Appendix W

Convention and Event Center Project Water System Technical Report

kpff Consulting Engineers

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1.0 INTRODUCTION

1.1 Project Description

The Convention and Event Center Project (hereafter referred to as the "Proposed Project") consists of the following three components: (1) expansion and modernization of the Los Angeles Convention Center (hereafter referred to as the "Convention Center"), (2) the construction of a new multi-use entertainment and sports facility (hereafter referred to as the "Event Center"), and (3) related parking and support facilities. The Proposed Project is located within an approximately 68-acre site that includes all of the existing Convention Center property, including the Bond Street Parking Lot and the Cherry Street Parking Garage, STAPLES Center, as well as the air space over Pico Boulevard and L.A. Live Way (hereafter referred to as the "Project Site"). The Project Site is generally bounded by the following major roadways: the I-110 Harbor Freeway to the west; Chick Hearn Court to the north; Figueroa Street to the east; and Venice Boulevard to the south.

With the implementation of the Proposed Project, the Project Site would function as a unified center for convention, sports and entertainment uses. The Proposed Project is proposed to be implemented through adoption of a new Specific Plan and Community Plan Amendment. Although the Specific Plan encompasses the entire Project Site, its primary focus would be on the regulation of the proposed buildings and related features, including signage, as well as the regulation of transportation and parking. In addition, notable elements of environmental sustainability would be comprehensively integrated into the Proposed Project and would be one of the key elements that would guide the design of the Proposed Project. Total building square footage to be constructed under the Proposed Project would be approximately 1.74 million square feet of net new gross floor area. A brief overview of each of the Proposed Project's three components is provided below.

The Proposed Project's first component would involve the demolition and replacement of the Convention Center's existing West and Petree Halls. The new structure (hereafter referred to as "New Hall"), would bridge over a portion of Pico Boulevard such that it would adjoin the Convention Center's existing South Hall and would consist of roughly the same amount of square footage as the former West and Petree Halls. While the total square footage would be comparable, the amount of functional space would substantially increase through a more efficient building design that among other benefits results in a substantial increase in contiguous floor space for the Convention Center.

The Proposed Project's second component is the development of the Event Center, a multi-purpose, entertainment and sports facility with a potentially retractable roof on the site of the former West and Petree Halls. The approximately 1,750,000 square-foot structure would include approximately 72,000 permanent seats with expandable seating capacity to approximately 76,250 seats for major marquee events, such as a Super Bowl. The Event Center would also be available for use as Convention Center exhibit and meeting room space, when not used for spectator events,

providing roughly 245,650 square feet of rentable exhibition and meeting room space.

The Proposed Project's third component would involve the construction of new larger, more efficient parking facilities on the existing Bond Street Parking Lot and Cherry Street Garage sites. As the West Hall would be demolished, the existing 1,625 parking spaces under the West Hall would be removed by the Proposed Project. The existing Cherry Street Garage would be rebuilt and expanded from the existing 858 spaces to approximately 2,950 parking spaces. A new parking garage would be constructed on the existing Bond Street Parking Lot, which would increase parking on that site from approximately 283 to approximately 928 parking spaces. These improvements would result in a net increase of approximately 1,121 parking spaces. Additionally, above-ground pedestrian bridges would provide connectivity between these parking structures and the Event Center and New Hall, as well as to LA Live Way.

In addition to the above improvements, the Proposed Project includes up to approximately 100,000 square feet of renovations to the existing Concourse building. Changes to the Convention Center's existing South Hall would be limited to its interface with the proposed New Hall. Existing parking under the South Hall and in the Convention Center's Venice Garage would not be affected by the Proposed Project. Street vacations involving portions of Pico Boulevard, LA Live Way, Bond Street and 12th Street would also occur under the Proposed Project.

The Proposed Project also includes approximately 4,317 square feet of landscape areas associated with the Event Center Plaza, approximately 69,485 square feet of landscape areas for the Gil Lindsay Plaza, and approximately 40,656 square feet of landscape areas along LA Live Way.

1.2 Scope of Work

As a part of the Environmental Impact Report for the proposed Farmers Field project, the purpose of this study is to analyze the potential impact of the project to the existing water supply and water system.

2.0 ENVIRONMENTAL SETTING

2.1 Regional Conditions

The City of Los Angeles Department of Water and Power (LADWP) is responsible for providing water supply to the City while complying with Local, State, and Federal regulations.

LADWP's water supply comes from the following sources: the Los Angeles Aqueduct, local groundwater, purchased imported water from the Metropolitan Water District (MWD), and recycled water. The Los Angeles Aqueduct has been the primary source of the City's water supply. In recent years, however, the amount of water supplies from the Los Angeles Aqueduct has been limited due to environmental concerns, and the City's water supply relied heavily (average of 52% in recent years) on the purchased water from MWD and delivered from the Colorado River or from the Sacramento-San Joaquin Delta. Local ground water has been reliable local water source, providing an average of 12% of the total water supply, but there have been concerns in recent years due to declining groundwater level and contamination issues. Lastly, the City's recycled water supply is limited to specific projects within the City at this time. (LADWP, 2010 Urban Water Management Plan)

Below are the State and Regional water supply regulations.

Metropolitan Water District (MWD) official reports and policies as outlined in its Regional Urban Water Management Plan, Water Surplus and Drought Management Plan, Water Supply Allocation Plan, and Integrated Resources Plan.

California Code of Regulations, Title 20, Chapter 4, Article 4, Section 1605 establishes water efficiency standards for all new plumbing fixtures and Section 1608 prohibits the sale of fixtures that do not comply with the regulations.

2007 California Green Building Standards Code, CCR, Title 24, Part 11, adopted on July 17, 2008, requires a water use reduction of 20% above the prescribed limits of the Energy Policy Act of 2005. The code applies to family homes, state buildings, health facilities, and commercial buildings.

California Urban Water Management Planning Act of 1984 requires water suppliers to adopt an Urban Water Management Plan (UWMP). LADWP's 2010 Urban Water Management Plan outlines the City's long-term water resources management strategy. The plan was presented for adoption by the LADWP Board of Commissioners in May 2011.

Senate Bill 610 and Senate Bill 221, approved on October 9, 2001, require land use agencies to perform a detailed analysis of available water supply when approving large developments. Historically, public water suppliers (PWS) simply provided a "will serve" letter to developers. SB 610, Public Resources Code (PRC) and Section 10910-10915 of the State Water Code requires lead agencies to request a Water Supply Assessment (WSA) from the local water purveyor prior to project approval. If the projected water demand associated with a proposed development is included in the most recent UWMP, the development is considered to have sufficient water

supply per California Water Code Section 10910, and a WSA is not required. All projects that meet any of the following criteria require a WSA:

- A proposed residential development of more than 500 dwelling units.
- A proposed shopping center or business establishment of more than 500,000 square feet of floor space or employing more than 1,000 persons
- A proposed commercial office building of more than 250,000 square feet of floor space or employing more than 1,000 persons
- A proposed hotel or motel of more than 500 rooms
- A proposed industrial, manufacturing, or processing plant or industrial park of more than 40 acres of land, more than 650,000 square feet of floor area, or employing more than 1,000 persons
- A mixed use project that falls in one or more of the above-identified categories
- A project not falling in one of the above-identified categories but that would demand water equal or greater than the amount required by a 500-dwelling unit project

2.2 Local Area Conditions

The Project Site is located in LADWP's Central District, in the 386 elevation pressure zone. The 386 elevation zone is gravity fed from the Hollywood reservoir and supplied by regulator stations. Please refer to Figure 3 for a map of service zones in the Central District. Figure 3 also identifies pressure regulator stations within the zone.

The City of Los Angeles Ordinance No. 172,075 adopted in 1998, Chapter XII, Article II, of the Los Angeles Municipal Code) requires all building owners to install low-flow showerheads (maximum flow of 2.5 gpm), water closets (with a maximum flow of 3.5 gpm), and low flow urinals (with a maximum 1.5 gallons per flush) prior to obtaining building permits. City ordinance No. 163,532 (Chapter XII, Article IV, of the LAMC) requires a 10 percent reduction in irrigation for large turf areas (three acres of turf or greater).

In response to recent water shortages caused by drought, decrease in snowpack levels, and environmental regulations restricting water supply, the City of Los Angeles is implementing water conservation and sustainability measures.

Under the City's Emergency Water Conservation Plan Ordinance (Chapter XIII, Article I, of the LAMC), following water uses are prohibited when the plan is in effect:

- Use water on hard surfaces (sidewalks, walkways, driveways, or parking areas)

- Water lawns between 10:00AM and 5:00PM, April 1 to September 30, and between 11:00AM and 3:00PM, October 1 to March 31.
- Allow excess water from sprinklers to flood gutters
- Use water to clean, fill, or maintain fountains unless the water is part of a recycling system
- Serve water to customers in eating establishments, unless requested
- Allow leaks to go unattended

In August 2008, following restrictions were added in the City's Emergency Water Conservation Ordinance:

- Prohibiting landscape watering during rain
- Prohibiting washing vehicles with a hose when the hose does not have a functioning self-closing nozzle attached or allowing the hose to run continuously
- Requiring hotels and motels to offer guests the option of reusing linen and towels
- Limiting watering days to Monday, Thursday, and Saturday
- Failure to comply with the above requirements would result in penalties per violation.

2.3 Existing Project Demand on Water Resources

The approximately 4.2 million gross square foot existing Convention Center facility provides roughly 867,000 useable square feet of combined exhibit hall/meeting room space and currently consists of three main structures: the West Hall, the South Hall, and the Concourse as well as supporting parking facilities.

STAPLES Center is Los Angeles' premier sports and entertainment venue, hosting over 250 events and nearly 4 million visitors a year. STAPLES Center is located on an approximately 8.5-acre site occupying the southwest corner of Figueroa Street and Chick Hearn Court. It is built on Convention Center property which has been ground leased to the owner of STAPLES Center. It includes 950,000 square feet of total arena space and a capacity for 20,000 seats.

Water Meter Data

The existing average water consumption 2010 for the Convention Center and STAPLES Center were determined based on the actual meter data provided by LACC and Staples Center. Please refer to Table 1.

Table 1 - Existing Water Consumption (Meter Data)

	2010 Annual Avg (Gallons)	**2010 Annual Avg (Gallons/Day)**	**2010 Annual Avg (Acre-ft)**
LACC	25,464,164	69,764	78.15
STAPLES Center	25,675,848	70,345	78.79
Total	**51,140,012**	**140,110**	**156.94**

From the average annual water consumption data shown above, the existing irrigation demand and the water usage within the central energy plant were subtracted in order to determine the general consumptions of the Convention Center alone. The existing irrigation demands for calendar year 2010 is based on meter data associated with irrigation meter numbers provided by the Los Angeles Convention Center, Inc. The existing Central Energy Plant water demand was provided by Syska Hennessy Group, Inc. Please refer to Table 2.

