Appendix H

Utilities Studies

Roseville Industrial Park Project
Water Supply Assessment

PREPARED FOR

City of Roseville

CITY OF ROSEVILLE CALIFORNIA

PREPARED BY

WEST YOST
Water. Engineered.

Roseville Industrial Park Project Water Supply Assessment

Prepared for

City of Roseville

Project No. 1002-60-21-01

Project Manager: Amy Kwong, PE

Date

QA/QC Review: Elizabeth Drayer, PE

Date

WEST YOST
Water. Engineered.

DRAFT REPORT | APRIL 2022

Table of Contents

LIST OF TABLES

Table of Contents

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
AF/yr	Acre-feet Per Year
ASR	Aquifer Storage and Recovery
BRWTP	Barton Road Water Treatment Plant
CEQA	California Environmental Quality Act
CHWD	Citrus Heights Water District
CIMIS	California Irrigation Management Information System
City	City of Roseville
CVP	Central Valley Project
CVP M&I WSP	Central Valley Project Municipal & Industrial Water Shortage Policy
Developer	Panattoni Development Company
Delta	Sacramento-San Joaquin Delta
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
GMP	Groundwater Management Plan
gpm	Gallons Per Minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
M&I	Municipal & Industrial
MFP	Middle Fork Project
mgd	Million Gallons Per Day
NOP	Notice of Preparation
OCAP	Operations Criteria and Plan
Ophir WTP	Ophir Water Treatment Plant
PCWA	Placer County Water Agency
Proposed Project	Roseville Industrial Park Project
SB 221	Senate Bill 221
SB 610	Senate Bill 610

sf	square foot or square feet
SGMA	Sustainable Groundwater Management Act of 2014
SJWD	San Juan Water District
SMUD	Sacramento Municipal Utilities District
SWRCB	State Water Resources Control Board
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WELO	Water Efficient Landscape Ordinance
WFA	Water Forum Agreement
WPGSA	West Placer Groundwater Sustainability Agency
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan

Roseville Industrial Park Project
Water Supply Assessment

EXECUTIVE SUMMARY

Overview

This Water Supply Assessment (WSA) has been prepared for the City of Roseville (City) by West Yost in accordance with California Water Code sections 10910 through 10915 in connection with the proposed Roseville Industrial Park Project (Proposed Project). The Proposed Project is located in the northwest portion of the City. The Proposed Project site is undeveloped and would contain various industrial uses, including light manufacturing, warehouse, and distribution uses.

The Proposed Project will include approximately 1,938 employees and up to 15 buildings totaling approximately 2,415,000 square feet.

Projected Water Demands

The projected potable water demands for buildout of the Proposed Project were calculated by Laugenour and Meikle Civil Engineers using the City's adopted unit water demand factors. The projected landscape irrigation demands for buildout of the Proposed Project were estimated based on total irrigated area and the City's Water Efficient Landscape Ordinance (WELO). The total water demand for the Proposed Project is estimated to be 561 acre-feet per year (AF/yr), with 518 AF/yr and 43 AF/yr for potable water and recycled water, respectively. The landscape irrigation demands for the Proposed Project will ultimately be served by the City's recycled water system; however, these demands will be served from the potable water system in the interim until the necessary recycled water system infrastructure is constructed. Summaries of the availability and reliability of potable and recycled water supplies to serve the projected water demands for the Proposed Project are discussed below.

Water Supply Availability and Reliability

The City's water supply sources include American River surface water purchased through supply contracts with the United States Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD); groundwater pumped from the City's active production wells; and recycled water. The availability and reliability of the City's water supplies as described in this WSA are based on information contained in the City's 2020 Urban Water Management Plan (UWMP). As the Proposed Project was not included in the City's 2020 UWMP, the supply and demand comparison in normal, single dry, and multiple dry years has been recalculated in this WSA to include water demand for the Proposed Project.

According to the City's 2020 UWMP and the technical analysis outlined in this WSA, the City does not anticipate water supply shortages during normal water years through 2045. In single dry years and years four and five of an extended drought, some supply shortages are projected ranging from approximately 0.3 percent to 8.6 percent of projected demand. In the event of any water shortages, the City will implement the provisions of its Water Shortage Contingency Plan (WSCP) to reduce water demand and make up the supply deficit. The Proposed Project, if approved, would be subject to the same water use restrictions as other City water customers if the WSCP is implemented.

1.0 INTRODUCTION

The Roseville Industrial Park Project (Proposed Project) would develop a property in the City of Roseville (City) with a range of industrial uses, including light manufacturing, warehouse, and distribution uses, as well as a potential electrical substation south of Pleasant Grove Creek. Up to 15 buildings would be constructed, ranging in size from approximately 80,000 square feet (sf) to approximately 300,000 sf and connected by a bridge across Pleasant Grove Creek.[1,2]

The purpose of this Water Supply Assessment (WSA) is to support the Environmental Impact Report (EIR) for the Proposed Project. The following sections describe the legal requirement for the WSA and the Project background.

1.1 Legal Requirement for a Water Supply Assessment

California Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 were companion measures which sought to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

SB 610 amended California Water Code sections 10910 through 10915 (inclusive) to require land use lead agencies to:

- Identify any public water purveyor that may supply water for a proposed development project
- Request a WSA from the identified water purveyor

The purpose of the WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the Proposed Project, while still meeting the water purveyor's existing and planned future uses. California Water Code sections 10910 through 10915 delineate the specific information that must be included in the WSA.

SB 221, which amended State law (California Government Code section 66473.7) to require that approval by a city or county of certain residential subdivisions,[3] requires an affirmative written verification of sufficient water supply. SB 221 was intended as a failsafe mechanism to ensure that collaboration on finding the needed water supplies to serve a new large residential subdivision occurs before construction

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[1] City of Roseville. July 2021. Notice of Preparation of an Environmental Impact Report for the proposed Roseville Industrial Park Project and Notice of Public Scoping Meeting.

[2] Laugenour and Meikle Civil Engineers. September 2021. Draft Potable Water Study for Roseville Industrial Project.

[3] Per Government Code Section 66473.7(a)(1) subdivision means a proposed residential development of more than 500 dwelling units.

begins. As described further in Section 3.2, the Proposed Project does not include residential dwelling units and is therefore exempt from the requirements of SB 221.

1.2 Need for and Purpose of a Water Supply Assessment

The purpose of this WSA is to perform the evaluation required by SB 610 (California Water Code Sections 10910 through 10915) in connection with the Proposed Project, located within the City limits. This WSA does not reserve water or function as a "will serve" letter or any other form of commitment to supply water (see California Water Code section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable policies and procedures, consistent with existing law.

1.3 Water Supply Assessment Preparation, Format, and Organization

The format of this WSA is intended to follow California Water Code sections 10910 through 10915 to clearly delineate compliance with the specific requirements for a WSA. This WSA includes the following sections:

Section 1:	Introduction
Section 2:	Description of the Proposed Project
Section 3:	Required Determinations
Section 4:	City of Roseville Water System
Section 5:	City of Roseville Water Demands
Section 6:	City of Roseville Water Supplies
Section 7:	Water Supply Reliability
Section 8:	Determination of Water Supply Sufficiency Based on the Requirements of SB 610
Section 9:	Water Supply Assessment Approval Process
Section 10:	References

Relevant citations of California Water Code Sections 10910 through 10915 are included throughout this WSA in *italics* to demonstrate compliance with the specific requirements of SB 610.

2.0 DESCRIPTION OF THE PROPOSED PROJECT

The following sections describe the Proposed Project, including the Proposed Project's location, proposed land uses, and projected water demand.

2.1 Proposed Project Location and Overview

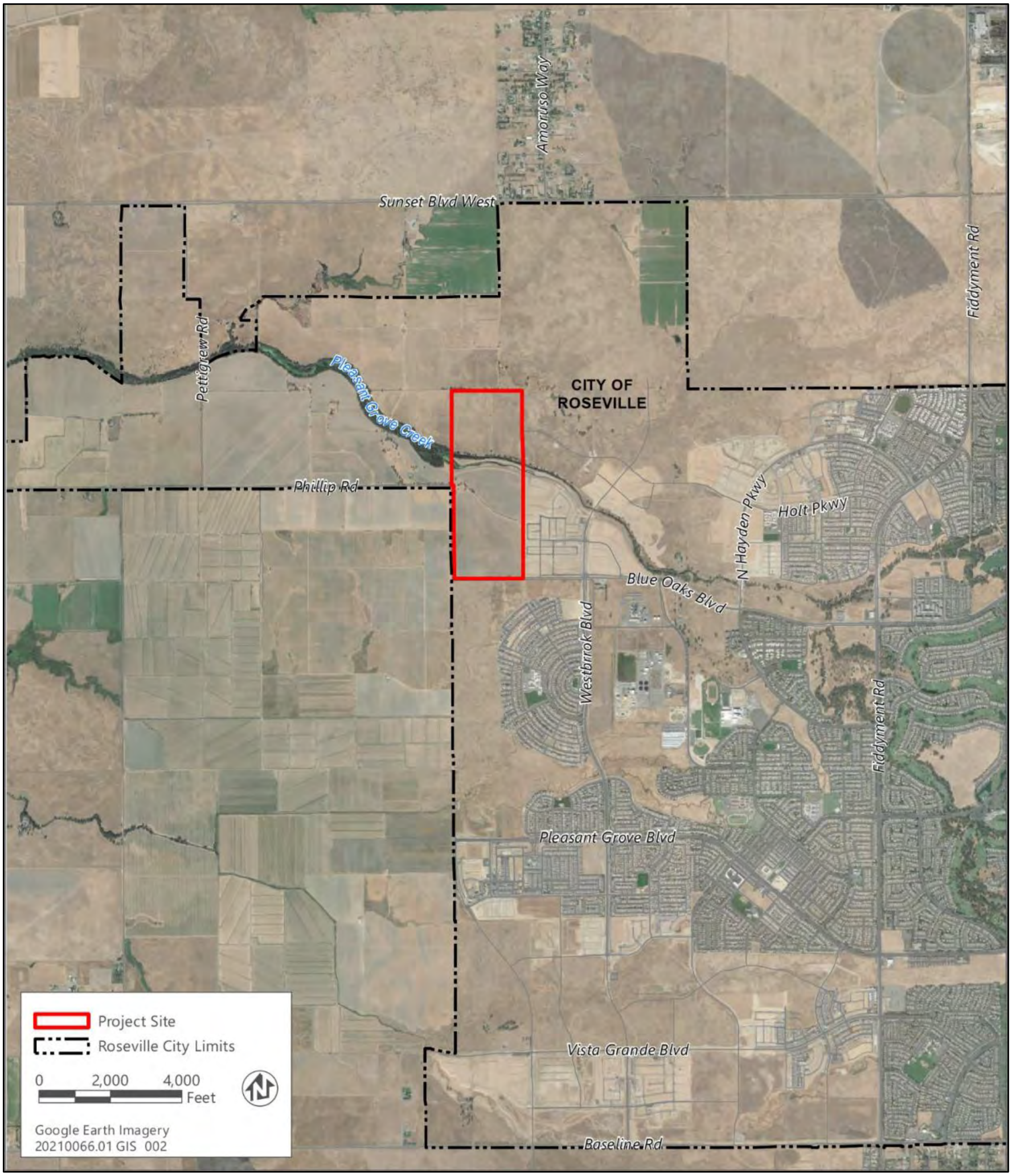
The Proposed Project location is 6382 Phillip Road in the northwest corner of the City, as shown on Figure 2-1. The Proposed Project site is bounded by the Al Johnson Wildlife Area to the northwest, and agricultural uses to the immediate west, east, and south. The future sites of the Creekview Specific Plan area (2,000 residential units), and the remainder of the West Roseville Specific Plan area (10,479 residential units, parks, open space, and commercial uses) are planned to the east and south, respectively. In addition, the Al Johnson Wildlife Area is part of a 1,700-acre site planned to accommodate the City's future stormwater Regional Retention facility.

