WATER STUDY REPORT

FOR THE

KAISER PERMANENTE
MORENO VALLEY MEDICAL CENTER

April 12, 2019

Prepared by:

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_____ _____
Signature Date

MBI JN 169814

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Section 1 - Introduction

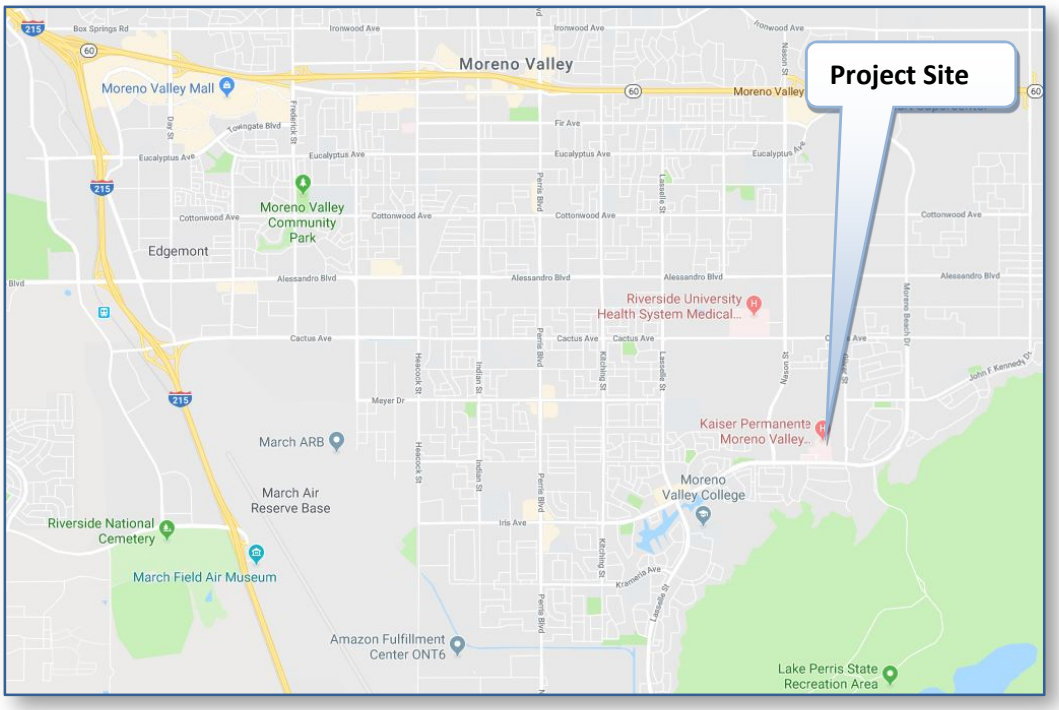
This report provides background data, hydraulic analysis, and a summary of results as part of a water study for the proposed Kaiser Permanente Moreno Valley Hospital project. The purpose of this study is to determine the potential impact of the proposed project on the existing public water distribution system and to verify design of the proposed onsite domestic water, fire loops and irrigation to meet the project's domestic, fire flow and irrigation demands.

Section 2 - Project Description

2.1 Project Location:

The proposed expansion of Kaiser Permanente Moreno Valley Medical Center site is comprised of a 29.8-acre dual-parcel (APN 486-310-033 and APN 486-310-034) that is currently developed with a hospital, patient tower, medical offices and onsite parking. Located at 27300 Iris Avenue in Moreno Valley, California, the Project site abuts undeveloped open space to the west, north and east, Fresenius Medical Care facility to the northeast, and residential single-family homes and golf course located to the east and south. The Project site is shown in Figure 2-1.

Figure 2-1
Project Site (Google Maps)



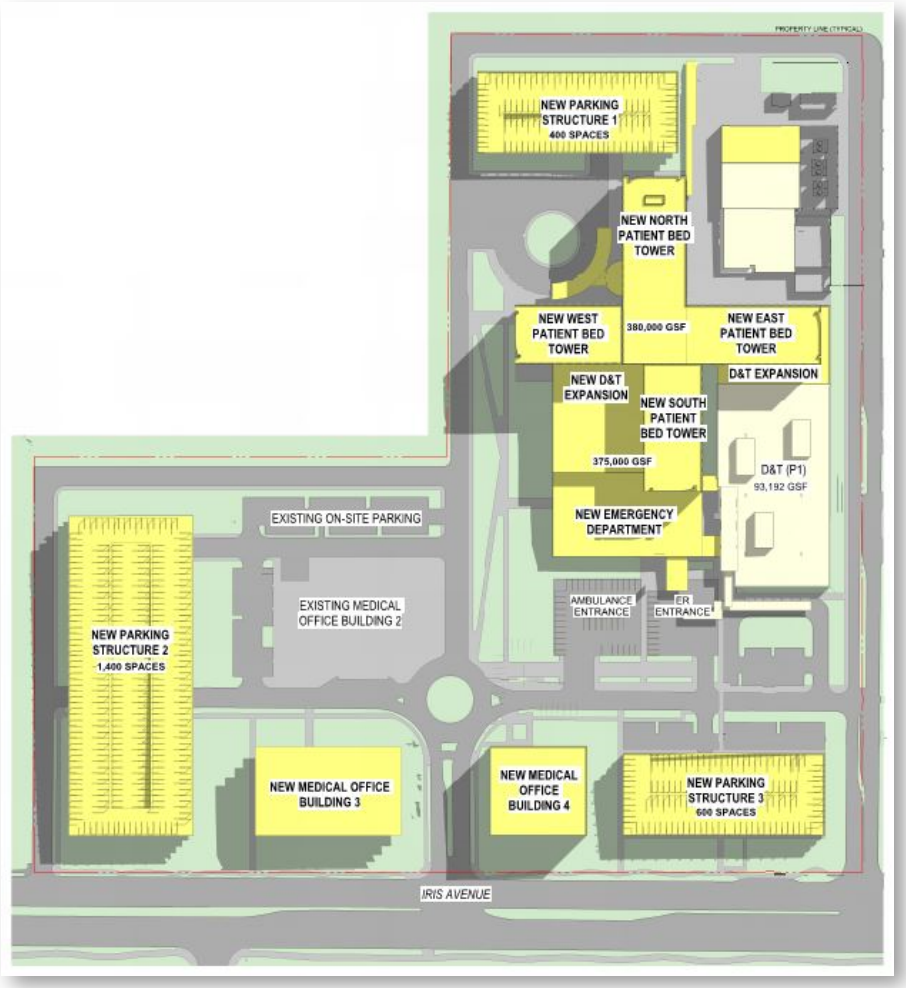
2.2 Proposed Project:

The proposed project will be an expansion to the existing medical campus. The new Kaiser Permanente Moreno Valley Medical Center (Medical Center) will be analyzed in two (2) segments – Early Project and Ultimate Project. This study addresses the total ultimate development for both segments which will include four (4) patient bed towers, a Diagnostics and Treatment Center (D&T), and an Emergency Department totaling 458 beds and 850,000 square feet. The project will also include a Central Utility Plant (CUP) of approximately 28,100 GSF and Parking Structures with a total of 2,550 parking stalls. Table 2-1 summarizes the existing, early, and ultimate project totals at the end of each proposed project segment. The development process for each project segment includes temporary on-site facilities and demolition of existing facilities which are not included in the report. Figure 2-2 depicts the schematic site layout for the Ultimate Project including the location of the patient bed towers, D&T, Emergency Department, CUP, medical office buildings, and parking structures within the Project area. See Appendix A for existing, early and ultimate project site layouts.

Table 2-1
Proposed Project Summary

	Existing Project	Early Project	Ultimate Project
Patient Towers; Emergency Department; D&T Expansion	99 Beds 133,000 SF	105 Beds 230,900 SF	458 Beds 850,000 SF
CUP	--	20,100 SF	28,100 SF
Medical Office Buildings	74,400 SF	84,500 SF	234,400 SF
Parking Structure	685 Stalls	730 Stalls	2,550 Stalls

Figure 2-2
Proposed Site Layout



2.3 Prior Site Planning

The Kaiser Permanente Moreno Valley Community Hospital currently consists of a two buildings, hospital and medical office building, respectively built in 1989 and 1997, and provides patient care services. This project currently designates the aging infrastructure as a facility requiring upgrades and renovations to meet current OSHPD requirements. The hospital will be demolished and restored in segments, along with demolition to existing on-site parking, to accommodate the proposed Project. The project area encompasses two zones including community commercial and office commercial per the City of Moreno Valley Zoning Atlas.

2.4 Study Area

The subject study area is roughly bounded by Delphinium Avenue to the north, Oliver Street to the east, Iris Avenue to the south, and Nason Street to the west. The primary zoning for the project area consists of a mixture of community commercial and office commercial along Iris Avenue. In accordance with the requirements specified in the Addendum #1 Entitlement Documents, the proposed project is required to prepare a preliminary water study to establish the potential impact of the proposed project on the existing public water infrastructure and to verify design of the proposed onsite domestic water, fire loops and irrigation meet the project's water demands.

The local water distribution system is comprised primarily of 4-inch and 6-inch domestic water and 6-inch and 10-inch looped fire service mains throughout the study area. The local distribution system mains within the study area connect to the 18-inch water pipeline at the Kaiser Permanente Moreno Valley Community Hospital main entrance along the south side of Iris Avenue. The proposed project will expand the on-site water distribution system and connect the new facilities to the existing domestic water and fire flow system. Refer to Figure 2-3 and Figure 2-4 for the Preliminary Utility Plan showing the proposed domestic water, fire flow, and recycled water mains within the project area.

2.5 Proposed Points of Connection

The proposed development will maintain the existing domestic water and fire flow main connections to the existing 18-inch water main on Iris Avenue. The existing water and fire mains will be extended to service new facilities, including the new D&T building and energy center depending on the construction segment. The existing and proposed on-site water and fire flow system will be modified for each construction segment described in further detail below:

As shown on

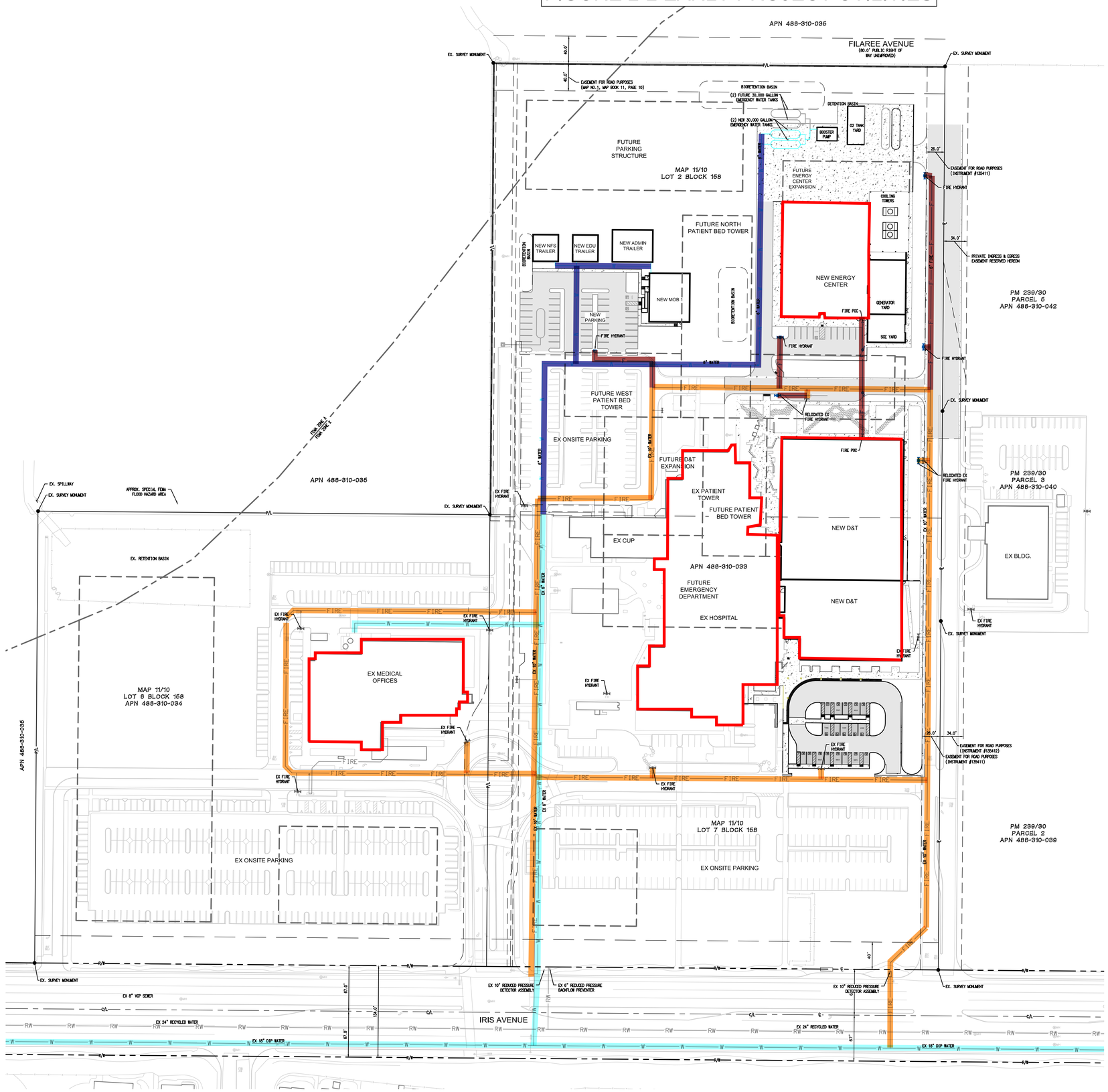
Figure 2-3, the Early Project includes the installation of a new 6-inch domestic water main that feeds directly into the proposed 20,000-gallon emergency water tanks at the north end of the project site. The supply and discharge lines to the emergency water tanks will both provide a point of connection to service the new Energy Center and new cooling towers, respectively, on the west side of the facility. This 6-inch water main also connects to the new NFS Trailer, EDU Trailer, Admin Trailer, and MOB at the north edge of the project site. Additional 10-inch fire lines will be added to provide flows for additional fire hydrants responsible for servicing new facilities at the north end of the project site. At the south end of the site fire line connections are provided for the Future Parking Structures 2 and 3 as well as Medical Office Buildings 3 and 4.

As shown on Figure 2-4, the Ultimate project includes two additional water line connections to the Medical Office Buildings 3 and 4. Also shown is an extension of the 10-inch fire line to feed proposed hydrants at the north end and central location of the site. At the south end of the site fire line connections are provided for the Future Parking Structures 2 and 3 as well as Medical Office Buildings 3 and 4.

2.6 Onsite Domestic Water Storage (OSHPD Required Redundancy)

The California Office of Statewide Health Planning and Development (OSHPD) provides specific design requirements and oversight for health care facilities. Specific criteria have been developed for mission critical health care facilities that require a 96-hour reserve of onsite stored water to meet critical hospital water needs. As a result of the OSHPD requirements, the proposed Kaiser Permanente Moreno Valley Community Hospital will incorporate 60,000 gallons of potable storage contained in two (2) underground storage tanks for the Early Project. The Ultimate Project will include an additional 60,000 gallons of potable storage contained in two (2) underground storage tanks for a total of four (4) underground storage tanks with 120,000 gallons of potable water storage. As this design requirement is driven by OSHPD, the storage sizing requirements are beyond the scope of this Water Study. However, this requirement should be understood as meeting the necessity for domestic water supply redundancy for this project.