Table 2 - Existing Water Consumption to be Removed		
	Water Use (Gallons per Day)	Annual Water Use (Acre-ft)
General Consumption [a]		
West Hall	10,448	11.70
Central Plant [b]		
Convention Center	22,485	25.19
STAPLES Center	2,910	3.26
Central Plants Subtotal	25,394	28.45
Irrigation [c]		
All Locations	12,498	14.00
Total Water Consumption of Existing Uses to be Removed	**48,340**	**54.15**

[a] *Excludes South Hall, Concourse Hall, and STAPLES Center as no changes are proposed to these facilities under the Proposed Project.*

[b] *Based on data provided by Syska Hennessy Group, Inc., 2011.*

[c] *Based on data provided by the Los Angeles Convention Center Inc., 2011.*

2.4 Existing Project Demand on Water Distribution System

There are several existing LADWP water mains, ranging from 8" to 20", located within and adjacent to the Project Site:

- 16"-20" main on LA Live Way, north of Pico Blvd.
- 20" main on Chick Hearn Court.
- 12" and 16"-24" mains on Figueroa St.
- 24" main on Venice Blvd.
- 8" and 16" mains on Pico Blvd.
- 12" main on South Hall Drive and 15th Street.

In addition, there are 60 existing public fire hydrants throughout the Project Site at regular intervals of approximately 250'. Please refer to Figure 1 for locations of water mains and fire hydrants surrounding the Project Site.

Water pressure and flow in existing LADWP water mains is measured from LADWP's hydraulic model. Pressure and flow readings for water mains surrounding and serving the Project Site are provided in Table 4 below.

The high hydraulic grade for the Project vicinity is 386, the low hydraulic grade is 355. Ground elevations appear to range from 223 to 241, therefore the static low pressure ranges from 49 psi to 57 psi, and the static high pressure ranges from 63 psi to 70 psi. Per LADWP, pressures in the entire 386 service zone range from 38 psi to 120 psi.

Existing average baseline for the public water system in the project vicinity is 53 psi, which represents the low static pressure. Low static pressure is the average pressure in the system during the peak demand and the maximum daily flow.

Table 3 - Existing Baseline Demand

	Pipe Size (inch)	Theoretical Pipe Capacity [a] (cfs)	Pipe Flow [b] (cfs)	Pipe Flow / Pipe Capacity (%)	Pipe Pressure [b] (psi)
Chick Hearn Court					
A	20	32.7	8.08	24.7	50.1
B	20	32.7	2.46	7.5	49.2
LA Live Way					
C	20	32.7	8.03	24.6	51.7
D	16	20.9	2.44	11.7	53.6
Figueroa St					
E	20	32.7	1.77	5.4	49.3
F	12	11.8	0.75	6.4	50.0
G	24	47.1	1.29	2.7	50.0
H	12	11.8	1.23	10.4	50.7
I	16	20.9	4.20	20.1	50.7
P	12	11.8	1.01	8.6	52.9
Q	20	32.7	2.16	6.6	52.9
S	12	11.8	0.71	6.0	54.8
T	20	32.7	1.43	4.4	54.8
Pico Blvd					
J	16	20.9	2.18	10.4	54.3
K	16	20.9	2.04	9.8	52.9
L	8	5.2	0.3	5.8	54.5
M	8	5.2	0.46	8.8	52.8
South Hall Drive					
N	12	11.8	0.01	0.1	54.7
O	12	11.8	1.24	10.5	55.4
15th Street (Vacated)					
R	12	11.8	1.03	8.7	54.9
Venice Blvd.					
U	24	47.1	8.12	17.2	55.4

[a] Pipe capacity based on maximum velocity of 15 ft/s. Does not account for minor losses or contributions from the larger network.
[b] Pipe flow and pressure values are based on exhibits provided by LADWP. Refer to Exhibit 1.

3.0 METHODOLOGY

The Project's impact on potable water has been determined by conducting an analysis of existing and future water demands at the Project Site, the capacity of water supply resources, and the capacity of water distribution systems surrounding the Project Site. Water demands include annual consumption, peak fire suppression pressure and flow requirements, and peak domestic water flows.

Existing annual water consumption has been determined from actual meter data for the existing site. Future water consumption has been analyzed by applying a per capita water consumption factor to projected attendance levels. In accordance with State law, a Water Supply Assessment (WSA) has been prepared by LADWP.

The existing water distribution network surrounding and serving the Project is owned and maintained by LADWP. LADWP also maintains a hydraulic model of the network that generates water flow values for pipe segments and pressure values for nodes. Nodes represent connection points, pipe junctions, fire hydrants, etc. Existing pressure and flow values have been provided by LADWP and are included in Exhibit 1.

An analysis of LADWP's hydraulic water model has been performed to account for additional peak domestic and fire suppression water demands associated with the Project. For domestic demand, per capita method was used to perform the analysis because it is tied to actual attendance. The results of the analysis are included in the Project Impact section 6.0 of this report. Additional flow capacity information obtained from LADWP in included in Exhibit 1.

4.0 SIGNIFICANCE THRESHOLDS

LA CEQA Thresholds Guide determines significance of a project on a case-by-case basis, considering the following factors:

- The total estimated water demand for the project;
- Whether sufficient capacity exists in the water infrastructure that would serve the project, taking into account the anticipated conditions at project buildout;
- The amount by which the project would cause the projected growth in population, housing or employment for the Community Plan area to be exceeded in the year of the project completion; and
- The degree to which scheduled water infrastructure improvements or project design features would reduce or offset service impacts.

5.0 PROJECT DESIGN FEATURES

Table 4 - Water Conservation Measures	
Commercial/Public Facility Water Conservation Measures	
Toilets	• High-efficiency toilets (maximum 1.28 gallons per flush)
Urinals	• High efficiency urinals (0.125 gallons/flush) for the Convention Center, waterless urinals for the Event Center
Restroom Sink Faucets	• Low-flow faucets for public and most private locations with a maximum flow rate of 0.5 gallons per minute. Low-flow faucets will be of a self-closing design (i.e., that would automatically turn off when not in use)
Low-Flow Shower Faucets	• Install no more than one showerhead per shower stall, having a flow rate no greater than 2 gallons per minute
Commercial Kitchens	• Prep and Service faucets with low flow control aerators - 1.8 gpm in lieu of standard 2.2 gpm flow aerators.
Dishwashers	• High-efficiency Energy Star-rated dishwashers within kitchen/food preparation area minimum per City ordinance requirements
Clothes Washers	• High-efficiency clothes washers (water factor of 6.0 or less), Energy Star-rated when possible. Includes both large and small washers to accommodate variances in load sizes.
Cooling Equipment	• Cooling Tower Conductivity Controllers or Cooling Tower pH Conductivity Controllers • For Cooling Towers: Install purple piping and associated connections (*i.e.*, reclaimed water infrastructure) to the property line for potential future connection to LADWP reclaimed water supply, pending confirmation of water chemical profile for acceptable use.
Landscaping Water Conservation Measures	
Smart Irrigation Controllers	• Weather-based irrigation controller with rain shutoff • Matched precipitation (flow) rates for sprinkler heads • Drip/microspray/subsurface irrigation where appropriate • Minimum irrigation system distribution uniformity of 85 percent • A separate water meter (or submeter), flow sensor, and master valve shutoff shall be installed for irrigated landscape areas totaling 5,000 square feet and greater
Landscape Design and Plant Selection	• Proper hydro-zoning • Use of landscape contouring to minimize precipitation runoff • Use of artificial turf for the proposed Event Center playing surface
Reclaimed Water Infrastructure	• For Irrigation systems: Install purple piping and associated connections (*i.e.*, reclaimed water infrastructure) to the property line for potential future connection to LADWP reclaimed water supply, pending confirmation of water chemical profile for acceptable use.
Water Performance Measurement	
Meters	• At minimum, whole building water meters for each facility that measure total potable water use. Submeters on cooling towers and irrigation subsystems per above.

6.0 PROJECT IMPACT

6.1 Proposed Project Demand on Water Resources

Annual Water Consumption

Based on the STAPLES Center's past water consumption data and the total number of attendees per year, the average water demand per capita is determined to be 8.8778[1]. The average water demand of the existing Convention Center per capita is 4.69 gallons. For retail space and bike station, standardized BOE sewer generation rates were used to determine the projected water demand.

As shown on Table 5, the total annual attendance for the Event Center and the Convention Center is projected to be more than 10 million. Applying these factors based on actual past water meter data, the total net increase in general domestic water consumption is calculated to be 233,569 gallons per day or 261.63 acre-ft/yr.

Table 5 - Project Projected Water Consumption Estimate

Convention Center				
	Forecasted Annual Attendance [a]	Per Capita Water Consumption	Water Use (GPD)	Annual Water Use (Acre-ft)
Patron Use	4,020,959	4.6874 [b]	51,638	57.84
	Floor Area	Water Consumption / 1,000 SQFT	Water Use (GPD)	Annual Water Use (Acre-ft)
Retail	3,975	80	318	0.36
Bike Station	3,250	80	260	0.29
Event Deck	8,000	80	640	0.72
Convention Center Sub-Total			**52,856**	**59.21**
Water Efficiency Requirements Ordinance Savings			**-5,612**	**-6.29**
Convention Center Sub-Total (with water savings)			**47,244**	**52.92**
Event Center				
	Forecasted Annual Attendance [a]	Per Capita Water Consumption	Water Use (GPD)	Annual Water Use (Acre-ft)
	6,094,190	8.8778 [c]	148,227	166.04
Water Efficiency Requirements Ordinance Savings			**-8,711**	**-9.76**
Event Center Sub-Total (with water savings)			**139,517**	**156.29**
Central Plant				
			Water Use (GPD)	Annual Water Use (Acre-ft)
All Facilities (Convention Center, Event Center, STAPLES Center) [d]			32,485	36.38

[1] Based on the approved LADWP Water Supply Assessment (WSA) for the Convention and Event Center Project. Dated December 15, 2011.

Total General Consumption + Central Plant	**219,246**	**245.59**

[a] Based on information provided by AEG, 2011.
[b] Based on the annual Existing General Consumption for the Convention Center of 12,693,194 gallons divided by the estimated existing annual attendance of approximately 2,708,262 patrons. Existing General Consumption for the Convention Center includes, but is not limited to, restaurant, concessions, kitchens, commissaries, and pantries.
[c] Based on per capita water consumption factor provided by the LADWP.
[d] Based on forecast provided by Syska Hennessy Group, Inc., 2011.

