

APPENDIX I – PRELIMINARY WATER STUDY



Moreno Valley Mall Redevelopment Water System Analysis Memorandum

Moreno Valley, CA

March 21, 2022

Kimley»»Horn

TABLE OF CONTENTS

1. INTRODUCTION & PURPOSE	1
2. WATER SYSTEM CALIBRATION	2
3. SYSTEM ANALYSIS AND RESULTS	2
<i>Demand Analysis</i>	2
4. SYSTEM RECOMMENDATIONS.....	3

LIST OF EXHIBITS

Figure 1	Project Location	1
Table 1	Fire Flow Model Test Data.....	2

APPENDICES

EMWD Water System Data, Base Modeling Results and Fire Flow Letter	Appendix A
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ACRONYMS

AC	Acre
APN	Assessor's Parcel Number
CFS	Cubic Feet Per Second
District	Eastern Municipal Water District
EDU	Equivalent Dwelling Units
EMWD	Eastern Municipal Water District
FF	Fire Flow Demand
GPD/AC	Gallons per Day per Acre
GPM	Gallons per Minute
HDR	High Density Residential
Hwy	Highway
IN	Inch
MDD	Maximum Day Demand
MDFF	Maximum Day + Fire Flow Demand
MG	Million Gallons
MGD	Million Gallons per Day
MHD	Maximum Hourly Demand
POC	Point of Connection
PHD	Peak Hourly Demand

1. INTRODUCTION & PURPOSE

The Moreno Valley Mall Project is proposing to redevelop 58.6 of the existing 80.1 acres of the existing Moreno Valley Mall land area to four new apartment complexes, two new hotel buildings, and a new office building. In total, the proposed redevelopment will result in an additional 1,246 equivalent dwelling units. The Project is located in Moreno Valley, CA, south of State Route 60 between the Day Street and Frederick Street, and is bounded by Town Circle. **Figure 1** depicts the project location and surrounding vicinity.

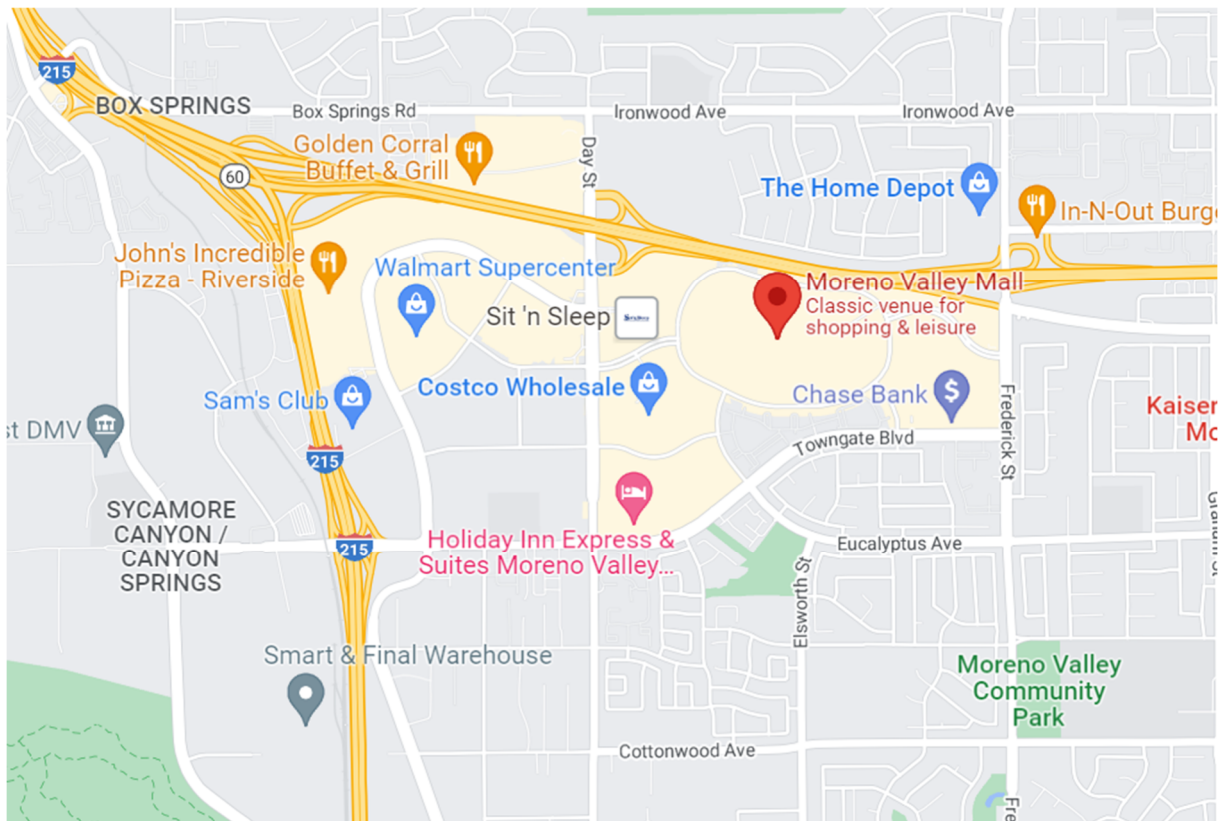


Figure 1: Project Location

A public domestic and private fire water system will be built as part of this project. This analysis determined pipe sizes for the public water system. The objectives of the analysis were to maximize the available pressure to each building and on-site fire hydrants, while meeting the following design criteria:

- Maintain a static service pressure of 60 to 125 PSI
- Maintain a residual pressure of 60 to 125 PSI for Maximum Day Demand (MDD)
- Maintain a residual pressure of 50 to 125 PSI for Peak Hour Demand (PHD)
- Maintain a minimum residual pressure of 20 PSI for Maximum Day Demand plus Fire Flow (MDFF)
- Maintain flow velocities under 10 fps, except during fire flow conditions.

