APPENDIX - J

HYDRAULIC WATER MODELING MEMORANDUM

THE CITY OF SAN DIEGO

M E M O R A N D U M

DATE: November 26, 2014

TO: Alex Garcia, Senior Civil Engineer, Project Implementation Division, Public Works Department

FROM: Feryal Moshavegh, Associate Civil Engineer, Engineering and Program Management Division via Eric Rubalcava, Senior Civil Engineer, Engineering and Program Division, Public Utilities Department

SUBJECT: Water Group Job 1019 – Request for Hydraulic Water Modeling and Pipe Sizing Assessment Study

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In response to your memorandum dated November 13, 2014 requesting pipe sizing assessment study of the existing Asbestos Cement (AC) water mains. We are providing the following information:

Background and Objective

The subject water mains are located within Alvarado 536 Hydraulic Grade Line (HGL) pressure zones. The objective of this project was to simulate the proposed pipeline improvements and abandonment in year 2035 demand condition and verify, if it will satisfy the City's design criteria for pressure, flow, velocity and redundancy requirement. This area is located in the single family zoning with 2,000 gallons per minutes (gpm) and in the commercial zone 4,000 gpm fire flow requirement.

Hydraulic Modeling Scenarios

The following scenarios were based on the proposed improvements, maximum day, peak hour, and worst case fire with one redundant feed out of services (Figure 3 & 4)

Case Scenario: 7:30 am, 4000 gpm commercial fire flow at Fire Hydrant No. 416 on Euclid Ave and Marilou Rd and section of existing 12-inch AC main in Euclid Ave between Marilou Rd and Elm St out of service (Figures 2 & 3).
Case Scenario: 7:30 am, 2000 gpm single family fire flow at Fire Hydrant No. 253 on Elm St and Tilden St and section of existing 6-inch AC main in Date St between 49th St and Duval St out of service (Figures 2 & 4).

Findings and Recommendations

The hydraulic results from the water modeling scenarios are listed on Table 1 and Figure 1. The proposed water main sizing will satisfy the current City's Design criteria for fire flow, pressure, velocity and redundancy.

Water Group Job 1019 - Table 1 (Figure 1)

Figure No	Location	Existing Main size	Proposed Main Size
1	Dafter Pl	6" & 8" AC	8" Pipe
1	Dafter Dr	8" AC	8" Pipe
1	Deaton Dr	6" & 8" AC	8" Pipe
1	Genesta St	6" AC	8" Pipe
1	Oakshire Ct	6" AC	8" Pipe
1	Fir St	6" AC	8" Pipe
1	Westover Pl	6"AC	8" Pipe
1	Elm St	6" & 8" AC	8" Pipe
1	Date Pl	6" & 8" AC	8" Pipe
1	Date St	6" AC	8" Pipe
1	Altadena Av	8" AC	8" Pipe
1	50th St from Deaton Dr to Date Pl	6" & 8" AC	8" Pipe
1	49th St from Fir St to Federal BL	8" AC	8" Pipe
1	Tilden St	8" AC	8" Pipe
1	48th St from Fir St to Federal Bl	6" AC	8" Pipe
1	Brookline St	6" AC	8" Pipe
1	Duval St from Fir St to Federal Bl	6" AC	8" Pipe
1	Duval St from Marilou Rd to Federal Bl	8" AC	8" Pipe
1	Marilou Rd	8" AC	8" Pipe