Irrigation/Outdoor Water Use

The EIR Calculation Exhibit provided by Melendrez divides the Project Site into 4 boundaries; Event Center Plaza, Gil Lindsay Plaza, Pico, and LA LIVE Way. Please refer to Figure 2. The future irrigation demand shown in Table 6 is based on LADWP's Water Supply Assessment. Anticipated water conversation due to implementation of drip irrigation, bubblers, and artificial turf is accounted in the additional water conversation estimate shown in Table 7.

Table 6 - Project Irrigation Demand

	SQFT	Annual Consumption (GPD) [a]	Annual Consumption (Acre-ft) [a]
Event Center Plaza	4,317	283	0.32
Gil Lindsay Plaza	69,485	4,583	5.13
Water Feature		45	0.05
L A LIVE Way	40,656	2,681	3.00
Football Field	57,600	4,095	4.59
TOTAL		**11,686**	**13.09**

[a] Per LADWP Water Supply Assessment (WSA) dated December 15, 2011.

Summary

Net increase in annual water demand based on forecasted annual attendance is summarized in Table 7.

Table 7 - Summary

	Water Use (GPD)	Annual Water Use (Acre-ft)
Proposed Project	219,246	245.59
Outdoor/Irrigation	11,686	13.09
Additional Water Conservation based on Project Design Features [a]	-9,024	-10
Existing Development	-48,340	-54.15
Net Increase in Annual Water Demand	173,568	194.53

[a] Per LADWP Water Supply Assessment (WSA) dated December 15, 2011.

6.2 Proposed Project Demand on Water Distribution System

Domestic Water Flow

As discussed in Section 6.1, the net increase in maximum number of attendance for the Event Center and the Convention Center (when there is no existing activity at the Convention Center) are 76,250 and 19,550, respectively. When there is normal existing activity at the Convention Center the net increase in annual attendance of the Convention Center is anticipated to be 2,550. By applying the per capita flow rate of 8.8778 and 4.6874 gallons per attendee, the peak water demand of the proposed project on the distribution system is 3,808 gallons per minute (GPM) when there is no existing activity at the Convention Center and 3,382 when there is normal existing activity at the Convention Center. Table 8 shows the breakdown of peak domestic water flow for the Project in GPM.

Table 8 – Peak Domestic Water Flow

	Net Increase in Maximum Number of Attendance	Per Capital Flow Rate (Gal/Event Day[c]/Attendance)	Net Increase in Peak Water Demand (GPM)
Event Center	76,250	8.8778 [a]	3,368 [b]
LACC (No Existing Activity Baseline)	19,550	4.6874 [a]	440 [d]
LACC (Normal Existing Activity Baseline)	2,550	4.6874 [a]	14 [d]
		Total (No Existing Activity at LACC)	3,808
		Total (Normal Existing Activity at LACC)	3,382

[a] See Table 5.
[b] Maximum number of attendance x per capita flow rate (with central plant uses and water efficiency reductions included) / 8 hrs / 60 mins x peaking factor of 2.5 = Peak Water Demand in GPM for Event Center.
[c] Equivalent to 8 hours which include 3 hour of average event duration and additional time for event preparation and clean-up.
[d] Maximum number of attendance x per capita flow rate (with central plant uses and water efficiency reductions included) / 8 hrs / 60 mins x peaking factor of 2.0 = Peak Water Demand in GPM for LACC. In addition, the following ancillary uses are added to the new peak demand value: 3,975 sf of Retail, 3,250 sf Bike Station, and 8,000 sf Event Deck at 80gpd/1,000 sf each = 1,218 gpd.

Domestic Water Flow Analysis

An analysis of LADWP's hydraulic model has been conducted considering the additional peak water demand for the Project. Table 9 shows the resulting pipe flows and pressures for the water mains serving the Project Site, as well as, the incremental change in pipe pressures and flows as compared with the existing baseline condition described in Section 2.4 above.

Table 9 - Project Impact on LADWP Infrastructure During the Normal Day Condition (Domestic Water Demand vs Existing Baseline Demand)

	Existing Baseline Demand					Project Domestic Demand			Δ	
	Pipe Size (inch)	**Theoretical Pipe Capacity[a] (cfs)**	**Pipe Flow [b] (cfs)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure[b] (psi)**	**Pipe Flow (cfs)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure[b] (psi)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure (psi)**
Chick Hearn Court										
A	20	32.7	8.08	24.7	49.6	5.47	16.7	48.0	8.0	1.6
B	20	32.7	2.46	7.5	48.7	0.13	0.40	47.5	2.1	1.2
LA Live Way										
C[c]	20	32.7	8.03	24.6	50.6	8.51	26.0	50.0	1.4	0.6
D	16	20.9	2.44	11.7	52.8	0.51	2.44	52.0	9.3	0.8
Figueroa St										
E	20	32.7	1.77	5.4	48.7	3.90	11.9	47.5	6.5	1.2
F	12	11.8	0.75	6.4	50.0	1.06	8.98	47.0	2.6	3.0
G	24	47.1	1.29	2.7	50.0	N/A	N/A	48.0	N/A	2.0
H	12	11.8	1.23	10.4	50.1	1.39	11.8	49.0	1.4	1.1
I	16	20.9	4.20	20.1	50.2	2.31	11.1	49.0	9.0	1.2
P	12	11.8	1.01	8.6	51.2	1.21	10.3	51.0	1.7	0.2
Q	20	32.7	2.16	6.6	54.6	3.62	11.1	51.5	4.5	3.1
S	12	11.8	0.71	6.0	54.6	0.95	8.05	53.0	2.1	1.6
T	20	32.7	1.43	4.4	54.6	3.05	9.32	53.0	4.9	1.6
Pico Blvd										
J	16	20.9	2.18	10.4	54.3	0.52	2.49	52.0	7.9	2.3
K[c]	16	20.9	2.04	9.8	51.4	0.56	2.68	51.0	7.1	0.4
L	8	5.2	0.3	5.8	54.3	N/A	N/A	52.0	N/A	2.3
M	8	5.2	0.46	8.8	51.7	0.37	7.12	50.5	1.7	1.2
South Hall Drive										
N	12	11.8	0.01	0.1	54.3	0.83	7.03	53.0	6.9	1.3

O	12	11.8	1.24	10.5	55.2	1.83	15.5	53.5	5.0	1.7
15th Street (Vacated)										
R	12	11.8	1.03	8.7	54.6	0.81	6.86	53.0	1.8	1.6
Venice Blvd.										
U	24	47.1	8.12	17.2	55.0	5.84	12.4	53.5	4.8	1.5

[a] Pipe capacity based on maximum velocity of 15 ft/s. Does not account for minor losses or contributions from the larger network.
[b] Pipe flow and pressure values are taken from exhibits provided by LADWP. See Exhibit 1.
[c] Where additional pipe segments have been added due to the introduction of analysis nodes in the LADWP model, readings have been averaged. See Exhibit 1 for all readings.

Table 10 - Project Impact on LADWP Infrastructure During the Dark Day Condition (Domestic Water Demand vs Existing Baseline Demand)

	Existing Baseline Demand					**Project Domestic Demand**			**Δ**	
	Pipe Size (inch)	**Theoretical Pipe Capacity[a] (cfs)**	**Pipe Flow[b] (cfs)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure[b] (psi)**	**Pipe Flow (cfs)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure[b] (psi)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure (psi)**
Chick Hearn Court										
A	20	32.7	8.08	24.7	49.6	5.47	16.7	48.0	8.0	1.6
B	20	32.7	2.46	7.5	48.7	0.13	0.40	47.5	2.1	1.2
LA Live Way										
C[c]	20	32.7	8.03	24.6	50.6	8.51	26.0	50.0	1.4	0.6
D	16	20.9	2.44	11.7	52.8	0.51	2.44	52.0	9.3	0.8
Figueroa St										
E	20	32.7	1.77	5.4	48.7	3.90	11.9	47.5	6.5	1.2
F	12	11.8	0.75	6.4	50.0	1.06	8.98	47.0	2.6	3.0
G	24	47.1	1.29	2.7	50.0	N/A	N/A	48.0	N/A	2.0
H	12	11.8	1.23	10.4	50.1	1.39	11.8	49.0	1.4	1.1
I	16	20.9	4.20	20.1	50.2	2.31	11.1	49.0	9.0	1.2

P	12	11.8	1.01	8.6	51.2	1.21	10.3	51.0	1.7	0.2
Q	20	32.7	2.16	6.6	54.6	3.62	11.1	51.5	4.5	3.1
S	12	11.8	0.71	6.0	54.6	0.95	8.05	53.0	2.1	1.6
T	20	32.7	1.43	4.4	54.6	3.05	9.32	53.0	4.9	1.6
Pico Blvd										
J	16	20.9	2.18	10.4	54.3	0.52	2.49	52.0	7.9	2.3
K [c]	16	20.9	2.04	9.8	51.4	0.56	2.68	51.0	7.1	0.4
L	8	5.2	0.3	5.8	54.3	N/A	N/A	52.0	N/A	2.3
M	8	5.2	0.46	8.8	51.7	0.37	7.12	50.5	1.7	1.2
South Hall Drive										
N	12	11.8	0.01	0.1	54.3	0.83	7.03	53.0	6.9	1.3
O	12	11.8	1.24	10.5	55.2	1.83	15.5	53.5	5.0	1.7
15th Street (Vacated)										
R	12	11.8	1.03	8.7	54.6	0.81	6.86	53.0	1.8	1.6
Venice Blvd.										
U	24	47.1	8.12	17.2	55.0	5.84	12.4	53.5	4.8	1.5

[a] Pipe capacity based on maximum velocity of 15 ft/s. Does not account for minor losses or contributions from the larger network.
[b] Pipe flow and pressure values are taken from exhibits provided by LADWP. See Exhibit 1.
[c] Where additional pipe segments have been added due to the introduction of analysis nodes in the LADWP model, readings have been averaged. See Exhibit 1 for all readings.

Based on the analysis summarized in Table 9 and Table 10 above, the pressure fluctuation in the system ranges from 0.2 psi to 3.1 psi and flow levels vary by no more than 9.3%. Therefore the analysis demonstrates that the incremental impact on flow and pressure in the water mains surrounding the Project Site due to the Project's additional domestic water demands is less than significant.