FIGURE 2-2 EARLY PROJECT UTILITIES



EXISTING DOMESTIC WATER

PROPOSED DOMESTIC WATER

EXISTING FIRE

PROPOSED FIRE

CO ARCHITECTS

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REVISIONS

KAISER PERMANENTE

MORENO VALLEY MEDICAL CENTER
DIAGNOSTIC & TREATMENT ADDITION

27300 IRIS AVENUE MORENO VALLEY, CA 92555
KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

E	A
F	B
G	C
H	D

N

PHASE 1 - COLOR UTILITY EXHIBIT

SCALE:AS INDICATED
DATE OF ISSUE: APRIL 2, 2019

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

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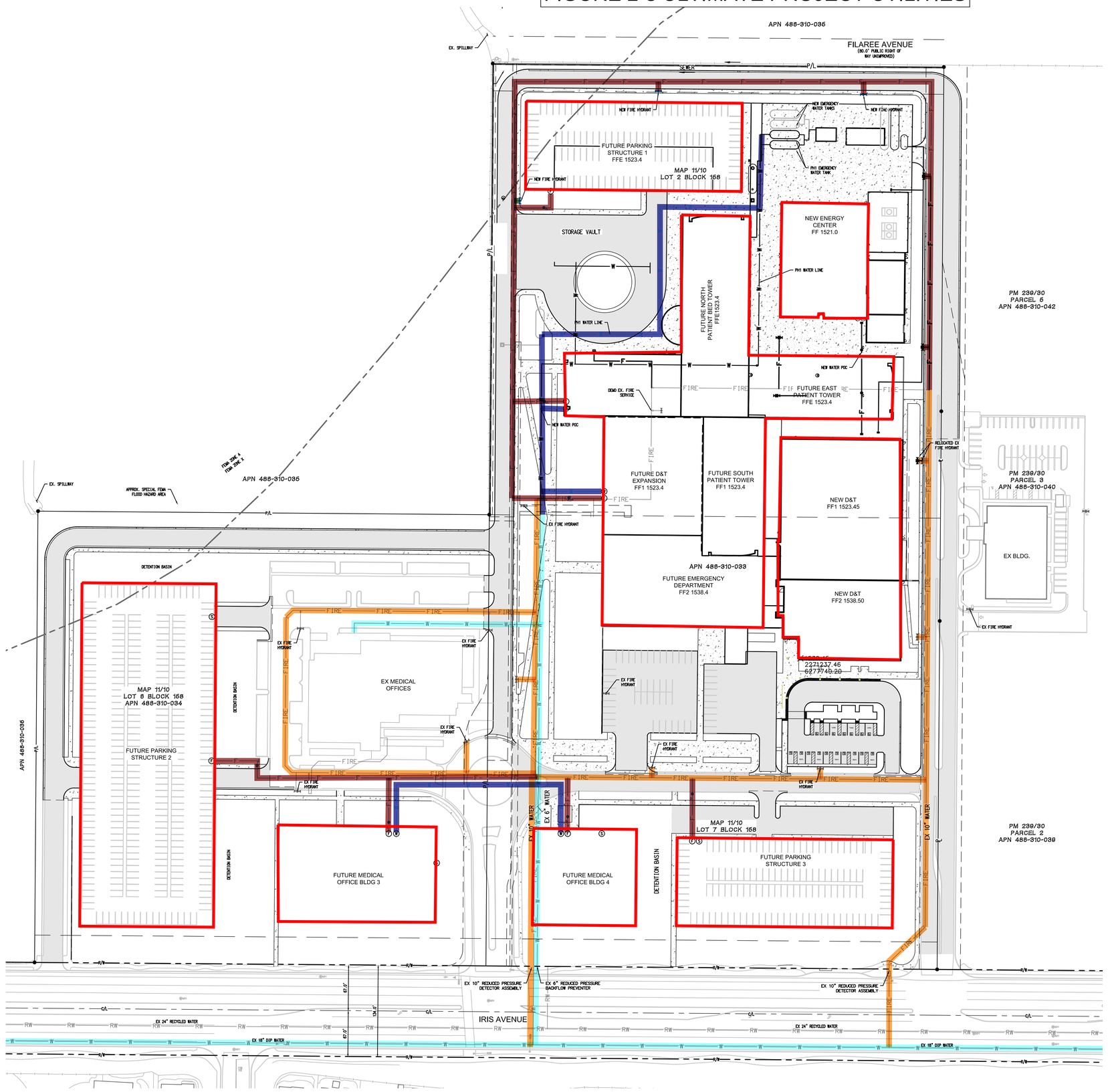
FIGURE 2-3 ULTIMATE PROJECT UTILITIES



EXISTING DOMESTIC WATER

PROPOSED DOMESTIC WATER

EXISTING FIRE

PROPOSED FIRE

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H	D

N

MASTER PHASE - COLOR
UTILITY EXHIBIT

SCALE: AS INDICATED
DATE OF ISSUE: APRIL 2, 2019

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

C1.00

Section 3 - Water Demands

Water demands for the proposed project were developed for both the Early Project and Ultimate Project conditions. These project demands were produced using existing onsite water meter data from January 2018 through December 2018 obtained from EMWD and include domestic, fire, and irrigation water usage. The total existing metered data was analyzed to determine the total amount of flow designated to three onsite facilities, including the hospital, medical office building, and energy center. Water demands for each existing facility was further examined by hospital bed count and square footage under each project buildout to determine the projected water demands for the core future facilities, including the hospital, medical office buildings, diagnostics and treatment center (D&T), and energy center. The total amount of water delivered to these new facilities are expressed as an Average Day Demand (ADD) and can be found in Figure 3-1.

The Maximum Day Demand and Peak Hour Demands (MDD and PHD, respectively) were calculated using the maximum day and peak hour peaking factors obtained from the EMWD Water System Planning & Design Principle Guidelines Criteria (See Appendix E). The City of Moreno Valley Zoning Map designates the medical campus as office and commercial zoning. Therefore, the peaking factors designated to the Commercial and Industrial land use are used to calculate the MDD and PHD. Sample calculations are found below and represent the MDD and PHD for the medical office building. The MDD and PHD water demand calculations for both the Early Project and Ultimate Project are found in Figure 3-1.

MDD = ADD * PF_{maxday} where PF_{maxday} = 1.5
= 21.66 gpm * 1.5
= 3.56 gpm

PDD = ADD * $PF_{peakhour}$ where $PF_{peakhour}$ = 2.0
= 2.37 gpm * 2.3
= 4.74 gpm

Peaking factors for the Energy Center cooing and heating calculations are independent of the peaking factors provided by EMWD. The existing heating and cooling load profiles from January 2018 through December 2018 were provided by ARUP. Cooling and heating loading were analyzed to determine the projected makeup water for the new Energy Center. Domestic water supplied by EMWD is used for the existing energy center and will continue to be used for the new energy center.

Hospital Demands – Demands for the Main Hospital Building were determined based on the total bed count for each phase provided by CO Architects multiplied by an industry average indoor Hospital water usage of 206 gpd/bed. The total number of beds planned for the Early Project and Ultimate Project is 105 and 458 beds respectively. This leads to an approximate AAD of 7.9 million gallons and 34.4 million

gallons for the Early and Ultimate Project phases respectively. The MDD and PHD were calculated by multiplying the AAD by the respective peaking factors of 1.5 and 2.0.

Medical Office Building – Average Annual Demand (AAD) for the Medical Office Buildings were determined based on an existing building area of 82,000 square feet, Early Project building area of 74,000 square feet, and Ultimate Project building area of 234,00 square feet. Each respective phases square footage was multiplied by the EMWD's unit water demand rate of 2,000 gpd/gross acre (0.0459 gpd/sf) to determine each respective phases expected water demand. The MDD and PHD were calculated by multiplying the AAD by the respective peaking factors of 1.5 and 2.0.

Diagnostics and Treatment – The diagnostics and treatment center demand is accounted for as an independent facility for the Early Project and is incorporated into the Hospital facilities demands for the Ultimate Project. This leads to an AAD of 1.6 million gallons for the early project. The MDD and PHD were calculated by multiplying the AAD by the respective peaking factors of 1.5 and 2.0.

Energy Center – The energy center is comprised of the cooling tower and steam boilers. The cooling tower and steam boilers were analyzed without conservation to observe extreme conditions. Recycled condensation was excluded from the heating makeup water demand and the chillers were analyzed at 4 cycles of concentration.

Irrigation Demands - Appendix A shows the hospital irrigation recycled water existing and proposed demands. All irrigation water is supplied by recycled water and not domestic water therefore it is briefly explained in this water study but not used in any of the hydraulic analysis. This table shows during the existing conditions a demand of approximately 21,000 gallons per year. A reduction of approximately 11,000 gallons to a demand of 10,000 gallons per year is expected during the Early Project phase. During the final phase a demand of approximately 15,000 gallons per is expected. The Early and Ultimate project demands were provided by Ridge Landscape Architects.

Figure 3-1
Water Demands Summary

Use Location	Early Project (gpm)			Ultimate Project (gpm)		
	ADD	MDD	PHD	ADD	MDD	PHD
Demand 1 - Hospital, D&T, Energy Center						
Hospital	15.02	22.53	30.04	65.52	98.28	131.04
Diagnostic & Treatment[1]	2.97	4.46	5.94	-	-	-
Energy Center[2]	33.06	55.40	55.40	113.22	189.76	189.76
Total Demand 1	**51.05**	**82.39**	**91.39**	**178.74**	**288.04**	**320.80**
Demand 2 - Medical Office Buildings						
MOB 1[3]	-	-	-	-	-	-
MOB 2	2.37	3.56	4.74	2.37	3.56	4.74
MOB 3	-	-	-	2.07	3.11	4.14
MOB 4	-	-	-	3.03	4.54	6.06
Total Demand 2	**2.37**	**3.56**	**4.74**	**7.47**	**11.21**	**14.95**
Total Domestic Demand	**53.42**	**85.95**	**96.13**	**186.22**	**299.25**	**335.74**

1. D&T Addition area included in Hospital Buildings area as shown per CO Architects' D&T Addition Schematic/Design Development Progress Set dated 11/30/18. D&T Addition is broken out to calculate water demand by facility size only for Early Project.
2. Multiplier factors for the Max Day and Peak Hour per EMWD are not incorporated into the Energy Center demands.
3. MOB 1 is a temporarily facility that receives minimal flow in comparison to MOB 2. This demand is negligible for the calculations.

Section 4 - Hydraulic Analysis

The analysis of the proposed fire service distribution system was performed using the InfoWater modeling software program by Innovyze. The water model was developed by imputing junction and pipe data taken from utility drawings and hydrant flow test data provided by EMWD. The water model only includes a segment of domestic water main along Iris Avenue and water utilities located within the project area. The model is calibrated using the fire flow test data to mimic existing onsite conditions.

Ground elevations in the general area of the proposed site range from approximately 1,514 feet above mean sea level (MSL) along the northwestern area of the project area (near the existing medical office building) to 1,559 feel MSL along the southeastern boundary (near the intersection of Iris Avenue and Oliver Street). A conservative Hazen-Williams pipe roughness coefficient ("C" factor) of 110 was utilized for existing public and private water mains and 120 for the proposed on-site domestic and fire service mains (PVC C900). Existing and proposed pipes and junctions, representative of the domestic and fire distribution systems, were assigned identification numbers which correspond to the type of function (i.e. Domestic Water, Fire Water, etc.) the section of pipe serves.

4.1 Boundary Conditions and Settings

Boundary conditions for the hydraulic model were established based on the known and planned operating hydraulic conditions within the project area. A reduced pressure detector assembly was located on the existing public fire loop and the public domestic water lead servicing the existing project area. Basic model calibration was performed based on fire hydrant testing data provided by EMWD (dated March 18, 2019) for two existing points of connection on the existing 18" water main along Iris

Avenue (Refer to Appendix B). No public fire hydrants were identified near the project area and points of connection were used to obtain fire flow data. The results of the hydrant flow test were used to verify the initial boundary conditions and calibration of the hydraulic model.

4.2 Analysis Criteria

In accordance with EMWD Water System Planning & Design Guideline the following analysis criteria will be verified:

1. Fire Flow Demand (Commercial): 4,000 gpm for a 4-hour duration
2. Operating Pressures:
   - Minimum Static (No Demand): 60 psi
3. Minimum Allowable Residual Pressures:
   - Under Peak Hour Demand: 50 psi
   - Under Max-Day plus Fire Flow: 20 psi
4. Maximum Pipeline Velocity (without Fire): 10 ft/s

The projected domestic water demands were assigned to two nodes in the Early Project scenarios and four nodes in the Ultimate Project scenarios. Except for domestic water servicing the medical office buildings, all domestic water is directed to the existing energy center. For the Early Project and Ultimate Project, domestic water will travel to the proposed water tanks and booster station prior to entering the new energy center. Water from the new energy center will be distributed to the expanded hospital and new D&T facility. One node is designated to represent all water servicing the new energy center, expanded hospital, and D&T facility.

The existing medical office building (MOB 2) will remain under the Early Project and Ultimate Project expansion. The new medical office buildings (MOB 3 and MOB 4) will be incorporated into the Ultimate project. Each medical office buildings is assigned a water demand node.

Two onsite fire hydrants were assigned an initial demand of 50.0 gpm to assist with model calibration. Three onsite fire hydrants were allotted a fire flow demand of 1,333 gpm to analyze the onsite water flow conditions under each scenario. The selected fire hydrants are located at the furthest distance away from the existing 18” water main along Iris Avenue.

4.3 Model Results – Domestic Water

Four (4) steady-state scenarios were developed for the Early Project and Ultimate Project (a total of 8 scenarios) to simulate water system behavior under Average Day Demand (ADD), Maximum Day Demand (MDD), Peak Hour Demand (PHD), and MDD plus 4,000 gpm fireflow (MDD + 4,000 FF). Model output data for each steady-state scenario is provided in Appendix C. Graphical color-coded

representations of the entire system node pressures and pipeline velocities area provided in Appendix B. Brief summaries of the model results are provided below.

Early Project ADD – Under this scenario, onsite pressure ranged between 83.1 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 0.61 feet per second (ft/s).

Early Project MDD – Under this scenario, onsite pressure ranged between 82.8 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 0.98 ft/s.

Early Project PHD – Under this scenario, onsite pressure ranged between 83.1 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 1.09 ft/s.

Ultimate Project ADD – Under this scenario, onsite pressure ranged between 83.1 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 2.11 ft/s.

Ultimate Project MDD – Under this scenario, onsite pressure ranged between 70.6 and 90.4 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 8.39 ft/s. The fire hydrants assigned with a 1,333 gpm fire flow demand display a hydrant lead velocity of 15.13 and 15.14 ft/s. Maximum velocity limits were not applied to the hydraulic model settings.

Ultimate Project PHD – Under this scenario, onsite pressure ranged between 83.1 and 94.5 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 3.81 ft/s.

4.4 Model Results – Fire Flow

The hydraulic fire flow analysis was run with two hydrant fire flows running simultaneously. This analysis determines the maximum fire flow that can be sustained onsite using multiple concurrent hydrants while maintaining a minimum residual pressure of 20 psi throughout the public and onsite water distribution system. The following tables provide the results of the multiple concurrent hydrant fire flow analysis.

Table 4-1: Results – Early Project Multiple Concurrent Hydrant Fire Flows

ID	Base Demand (gpm)	Base Pressure (psi)	Initial Fire Demand (gpm)	Combined Demand (gpm)	Residual Pressure (psi)	Available Flow (gpm)	Available Pressure (psi)
J404	0	92.22	1,333	1,333	72.39	2,492.29	20.0
J406	0	89.62	1,333	1,333	70.93	3,166.15	20.0
J420	0	91.35	1,333	1,333	70.48	2,201.20	20.0

Cumulative Fire Flow (All Hydrants)	**7,859.64**	

Early Project MDD + 4,000 FF – Under this scenario, onsite pressure ranged between 69.0 and 94.6 psi in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 10.89 ft/s. The fire hydrants assigned with a 1,333 gpm fire flow demand display a hydrant lead velocity of 15.13 ft/s. Maximum velocity limits were not applied to the hydraulic model settings.

Table 4-2: Results – Ultimate Project Multiple Concurrent Hydrant Fire Flows

ID	Base Demand (gpm)	Base Pressure (psi)	Initial Fire Demand (gpm)	Combined Demand (gpm)	Residual Pressure (psi)	Available Flow (gpm)	Available Pressure (psi)
J404	0	92.18	1,333	1,333	71.93	2,715.16	20.0
J630	0	93.35	1,334	1,334	71.93	2,041.37	20.0
J628	0	94.18	1,333	1,333	73.70	3,067.83	20.0
Cumulative Fire Flow (All Hydrants)						**7,824.36**	

Ultimate Project MDD + 4,000 FF – Under this scenario, onsite pressure ranged between 70.3 and 90.4 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 8.63 ft/s. The fire hydrants assigned with a 1,333 gpm fire flow demand display a hydrant lead velocity of 15.13 and 15.14 ft/s. Maximum velocity limits were not applied to the hydraulic model settings.

Section 5 - Conclusions

Based on the discussion provided in Sections 2 and 3, and the analysis results provided in Section 4 regarding the proposed Kaiser Permanente Moreno Valley Medical Center project, the following conclusions are provided:

1. During domestic demand analysis under Early Project conditions, the onsite static demands during ADD, MDD, and PHD design scenarios range between 82.7 and 92.4 psi. The onsite velocities under the same scenarios range between 0.00 and 1.09 ft/s. During domestic demand analysis under Ultimate Project conditions, the onsite static demands during ADD, MDD, and PHD design scenarios range between 82.5 to 91.1 psi. The onsite velocities under the same scenarios range between 0.00 and 3.64 ft/s.

2. The fire flow results in the Early Project and Ultimate Project both exceed a fire flow of 4,000 gpm and approach 7,860 gpm and 7,825 gpm, respectively.

