APPENDIX O

Water Service Analysis

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

WATER SERVICE ANALYSIS FOR THE
BELCARO PROJECT
IN THE
SANTA CLARITA VALLEY WATER AGENCY

February 11, 2026

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

WATER SERVICE ANALYSIS FOR THE BELCARO PROJECT IN THE SANTA CLARITA VALLEY WATER AGENCY

February 11, 2026



2-11-26

Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
(760) 438-4422

Job No. 159-001

TABLE OF CONTENTS

PAGE NO.

CHAPTER 1 INTRODUCTION 1-1
LAND USE PLAN 1-1
PURPOSE OF STUDY 1-1

CHAPTER 2 DESIGN CRITERIA 2-1
Water Demands and Peaking Factors 2-1
Fire Flow Requirement 2-2
System Pressures and Pipeline Criteria 2-2
Water Booster Stations 2-3
Reservoir Storage 2-3

CHAPTER 3 WATER DEMANDS, PUMPING, & STORAGE REQUIREMENTS 3-1
Booster/Pumping Requirements 3-2
Reservoir Storage 3-2

CHAPTER 4 EXISTING WATER FACILITIES 4-1
Water Supply 4-1
Pumping Facilities 4-1
Sand Canyon Zone 5 4-1
Sand Canyon Zone 7 4-2
Reservoir Storage 4-2
Sand Canyon Zone 5 4-2
Sand Canyon Zone 7 4-2

CHAPTER 5 PROPOSED SYSTEM CONFIGURATION 5-1
PUMPING ANALYSIS 5-3
STORAGE ANALYSIS 5-3
Fair-Share Cost 5-4

CHAPTER 6 PUBLIC WATER SYSTEM HYDRAULIC ANALYSIS 6-1
Water System Analysis 6-1

CHAPTER 7 CONCLUSION AND RECOMMENDATIONS 7-1

LIST OF APPENDICES

APPENDIX A BELCARO SITE DEVELOPMENT PLAN

APPENDIX B 2024 WATER MASTER PLAN EXCERPTS

APPENDIX C BELCARO FIRE FLOW REQUIREMENT EXHIBIT AND CURRENT FIRE ACCESS/HYDRANT PLAN

APPENDIX D BELCARO LANDSCAPE IRRIGATION PLAN

APPENDIX E LIVE OAK RESERVOIR SITE

APPENDIX F HYDRAULIC COMPUTER MODEL SYSTEM ANALYSIS

LIST OF TABLES

PAGE NO.

TABLE 2-1 SANTA CLARITA VALLEY WATER AGENCY AVERAGE DAY WATER DEMAND FACTORS 2-1

TABLE 2-2 SANTA CLARITA VALLEY WATER AGENCY SYSTEM PRESSURE AND PIPELINE DESIGN CRITERIA 2-2

TABLE 3-1 BELCARO PROJECT ESTIMATE OF POTABLE WATER DEMAND 3-1

TABLE 3-2 BELCARO PROJECT BOOSTER/PUMPING REQUIREMENTS 3-2

TABLE 3-3 BELCARO PROJECT RESERVOIR STORAGE REQUIREMENT 3-2

TABLE 5-1 SAND CANYON ZONE 7 ZONE STORAGE ANALYSIS 5-3

TABLE 6-1 BELCARO PROJECT COMPUTER MODELING SUMMARY 6-2

LIST OF FIGURES

PAGE NO.

FIGURE 1-1 BELCARO VICINITY MAP 1-2

FIGURE 5-1 BELCARO ULTIMATE ONSITE WATER SYSTEM 5-2

CHAPTER 1

INTRODUCTION

This report outlines the water service system requirements for the Belcaro project in the Santa Clarita Valley Water Agency (SCV Water). This report will develop water demands for the project, recommend required onsite facilities to accommodate the projected demands, and present offsite facility improvements needed to provide water supply for the project.

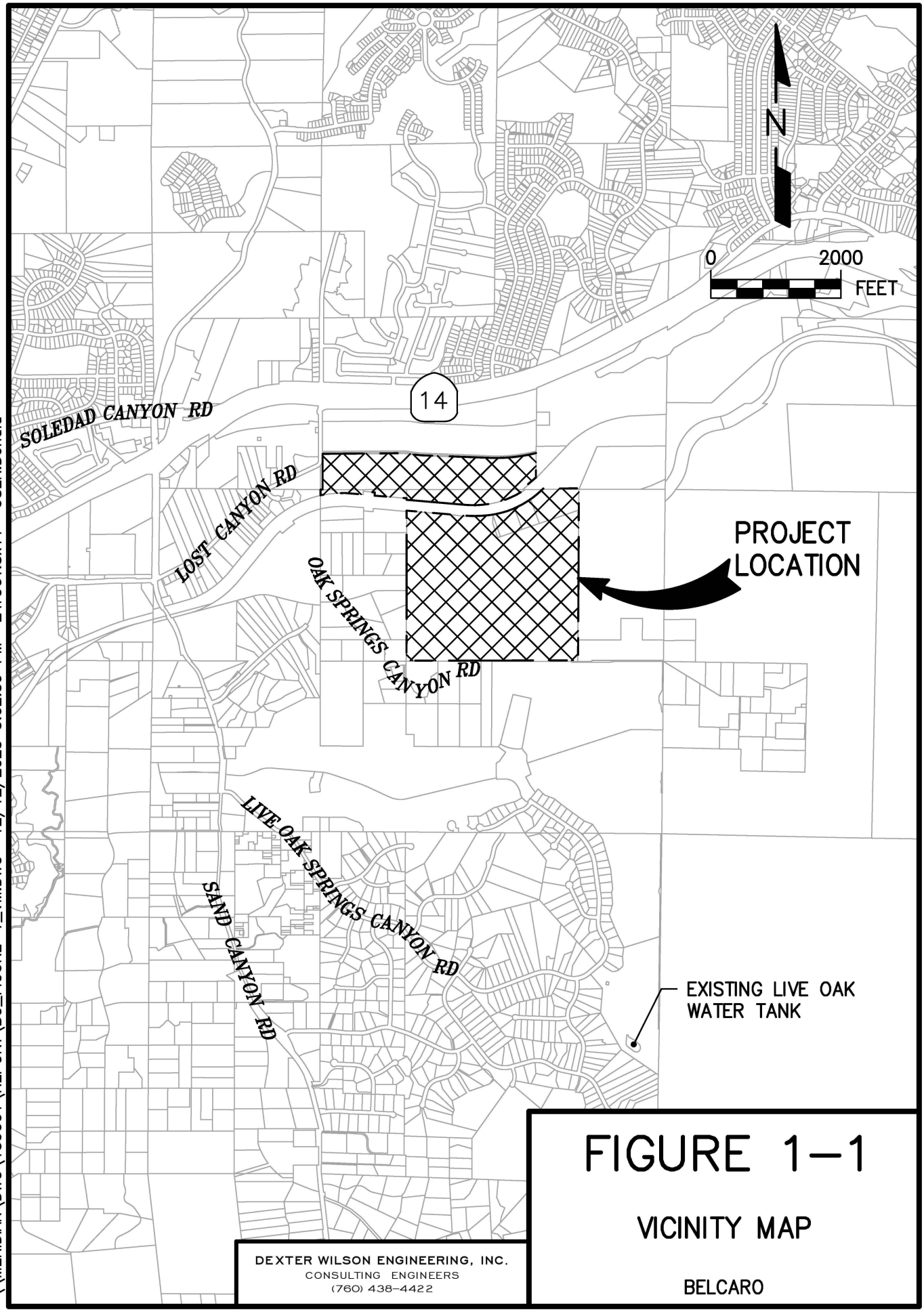
The Belcaro project is located in the City of Santa Clarita east of the intersection of Oak Spring Canyon Road and Lost Canyon Road. The project is generally bounded by the Santa Clara River to the north, Oak Spring Canyon Wash to the west, the Robinson Ranch Golf Club to the south, and unincorporated Los Angeles County and the Angeles National Forest to the east. A vicinity map is included in Figure 1-1.

LAND USE PLAN

The Belcaro project encompasses approximately 193.8 acres and proposes 341 single family residential units and a recreational center. Developed pads on the project will range in elevation from approximately 1,602 feet to approximately 1,656 feet. The site development plan for the project is provided in Appendix A for reference.

PURPOSE OF STUDY

The purpose of this report is to establish the water facilities that will be required for the development of the Belcaro project. A key facet of the study will be to analyze the hydraulics of the system to show how the proposed facilities will be integrated with the overall system and meet the operational requirements of SCV Water.



\\MERIDIAN\DWG\159001\REPORT\BC_FIGURE-1_VM.DWG 12/12/2025 3:02:59 PM LAYOUT:8x11 USER:Donald

FIGURE 1-1

VICINITY MAP

BELCARO

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

CHAPTER 2

DESIGN CRITERIA

This chapter presents the design criteria used in planning the water facilities for the Belcaro project. Unless otherwise noted, the criteria utilized in this report are taken from the "Santa Clarita Valley Water Agency Water Master Plan, October 2024," prepared by Hazen (2024 Water Master Plan). Excerpts pertinent to this study from the 2024 Master Plan are included in Appendix B. The design criteria are used for analysis of the proposed water system to deliver the projected water demands for the proposed Belcaro project.

Water Demands and Peaking Factors

Water demand factors are presented in Table 3-8 of the 2024 Water Master Plan. Average water demands are determined using proposed land use and its associated water demand factor. Table 2-1 summarizes the water demand factors utilized in this study. The Belcaro project will primarily be served by the Sand Canyon Zone 7 Pressure Zone.

TABLE 2-1
SANTA CLARITA VALLEY WATER AGENCY
AVERAGE DAY WATER DEMAND FACTORS

Land Use	Gallons per Day per Account
Single Family Residential	480
Commercial	2,125
Dedicated Irrigation	4,482

Given that the Belcaro project will be located in a high fire-risk area with limited water supply, peaking factors are taken from the "Santa Clarita Water Division 2012 Water Master Plan, 2013 Update," prepared by Civiltec Engineering, as they are higher than the peaking factors presented in the 2024 Master Plan. To convert average day demands to maximum day demands within Sand Canyon Zone 7, a factor of 2.08 is used. To convert average day demands to peak hour demands within Sand Canyon Zone 7, a factor of 4.59 is used.

Fire Flow Requirement

The fire flow requirement for the Belcaro project was established by the Los Angeles County Fire Department. Per the fire flow requirement exhibit in Appendix C dated October 1, 2024 (2024 Exhibit), the fire flow requirement for the single-family homes is 1,250 gpm for 1 hour and the fire flow requirement for the recreation center is 1,500 gpm for 4 hours. The 2024 Exhibit in Appendix C is followed by the project's current fire access/hydrant plan, dated September 8, 2025, for reference. The latest exhibit reflects the 38 fire hydrant locations required by the Los Angeles County Fire Department in the 2024 Exhibit.

System Pressures and Pipeline Criteria

Table 2-2 summarizes the system pressure and pipeline design criteria based on the 2024 Water Master Plan.

TABLE 2-2
SANTA CLARITA VALLEY WATER AGENCY
SYSTEM PRESSURE AND PIPELINE DESIGN CRITERIA

Criteria	Design Requirement
Minimum Static Pressure (Preferred)	60 psi
Maximum Static Pressure	Pipeline Pressure Class
Minimum Pressure during Fire Flow Scenario	20 psi
Minimum Pressure during Peak Hour Demand	40 psi
Hazen-Williams Coefficient ("C" Factor) [1]	120
Maximum Pipeline Velocity	10 fps during Peak Hour Demand 15 fps during MDD plus Fire Flow Scenarios 5 fps during Max Day Demand

1. C = 120 used in hydraulic model evaluation for all proposed pipelines as a conservative approach.

Water Booster Stations

Per the 2024 Water Master Plan, water booster stations for open pressure zones are designed to pump maximum day demand for the pressure zone over a 16-hour period. The maximum day demand of the pressure zone shall also include the demands of dependent pressure zones.

Water booster stations for closed pressure zones (fed by hydropneumatic pump stations) are designed to pump peak hour demand and fire flow for the pressure zone. The firm capacity shall be peak hour demand plus a dedicated fire flow pump or peak hour demand plus the required fire flow.

Reservoir Storage

Per the 2024 Water Master Plan, SCV Water sizes reservoirs for equalization, emergency, and fire flow storage. The equalization storage requirement is calculated based on six percent of the maximum day demand. Emergency storage is to be equivalent to two days of average day demand for zones with local water supply sources and equivalent to three days of the average day demand for zones without local water supply sources. Fire flow storage is based on the worst-case fire flow within the reservoir service area.

CHAPTER 3

WATER DEMANDS, PUMPING, AND STORAGE REQUIREMENTS

Based on the water demand factors presented in Chapter 2 and the proposed development plan for the Belcaro project, Table 3-1 provides the estimated average day water use for the project. The total projected average water demand is 0.20 mgd. Using the peaking factors from Chapter 2, the projected maximum daily demand is 0.41 mgd (287.0 gpm) and the projected peak hour demand is 0.91 mgd (633.4 gpm).

TABLE 3-1
BELCARO PROJECT
ESTIMATE OF POTABLE WATER DEMAND

Land Use	Quantity	Demand Factor	Average Day Demand, gpd	Average Day Demand, gpm
Single Family Residential	341	480 gpd/acct	163,680	113.7
Commercial (Rec Center)	1	2,125 gpd/acct	2,125	1.5
Irrigation[1]	-	-	32,825	22.8
TOTAL ADD	**-**	**-**	**198,630**	**138.0**
TOTAL MDD	**-**	**-**	**413,150**	**287.0**
TOTAL PHD	**-**	**-**	**911,712**	**633.4**

1. See Appendix D for Belcaro Landscape Irrigation Plan for demand details.

Booster/Pumping Requirements

Based on the estimated water demands in Table 3-1, Table 3-2 summarizes the required booster station pumping capacity for the Belcaro project.