Fire Suppression Water Flow

Per consultation with City of Los Angeles Fire Department, the proposed project site is considered to be High Density Industrial and Commercial. Division 9 of the City of Los Angeles Fire Code requires that this type of development to have fire flow capacity of 12,000 GPM available to any block. In addition, the minimum distance between hydrants on roads and fire lanes is 300 feet. A complete table of required fire flow from Los Angeles Fire Code is included in Table 11. The Fire Department provided additional clarification for this project that no more than 1500 gpm will be required from any one hydrant, therefore 8 hydrants flowing simultaneously at 1500 gpm each would be required to achieve 12,000 gpm.

Table 11 - Fire Flow by Type of Land Development

Type of Land Development	Fire-Flow in Gallons Per Minute	Distance Between Hydrants on Roads and Fire Lanes	Type of Hydrant
Low Density Residential	2,000 GPM from three adjacent hydrants running simultaneously	600 Ft	2-1/2" x 4" Double Fire Hydrant
High Density Residential & Neighborhood Commercial	4,000 GPM from four adjacent hydrants running simultaneously	300-450 Ft	2-1/2" x 4" Double Fire Hydrant
Industrial & Commercial	6,000 to 9,000 GPM from four to six hydrants running simultaneously	300 Ft	2-1/2" x 4" Double Fire Hydrant or 4" x 4" Double Fire Hydrant
High Density Industrial & Commercial	12,000 GPM available to any block	300 Ft	4" x 4" Double Fire Hydrant

Fire Suppression Water Flow Analysis

An analysis of LADWP's hydraulic model has been conducted considering several scenarios for the Project that meets the Fire Department's requirements. For the purpose of this technical report the worst case scenario has been considered. The worst case scenario is a result of flowing the six hydrants connected to the 8" main in Pico Boulevard and two hydrants from the adjacent 16" main in LA Live Way at 1500 gpm each for a total of 12,000 gpm from 8 hydrants flowing simultaneously. Table 12 shows the resulting pipe flows and pressures for the water mains serving the Project Site.

Table 12 - Project Impact on LADWP Infrastructure (Fire Demand vs Existing Baseline Demand)

	Existing Baseline Demand					Project Fire Demand			Δ	
	Pipe Size (inch)	**Theoretical Pipe Capacity[a] (cfs)**	**Pipe Flow [b] (cfs)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure[b] (psi)**	**Pipe Flow (cfs)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure[b] (psi)**	**Pipe Flow / Pipe Capacity (%)**	**Pipe Pressure (psi)**
Chick Hearn Court										
A	20	32.7	8.08	24.7	50.1	9.48	30.0	42.5	5.3	7.6
B	20	32.7	2.46	7.5	49.2	3.92	12.0	41.5	4.5	7.7
LA Live Way										
C	20	32.7	8.03	24.6	51.7	8.23	25.2	44.5	0.6	10.2
D	16	20.9	2.44	11.7	53.6	8.88	42.5	45	30.8	8.6
Figueroa St										
E	20	32.7	1.77	5.4	49.3	0.16	0.5	41.5	4.9	7.8
F	12	11.8	0.75	6.4	50.0	0.59	5.0	41.5	1.4	8.5
G	24	47.1	1.29	2.7	50.0	1.65	3.5	42.0	0.8	8.0
H	12	11.8	1.23	10.4	50.7	5.52	46.8	43.0	36.4	14.3
I	16	20.9	4.20	20.1	50.7	2.13	10.2	44.0	9.9	6.7
P	12	11.8	1.01	8.6	52.9	3.85	32.6	46.0	24.0	6.9
Q	20	32.7	2.16	6.6	52.9	6.04	18.5	46.0	11.9	6.9
S	12	11.8	0.71	6.0	54.8	3.85	32.6	48.0	26.6	6.8
T	20	32.7	1.43	4.4	54.8	5.65	17.3	48.0	12.9	6.8
Pico Blvd										
J	16	20.9	2.17	10.4	54.3	2.09	10.0	45.0	0.4	9.3
K	16	20.9	2.04	9.8	51.9	3.92	18.8	44.5	9.0	7.4
L [c]	8	5.2	0.3	5.8	54.8	1.68	32.3	45.0	26.5	9.8
M [c]	8	5.2	0.47	9.0	52.4	5.83	112.1	15.0 [d]	103.1	37.4
South Hall Drive										
N	12	11.8	0.01	0.1	54.7	2.69	22.8	46.5	22.7	8.2
O	12	11.8	1.24	10.5	55.4	3.28	27.8	48.5	17.3	6.9
15th Street (Vacated)										

R	12	11.8	1.03	8.7	54.9	0.40	3.4	48.0	5.3	6.9
Venice Blvd.										
U	24	47.1	8.12	17.2	55.4	11.73	24.9	48.5	7.7	6.9

[a] Pipe capacity based on maximum velocity of 15 ft/s. Does not account for minor losses or contributions from the larger network.
[b] Pipe flow and pressure values are taken from exhibits provided by LADWP. See Exhibit 1.
[c] Where additional pipe segments have been added due to the introduction of analysis nodes in the LADWP model, readings have been averaged. See Exhibit 1 for all readings.
[d] This is the lowest reading along segment M, not the average. Once Line M is upsized to 12", the lowest reading increases to 35 psi. See Exhibit 1.

Based on the analysis summarized in Table 14 above, the pressure fluctuation in the system due to the worst case fire flow scenario is less than 15 psi with the exception of the 8" main on the south side of Pico (Line M) which drops by over 37 psi. This is to be expected since in the worst case scenario the six of the eight modeled hydrants flowing at 1500 gpm are all fed from Line M. The analysis demonstrates that three hydrants on the south side of Pico Boulevard drop to roughly 15 psi at 1500 gpm. In addition, average pipe velocity in the Line M increased to 112.1% of the pipe capacity.

Upsizing Line M from 8" to 12" would improve the pipe flow and pressure to meet the LADWP's maximum pipe velocity requirement of 15 fps, as well as, the Fire Department requirement of at least 20 psi at any hydrant flowing at 1500 gpm. LADWP's additional fire flow analysis (see Exhibit 1) confirms this. Once the Line M is upsized from 8" to 12", the analysis shows that the lowest pressure at the hydrants increases from 19 psi to 35 psi, which is well-above the Fire Department's minimum pressure requirement. In addition, the anticipated pipe flow in the Line M during the worst case scenario becomes 48% of the pipe capacity.

Please refer to Exhibit 1 for LADWP's assessment of the 8" main in Pico Boulevard pipe and the possible need to upsize the line to 12".

6.3 Construction

Water demand for project construction would be required for dust control, concrete mixer truck cleanout, cleaning of equipment, etc. Water demand created by these activities would be minor compared to the existing water demand, and temporary in nature.

Construction impacts associated with the installation of new water distribution lines would be primarily involve trenching and would not have any significant impacts for the Project Site or to adjoining property, including upsizing of the existing 8-inch water line to a proposed 12-inch water line within Pico Boulevard, between L A LIVE Way and Figueroa Street. Prior to ground disturbance, Project contractors would coordinate with LADWP to identify the locations and depth of all lines. Further, LADWP would be notified in advance of proposed ground disturbance activities to avoid water lines and disruption of water service. Therefore, Project impacts on water associated with construction activities would be less than significant.

6.4 Cumulative Impacts

Both the Project and similar projects in the region will result in additional demand for water. Based on the Urban Water Managemen Plan (2010), LADWP has determined that it will be able to reliably provide water to its customers through the 25-year planning period covered by the UWMP. In addition, each new project in the City of Los Angeles is required to comply with the City's water conservation ordinances, including Title 24 and the California Green Building Code standards. New projects are therefore expected to generate significantly less water than older developments of similar size.

7.0 LEVEL OF SIGNIFICANCE

Based on the analysis contained in this report, no significant impacts to the water system have been identified for the Proposed Project.