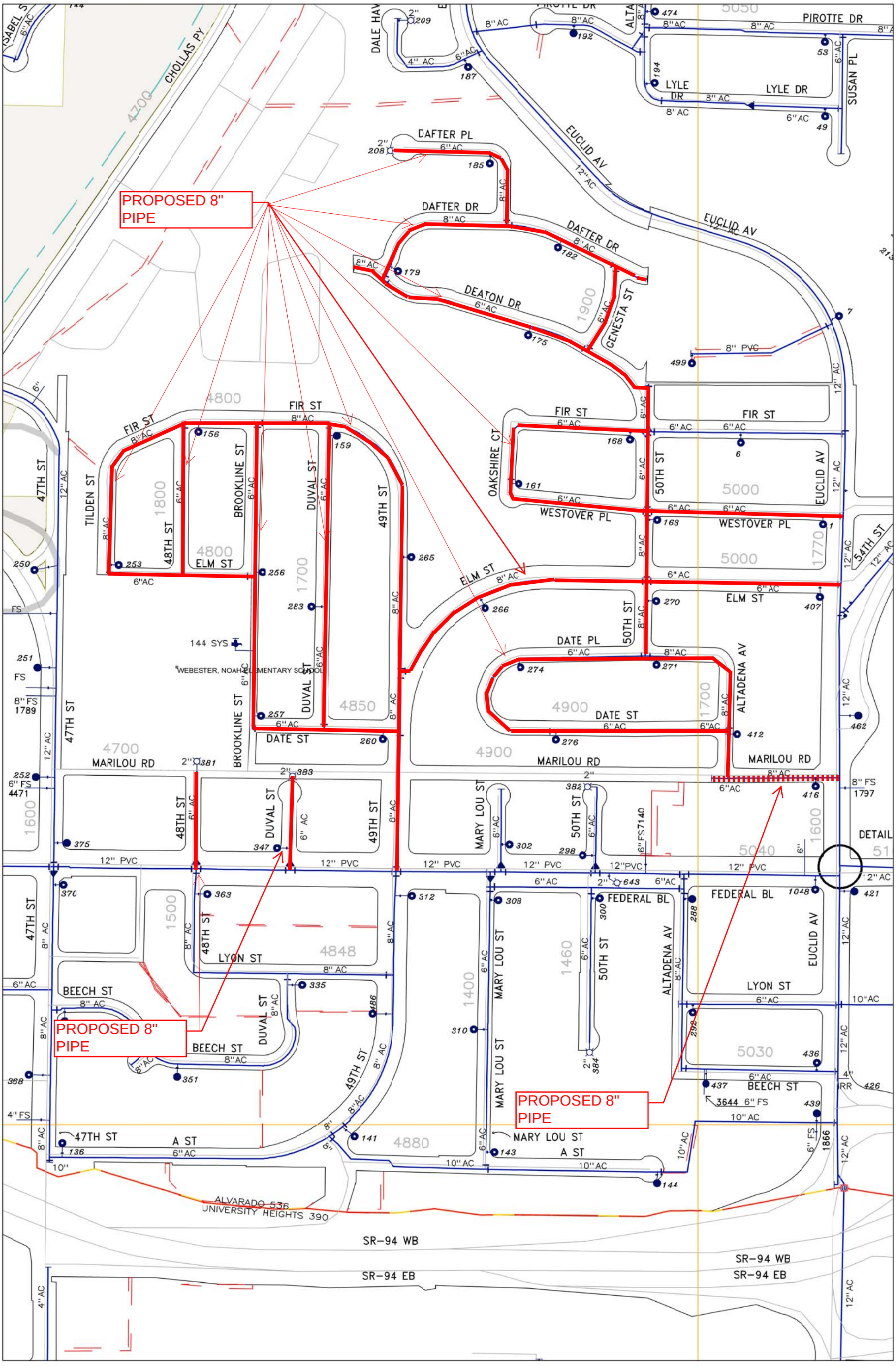
The existing water mains can be shutdown and hi-lined during construction. Please coordinate with Water Operations Division prior to construction. If you have any questions feel free to call me at (858) 654-4241, or Assistant Civil Engineer My-Lee Huynh at (858) 292-6359.