TABLE 3-2
BELCARO PROJECT
BOOSTER/PUMPING REQUIREMENTS

Pumping Component	Flow Required	Time Required	Pumping Capacity, gpm
Max Day Demand	One Max Day Demand	16 Hours	431
TOTAL	**-**	**-**	**431**

Reservoir Storage

Based on the estimated water demands in Table 3-1, Table 3-3 summarizes the required reservoir storage for the Belcaro project.

TABLE 3-3
BELCARO PROJECT
RESERVOIR STORAGE REQUIREMENT

Storage Component	Volume Required	Reservoir Storage, gallons
Equalization	6% of Max Day Demand	24,789
Emergency	3 Days of Average Day Demand [1]	595,890
SUBTOTAL	**-**	**620,679**
Fire	1,500 gpm for 4 Hours	360,000
TOTAL	**-**	**980,679**

1. Assumes storage in a zone without local water supply sources.

CHAPTER 4

EXISTING WATER FACILITIES

Existing regional water facilities pertinent to the Belcaro project consist of supply, transmission, pumping, and storage facilities. Appendix B graphically shows existing regional facilities in relation to the 2024 Water Master Plan and a brief discussion is provided below.

Water Supply

The current supply of water to SCV Water is from a variety of sources including imported water supplies, local groundwater, and water from existing banking programs. There are a total of 57 pressure zones ranging from a hydraulic grade line of 1,319 feet to 2,340 feet. The water facilities in the area of the Belcaro project consists of two pressure zones: the Sand Canyon Zone 5 Pressure Zone (HGL = 1797 feet) and the Sand Canyon Zone 7 Pressure Zone (HGL = 1976 feet). Current average demands within the SCV Water potable water service area are approximately 50.44 MGD (78.0 cfs) per Table 3-1 of the 2024 Water Master Plan.

The project proposes to construct less than 500 equivalent residential units; therefore, a Water Supply Assessment is not required.

Pumping Facilities

There are two pressure zones in the vicinity of the Belcaro project, Sand Canyon Zone 5 and Sand Canyon Zone 7, each with their own pumping facilities. Both zones are open pressure zones; therefore, the pumping capacity criteria is maximum day demand over 16 hours.

Sand Canyon Zone 5. Sand Canyon Zone 5 has one booster station located at a turnout named SC-12 with a firm capacity of 2,086 gpm. The current pumping requirement of this zone is 724 gpm per the 2024 Water Master Plan, so there is a 1,362 gpm pumping surplus.

Sand Canyon Zone 7. Sand Canyon Zone 7 has one booster station called Appaloosa Booster Station with a firm capacity of 650 gpm. The current pumping requirement of Sand Canyon Zone 7 is 232 gpm per the 2024 Water Master Plan, so there is a 418 gpm pumping surplus. There is a CIP project planned at the booster station in the next five years to replace electrical equipment that is approaching the end of its useful life.

Reservoir Storage

Each of the two pressure zones within the vicinity of the Belcaro project also have their own storage reservoirs.

Sand Canyon Zone 5. Sand Canyon Zone 5 has a total of 1.7 MG of nominal storage with a total usable storage of 1.56 MG split between two existing storage reservoirs: the Appaloosa Reservoir (1.5 MG) with a usable storage of 1.4 MG and the Sand Canyon Reservoir (0.2 MG) with a usable storage of 0.16 MG. The existing total storage required in the zone is 1.88 MG, so there is a 0.32 MG existing storage deficit in the zone based on usable storage. The current fire flow storage in the zone is 0.96 MG. This zone has local water supplies, so the emergency storage requirement is two days of average day demand.

Sand Canyon Zone 7. Sand Canyon Zone 7 has a total of 1.0 MG of storage in the existing Live Oak Reservoir; however, only 0.94 MG is usable because the tank overflow elevation is one foot below the tank roof and the inlet elevation is one foot above the tank pad. As a result, only 30 feet of the 32-foot tank height provides usable storage volume. The existing total storage required in the zone is 0.62 MG, so there is a 0.32 MG existing storage surplus in the zone based on usable storage. The current fire flow storage in the zone is 0.18 MG. This zone does not have local water supplies, so the emergency storage requirement is three days of average day demand.

CHAPTER 5

PROPOSED SYSTEM CONFIGURATION

The purpose of this chapter is to describe the required onsite and offsite public improvements to serve the Belcaro project. The proposed water system consists of public water lines and a new storage reservoir. Figure 5-1 presents the recommended onsite water facilities and required offsite water improvements for the Belcaro project.

Supply to the Belcaro project will primarily be provided by Sand Canyon Zone 7. With service from the Sand Canyon Zone 7 Pressure Zone (1976 HGL), the maximum static pressure range for the project is 138 psi to 162 psi based on pad elevations ranging from 1602 feet to 1656 feet. Individual

The primary water service connection for the project will be made to the existing 16-inch Sand Canyon Zone 7 water line just north of Oak Spring Canyon Road. A secondary connection will be made to the existing 8-inch Sand Canyon Zone 5 water line in Lost Canyon Road. The Sand Canyon Zone 5 water line is proposed to be extended approximately 2,300 feet east to a new pressure reducing station, to be constructed as part of the Belcaro project, that is required to connect the proposed Sand Canyon Zone 5 water line extension in Lost Canyon Road to the onsite Sand Canyon Zone 7 piping.

The pressure reducing station will need to include two pressure reducing valves: one to supply project peak hour demand and the other to supply maximum day demand plus fire flow to the project. Therefore, at minimum a 4-inch valve is required for peak hour demand (800 gpm capacity for project peak hour demand of 633.4 gpm) and a 6-inch valve is required for maximum day demand plus fire flow (1,800 gpm capacity for project maximum day demand plus fire flow of 1,787.0 gpm). A water booster station could also potentially be installed at this location to pump water from the Sand Canyon Zone 5 (1797 HGL) to Sand Canyon Zone 7 (1976 HGL); a concrete pad with standpipe could be constructed in lieu of a full water booster station.

Water service to the Belcaro project will primarily be provided by Sand Canyon Zone 7. All onsite and offsite distribution piping is proposed to be public.

POTENTIAL SAND CANYON ZONE 5 TO SAN CANYON ZONE 7 WATER BOOSTER STATION

PROPOSED SAND CANYON ZONE 7 TO SAN CANYON ZONE 5 PRESSURE REDUCING STATION

SAND CANYON 5 ZONE

SAN CANYON 7 ZONE

RAILROAD

LOST CANYON RD

OAK SPRING CANYON RD

EX.8"

EX.10"

COMET WAY

CONNECT TO EX. 16" LINE USING 12"x16" REDUCER

EXISTING SAND CANYON ZONE 7 TO SAN CANYON ZONE 5 PRESSURE REDUCING STATION

EX.16"

IDENTICAL POINT

TO LIVE OAK RESERVOIR



LEGEND

- PROJECT BOUNDARY
- EXISTING PUBLIC WATER LINE (SAND CANYON 5 ZONE)
- EXISTING PUBLIC WATER LINE (SAND CANYON 7 ZONE)
- PROPOSED PUBLIC WATER LINE (SAND CANYON 5 ZONE)
- PROPOSED PUBLIC WATER LINE (SAND CANYON 7 ZONE)
- EXISTING PUBLIC FIRE HYDRANT (SAND CANYON 5 ZONE)
- EXISTING PUBLIC FIRE HYDRANT (SAND CANYON 7 ZONE)
- PROPOSED PUBLIC FIRE HYDRANT (SAND CANYON 5 ZONE)
- PROPOSED PUBLIC FIRE HYDRANT (SAND CANYON 7 ZONE)
- POTENTIAL WATER BOOSTER STATION
- EXISTING/PROPOSED PRESSURE REDUCING STATION

N

0 200 FEET

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008
(760) 438-4422

FIGURE 5-1

EXISTING AND PROPOSED WATER FACILITIES

BELCARO

\\MERIDIAN\DWG\159001\BC_REPORT\BC_FIGURE-5-1_EXPROWTR.DWG 1/27/2026 10:05:51 AM LAYOUT: 24x36 USER: fernando

PUMPING ANALYSIS

Per Chapter 4, pumping for Sand Canyon Zone 7 is provided by the Appaloosa Booster Station and there is an existing 418 gpm pumping surplus to the zone based on firm capacity of the booster station. The firm capacity of the Appaloosa Booster Station is 650 gpm and the total capacity of the booster station is 1,350 gpm.

The project's pumping requirement is 431 gpm, per Chapter 3. Therefore, a pumping deficiency of 13 gpm is created under firm booster station capacity; however, there is a 687 gpm surplus under total booster station capacity. The 13 gpm pumping deficiency under firm booster station capacity can be offset with the construction of the Sand Canyon Zone 5 to Sand Canyon Zone 7 Booster Station in Lost Canyon Road (previously mentioned) or by the additional storage facility to be provided by the project as discussed in the "Storage Analysis" section below.

STORAGE ANALYSIS

Storage for Sand Canyon Zone 7 is provided by the existing Live Oak 1.0 MG Reservoir (with 0.94 MG of usable storage). A total of 0.62 MG of non-fire flow storage and a total of 0.36 MG of fire flow storage is needed within Sand Canyon Zone 7 to serve the project. Per Chapter 4, there is a surplus of 0.32 MG of usable storage in Sand Canyon Zone 7 with only 0.18 MG currently dedicated to fire flow storage. As shown in Table 5-1, the addition of the project would result in a 0.48 MG storage deficit within the zone, so additional storage will be required to serve the project.

TABLE 5-1
SAND CANYON ZONE 7
STORAGE ANALYSIS

Condition	Storage
Existing	0.32 MG Surplus
Additional Non-Fire Flow Storage	- 0.62 MG
Additional Fire Flow Storage	- 0.18 MG
Remaining	- 0.48 MG Deficit

Additional storage will be provided by the project by constructing a new 1.0 MG reservoir within the existing Live Oak Reservoir site. When the Live Oak Reservoir was constructed, the site was designed so that an additional tank could be added in the future. From the aerial view of the site included in Appendix E, it appears a ringwall foundation (and possibly under drain) may have already been constructed for a future welded steel reservoir. This ringwall foundation will need to be removed to accommodate the construction of a new 1.0 MG concrete reservoir. A Reservoir Management System (RMS) building will be required as part of the 1.0 MG concrete reservoir scope.

The new 1.0 MG concrete reservoir, with the assumption of 0.94 MG of usable storage, will have 0.48 MG of storage reserved for the Belcaro project. The remaining 0.46 MG of usable storage could be used to offset the firm booster station capacity deficit created by the project of 13 gpm (13 gpm = 18,720 gpd = 0.02 MG) as described in the "Pumping Analysis" section above and the existing Sand Canyon Zone 5 storage deficit and/or to provide storage for future development in either zone.

Fair-Share Cost. The Belcaro project only requires 0.50 MG (0.48 MG for storage needs and 0.02 MG to offset the pumping deficiency) of the additional 0.94 MG of usable storage to be constructed by the project. Therefore, it is anticipated that the Belcaro project will be responsible for approximately 53.2% of the construction cost of the proposed 1.0 MG concrete reservoir (0.94 MG of usable storage) and associated RMS building, with the Santa Clarita Valley Water Agency responsible for the remaining 46.8%. The fair-share cost percentage will be formally established and finalized as planning of the Belcaro project progresses.

CHAPTER 6

PUBLIC WATER SYSTEM HYDRAULIC ANALYSIS

To analyze the proposed water system for the Belcaro project, the Santa Clarita Valley Water Agency's InfoWater Pro computer model was used. Specifically, the Model Scenario used was the "2025_MDD_EPS, updated - running 3 days" scenario. The computer model includes the Santa Clarita Valley Water Agency's entire potable water system and was used to determine pressures and velocities throughout the water system. A friction loss coefficient "C" value of 120 was used for all proposed pipelines.

Water System Analysis

Appendix F presents the computer modeling results for the existing and proposed water system, and the corresponding Node and Pipe Diagram is presented as Exhibit A at the back of this report. Peak Hour Demand and Maximum Day Demand plus Fire Flow scenarios were modeled within the system. Six (6) Maximum Day Demand plus Fire Flow demand scenarios were modeled; the fire flow requirement of 1,250 gpm or 1,500 gpm was placed at a single hydrant onsite in each scenario. Table 6-1 presents a summary of the fire flow analysis results. For each fire flow scenario modeled, the fire flow requirement is being met with greater than 20 psi residual pressure at all locations within the project. The minimum residual pressure during the fire flow scenarios analyzed is 126 psi. As shown in the computer modeling results, the maximum flow velocity in the Peak Hour Demand scenario is 1.9 fps, and the maximum flow velocity in the Maximum Day Demand plus Fire Flow scenarios is 8.2 fps.

TABLE 6-1
BELCARO PROJECT
COMPUTER MODELING SUMMARY

Description	Minimum Residual Pressure, psi	At Node	Node Elevation, ft
Peak Hour Demand	138	342	1656
Maximum Day Demand plus 1,250 gpm Fire Flow at Node 108	126	108	1608
Maximum Day Demand plus 1,250 gpm Fire Flow at Node 124	132	342	1656
Maximum Day Demand plus 1,250 gpm Fire Flow at Node 154	126	154	1632
Maximum Day Demand plus 1,250 gpm Fire Flow at Node 222	132	342	1656
Maximum Day Demand plus 1,250 gpm Fire Flow at Node 342	127	342	1656
Maximum Day Demand plus 1,500 gpm Fire Flow at Node 302	130	342	1656

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

The following conclusions and recommendations are presented based upon the water service analysis prepared for the Belcaro project. It is the developer's responsibility to pay for all infrastructure costs, except for Item 8 below, which covers the fair-share contribution for the proposed 1.0 MG concrete reservoir.