Figure 1 – Existing Water System

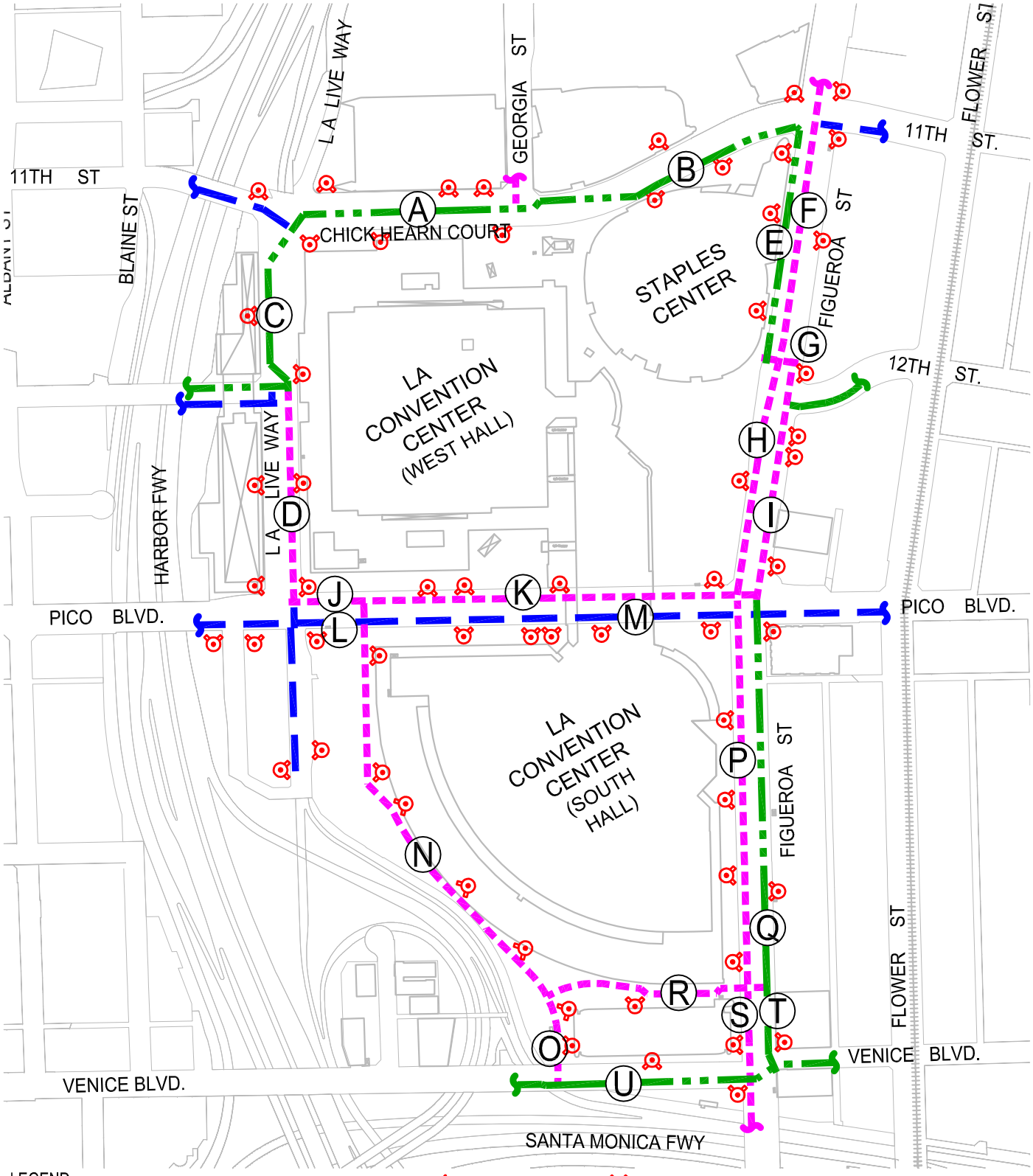


FIGURE 1

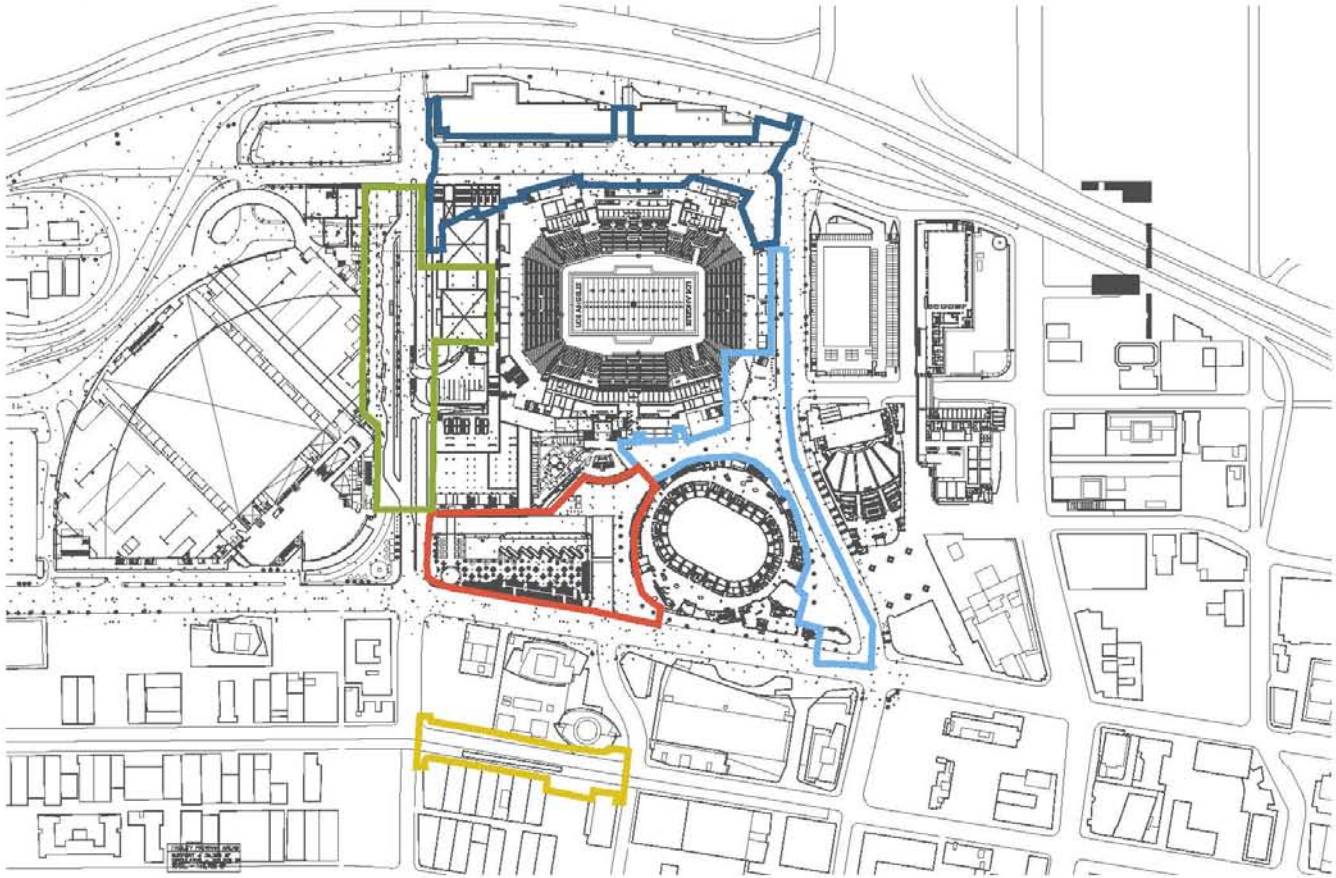
EXISTING WATER SYSTEM

kpff

Figure 2 – EIR Calculation Exhibit By Melendrez

Exhibit 1: EIR Calculation Boundaries

- AREA A: Farmers Plaza
- AREA B: Gil Lindsay Plaza
- AREA C: Pico Station
- AREA D: Pico
- AREA E: LA Live Way



MELÉNDREZ
GEHL ARCHITECTS
URBAN QUALITY CONSULTANTS

LA EVENTS AND ENTERTAINMENT DISTRICT
Exhibit 1: EIR Calculation Boundaries
July 26, 2011