The Proposed Project site is part of a larger 1,500-acre City-owned property (Reason Farms) purchased in 2003 for a retention basin project. As noted above, the retention basin project will now be located in the Al Johnson Wildlife Area. Therefore, the City entered into an Option and Purchase and Sale Agreement with Panattoni Development Company (Developer) to conduct due diligence and entitle the property in March 2021.

The Proposed Project site consists of approximately 241 acres of undeveloped grazing land. The existing site is predominantly flat with sparsely vegetated, low hills, and Pleasant Grove Creek bisects the property into a north and south parcel. Approximately 180 acres of the site are considered developable with approximately 7 acres for Blue Oaks Boulevard and Phillip Road extensions/widening; the remaining 55 acres consist of the Pleasant Grove Creek Floodplain, a retention basin bypass channel, and the future alignment of Placer Parkway.

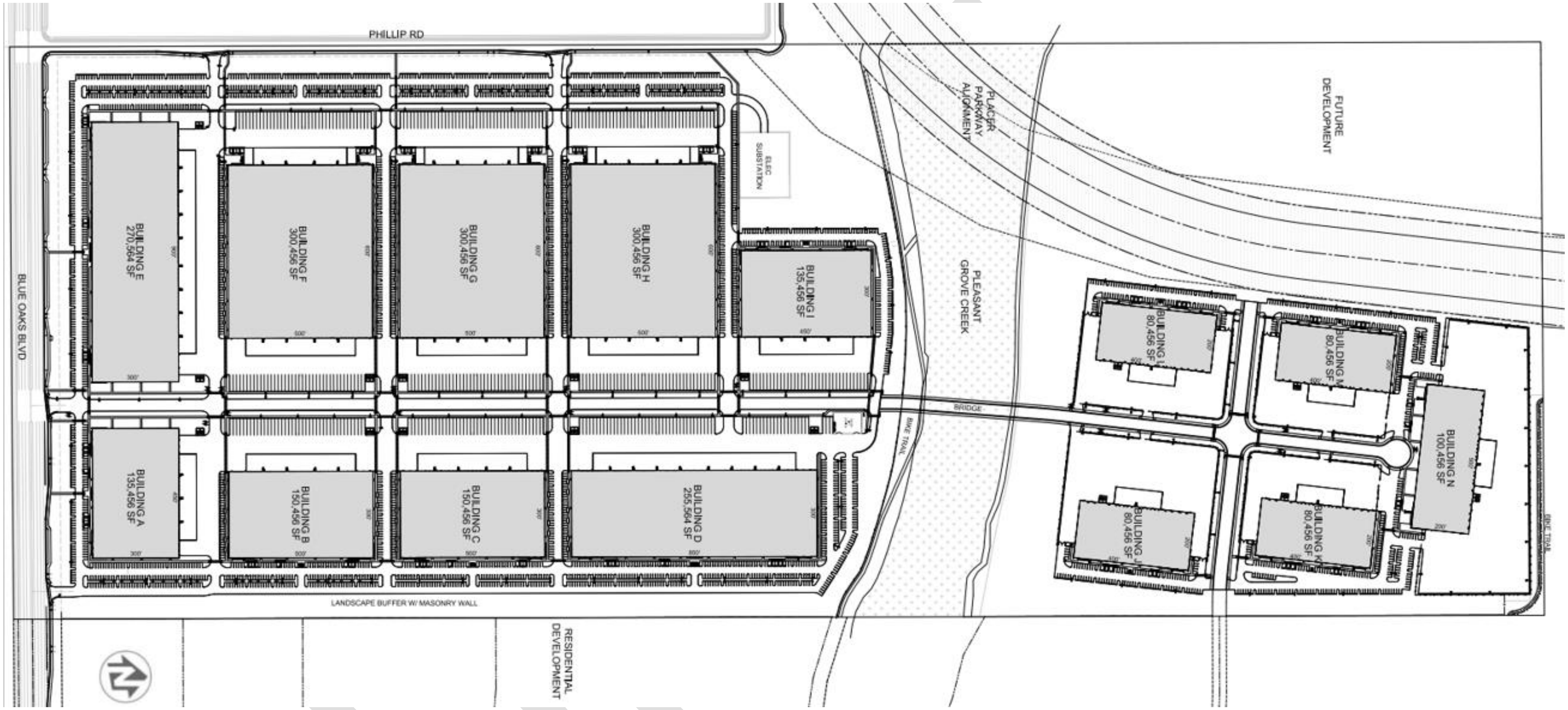
2.2 Proposed Land Uses

The Proposed Project will be developed to incorporate a range of industrial uses, including light manufacturing, warehouse, and distribution uses, totaling up to 2,415,000 sf. The south parcel would include 131 acres of large warehouse buildings for warehousing, distribution, and light manufacturing, and an electrical substation. The north parcel would include 48 acres of industrial buildings for warehousing, light manufacturing, and storage yards. A center spine designed for large truck circulation and a bridge across Pleasant Grove Creek will connect the two parcels, with pedestrian and vehicular paths located around the site perimeter. At buildout, there would be approximately 1,938 employees and up to 15 buildings. Figure 2-2 illustrates the Proposed Project site plan at buildout.



Source: Notice of Preparation of an Environmental Impact Report for the proposed Roseville Industrial Park Project and Notice of Public Scoping Meeting, Figure 2: Project Location. Dated July 2021.

Figure 2-1. Proposed Project Location



Source: Provided by Developer. Dated March 2022.

Figure 2-2. Proposed Project Site

2.3 Projected Water Demand for the Proposed Project

The potable water demand for the Proposed Project was estimated by Laugenour and Meikle Civil Engineers using the City's adopted unit water demand factors. A copy of the potable water demand projection from the draft Potable Water Master Plan is provided in Appendix A. The total projected potable water demand for the Proposed Project is approximately 518 acre-feet per year (AF/yr).

The recycled water demand for the Proposed Project was estimated by Laugenour and Meikle Civil Engineers using the total irrigated area and the City's Water Efficient Landscape Ordinance. A copy of the recycled water demand projection from the draft Potable Water Master Plan is provided in Appendix A. The total projected recycled water demand for the Proposed Project is approximately 43 AF/yr.[4] The landscape irrigation demands for the Proposed Project will ultimately be served by the City's recycled water system; however, these demands will be served from the potable water system in the interim until the necessary recycled water system infrastructure is constructed.

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[4] Based on a total estimated water use of 14,147,095 gallons per year.

3.0 REQUIRED DETERMINATIONS

The following sections describe the required determinations for a WSA.

3.1 Does SB 610 Apply to the Proposed Project?

> *10910 (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.*
>
> *10912 (a) "Project" means any of the following:*
>
> *(1) A proposed residential development of more than 500 dwelling units.*
>
> *(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*
>
> *(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*
>
> *(4) A proposed hotel or motel, or both, having more than 500 rooms.*
>
> *(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.*
>
> *(6) A mixed-use project that includes one or more of the projects specified in this subdivision.*
>
> *(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.*

As shown in Table 3-1, the Proposed Project does meet the definition of a "Project" as specified in California Water Code section 10912(a). The Proposed Project has not been the subject of a previously adopted WSA and has not been included in an adopted WSA for a larger project. Therefore, according to California Water Code section 10910(a), a WSA is required for the Proposed Project. The City has also determined that the Proposed Project is subject to the California Environmental Quality Act (CEQA) and that an EIR is required.

Table 3-1. Does the Proposed Project Meet the SB 610 Definition of a "Project"?

SB 610 Project Definition Components	Proposed Project Quantity	Meets the SB 610 Definition of a "Project"?
Residential > 500 dwelling units	N/A	NO
Retail > 1,000 employees or > 500,000 sf	N/A	NO
Commercial Office Building > 1,000 employees or > 250,000 sf	N/A	NO
Hotel/Motel > 500 rooms	N/A	NO
Industrial Plant/Park > 1,000 employees or > 40 acres or > 650,000 sf	1,938 employees 180 acres 2.42 million sf	YES
Mixed Use Project that includes one or more of the above	N/A	NO
A Project that would demand the amount of water required by a 500-dwelling unit project	N/A	NO
SB 610 Required?	--	**YES**

3.2 Does SB 221 Apply to the Proposed Project?

In 2001, SB 221 amended State law to require that approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply. Per California Government Code Section 66473.7(a)(1), a subdivision means a proposed residential development of more than 500 dwelling units. The Proposed Project does not include residential dwelling units and is therefore exempt from the requirements of SB 221.