The result of the Fire Flow design test indicated that the offsite system has adequate capacity to easily deliver a fire flow demand of 4,000 gpm to the project site as required by EMWD.

Section 6 - Appendices

A. Phase Exhibits

B. Water Model Exhibits

- Node and Pipe Labels
- Early Project – ADD, MDD, PHD, MDD + 4,000 FF
- Ultimate Project – ADD, MDD, PHD, MDD + 4,000 FF

C. Model Output Data

D. Fire Flow Test Data from EMWD

E. Water System Planning & Design Principle Guidelines Criteria from EMWD

APPENDIX A – PHASE EXHIBITS

CO ARCHITECTS

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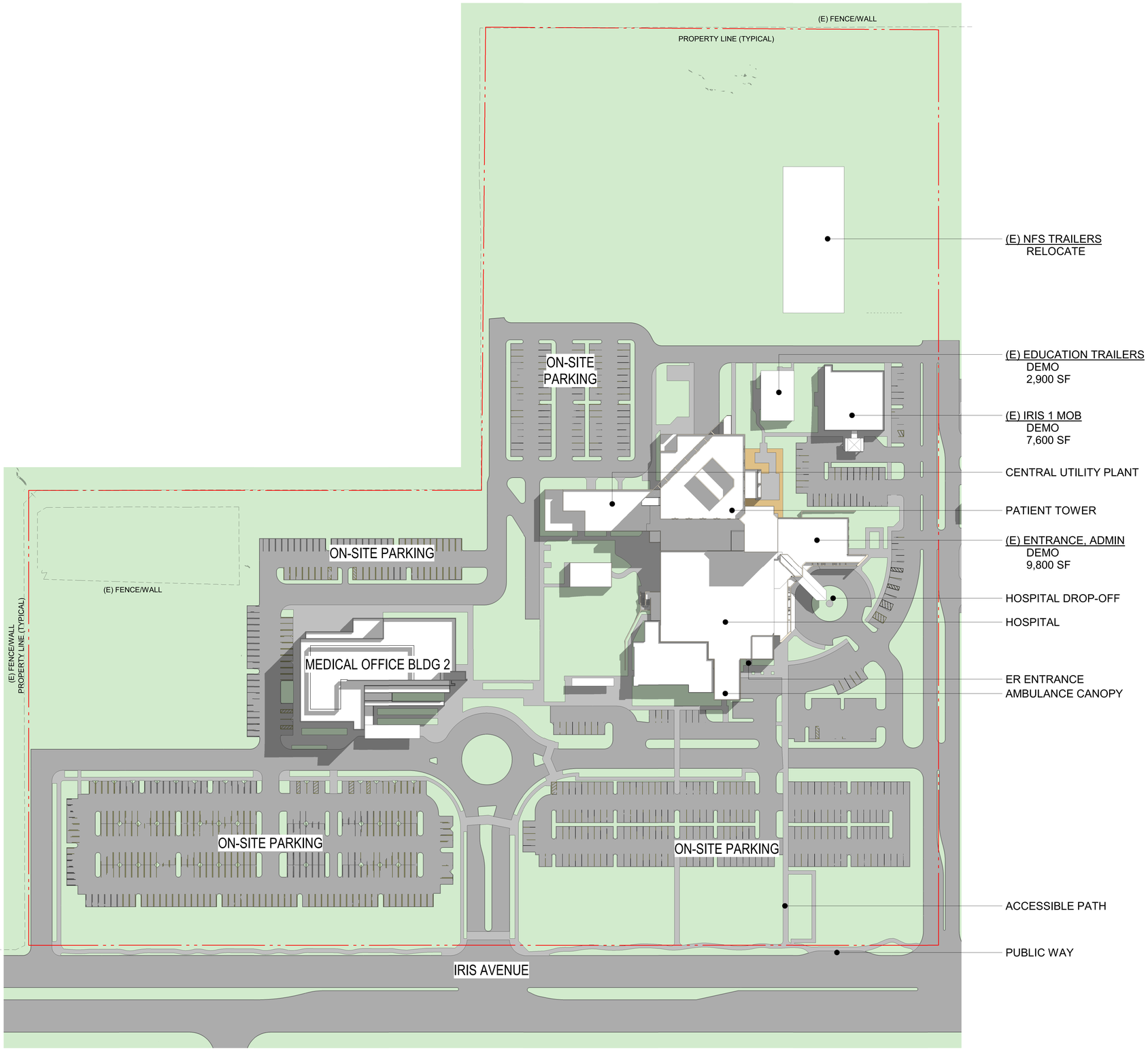


KAISER PERMANENTE

MORENO VALLEY MEDICAL CENTER
DIAGNOSTIC & TREATMENT ADDITION

27300 IRIS AVENUE MORENO VALLEY, CA 92555

KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

N

SITE PLAN - EXISTING

SCALE: 1" = 60'-0"
DATE OF ISSUE: NOVEMBER 30, 2018

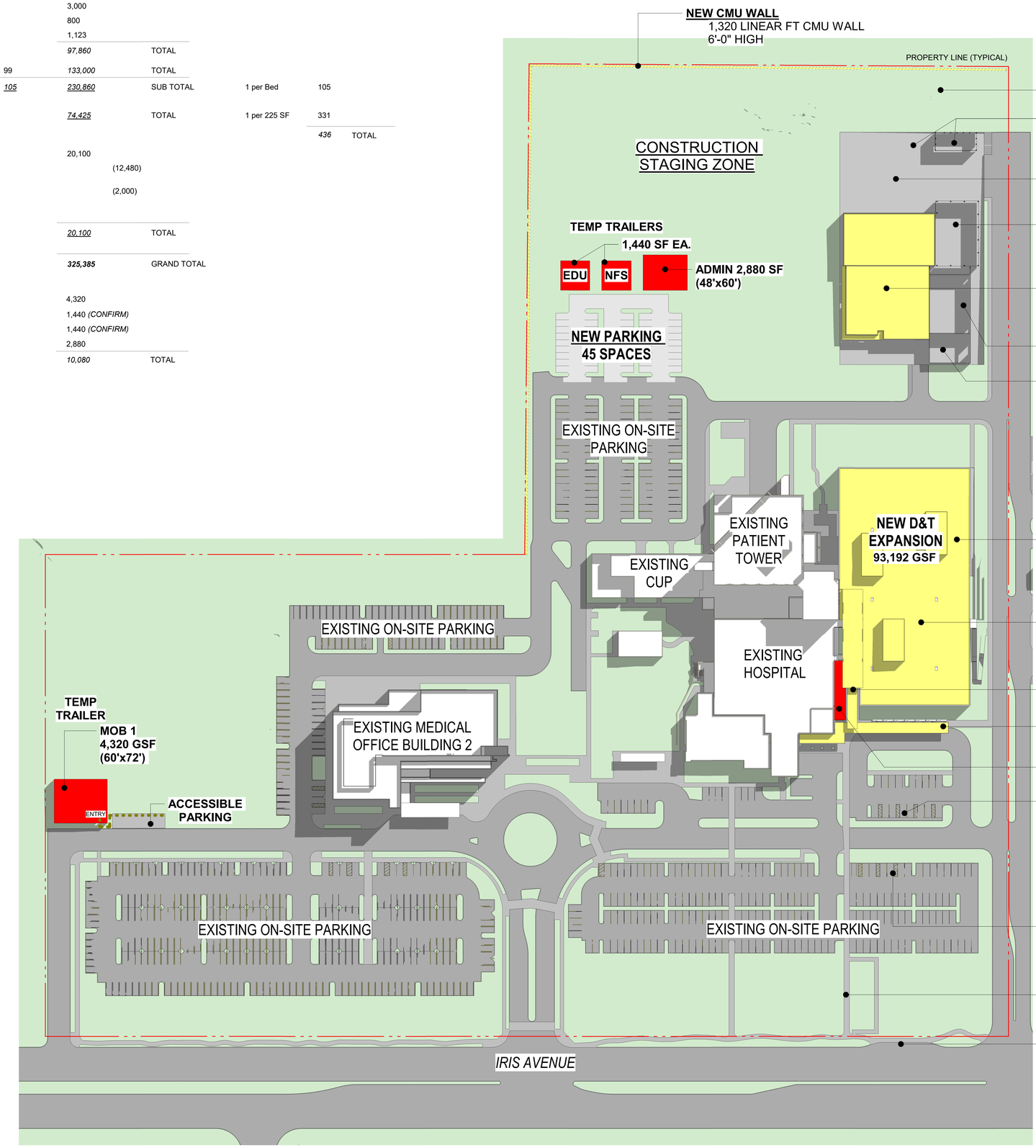
SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

A1.00

PROGRAM SUMMARY - EARLY PROJECT

	Beds	GSF		Parking Factor	Parking Required
New D&T Expansion	6 (NICU)	93,192			
Drop-off Canopy (covered)		3,000			
Entrance Canopy (covered)		800			
Entrance		1,123			
		97,860	TOTAL		
Existing Hospital	99	*133,000*	TOTAL		
	105	*230,860*	SUB TOTAL	1 per Bed	105
Existing MOB 2		*74,425*	TOTAL	1 per 225 SF	331
					436 TOTAL
New CUP					
Energy Center		20,100			
Yard - Cooling Towers, Emergency Gen., SCE (uncovered)			(12,480)		
Yard - O2, Pump (uncovered)			(2,000)		
Underground Tanks					
		20,100	TOTAL		
		325,385	GRAND TOTAL		
New Temp Trailers					
MOB 1		4,320			
EDU		1,440 *(CONFIRM)*			
NFS		1,440 *(CONFIRM)*			
Admin		2,880			
		10,080	TOTAL		

Parking Spaces		
Existing	685	
New Temporary	45	
	730	TOTAL



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27300 IRIS AVENUE MORENO VALLEY, CA 92555
KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

N

SITE PLAN - EARLY PROJECT

SCALE: As indicated
DATE OF ISSUE: NOVEMBER 30, 2018

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

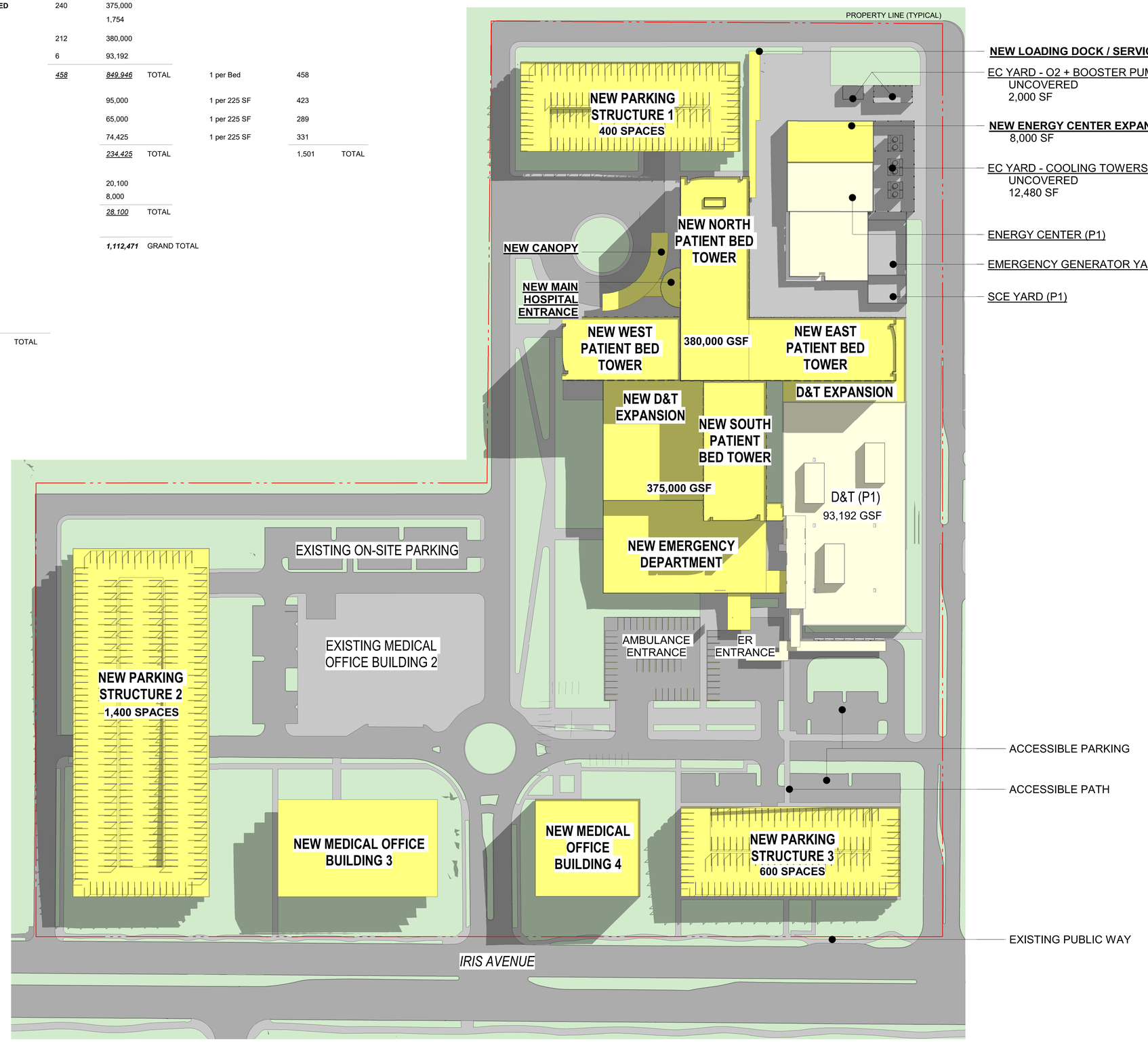
A1.10

PROGRAM SUMMARY - ULTIMATE PROJECT

	Beds	GSF		Parking Factor	Parking Required	
New Patient Bed Towers, D&T Expansion, and ED	240	375,000				
ED Entrance Canopy		1,754				
New Patient Bed Towers and D&T Expansion (P2)	212	380,000				
D&T (P1)	6	93,192				
	458	*849,946*	TOTAL	1 per Bed	458	
New MOB 4		95,000		1 per 225 SF	423	
New MOB 3		65,000		1 per 225 SF	289	
Existing MOB 2		74,425		1 per 225 SF	331	
		234,425	TOTAL		1,501	TOTAL
CUP (P1)		20,100				
New CUP Expansion		8,000				
		28,100	TOTAL			
		1,112,471	GRAND TOTAL			

Parking Spaces

Existing	150	
New Structure 1	400	
New Structure 2	1,400	
New Structure 3	600	
	2,550	TOTAL



CO ARCHITECTS

5055 Wilshire Boulevard, 9th Floor
Los Angeles, California 90036
323.525.0500 phone, 323.525.0955 fax

KAISER PERMANENTE

MORENO VALLEY MEDICAL CENTER
DIAGNOSTIC & TREATMENT ADDITION
27300 IRIS AVENUE MORENO VALLEY, CA 92555
KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