Figure 3 – LADWP Central District Service Zone

Central District

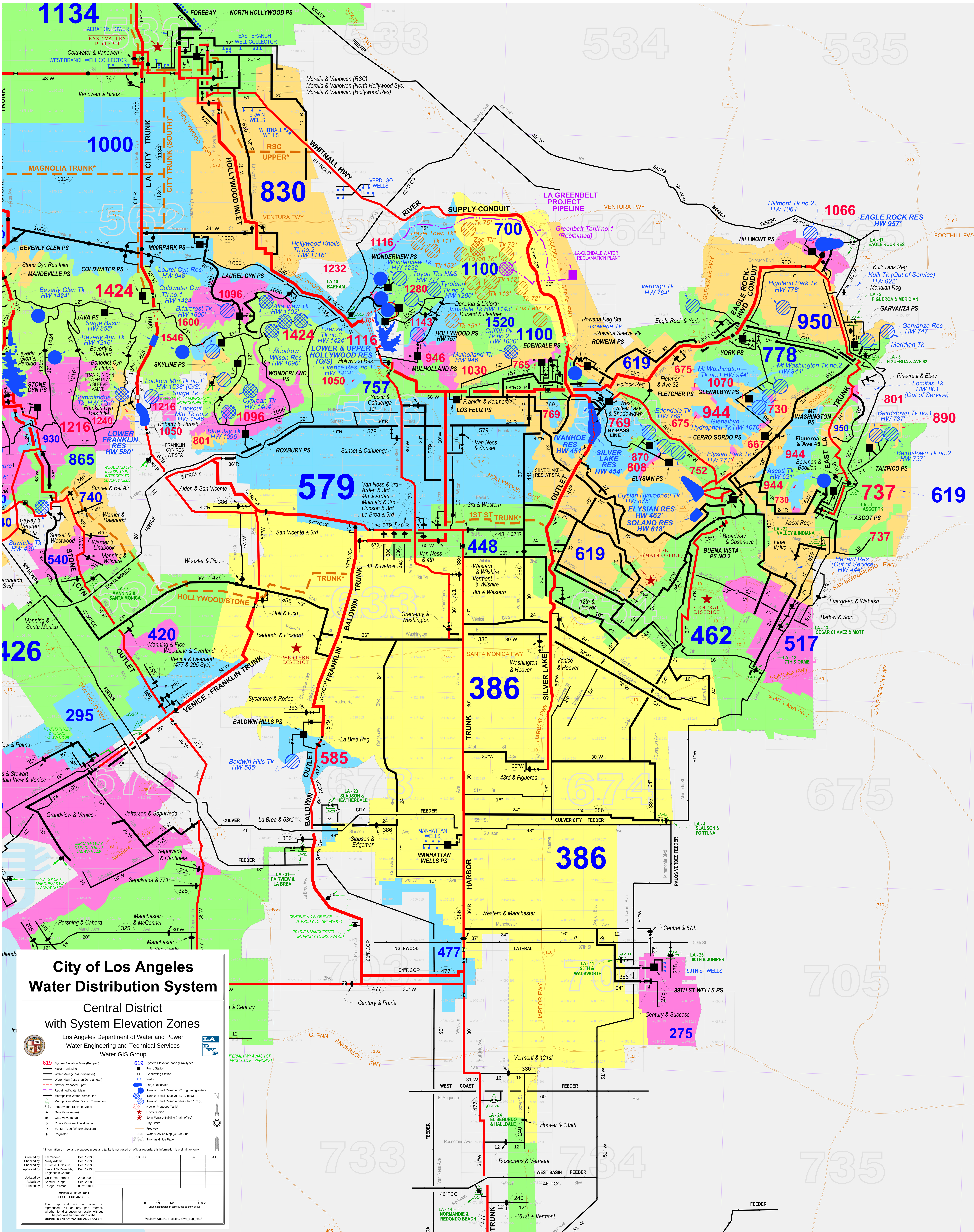
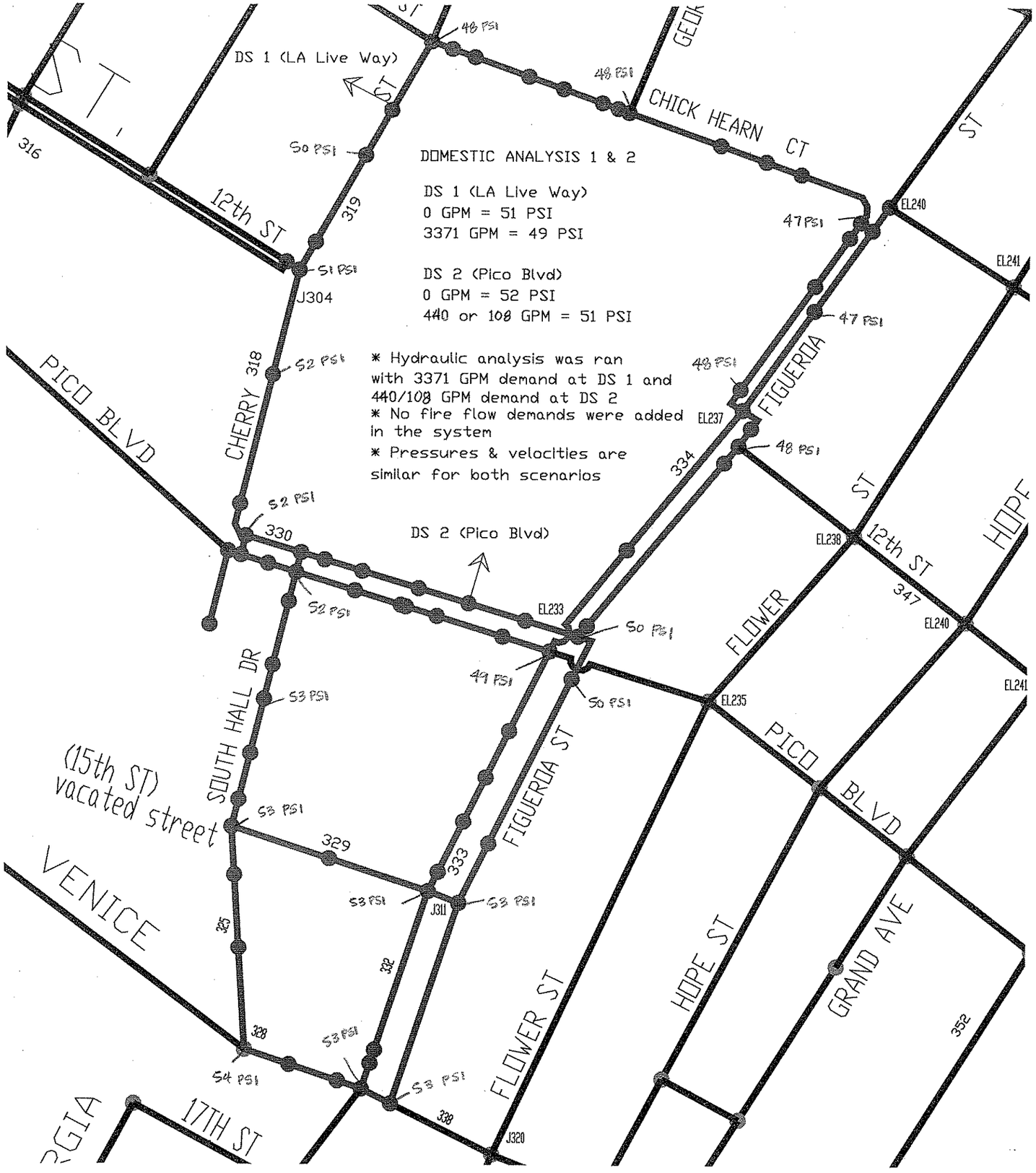
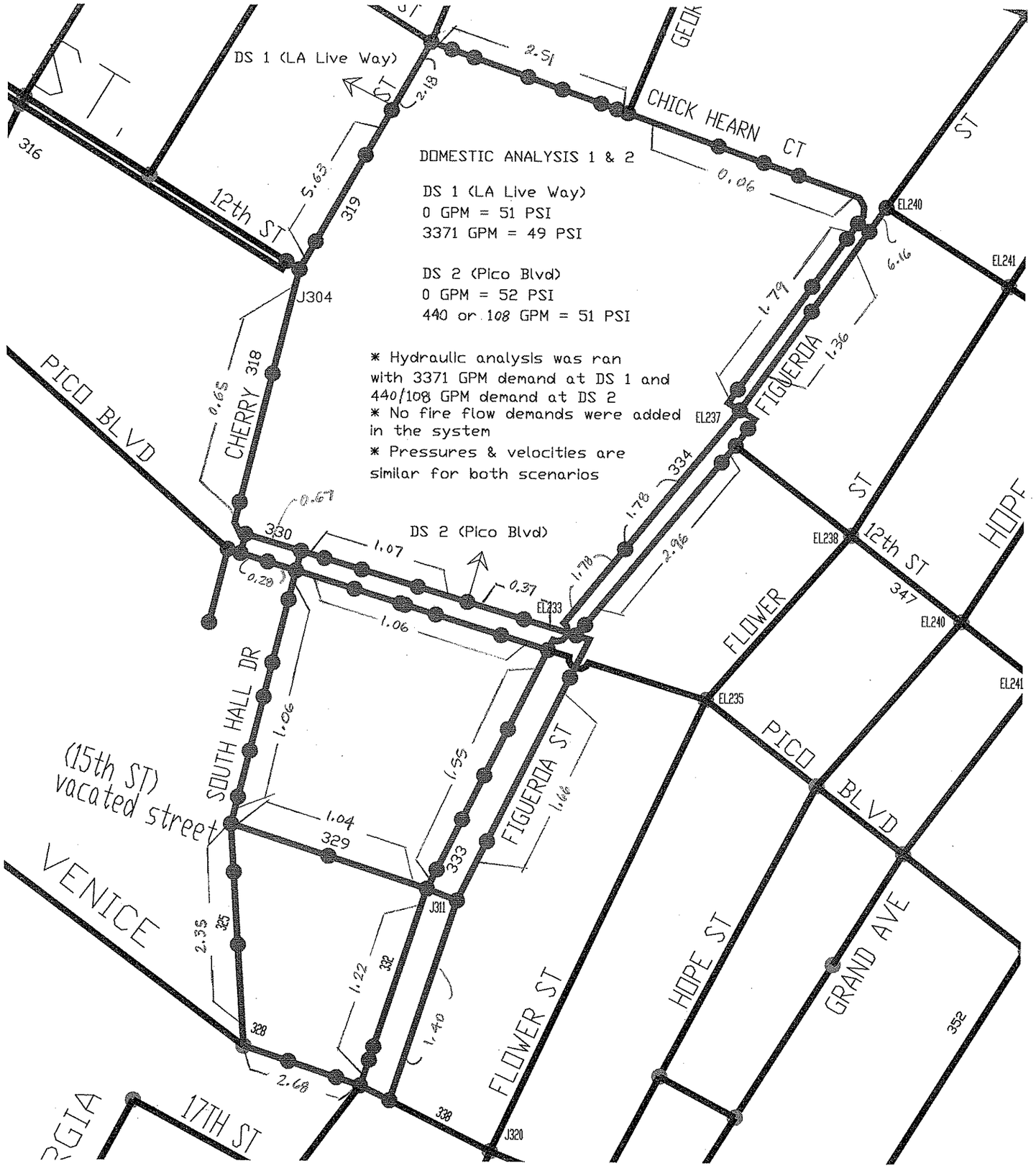
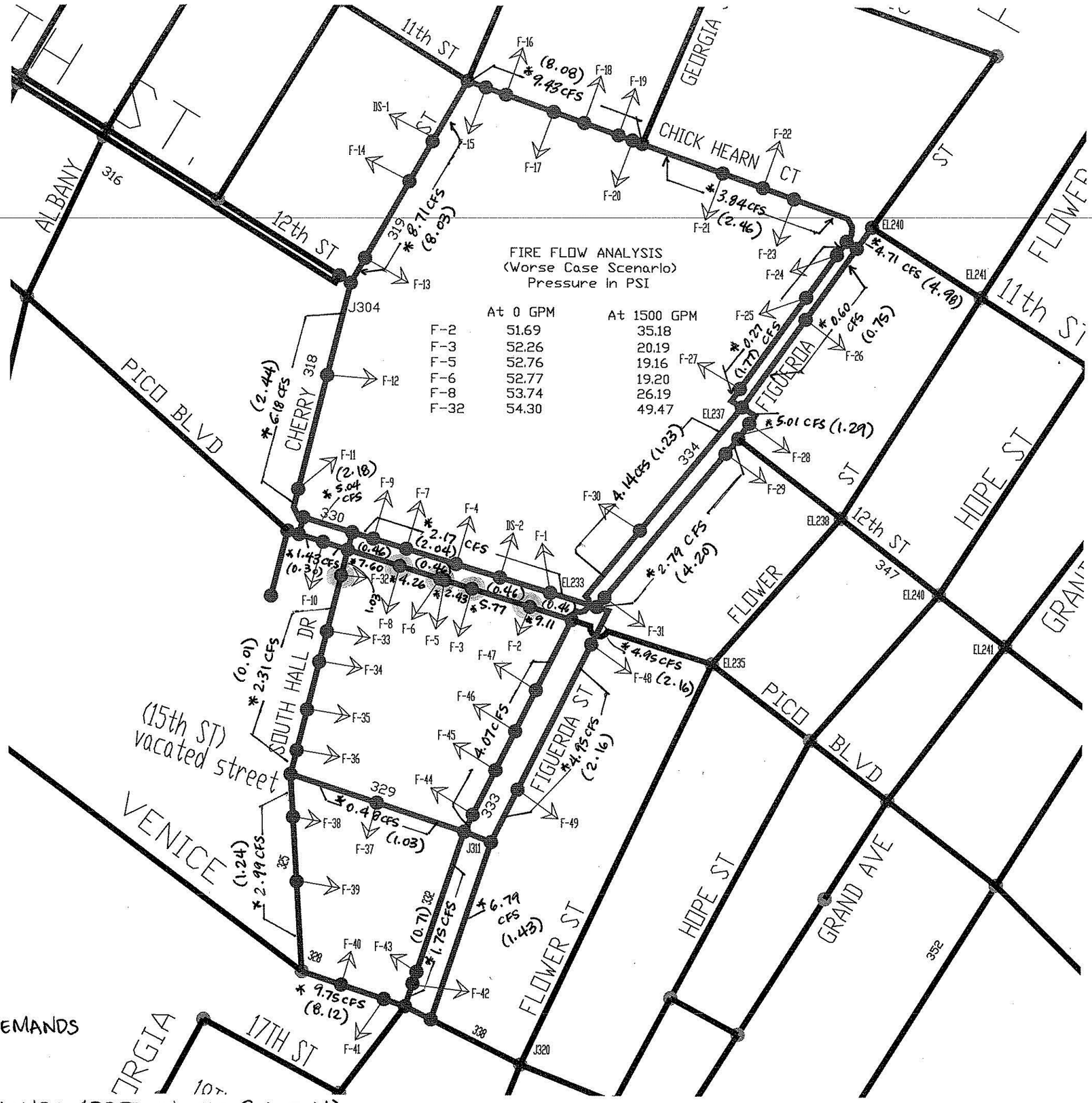


Exhibit 1 – LADWP Water Model Analysis



PRESSURES (PSI)