3.3 Who is the Identified Public Water System?

> *10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project*
>
> *10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…*

The Proposed Project is located in the City limits. Therefore, the City of Roseville is the identified public water system for the Proposed Project.

3.4 Does the Identified Water Supplier have an adopted UWMP and does the UWMP include the projected water demand for the Proposed Project?

> *10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).*

The City's 2020 Urban Water Management Plan (UWMP) was adopted in June 2021 and is incorporated by reference into this WSA[5]. The City's 2020 UWMP included existing and projected water demands for existing and projected future land uses to be developed within the City's various specific plans through the year 2035. The water demand projections in the City's 2020 UWMP included existing City water demands, plus projected water demands for future developments, but did not include water demand projections for the Proposed Project, because the Proposed Project was not yet part of the City's development planning process. Therefore, this WSA has revised the water demand projections (UWMP Chapter 4) and the supply and demand comparison (UWMP Chapter 7) presented in the City's 2020 UWMP.

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[5] City of Roseville 2020 Urban Water Management Plan, June 2021.

4.0 CITY OF ROSEVILLE WATER SYSTEM

The following sections describe the City's existing water service area, including population and climate information.

4.1 Water Service Area

The City of Roseville Water Utility is a public utility owned and operated by the City of Roseville. The City is located along the Interstate 80 corridor, approximately 15 miles northeast of downtown Sacramento, California. The City obtains its surface water from Folsom Lake through wholesale purchase primarily from the United States Bureau of Reclamation (USBR) and additional water contracts with Placer County Water Agency (PCWA) and San Juan Water District (SJWD). The City also maintains and operates several production well sites that provide additional water supply reliability; the City plans to construct additional wells in the future. The City also operates a recycled water system to irrigate landscaped areas throughout the City.

The City's service area boundary lies within the limits of the City of Roseville. There are a few small areas within the City limits that are served by PCWA, SJWD, and Citrus Heights Water District (CHWD). The service area is approximately 3,150 acres.

4.2 Population

City water service area population projections differ slightly from total City population estimates as a small number of City residents are served by adjacent water purveyors. The City estimated its current and projected water service area population in its 2020 UWMP through coordination with the City's General Plan, direct input from the City's Planning Division, and previous studies performed by the City's Environmental Utilities Division. As shown in Table 4-1, the City projects approximately 38 percent growth to occur from 2020 to buildout in 2035, and assumes the population will then remain constant through the rest of the planning period.

Table 4-1. Current and Projected Service Area Population

2020	2025	2030	2035	2040	2045
140,187	151,742	170,526	193,190	193,190	193,190

Source: City of Roseville 2020 UWMP, DWR Table 3-1.

4.3 Climate

The City's water service area experiences cool winters and hot and dry summers. The City's climate is similar to the City of Sacramento approximately 15 miles southwest. Historical climate data reported in the City's 2020 UWMP was obtained from California Irrigation Management Information System (CIMIS) Station 155 in Sacramento and is summarized in Table 4-2. The average monthly temperature from 2016 to 2020 ranged from 39.8 degrees Fahrenheit (°F) to 95.1°F. Typically the wet season begins in October and ends in May, with an average annual total precipitation of 13.2 inches.

Table 4-2. Monthly Average Climate Data[a]

Month	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)	Average Temperature (°F)	Average Monthly Precipitation, inches
January	42.7	56.3	49.5	3.6
February	42.5	61.7	52.1	1.7
March	46.3	64.7	55.5	2.3
April	50.6	73.3	62.0	0.8
May	54.2	80.6	67.4	0.8
June	59.2	90.5	74.9	0.0
July	60.9	95.1	78.0	0.0
August	61.3	92.4	76.9	0.0
September	58.9	87.5	73.2	0.0
October	51.7	78.2	65.0	0.7
November	44.7	65.0	54.9	1.2
December	39.8	56.7	48.3	2.1
Average or Total	**51.1**	**75.2**	**63.1**	**13.2**

Source: City of Roseville 2020 UWMP, COR Table 3-E

(a) Values represent average monthly climate data for the CIMIS station 155 located in Sacramento from 2016 through 2020.

5.0 CITY OF ROSEVILLE WATER DEMANDS

> *10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).*

The descriptions provided below for the City's water demands have been taken, for the most part, from the City's 2020 UWMP (adopted in June 2021). As indicated above, the Proposed Project was not included in the City's 2020 UWMP, and the water demand projections have been updated to include the water demand for the Proposed Project.

5.1 Historical and Existing Water Demand

The City's water demand from 2015 to 2020 is shown in Table 5-1. Water demand has increased since 2015 when the drought and subsequent water use restrictions limited demand, but that growth has slowed in recent years. Water demand significantly increased in 2020 due to water transfers to other agencies, as well as groundwater banking via the City's aquifer storage and recovery (ASR) program.

Table 5-1. Historical and Current Water Demand, AF/yr

Use Type	2015[a]	2016[a]	2017[a]	2018[a]	2019[a]	2020[b]
Commercial	1,930	2,101	2,218	2,565	3,021	2,630
Industrial	934	954	921	797	276	254
Institutional/Governmental	561	650	770	384	393	412
Multi-Family	1,464	1,556	1,569	1,376	1,358	1,416
Single Family	11,680	13,215	14,674	15,303	15,387	17,115
Landscape	4,152	4,691	5,491	5,656	5,974	6,422
Losses[c]	2,128	2,330	2,683	2,141	1,865	1,599
Sales/Transfers/Exchanges to other Suppliers	0	0	0	0	0	1,451
Groundwater Recharge	0	0	0	0	0	597
Raw Water[d]	0	0	0	0	0	404
Total	**22,849**	**25,497**	**28,326**	**28,222**	**28,274**	**32,300**

(a) City of Roseville 2020 UWMP, COR Table 4-A. See note (c) for losses.
(b) City of Roseville 2020 UWMP, DWR Table 4-1.
(c) All water losses are from the City of Roseville 2020 UWMP; 2015-2019 water losses are from COR Table 4-D.
(d) Discharge to Linda Creek and water wheeled on behalf of SJWD.

5.2 Projected Water Demand

In the City's 2020 UWMP, projected water demands were calculated by applying the City's current land-used based unit water demand factors to land uses in the City's various specific plans at buildout. As shown in Table 5-2, buildout of all specific plans is assumed to occur in 2035 with a total potable and recycled water demand of 62,546 AF/yr and remains constant through 2045.

Table 5-2. 2020 UWMP Projected Normal Year Water Demand, AF/yr

Use Type	2025	2030	2035	2040	2045
Commercial	6,135	6,508	7,017	7,017	7,017
Industrial	4,175	4,726	5,123	5,123	5,123
Institutional/Governmental	8,904	9,494	10,321	10,321	10,321
Multi-Family	1,752	2,029	2,725	2,725	2,725
Single Family	22,564	24,508	26,281	26,281	26,281
Landscape	644	765	805	805	805
Losses	1,429	1,401	1,587	1,587	1,587
Sales/Transfers/Exchanges to other Suppliers(a)	0	0	0	0	0
Groundwater Recharge	1,560	2,720	3,350	3,350	3,350
Raw Water(b)	404	404	404	404	404
Recycled Water(c)	4,022	4,435	4,933	4,933	4,933
Total (Potable and Raw Water Only)	**47,567**	**52,555**	**57,613**	**57,613**	**57,613**
Total (All Sources)	**51,589**	**56,990**	**62,546**	**62,546**	**62,546**

Source: City of Roseville 2020 UWMP, DWR Table 4-2.

(a) The City has no planned contracts for water transfers from 2025-2045 as of the preparation of the 2020 UWMP.

(b) Discharge to Linda Creek and water wheeled on behalf of SJWD.

(c) Recycled water projections are from Table DWR 6-4 of the City's 2020 UWMP.

At the time the 2020 UWMP was prepared, the Proposed Project was not considered in the City's water demand projections, as described in Section 3.4. According to the Notice of Preparation (NOP) of an Environmental Impact Report prepared by the City in July 2021, Phase 1 of the Proposed Project will begin occupancy in 2025 with future phases to be determined later. This WSA assumes that the Proposed Project water demand will begin in the year 2025 and linearly increase until buildout in 2035, consistent with the 2020 UWMP.

The Proposed Project water demands are added to the 2020 UWMP potable water demands to obtain the revised water demand projections presented in Table 5-3.

Table 5-3. Revised Projected Water Demand, AF/yr

Demand Projection	2025	2030	2035	2040	2045
Potable and Raw Water Demand					
2020 UWMP(a)	47,567	52,555	57,613	57,613	57,613
Proposed Project	173	345	518	518	518
Subtotal	**47,740**	**52,900**	**58,131**	**58,131**	**58,131**
Recycled Water Demand					
2020 UWMP(a)	4,022	4,435	4,933	4,933	4,933
Proposed Project	14	29	43	43	43
Subtotal	**4,036**	**4,464**	**4,976**	**4,976**	**4,976**
Total Water Demand	**51,776**	**57,364**	**63,107**	**63,107**	**63,107**

(a) Table 5-2 this WSA.

5.3 Dry Year Water Demand

The City currently has a Water Shortage Contingency Plan (WSCP) in place, as described in Appendix K of the City's 2020 UWMP. The City assumed in its 2020 UWMP that water demand in single dry or multiple dry years would be equal to normal year water demand. This is a conservative assumption as additional water conservation would likely occur in the event of drought or another water supply shortage or emergency due to the implementation of additional water conservation measures outlined in the City's WSCP and Chapter 14.09 of the City's Municipal Code. The City's WSCP and Municipal Code include a five-stage plan describing specific actions to reduce water demand by greater than 50 percent in the event of a water supply shortage or emergency. The water shortage stages, and their respective anticipated reduction in potable water demand, are shown in Table 5-4.[6]

Table 5-4. Water Shortage Contingency Plan Projected Demand Reduction

Water Shortage Stage Description	Projected Demand Reduction, percent
Baseline Water Conservation	0%
Stage 1 Drought	Up to 10
Stage 2 Drought	Up to 20
Stage 3 Drought	Up to 30
Stage 4 Drought	Up to 40
Stage 5 Drought	Up to 50 and Greater than 50

Source: City of Roseville 2020 UWMP, Appendix K, WSCP Table 4.