N

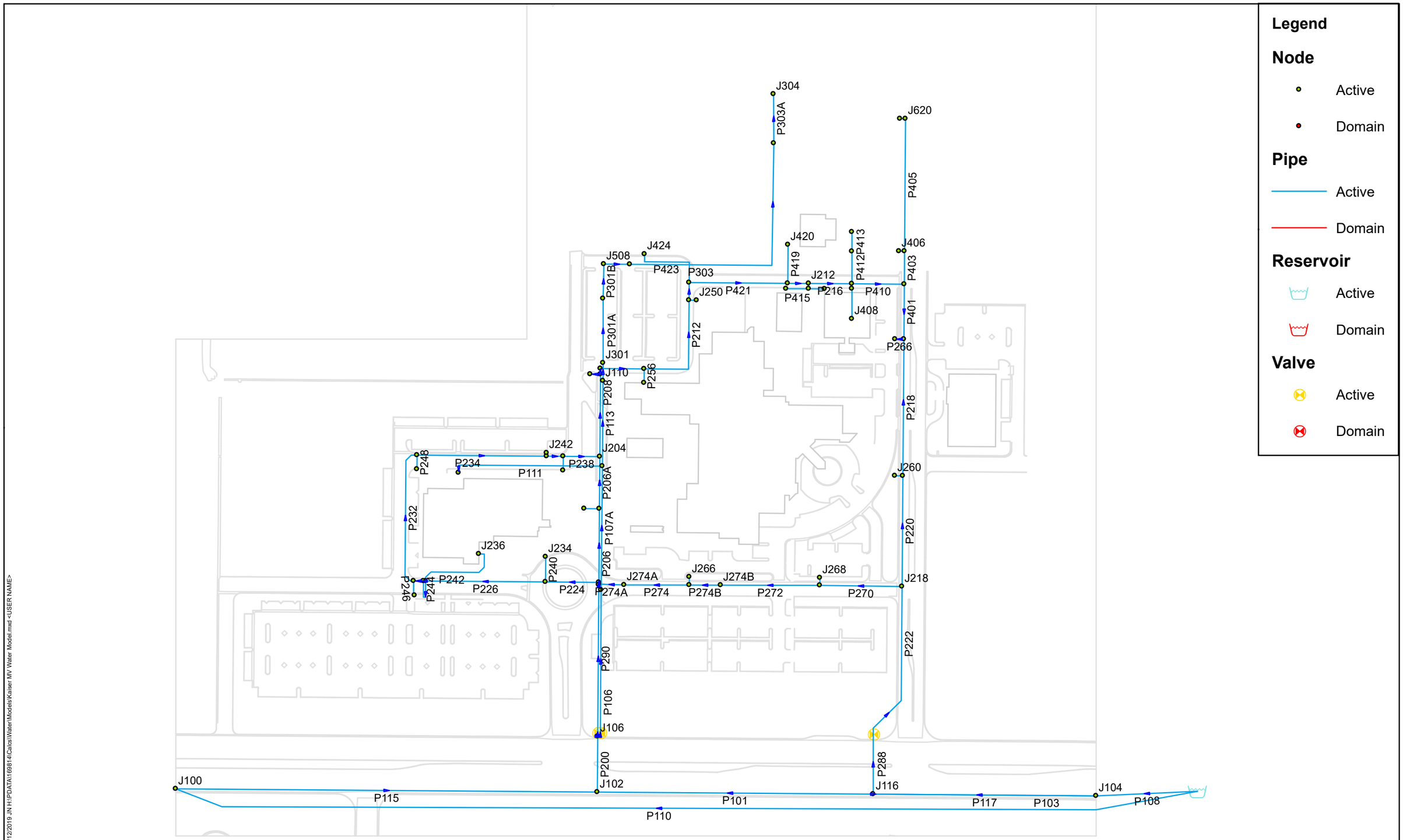
SITE PLAN - ULTIMATE PROJECT

SCALE: As indicated
DATE OF ISSUE: NOVEMBER 30, 2018

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

A1.12

APPENDIX B – WATER MODEL EXHIBITS



Legend

Node
- Active
- Domain

Pipe
- Active
- Domain

Reservoir
- Active
- Domain

Valve
- Active
- Domain

4/12/2019 JN H:\PDATA\169814\Cals\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

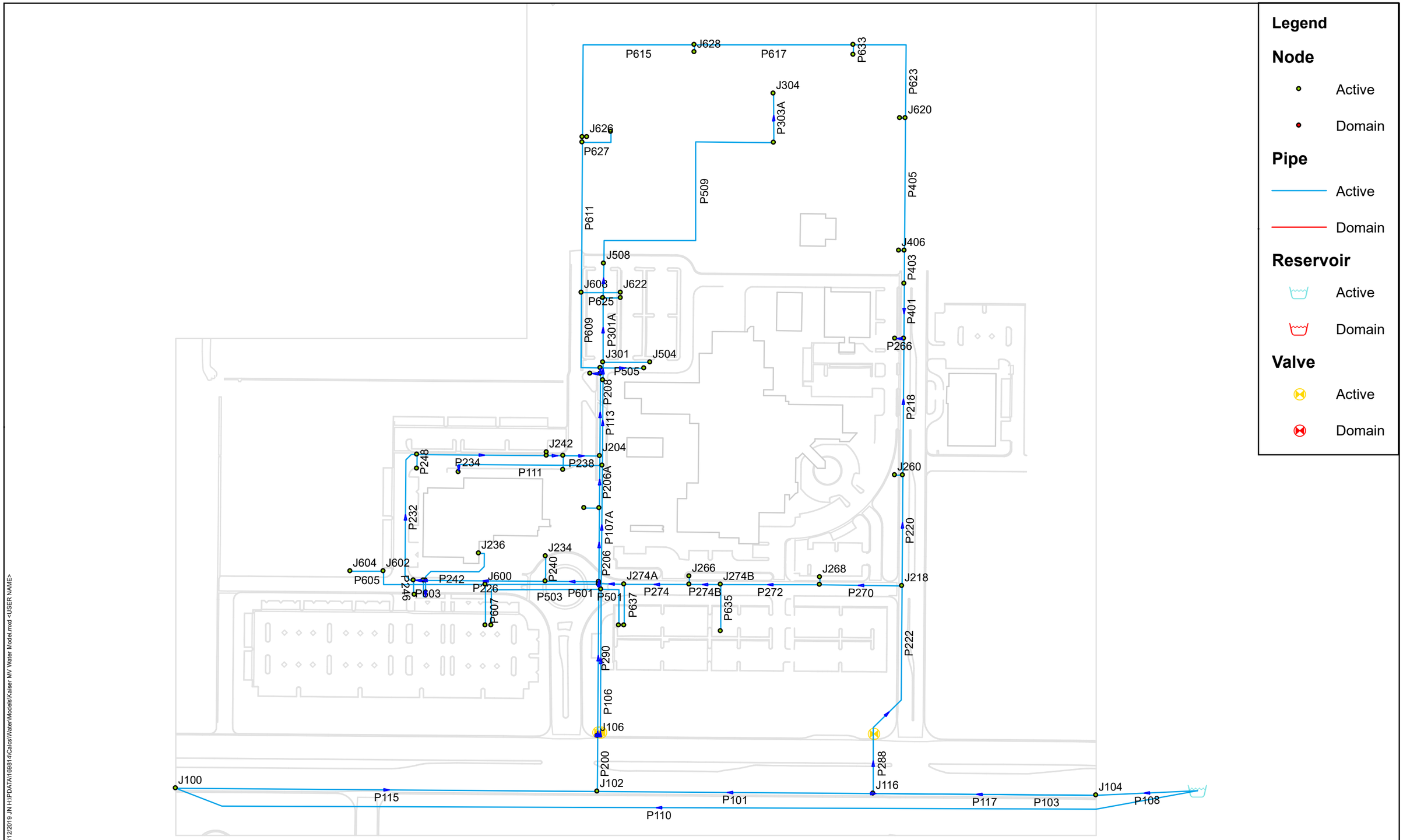
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Node and Pipe Labels



4/12/2019 JN H:\PDATA\169814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Node and Pipe Labels

J620 Fireflow demand of 1,333 gpm drawn from fire hydrant

J420 Fireflow demand of 1,333 gpm drawn from fire hydrant

J406 Fireflow demand of 1,333 gpm drawn from fire hydrant

92.60
92.26
92.22
91.67
92.22
91.35
91.14
90.49
89.62
91.35
90.05
90.05
88.75
88.75
91.02
90.92
87.89
87.45
90.92
89.62
89.94
89.62
86.55
85.72
89.62
86.55
85.64
85.72
85.29
87.39
85.73
85.60
86.59
85.60
84.60
84.86
84.43
83.91
83.13
82.78
86.59
89.38
94.58
92.28
89.25
84.22

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 J:\N:\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\WaterModels\Kaiser.MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Average Day Demand

J620 Fireflow demand of 1,333 gpm drawn from fire hydrant

J420 Fireflow demand of 1,333 gpm drawn from fire hydrant

J406 Fireflow demand of 1,333 gpm drawn from fire hydrant

92.45 92.11 92.22 91.55 92.22 91.35 91.13 90.48 89.62 90.90 91.35 90.92 90.05 90.05 88.75 88.75 87.88 87.45 90.92 89.62 89.83 89.62 86.54 85.72 89.62 86.54 85.57 85.72 85.29 87.39 85.72 85.59 86.59 86.59 85.59 84.60 84.86 84.42 83.90 83.12 82.78 89.37 94.58 92.28 89.25 84.22

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 J:\N:\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA1698141\Calcs\WaterModels\Kaiser.MV Water Model.mxd <USER NAME>

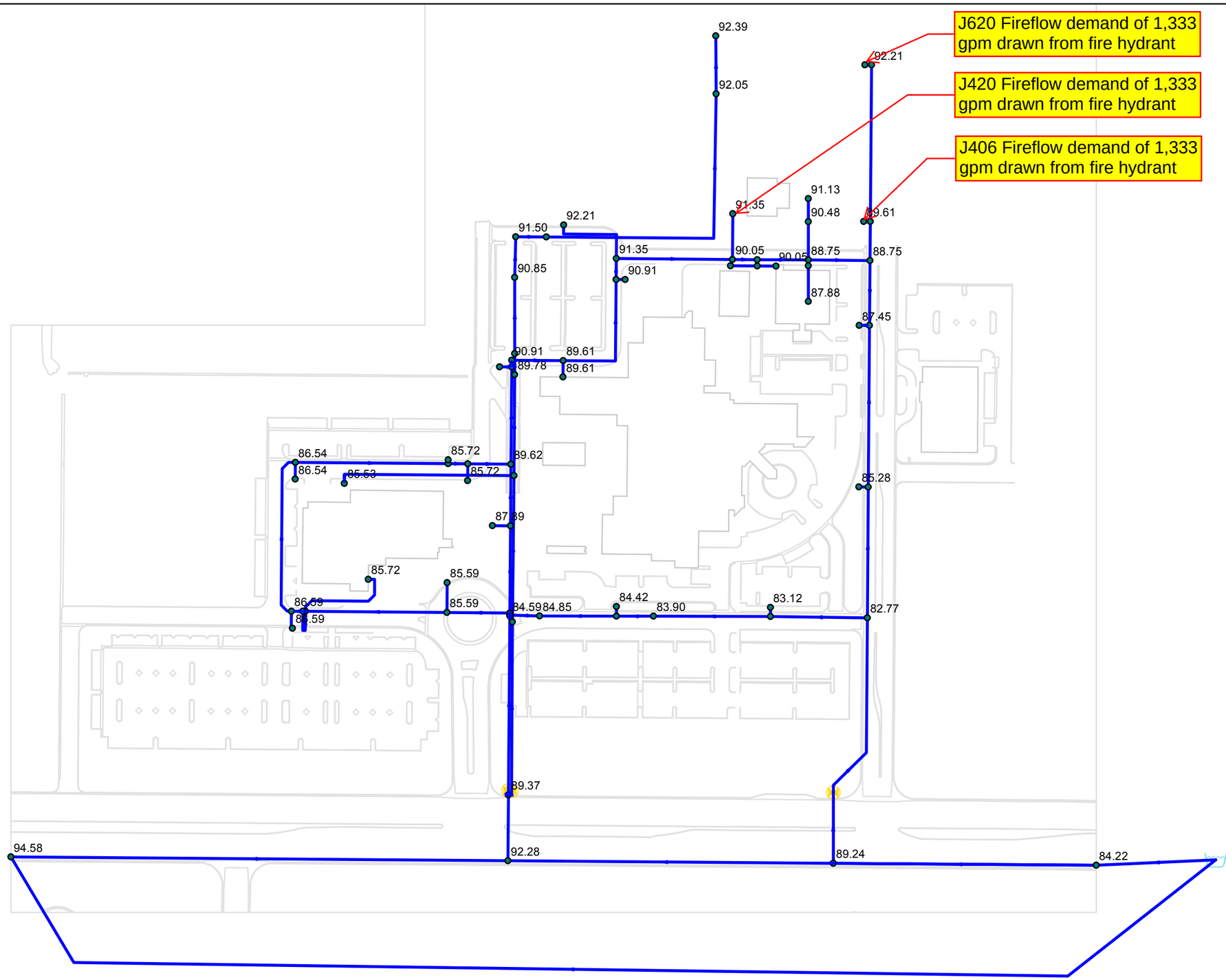
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Maximum Day Demand



Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

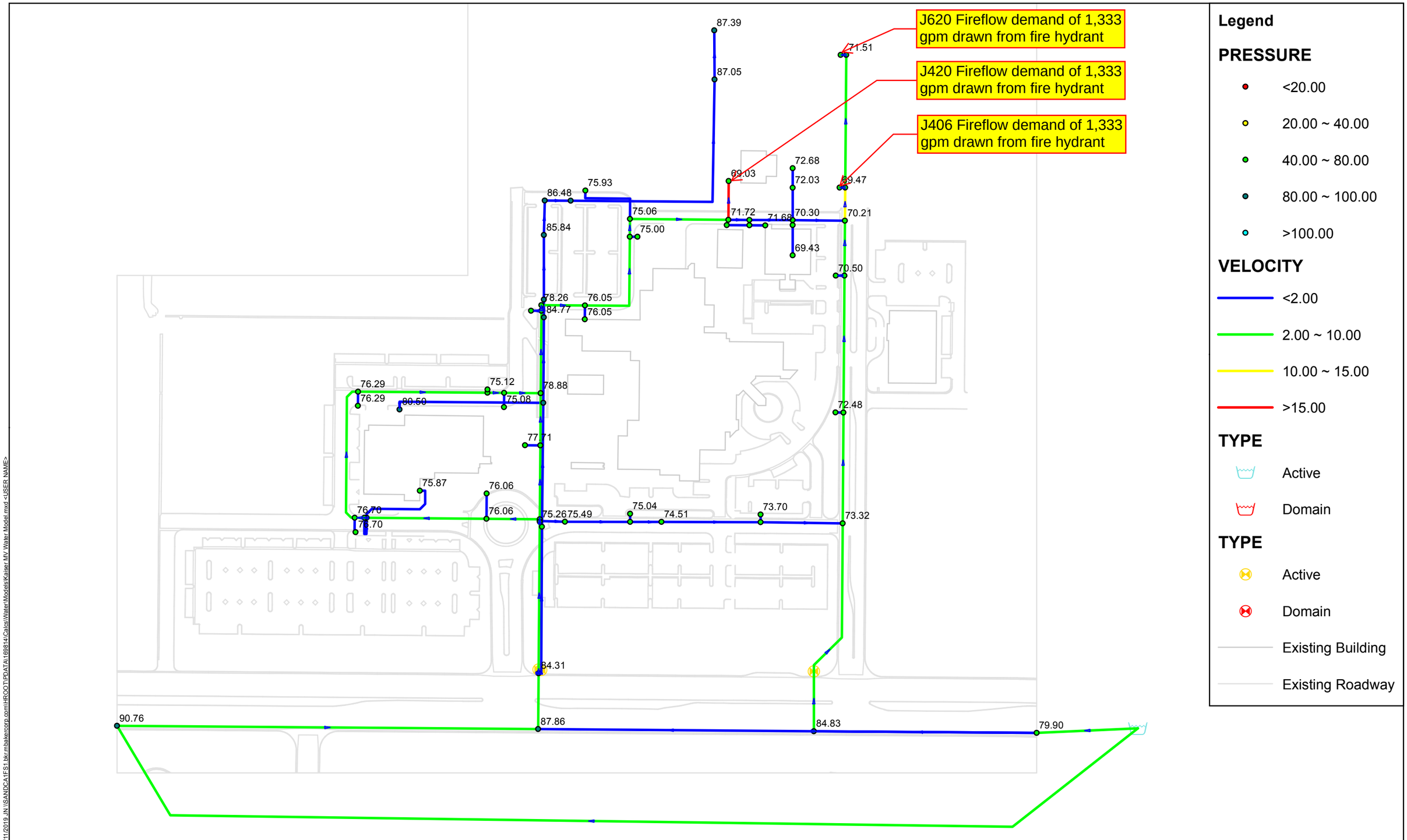
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Peak Hour Demand