DOMESTIC ANALYSIS 1 & 2
DS 1 (LA Live Way)
0 GPM = 51 PSI
3371 GPM = 49 PSI
DS 2 (Pico Blvd)
0 GPM = 52 PSI
440 or 108 GPM = 51 PSI
* Hydraulic analysis was ran with 3371 GPM demand at DS 1 and 440/108 GPM demand at DS 2
* No fire flow demands were added in the system
* Pressures & velocities are similar for both scenarios
DS 1 (LA Live Way)
DS 2 (Pico Blvd)
CHICK HEARN CT
12th ST
PICO BLVD
CHERRY
FIGUEROA
FLOWER
HOPE ST
GRAND AVE
SOUTH HALL DR
FIGUEROA ST
(15th ST) vacated street
VENICE
17TH ST
J304
J311
J320
EL237
EL238
EL240
EL241
EL233
EL235
316
319
318
330
329
333
325
328
332
338
347
352
2.51
2.18
5.63
0.06
6.16
1.79
1.36
0.65
0.67
1.07
0.29
0.37
1.78
2.96
1.06
1.06
1.55
1.04
1.66
2.35
1.22
1.40
2.68
VELOCITIES (FPS)



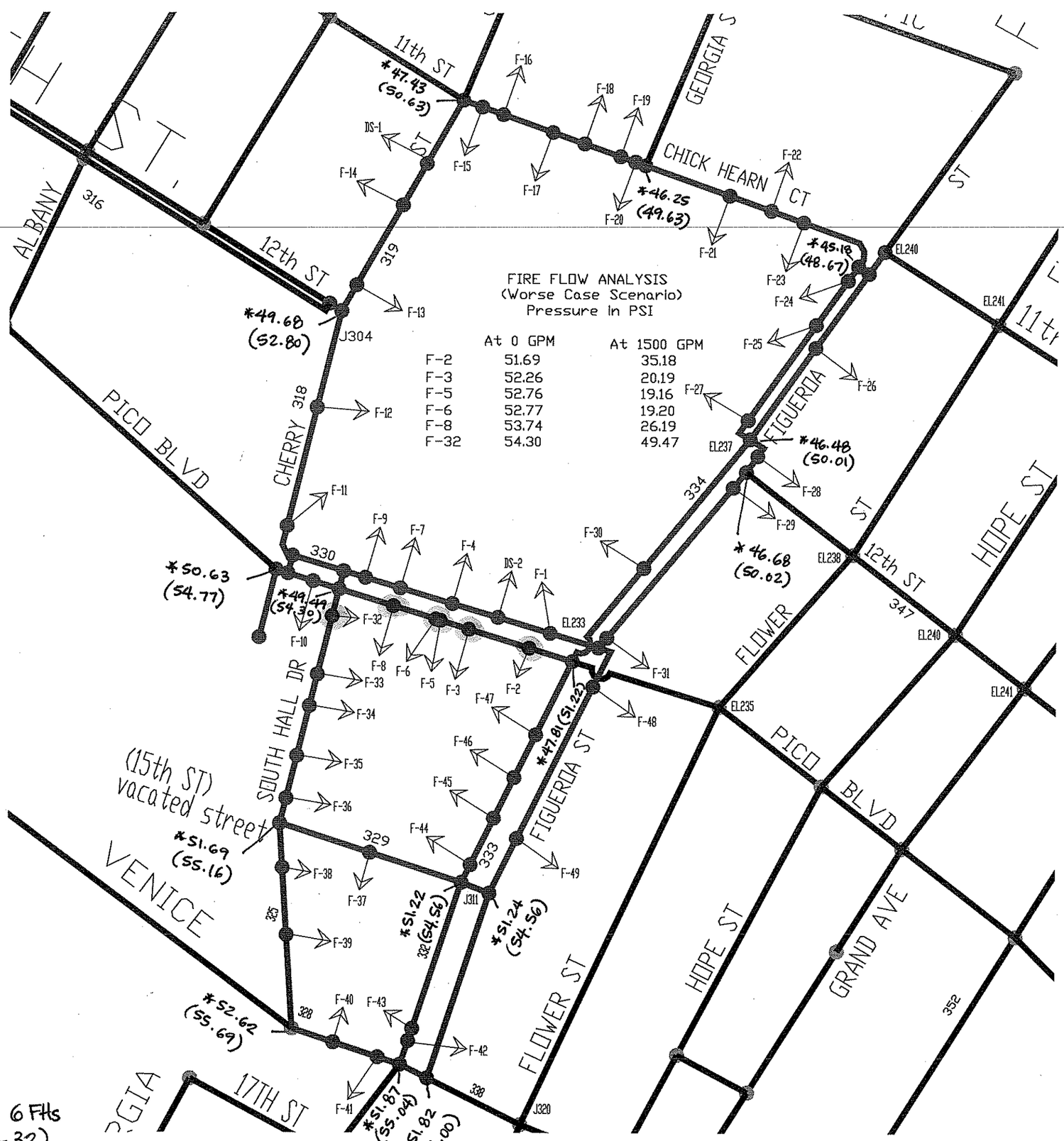
FIRE FLOW ANALYSIS
(Worse Case Scenario)
Pressure in PSI

	At 0 GPM	At 1500 GPM
F-2	51.69	35.18
F-3	52.26	20.19
F-5	52.76	19.16
F-6	52.77	19.20
F-8	53.74	26.19
F-32	54.30	49.47

PIPE FLOW IN (—) ⇒ NO FF DEMANDS

FIRE FLOW ANALYSIS
(WORSE CASE)

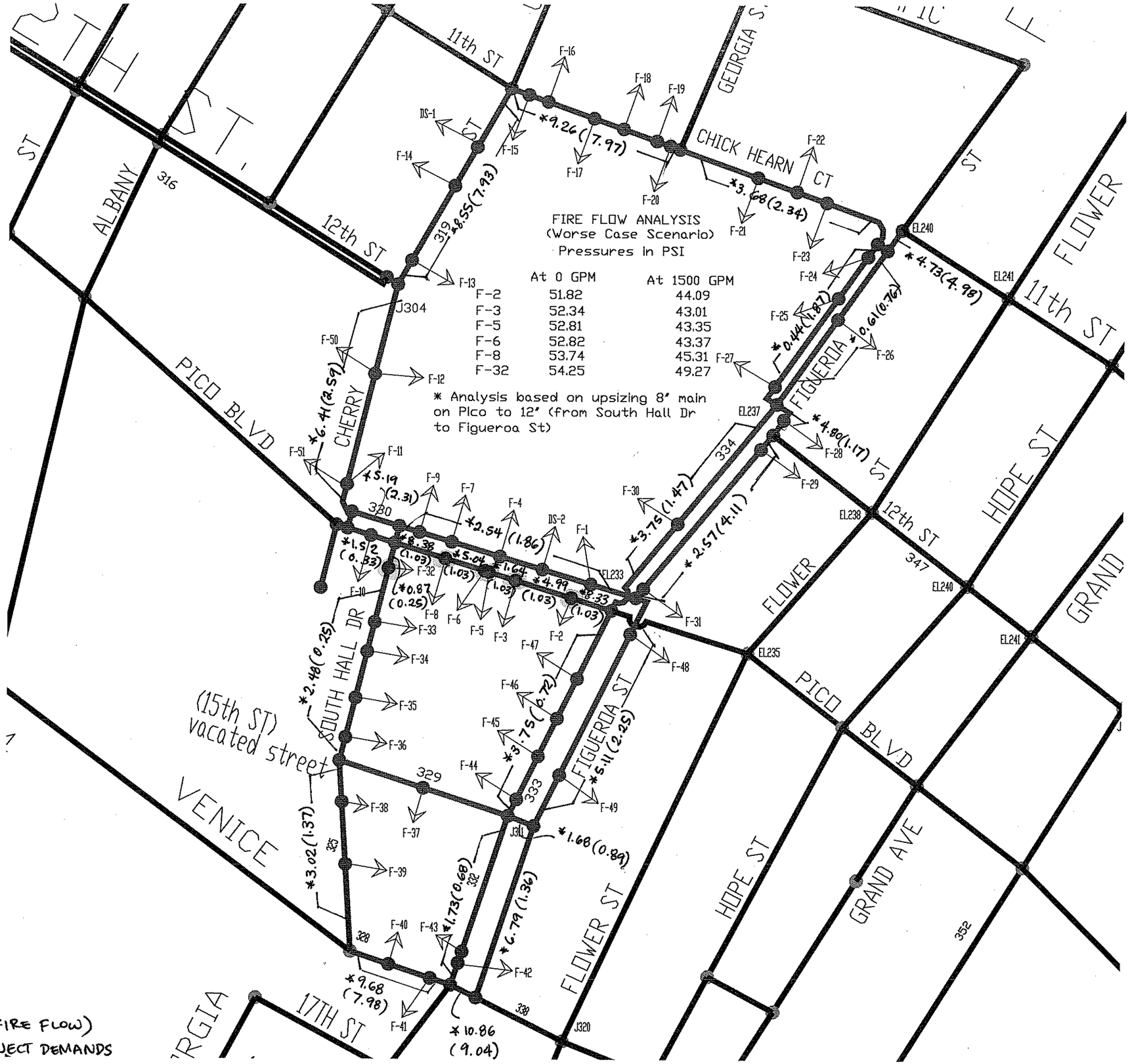
*PIPE FLOW IN CFS (FF DEMANDS ADDED IN THE SYSTEM)