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[6] City of Roseville 2020 Water Shortage Contingency Plan, June 2021.

6.0 CITY OF ROSEVILLE WATER SUPPLIES

The descriptions provided below for the City's water supplies have been taken, for the most part, from the City's 2020 UWMP (adopted in June 2021).

6.1 Roseville Existing and Projected Water Supplies

The City currently receives water from the following sources:

- Untreated surface water from the Folsom Reservoir through water supply contracts with PCWA, USBR, and SJWD;
- Groundwater from the North American Subbasin of the Sacramento Valley Groundwater Basin pumped from six groundwater wells, four of which possess ASR capability; and
- Recycled water delivered through the City's recycled water system.

Each of these existing supplies is discussed below.

6.1.1 Purchased and Imported Water

6.1.1.1 Surface Water from Folsom Lake

The City has historically relied heavily on its water supply contracts with PCWA, the USBR, and SJWD. The four untreated surface water contract entitlements for American River supply total 66,000 AF/yr. The City's current contract and supplies are outlined in Table 6-1.

Table 6-1. Purchased Surface Water Supply Summary

Contract Supply	Supply Type	Quantity, AF	Availability
USBR	Raw Surface Water	32,000	Subject to CVP M&I Usage Policy[(a)]
PCWA	Raw Surface Water	30,000	All Year Types
SJWD	Raw Surface Water	800	Normal or Wet Hydrologic Years
SJWD	Raw Surface Water	3,200	Normal or Wet Hydrologic Years

Source: City of Roseville 2020 UWMP, COR Table 6-A

(a) The City's USBR supply is subject in any year to determinations of allotments based on unimpaired inflow to Folsom Reservoir and downstream operations. See Section 7.1 and subsections for further discussion.

Water supplies from all three source agencies outlined above are received through the same point location at Folsom Dam. Folsom Lake has been the primary source of water supply for the City of Roseville since 1971. Surface water from the American River is collected and diverted at the Folsom Lake Pumping Plant located at Folsom Dam.The City receives supplies from all four of its raw water contract entitlements through the Folsom Lake Municipal and Industrial (M&I) Intake at this facility.

Untreated water supplies received at this point are conveyed by gravity or pumped by USBR depending on lake level through two parallel pipelines (84-inch and 72-inch) to the City's Barton Road Water Treatment Plant (BRWTP), with a capacity for treatment of up to 100 million gallons per day (mgd). The 72-inch pipeline was constructed in 2010 to increase redundancy and reliability of this critical supply route, in partnership with SJWD. Additionally, the City has 17 intertie facilities with neighboring agencies through which water supplies may be transferred under normal water year conditions as well as emergency or drought conditions. In the future, the City is exploring options with PCWA to facilitate receipt of treated water directly through existing and/or new intertie facilities.

6.1.1.2 Other Available Water Purchases

The City may choose to purchase Article 3F water from the USBR when such supply is available.This supply source is typically only available in winter and spring months as it is generally considered "excess flow" released by the USBR above and beyond the entitlements of downstream users. In 2019, the City exercised this option and used approximately 950 AF of Article 3F water as part of their ASR program to inject and recharge the aquifer. This effort represented a continued commitment to provide not only water supply reliability for the City's residents, but also to support conjunctive use to aid in regional water supply reliability.

6.1.2 Groundwater

In recent years, the City has taken significant steps to expand and strengthen their groundwater program to broaden the City's water supply portfolio. The City currently owns and maintains six operational groundwater wells,with six additional wells planned for development in the next ten years, and one planned destruction. Four of the six operational wells are capable of ASR whereby treated water is injected into the underlying aquifer for later extraction and use. Currently, the City plans to design all new wells with ASR capability, as the City moves toward a more diversified water supply portfolio.

Groundwater is considered to be available for use as part of the City's water supply portfolio in all year types including normal, single dry, or multiple dry year scenarios. Importantly, groundwater will be a critical resource in future drought years as it supplements increasingly vulnerable surface water supplies.

6.1.2.1 Groundwater Basin Description

The City is located over the North American Subbasin of the Sacramento Valley Groundwater Basin. The North American Subbasin (DWR Groundwater Basin Number 5-21.64) is located in the eastern central portion of the Sacramento Valley Groundwater Basin, encompassing portions of Sutter, Placer, and Sacramento Counties. As of 2020, the Basin is listed by the California Department of Water Resources (DWR) as high priority in large part due to the population in the basin and the existing and projected future groundwater use, but the Basin has neither been adjudicated nor is it considered in overdraft or critical overdraft conditions.

Groundwater elevations in the subbasin along the Placer/Sacramento County line declined at a rate of 1 to 1.5 feet per year for multiple decades until approximately the mid-1990s. Some of the largest decreases have occurred in the area of the former McClellan Air Force Base. From 1995, groundwater elevations were stabilized, and the declining elevation trend was dampened due to groundwater management activities stemming from the Water Forum Agreement (see Section 7.1.1) restraining further increases in groundwater pumping and implementation of in-lieu banking in the region. Groundwater elevations in Sutter and northern Placer counties generally remain stable, although some wells in southern Sutter County have experienced declines.

In addition, the subbasin has historically been pumped by agricultural and urban users. Recently, in some areas of the subbasin, agricultural land has been and is being developed and converted to urban uses. The subbasin currently operates within the most recent estimate of sustainable yield.

6.1.2.2 Historical Groundwater Production

Until recently, groundwater had not been utilized by the City under normal year conditions. In the City's 2015 UWMP, the City's groundwater wells were identified for use only in drought or emergency conditions, with minimal pumping for the purpose of maintenance or demonstration of the City's ASR program. Over the last five years, the City has worked to advance and expand the groundwater infrastructure and groundwater program to provide additional water supply reliability.

Beginning in 2018, the City began to regularly operate existing groundwater infrastructure, specifically by pumping small volumes of groundwater from the City's production wells and serving that water into the distribution system as part of the maintenance plan. In 2019 and 2020, the City was able to store excess surface water using the ASR production wells to inject water into the aquifer. As the City continues to develop this program and look to the future of sustainable supply, groundwater pumping patterns will continue to evolve. A summary of the amount of groundwater pumped by the City over the past five years is provided in Table 6-2.

Table 6-2. Historical Groundwater Production, AF/yr

2016	2017	2018	2019	2020
0	0	17	23	201

Source: City of Roseville 2020 UWMP, DWR Table 6-1

6.1.2.3 Groundwater Management

The City actively manages groundwater resources both internally in coordination with land use planning and growth projections as well as regionally in accordance with the provisions of the Sustainable Groundwater Management Act. These efforts are discussed in the following subsections.

6.1.2.3.1 Western Placer County Groundwater Management

A Groundwater Management Plan (GMP) was completed in November of 2007 in accordance with Senate Bill 1938 and Assembly Bill 3030 in cooperation with PCWA, City of Lincoln, and California American Water.

6.1.2.3.2 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA) contains a framework for sustainable management of groundwater supplies by local agencies, with a limited role for state intervention if local agencies fail to meet the requirements of SGMA. SGMA lays out a process and a timeline for local authorities to achieve sustainable management of high and medium-priority groundwater basins throughout the state. It also provides tools, authorities, and deadlines to achieve statewide sustainable groundwater management. For local agencies involved in implementation, the requirements are significant and will take years to accomplish. DWR has the responsibility to evaluate local agency progress, while the California State Water Resources Control Board (SWRCB) may intervene if DWR determines that local agencies fail to make progress and achieve the requirements of SGMA. Local agencies who volunteer to comply with SGMA must form a Groundwater Sustainability Agency (GSA) and prepare, adopt, and implement a Groundwater Sustainability Plan (GSP) that meets the requirements of SGMA.

More specifically, critical required steps include the formation of GSAs within two years of when SGMA became effective; the adoption of GSPs within five to seven years depending on the status of the basin in question (in critical overdraft condition or not); and preparation, adoption, and implementation of a GSP(s) that achieves the sustainability goal within 20 years of plan adoption.

SGMA applies to basins or subbasins designated by DWR as high or medium-priority, based on a statewide prioritization that uses criteria including population, importance and amount of groundwater pumped, extent of irrigated agriculture dependent on groundwater, and other criteria. DWR's final Basin Prioritization findings indicate that there are 127 of California's 515 groundwater basins and subbasins which are high and/or medium-priority. These high and medium-priority basins account for 96 percent of California's annual groundwater pumping and include 88 percent of the State's population. The priority ranking for the North American Subbasin of the Sacramento Valley Groundwater Basin (from which the City pumps groundwater) is 24 out of the state's 515 basins, with an overall ranking score of 22.5 and a designation of high-priority.

The City is well along the path of SGMA compliance, having joined the West Placer Groundwater Sustainability Agency (WPGSA) consisting of the City of Lincoln, Placer County Water Agency, Nevada Irrigation District, and the County of Placer. The WPGSA is one of a group of five GSAs formed within the North American Subbasin that consist of the West Placer, Sacramento, South Sutter Water District, Sutter County, and Recreation District 1001 GSAs. All five of these GSAs will prepare and submit one joint GSP for the entire subbasin. This GSP has been submitted to DWR for review, and the public comment period closed on April 16, 2022.

6.1.2.3.3 Aquifer Storage and Recovery

The City considers development of a diverse and drought resistant water supply portfolio of primary importance. To this end, the City has invested in both planning and capital improvements to develop their ASR program into a highly functional and critical component of the City's future. The ASR program utilizes groundwater pumping infrastructure along with existing water supplies to increase reliability. ASR wells can inject treated surface water from the distribution system into the groundwater aquifer for later extraction and use.