4/11/2019 J:\N\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

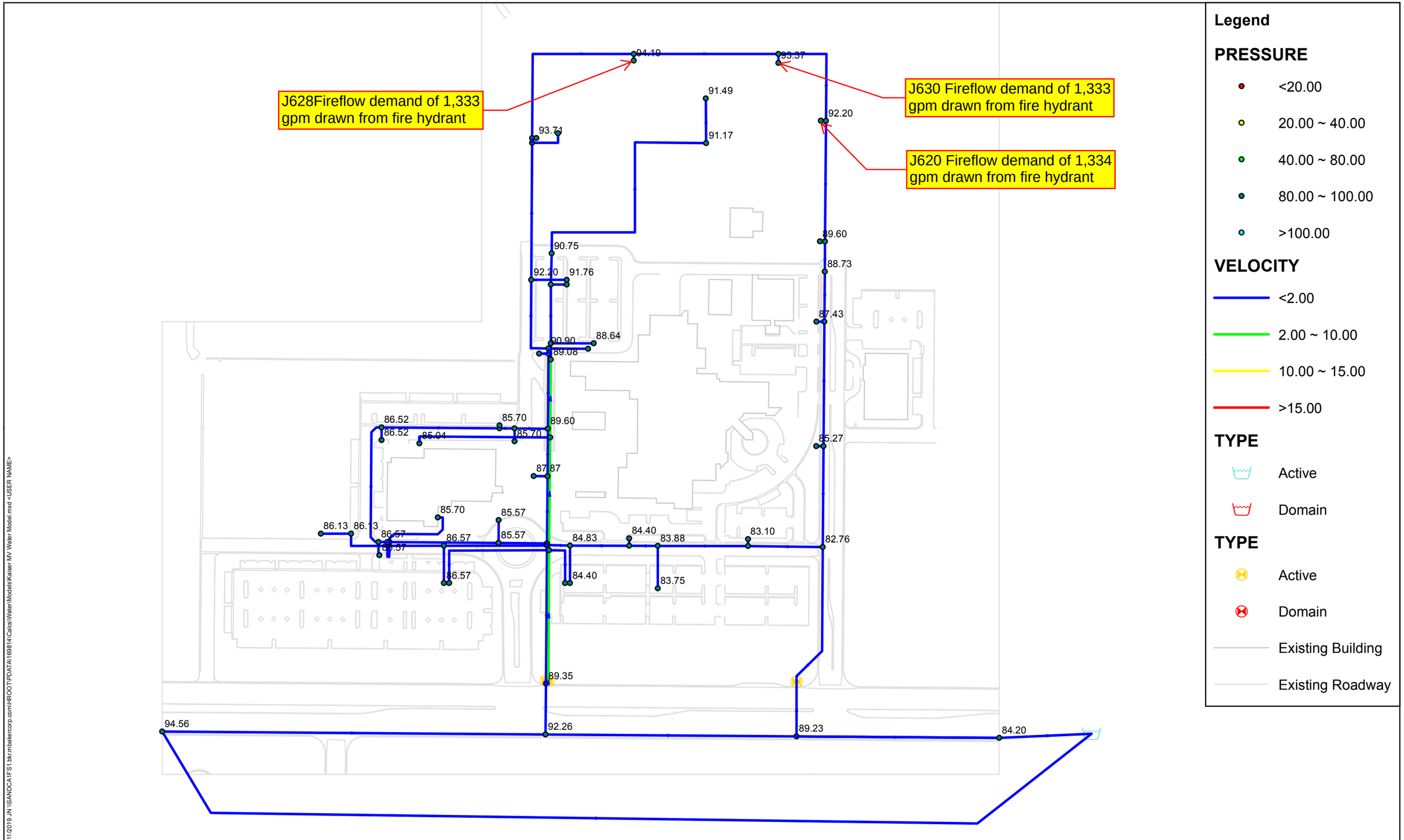
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Maximum Day + 4000 Fireflow Demand



Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

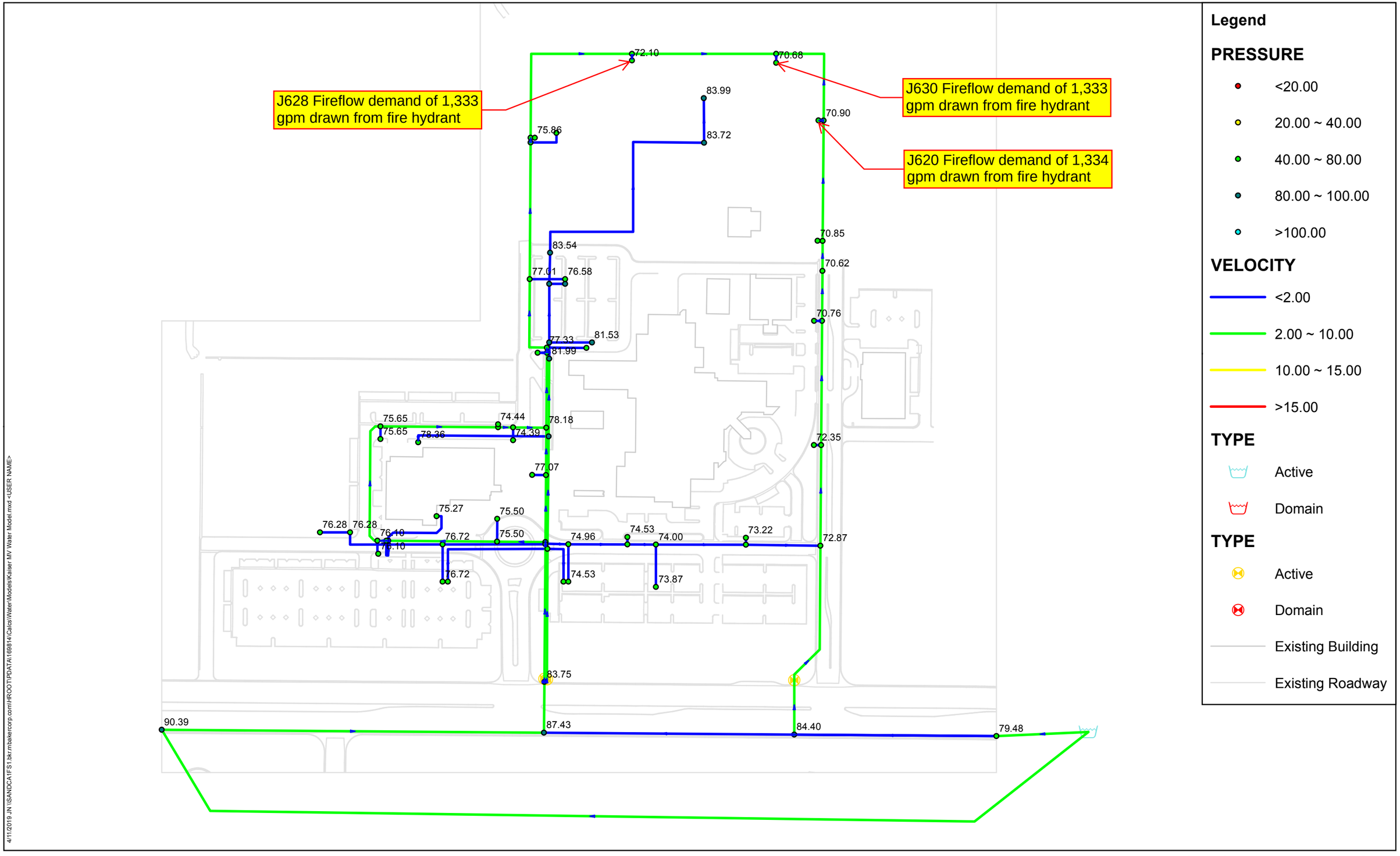
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Average Day Demand



Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA1\69814\Caltcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Maximum Day Demand

J628 Fireflow demand of 1,333 gpm drawn from fire hydrant

J630 Fireflow demand of 1,333 gpm drawn from fire hydrant

J620 Fireflow demand of 1,334 gpm drawn from fire hydrant

94.14
93.32
88.77
92.15
93.67
88.52
89.55
88.44
88.68
92.15
91.72
87.38
90.85
86.45
86.92
86.48
85.65
89.55
86.48
83.45
85.65
85.22
87.82
85.65
85.53
86.09
86.09
86.52
86.52
85.53
84.79
84.36
83.84
83.06
82.71
86.52
84.36
83.71
89.30
94.53
92.22
89.19
84.17

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Peak Hour Demand

J628 Fireflow demand of 1,333 gpm drawn from fire hydrant

J630 Fireflow demand of 1,333 gpm drawn from fire hydrant

J620 Fireflow demand of 1,334 gpm drawn from fire hydrant

72.10
70.68
83.99
70.90
75.86
83.72
70.85
83.54
70.62
77.01
76.58
70.76
77.33
81.53
81.99
75.65
74.44
78.18
75.65
78.36
74.39
72.35
77.07
75.27
75.50
76.28
76.28
76.40
76.72
75.50
74.96
74.53
74.00
73.22
72.87
76.10
76.72
74.53
73.87
83.75
90.39
87.43
84.40
79.48

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA1\69814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Maximum Day + 4000 Fireflow Demand

APPENDIX C – MODEL OUTPUT DATA

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Early Project
  ADD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP1\~INP
      Number of Junctions.............. 70
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 79
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.98     94.58
  J102                                    0.00   1752.98     92.28
  J104                                    0.00   1752.98     84.22
```

J106	0.00	1752.97	89.38
J107	0.00	1727.74	83.69
J108	0.00	1727.64	88.67
J110	0.00	1727.57	89.94
J114	2.37	1727.64	85.64
J116	0.00	1752.98	89.25
J200	0.00	1729.85	84.60
J202	0.00	1729.85	84.60
J202A	0.00	1729.85	84.60
J204	0.00	1729.84	89.62
J206	0.00	1729.84	90.49
J206A	0.00	1729.84	87.89
J208	0.00	1729.84	89.62
J210	0.00	1729.83	90.92
J210A	0.00	1729.84	90.92
J212	0.00	1729.83	90.05
J214	0.00	1729.83	87.45
J216	0.00	1729.84	85.29
J218	0.00	1729.85	82.78
J220	0.00	1729.85	85.60
J222	0.00	1729.84	86.59
J224	0.00	1729.84	86.59
J226	0.00	1729.84	86.59
J228	0.00	1729.84	86.55
J230	0.00	1729.84	85.72
J232	0.00	1729.84	85.72
J234	0.00	1729.85	85.60
J236	0.00	1729.84	85.73
J238	0.00	1729.84	86.59
J240	0.00	1729.84	86.55
J242	0.00	1729.84	85.72
J244	0.00	1729.84	85.72
J246	50.00	1729.83	90.48
J248	0.00	1729.84	89.62
J250	0.00	1729.83	90.92
J254	0.00	1729.83	90.05
J256	0.00	1729.83	90.05
J258	50.00	1729.83	87.45
J260	0.00	1729.84	85.29
J262	0.00	1729.85	83.13
J264	0.00	1729.85	84.43
J266	0.00	1729.85	84.43
J268	0.00	1729.85	83.13
J274A	0.00	1729.85	84.86
J274B	0.00	1729.85	83.91
J278	0.00	1729.84	87.89
J300	0.00	1727.55	91.23
J301	0.00	1727.57	89.94

J301B	0.00	1727.56	91.02	
J303	0.00	1727.51	92.26	
J304	51.05	1727.51	92.60	
J400	0.00	1729.83	88.75	
J402	0.00	1729.83	89.62	
J404	0.00	1729.83	92.22	
J406	0.00	1729.83	89.62	
J408	0.00	1729.83	87.89	
J410	0.00	1729.83	88.75	
J410A	0.00	1729.83	88.75	
J412	0.00	1729.83	90.49	
J414	0.00	1729.83	91.14	
J416	0.00	1729.83	90.05	
J418	0.00	1729.83	90.05	
J420	0.00	1729.83	91.35	
J422	0.00	1729.83	91.35	
J424	0.00	1729.83	92.22	
J508	0.00	1727.55	91.67	
J620	0.00	1729.83	92.22	
RES9000	-153.45	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-27.00	0.03	0.00
P103	39.51	0.05	0.00
P106	53.42	0.61	0.12
P107	53.42	0.61	0.01
P107A	53.42	0.61	0.10
P108	79.02	0.10	0.02
P110	74.43	0.09	0.02
P111	2.37	0.03	0.00
P113	51.05	0.58	0.07
P115	74.43	0.09	0.00
P117	-39.51	0.05	0.00
P200	101.43	0.29	0.01
P202	48.01	0.20	0.00
P202A	48.01	0.20	0.00
P204	55.83	0.23	0.00
P206	37.95	0.16	0.00
P206A	37.95	0.16	0.00
P208	55.82	0.23	0.01
P210	5.82	0.02	0.00
P210A	5.82	0.02	0.00
P212	5.82	0.02	0.00

P214	5.82	0.02	0.00
P216	5.81	0.02	0.00
P218	-44.20	0.18	0.01
P220	-44.20	0.18	0.01
P222	52.01	0.21	0.01
P224	17.88	0.07	0.00
P226	17.87	0.07	0.00
P228	16.84	0.07	0.00
P230	17.87	0.07	0.00
P232	17.87	0.07	0.00
P234	17.87	0.07	0.00
P236	17.87	0.07	0.00
P238	17.87	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-1.03	0.01	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	7.82	0.03	0.00
P272	7.82	0.03	0.00
P274	7.81	0.03	0.00
P274A	7.81	0.03	0.00
P274B	7.82	0.03	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	52.01	0.15	0.00
P290	48.01	0.20	0.01
P301	51.05	0.33	0.00
P301A	51.05	0.33	0.01
P301B	51.05	0.33	0.00
P301C	51.05	0.33	0.00
P303	51.05	0.33	0.04
P303A	51.05	0.33	0.01
P401	5.80	0.02	0.00
P403	0.00	0.00	0.00
P405	0.00	0.00	0.00
P407	0.00	0.00	0.00
P409	0.00	0.00	0.00

P410	5.81	0.02	0.00
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	5.82	0.02	0.00
P419	0.00	0.00	0.00
P421	5.82	0.02	0.00
P423	0.00	0.00	0.00
P621	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	52.01	0.21	23.12	GPV
V8002	48.01	0.20	23.12	GPV
V8004	53.42	0.61	25.11	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Early Project
  MDD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP2\~INP
      Number of Junctions.............. 70
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 79
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.97     94.58
  J102                                    0.00   1752.97     92.28
  J104                                    0.00   1752.97     84.22
```

J106	0.00	1752.96	89.37
J107	0.00	1727.73	83.68
J108	0.00	1727.48	88.60
J110	0.00	1727.32	89.83
J114	3.56	1727.48	85.57
J116	0.00	1752.97	89.25
J200	0.00	1729.83	84.60
J202	0.00	1729.83	84.60
J202A	0.00	1729.83	84.60
J204	0.00	1729.83	89.62
J206	0.00	1729.82	90.48
J206A	0.00	1729.83	87.89
J208	0.00	1729.82	89.62
J210	0.00	1729.82	90.92
J210A	0.00	1729.82	90.92
J212	0.00	1729.82	90.05
J214	0.00	1729.82	87.45
J216	0.00	1729.83	85.29
J218	0.00	1729.84	82.78
J220	0.00	1729.83	85.59
J222	0.00	1729.83	86.59
J224	0.00	1729.83	86.59
J226	0.00	1729.83	86.59
J228	0.00	1729.83	86.54
J230	0.00	1729.83	85.72
J232	0.00	1729.83	85.72
J234	0.00	1729.83	85.59
J236	0.00	1729.83	85.72
J238	0.00	1729.83	86.59
J240	0.00	1729.83	86.54
J242	0.00	1729.83	85.72
J244	0.00	1729.83	85.72
J246	50.00	1729.82	90.48
J248	0.00	1729.82	89.62
J250	0.00	1729.82	90.92
J254	0.00	1729.82	90.05
J256	0.00	1729.82	90.05
J258	50.00	1729.82	87.45
J260	0.00	1729.83	85.29
J262	0.00	1729.84	83.12
J264	0.00	1729.83	84.42
J266	0.00	1729.83	84.42
J268	0.00	1729.84	83.12
J274A	0.00	1729.83	84.86
J274B	0.00	1729.83	83.90
J278	0.00	1729.83	87.89
J300	0.00	1727.27	91.11
J301	0.00	1727.31	89.83

J301B	0.00	1727.29	90.90	
J303	0.00	1727.18	92.11	
J304	82.39	1727.16	92.45	
J400	0.00	1729.82	88.75	
J402	0.00	1729.82	89.62	
J404	0.00	1729.82	92.22	
J406	0.00	1729.82	89.62	
J408	0.00	1729.82	87.88	
J410	0.00	1729.82	88.75	
J410A	0.00	1729.82	88.75	
J412	0.00	1729.82	90.48	
J414	0.00	1729.82	91.13	
J416	0.00	1729.82	90.05	
J418	0.00	1729.82	90.05	
J420	0.00	1729.82	91.35	
J422	0.00	1729.82	91.35	
J424	0.00	1729.82	92.22	
J508	0.00	1727.28	91.55	
J620	0.00	1729.82	92.22	
RES9000	-185.98	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-41.33	0.05	0.00
P103	47.79	0.06	0.00
P106	85.95	0.98	0.29
P107	85.95	0.98	0.01
P107A	85.95	0.98	0.25
P108	95.58	0.12	0.03
P110	90.40	0.11	0.03
P111	3.56	0.04	0.00
P113	82.39	0.93	0.16
P115	90.40	0.11	0.00
P117	-47.79	0.06	0.00
P200	131.73	0.37	0.01
P202	45.78	0.19	0.00
P202A	45.78	0.19	0.00
P204	55.54	0.23	0.00
P206	37.75	0.15	0.00
P206A	37.75	0.15	0.00
P208	55.53	0.23	0.01
P210	5.53	0.02	0.00
P210A	5.53	0.02	0.00
P212	5.53	0.02	0.00