- Maintain head loss in mains under 3.0 feet/1000 feet for flows up to 20 cfs., 2.0 feet/1000 feet for flows between 20 cfs and 50 cfs and 1.0 feet/1000 feet for flows over 50 cfs.

The fire flow requirements for the site are 4,000 GPM @ 20 PSI for four (4) hours. The Fire Marshal has confirmed this requirement includes a 50% reduction since all buildings will need to be sprinklered. The City of Moreno Valley Fire Flow Letter stating the fire flow requirements is included in **Appendix A**.

2. WATER SYSTEM CALIBRATION

The proposed water system will have one (1) point of connection (POC) at the intersection of Campus Parkway and Town Circle to an existing 12-inch DIP waterline.

BASE MODEL

The water system will be analyzed using Bentley's WaterCAD v8i simulation model. WaterCAD is a dynamic water distribution system modeling software that models multiple flow conditions evaluating velocities, pressures, and head losses across the entire system. The water system will be analyzed after receipt of EMWD Hydraulic Boundary Conditions and Fire Flow results.

3. SYSTEM ANALYSIS AND RESULTS

Demand Analysis

The proposed water system will be analyzed to meet the design criteria for MDFF and PHD. The project consists of Very High Density residential, Commercial, and Business Park. The MDFF and PHD demands were calculated by following the steps outlined in *EMWD Water Facilities Master Plan (2015)*. The demands are summarized below. See **Table 1** for complete Water Demand Calculations:

- PHD = 2,139 GPM
- MDFF = 5,070 GPM

Table 1 – Water Demand Calculations

Proposed											
Building	Land Use	Lot size (ac)	DU	gpd/du	gpd/ac	MDD Peaking Factor	PD Peaking Factor	ADD (gpm)	MDD (gpm)	PHD (gpm)	Fire Flow (gpm)
Office	Commercial	2.66	-	-	2200	2	2	4.06	8.13	16.26	4,000
Hotel A	High Density	-	150	290	-	2	2	30.21	60.42	120.83	4,000
Hotel B	High Density	-	120	290	-	2	2	24.17	48.33	96.67	4,000
Residential A	High Density	-	596	290	-	2	2	120.03	240.06	480.11	4,000
Residential B	High Density	-	216	290	-	2	2	43.50	87.00	174.00	4,000
Residential C	High Density	-	565	290	-	2	2	113.78	227.57	455.14	4,000
Residential D	High Density	-	250	290	-	2	2	50.35	100.69	201.39	4,000
Existing											
Commercial	Commercial	80.1			2,200	2	2	122	245	490	4,000
Summary								508	1,017	2,034	4,000

4. SYSTEM RECOMMENDATIONS

The water system analysis will be based on the above-summarized demands. The analysis will be used to size the proposed distribution system and ensure the existing system has capacity to provide required flows.

This analysis will be completed upon receipt of EMWD Hydraulic Boundary Conditions and Fire Flow results.

Tammie Moreno, P.E.
C 74417 Exp. 09/30/23

APPENDIX A

Fire Flow Letter

FIRE FLOW LETTER

Date: 3/8/22	Address: 22500 Town Cir.
Case Number: PPA21-0014	A.P.N.: 291110032

This is certification the water system is capable of meeting the following required fire flows as determined by the California Fire Code Appendix B.

Based on the information provided on the above referenced case. The fire flow required for this project will be 4000 G.P.M. for duration of 4-HOURS measured at 20-psi residual pressure.

The required fire flow may be adjusted during the approval process to reflect changes in design, construction type or automatic fire protection measures as approved by the Fire Prevention Bureau.

**Applicant/
Developer:** _____

By: _____ **Date:** _____

Title: _____

WATER AGENCY APPROVAL

Name of Agency: _____

Address: _____

Telephone: _____ **Date:** _____

By: _____ **Title:** _____

NOTE: THE COMPLETION AND SUBMITTAL OF THIS LETTER TO THE FIRE PREVENTION BUREAU SHALL NOT BE CONSTRUED AS APPROVAL FOR THE INSTALLATION OF THE REQUIRED FIRE HYDRANT (S) AND/OR WATER SYSTEM.

EXHIBIT A

LEGEND

- EXISTING WATER MAIN
- PROPOSED WATER LINE
- EXISTING WATER LINE TO BE DEMOLISHED
- PROPOSED FIRE HYDRANT AND FIRE COVERAGE (300FT RADIUS)