Feryal Moshavegh

Mxl/FM

Attachments:
1. Figure 1 – Location Map
3. Figure 2 –Hydraulic Map Existing Condition
4. Figure 3 – Hydraulic Map Proposed Case Scenario
5. Figure 4 – Hydraulic Map Proposed Case Scenario

cc: Rania Amen, Deputy Director, Engineering and Program Management Division
Darren Greenhalgh, Deputy Director, Project Implementation Division
Tatyana Fikhman, Water Production Superintendent, Water Operations Division
Santiago Crespo, Associate Civil Engineer, Water Operations Engineering Division
Tina Huang, Associate Civil Engineer, Project Implementation Division
My-Lee Huynh, Assistant Civil Engineer, Engineering & Program Management Division
Virginia Oskoui, Assistant Civil Engineer, Project Implementation Division



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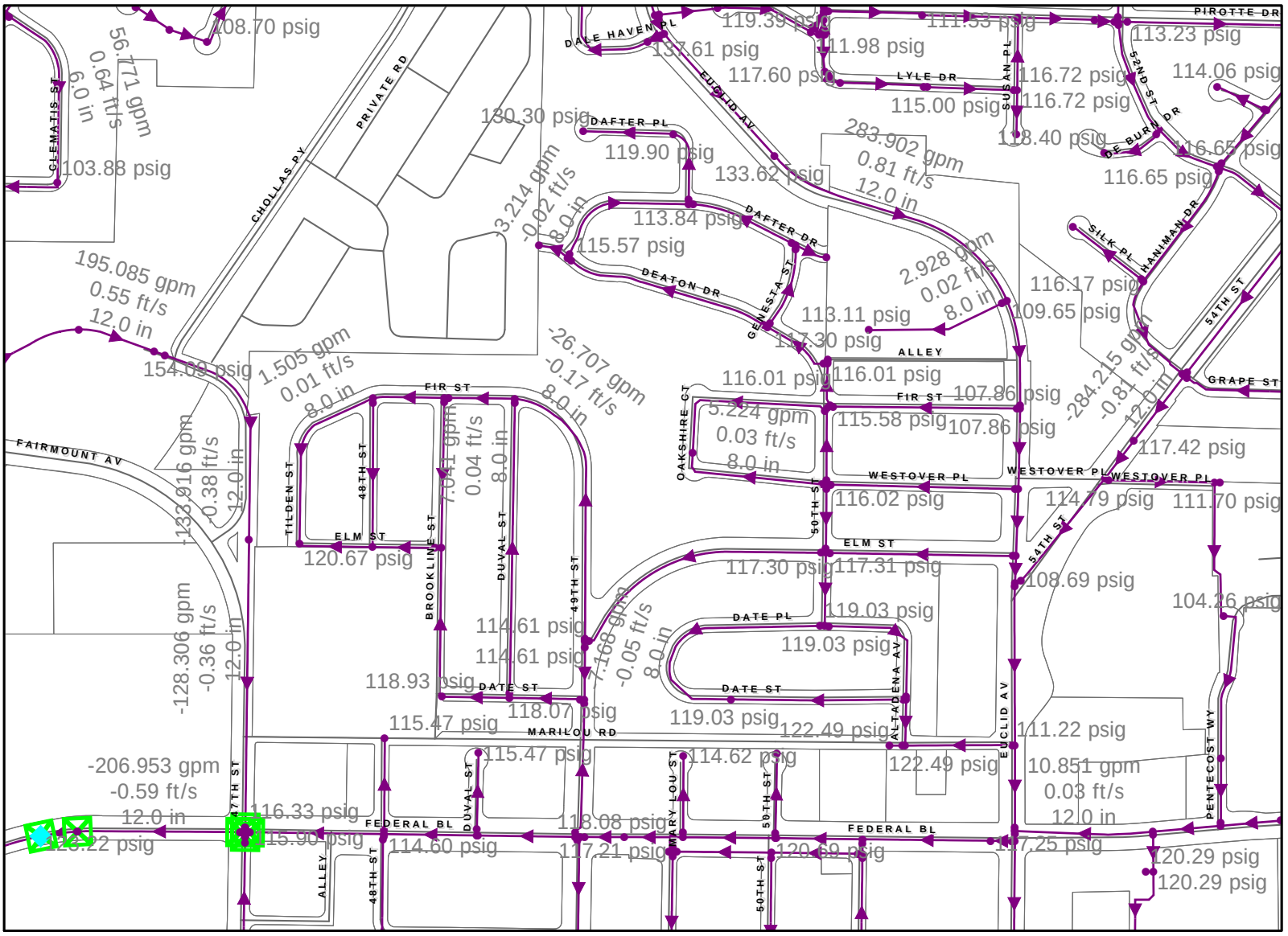
GROUP JOB 1019
LOCATION MAP