P214	5.52	0.02	0.00
P216	5.51	0.02	0.00
P218	-44.49	0.18	0.01
P220	-44.49	0.18	0.01
P222	54.25	0.22	0.01
P224	17.78	0.07	0.00
P226	17.78	0.07	0.00
P228	16.76	0.07	0.00
P230	17.78	0.07	0.00
P232	17.78	0.07	0.00
P234	17.78	0.07	0.00
P236	17.78	0.07	0.00
P238	17.78	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-1.02	0.01	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	9.76	0.04	0.00
P272	9.76	0.04	0.00
P274	9.75	0.04	0.00
P274A	9.75	0.04	0.00
P274B	9.76	0.04	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	54.25	0.15	0.00
P290	45.78	0.19	0.01
P301	82.39	0.53	0.01
P301A	82.39	0.53	0.02
P301B	82.39	0.53	0.01
P301C	82.39	0.53	0.01
P303	82.39	0.53	0.09
P303A	82.39	0.53	0.02
P401	5.51	0.02	0.00
P403	0.00	0.00	0.00
P405	0.00	0.00	0.00
P407	0.00	0.00	0.00
P409	0.00	0.00	0.00

P410	5.51	0.02	0.00
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	5.52	0.02	0.00
P419	0.00	0.00	0.00
P421	5.52	0.02	0.00
P423	0.00	0.00	0.00
P621	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	54.25	0.22	23.12	GPV
V8002	45.78	0.19	23.12	GPV
V8004	85.95	0.98	24.93	GPV

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**********************************************************************
***                                                                ***
***                  Comprehensive Analysis of                     ***
***              Water Distribution Piping Network                 ***
***                                                                ***
**********************************************************************

Kaiser Moreno Valley MC
Early Project
PHD

     Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP3\~INP
     Number of Junctions.............. 70
     Number of Reservoirs............. 1
     Number of Tanks ................. 0
     Number of Pipes ................. 79
     Number of Pumps ................. 0
     Number of Valves ................ 3
     Headloss Formula ................ Hazen-Williams
     Hydraulic Timestep .............. 1.00 hrs
     Hydraulic Accuracy .............. 0.001000
     Status Check Frequency ............ 2
     Maximum Trials Checked ............ 10
     Damping Limit Threshold ........... 0.000000
     Maximum Trials .................. 500
     Quality Analysis ................ None
     Specific Gravity ................ 1.00
     Relative Kinematic Viscosity ..... 1.00
     Relative Chemical Diffusivity ..... 1.00
     Demand Multiplier ............... 1.00
     Total Duration .................. 0.00 hrs
     Reporting Criteria:
        All Junctions/Tanks/Reservoirs
        All Pipes
        All Pumps/Valves


Node Results:
----------------------------------------------------------------------
                                      Demand      Head  Pressure
Node                                     gpm        ft       psi
----------------------------------------------------------------------
J100                                    0.00   1752.97     94.58
J102                                    0.00   1752.96     92.28
J104                                    0.00   1752.97     84.22
```

J106	0.00	1752.95	89.37
J107	0.00	1727.71	83.68
J108	0.00	1727.40	88.57
J110	0.00	1727.21	89.78
J114	4.74	1727.40	85.53
J116	0.00	1752.97	89.24
J200	0.00	1729.83	84.59
J202	0.00	1729.83	84.59
J202A	0.00	1729.83	84.59
J204	0.00	1729.83	89.62
J206	0.00	1729.82	90.48
J206A	0.00	1729.83	87.89
J208	0.00	1729.82	89.61
J210	0.00	1729.82	90.91
J210A	0.00	1729.82	90.91
J212	0.00	1729.82	90.05
J214	0.00	1729.82	87.45
J216	0.00	1729.83	85.28
J218	0.00	1729.83	82.77
J220	0.00	1729.83	85.59
J222	0.00	1729.83	86.59
J224	0.00	1729.83	86.59
J226	0.00	1729.83	86.59
J228	0.00	1729.83	86.54
J230	0.00	1729.83	85.72
J232	0.00	1729.83	85.72
J234	0.00	1729.83	85.59
J236	0.00	1729.83	85.72
J238	0.00	1729.83	86.59
J240	0.00	1729.83	86.54
J242	0.00	1729.83	85.72
J244	0.00	1729.83	85.72
J246	50.00	1729.81	90.48
J248	0.00	1729.82	89.61
J250	0.00	1729.82	90.91
J254	0.00	1729.82	90.05
J256	0.00	1729.82	90.05
J258	50.00	1729.81	87.45
J260	0.00	1729.83	85.28
J262	0.00	1729.83	83.12
J264	0.00	1729.83	84.42
J266	0.00	1729.83	84.42
J268	0.00	1729.83	83.12
J274A	0.00	1729.83	84.85
J274B	0.00	1729.83	83.90
J278	0.00	1729.83	87.89
J300	0.00	1727.15	91.06
J301	0.00	1727.20	89.78

J301B	0.00	1727.18	90.85	
J303	0.00	1727.04	92.05	
J304	91.39	1727.02	92.39	
J400	0.00	1729.82	88.75	
J402	0.00	1729.82	89.61	
J404	0.00	1729.82	92.21	
J406	0.00	1729.82	89.61	
J408	0.00	1729.82	87.88	
J410	0.00	1729.82	88.75	
J410A	0.00	1729.82	88.75	
J412	0.00	1729.82	90.48	
J414	0.00	1729.82	91.13	
J416	0.00	1729.82	90.05	
J418	0.00	1729.82	90.05	
J420	0.00	1729.82	91.35	
J422	0.00	1729.82	91.35	
J424	0.00	1729.82	92.21	
J508	0.00	1727.16	91.50	
J620	0.00	1729.82	92.21	
RES9000	-196.16	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-45.72	0.06	0.00
P103	50.38	0.06	0.00
P106	96.13	1.09	0.36
P107	96.13	1.09	0.02
P107A	96.13	1.09	0.31
P108	100.76	0.13	0.03
P110	95.40	0.12	0.03
P111	4.74	0.05	0.00
P113	91.39	1.04	0.19
P115	95.40	0.12	0.00
P117	-50.38	0.06	0.00
P200	141.12	0.40	0.01
P202	44.99	0.18	0.00
P202A	44.99	0.18	0.00
P204	55.42	0.23	0.00
P206	37.67	0.15	0.00
P206A	37.67	0.15	0.00
P208	55.41	0.23	0.01
P210	5.41	0.02	0.00
P210A	5.41	0.02	0.00
P212	5.41	0.02	0.00

P214	5.41	0.02	0.00
P216	5.40	0.02	0.00
P218	-44.60	0.18	0.01
P220	-44.61	0.18	0.01
P222	55.04	0.22	0.01
P224	17.74	0.07	0.00
P226	17.74	0.07	0.00
P228	16.73	0.07	0.00
P230	17.74	0.07	0.00
P232	17.74	0.07	0.00
P234	17.74	0.07	0.00
P236	17.74	0.07	0.00
P238	17.74	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-1.01	0.01	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	10.43	0.04	0.00
P272	10.43	0.04	0.00
P274	10.43	0.04	0.00
P274A	10.43	0.04	0.00
P274B	10.43	0.04	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	55.04	0.16	0.00
P290	44.99	0.18	0.01
P301	91.39	0.58	0.01
P301A	91.39	0.58	0.03
P301B	91.39	0.58	0.01
P301C	91.39	0.58	0.01
P303	91.39	0.58	0.11
P303A	91.39	0.58	0.02
P401	5.40	0.02	0.00
P403	0.00	0.00	0.00
P405	0.00	0.00	0.00
P407	0.00	0.00	0.00
P409	0.00	0.00	0.00

P410	5.40	0.02	0.00
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	5.40	0.02	0.00
P419	0.00	0.00	0.00
P421	5.40	0.02	0.00
P423	0.00	0.00	0.00
P621	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	55.04	0.22	23.12	GPV
V8002	44.99	0.18	23.12	GPV
V8004	96.13	1.09	24.87	GPV

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  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Early Project
  Max Day + 4,000 Fireflow

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP4\~INP
      Number of Junctions.............. 70
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 79
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1744.17     90.76
  J102                                    0.00   1742.77     87.86
  J104                                    0.00   1743.00     79.90
```

J106	0.00	1741.27	84.31
J107	0.00	1716.04	78.62
J108	0.00	1715.79	83.54
J110	0.00	1715.63	84.77
J114	3.56	1715.79	80.50
J116	0.00	1742.77	84.83
J200	0.00	1708.24	75.24
J202	0.00	1708.15	75.20
J202A	0.00	1708.29	75.26
J204	0.00	1705.05	78.88
J206	0.00	1700.89	77.95
J206A	0.00	1706.33	77.71
J208	0.00	1698.52	76.05
J210	0.00	1693.09	75.00
J210A	0.00	1700.62	78.26
J212	0.00	1687.42	71.68
J214	0.00	1690.71	70.50
J216	0.00	1700.27	72.48
J218	0.00	1708.02	73.32
J220	0.00	1707.83	76.06
J222	0.00	1707.09	76.73
J224	0.00	1707.08	76.73
J226	0.00	1707.02	76.70
J228	0.00	1706.17	76.29
J230	0.00	1705.37	75.12
J232	0.00	1705.27	75.08
J234	0.00	1707.83	76.06
J236	0.00	1707.09	75.87
J238	0.00	1707.02	76.70
J240	0.00	1706.17	76.29
J242	0.00	1705.37	75.12
J244	0.00	1705.27	75.08
J246	50.00	1700.89	77.94
J248	0.00	1698.52	76.05
J250	0.00	1693.09	75.00
J254	0.00	1687.42	71.68
J256	0.00	1687.42	71.68
J258	50.00	1690.71	70.50
J260	0.00	1700.27	72.48
J262	0.00	1708.08	73.70
J264	0.00	1708.18	75.04
J266	0.00	1708.18	75.04
J268	0.00	1708.08	73.70
J274A	0.00	1708.22	75.49
J274B	0.00	1708.15	74.51
J278	0.00	1706.33	77.71
J300	0.00	1715.58	86.05
J301	0.00	1715.63	84.76

J301B	0.00	1715.60	85.84	
J303	0.00	1715.49	87.05	
J304	82.39	1715.48	87.39	
J400	0.00	1687.02	70.21	
J402	0.00	1684.66	70.05	
J404	1333.00	1680.71	70.94	
J406	1333.00	1683.34	69.47	
J408	0.00	1687.24	69.43	
J410	0.00	1687.24	70.30	
J410A	0.00	1687.24	70.30	
J412	0.00	1687.24	72.03	
J414	0.00	1687.24	72.68	
J416	0.00	1687.42	71.68	
J418	0.00	1687.51	71.72	
J420	1333.00	1678.31	69.03	
J422	0.00	1692.24	75.06	
J424	0.00	1692.24	75.93	
J508	0.00	1715.59	86.48	
J620	0.00	1682.04	71.51	
RES9000	-4184.95	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-123.05	0.16	0.01
P103	1081.27	1.36	0.23
P106	85.95	0.98	0.29
P107	85.95	0.98	0.01
P107A	85.95	0.98	0.25
P108	2162.55	2.73	10.00
P110	2022.41	2.55	8.83
P111	3.56	0.04	0.00
P113	82.39	0.93	0.16
P115	2022.41	2.55	1.40
P117	-1081.27	1.36	0.23
P200	2145.46	6.09	1.49
P202	2059.51	8.41	0.22
P202A	2059.51	8.41	0.04
P204	1868.87	7.63	0.09
P206	1270.49	5.19	1.82
P206A	1270.49	5.19	1.29
P208	1868.86	7.63	4.15
P210	1818.86	7.43	0.27
P210A	1818.86	7.43	2.10
P212	1818.86	7.43	5.43

P214	1818.86	7.43	0.85
P216	485.86	1.98	0.18
P218	-2230.14	9.11	9.56
P220	-2230.14	9.11	7.74
P222	2039.50	8.33	9.45
P224	598.37	2.44	0.33
P226	598.37	2.44	0.73
P228	556.13	2.27	0.01
P230	598.37	2.44	0.06
P232	598.37	2.44	0.85
P234	598.37	2.44	0.79
P236	598.37	2.44	0.10
P238	598.37	2.44	0.22
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-42.24	0.48	0.01
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	-190.64	0.78	0.06
P272	-190.64	0.78	0.07
P274	-190.64	0.78	0.05
P274A	-190.64	0.78	0.02
P274B	-190.64	0.78	0.02
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	2039.50	5.79	1.46
P290	2059.51	8.41	8.92
P301	82.39	0.53	0.01
P301A	82.39	0.53	0.02
P301B	82.39	0.53	0.01
P301C	82.39	0.53	0.01
P303	82.39	0.53	0.09
P303A	82.39	0.53	0.02
P401	-2180.14	8.91	3.69
P403	2666.00	10.89	2.36
P405	1333.00	5.45	2.62
P407	1333.00	15.13	1.33
P409	0.00	0.00	0.00

P410	485.86	1.98	0.22
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	485.86	1.98	0.09
P419	1333.00	15.13	9.20
P421	1818.86	7.43	4.73
P423	0.00	0.00	0.00
P621	1333.00	15.13	1.33

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	2039.50	8.33	23.83	GPV
V8002	2059.51	8.41	23.84	GPV
V8004	85.95	0.98	24.93	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Ultimate Project
  ADD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP1\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.94     94.56
  J102                                    0.00   1752.93     92.26
  J104                                    0.00   1752.93     84.20
```

J106	0.00	1752.91	89.35
J107	0.00	1727.26	83.48
J108	0.00	1726.27	88.08
J110	0.00	1725.60	89.08
J114	2.37	1726.27	85.04
J116	0.00	1752.93	89.23
J200	0.00	1729.79	84.57
J202	0.00	1729.79	84.57
J202A	0.00	1729.79	84.57
J204	0.00	1729.78	89.60
J206	0.00	1729.78	90.46
J206A	0.00	1729.78	87.87
J208	0.00	1729.78	89.60
J210A	0.00	1729.78	90.90
J214	0.00	1729.78	87.43
J216	0.00	1729.78	85.27
J218	0.00	1729.79	82.76
J220	0.00	1729.79	85.57
J222	0.00	1729.79	86.57
J224	0.00	1729.79	86.57
J226	0.00	1729.79	86.57
J228	0.00	1729.78	86.52
J230	0.00	1729.78	85.70
J232	0.00	1729.78	85.70
J234	0.00	1729.79	85.57
J236	0.00	1729.79	85.70
J238	0.00	1729.79	86.57
J240	0.00	1729.78	86.52
J242	0.00	1729.78	85.70
J244	0.00	1729.78	85.70
J246	50.00	1729.77	90.46
J258	50.00	1729.77	87.43
J260	0.00	1729.78	85.27
J262	0.00	1729.79	83.10
J264	0.00	1729.79	84.40
J266	0.00	1729.79	84.40
J268	0.00	1729.79	83.10
J274A	0.00	1729.79	84.83
J274B	0.00	1729.79	83.88
J278	0.00	1729.78	87.87
J301	0.00	1725.57	89.07
J301B	0.00	1725.48	90.12
J303	0.00	1725.02	91.17
J304	178.74	1724.95	91.49
J400	0.00	1729.78	88.73
J402	0.00	1729.78	89.60
J404	0.00	1729.78	92.20
J406	0.00	1729.78	89.60

J500	3.03	1727.26	83.31	
J502	2.07	1727.26	85.47	
J504	0.00	1725.57	88.64	
J506	0.00	1725.48	89.90	
J508	0.00	1725.43	90.75	
J600	0.00	1729.79	86.57	
J602	0.00	1729.79	86.13	
J604	0.00	1729.79	86.13	
J606	0.00	1729.79	86.57	
J608	0.00	1729.78	92.20	
J610	0.00	1729.78	93.71	
J612	0.00	1729.78	93.71	
J614	0.00	1729.78	94.19	
J616	0.00	1729.78	93.37	
J620	0.00	1729.78	92.20	
J622	0.00	1729.78	91.76	
J624	0.00	1729.78	93.71	
J626	0.00	1729.78	93.71	
J628	0.00	1729.78	94.19	
J630	0.00	1729.78	93.37	
J632	0.00	1729.79	83.75	
J634	0.00	1729.79	84.40	
RES9000	-286.25	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-82.96	0.10	0.00
P103	73.30	0.09	0.00
P106	186.21	2.11	1.21
P107	186.21	2.11	0.05
P107A	181.11	2.06	1.00
P108	146.59	0.18	0.07
P110	139.66	0.18	0.06
P111	2.37	0.03	0.00
P113	178.74	2.03	0.67
P115	139.66	0.18	0.01
P117	-73.30	0.09	0.00
P200	222.61	0.63	0.02
P202	36.40	0.15	0.00
P202A	36.39	0.15	0.00
P204	53.71	0.22	0.00
P206	36.51	0.15	0.00
P206A	36.51	0.15	0.00
P208	53.70	0.22	0.01

P210	3.70	0.02	0.00
P210A	0.00	0.00	0.00
P218	-46.31	0.19	0.01
P220	-46.32	0.19	0.01
P222	63.63	0.26	0.02
P224	17.19	0.07	0.00
P226	17.19	0.07	0.00
P228	17.51	0.07	0.00
P230	17.19	0.07	0.00
P232	17.19	0.07	0.00
P234	17.19	0.07	0.00
P236	17.19	0.07	0.00
P238	17.18	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	0.32	0.00	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	17.32	0.07	0.00
P272	17.32	0.07	0.00
P274	17.31	0.07	0.00
P274A	17.31	0.07	0.00
P274B	17.31	0.07	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	63.63	0.18	0.00
P290	36.40	0.15	0.01
P301	178.74	1.14	0.03
P301A	178.74	1.14	0.09
P301B	178.74	1.14	0.05
P303A	178.74	1.14	0.07
P401	3.69	0.02	0.00
P403	-3.69	0.02	0.00
P405	-3.69	0.02	0.00
P407	0.00	0.00	0.00
P501	3.03	0.03	0.00
P503	2.07	0.02	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	178.74	1.14	0.41
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00
P607	0.00	0.00	0.00
P609	3.69	0.02	0.00
P611	3.69	0.02	0.00
P613	3.69	0.02	0.00
P615	3.69	0.02	0.00
P617	3.69	0.02	0.00
P621	0.00	0.00	0.00
P623	3.69	0.02	0.00
P625	0.00	0.00	0.00
P627	0.00	0.00	0.00
P629	0.00	0.00	0.00
P631	0.00	0.00	0.00
P633	0.00	0.00	0.00
P635	0.00	0.00	0.00
P637	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	63.63	0.26	23.12	GPV
V8002	36.40	0.15	23.11	GPV
V8004	186.21	2.11	24.38	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Ultimate Project
  MDD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP2\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ...... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1743.31     90.39
  J102                                    0.00   1741.77     87.43
  J104                                    0.00   1742.04     79.48
```