ASR production wells can be used seasonally (i.e., throughout the water year) or periodically over many years to create a "groundwater bank", storing surface water supplies within the aquifer in times of abundance (wet seasons or wet years) for use in times of scarcity (dry season or dry years). An important component of an ASR program is to maintain consistent and detailed records of groundwater levels within the aquifer and extraction/injection volumes. This information is used to ensure the groundwater basin is managed sustainably providing water supply reliability benefits while avoiding impacts to the groundwater basin. The City is a committed leader in the region with respect to the development of potential future cooperative water banking and responsible regional resource management.

6.1.3 Recycled Water

The Proposed Project will utilize recycled water for landscape irrigation demand and construct the necessary recycled water system infrastructure required to connect to the City's existing recycled water system[7]. The City has been successfully irrigating landscaped areas through the City with recycled water and is planning recycled water implementation as part of new developments. The City operates the recycled water program through the requirements of Master Reclamation Permit Order 97-147 (Permit).

Current uses of recycled water within the City include irrigation of landscapes and golf courses, industrial cooling for the Roseville Energy Park, and construction purposes such as dust control and soil compaction; recycled water is also conveyed outside the City's service area for golf course and landscape irrigation.

The City prepared the 2016 Recycled Water Systems Evaluation to position the City for implementing the next phases of recycled water projects as new users within the City come online, and as the various Urban Growth Areas plan for and install recycled water system infrastructure. The City continues to utilize recycled water supplies to promote responsible water supply management. Beneficial use of available disinfected tertiary treated Title 22 recycled water allows surface water and groundwater supplies to be applied to potable uses.

As of 2020, the peak recycled water production occurs in July and is approximately equal to the peak recycled water demand in July. For the City to further expand recycled water usage during the irrigation season, additional recycled water must be made available. This will most likely be accomplished through expansion of operational storage, with the necessary storage volume dependent on actual demand requirements. Therefore, the City will continue to evaluate City and regional recycled water demands and consider its ability to provide recycled water for future developments.

A major hindrance to expanding use of recycled water in existing developments is lack of infrastructure. Installing new infrastructure in existing areas is exceedingly expensive. The City requires use of recycled water for all commercial irrigation services in newly developing master planned areas, in which the infrastructure can be installed as part of the new construction, such as the Proposed Project.

6.2 Future Water Supply Projects

Future water supply project opportunities, including diversifying the purchasing or importing of water, expansion of the City's groundwater and ASR program, and regional cooperative conjunctive use, are discussed in the following sections.

6.2.1 Purchased or Imported Water

In addition to the current contract with PCWA for 30,000 AF/yr of surface water, the City is evaluating and may enter an agreement with PCWA for additional treated surface water supplies available in all hydrologic year types.The treated PCWA water would be supplied by PCWA's future Ophir Water Treatment Plant (Ophir WTP) which will treat water from the Middle Fork Project. The Ophir WTP will be constructed in phases, with the first phase expected to be operational by 2035 and provide an estimated 10 mgd of total supply to all customers. Additional phases will be evaluated as PCWA wholesale customers need

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[7] Laugenour and Meikle Civil Engineers. August 2021. Draft Recycled Water Study for Roseville Industrial Project.

additional supply. The City may purchase up to 3 mgd of normal year capacity from the Ophir WTP, equivalent to 3,360 AF/yr of treated surface water supply.

The City is also exploring future opportunities for water transfers with regional partner agencies in an effort to diversify regional water management strategies in conjunction with responsible groundwater management practices. In 2019, the City executed an agreement for a pilot water transfer program with Sacramento Municipal Utilities District (SMUD). This agreement allows for an annual water transfer for up to 6,000 AF for three years. The transfer allows the City to use wet season supply to recharge the groundwater aquifer for later extraction and use. The City may look to renew this transfer or evaluate similar opportunities in coming years to provide drought resiliency and support the sustainable management of groundwater.

6.2.2 Groundwater and ASR Program

The City has historically relied upon groundwater resources only as a backup supply in times of shortage. In recent years and in response to lessons learned during the 2015 drought, changing climate conditions, and the overall need for further diversity and reliability of water supply, the City has invested in efforts to operate and expand its groundwater program as a regular part of its water supply portfolio in all year types. During the development of the GSP, the City evaluated current infrastructure, potential new well sites, and developed further understanding of the conditions and accessibility of the aquifer within the City's service area boundary to determine how groundwater planning would look moving forward. The result of these planning efforts has been the identification of six future well sites.

Conceptual design and siting have been completed for these sites, with exploratory drilling. The City plans to develop these wells and their above-ground improvements within the next 5 to 10 years, all with ASR capability to enhance flexibility of water system operations and expand the City's conjunctive use capabilities. For planning purposes, each well is assumed to extract a nominal 1,750 gallons per minute (gpm), with a final production value to be determined upon completion of well drilling and development. These six future wells are expected to represent a total of 16,936 AF/yr of additional water supplies.

7.0 WATER SUPPLY RELIABILITY

> *10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*
>
> *10911(a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:*
>
> *(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.*
>
> *(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.*
>
> *(3) Based on the consideration set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to able to acquire additional water supplies.*

The reliability discussion provided below has been taken, for the most part, from the City’s 2020 UWMP (adopted in June 2021).

7.1 Surface Water Reliability

The City’s purchased surface water supply is subject to reductions during dry years (seasonal and climatic shortages) pursuant to the Water Forum Agreement (WFA), the USBR Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP). These agreements and programs are discussed in greater detail in the following subsections.

7.1.1 Sacramento Water Forum Agreement

The Sacramento Water Forum is a diverse group of business and agricultural leaders, citizen groups, environmentalists, water managers, and local governments working together to balance two co-equal objectives:

1. Provide a reliable and safe water supply for the Sacramento region’s long-term growth and economic health.
2. Preserve the fishery, wildlife, recreational and aesthetic values of the Lower American River.

The City along with several other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement (WFA) which includes Purveyor Specific Agreements, with the most recent revisions adopted in 2015. The WFA provides the framework for how water resources, including surface water and groundwater supplies, would be used in the region through the year 2030. The City’s Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under various hydrologic conditions. The Water Forum categorized water years into three types, all of which are defined in terms of the projected March through November unimpaired flow into Folsom Reservoir. The City's diversions from the American River are limited by the WFA in accordance with the hydrologic conditions outlined in Table 7-1.

Table 7-1. WFA Hydrologic Year Characterization and Limits on City Supplies

WFA Year Type	Required Unimpaired Flow into Folsom Reservoir, AF[a]	Maximum Volume of American River Water Diverted by the City, AF[b]
Normal/Average or Wet	≥ 950,000	58,900
Drier	400,000 to 950,000	43,800 to 58,900[c]
Driest/Critically Dry	≤ 400,000	43,800

(a) From City of Roseville 2020 UWMP, Table 7-A.

(b) From City of Roseville 2020 UWMP, Figure 7-1.

(c) In drier years, the City's maximum diversion from the American River is calculated linearly between 43,800 AF and 58,900 AF, based on the required amount of unimpaired flow between 400,000 AF and 950,000 AF.

It is important to note that during the drier and driest years, the City has an agreement with PCWA to release an additional 20,000 AF/yr of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project (MFP). This 20,000 AF/yr of water is not part of the City's contracted supply of 66,000 AF/yr. The intent of the MFP re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

7.1.2 USBR Operations and Criteria Plan

In addition to the WFA, the City's USBR supply is also subject to restrictions as detailed in the 2004 Long-Term Central Valley Project Operations Criteria and Plan. Chapter 5 of the OCAP entitled "Operations Forecasting" states that CVP allocations can be affected by:

- Forecasted reservoir inflows and Central Valley hydrologic water supply;
- Current amounts of storage in upstream reservoirs and in San Luis Reservoir;
- Projected water demands in the Sacramento Valley;
- Instream and Sacramento-San Joaquin Delta (Delta) regulatory requirements;
- Annual management of 3406(b)(2) resources (related to fish and wildlife); and/or
- Efficient use of CVP-SWP export capacity through Joint Point of Diversion flexibility.

The OCAP includes a requirement that contractors be informed by USBR no later than February 15 of any possible deficiency in supplies that year. Since 1992, increasing constraints placed on operations by legislative and Endangered Species Act (ESA) requirements have made water delivery to CVP contractors more difficult, with recent drought conditions further impacting deliveries. Additionally, it is important to note that the City's USBR water deliveries may be curtailed purely based on downstream Delta conditions, irrespective of available upstream supply.

For the purposes of this WSA, the City's USBR contracted amount is assumed to be reduced by 75 percent in single dry years and the fifth year of a five-year drought. This represents the actual curtailments experienced by the City in 2015, and is the largest reduction imposed on the City's USBR supply to date.

The full 32,000 AF is assumed to be available in the first multiple dry year and will decrease by 8,000 AF for each subsequent dry year.

7.1.3 Central Valley Project Municipal and Industrial Water Shortage Policy

Upon a condition of shortage as determined by the OCAP, the CVP M&I WSP details the "incremental steps" by which available M&I water supply is allocated to the CVP water service contractors. Elements of the CVP M&I WSP include:

- Defining water shortage terms and conditions for applicable CVP water service contractors, as appropriate.
- Determining the quantity of water made available to CVP water service contractors that, together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies would assist the M&I water service contractors in their efforts to protect public health and safety during severe or continuing drought.
- Providing information to CVP water service contractors for their use in water supply planning and development of drought contingency plans.

The Final Environmental Impact Statement (EIS) describes the existing setting, alternatives for future operations under the CVP M&I WSP, and potential environmental impacts of each alternative. USBR selected Alternative 4, the Preferred Alternative, which comprises the Updated CVP M&I WSP developed by USBR with stakeholder input received during preparation of the Final EIS. The decision will allow USBR the greatest degree of flexibility to address CVP water service contractors' needs during a shortage condition while recognizing that CVP deliveries are subject to the amount of CVP water available. The updated CVP M&I WSP also provides clarity to the terms, conditions, and procedures of the CVP M&I WSP.

7.2 Groundwater Reliability

While the City's groundwater supply is not limited in different year types like its purchased supply, the City intends to use their groundwater supply differently in different year types:

- **Normal Years –** In a normal year the City would typically extract less than or equal to the volume injected.
- **Single Dry Years –** In a single dry year the City would expect to pump for six months of the year at 90 percent of total extraction capacity.
- **Multiple Dry Years –** In the fifth year of a five-year drought, the City would expect to pump for six months of the year at 90 percent capacity.