1. The Belcaro project will receive water service from the Santa Clarita Valley Water Agency Sand Canyon Zone 7 Pressure Zone.

2. With service from the Sand Canyon Zone 7 Pressure Zone (1976 HGL), the maximum static pressure range for the project is 138 psi to 162 psi based on pad elevations ranging from 1602 feet to 1656 feet. Individual pressure regulators will be required at each building supply to limit service pressures to 80 psi in accordance with the California Plumbing Code.

3. All proposed buildings within the project will require a minimum 3/4-inch domestic water meter.

4. The project proposes to extend Sand Cayon Zone 7 water lines into the project site from the existing 16-inch water line in Oak Spring Canyon Road. All onsite and offsite water lines will be public.

5. A secondary connection will be made to the existing 8-inch Sand Canyon Zone 5 water line in Lost Canyon Road. The Sand Canyon Zone 5 water line is proposed to be extended approximately 2,300 feet east to a new pressure reducing station, to be constructed as part of the Belcaro project, that is be required to connect the proposed Sand Canyon Zone 5 water line extension in Lost Canyon Road to the onsite Sand Canyon Zone 7 piping.

6. A water booster station could be installed at the same site as the proposed pressure reducing station to pump water from the Sand Canyon Zone 5 to Sand Canyon Zone 7; a concrete pad with standpipe could be constructed in lieu of a full water booster station.

7. The project will be required to construct a 1.0 MG concrete reservoir and Reservoir Management System (RMS) building at the existing Live Oak Reservoir site.

8. Because the Belcaro project only requires 0.50 MG of the additional 1.0 MG of storage (with the assumption of 0.94 MG of usable storage) to be constructed by the project, it is anticipated that the Belcaro project will be responsible for approximately 53.2% of the construction cost of the proposed 1.0 MG concrete reservoir and associated RMS building, with the Santa Clarita Valley Water Agency responsible for the remaining 46.8%. The fair-share cost percentage will be formally established and finalized as planning of the Belcaro project progresses.

9. Figure 5-1 presents the proposed water system for the project. The proposed public water system will provide adequate flow and pressure to the project.

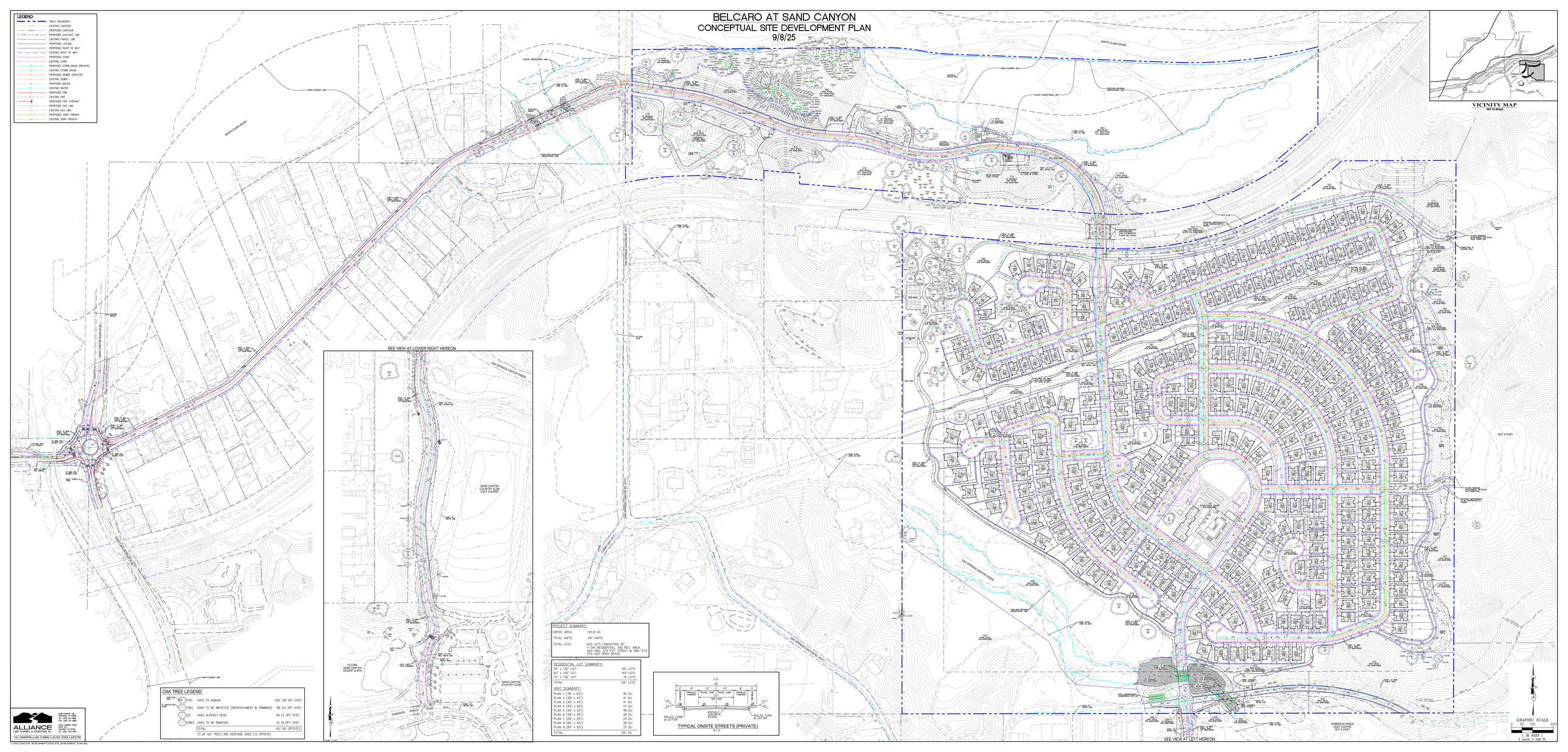
10. The public water system shall be designed and constructed in accordance with the guidelines, standards, and approved materials of the Santa Clarita Valley Water Agency.

11. This report presents the sizing and a general schematic layout of the proposed water system. The design engineer for these systems should incorporate valves, fittings, and appurtenances as needed for proper installation and long-term operation of the water systems.

APPENDIX A

BELCARO SITE DEVELOPMENT PLAN

BELCARO AT SAND CANYON
CONCEPTUAL SITE DEVELOPMENT PLAN
9/8/25



OAK TREE LEGEND:

REMAIN	(T#)	OAKS TO REMAIN	256 (38 OFF-SITE)
IMPACT	(T#)	OAKS TO BE IMPACTED (ENCROACHMENT & TRIMMING)	89 (10 OFF-SITE)
DEAD	(D)	OAKS ALREADY DEAD	60 (5 OFF-SITE)
REMOVE	(T#R)	OAKS TO BE REMOVED	16 (8 OFF-SITE)
	TOTAL:		421 (61 OFFSITE)

73 OF 421 TREES ARE HERITAGE OAKS (12 OFFSITE)

PROJECT SUMMARY:

GROSS AREA:	193.8 AC
TOTAL UNITS:	341 UNITS
TOTAL LOTS:	420 LOTS CONSISTING OF: 1-341 RESIDENTIAL, 342 REC. AREA, 343-365, 374 PVT. STREET & 366-373, 375-420 OPEN SPACE

RESIDENTIAL LOT SUMMARY:

50' x 100' LOT:	122 LOTS
60' x 100' LOT:	143 LOTS
75' x 100' LOT:	76 LOTS
TOTAL:	341 LOTS

UNIT SUMMARY:

PLAN 1 (38' x 62'):	40 DU
PLAN 2 (38' x 65'):	41 DU
PLAN 3 (40' x 65'):	41 DU
PLAN 4 (47' x 65'):	47 DU
PLAN 5 (45' x 65'):	48 DU
PLAN 6 (48' x 65'):	48 DU
PLAN 7 (60' x 65'):	25 DU
PLAN 8 (60' x 65'):	26 DU
PLAN 9 (65' x 65'):	25 DU
TOTAL:	341 DU

TYPICAL ONSITE STREETS (PRIVATE)
N.T.S.

ALLIANCE
LAND PLANNING & ENGINEERING INC.
2240 TOWNSGATE RD.
SUITE 100
THOUSAND OAKS, CA 91361
TEL (805) 497-1888
FAX (805) 497-8882
CIVIL ENGINEERING ▪ LAND PLANNING ▪ RELIABLE DESIGN ▪ SURVEYING

APPENDIX B

2024 WATER MASTER PLAN EXCERPTS

Hazen

1. Design Criteria for New Developments

Design criteria are used to evaluate the performance of the existing water system and to set requirements for the design of new facilities. These criteria are essential when evaluating existing facilities to ensure they adequately meet system requirements. The establishment of design criteria drew from various sources, including industry best practices and utility regulatory guidelines.

1.1 Pressure

Pressure criteria for a water system are based on the requirements set forth in General Order 103-A by the Public Utilities Commission of the State of California (Effective September 10, 2009). The identified pressure criteria for the water system incorporates the requirements of General Order 103-A and industry best practices for operating a water system, as shown in Table 1-1. Minimum service pressures are measured at the service connection to the distribution pipeline.

Table 1-1: Minimum Pressure Criteria

Demand Condition	Minimum Service Pressure (psi)	Notes
Static Pressure (No Demands)	60 psi	This is preferred, not required. Desired range is 60 to 80 psi.
Dynamic Pressure (Operating)	40 psi	This is a requirement for all demand conditions (including peak hour) except fire
Maximum Day + Fire Flow	20 psi	This is a requirement

The legacy system master plans listed 150 psi, 200 psi, or the pipeline pressure class as the maximum pressure requirement. For the purposes of this merged water system master plan, the pipeline pressure class will be used for the maximum pressure requirement. SCV Water requires that individual pressure regulators are installed on services that have pressure greater than 80 psi.

1.2 Pipelines

Distribution pipelines are typically designed to convey the peak flow condition at an acceptable pipe velocity. The minimum size for distribution pipelines shall be 8-inch in diameter, unless otherwise approved by SCV Water. In municipal water systems, this condition is usually the greater of either the peak hour demand or the maximum day demand plus fire flow. The distribution pipeline velocity criteria are shown in Table 1-2.

Table 1-2: Distribution Pipeline Velocity Criteria

Demand Condition	Max Velocity
Maximum Day Demand	5 ft/sec
Peak Hour Demand	10 ft/sec
Maximum Day + Fire Flow	15 ft/sec

Transmission mains are defined as major pipelines that connect to the Earl Schmidt Filtration Plant, Rio Vista Water Treatment Plant, and the major groundwater treatment facilities. Major groundwater treatment facilities are defined as those that treat two or more groundwater wells. Transmission mains shall be sized for a target velocity range of 5 ft/sec under peak hour demand or worst-case flow conditions and may be sized beyond this velocity range if deemed appropriate for the application.

Table 1-3: Transmission Main Velocity Criteria

Demand Condition	Velocity Range
Peak Hour, or Worst-Case Flow Condition	5 ft/sec

1.3 Fire Flow

Water systems must be capable of providing sufficient fire flow for firefighting while maintaining a 20-psi residual pressure in the system. The purpose of fire flow criteria is to ensure adequate protection of buildings. The criteria listed in Table 1-4 are planning-level criteria utilized for master planning purposes.

Actual fire flow requirements are subject to the requirements of the California Fire Code and Los Angeles County Fire Department and are based upon building category, construction type, fire flow area, presence of hazardous materials, and high fire hazard areas. Reductions in required fire flow may be allowed by the Los Angeles County Fire Department where automatic sprinkler systems are provided.

Table 1-4: Fire Flow Criteria

Land Use Designation	Fire Flow Required (gpm)	Duration (hours)
Single Family Residential	1,500	2
Multi-family Residential	2,500	2
Commercial	3,000	3
Industrial[1]	3,500	3
Critical Facilities[2] (Schools, Hospitals, Daycare, Assisted Living Facilities, Fire Stations etc.)	4,000	4

[1]3,500 gpm for industrial land user per Insurance Services Office (ISO). 2013 SCWD Master Plan listed 5,000 gpm.
[2]Critical facilities determined in collaboration with SCV Water as part of the Risk Assessment effort. Refer Section 9- Condition Assessment and Risk Assessment for additional information.

1.4 Pump Stations

Pump station criteria must consider the different types of pump stations and different operating conditions. For example, the criteria for pump stations serving open pressure zones will be different than the criteria for hydropneumatic pump stations serving a closed zone.

Firm capacity is defined as the pump station capacity with the largest pump out of service. Industry standards and best practices generally govern pump station design such that the firm capacity must meet a certain demand condition.

The recommended pump station criteria are shown in Table 1-5. These criteria consider situations where multiple pump stations serve the same pressure zone, enabling them to collectively meet the specified criteria for that zone. This approach offers flexibility in implementing improvements and allows SCV Water to expand capacity at specific pump stations where it's more feasible. Furthermore, the criteria utilize a 16-hour pumping window to leverage lower-tiered pricing for electricity, which is available during non-peak hours of the day.

Table 1-5: Pump Station Criteria

Pump Station Type	Criteria
Pumping to Open Pressure Zone	Total combined firm capacity[1] for all pump stations serving the zone shall be maximum day demand flow rate in a 16-hour period. The maximum day demand of the zone shall also include the demands of dependent zones.
Pumping to Closed Pressure Zone	Firm capacity shall be Peak Hour Demand plus have a dedicated fire flow pump OR Peak Hour Demand plus the required fire flow.

[1] Total combined firm capacity is defined by the sum of the firm capacities at each individual pump station.