J106	0.00	1739.99	83.75
J107	0.00	1713.25	77.41
J108	0.00	1710.84	81.39
J110	0.00	1709.21	81.99
J114	3.56	1710.84	78.36
J116	0.00	1741.78	84.40
J200	0.00	1707.01	74.70
J202	0.00	1706.91	74.66
J202A	0.00	1707.05	74.72
J204	0.00	1703.43	78.18
J206	0.00	1698.78	77.03
J206A	0.00	1704.87	77.07
J208	0.00	1698.47	76.03
J210A	0.00	1698.47	77.33
J214	0.00	1691.31	70.76
J216	0.00	1699.96	72.35
J218	0.00	1706.97	72.87
J220	0.00	1706.54	75.50
J222	0.00	1705.72	76.14
J224	0.00	1705.71	76.13
J226	0.00	1705.64	76.10
J228	0.00	1704.68	75.65
J230	0.00	1703.79	74.44
J232	0.00	1703.68	74.39
J234	0.00	1706.54	75.50
J236	0.00	1705.72	75.27
J238	0.00	1705.64	76.10
J240	0.00	1704.68	75.65
J242	0.00	1703.79	74.44
J244	0.00	1703.68	74.39
J246	50.00	1698.77	77.03
J258	50.00	1691.30	70.76
J260	0.00	1699.96	72.35
J262	0.00	1706.98	73.22
J264	0.00	1707.00	74.53
J266	0.00	1707.00	74.53
J268	0.00	1706.98	73.22
J274A	0.00	1707.00	74.96
J274B	0.00	1706.99	74.00
J278	0.00	1704.87	77.07
J301	0.00	1709.15	81.96
J301B	0.00	1708.93	82.95
J303	0.00	1707.81	83.72
J304	288.04	1707.64	83.99
J400	0.00	1687.98	70.62
J402	0.00	1686.51	70.85
J404	1334.00	1679.29	70.32
J406	0.00	1686.51	70.85

J500	4.54	1713.25	77.23	
J502	3.11	1713.25	79.40	
J504	0.00	1709.15	81.53	
J506	0.00	1708.93	82.73	
J508	0.00	1708.81	83.54	
J600	0.00	1707.05	76.72	
J602	0.00	1707.05	76.28	
J604	0.00	1707.05	76.28	
J606	0.00	1707.05	76.72	
J608	0.00	1694.73	77.01	
J610	0.00	1688.79	75.95	
J612	0.00	1688.58	75.86	
J614	0.00	1680.53	72.85	
J616	0.00	1679.80	71.71	
J620	0.00	1680.62	70.90	
J622	0.00	1694.73	76.58	
J624	0.00	1688.79	75.95	
J626	0.00	1688.58	75.86	
J628	1333.00	1678.79	72.10	
J630	1333.00	1677.43	70.68	
J632	0.00	1706.99	73.87	
J634	0.00	1707.00	74.53	
RES9000	-4399.25	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-227.45	0.29	0.02
P103	1136.37	1.43	0.26
P106	299.25	3.40	2.92
P107	299.25	3.40	0.12
P107A	291.60	3.31	2.41
P108	2272.73	2.87	10.96
P110	2126.52	2.68	9.69
P111	3.56	0.04	0.00
P113	288.04	3.27	1.63
P115	2126.52	2.68	1.54
P117	-1136.37	1.43	0.26
P200	2353.97	6.68	1.77
P202	2054.72	8.39	0.22
P202A	2054.72	8.39	0.04
P204	1986.70	8.12	0.10
P206	1350.62	5.52	2.04
P206A	1350.62	5.52	1.44
P208	1986.70	8.12	4.65

P210	1936.70	7.91	0.31
P210A	0.00	0.00	0.00
P218	-2113.30	8.63	8.65
P220	-2113.30	8.63	7.01
P222	2045.29	8.35	9.50
P224	636.08	2.60	0.37
P226	636.08	2.60	0.82
P228	598.51	2.44	0.01
P230	636.08	2.60	0.07
P232	636.08	2.60	0.96
P234	636.08	2.60	0.89
P236	636.08	2.60	0.11
P238	636.08	2.60	0.25
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-37.57	0.43	0.01
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	-68.02	0.28	0.01
P272	-68.02	0.28	0.01
P274	-68.02	0.28	0.01
P274A	-68.02	0.28	0.00
P274B	-68.02	0.28	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	2045.29	5.80	1.47
P290	2054.72	8.39	8.88
P301	288.04	1.84	0.06
P301A	288.04	1.84	0.22
P301B	288.04	1.84	0.12
P303A	288.04	1.84	0.17
P401	-2063.30	8.43	3.33
P403	2063.30	8.43	1.47
P405	2063.30	8.43	5.89
P407	0.00	0.00	0.00
P501	4.54	0.05	0.00
P503	3.11	0.04	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	288.04	1.84	1.00
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00
P607	0.00	0.00	0.00
P609	1936.70	7.91	3.74
P611	1936.70	7.91	5.94
P613	1936.70	7.91	0.21
P615	1936.70	7.91	8.05
P617	603.70	2.47	0.73
P621	1334.00	15.14	1.33
P623	-729.30	2.98	0.82
P625	0.00	0.00	0.00
P627	0.00	0.00	0.00
P629	0.00	0.00	0.00
P631	1333.00	15.13	1.74
P633	1333.00	15.13	2.37
P635	0.00	0.00	0.00
P637	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	2045.29	8.35	23.84	GPV
V8002	2054.72	8.39	23.84	GPV
V8004	299.25	3.40	23.70	GPV

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  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Ultimate Project
  PHD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP3\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.86     94.53
  J102                                    0.00   1752.84     92.22
  J104                                    0.00   1752.85     84.17
```

J106	0.00	1752.79	89.30
J107	0.00	1725.54	82.73
J108	0.00	1722.58	86.48
J110	0.00	1720.60	86.92
J114	4.74	1722.58	83.45
J116	0.00	1752.85	89.19
J200	0.00	1729.68	84.53
J202	0.00	1729.68	84.53
J202A	0.00	1729.68	84.53
J204	0.00	1729.68	89.55
J206	0.00	1729.67	90.42
J206A	0.00	1729.68	87.82
J208	0.00	1729.67	89.55
J210A	0.00	1729.67	90.85
J214	0.00	1729.67	87.38
J216	0.00	1729.68	85.22
J218	0.00	1729.69	82.71
J220	0.00	1729.68	85.53
J222	0.00	1729.68	86.52
J224	0.00	1729.68	86.52
J226	0.00	1729.68	86.52
J228	0.00	1729.68	86.48
J230	0.00	1729.68	85.65
J232	0.00	1729.68	85.65
J234	0.00	1729.68	85.53
J236	0.00	1729.68	85.65
J238	0.00	1729.68	86.52
J240	0.00	1729.68	86.48
J242	0.00	1729.68	85.65
J244	0.00	1729.68	85.65
J246	50.00	1729.67	90.41
J258	50.00	1729.67	87.38
J260	0.00	1729.68	85.22
J262	0.00	1729.69	83.06
J264	0.00	1729.68	84.36
J266	0.00	1729.68	84.36
J268	0.00	1729.69	83.06
J274A	0.00	1729.68	84.79
J274B	0.00	1729.68	83.84
J278	0.00	1729.68	87.82
J301	0.00	1720.52	86.89
J301B	0.00	1720.25	87.85
J303	0.00	1718.88	88.52
J304	320.80	1718.68	88.77
J400	0.00	1729.67	88.68
J402	0.00	1729.67	89.55
J404	0.00	1729.67	92.15
J406	0.00	1729.67	89.55

J500	6.06	1725.54	82.56	
J502	4.14	1725.54	84.73	
J504	0.00	1720.52	86.45	
J506	0.00	1720.25	87.64	
J508	0.00	1720.11	88.44	
J600	0.00	1729.68	86.52	
J602	0.00	1729.68	86.09	
J604	0.00	1729.68	86.09	
J606	0.00	1729.68	86.52	
J608	0.00	1729.67	92.15	
J610	0.00	1729.67	93.67	
J612	0.00	1729.67	93.67	
J614	0.00	1729.67	94.14	
J616	0.00	1729.67	93.32	
J620	0.00	1729.67	92.15	
J622	0.00	1729.67	91.72	
J624	0.00	1729.67	93.67	
J626	0.00	1729.67	93.67	
J628	0.00	1729.67	94.14	
J630	0.00	1729.67	93.32	
J632	0.00	1729.68	83.71	
J634	0.00	1729.68	84.36	
RES9000	-435.77	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-139.79	0.18	0.01
P103	111.37	0.14	0.00
P106	335.74	3.81	3.61
P107	335.74	3.81	0.15
P107A	325.54	3.69	2.95
P108	222.74	0.28	0.15
P110	213.03	0.27	0.14
P111	4.74	0.05	0.00
P113	320.80	3.64	1.98
P115	213.03	0.27	0.02
P117	-111.37	0.14	0.00
P200	352.82	1.00	0.05
P202	17.08	0.07	0.00
P202A	17.08	0.07	0.00
P204	48.36	0.20	0.00
P206	32.87	0.13	0.00
P206A	32.87	0.13	0.00
P208	48.35	0.20	0.00

P210	-1.65	0.01	0.00
P210A	0.00	0.00	0.00
P218	-51.67	0.21	0.01
P220	-51.67	0.21	0.01
P222	82.95	0.34	0.03
P224	15.48	0.06	0.00
P226	15.48	0.06	0.00
P228	15.89	0.06	0.00
P230	15.48	0.06	0.00
P232	15.48	0.06	0.00
P234	15.48	0.06	0.00
P236	15.48	0.06	0.00
P238	15.47	0.06	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	0.41	0.00	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	31.28	0.13	0.00
P272	31.28	0.13	0.00
P274	31.28	0.13	0.00
P274A	31.28	0.13	0.00
P274B	31.28	0.13	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	82.95	0.24	0.00
P290	17.08	0.07	0.00
P301	320.80	2.05	0.07
P301A	320.80	2.05	0.27
P301B	320.80	2.05	0.14
P303A	320.80	2.05	0.21
P401	-1.67	0.01	0.00
P403	1.67	0.01	0.00
P405	1.66	0.01	0.00
P407	0.00	0.00	0.00
P501	6.06	0.07	0.00
P503	4.14	0.05	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	320.80	2.05	1.22
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00
P607	0.00	0.00	0.00
P609	-1.65	0.01	0.00
P611	-1.66	0.01	0.00
P613	-1.66	0.01	0.00
P615	-1.66	0.01	0.00
P617	-1.66	0.01	0.00
P621	0.00	0.00	0.00
P623	-1.66	0.01	0.00
P625	0.00	0.00	0.00
P627	0.00	0.00	0.00
P629	0.00	0.00	0.00
P631	0.00	0.00	0.00
P633	0.00	0.00	0.00
P635	0.00	0.00	0.00
P637	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	82.95	0.34	23.13	GPV
V8002	17.08	0.07	23.11	GPV
V8004	335.74	3.81	23.49	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Ultimate Project
  Max Day + 4,000 Fireflow

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP4\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1743.31     90.39
  J102                                    0.00   1741.77     87.43
  J104                                    0.00   1742.04     79.48
```

J106	0.00	1739.99	83.75
J107	0.00	1713.25	77.41
J108	0.00	1710.84	81.39
J110	0.00	1709.21	81.99
J114	3.56	1710.84	78.36
J116	0.00	1741.78	84.40
J200	0.00	1707.01	74.70
J202	0.00	1706.91	74.66
J202A	0.00	1707.05	74.72
J204	0.00	1703.43	78.18
J206	0.00	1698.78	77.03
J206A	0.00	1704.87	77.07
J208	0.00	1698.47	76.03
J210A	0.00	1698.47	77.33
J214	0.00	1691.31	70.76
J216	0.00	1699.96	72.35
J218	0.00	1706.97	72.87
J220	0.00	1706.54	75.50
J222	0.00	1705.72	76.14
J224	0.00	1705.71	76.13
J226	0.00	1705.64	76.10
J228	0.00	1704.68	75.65
J230	0.00	1703.79	74.44
J232	0.00	1703.68	74.39
J234	0.00	1706.54	75.50
J236	0.00	1705.72	75.27
J238	0.00	1705.64	76.10
J240	0.00	1704.68	75.65
J242	0.00	1703.79	74.44
J244	0.00	1703.68	74.39
J246	50.00	1698.77	77.03
J258	50.00	1691.30	70.76
J260	0.00	1699.96	72.35
J262	0.00	1706.98	73.22
J264	0.00	1707.00	74.53
J266	0.00	1707.00	74.53
J268	0.00	1706.98	73.22
J274A	0.00	1707.00	74.96
J274B	0.00	1706.99	74.00
J278	0.00	1704.87	77.07
J301	0.00	1709.15	81.96
J301B	0.00	1708.93	82.95
J303	0.00	1707.81	83.72
J304	288.04	1707.64	83.99
J400	0.00	1687.98	70.62
J402	0.00	1686.51	70.85
J404	1334.00	1679.29	70.32
J406	0.00	1686.51	70.85

J500	4.54	1713.25	77.23	
J502	3.11	1713.25	79.40	
J504	0.00	1709.15	81.53	
J506	0.00	1708.93	82.73	
J508	0.00	1708.81	83.54	
J600	0.00	1707.05	76.72	
J602	0.00	1707.05	76.28	
J604	0.00	1707.05	76.28	
J606	0.00	1707.05	76.72	
J608	0.00	1694.73	77.01	
J610	0.00	1688.79	75.95	
J612	0.00	1688.58	75.86	
J614	0.00	1680.53	72.85	
J616	0.00	1679.80	71.71	
J620	0.00	1680.62	70.90	
J622	0.00	1694.73	76.58	
J624	0.00	1688.79	75.95	
J626	0.00	1688.58	75.86	
J628	1333.00	1678.79	72.10	
J630	1333.00	1677.43	70.68	
J632	0.00	1706.99	73.87	
J634	0.00	1707.00	74.53	
RES9000	-4399.25	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-227.45	0.29	0.02
P103	1136.37	1.43	0.26
P106	299.25	3.40	2.92
P107	299.25	3.40	0.12
P107A	291.60	3.31	2.41
P108	2272.73	2.87	10.96
P110	2126.52	2.68	9.69
P111	3.56	0.04	0.00
P113	288.04	3.27	1.63
P115	2126.52	2.68	1.54
P117	-1136.37	1.43	0.26
P200	2353.97	6.68	1.77
P202	2054.72	8.39	0.22
P202A	2054.72	8.39	0.04
P204	1986.70	8.12	0.10
P206	1350.62	5.52	2.04
P206A	1350.62	5.52	1.44
P208	1986.70	8.12	4.65