FIGURE 1

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

GROUP JOB 1019 - HYDRAULIC WATER MODELING - EXISTING CONDITION



X,Y (Feet): 6301400.56, 1842974.56

Legend

Facilities Color By
Average Pressure (psig)
- Not Applicable (748)
- < 20.00 (738)
- 20.00 - 30.00 (371)
- 30.00 - 40.00 (861)
- 40.00 - 50.00 (2342)
- > 50.00 (61266)

Nodes Color By
Pressure (psig)
- Not Applicable (604)
- < 20.00 (723)
- 20.00 - 30.00 (363)
- 30.00 - 40.00 (789)
- 40.00 - 50.00 (2188)
- > 50.00 (55602)

Facilities Symbols
- Default Pipe
- Default Valve
- Default Check Valve
- Default Tank Fill Valve
- Default Pump
- Default Energy Reporting Pump
- Default Tank/Reservoir
- Default Pressure Regulator
- Default Meter
- Default Subsystem Border

N W E S

0 150 300 600 900 1,200 Feet

Scale: 1 = 6,391

Simulation Data:
State: Solved
Date: 11/18/2014
Time: 7.50000

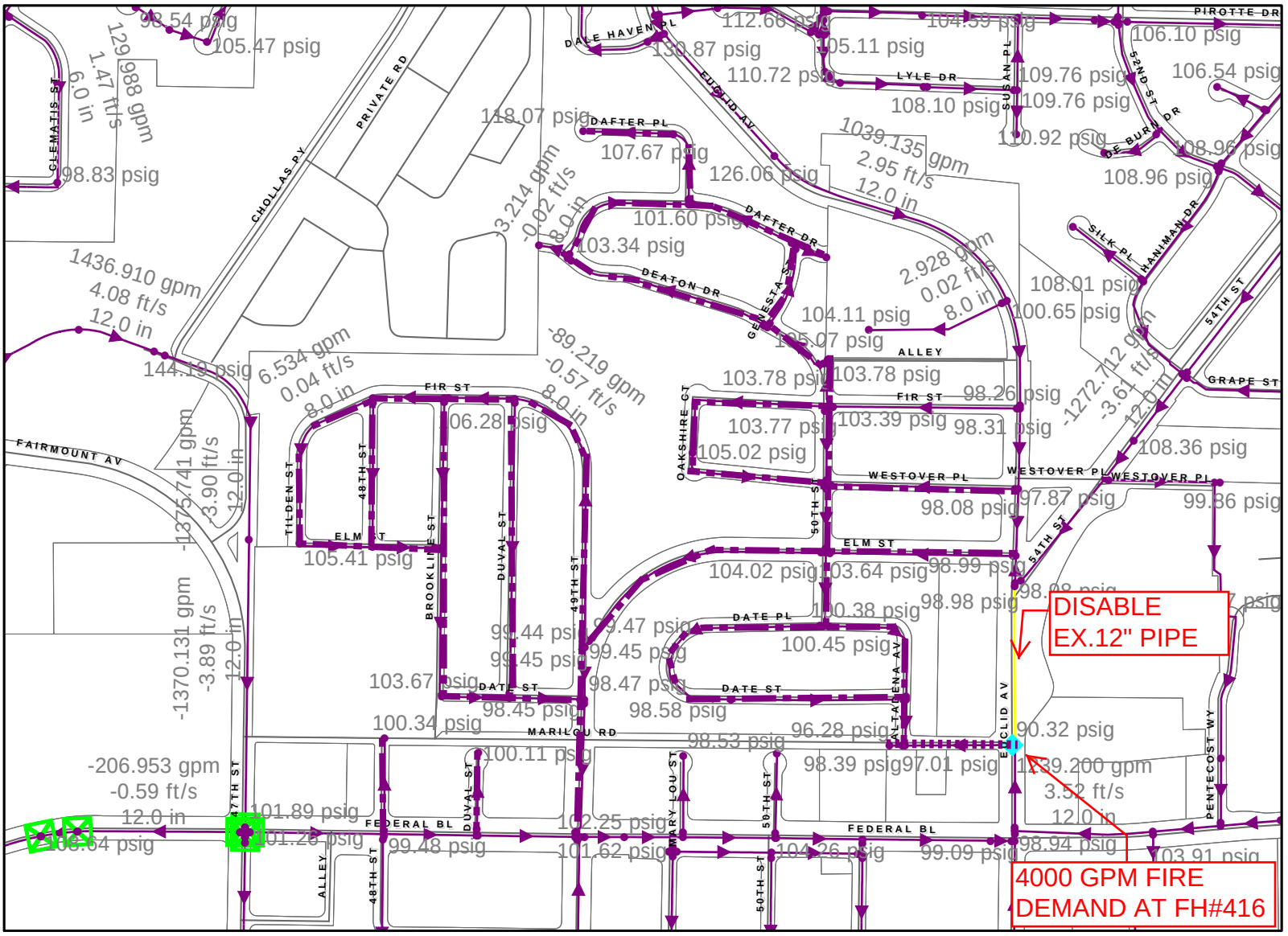
FIGURE 2

Model Name: 2035_Base_MDD_Alvarado_24hr

Model Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet

SynerGEE Water 4.7.0 (04 Jun 2013)

GROUP JOB 1019 - HYDRAULIC WATER MODELING - CASE SCENARIO



X,Y (Feet): 6301400.56, 1842974.56

Legend

Facilities Color By
Average Pressure (psig)
- Not Applicable (749)
- < 20.00 (745)
- 20.00 - 30.00 (365)
- 30.00 - 40.00 (867)
- 40.00 - 50.00 (2483)
- > 50.00 (61117)

Nodes Color By
Pressure (psig)
- Not Applicable (604)
- < 20.00 (729)
- 20.00 - 30.00 (359)
- 30.00 - 40.00 (793)
- 40.00 - 50.00 (2307)
- > 50.00 (55477)

Facilities Symbols
- Default Pipe
- Default Valve
- Default Check Valve
- Default Tank Fill Valve
- Default Pump
- Default Energy Reporting Pump
- Default Tank/Reservoir
- Default Pressure Regulator
- Default Meter
- Default Subsystem Border

