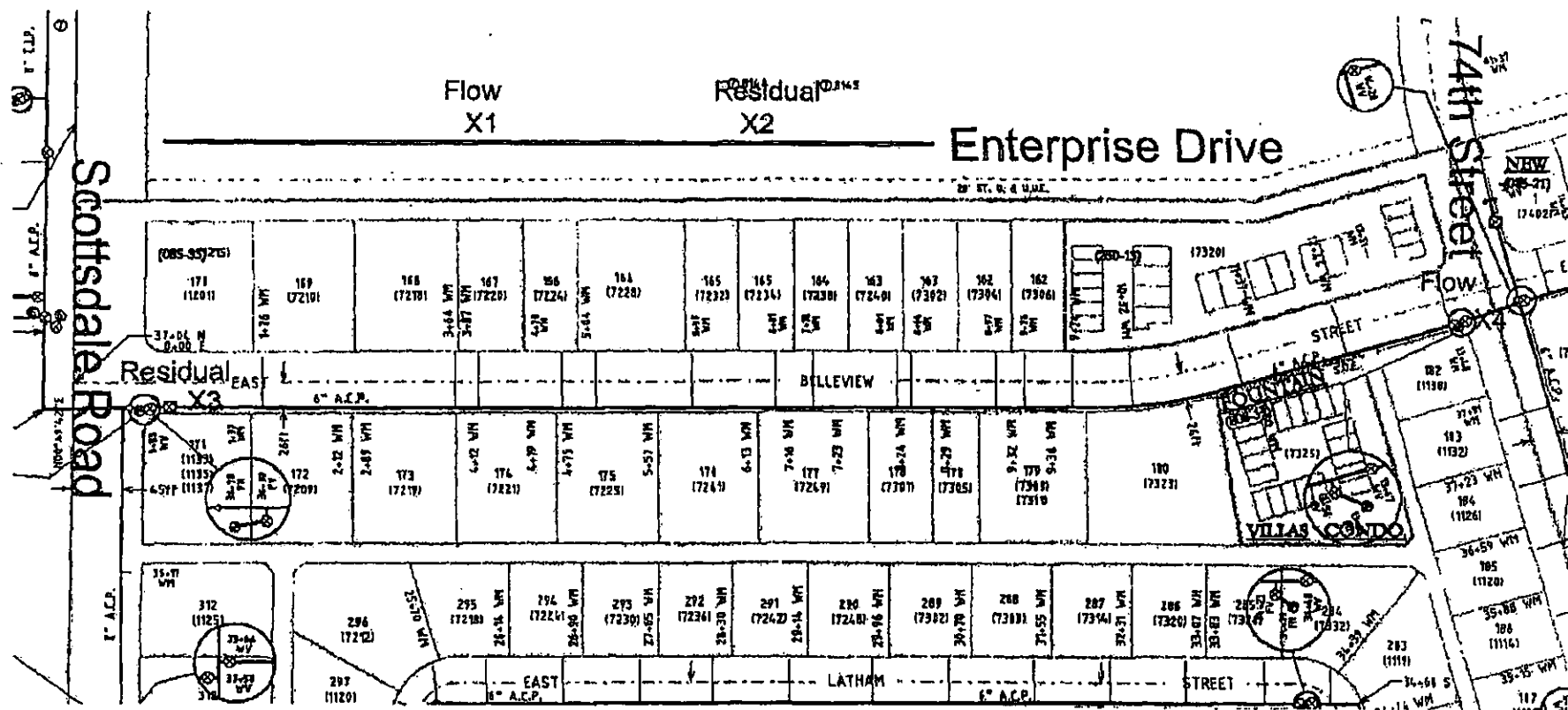
NOTES:

1. Flowing hydrant is assumed to be on a circulating main or downstream of the pressure test hydrant on a dead-end system.
2. Flow analysis assumes a gravity flow system with no distribution pumps and having no demand other than the test.
3. The distance between hydrants, elevations & main diameters are for information only.



THIS WDFX WAS PREPARED BY ME
OR UNDER MY SUPERVISION, AND
CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY SUPERVISION.

Signature



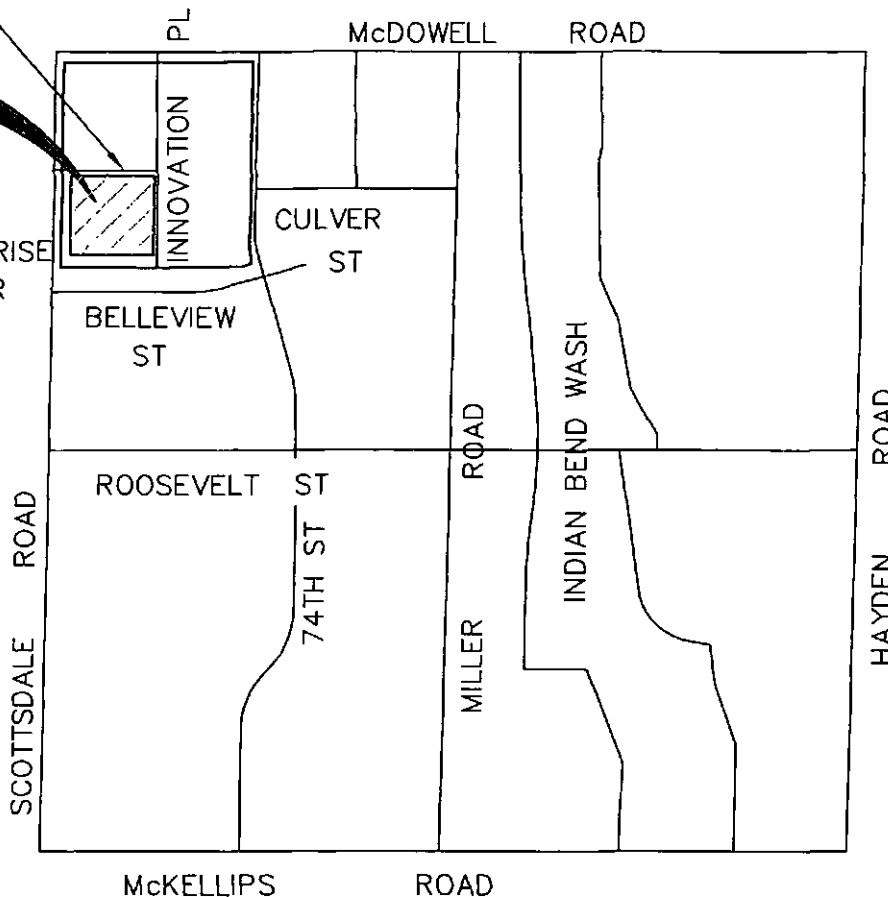
SkyVista - WP# 083117

VICINITY MAP

SKYSONG
BOULEVARD

SITE

ENTERPRISE
DR



VICINITY MAP

N.T.S.

VICINITY MAP

SKYSONG BUILDING #3
SCOTTSDALE, AZ

ENGINEER J. BULKA
DESIGNER J. PENROD
CAD TECHNICIAN J. SANCHEZ

SCALE NTS
DATE 5/6/09
JOB NUMBER 062663.30
REF. SHEET 1 OF 1

WOOD/PATEL

LAND DEVELOPMENT • WATER RESOURCES
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WATER DISTRIBUTION SYSTEM EXHIBIT