P210	1936.70	7.91	0.31
P210A	0.00	0.00	0.00
P218	-2113.30	8.63	8.65
P220	-2113.30	8.63	7.01
P222	2045.29	8.35	9.50
P224	636.08	2.60	0.37
P226	636.08	2.60	0.82
P228	598.51	2.44	0.01
P230	636.08	2.60	0.07
P232	636.08	2.60	0.96
P234	636.08	2.60	0.89
P236	636.08	2.60	0.11
P238	636.08	2.60	0.25
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-37.57	0.43	0.01
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	-68.02	0.28	0.01
P272	-68.02	0.28	0.01
P274	-68.02	0.28	0.01
P274A	-68.02	0.28	0.00
P274B	-68.02	0.28	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	2045.29	5.80	1.47
P290	2054.72	8.39	8.88
P301	288.04	1.84	0.06
P301A	288.04	1.84	0.22
P301B	288.04	1.84	0.12
P303A	288.04	1.84	0.17
P401	-2063.30	8.43	3.33
P403	2063.30	8.43	1.47
P405	2063.30	8.43	5.89
P407	0.00	0.00	0.00
P501	4.54	0.05	0.00
P503	3.11	0.04	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	288.04	1.84	1.00
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00	
P607	0.00	0.00	0.00	
P609	1936.70	7.91	3.74	
P611	1936.70	7.91	5.94	
P613	1936.70	7.91	0.21	
P615	1936.70	7.91	8.05	
P617	603.70	2.47	0.73	
P621	1334.00	15.14	1.33	
P623	-729.30	2.98	0.82	
P625	0.00	0.00	0.00	
P627	0.00	0.00	0.00	
P629	0.00	0.00	0.00	
P631	1333.00	15.13	1.74	
P633	1333.00	15.13	2.37	
P635	0.00	0.00	0.00	
P637	0.00	0.00	0.00	

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	2045.29	8.35	23.84	GPV
V8002	2054.72	8.39	23.84	GPV
V8004	299.25	3.40	23.70	GPV

APPENDIX D – FIRE FLOW TEST DATA FROM EMWD

COMPUTER MODEL TEST

Grid Number:	55-C	Date:	3-18-2019
Customer Name:	Kaiser Permanente	Address:	9755 Clairemont Mesa Blvd.
City, State Zip:	San Diego, CA 92124		
Contact Name:	Shirley Reppert		
Phone:	858-614-550	Cell:	
Fax:		Email:	Shirley.reppert@mbakerintl.com
Project Record Number:	WS20190000087	WO/CO:	WO 15935
Project Name:	Kaiser Permanente Moreno Valley Medical Center	APN:	486-310-033, 034
(Approximate) Test & Hydrant Location	(1) 952 feet Northeast of the intersection of Turnberry St. & Iris Av. See attached map. (2) 369 feet Northeast of the intersection of Turnberry St. & Iris Av. See attached map.		

MODEL	NBD_EMWD_PORTABLE_20170321_POS FF Diurnal_v2				
POC Test Location:	EMWD RESULTS			Requested	Flow Availability for Fire Department
	Fire Flow				
Elevation (ft):	1,547	1,540			
Steady State, Dynamic (psi):	89	93			
Residual Pressure (psi):	85	88			
Tested FF (gpm):	2,032	2,032			
Combined Total (gpm):	Both Fire Flows were ran together with MDD			4, 064	
Number of Hydrants:	Used 2 Test Nodes			2	
Duration Tested @:	4 Hour			4	

Demand Conditions:	Max Day						
Pressure Zone/ Tank Name(s)/ Level(s):	PZ 1764 / Wolfskill Tank / Base Elevation 1732 Feet						
Pump Operating Status:	ON				Computer Model Setting	EPS	
Number of Points of Connections (POC):	POC (Circle One)		Reason (Circle what Applies)				
	One	Two or More	Plan of Service	Limited Capacity (Existing Systems)	Supply Redundancy	Conditions of Approval	Fire Sprinkler Connection(s)

Comments: The water system is capable of providing 4,064 GPM for 4 hours at a minimum of 20 psi, as shown in the attached map. These Fire Flow test results may need to be complemented by a Design Condition and do not include all facility conditioning that may be required for this project. Fire Agency Conditions were not provided, if any Fire Flow changes occur in the Fire Agency Conditions, you may need to submit another Fire Flow test at the requester's expense.

The above results are not a guarantee the District's system will supply water to the project at any specific flows or pressures. These results were determined from a computer simulation of the District's water system and/or from hydraulic calculations pertaining to distribution pipelines: The capacity of the service laterals, meters, backflow assemblies, on-site fire system, and other appurtenances were not considered in these results. The design and sizing of service laterals and downstream facilities shall be the responsibility of the Project Sponsor.

EMWD's Fire Flow test results are valid for 12 months from the date of testing.

Completed By: RUDY ESPARZA **DRAFT - Pending Formal Fire Agency Conditions**

Should you have any questions or need additional information, please contact me at (951) 928-3777, ext. 4478.

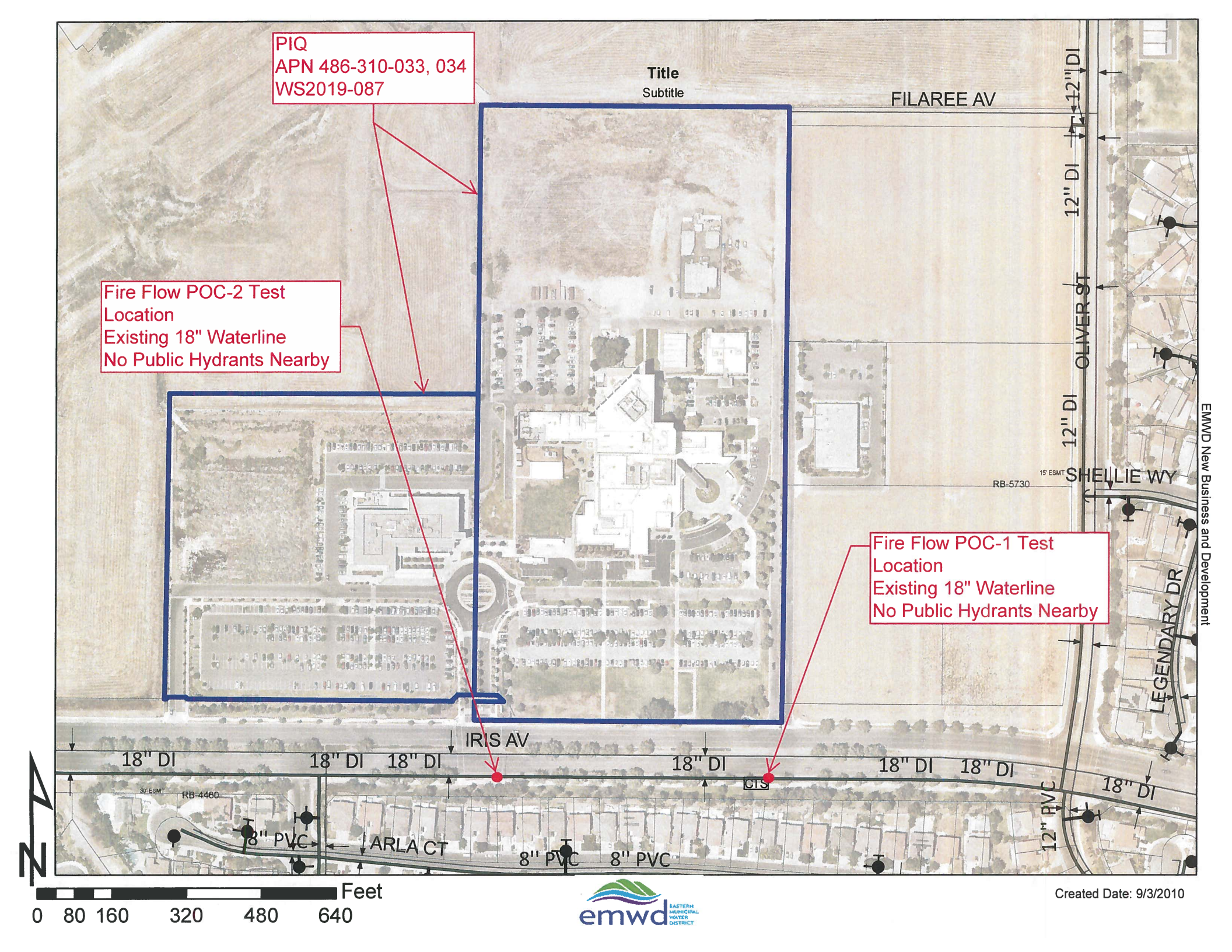
Sincerely, RE

Rudy Esparza
Sr. Engineering Technician
Development Services Department

Date: 3-18-2019

Reviewed By: BAR

Date: 3/18/19


PIQ
APN 486-310-033, 034
WS2019-087
Title
Subtitle
Fire Flow POC-2 Test
Location
Existing 18" Waterline
No Public Hydrants Nearby
Fire Flow POC-1 Test
Location
Existing 18" Waterline
No Public Hydrants Nearby
FILAREE AV
12" DI
OLIVER ST
SHELLIE WY
15' ESMT
RB-5730
LEGENDARY DR
IRIS AV
18" DI
CTS
37' ESMT
RB-4460
8" PVC
ARLA CT
12" PVC
N
Feet
0 80 160 320 480 640
emwd
EASTERN MUNICIPAL WATER DISTRICT
Created Date: 9/3/2010
EMWD New Business and Development

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: Kaiser Permanente Moreno Valley Medical Center
Pressure Zone: 1764 / WS2019-087
Model Version (12)

ADD (GPM): 32
FFD (GPM): 2,000
Duration (Hours): 4

POC Location: Fire Flow & POC-1 See Attached Map
Elevation (ft): 1,547.0
Junction Name: APN 486-310-033,034 (See Attached Exhibit)

	Modeling Scenario (12)	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	64		1,752	89		
Operational Demand	EPS, MDD, Pumps On (8)	PHD	128		1,753	86		
Operational Demand	EPS, ADD, Pumps On (8)	MHD						
Fire Flow Demand		FFD + MDD	32	2,000	1,744	85		
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD						

Footnotes (see page 2 for additional footnotes):
(1) If improvements are required, please describe the improvements here:

Minimum Pressure Criteria:

50 PSI	...under PHD, MDD, and MHD
20 PSI	...under MDD + FFD

Minimum Criteria, Velocities in Pipelines:
Equal to or less than 5 fps: ...for MDD
Equal to or less than 10 fps: ...for PHD
Equal to or less than 15 fps: ...for FF + MDD

	Adequate?	Comments:
Available Firm Pumping Capacity:	TBD	(TBD indicates To Be Determined) Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.
Available Firm Pumping Capacity, w/ Electrical Outage :	TBD	
Available Storage Capacity:	TBD	

Additional Comments:

Prepared by: Rudy Esparza
Date: 3/18/2019

Reviewed by: BAC
Date: 3/18/2019

File: PZ 1764 APN 486-310-033, 034 POC (1) WS2019-087
FORM: NBD-068 (July 25, 2016) --- Date Printed: 3/18/2019, 3:10 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: Kaiser Permanente Moreno Valley Medical Center	**ADD (GPM):**	32
Pressure Zone: 1764 / WS2019-087	**FFD (GPM):**	2,000
Model Version (12)	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

(8) Storage tanks: Initial levels set at 75% full in EPS

(9) Storage tanks: Initial levels set at 50% full in SSS, Pumps Off

(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***NBD_EPS_EMWD_POTABLE_2308_WYA20151019.mxd***

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: Kaiser Permanente Moreno Valley Medical Center
Pressure Zone: 1764 / WS2019-087
Model Version (12)

ADD (GPM): 32
FFD (GPM): 2,000
Duration (Hours): 4

POC Location: Fire Flow & POC-2 See Attached Map
Elevation (ft): 1,540.0
Junction Name: APN 486-310-033,034 (See Attached Exhibit)

	Modeling Scenario (12)	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	64		1,752	92		
Operational Demand	EPS, MDD, Pumps On (8)	PHD	128		1,745	89		
Operational Demand	EPS, ADD, Pumps On (8)	MHD						
Fire Flow Demand		FFD + MDD	32	2,000	1,744	88		
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD						

Footnotes (see page 2 for additional footnotes):
(1) If improvements are required, please describe the improvements here:

Minimum Pressure Criteria:

50 PSI	...under PHD, MDD, and MHD
20 PSI	...under MDD + FFD

Minimum Criteria, Velocities in Pipelines:
Equal to or less than 5 fps: ...for MDD
Equal to or less than 10 fps: ...for PHD
Equal to or less than 15 fps: ...for FF + MDD

	Adequate?	Comments:
Available Firm Pumping Capacity:	TBD	(TBD indicates To Be Determined) Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.
Available Firm Pumping Capacity, w/ Electrical Outage :	TBD	
Available Storage Capacity:	TBD	

Additional Comments:

Prepared by: Rudy Esparza
Date: 3/18/2019

Reviewed by: BAR
Date: 3/18/2019

File: PZ 1764 APN 486-310-033, 034 POC (2) WS2019-087
FORM: NBD-068 (July 25, 2016) --- Date Printed: 3/18/2019, 3:10 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results		
Project Name: Kaiser Permanente Moreno Valley Medical Center	**ADD (GPM):**	32
Pressure Zone: 1764 / WS2019-087	**FFD (GPM):**	2,000
Model Version (12)	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

(8) Storage tanks: Initial levels set at 75% full in EPS

(9) Storage tanks: Initial levels set at 50% full in SSS, Pumps Off

(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***NBD_EPS_EMWD_POTABLE_2308_WYA20151019.mxd***

APPENDIX E – WATER SYSTEM PLANNING & DESIGN PRINCIPLE GUIDELINES CRITERIA FROM EMWD

CRITERIA

The following criteria and are to be used in the planning and design of facilities for the District's domestic water system. They apply to existing and future conditions.

I. FLOW DEMAND CALCULATION(S):

A. Average Day Demand (ADD)

The recommended rates for determining ADD are:

1. **RESIDENTIAL**

	DU/Ac	C/DU	GPD/C	GPD/Ac
Low Density (0-3)	2.5	4	200*	2,000
Medium Density (4-8)	4.5	3.5	180	2,835
High Density (9-20)	12	2.5	120	3,600
Mobile Home	6	2	100	1,200

2. **NON-RESIDENTIAL**

Institutional	3,000* GPD/Gross Acre
Commercial	2,000* GPD/Gross Acre
Industrial	2,000* GPD/Gross Acre
Agricultural	1 to 5* AF/Ac/Yr
Golf Courses & Ponds	4.5 AF/Ac/Yr

* Note: If site specific data is available and has a higher or lower use rate than the recommended value, it should be used. If no site specific data is available for Agricultural use, a default value of 4 AF/Ac/Yr shall be used.

B. Maximum Day Demand (MDD):

Based on the results of studies conducted to develop the Water Facilities Master Plan, recommended Peaking Factors (PF) are as follows for use in system analysis:

Land Use	Peaking Factor‡	
	Maximum Day	Peak Hour
1. Low and Medium Density Residential		
a. Small Pressure Zones Under 500 gpm ADD	3.0	7.0
b. Medium Pressure Zones 500-2,000 gpm ADD	2.5	5.0
c. Large Pressure Zones Above 2,000 gpm ADD	2.0	3.5
2. High Density Residential and Mobile Homes	1.5	2.5
3. Commercial and Industrial	1.5	2.0
4. Schools and Other Public Institutions (Institutional)	1.5	2.0
5. Parks and Golf Courses	2.5	2.5
6. Agricultural (see WFMP p. 3-23)	2.0	2.0
‡ Reference WFMP Table 3-5		

Notes:

- Maximum Day Demand is equal to Average Day Demand times the Maximum Day Peaking Factor.
- Peak Hour Demand is equal to the Average Day Demand times the Peak Hour Peaking Factor.
- If a Peaking Factor is known to be higher or lower within an existing pressure zone (based upon record data), then it may used.

C. Fire Flow Requirements

These Recommended Fire Flows will be used for District planning and design purposes unless the local (approving) fire department stipulates or requires a different fire flow. It is understood that the minimum Fire Flow in several less developed areas of the District is still 500 gpm.

STRUCTURE	Flow GPM	Duration Hours	Number of Fire Hydrants
Single Family (Residential)	1500	2	2
Multi-Family* (Residential)	3000	2	3
Light Commercial/Industrial (Including Schools)	3000	3	3
Heavy Commercial/Industrial	5000	4	4

*Five or more units per acre