A more detailed summary of the City's available groundwater supply is tabulated in Sections 7.4 and 7.5.

7.3 Recycled Water Reliability

Recycled water is considered 100 percent reliable in all water types. For the purposes of this WSA, projected recycled water supply is assumed to be equal to demand. Showing recycled water surpluses would incorrectly assume that potable water shortages could be offset by recycled water. Therefore, the Proposed Project recycled water demand of 43 AF/yr has been added to the City's recycled water supplies shown in Sections 7.4 and 7.5.

7.4 Normal Year Water Supply

The City's available water supplies in normal years are shown in Table 7-2.

Table 7-2. Normal Year Available Water Supplies, AF/yr

Supply Source	2025	2030	2035	2040	2045
USBR	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation[(a)]	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	3,360	3,360	3,360
Groundwater	1,560	2,720	3,350	3,350	3,350
Recycled Water[(b)]	4,036	4,464	4,976	4,976	4,976
Total	**64,496**	**66,084**	**70,586**	**70,586**	**70,586**

Source: City of Roseville UWMP, COR Table 7-D

(a) The WFA limits the City's maximum surface water diversion to 58,900 AF in normal/wet years, even if there are no curtailments on the City's total contract amounts of 66,000 AF.

(b) Recycled water supply assumed equal to demands projected in Table 5-3 of this WSA.

7.5 Dry Year Water Supply

The City's available water supplies in single dry years are shown in Table 7-3.

Table 7-3. Single Dry Year Available Water Supplies, AF/yr

Supply Source	2025	2030	2035	2040	2045
USBR[(a)]	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0
PCWA (Future)	0	0	3,360	3,360	3,360
Groundwater[(b)]	7,920	12,570	14,431	14,431	14,431
Recycled Water[(c)]	4,036	4,464	4,976	4,976	4,976
Total	**49,956**	**55,034**	**60,767**	**60,767**	**60,767**

Source: City of Roseville UWMP, COR Table 7-D

(a) Assumes a 75 percent curtailment of the USBR contracted value, based on the same curtailment experienced in 2015.

(b) Groundwater is not used as a significant source of supply until a Drought Stage 3 of the WSCP is declared by the City.

(c) Recycled water supply assumed equal to demands projected in Table 5-3 of this WSA.

The City's available water supplies in multiple dry years are shown in Table 7-4.

Table 7-4. Multiple Dry Years Available Water Supplies, AF/yr

Supply Source	2025	2030	2035	2040	2045
Multiple Dry Year 1					
USBR	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	3,360	3,360	3,360
Groundwater	1,560	2,720	3,350	3,350	3,350
Recycled Water(a)	4,036	4,464	4,976	4,976	4,976
Total	**64,496**	**66,084**	**70,586**	**70,586**	**70,586**
Multiple Dry Year 2					
USBR	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0
PCWA (Future)	0	0	3,360	3,360	3,360
Groundwater	1,560	2,720	3,350	3,350	3,350
Recycled Water(a)	4,036	4,464	4,976	4,976	4,976
Total	**59,596**	**61,184**	**65,686**	**65,686**	**65,686**
Multiple Dry Year 3					
USBR	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0
PCWA (Future)	0	0	3,360	3,360	3,360
Groundwater	1,560	2,720	3,350	3,350	3,350
Recycled Water(a)	4,036	4,464	4,976	4,976	4,976
Total	**59,596**	**61,184**	**65,686**	**65,686**	**65,686**
Multiple Dry Year 4					
USBR	16,000	16,000	16,000	16,000	16,000
PCWA	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0
PCWA (Future)	0	0	3,360	3,360	3,360
Groundwater	1,560	2,720	3,350	3,350	3,350
Recycled Water(a)	4,036	4,464	4,976	4,976	4,976
Total	**51,596**	**53,184**	**57,686**	**57,686**	**57,686**

Table 7-4. Multiple Dry Years Available Water Supplies, AF/yr

Supply Source	2025	2030	2035	2040	2045
Multiple Dry Year 5					
USBR	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0
PCWA (Future)	0	0	3,360	3,360	3,360
Groundwater	7,920	12,570	14,431	14,431	14,431
Recycled Water[(a)]	4,036	4,464	4,976	4,976	4,976
Total	**49,956**	**55,034**	**60,767**	**60,767**	**60,767**

Source: City of Roseville UWMP, COR Table 7-D

(a) Recycled water supply assumed equal to demands projected in Table 5-3 of this WSA.

8.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

> *10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*
>
> *10911 (a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies.*

Pursuant to California Water Code section 10910(c)(4) and based on the technical analyses described in this WSA, the City finds that the total projected water supplies determined to be available for the Proposed Project through 2045 will meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses.

Table 8-1 summarizes the projected availability of the City's existing and planned future water supplies and the City's projected water demands in normal, single dry, and multiple dry years through 2045. There is sufficient supply to meet projected demands in normal years through buildout. In single dry years and years four and five of an extended drought, some supply shortages are shown ranging from approximately 0.3 percent to 8.6 percent of projected demand. As discussed in Section 5.3, projected demands were not reduced in dry years to remain conservative. It is expected that the City will implement the provisions of its WSCP to reduce demand in years where a shortage is likely.

Table 8-1. Summary of Water Demand Versus Supply During Hydrologic Normal, Single Dry, and Multiple Dry Years

Year Type	Supply and Demand Comparison				
	2025	2030	2035	2040	2045
Normal Year					
Available Potable Water Supply(a)	64,496	66,084	70,586	70,586	70,586
Total Water Demand(b)	51,776	57,364	63,107	63,107	63,107
Surplus (Deficit)	12,720	8,720	7,479	7,479	7,479
Percent Shortfall	--	--	--	--	--
Single Dry Year					
Available Potable Water Supply(c)	49,956	55,034	60,767	60,767	60,767
Total Water Demand(b)	51,776	57,364	63,107	63,107	63,107
Surplus (Deficit)	(1,820)	(2,330)	(2,340)	(2,340)	(2,340)
Percent Shortfall	3.5%	4.1%	3.7%	3.7%	3.7%
Multiple Dry Year 1					
Available Potable Water Supply(d)	64,496	66,084	70,586	70,586	70,586
Total Water Demand(b)	51,776	57,364	63,107	63,107	63,107
Surplus (Deficit)	12,720	8,720	7,479	7,479	7,479
Percent Shortfall	--	--	--	--	--
Multiple Dry Year 2					
Available Potable Water Supply(d)	59,596	61,184	65,686	65,686	65,686
Total Water Demand(b)	51,776	57,364	63,107	63,107	63,107
Surplus (Deficit)	7,820	3,820	2,579	2,579	2,579
Percent Shortfall	--	--	--	--	--
Multiple Dry Year 3					
Available Potable Water Supply(d)	59,596	61,184	65,686	65,686	65,686
Total Water Demand(b)	51,776	57,364	63,107	63,107	63,107
Surplus (Deficit)	7,820	3,820	2,579	2,579	2,579
Percent Shortfall	--	--	--	--	--
Multiple Dry Year 4					
Available Potable Water Supply(d)	51,596	53,184	57,686	57,686	57,686
Total Water Demand(b)	51,776	57,364	63,107	63,107	63,107
Surplus (Deficit)	(180)	(4,180)	(5,421)	(5,421)	(5,421)
Percent Shortfall	0.3%	7.3%	8.6%	8.6%	8.6%
Multiple Dry Year 5					
Available Potable Water Supply(d)	49,956	55,034	60,767	60,767	60,767
Total Water Demand(b)	51,776	57,364	63,107	63,107	63,107
Surplus (Deficit)	(1,820)	(2,330)	(2,340)	(2,340)	(2,340)
Percent Shortfall	3.5%	4.1%	3.7%	3.7%	3.7%

(a) Normal Year water supplies are from Table 7-2.

(b) Projected water demand is from Table 5-3. This WSA conservatively assumes no reduction in water demand in dry years, consistent with the City of Roseville's 2020 UWMP.

(c) Single dry year water supplies are from Table 7-3.

(d) Multiple dry year water supplies are from Table 7-4.

9.0 WATER SUPPLY ASSESSMENT APPROVAL PROCESS

> *10910 (g)(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.*

The Roseville City Council must approve this WSA at a regular or special meeting. Furthermore, this WSA must be included in the Draft EIR being prepared for the Proposed Project.

10.0 REFERENCES

City of Roseville Development Services Planning Division. 2021. *Notice of Preparation: Roseville Industrial Park Project.* July 2021.

City of Roseville. 2021. *Design Standards Section 8 – Domestic Water Supply System*. Accessed at https://www.roseville.ca.us/government/departments/development_services/engineering_land_development/construction_management_inspection/design_construction_standards, on September 16, 2021.

Laugenour and Meikle Civil Engineers. 2021. *Draft Recycle Water Study for Roseville Industrial Project.* August 2021.

Laugenour and Meikle Civil Engineers. 2021. *Draft Potable Water Study for Roseville Industrial Project.* September 2021

Laugenour and Meikle Civil Engineers. 2022. *Potable Water Master Plan for Roseville Industrial Project.* March 2022.

Water Works Engineers, LLC. 2021. *City of Roseville 2020 Urban Water Management Plan.* June 2021.

Water Works Engineers, LLC. 2021. *City of Roseville 2020 Water Shortage Contingency Plan.* June 2021.