PROPOSED 8" PIPE

PROPOSED 12" PIPE

N W E S

0 150 300 600 900 1,200 Feet

Scale: 1 = 6,391

Simulation Data:
State: Solved
Date: 11/19/2014
Time: 7.50000

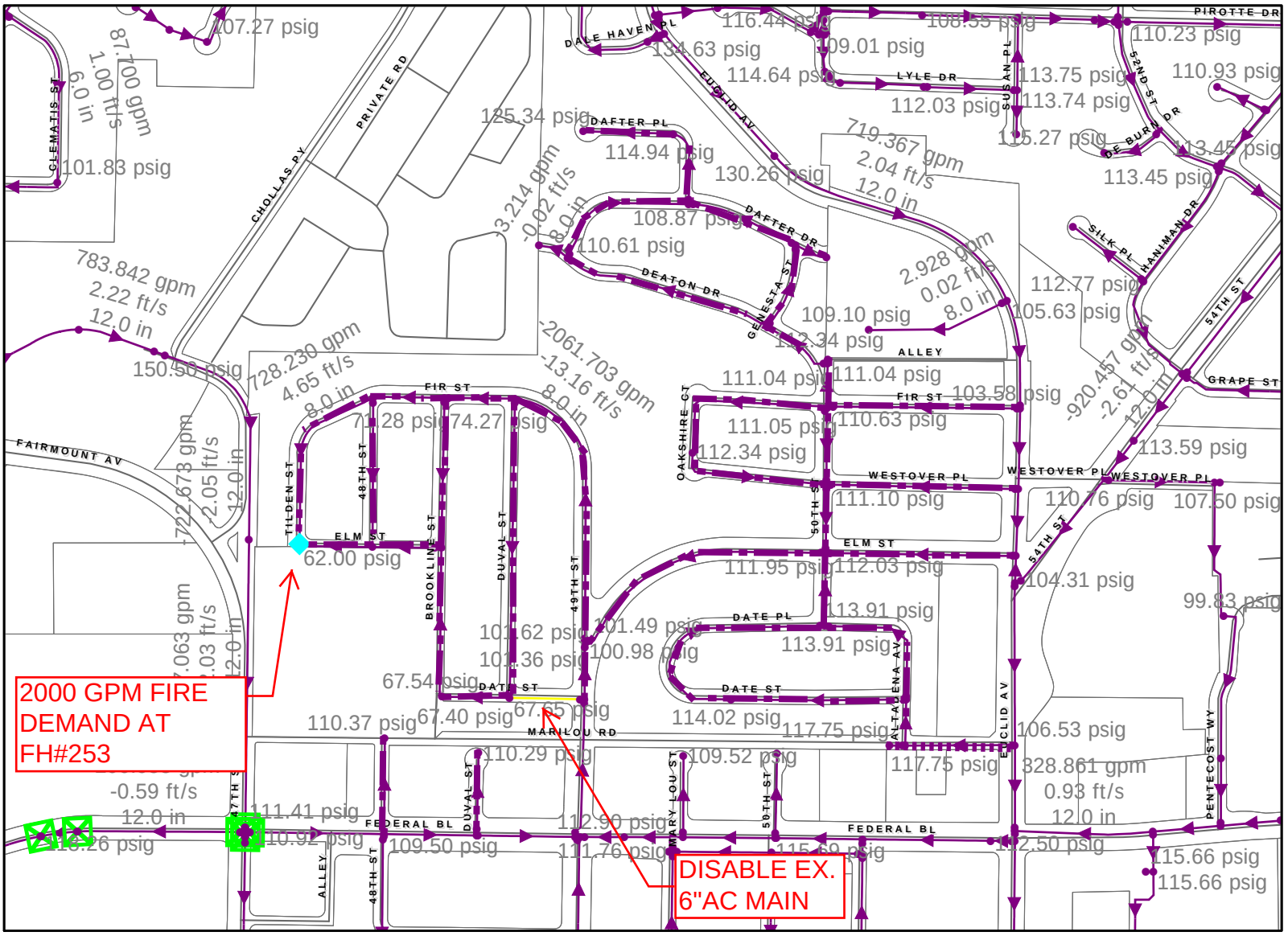
FIGURE 3

Model Name: 2035_Base_MDD_Alvarado_24hr

Model Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet

SynerGEE Water 4.7.0 (04 Jun 2013)

GROUP JOB 1019 - HYDRAULIC WATER MODELING - CASE SCENARIO



PROPOSED 8" PIPE

PROPOSED 12" PIPE

X,Y (Feet): 6301400.56, 1842974.56

Legend

Facilities Color By
Average Pressure (psig)
- Not Applicable (749)
- < 20.00 (742)
- 20.00 - 30.00 (368)
- 30.00 - 40.00 (863)
- 40.00 - 50.00 (2406)
- > 50.00 (61198)