1.4.1 Backup Power

Reservoirs and PRVs operate on gravity and hydraulics, so their primary functions can be maintained in the event of a power outage. Pump stations and wells require power to operate. Backup power at pump stations and wells can be provided through two primary methods:

- **Permanent On-site Backup Generator –** A permanent on-site backup generator allows pump station controls to be set up to immediately switch over to using the backup generator in the event of a power outage. Permanent backup generators are recommended at critical or larger pump stations.

- **Portable Generator Connections –** Trailer-mounted portable generators can be brought to various pump station facilities to be used during a power outage. Those pump stations require a manual transfer switch and portable generator connections to be used during a power outage. This method is acceptable for smaller pump stations, or for sites where permanent generators are not feasible.

1.5 Storage

AWWA M32 Manual – Computer Modeling of Water Distribution Systems provides guidelines on storage criteria to support normal and emergency system operation. The Manual identifies three primary storage components:

Equalization storage: Amount of water required to meet demands in excess of normal production and delivery capabilities.

Fire storage: Volume of water based on the maximum fire flow requirement in each pressure zone multiplied by the required flow duration.

Emergency storage: Amount of additional storage as determined by each individual agency necessary to provide water during emergency events such as short-term supply disruptions.

Similar to the requirement for pump stations, the criteria for storage facilities apply to the total of all reservoirs that serve a particular pressure zone, not each individual reservoir. The individual pressure zone criteria identify emergency storage of 2 or 3 days of average day demand depending on local supply availability. See Table 1-6.

Table 1-6: Pressure Zone Storage Criteria

Storage Component	Criteria
Equalization	6% of Maximum Day Demand
Fire	Worst Case Scenario of Fire Flow Requirement x Duration
Pressure Zones with Local Water Supply[1]	2 days of Average Day Demand
Pressure Zones without Local Water Supply	3 days of Average Day Demand

[1]Includes local water supply sources i.e., groundwater.

1.6 Diurnal Curves

Figure 1-1 illustrates the derived average day demand diurnal pattern for the entire water system based on data from February 2023.

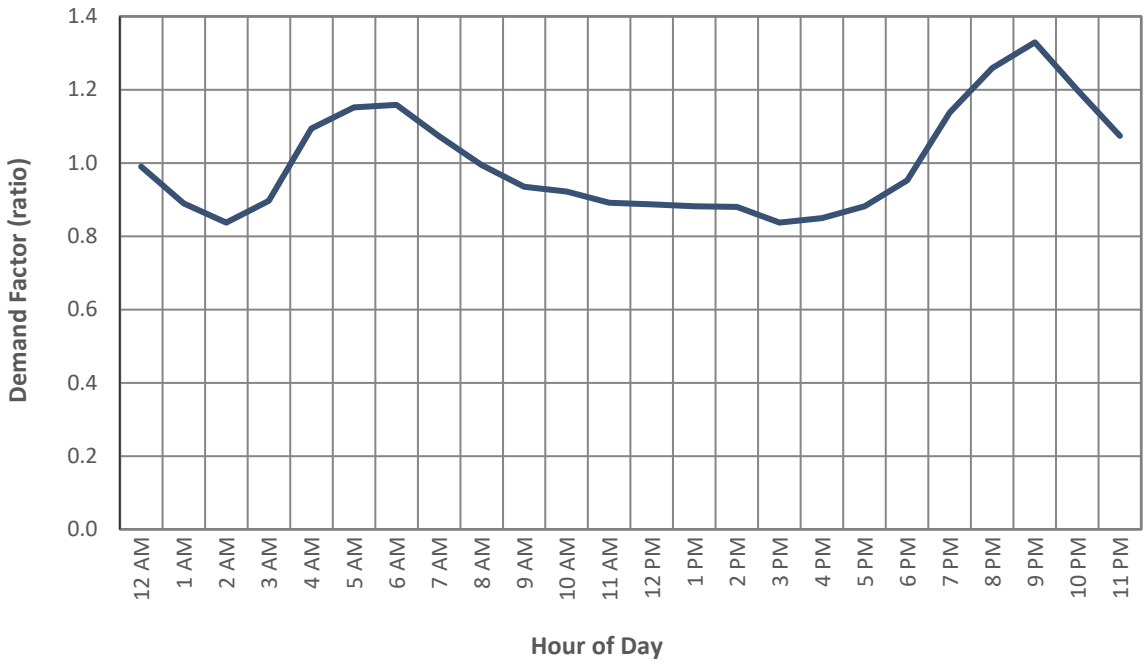


Figure 1-1: Average Day Diurnal Curve

1.7 Peaking Factors

Peaking factors are ratios derived from a system's average day demand and relative peaking condition. Peaking factors are summarized in Table 1-7.

Table 1-7: Peaking Factors

Demand Condition	Peaking Factor	Demand (MGD)	Demand (gpm)	Demand (AFY)
Minimum Day	0.43	24.19	16,799	27,096
Minimum Monthly	0.44	24.87	17,268	27,853
Average Day	1.00	55.89	38,813	62,605
Maximum Monthly	1.53	85.41	59,311	95,669
Maximum Day	1.58	88.25	61,285	98,853
Peak Hour	1.83	102.18	70,957	114,454

Notes:

1. All peaking factors are applied to Average Day Demand.
2. Average Day Demand was calculated using meter billing records supplied by SCV for the period October 2021 through September 2022
3. Minimum Day Demand and Maximum Day Demand were determined using daily well, treated surface water, and turnout supply records from SCV for the period August 2021 through July 2022 (minimum occurred on December 23, 2021; maximum occurred on August 2, 2021).

4. Minimum Month Demand and Maximum Month Demand were determined using monthly well and turnout supply records from SCV for the period January 2016 through July 2022 (minimum occurred February 2019; maximum occurred August 2018).
5. Peak Hour was calculated from the average-to-maximum hour peaking factor observed in February 2023 hourly supply data provided by SCV. This peaking factor (1.83) was then applied to the calculated Average Day Demand to determine the Peak Hour Demand

1.8 Demand Factors

Demand factors are used to evaluate the potential impacts of proposed developments on the distribution system. These factors are derived from land use categories and vary significantly between land use types. The demand factors used in the Master Plan were obtained from the 2020 UWMP.

Table 1-8: UWMP Customer Type Demand Factors

Customer Category	Average Day Demand (gpd/acct)
Single Family Residential	480
Multi-family Residential	373
Commercial	2,125
Industrial	2,735
Institutional	6,573
Dedicated Irrigation	4,482

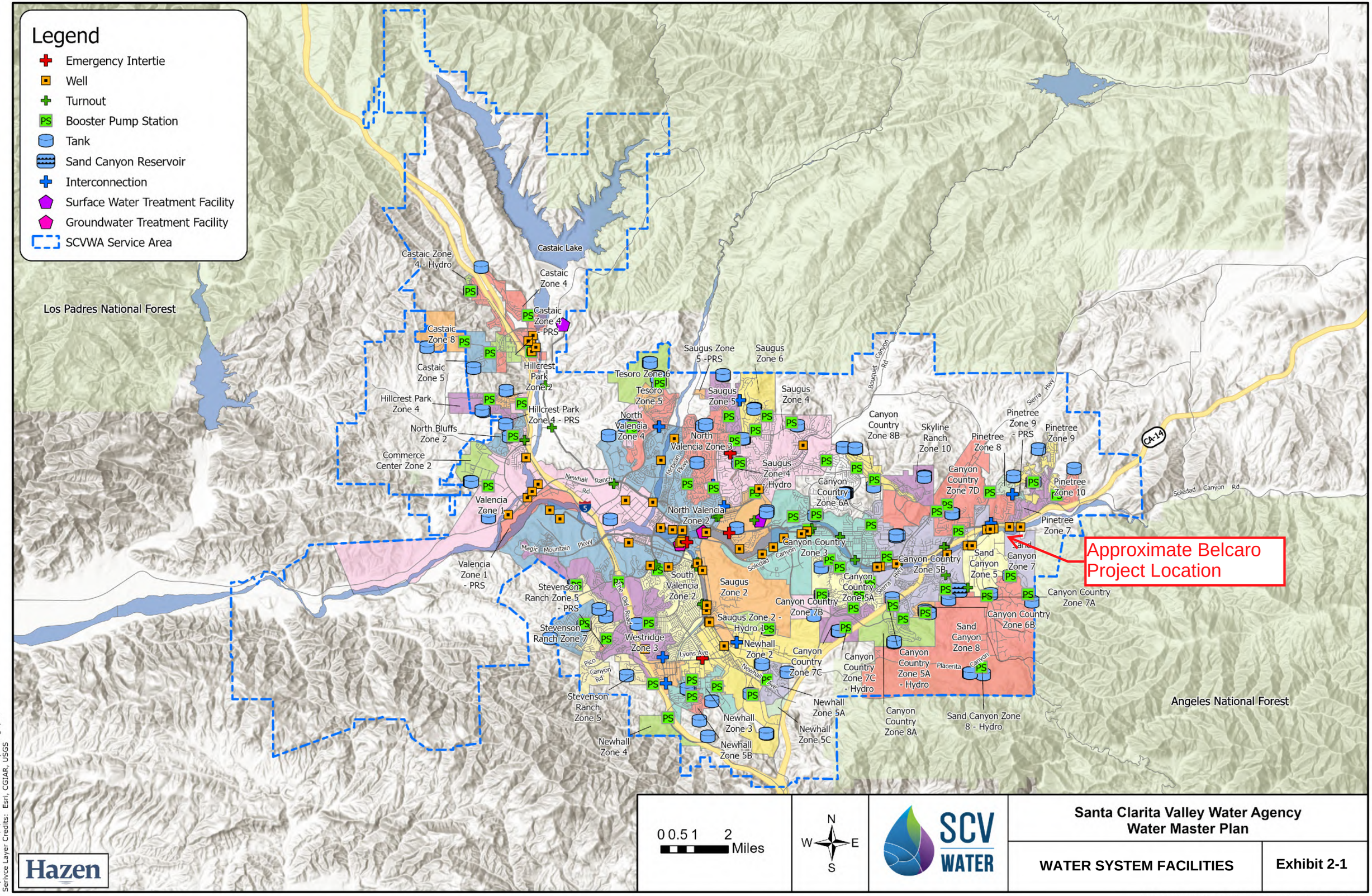
Demand factors derived from both customer type and meter size are presented in Table 1-9. Customer billing data from January 2022 through December 2023 was linked to meter sizes from GIS data through meter account numbers. It should be noted that not all account numbers were pairable. As such, after calculating the percent demand within each meter size and land use category using the pairable data, these percent factors were extrapolated to the 2022 and 2023 average day demand presented in Table 1-9. The demand within each meter size and land use category was divided by the number of accounts within the corresponding meter size and land category to calculate the demand factor.

The demand factors presented in Table 1-9 only include meter sizes that comprise a substantial number of meters within their respective land use categories, so the data is not skewed by outliers. Meter sizes that had too few meters to obtain consistent data from were not included.

Table 1-9: Meter Size and Customer Type Demand Factors (2022-2023)

Customer Category[1]	Average Day Demand (gpd/account)			
Commercial	**0.75"**	**1"**	**1.5"**	**2"**
	425	638	1,508	2,160
Industrial	**1'**	**1.5"**	**2"**	
	1,305	1,468	2,103	
Irrigation	**0.75"**	**1"**	**1.5"**	**2"**
	590	871	1,760	3,925
Multi-Residential	**0.625"**	**0.75"**		
	131	209		
Residential	**0.625"**	**0.75"**	**1"**	
	356	372	510	

[1]Customer naming categories are consistent with SCV Water's Potable Water Consumption Billing Data.


Legend
Emergency Intertie
Well
Turnout
Booster Pump Station
Tank
Sand Canyon Reservoir
Interconnection
Surface Water Treatment Facility
Groundwater Treatment Facility
SCVWA Service Area
Los Padres National Forest
Castaic Lake
Castaic Zone 4 - Hydro
Castaic Zone 4
Castaic Zone 4 - PRS
Castaic Zone 8
Castaic Zone 5
Hillcrest Park Zone 2
Hillcrest Park Zone 4
Hillcrest Park Zone 4 - PRS
North Bluffs Zone 2
Commerce Center Zone 2
Valencia Zone 1
Valencia Zone 1 - PRS
Stevenson Ranch Zone 5 - PRS
Stevenson Ranch Zone 7
Stevenson Ranch Zone 5
Newhall Zone 4
Tesoro Zone 6
Tesoro Zone 5
Saugus Zone 5 -PRS
Saugus Zone 6
Saugus Zone 5
Saugus Zone 4
North Valencia Zone 4
North Valencia Zone 3
North Valencia Zone 2
Saugus Zone 4 Hydro
Canyon Country Zone 6A
Canyon Country Zone 8B
Skyline Ranch Zone 10
Pinetree Zone 9 - PRS
Pinetree Zone 9
Pinetree Zone 8
Canyon Country Zone 7D
Pinetree Zone 10
Pinetree Zone 7
Sand Canyon Zone 7
Sand Canyon Zone 5
Canyon Country Zone 5B
Canyon Country Zone 3
Canyon Country Zone 5A
Canyon Country Zone 7A
Canyon Country Zone 6B
Sand Canyon Zone 8
Canyon Country Zone 7B
Saugus Zone 2 - Hydro 1
Saugus Zone 2
South Valencia Zone 2
Westridge Zone 3
Newhall Zone 2
Canyon Country Zone 7C
Canyon Country Zone 7C - Hydro
Canyon Country Zone 5A - Hydro
Canyon Country Zone 8A
Sand Canyon Zone 8 - Hydro
Newhall Zone 5A
Newhall Zone 5C
Newhall Zone 3
Newhall Zone 5B
Angeles National Forest
Approximate Belcaro Project Location
0 0.5 1 2 Miles
N
W
E
S
SCV WATER
Santa Clarita Valley Water Agency
Water Master Plan
WATER SYSTEM FACILITIES
Exhibit 2-1
Hazen
Hazen Project Number: 20155-014
Export Date: 10/4/2024 1:46 PM By: KNguyen
Serivce Layer Credits: Esri, CGIAR, USGS
File = O:\GIS\Projects\20155-014\ArcGISPro\MP_Exhibits.aprx


APPENDIX C

BELCARO FIRE FLOW REQUIREMENT EXHIBIT
AND
CURRENT FIRE ACCESS/HYDRANT PLAN

BELCARO AT SAND CANYON

FIRE ACCESS/HYDRANT PLAN

10/1/24



3 EMERGENCY VEHICLE ACCESS GATE

N.T.S.