Appendix A

Project Water Demand

Table 2 – Potable Water Demand

Location on Site	Water Demand Area (ac)	Land Use	Average Day Unit Water Demand Factor[(a)]	Unit-Factor Units	Average Day Demand (gpd) (gpd)[(b)]	Annual Demand (ac-ft/yr)	Peaking Factor[(c)]	Maximum Day Demand	Peaking Factor[(d)]	Peak Flow (gpd)[(e)]	Design Flow (gpm)
Area 1	81.27	M2, General Industrial	2,562	gpd/acre	208,209	233.2	2.0	416,417	1.7	707,909	492
Area 2	48.50	M1, Light Industrial	2,598	gpd/acre	126,008	141.2	2.0	252,016	1.7	428,428	298
Area 3	0.90	PQP, Public Quasi Public	1,780	gpd/acre	1,609	1.8	2.0	3,218	1.7	5,471	4
Area 4	0.17	PQP, Public Quasi Public	1,780	gpd/acre	306	0.3	2.0	612	1.7	1,041	1
Area 5	16.19	OS/Open Space	0	gpd/acre	0	0.0	2.0	0	1.7	0	0
Area 6	16.98	M2, General Industrial	2,562	gpd/acre	43,495	48.7	2.0	86,990	1.7	147,883	103
Area 7	31.86	M1, Light Industrial	2,598	gpd/acre	82,777	92.7	2.0	165,555	1.7	281,443	195
Area 8	21.19	PQP, Public Quasi Public[(f)]	0	gpd/acre	0	0	2.0	0	1.7	0	0
Area 9	17.34	Future Placer Parkway[(g)]	0	gpd/acre	0	0	2.0	0	1.7	0	0

(a) From Table of Section 8-6 of the City of Roseville Design Standards (January, 2020) (gpd/ac).

(b) Average Day Demand (gallons per day) = Water Demand Area x Average Day Demand Unit Flow Factor.

(c) Peaking factor from average day demand to maximum day demand per Section 8-7 of the City of Roseville Design Standards (January, 2020).

(d) Peaking factor from maximum day demand to peak hour demand per Section 8-7 of the City of Roseville Design Standards (January, 2020).

(e) Peak Hour Demand = Peaking Factor * Maximum Day Demand.

(f) Area 9 will not be served by the Proposed Project.

(g) The future Placer Parkway is not part of this Master Plan; therefore, no water demand is included in the Report.

Roseville Industrial Park North Worksheet

Reference Evapotranspiration (Eto) 52.2

Regular Landscape Areas There are no special landscape areas. Trees count as 25 sq'

Hydrozone#	Plant Factor	Irrigation Method	Irrigation Efficiency	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF X Area	Estimated Total Water Use (GPY)
1	0.2	Drip	0.81	0.25	306,605	76,651	2,480,741
2	0.4	Drip	0.81	0.49	76,651	37,559	1,215,559
3	0.2	Bubbler	0.81	0.25	7,750	1,938	62,705
4	0.4	Bubbler	0.81	0.49	1,650	809	26,166
Total					392,656		3,785,172

Maximum Allowed Water Allowance (MAWA)	5,718,563
Estimated Total Water Use (ETWU)	3,785,172
Average ETAF	0.27
Allowed ETAF	0.45

🟧	Total Landscape Area
🟨	Total Gallons Per Year Allowed Per The Model Water Efficient Landscape Ordinance
🟩	Total Gallons Per Year Projected Per The Projected Irrigation Design Usage

Roseville Industrial Park Worksheet

Reference Evapotranspiration (Eto) 52.2

Regular Landscape Areas There are no special landscape areas. Trees count as 25 sq'

Hydrozone#	Plant Factor	Irrigation Method	Irrigation Efficiency	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF X Area	Estimated Total Water Use (GPY)
1	0.2	Drip	0.81	0.25	848,078	212,020	6,861,799
2	0.4	Drip	0.81	0.49	207,507	101,678	3,290,721
3	0.2	Bubbler	0.81	0.25	12,700	3,175	102,756
4	0.4	Bubbler	0.81	0.49	6,725	3,295	106,647
Total					1,075,010		10,361,923

Maximum Allowed Water Allowance (MAWA)	15,656,231
Estimated Total Water Use (ETWU)	10,361,923
Average ETAF	0.27
Allowed ETAF	0.45

🟧	Total Landscape Area
🟨	Total Gallons Per Year Allowed Per The Model Water Efficient Landscape Ordinance
🟩	Total Gallons Per Year Projected Per The Projected Irrigation Design Usage

Concord

1001 Galaxy Way, Suite 310
Concord CA 94520
925-949-5800

Davis

2020 Research Park Drive, Suite 100
Davis CA 95618
530-756-5905

Eugene

1650 W 11th Avenue, Suite 1-A
Eugene OR 97402
541-431-1280

Lake Forest

23692 Birtcher Drive
Lake Forest CA 92630
949-420-3030

Lake Oswego

5 Centerpointe Drive, Suite 130
Lake Oswego OR 97035
503-451-4500

Oceanside

804 Pier View Way, Suite 100
Oceanside CA 92054
760-795-0365

Olympia

825 Legion Way SE, Suite A6
Olympia WA 98501
360-350-4523

Phoenix

4505 E Chandler Boulevard, Suite 230
Phoenix AZ 85048
602-337-6110

Pleasanton

6800 Koll Center Parkway, Suite 150
Pleasanton CA 94566
925-426-2580

Sacramento

8950 Cal Center Drive, Bldg. 1, Suite 363
Sacramento CA 95826
916-306-2250

San Diego

11939 Rancho Bernardo Road, Suite 100
San Diego CA 92128
858-505-0075

Santa Rosa

2235 Mercury Way, Suite 105
Santa Rosa CA 95407
707-543-8506

POTABLE WATER MASTER PLAN

PHILLIP ROAD
ROSEVILLE, CALIFORNIA
(PLANNING APPLICATION 21-0193)

March 1, 2022

Panattoni Development Company, Inc.
8775 Folsom Boulevard, Suite 200
Sacramento, CA 95826
(916) 340-2424

Prepared By:

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Table of Contents

Tables:

Exhibit:

Appendices:

I. INTRODUCTION

The Roseville Industrial Park Project (Proposed Project) Potable Water Master Plan (Plan) has been prepared at the request of Panattoni Development Company, Inc. (PDC) to meet the City of Roseville's (City) utility demand planning requirements and in support of the Roseville Industrial Park environmental review process.

Proposed land uses, tributary areas, irrigation generation rates, peaking factors are used to size the potable water facilities for the project. The project will connect to the potable water line located in Blue Oaks Boulevard at the intersection with Cloud Dance Drive.

The purposes of this Potable Water Master Plan are as follows:

- Estimate the expected potable water system demand for the Proposed Project during Phase 1 and complete build-out.
- Determine impacts on the neighboring Creekview Specific Plan Area (CVSP) and Amoruso Ranch Specific Plan Area (ARSP).
- Size potable water system main pipelines for the Proposed Project.

I.A. PROJECT VICINITY:

The Proposed Project is located in the northwest edge of the City of Roseville as shown on **Exhibit 1 – Project Location Plan**. Pleasant Grove Creek and the Pleasant Grove Bypass Channel dissect the Proposed Project.

The southern portion of the Proposed Project is known as Phase 1 and will be the first area to be constructed. It is bounded by the extension of Blue Oaks Boulevard to the south, Phillip Road to the west, the Pleasant Grove Bypass Channel to the north, and the Creekview Subdivision to the east.

The northern portion of the Proposed Project will be constructed after the southern portion. It is bounded by the Pleasant Grove Creek to the south, the future Placer Parkway to the west, the Amoruso Specific Plan to the north, and the Creekview Subdivision to the east.

I.B. PRE-DEVELOPMENT CONDITIONS:

The Proposed Project site is an undeveloped agricultural parcel that was originally planted during the 1950's, maintained in rice production through the 1990's, and has been planted in irrigated crops until the present.

The Pleasant Grove Creek Bypass Channel was constructed south of Pleasant Grove Creek during the summer of 2019 to augment flood mitigation/control in this area.

A 10-foot to 15-foot escarpment runs in a southeasterly direction from the Phillip Road entrance of the property's southern portion of the site to its eastern boundary, demarcating an elevation change between the southern and northern portions of Phase 1 of the Proposed Project.

The portion of the property north of Pleasant Grove Creek is also currently actively cultivated and irrigated with water from a long-established irrigation canal along the northern boundary.

I.C. PROPOSED PROJECT AREA DEVELOPMENT OPPORTUNITIES AND CONSTRAINTS:

The Proposed Project Area Land Use Plan is influenced by several factors, including the physical setting, land use, circulation considerations, and public policies. Two significant aspects that influence the development of the Land Use Plan are described below and depicted on **Exhibit 2 – Land Use Plan.**

- PLACER PARKWAY

  The proposed Placer Parkway will bisect the northerly portion of the Proposed Project Area. Due to the limited area and difficulty with getting utility and roadways across Placer Parkway, the northwesterly portion of the site will remain open space.

- PLEASANT GROVE CREEK AND PLEASANT GROVE CREEK BYPASS CHANNEL

  The existing Pleasant Grove Creek and newly constructed Pleasant Grove Creek Bypass Channel divides the Proposed Project Area. The area south of these two features will be constructed first, Phase 1. A bridge will be needed in the future to access the area to the north when it is developed.

II. POTABLE WATER STUDY PROCESS

The Potable Water Study is used to determine the demand and distribution pipelines for the Proposed Project. The methodology being used in this Study is based on the City of Roseville's Environmental Utilities Department. The current City of Roseville Design Standards (January, 2020) were also utilized.

The Proposed Project Area will consist of Light Industrial (M1), General Industrial (M2), and Public/Quasi Public land uses. The Proposed Project Area Land Use Plan is shown in **Exhibit 2 – Land Use Plan.**

The average day demand for land use is based on the methods used in the City of Roseville Design Standards (January, 2020) as shown in **Table 1 – City of Roseville Demand Factors**.

Table 1 – City of Roseville Demand Factors

Land Use	Average Day Demand
Light Industrial	2,598 GPD/Acre
Industrial	2,562 GPD/Acre
Public/Quais Public	1,780 GPD/Acre
Open Space	0 GPD/Acre

The estimated potable water demand is based on the land use. **Table 2 – Potable Water Demand -** shows the potable water demand.