Nodes Color By
Pressure (psig)
- Not Applicable (604)
- < 20.00 (724)
- 20.00 - 30.00 (364)
- 30.00 - 40.00 (789)
- 40.00 - 50.00 (2244)
- > 50.00 (55544)

Facilities Symbols
- Default Pipe
- Default Valve
- Default Check Valve
- Default Tank Fill Valve
- Default Pump
- Default Energy Reporting Pump
- Default Tank/Reservoir
- Default Pressure Regulator
- Default Meter
- Default Subsystem Border

N W E S

0 150 300 600 900 1,200 Feet

Scale: 1 = 6,391

Simulation Data:
State: Solved
Date: 11/19/2014
Time: 7.50000

FIGURE 4

Model Name: 2035_Base_MDD_Alvarado_24hr

Model Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet

SynerGEE Water 4.7.0 (04 Jun 2013)

THE CITY OF SAN DIEGO

M E M O R A N D U M

DATE: November 13, 2014

TO: Eric Rubalcava, Senior Civil Engineer, EPM Division, Public Utilities Department (PUD)

FROM: Alex Garcia, Senior Civil Engineer, Project Implementation Division, Public Works Department

SUBJECT: Request for Modeling Assessment – AC Water Group 1019, WBS TBD

Please provide a hydraulic modeling and PRS assessment to identify the pipe sizes for the proposed cement (AC) water main replacement at the locations shown on the attached location map. All locations are within the Alvarado 536 pressure zones.

In addition, please provide shutdown modeling to determine if each section of the alignment can be taken out of service during construction. In the event that the entire alignment cannot be taken out of service, please provide an assessment of the maximum length of water main that can be taken out of service at a time.

This is a Design Bid Build project that is scheduled for advertisement in Fiscal Year 2016. Your expedient response to this request will be greatly appreciated.

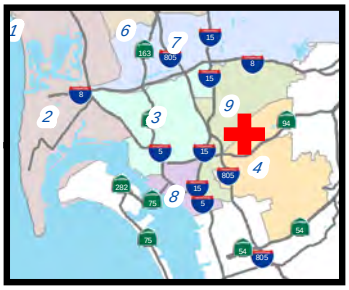
Should you require further information about this project, please contact Project Engineer Virginia Oskoui at (619) 533-5152.

Alex Garcia
Senior Civil Engineer

KB

Attachments: 1. Location Map
2. Land Use Map

cc: Feryal Moshavegh, Associate Engineer-Civil, PUD
Richard Stevens, Associate Engineer-Civil, PUD
Tatyana Fikhman, Senior Civil Engineer, PUD
Huang Tina, Associate Engineer-Civil, PW



PREDESIGN LOCATION MAP

AC WATER GROUP 1019

CITY OF SAN DIEGO PUBLIC WORKS DEPARTMENT

PROJECT IMPLEMENTATION DIVISION

PREDESIGN SENIOR ENGINEER
ALEX GARCIA
(619) 533-3634

PREDESIGN PROJECT MANAGER
TINA HUANG
(619) 533-3863

PREDESIGN PROJECT ENGINEER
VIRGINIA OSKOUI
(619) 533-5152

PREDESIGN DRAFTER
TEDDY RAMOS
(619) 533-3734

Legend

AC Water Group 1019

No Scale

Document Path: S:\PITS\PITS-CIP-Preliminary-Engineering-and-Program-Coordination\Drafting\Water & Sewer Projects\AC Water Projects\AC Water and Sewer Group 1019\CIP Tracking\Location Maps\Predesign Location Map (11-4-2014).mxd

Community Name: Mid-City: Eastern Area

Council District: 4

SAP ID# TBD (W)
TBD (S)

Date: 11-5-2014

SanGIS

Last updated by: SBlantz on 11/7/2014 at 1:27:16 PM