VEHICULAR GATES NOTES:

VEHICULAR GATES SHALL MAINTAIN A MINIMUM ACCESS WIDTH OF 20 FEET. THE SECURITY GATE SHALL BE PROVIDED WITH AN APPROVED MEANS OF EMERGENCY OPERATION, AND SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES AND REPLACED OR REPAIRED WHEN DEFECTIVE. ELECTRIC GATE OPERATORS, WHERE PROVIDED, SHALL BE LISTED IN ACCORDANCE WITH UL 325. GATES INTENDED FOR AUTOMATIC OPERATION SHALL BE DESIGNED, CONSTRUCTED AND INSTALLED TO COMPLY WITH THE REQUIREMENTS OF ASTM F220. GATES SHALL BE OF THE SWINGING OR SLIDING TYPE. CONSTRUCTION OF GATES SHALL BE OF MATERIALS THAT ALLOW MANUAL OPERATION BY ONE PERSON. FIRE CODE 503.6.

LARGEST BUILDING 7,581 SF
CONSTRUCTION TYPE V-B (PROTECTED WOOD FRAME)


LEGEND:

- TRACT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED CONTOUR PER RG PLAN
- PROPOSED CURB
- LIMIT OF FIRE LANE
- FIRE HOSE LENGTH (150')
- PROPOSED PUBLIC FIRE HYDRANT
- PROPOSED PRIVATE FIRE HYDRANT
- EXISTING OFFSITE FIRE HYDRANT
- FIRE LANE

BELCARO AT SAND CANYON

FIRE ACCESS/HYDRANT PLAN

9/8/25



VEHICULAR GATES NOTES:

VEHICULAR GATES SHALL MAINTAIN A MINIMUM ACCESS WIDTH OF 20 FEET. THE SECURITY GATE SHALL BE PROVIDED WITH AN APPROVED MEANS OF EMERGENCY OPERATION, AND SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES AND REPLACED OR REPAIRED WHEN DEFECTIVE. ELECTRIC GATE OPERATORS, WHERE PROVIDED, SHALL BE LISTED IN ACCORDANCE WITH UL 325. GATES INTENDED FOR AUTOMATIC OPERATION SHALL BE DESIGNED, CONSTRUCTED AND INSTALLED TO COMPLY WITH THE REQUIREMENTS OF ASTM F220. GATES SHALL BE OF THE SWINGING OR SLIDING TYPE. CONSTRUCTION OF GATES SHALL BE OF MATERIALS THAT ALLOW MANUAL OPERATION BY ONE PERSON. FIRE CODE 503.6.

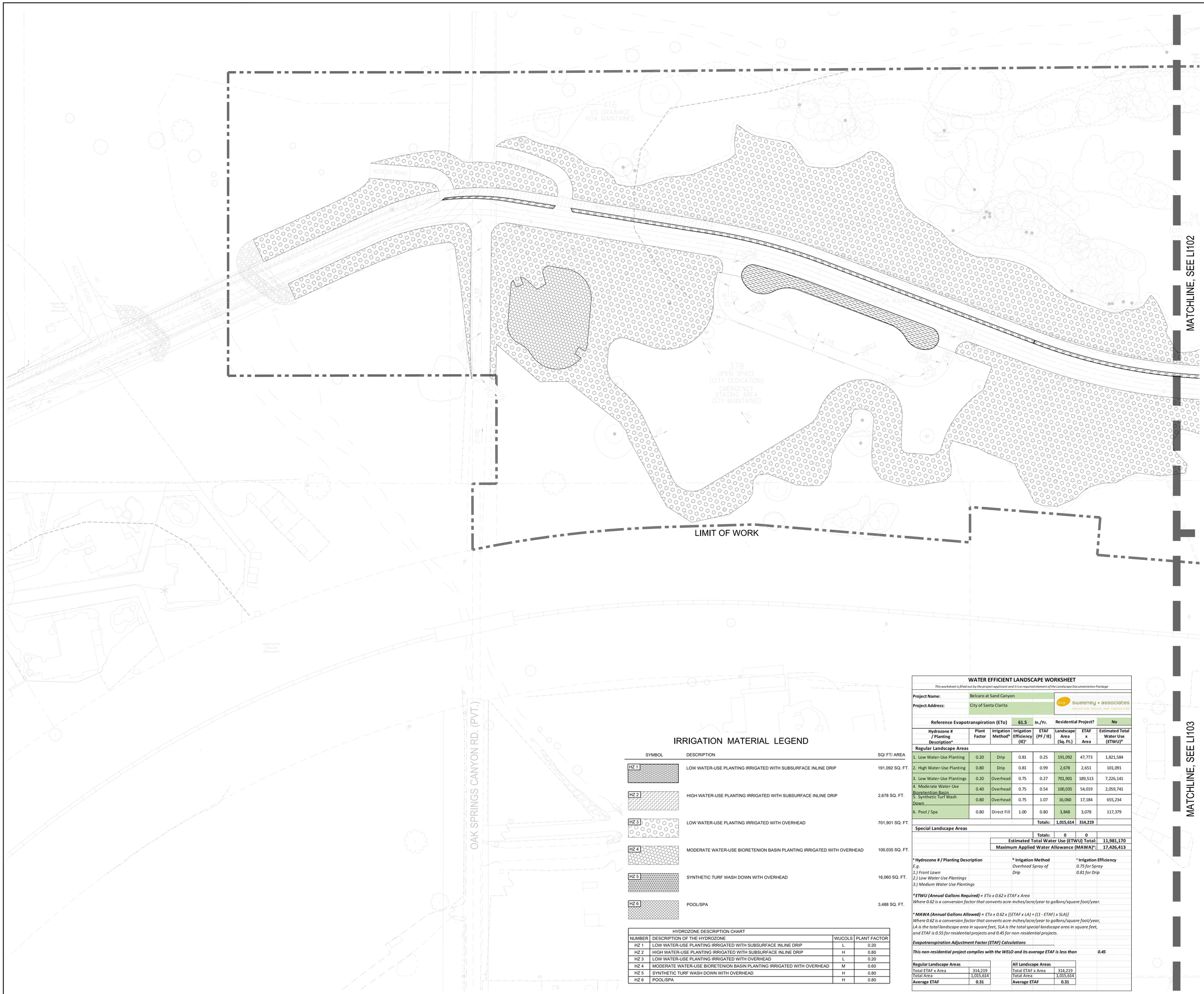
LARGEST BUILDING 7,581 SF
CONSTRUCTION TYPE V-B (PROTECTED WOOD FRAME)

LEGEND:

- TRACT BOUNDARY
- PROPOSED LOT LINE
- 1600 PROPOSED CONTOUR PER RG PLAN
- PROPOSED CURB
- LIMIT OF FIRE LANE
- 150' FIRE HOSE LENGTH
- PROPOSED PUBLIC FIRE HYDRANT
- EXIST. OFFSITE PUBLIC FIRE HYDRANT
- FIRE LANE

APPENDIX D

BELCARO
LANDSCAPE IRRIGATION PLAN



IRRIGATION MATERIAL LEGEND

SYMBOL	DESCRIPTION	SQ/ FT/ AREA
HZ 1	LOW WATER-USE PLANTING IRRIGATED WITH SUBSURFACE INLINE DRIP	191,092 SQ. FT.
HZ 2	HIGH WATER-USE PLANTING IRRIGATED WITH SUBSURFACE INLINE DRIP	2,678 SQ. FT.
HZ 3	LOW WATER-USE PLANTING IRRIGATED WITH OVERHEAD	701,901 SQ. FT.
HZ 4	MODERATE WATER-USE BIORETENION BASIN PLANTING IRRIGATED WITH OVERHEAD	100,035 SQ. FT.
HZ 5	SYNTHETIC TURF WASH DOWN WITH OVERHEAD	16,060 SQ. FT.
HZ 6	POOL/SPA	3,488 SQ. FT.

HYDROZONE DESCRIPTION CHART

NUMBER	DESCRIPTION OF THE HYDROZONE	WUCOLS	PLANT FACTOR
HZ 1	LOW WATER-USE PLANTING IRRIGATED WITH SUBSURFACE INLINE DRIP	L	0.20
HZ 2	HIGH WATER-USE PLANTING IRRIGATED WITH SUBSURFACE INLINE DRIP	H	0.80
HZ 3	LOW WATER-USE PLANTING IRRIGATED WITH OVERHEAD	L	0.20
HZ 4	MODERATE WATER-USE BIORETENION BASIN PLANTING IRRIGATED WITH OVERHEAD	M	0.60
HZ 5	SYNTHETIC TURF WASH DOWN WITH OVERHEAD	H	0.80
HZ 6	POOL/SPA	H	0.80

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package

Project Name: Belcaro at Sand Canyon
Project Address: City of Santa Clarita

sweeney + associates
IRRIGATION DESIGN AND CONSULTING

Reference Evapotranspiration (ETo) 61.5 in./Yr. **Residential Project?** No

Hydrozone # / Planting Description[a]	Plant Factor	Irrigation Method[b]	Irrigation Efficiency (IE)[c]	ETAF (PF / IE)	Landscape Area (Sq. Ft.)	ETAF x Area	Estimated Total Water Use (ETWU)[d]
Regular Landscape Areas							
1. Low Water-Use Planting	0.20	Drip	0.81	0.25	191,092	47,773	1,821,584
2. High Water-Use Planting	0.80	Drip	0.81	0.99	2,678	2,651	101,091
3. Low Water-Use Plantings	0.20	Overhead	0.75	0.27	701,901	189,513	7,226,141
4. Moderate Water-Use Bioretention Basin	0.40	Overhead	0.75	0.54	100,035	54,019	2,059,741
5. Synthetic Turf Wash Down	0.80	Overhead	0.75	1.07	16,060	17,184	655,234
6. Pool / Spa	0.80	Direct Fill	1.00	0.80	3,848	3,078	117,379
				Totals:	**1,015,614**	**314,219**	
Special Landscape Areas							
				Totals:	**0**	**0**	
				Estimated Total Water Use (ETWU) Total:			**11,981,170**
				Maximum Applied Water Allowance (MAWA)[e]:			**17,426,413**

[a] **Hydrozone # / Planting Description** — *E.g. 1.) Front Lawn; 2.) Low Water Use Plantings; 3.) Medium Water Use Plantings*
[b] **Irrigation Method** — *Overhead Spray of Drip*
[c] **Irrigation Efficiency** — *0.75 for Spray; 0.81 for Drip*

[d] ***ETWU (Annual Gallons Required)*** = *ETo x 0.62 x ETAF x Area*
Where 0.62 is a conversion factor that converts acre-inches/acre/year to gallons/square foot/year.

[e] ***MAWA (Annual Gallons Allowed)*** = *ETo x 0.62 x [(ETAF x LA) + ((1 - ETAF) x SLA)]*
Where 0.62 is a conversion factor that converts acre-inches/acre/year to gallons/square foot/year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is 0.55 for residential projects and 0.45 for non-residential projects.

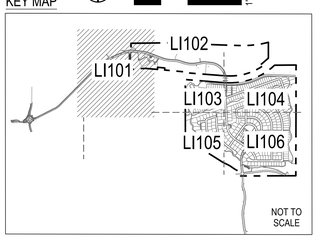
Evapotranspiration Adjustment Factor (ETAF) Calculations

This non-residential project complies with the WELO and its average ETAF is less than 0.45

Regular Landscape Areas	
Total ETAF x Area	314,219
Total Area	1,015,614
Average ETAF	**0.31**

All Landscape Areas	
Total ETAF x Area	314,219
Total Area	1,015,614
Average ETAF	**0.31**

KEY MAP



0' 20' 40' 80'
1"=40'

sweeney + associates
IRRIGATION DESIGN AND CONSULTING
321 Rampart Street, Suite 209
Orange, Ca 92868
e: info@sweeneyassoc.com | t: (714) 938-0656
w: www.sweeneyassoc.com | f: (714) 938-0656

I HAVE COMPLIED WITH THE CRITERIA OF THE IRRIGATION GUIDELINES AND APPLIED THEM ACCORDINGLY FOR THE EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN

GROUNDLEVEL
LANDSCAPE ARCHITECTURE
2605 State Street, Suite B
San Diego, CA 92103
619 325 1990
GroundLevelSD.com

PLAN PREPARED FOR:
NUWI-SAND CANYON, LLC
2001 WILSHIRE BLVD. SUITE 401
SANTA MONICA, CA 90403
TEL: (916) 717-8599
ATTN: COREY HARPOLE

NO.	DATE	REVISIONS	BY	APPR

SHEET CITY OF SANTA CLARITA SHEETS

BELCARO AT SAND CANYON
VESTING TENTATIVE MAP NO. 84497

LI101 IRRIGATION PLAN

APPENDIX E

LIVE OAK RESERVOIR SITE


Google Earth
Image © 2025 Airbus
N
300 ft

APPENDIX F

HYDRAULIC COMPUTER MODEL SYSTEM ANALYSIS

NODE AND PIPE DIAGRAM REFERENCE:

Exhibit A at the back of this report.