FIRE FLOW ANALYSIS
(Worse Case Scenario)
Pressure In PSI

	At 0 GPM	At 1500 GPM
F-2	51.69	35.18
F-3	52.26	20.19
F-5	52.76	19.16
F-6	52.77	19.20
F-8	53.74	26.19
F-32	54.30	49.47

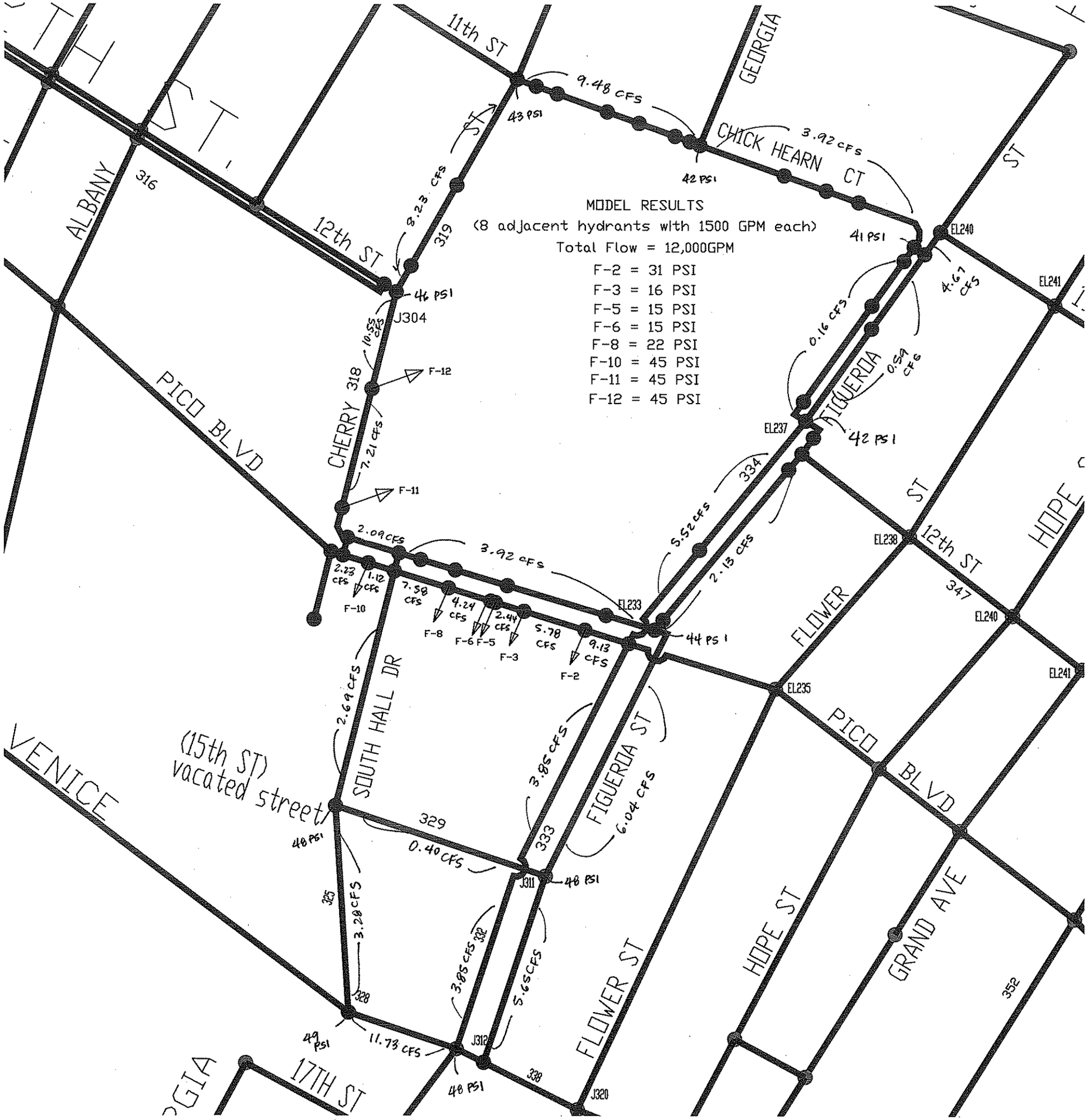
PRESSURES IN PSI
* WITH 1500 GPM DEMAND ON 6 FHs
(F-2, F-3, F-5, F-6, F-8, F-32)
* IN PARENTHESIS – NO ADDED DEMANDS ON FHs

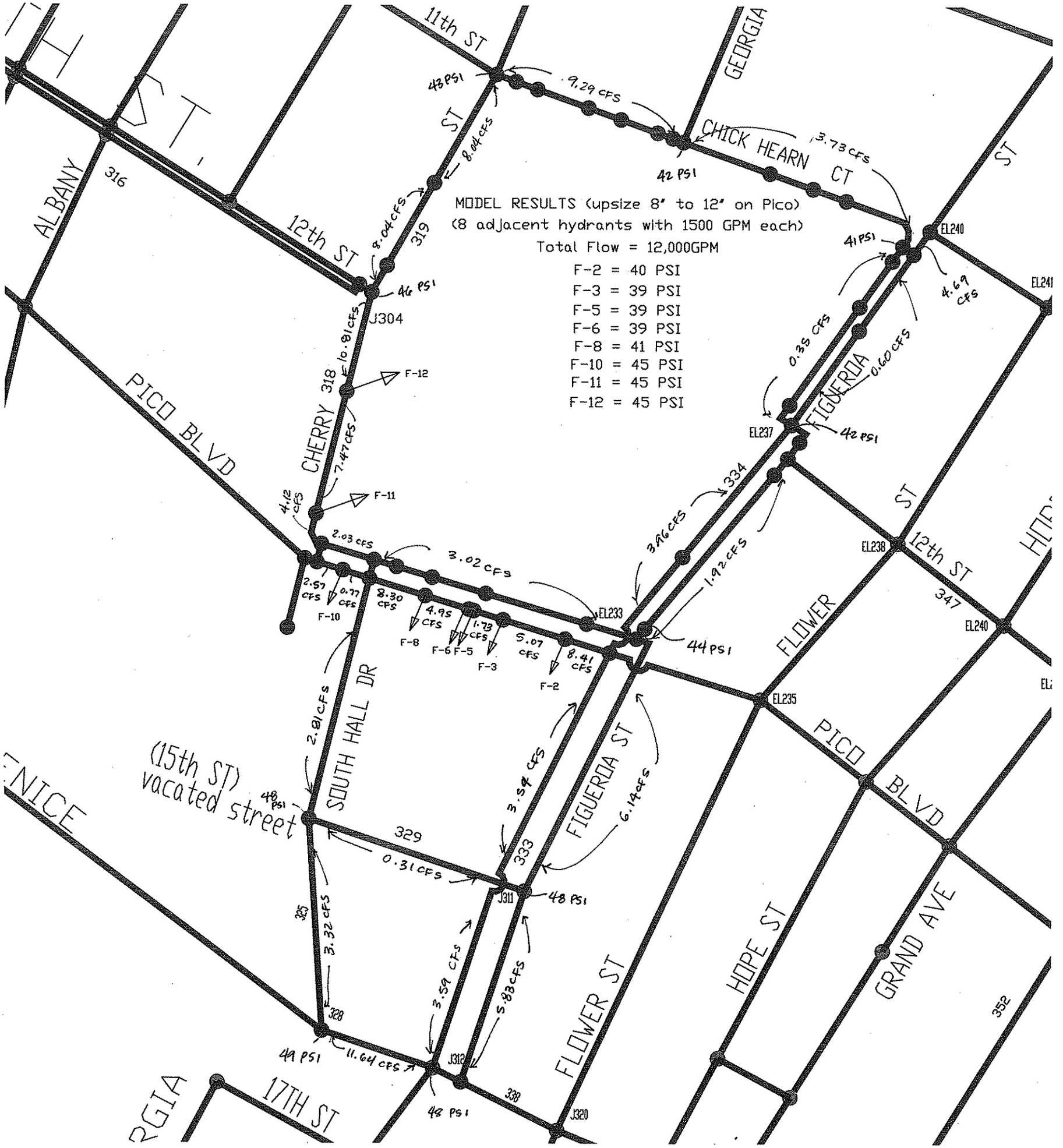


(FIRE FLOW)

* PIPE FLOW W/ ADDITIONAL PROJECT DEMANDS

PIPE FLOW IN (—) ⇒ W/O ADDITIONAL FIRE FLOW DEMANDS


MODEL RESULTS
(8 adjacent hydrants with 1500 GPM each)
Total Flow = 12,000GPM
F-2 = 31 PSI
F-3 = 16 PSI
F-5 = 15 PSI
F-6 = 15 PSI
F-8 = 22 PSI
F-10 = 45 PSI
F-11 = 45 PSI
F-12 = 45 PSI
11th ST
GEORGIA
9.48 CFS
43 PSI
CHICK HEARN CT
3.92 CFS
42 PSI
ALBANY
316
12th ST
9.23 CFS
319
46 PSI
J304
10.55 CFS
CHERRY
318
7.21 CFS
F-12
F-11
PICO BLVD
41 PSI
EL240
4.67 CFS
EL241
0.16 CFS
0.59 CFS
FIGUERDA
EL237
42 PSI
334
5.52 CFS
2.13 CFS
ST
HOPE
EL238
12th ST
347
EL240
EL241
2.09 CFS
3.92 CFS
2.23 CFS
1.12 CFS
F-10
7.58 CFS
4.24 CFS
2.44 CFS
5.78 CFS
9.13 CFS
F-8
F-6
F-5
F-3
F-2
EL233
44 PSI
FLOWER
EL235
PICO
BLVD
2.69 CFS
SOUTH HALL DR
3.85 CFS
FIGUERDA ST
6.04 CFS
(15th ST)
vacated street
VENICE
329
40 PSI
0.40 CFS
333
J311
40 PSI
325
3.28 CFS
3.85 CFS
332
5.65 CFS
FLOWER ST
HOPE ST
GRAND AVE
352
J328
49 PSI
11.73 CFS
J312
338
J320
40 PSI
17TH ST


MODEL RESULTS (upsize 8" to 12" on Pico)
(8 adjacent hydrants with 1500 GPM each)
Total Flow = 12,000GPM
F-2 = 40 PSI
F-3 = 39 PSI
F-5 = 39 PSI
F-6 = 39 PSI
F-8 = 41 PSI
F-10 = 45 PSI
F-11 = 45 PSI
F-12 = 45 PSI
11th ST
GEORGIA
ST
CHICK HEARN CT
ALBANY
316
12th ST
319
J304
CHERRY
318
PICO BLVD
F-12
F-11
FIGUEROA
EL237
334
EL240
EL241
41 PSI
42 PSI
46 PSI
43 PSI
42 PSI
9.29 CFS
8.04 CFS
9.04 CFS
10.81 CFS
7.47 CFS
4.12 CFS
2.03 CFS
3.02 CFS
3.73 CFS
4.69 CFS
0.35 CFS
0.60 CFS
3.86 CFS
1.92 CFS
2.57 CFS
0.77 CFS
8.30 CFS
4.95 CFS
1.73 CFS
5.07 CFS
8.41 CFS
F-10
F-8
F-6
F-5
F-3
F-2
EL233
44 PSI
EL238
12th ST
347
EL240
FLOWER
EL235
PICO
BLVD
SOUTH HALL DR
2.81 CFS
(15th ST)
vacated street
48 PSI
329
0.31 CFS
333
3.54 CFS
FIGUEROA ST
6.14 CFS
J311
48 PSI
325
3.32 CFS
328
3.59 CFS
5.83 CFS
49 PSI
11.64 CFS
J312
48 PSI
338
J320
FLOWER ST
HOPE ST
GRAND AVE
352
17TH ST