CONDITIONS MODELED:

Run No. 1. Peak Hour Demand

Run No. 2. Maximum Day Demands plus 1,250 gpm Fire Flow at Node 108

Run No. 3. Maximum Day Demands plus 1,250 gpm Fire Flow at Node 124

Run No. 4. Maximum Day Demands plus 1,250 gpm Fire Flow at Node 154

Run No. 5. Maximum Day Demands plus 1,250 gpm Fire Flow at Node 222

Run No. 6. Maximum Day Demands plus 1,250 gpm Fire Flow at Node 342

Run No. 7. Maximum Day Demands plus 1,500 gpm Fire Flow at Node 302

Run No. 1: Peak Hour Demand
Node Report

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
104	13.1	1,592.00	1974.3	165.7
106	13.1	1,592.00	1974.4	165.7
108	13.1	1,608.00	1974.3	158.7
110	16.8	1,607.00	1974.4	159.2
112	13.8	1,607.00	1974.3	159.2
118	15.3	1,604.00	1974.3	160.5
124	39.1	1,603.00	1974.3	160.9
130	19.9	1,624.00	1974.5	151.9
136	19.9	1,623.00	1974.5	152.3
142	13.8	1,622.00	1974.5	152.7
148	7.7	1,623.00	1974.5	152.3
154	9.2	1,632.00	1974.5	148.4
160	12.3	1,642.00	1974.6	144.1
166	19.2	1,648.00	1974.6	141.5
172	10.7	1,638.00	1974.6	145.9
204	35.2	1,610.00	1974.4	157.9
210	27.5	1,608.00	1974.4	158.8
216	21.4	1,612.00	1974.4	157.0
222	7.7	1,619.00	1974.4	154.0
228	32.1	1,614.00	1974.4	156.2
232	4.6	1,611.00	1974.4	157.5
240	36.7	1,615.00	1974.5	155.8
246	19.9	1,624.00	1974.6	151.9
252	30.6	1,624.00	1974.5	151.9
258	49.8	1,622.00	1974.5	152.7
266	24.5	1,632.00	1974.5	148.4
270	15.3	1,642.00	1974.6	144.1
276	16.8	1,636.00	1974.6	146.7
282	10.7	1,637.00	1974.6	146.3
292	7.7	1,631.00	1974.6	148.9
302	7.7	1,632.00	1974.7	148.5
308	22.3	1,625.00	1974.6	151.5
322	26.9	1,648.00	1975.2	141.8
332	12.3	1,653.00	1974.9	139.5
342	7.7	1,656.00	1974.9	138.2
SC-J65898	0.0	1,654.42	1976.1	139.4
SC-J67380	0.0	1651.85	1976.1	140.5
SC-J68586	0.0	1654.34	1976.1	139.4

Run No. 1: Peak Hour Demand
Pipe Report

ID	From Node	To Node	Length (ft)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
105	106	104	805.2	8	13.1	0.08	0.01	0.01
107	106	108	1,268.4	8	13.1	0.08	0.01	0.01
109	110	106	320.1	8	39.2	0.25	0.02	0.05
111	110	112	186.8	8	68.2	0.44	0.03	0.16
117	112	118	415.8	8	15.3	0.10	0.00	0.01
123	112	124	685.4	8	39.1	0.25	0.04	0.05
129	130	110	629.7	8	85.2	0.54	0.14	0.23
135	130	136	266.0	8	-3.6	0.02	0.00	0.00
141	136	142	448.2	8	30.6	0.20	0.02	0.03
147	142	148	169.3	8	7.7	0.05	0.00	0.00
153	142	154	365.2	8	9.2	0.06	0.00	0.00
159	136	160	638.7	8	-54.1	0.35	0.06	0.10
165	160	166	198.0	8	19.2	0.12	0.00	0.01
171	172	160	266.3	8	85.5	0.55	0.06	0.24
175	172	130	402.9	8	101.5	0.65	0.13	0.31
203	110	204	457.1	8	-39.1	0.25	0.03	0.05
209	204	210	651.2	8	11.5	0.07	0.00	0.01
215	210	216	796.2	8	-16.1	0.10	0.01	0.01
221	216	222	414.1	8	7.7	0.05	0.00	0.00
227	228	216	283.1	8	45.2	0.29	0.02	0.07
231	228	232	519.7	8	-18.7	0.12	0.01	0.01
235	232	204	133.5	8	85.7	0.55	0.03	0.24
239	240	232	251.3	8	109.0	0.70	0.09	0.37
245	246	240	581.7	8	43.7	0.28	0.04	0.07
249	246	240	232.2	8	72.3	0.46	0.04	0.17
251	252	240	990.9	8	29.8	0.19	0.03	0.03
257	252	258	251.2	8	62.6	0.40	0.03	0.13
263	258	228	870.0	8	58.6	0.37	0.10	0.11
265	266	258	445.5	8	45.8	0.29	0.03	0.07
269	270	266	415.3	8	70.2	0.45	0.07	0.16
275	270	276	232.8	8	69.1	0.44	0.04	0.16
281	276	282	411.0	8	10.7	0.07	0.00	0.01
287	252	276	458.9	8	-41.5	0.26	0.03	0.06
291	292	252	231.8	8	81.5	0.52	0.05	0.21
297	292	246	626.3	8	43.6	0.28	0.04	0.07
301	302	292	124.8	8	132.8	0.85	0.07	0.59
307	302	308	362.9	8	71.8	0.46	0.06	0.17
313	308	246	189.3	8	92.2	0.59	0.05	0.28
317	172	308	414.2	8	42.7	0.27	0.03	0.06
321	322	302	443.0	8	212.2	1.35	0.55	1.24
327	322	172	361.0	8	240.4	1.53	0.58	1.61
331	322	332	398.9	8	174.5	1.11	0.35	0.88
337	332	270	355.3	8	154.6	0.99	0.25	0.71
341	332	342	193.0	8	7.7	0.05	0.00	0.00
347	322	SC-J67380	610.5	12	-654.0	1.86	0.88	1.44
SC-6448	SC-J68586	SC-J65898	12.0	16	654.0	1.04	0.00	0.32
SC-7142	SC-J65898	SC-J67380	20.1	16	654.0	1.04	0.01	0.33

Run No. 2: MDD Plus 1,250 gpm Fire Flow at ID 108
Node Report

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
104	5.9	1,592.00	1941.3	151.3
106	5.9	1,592.00	1941.3	151.3
108	1,255.9	1,608.00	1899.1	126.2
110	7.6	1,607.00	1951.8	149.4
112	6.2	1,607.00	1951.8	149.4
118	6.9	1,604.00	1951.8	150.7
124	17.7	1,603.00	1951.8	151.1
130	9.0	1,624.00	1957.7	144.6
136	9.0	1,623.00	1958.1	145.2
142	6.2	1,622.00	1958.1	145.6
148	3.5	1,623.00	1958.1	145.2
154	4.2	1,632.00	1958.1	141.3
160	5.6	1,642.00	1959.1	137.4
166	8.7	1,648.00	1959.1	134.8
172	4.8	1,638.00	1959.5	139.3
204	16.0	1,610.00	1956.8	150.3
210	12.5	1,608.00	1957.2	151.3
216	9.7	1,612.00	1957.7	149.8
222	3.5	1,619.00	1957.7	146.8
228	14.6	1,614.00	1957.9	149.0
232	2.1	1,611.00	1957.8	150.3
240	16.6	1,615.00	1959.1	149.1
246	9.0	1,624.00	1959.4	145.3
252	13.9	1,624.00	1959.8	145.5
258	22.6	1,622.00	1959.6	146.3
266	11.1	1,632.00	1960.0	142.1
270	6.9	1,642.00	1960.4	137.9
276	7.6	1,636.00	1960.1	140.4
282	4.8	1,637.00	1960.1	140.0
292	3.5	1,631.00	1959.9	142.5
302	3.5	1,632.00	1960.2	142.2
308	10.1	1,625.00	1959.6	145.0
322	12.2	1,648.00	1963.1	136.5
332	5.6	1,653.00	1961.6	133.7
342	3.5	1,656.00	1961.6	132.4
SC-J65898	0.0	1,654.42	1967.5	135.7
SC-J67380	0.0	1,651.85	1967.5	136.8
SC-J68586	0.0	1,654.34	1967.5	135.7

Run No. 2: MDD Plus 1,250 gpm Fire Flow at Node 108
Pipe Report

ID	From Node	To Node	Length (ft)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
105	106	104	805.2	8	5.9	0.04	0.00	0.00
107	106	108	1,268.4	8	1,255.9	8.02	42.15	33.23
109	110	106	320.1	8	1,267.8	8.09	10.52	32.87
111	110	112	186.8	8	30.9	0.20	0.01	0.04
117	112	118	415.8	8	6.9	0.04	0.00	0.00
123	112	124	685.4	8	17.7	0.11	0.01	0.01
129	130	110	629.7	8	635.2	4.05	5.89	9.36
135	130	136	266.0	8	-216.3	1.38	0.36	1.35
141	136	142	448.2	8	13.9	0.09	0.00	0.01
147	142	148	169.3	8	3.5	0.02	0.00	0.00
153	142	154	365.2	8	4.2	0.03	0.00	0.00
159	136	160	638.7	8	-239.2	1.53	0.99	1.55
165	160	166	198.0	8	8.7	0.06	0.00	0.00
171	172	160	266.3	8	253.5	1.62	0.48	1.82
175	172	130	402.9	8	427.9	2.73	1.83	4.55
203	110	204	457.1	8	-671.1	4.28	4.98	10.89
209	204	210	651.2	8	-141.4	0.90	0.38	0.59
215	210	216	796.2	8	-153.9	0.98	0.54	0.68
221	216	222	414.1	8	3.5	0.02	0.00	0.00
227	228	216	283.1	8	167.1	1.07	0.24	0.83
231	228	232	519.7	8	90.2	0.58	0.13	0.26
235	232	204	133.5	8	545.6	3.48	1.02	7.66
239	240	232	251.3	8	457.5	2.92	1.32	5.26
245	246	240	581.7	8	122.7	0.78	0.27	0.46
249	246	240	232.2	8	203.3	1.30	0.27	1.14
251	252	240	990.9	8	148.2	0.95	0.62	0.62
257	252	258	251.2	8	127.1	0.81	0.12	0.49
263	258	228	870.0	8	271.8	1.74	1.69	1.94
265	266	258	445.5	8	167.3	1.07	0.35	0.78
269	270	266	415.3	8	178.4	1.14	0.38	0.90
275	270	276	232.8	8	181.7	1.16	0.23	0.99
281	276	282	411.0	8	4.8	0.03	0.00	0.00
287	252	276	458.9	8	-169.2	1.08	0.37	0.81
291	292	252	231.8	8	119.9	0.77	0.10	0.43
297	292	246	626.3	8	158.4	1.01	0.45	0.72
301	302	292	124.8	8	281.8	1.80	0.30	2.43
307	302	308	362.9	8	238.7	1.52	0.57	1.58
313	308	246	189.3	8	176.6	1.13	0.18	0.96
317	172	308	414.2	8	-52.0	0.33	0.04	0.09
321	322	302	443.0	8	524.0	3.34	2.93	6.61
327	322	172	361.0	8	634.2	4.05	3.54	9.81
331	322	332	398.9	8	376.0	2.40	1.47	3.68
337	332	270	355.3	8	367.0	2.34	1.26	3.55
341	332	342	193.0	8	3.5	0.02	0.00	0.00
347	322	SC-J67380	610.5	12	-1,546.4	4.39	4.37	7.16
SC-6448	SC-J68586	SC-J65898	12.0	16	1,546.4	2.47	0.02	1.62
SC-7142	SC-J65898	SC-J67380	20.1	16	1,546.4	2.47	0.03	1.62

Run No. 3: MDD Plus 1,250 gpm Fire Flow at ID 124
Node Report

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
104	5.9	1,592.00	1951.8	155.9
106	5.9	1,592.00	1951.8	155.9
108	5.9	1,608.00	1951.8	149.0
110	7.6	1,607.00	1951.8	149.4
112	6.2	1,607.00	1944.5	146.3
118	6.9	1,604.00	1944.5	147.6
124	1,267.7	1,603.00	1921.4	138.0
130	9.0	1,624.00	1957.7	144.6
136	9.0	1,623.00	1958.1	145.2
142	6.2	1,622.00	1958.1	145.6
148	3.5	1,623.00	1958.1	145.2
154	4.2	1,632.00	1958.1	141.3
160	5.6	1,642.00	1959.1	137.4
166	8.7	1,648.00	1959.1	134.8
172	4.8	1,638.00	1959.5	139.3
204	16.0	1,610.00	1956.8	150.3
210	12.5	1,608.00	1957.2	151.3
216	9.7	1,612.00	1957.7	149.8
222	3.5	1,619.00	1957.7	146.8
228	14.6	1,614.00	1957.9	149.0
232	2.1	1,611.00	1957.8	150.3
240	16.6	1,615.00	1959.1	149.1
246	9.0	1,624.00	1959.4	145.3
252	13.9	1,624.00	1959.8	145.5
258	22.6	1,622.00	1959.6	146.3
266	11.1	1,632.00	1960.0	142.1
270	6.9	1,642.00	1960.4	137.9
276	7.6	1,636.00	1960.1	140.4
282	4.8	1,637.00	1960.1	140.0
292	3.5	1,631.00	1959.9	142.5
302	3.5	1,632.00	1960.2	142.2
308	10.1	1,625.00	1959.6	145.0
322	12.2	1,648.00	1963.1	136.5
332	5.6	1,653.00	1961.6	133.7
342	3.5	1,656.00	1961.6	132.4
SC-J65898	0.0	1,654.42	1967.5	135.7
SC-J67380	0.0	1651.85	1967.5	136.8
SC-J68586	0.0	1654.34	1967.5	135.7

Run No. 3: MDD Plus 1,250 gpm Fire Flow at Node 124
Pipe Report

ID	From Node	To Node	Length (ft)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
105	106	104	805.2	8	5.9	0.04	0.00	0.00
107	106	108	1,268.4	8	5.9	0.04	0.00	0.00
109	110	106	320.1	8	17.8	0.11	0.00	0.01
111	110	112	186.8	8	1,280.9	8.18	7.29	39.01
117	112	118	415.8	8	6.9	0.04	0.00	0.00
123	112	124	685.4	8	1,267.7	8.09	23.09	33.69
129	130	110	629.7	8	635.2	4.05	5.89	9.36
135	130	136	266.0	8	-216.3	1.38	0.36	1.35
141	136	142	448.2	8	13.9	0.09	0.00	0.01
147	142	148	169.3	8	3.5	0.02	0.00	0.00
153	142	154	365.2	8	4.2	0.03	0.00	0.00
159	136	160	638.7	8	-239.2	1.53	0.99	1.55
165	160	166	198.0	8	8.7	0.06	0.00	0.00
171	172	160	266.3	8	253.5	1.62	0.48	1.82
175	172	130	402.9	8	427.9	2.73	1.83	4.55
203	110	204	457.1	8	-671.1	4.28	4.98	10.89
209	204	210	651.2	8	-141.4	0.90	0.38	0.59
215	210	216	796.2	8	-153.9	0.98	0.54	0.68
221	216	222	414.1	8	3.5	0.02	0.00	0.00
227	228	216	283.1	8	167.1	1.07	0.24	0.83
231	228	232	519.7	8	90.2	0.58	0.13	0.26
235	232	204	133.5	8	545.6	3.48	1.02	7.66
239	240	232	251.3	8	457.5	2.92	1.32	5.26
245	246	240	581.7	8	122.7	0.78	0.27	0.46
249	246	240	232.2	8	203.3	1.30	0.27	1.14
251	252	240	990.9	8	148.2	0.95	0.62	0.62
257	252	258	251.2	8	127.1	0.81	0.12	0.49
263	258	228	870.0	8	271.8	1.74	1.69	1.94
265	266	258	445.5	8	167.3	1.07	0.35	0.78
269	270	266	415.3	8	178.4	1.14	0.38	0.90
275	270	276	232.8	8	181.7	1.16	0.23	0.99
281	276	282	411.0	8	4.8	0.03	0.00	0.00
287	252	276	458.9	8	-169.2	1.08	0.37	0.81
291	292	252	231.8	8	119.9	0.77	0.10	0.43
297	292	246	626.3	8	158.4	1.01	0.45	0.72
301	302	292	124.8	8	281.8	1.80	0.30	2.43
307	302	308	362.9	8	238.7	1.52	0.57	1.58
313	308	246	189.3	8	176.6	1.13	0.18	0.96
317	172	308	414.2	8	-52.0	0.33	0.04	0.09
321	322	302	443.0	8	524.0	3.34	2.93	6.61
327	322	172	361.0	8	634.2	4.05	3.54	9.81
331	322	332	398.9	8	376.0	2.40	1.47	3.68
337	332	270	355.3	8	367.0	2.34	1.26	3.55
341	332	342	193.0	8	3.5	0.02	0.00	0.00
347	322	SC-J67380	610.5	12	-1,546.4	4.39	4.37	7.16
SC-6448	SC-J68586	SC-J65898	12.0	16	1,546.4	2.47	0.02	1.62
SC-7142	SC-J65898	SC-J67380	20.1	16	1,546.4	2.47	0.03	1.62

Run No. 4: MDD Plus 1,250 gpm Fire Flow at ID 154
Node Report

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
104	5.9	1,592.00	1957.7	158.5
106	5.9	1,592.00	1957.7	158.5
108	5.9	1,608.00	1957.7	151.5
110	7.6	1,607.00	1957.7	152.0
112	6.2	1,607.00	1957.7	152.0
118	6.9	1,604.00	1957.7	153.3
124	17.7	1,603.00	1957.7	153.7
130	9.0	1,624.00	1956.4	144.0
136	9.0	1,623.00	1952.7	142.9
142	6.2	1,622.00	1936.8	136.4
148	3.5	1,623.00	1936.8	136.0
154	1,254.2	1,632.00	1924.7	126.8
160	5.6	1,642.00	1956.8	136.4
166	8.7	1,648.00	1956.8	133.8
172	4.8	1,638.00	1958.7	139.0
204	16.0	1,610.00	1959.1	151.3
210	12.5	1,608.00	1959.2	152.2
216	9.7	1,612.00	1959.4	150.5
222	3.5	1,619.00	1959.4	147.5
228	14.6	1,614.00	1959.5	149.7
232	2.1	1,611.00	1959.4	151.0
240	16.6	1,615.00	1959.8	149.4
246	9.0	1,624.00	1959.8	145.5
252	13.9	1,624.00	1960.3	145.7
258	22.6	1,622.00	1960.3	146.6
266	11.1	1,632.00	1960.5	142.4
270	6.9	1,642.00	1960.8	138.1
276	7.6	1,636.00	1960.6	140.7
282	4.8	1,637.00	1960.6	140.2
292	3.5	1,631.00	1960.3	142.7
302	3.5	1,632.00	1960.5	142.3
308	10.1	1,625.00	1959.8	145.1
322	12.2	1,648.00	1963.1	136.5
332	5.6	1,653.00	1961.9	133.8
342	3.5	1,656.00	1961.9	132.5
SC-J65898	0.0	1,654.42	1967.5	135.6
SC-J67380	0.0	1,651.85	1967.4	136.7
SC-J68586	0.0	1,654.34	1967.5	135.7

Run No. 4: MDD 1,250 gpm Fire Flow at Node 154
Pipe Report

ID	From Node	To Node	Length (ft)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
105	106	104	805.2	8	5.9	0.04	0.00	0.00
107	106	108	1,268.4	8	5.9	0.04	0.00	0.00
109	110	106	320.1	8	17.8	0.11	0.00	0.01
111	110	112	186.8	8	30.9	0.20	0.01	0.04
117	112	118	415.8	8	6.9	0.04	0.00	0.00
123	112	124	685.4	8	17.7	0.11	0.01	0.01
129	130	110	629.7	8	-283.1	1.81	1.32	2.09
135	130	136	266.0	8	757.6	4.84	3.73	14.02
141	136	142	448.2	8	1,263.9	8.07	15.91	35.51
147	142	148	169.3	8	3.5	0.02	0.00	0.00
153	142	154	365.2	8	1,254.2	8.01	12.07	33.04
159	136	160	638.7	8	-515.2	3.29	4.12	6.45
165	160	166	198.0	8	8.7	0.06	0.00	0.00
171	172	160	266.3	8	529.5	3.38	1.91	7.18
175	172	130	402.9	8	483.5	3.09	2.30	5.71
203	110	204	457.1	8	-339.4	2.17	1.40	3.06
209	204	210	651.2	8	-72.0	0.46	0.11	0.17
215	210	216	796.2	8	-84.4	0.54	0.18	0.22
221	216	222	414.1	8	3.5	0.02	0.00	0.00
227	228	216	283.1	8	97.6	0.62	0.09	0.31
231	228	232	519.7	8	64.4	0.41	0.07	0.14
235	232	204	133.5	8	283.4	1.81	0.30	2.26
239	240	232	251.3	8	221.1	1.41	0.34	1.36
245	246	240	581.7	8	39.1	0.25	0.03	0.05
249	246	240	232.2	8	64.7	0.41	0.03	0.14
251	252	240	990.9	8	133.9	0.85	0.51	0.52
257	252	258	251.2	8	55.9	0.36	0.03	0.11
263	258	228	870.0	8	176.6	1.13	0.76	0.87
265	266	258	445.5	8	143.3	0.91	0.26	0.59
269	270	266	415.3	8	154.4	0.99	0.29	0.69
275	270	276	232.8	8	168.9	1.08	0.20	0.86
281	276	282	411.0	8	4.8	0.03	0.00	0.00
287	252	276	458.9	8	-156.4	1.00	0.32	0.70
291	292	252	231.8	8	47.3	0.30	0.02	0.08
297	292	246	626.3	8	167.0	1.07	0.50	0.80
301	302	292	124.8	8	217.8	1.39	0.19	1.50
307	302	308	362.9	8	266.7	1.70	0.71	1.94
313	308	246	189.3	8	-54.2	0.35	0.02	0.11
317	172	308	414.2	8	-310.7	1.98	1.07	2.58
321	322	302	443.0	8	487.9	3.11	2.57	5.79
327	322	172	361.0	8	707.1	4.51	4.34	12.02
331	322	332	398.9	8	339.2	2.16	1.21	3.04
337	332	270	355.3	8	330.2	2.11	1.03	2.91
341	332	342	193.0	8	3.5	0.02	0.00	0.00
347	322	SC-J67380	610.5	12	-1,546.4	4.39	4.37	7.16
SC-6448	SC-J68586	SC-J65898	12.0	16	1,546.4	2.47	0.02	1.62
SC-7142	SC-J65898	SC-J67380	20.1	16	1,546.4	2.47	0.03	1.62

Run No. 5: MDD Plus 1,250 gpm Fire Flow at ID 222
Node Report

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
104	5.9	1,592.00	1957.6	158.4
106	5.9	1,592.00	1957.6	158.4
108	5.9	1,608.00	1957.6	151.5
110	7.6	1,607.00	1957.6	151.9
112	6.2	1,607.00	1957.6	151.9
118	6.9	1,604.00	1957.6	153.2
124	17.7	1,603.00	1957.5	153.6
130	9.0	1,624.00	1959.5	145.4
136	9.0	1,623.00	1959.6	145.8
142	6.2	1,622.00	1959.6	146.3
148	3.5	1,623.00	1959.6	145.8
154	4.2	1,632.00	1959.6	141.9
160	5.6	1,642.00	1959.9	137.8
166	8.7	1,648.00	1959.9	135.2
172	4.8	1,638.00	1960.1	139.6
204	16.0	1,610.00	1956.5	150.1
210	12.5	1,608.00	1953.4	149.6
216	9.7	1,612.00	1949.8	146.3
222	1,253.5	1,619.00	1935.7	137.2
228	14.6	1,614.00	1954.5	147.5
232	2.1	1,611.00	1956.6	149.8
240	16.6	1,615.00	1958.6	148.9
246	9.0	1,624.00	1959.1	145.2
252	13.9	1,624.00	1959.1	145.2
258	22.6	1,622.00	1958.7	145.9
266	11.1	1,632.00	1959.2	141.8
270	6.9	1,642.00	1959.8	137.7
276	7.6	1,636.00	1959.5	140.2
282	4.8	1,637.00	1959.5	139.7
292	3.5	1,631.00	1959.5	142.3
302	3.5	1,632.00	1960.0	142.1
308	10.1	1,625.00	1959.7	145.0
322	12.2	1,648.00	1963.1	136.5
332	5.6	1,653.00	1961.3	133.6
342	3.5	1,656.00	1961.3	132.3
SC-J65898	0.0	1,654.42	1967.5	135.7
SC-J67380	0.0	1,651.85	1967.5	136.8
SC-J68586	0.0	1,654.34	1967.5	135.7

Run No. 5: MDD Plus 1,250 gpm Fire Flow at Node 222
Pipe Report

ID	From Node	To Node	Length (ft)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
105	106	104	805.2	8	5.9	0.04	0.00	0.00
107	106	108	1,268.4	8	5.9	0.04	0.00	0.00
109	110	106	320.1	8	17.8	0.11	0.00	0.01
111	110	112	186.8	8	30.9	0.20	0.01	0.04
117	112	118	415.8	8	6.9	0.04	0.00	0.00
123	112	124	685.4	8	17.7	0.11	0.01	0.01
129	130	110	629.7	8	346.3	2.21	1.91	3.04
135	130	136	266.0	8	-113.2	0.72	0.11	0.40
141	136	142	448.2	8	13.9	0.09	0.00	0.01
147	142	148	169.3	8	3.5	0.02	0.00	0.00
153	142	154	365.2	8	4.2	0.03	0.00	0.00
159	136	160	638.7	8	-136.0	0.87	0.35	0.54
165	160	166	198.0	8	8.7	0.06	0.00	0.00
171	172	160	266.3	8	150.3	0.96	0.18	0.69
175	172	130	402.9	8	242.2	1.55	0.64	1.58
203	110	204	457.1	8	290.0	1.85	1.04	2.28
209	204	210	651.2	8	441.4	2.82	3.16	4.85
215	210	216	796.2	8	428.9	2.74	3.61	4.53
221	216	222	414.1	8	1,253.5	8.00	14.08	33.99
227	228	216	283.1	8	834.2	5.32	4.72	16.68
231	228	232	519.7	8	-403.8	2.58	2.16	4.15
235	232	204	133.5	8	167.3	1.07	0.11	0.84
239	240	232	251.3	8	573.3	3.66	2.01	8.01
245	246	240	581.7	8	172.5	1.10	0.50	0.86
249	246	240	232.2	8	285.7	1.82	0.50	2.15
251	252	240	990.9	8	131.7	0.84	0.50	0.50
257	252	258	251.2	8	259.5	1.66	0.46	1.83
263	258	228	870.0	8	445.0	2.84	4.20	4.83
265	266	258	445.5	8	208.0	1.33	0.52	1.17
269	270	266	415.3	8	219.1	1.40	0.55	1.33
275	270	276	232.8	8	183.2	1.17	0.23	1.00
281	276	282	411.0	8	4.8	0.03	0.00	0.00
287	252	276	458.9	8	-170.7	1.09	0.38	0.82
291	292	252	231.8	8	234.5	1.50	0.35	1.49
297	292	246	626.3	8	136.6	0.87	0.34	0.55
301	302	292	124.8	8	374.5	2.39	0.52	4.14
307	302	308	362.9	8	160.8	1.03	0.28	0.76
313	308	246	189.3	8	330.6	2.11	0.58	3.09
317	172	308	414.2	8	179.9	1.15	0.39	0.93
321	322	302	443.0	8	538.7	3.44	3.08	6.96
327	322	172	361.0	8	577.2	3.68	2.97	8.24
331	322	332	398.9	8	418.2	2.67	1.79	4.49
337	332	270	355.3	8	409.2	2.61	1.54	4.34
341	332	342	193.0	8	3.5	0.02	0.00	0.00
347	322	SC-J67380	610.5	12	-1,546.4	4.39	4.37	7.16
SC-6448	SC-J68586	SC-J65898	12.0	16	1,546.4	2.47	0.02	1.62
SC-7142	SC-J65898	SC-J67380	20.1	16	1,546.4	2.47	0.03	1.62

Run No. 6: MDD Plus 1,250 gpm Fire Flow at ID 342
Node Report

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
104	5.9	1,592.00	1961.1	159.9
106	5.9	1,592.00	1961.1	159.9
108	5.9	1,608.00	1961.1	153.0
110	7.6	1,607.00	1961.1	153.4
112	6.2	1,607.00	1961.1	153.4
118	6.9	1,604.00	1961.1	154.7
124	17.7	1,603.00	1961.1	155.2
130	9.0	1,624.00	1961.6	146.3
136	9.0	1,623.00	1961.6	146.7
142	6.2	1,622.00	1961.6	147.1
148	3.5	1,623.00	1961.6	146.7
154	4.2	1,632.00	1961.6	142.8
160	5.6	1,642.00	1961.7	138.5
166	8.7	1,648.00	1961.7	135.9
172	4.8	1,638.00	1961.8	140.3
204	16.0	1,610.00	1961.0	152.1
210	12.5	1,608.00	1960.9	152.9
216	9.7	1,612.00	1960.8	151.2
222	3.5	1,619.00	1960.8	148.1
228	14.6	1,614.00	1960.8	150.3
232	2.1	1,611.00	1961.0	151.6
240	16.6	1,615.00	1961.0	149.9
246	9.0	1,624.00	1961.1	146.1
252	13.9	1,624.00	1960.6	145.8
258	22.6	1,622.00	1960.5	146.7
266	11.1	1,632.00	1959.8	142.0
270	6.9	1,642.00	1959.3	137.5
276	7.6	1,636.00	1959.7	140.3
282	4.8	1,637.00	1959.7	139.8
292	3.5	1,631.00	1961.1	143.1
302	3.5	1,632.00	1961.5	142.8
308	10.1	1,625.00	1961.4	145.8
322	12.2	1,648.00	1963.1	136.5
332	5.6	1,653.00	1957.3	131.8
342	1,253.5	1,656.00	1950.3	127.5
SC-J65898	0.0	1,654.42	1967.5	135.6
SC-J67380	0.0	1,651.85	1967.4	136.7
SC-J68586	0.0	1,654.34	1967.5	135.7

Run No. 6: MDD Plus 1,250 gpm Fire Flow at Node 342
Pipe Report

ID	From Node	To Node	Length (ft)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
105	106	104	805.2	8	5.9	0.04	0.00	0.00
107	106	108	1,268.4	8	5.9	0.04	0.00	0.00
109	110	106	320.1	8	17.8	0.11	0.00	0.01
111	110	112	186.8	8	30.9	0.20	0.01	0.04
117	112	118	415.8	8	6.9	0.04	0.00	0.00
123	112	124	685.4	8	17.7	0.11	0.01	0.01
129	130	110	629.7	8	157.7	1.01	0.44	0.71
135	130	136	266.0	8	-45.5	0.29	0.02	0.07
141	136	142	448.2	8	13.9	0.09	0.00	0.01
147	142	148	169.3	8	3.5	0.02	0.00	0.00
153	142	154	365.2	8	4.2	0.03	0.00	0.00
159	136	160	638.7	8	-68.4	0.44	0.10	0.15
165	160	166	198.0	8	8.7	0.06	0.00	0.00
171	172	160	266.3	8	82.6	0.53	0.06	0.23
175	172	130	402.9	8	121.2	0.77	0.18	0.44
203	110	204	457.1	8	101.4	0.65	0.15	0.32
209	204	210	651.2	8	61.1	0.39	0.08	0.12
215	210	216	796.2	8	48.7	0.31	0.06	0.08
221	216	222	414.1	8	3.5	0.02	0.00	0.00
227	228	216	283.1	8	-35.5	0.23	0.01	0.05
231	228	232	519.7	8	-97.6	0.62	0.15	0.30
235	232	204	133.5	8	-24.3	0.16	0.00	0.02
239	240	232	251.3	8	75.4	0.48	0.05	0.18
245	246	240	581.7	8	80.2	0.51	0.12	0.21
249	246	240	232.2	8	132.7	0.85	0.12	0.52
251	252	240	990.9	8	-120.9	0.77	0.42	0.43
257	252	258	251.2	8	135.8	0.87	0.14	0.55
263	258	228	870.0	8	-118.6	0.76	0.36	0.42
265	266	258	445.5	8	-231.8	1.48	0.64	1.43
269	270	266	415.3	8	-220.7	1.41	0.56	1.34
275	270	276	232.8	8	-258.3	1.65	0.44	1.91
281	276	282	411.0	8	4.8	0.03	0.00	0.00
287	252	276	458.9	8	270.8	1.73	0.89	1.94
291	292	252	231.8	8	299.6	1.91	0.54	2.35
297	292	246	626.3	8	-2.2	0.01	0.00	0.00
301	302	292	124.8	8	300.9	1.92	0.34	2.75
307	302	308	362.9	8	70.8	0.45	0.06	0.16
313	308	246	189.3	8	224.1	1.43	0.28	1.49
317	172	308	414.2	8	163.4	1.04	0.32	0.78
321	322	302	443.0	8	375.2	2.39	1.58	3.56
327	322	172	361.0	8	372.1	2.37	1.31	3.64
331	322	332	398.9	8	786.9	5.02	5.81	14.56
337	332	270	355.3	8	-472.1	3.01	2.01	5.67
341	332	342	193.0	8	1,253.5	8.00	6.96	36.05
347	322	SC-J67380	610.5	12	-1,546.4	4.39	4.37	7.16
SC-6448	SC-J68586	SC-J65898	12.0	16	1,546.4	2.47	0.02	1.62
SC-7142	SC-J65898	SC-J67380	20.1	16	1,546.4	2.47	0.03	1.62

Run No. 7: MDD Plus 1,500 gpm Fire Flow at ID 302
Node Report

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
104	5.9	1,592.00	1955.6	157.6
106	5.9	1,592.00	1955.6	157.6
108	5.9	1,608.00	1955.6	150.6
110	7.6	1,607.00	1955.6	151.1
112	6.2	1,607.00	1955.6	151.1
118	6.9	1,604.00	1955.6	152.4
124	17.7	1,603.00	1955.6	152.8
130	9.0	1,624.00	1956.3	144.0
136	9.0	1,623.00	1956.3	144.4
142	6.2	1,622.00	1956.3	144.9
148	3.5	1,623.00	1956.3	144.4
154	4.2	1,632.00	1956.3	140.5
160	5.6	1,642.00	1956.5	136.3
166	8.7	1,648.00	1956.5	133.7
172	4.8	1,638.00	1956.5	138.0
204	16.0	1,610.00	1955.4	149.6
210	12.5	1,608.00	1955.3	150.5
216	9.7	1,612.00	1955.3	148.8
222	3.5	1,619.00	1955.3	145.7
228	14.6	1,614.00	1955.3	147.9
232	2.1	1,611.00	1955.3	149.2
240	16.6	1,615.00	1955.2	147.4
246	9.0	1,624.00	1955.2	143.5
252	13.9	1,624.00	1955.3	143.5
258	22.6	1,622.00	1955.4	144.4
266	11.1	1,632.00	1955.8	140.3
270	6.9	1,642.00	1956.2	136.1
276	7.6	1,636.00	1955.8	138.6
282	4.8	1,637.00	1955.8	138.2
292	3.5	1,631.00	1954.8	140.3
302	1,503.5	1,632.00	1954.1	139.6
308	10.1	1,625.00	1955.2	143.1
322	12.2	1,648.00	1959.8	135.1
332	5.6	1,653.00	1957.8	132.1
342	3.5	1,656.00	1957.8	130.8
SC-J65898	0.0	1,654.42	1965.6	134.8
SC-J67380	0.0	1,651.85	1965.5	135.9
SC-J68586	0.0	1,654.34	1965.6	134.9

Run No. 7: MDD Plus 1,500 gpm Fire Flow at Node 302
Pipe Report

ID	From Node	To Node	Length (ft)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
105	106	104	805.2	8	5.9	0.04	0.00	0.00
107	106	108	1,268.4	8	5.9	0.04	0.00	0.00
109	110	106	320.1	8	17.8	0.11	0.00	0.01
111	110	112	186.8	8	30.9	0.20	0.01	0.04
117	112	118	415.8	8	6.9	0.04	0.00	0.00
123	112	124	685.4	8	17.7	0.11	0.01	0.01
129	130	110	629.7	8	195.9	1.25	0.66	1.06
135	130	136	266.0	8	-59.2	0.38	0.03	0.12
141	136	142	448.2	8	13.9	0.09	0.00	0.01
147	142	148	169.3	8	3.5	0.02	0.00	0.00
153	142	154	365.2	8	4.2	0.03	0.00	0.00
159	136	160	638.7	8	-82.1	0.52	0.14	0.21
165	160	166	198.0	8	8.7	0.06	0.00	0.00
171	172	160	266.3	8	96.4	0.62	0.08	0.30
175	172	130	402.9	8	145.7	0.93	0.25	0.62
203	110	204	457.1	8	139.6	0.89	0.27	0.59
209	204	210	651.2	8	28.4	0.18	0.02	0.03
215	210	216	796.2	8	15.9	0.10	0.01	0.01
221	216	222	414.1	8	3.5	0.02	0.00	0.00
227	228	216	283.1	8	-2.7	0.02	0.00	0.00
231	228	232	519.7	8	24.7	0.16	0.01	0.02
235	232	204	133.5	8	-95.3	0.61	0.04	0.30
239	240	232	251.3	8	-117.9	0.75	0.11	0.42
245	246	240	581.7	8	-52.3	0.33	0.05	0.09
249	246	240	232.2	8	-86.6	0.55	0.05	0.23
251	252	240	990.9	8	37.7	0.24	0.05	0.05
257	252	258	251.2	8	-120.2	0.77	0.11	0.44
263	258	228	870.0	8	36.5	0.23	0.04	0.05
265	266	258	445.5	8	179.3	1.14	0.40	0.89
269	270	266	415.3	8	190.4	1.22	0.42	1.02
275	270	276	232.8	8	227.6	1.45	0.35	1.51
281	276	282	411.0	8	4.8	0.03	0.00	0.00
287	252	276	458.9	8	-215.1	1.37	0.58	1.27
291	292	252	231.8	8	-283.8	1.81	0.49	2.12
297	292	246	626.3	8	-146.0	0.93	0.39	0.62
301	302	292	124.8	8	-426.4	2.72	0.66	5.28
307	302	308	362.9	8	-330.2	2.11	1.05	2.89
313	308	246	189.3	8	16.2	0.10	0.00	0.01
317	172	308	414.2	8	356.5	2.28	1.38	3.33
321	322	302	443.0	8	746.9	4.77	5.66	12.77
327	322	172	361.0	8	603.3	3.85	3.23	8.94
331	322	332	398.9	8	434.0	2.77	1.92	4.81
337	332	270	355.3	8	424.9	2.71	1.66	4.66
341	332	342	193.0	8	3.5	0.02	0.00	0.00
347	322	SC-J67380	610.5	12	-1,796.4	5.10	5.78	9.47
SC-6448	SC-J68586	SC-J65898	12.0	16	1,796.4	2.87	0.03	2.14
SC-7142	SC-J65898	SC-J67380	20.1	16	1,796.4	2.87	0.04	2.14

EXHIBIT A

NODE AND PIPE DIAGRAM

POTENTIAL SAND CANYON ZONE 5 TO SAN CANYON ZONE 7 WATER BOOSTER STATION

PROPOSED SAND CANYON ZONE 7 TO SAN CANYON ZONE 5 PRESSURE REDUCING STATION

SAND CANYON 5 ZONE

SAN CANYON 7 ZONE

RAILROAD

LOST CANYON RD

OAK SPRING CANYON RD

COMET WAY

TO LIVE OAK RESERVOIR

LEGEND

- PROJECT BOUNDARY
- EXISTING PUBLIC WATER LINE (SAND CANYON 5 ZONE)
- EXISTING PUBLIC WATER LINE (SAND CANYON 7 ZONE)
- PROPOSED PUBLIC WATER LINE (SAND CANYON 5 ZONE)
- PROPOSED PUBLIC WATER LINE (SAND CANYON 7 ZONE)
- EXISTING PUBLIC FIRE HYDRANT (SAND CANYON 5 ZONE)
- EXISTING PUBLIC FIRE HYDRANT (SAND CANYON 7 ZONE)
- PROPOSED PUBLIC FIRE HYDRANT (SAND CANYON 5 ZONE)
- PROPOSED PUBLIC FIRE HYDRANT (SAND CANYON 7 ZONE)
- POTENTIAL WATER BOOSTER STATION
- EXISTING/PROPOSED PRESSURE REDUCING STATION
- (154) COMPUTER MODEL NODE NUMBER
- [291] COMPUTER MODEL PIPE NUMBER

N

0 200 FEET

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008
(760) 438-4422

EXHIBIT A

NODE AND PIPE DIAGRAM

BELCARO

\\MERIDIAN\DWG\159001\BC_REPORT\BC_EXHIBIT-A_NP.DWG 1/27/2026 9:40:49 AM LAYOUT:24x36 USER:fernando