Table 2 – Potable Water Demand

Location on Site	Water Demand Area (ac)	Land Use	Average Day Unit Water Demand Factor[a]	Unit-Factor Units	Average Day Demand (gpd) (gpd)[b]	Annual Demand (ac-ft/yr)	Peaking Factor[c]	Maximum Day Demand	Peaking Factor[d]	Peak Flow (gpd)[e]	Design Flow (gpm)
Area 1	81.27	M2, General Industrial	2,562	gpd/acre	208,209	233.2	2.0	416,417	1.7	707,909	492
Area 2	48.50	M1, Light Industrial	2,598	gpd/acre	126,008	141.2	2.0	252,016	1.7	428,428	298
Area 3	0.90	PQP, Public Quasi Public	1,780	gpd/acre	1,609	1.8	2.0	3,218	1.7	5,471	4
Area 4	0.17	PQP, Public Quasi Public	1,780	gpd/acre	306	0.3	2.0	612	1.7	1,041	1
Area 5	16.19	OS/Open Space	0	gpd/acre	0	0.0	2.0	0	1.7	0	0
Area 6	16.98	M2, General Industrial	2,562	gpd/acre	43,495	48.7	2.0	86,990	1.7	147,883	103
Area 7	31.86	M1, Light Industrial	2,598	gpd/acre	82,777	92.7	2.0	165,555	1.7	281,443	195
Area 8	21.19	PQP, Public Quasi Public(f)	0	gpd/acre	0	0	2.0	0	1.7	0	0
Area 9	17.34	Future Placer Parkway(g)	0	gpd/acre	0	0	2.0	0	1.7	0	0

(a) From Table of Section 8-6 of the City of Roseville Design Standards (January, 2020) (gpd/ac).

(b) Average Day Demand (gallons per day) = Water Demand Area x Average Day Demand Unit Flow Factor.

(c) Peaking factor from average day demand to maximum day demand per Section 8-7 of the City of Roseville Design Standards (January, 2020).

(d) Peaking factor from maximum day demand to peak hour demand per Section 8-7 of the City of Roseville Design Standards (January, 2020).

(e) Peak Hour Demand = Peaking Factor * Maximum Day Demand.

(f) Area 9 will not be served by the Proposed Project.

(g) The future Placer Parkway is not part of this Master Plan; therefore, no water demand is included in the Report.

II.A. MAXIMUM DAY DEMAND:

The Maximum Day Demand (MDD) is based on applying a peaking factor of 2.0 to the Average Day Demand (ADD). The MDD will be used for sizing the supply mains. The peaking factor is from the City of Roseville Design Standards.

II.B. FIRE FLOW DEMAND:

The maximum fire flow required by the City of Roseville for a commercial project is 4,000 gpm for sprinklered buildings. Per City of Roseville Standards, each fire hydrant shall not exceed 1,000 gpm.

II.C. MINOR LOSSES:

The minor losses in the system are accounted for by increasing the flow rate by 2%.

III. POTABLE WATER SYSTEM INFRASTRUCTURE

III.A. SYSTEM DESCRIPTION:

The potable water system is designed to serve the Land Use Plan areas, as shown in **Exhibit 2 – Land Use Plan.** The potable water system transmission lines, comprised of 12-inch pipes, have been designed to convey potable water flows within the Proposed Project Area as shown in **Exhibit 3 – Site Plan.** The Proposed Project's main transmission line connects to the CVSP development at three locations.

The first connection is at the intersection of Blue Oaks Boulevard and Cloud Dance Drive. A 12-inch pipe continues west along Blue Oaks Boulevard to Phillip Road, then continues North along Phillip Road to the bend in the road to the west. There are three connections to the Proposed Project from this 12-inch pipe.

The second connection is at the west end of Grasscreek Drive. As part of the CVSP project a stub will be built to the Proposed Project's east property line. A 12-inch line will connect to the Proposed Project's main transmission line.

The third connection will be in the future. The connection point will be in the portion of the Proposed Project that is north of Pleasant Grove Creek. The connection will be to the proposed water main in the future Benchmark Road.

Each building in the Proposed Project will have a 12-inch water line loop around the building. The loops will be connected with a common 12-inch line within the main North-South access road. A 12-inch water line will continue north across the proposed bridge to the north section of the Proposed Project.

III.B. SYSTEM DESIGN CRITERIA:

The potable water system will be operated and owned by the City of Roseville. The City is responsible for all maintenance and operations upstream of the water meter, including the water meters. Each individual property owner is responsible for all onsite maintenance and operations downstream of the water meter.

The City has established a set of design standards for the potable water systems that they will operate and maintain. Their goal is to maintain operations to all customers on a consistent basis. See **Table 3 – City of Roseville Operational Criteria** for the City of Roseville Potable Water Operational Criteria.

Table 3 – City of Roseville Operational Criteria

Condition	Operation Value
Normal Minimum Residual Pressure	50 psi
Normal Maximum Residual Pressure	100 psi
Peak Domestic and Fire demand	20 psi

IV. RECYCLED WATER SUPPLY

The Proposed Project anticipates receiving a commitment for recycled water from the City for the amount discussed in the Recycled Water Master Plan. The recycled water system will supply the irrigation demands for the Proposed Project.

However, according to the analysis done by Woodard and Curran, see **Appendix A – Technical Memorandum – Roseville Industrial Park Recycled Water Study,** the storage capacity of the City recycled water system will not be able to supply the required volume until future tank and pump expansions are completed. During the interim, irrigation water will be delivered from the potable water system. As discussed in the Recycled Water Master Plan, the irrigation demand for the Proposed Project will be 280 gpm (180 gpm of which will be included in Phase 1). This demand will be added to the water demand calculated in Section II of this Plan.

V. HYDRAULIC MODEL ANALYSIS

V.A. HYDRAULIC MODEL ANALYSIS CRITERIA:

The following procedure was used for the preliminary assumptions used for the modeling of the potable water system:

- A Hazen Williams “C” factor of 130 was used for all pipes in the recycled water system.
- Steady state condition.
- Operation demand flows increased by 2% to account for system losses.
- Minimum pressure of 50 psi at service connections.
- Minimum Pressure of 20 psi during fire flow.
- Velocity in pipes shall not exceed 8 fps.
- Minimum size is 6-inch pipe.

- Project Datum (N.A.V.D. 88) = As-built Plans (N.G.V.D. 29) + (+/-) 2 feet.

V.B. HYDRAULIC MODEL ASSUMPTIONS:

The Technical Memorandum provided by Woodard & Curran (**Appendix A – Technical Memorandum – Roseville Industrial Park Recycled Water Study)** analyzed two different scenarios:

- **Near-Term**: Demands in the model reflect Phase 1 of the Proposed Project, Phase 1 includes Areas 1 - 4 as shown on **Exhibit 2 – Land Use Plan.** Irrigation demand is based on buildings A-I, **Exhibit 3 – Site Plan,** being completed in Phase 1. The near-term potable water demand is shown in **Table 4 – Near-Term Potable Water Demand**.

Table 4 – Near-Term Potable Water Demand

Condition	Maximum Daily Demand (gpm)	Irrigation Demand (gpm)	Total Without Fire Flow (gpm)	Total Without Fire Flow +2% (gpm)	Fire Demand (gpm)	Total with Fire Flow (gpm)	Total with Fire Flow + 2% (gpm)
Buildout	468	180	648	661	4,000	4,648	4,741

The MDD is applied to the service connection nodes for the Proposed Project's buildings. Since the irrigation demand will be supplied by the potable water supply, it will be applied at the point of connection for Buildings A-D. See **Table 5 – Near-Term Potable Water Demand and Location** for flow demand applied at each point of connection and the corresponding node label.

Table 5 – Near-Term Potable Water Demand and Location

Buildings Served	Potable Water Demand (gpm)	Model Node
Buildings A-D + Irrigation	350	J-1002
Buildings E	65	J-1001
Buildings F & G	141	J-1039
Buildings H & I	105	J-1063

The near-term connection pressures are based off the City of Roseville Modeling Results sent to Laugenour and Meikle on February 18, 2022 in an email from George Hanson, **See Appendix B – City Potable Water Model Analysis.**

- **Buildout**: Demands in the model reflect complete buildout of the Proposed Project as shown in **Exhibit 2 – Land Use Plan** and **Exhibit 3 – Site Plan.** The Buildout potable water demand is shown in **Table 6 – Buildout Potable Water Demand**.

Table 6 – Buildout Potable Water Demand

Condition	Maximum Daily Demand (gpm)	Irrigation Demand (gpm)	Total Without Fire Flow (gpm)	Total Without Fire Flow +2% (gpm)	Fire Demand (gpm)	Total with Fire Flow (gpm)	Total with Fire Flow + 2% (gpm)
Buildout	643	280	923	942	4,000	4,923	5,021

The MDD is applied to the service connection nodes for the Proposed Project's buildings. Since the irrigation demand will be supplied by the potable water supply, it will be applied at the point of connection for Buildings A-D. See **Table 7 – Buildout Potable Water Demand and Location** for flow demand applied at each point of connection and the corresponding node label.

Table 7 – Buildout Potable Water Demand and Location

Buildings Served	Potable Water Demand (gpm)	Model Node
Buildings A-D + Irrigation	451	J-1002
Buildings E	65	J-1001
Buildings F & G	141	J-1039
Buildings H & I	105	J-1063
Buildings J-N	178	J-1084

The Buildout connection pressures are based off the City of Roseville modeling results sent to Laugenour and Meikle on February 18, 2022 in an email from George Hanson, **See Appendix B – City Potable Water Model Analysis.** It is assumed that the Creekview project will be completed.

The point of connection was modeled using a reservoir with a water surface height set above the assumed pipe elevation to create a constant pressure. The water surface height is the connection pressure supplied by the City of Roseville (**Appendix B – City Potable Water Model Analysis).** It is assumed that the existing potable water system can supply the needed volume of water at the constant pressure.

V.C. HYDRAULIC MODEL RESULTS:

The near-term without fire flow model node, pipe and network exhibits are shown in **Appendix C - Potable Water Plan – Near Term Onsite Without Fire Flow Model Results**. Nodes were placed at each building service point.

The near-term with fire flow model node, pipe and network exhibits are shown in **Appendix D - Potable Water Plan – Near-Term Onsite With Fire Flow Model Results**. Nodes were placed at service points and fire hydrant locations for each proposed building of the Proposed Project. The four (4) fire hydrants (FH-39, FH-44, FH-45, and FH-46) are the farthest from the points of connection each have a demand of 1,000 gpm.

The Buildout without fire flow model node, pipe and network exhibits are shown in **Appendix E - Potable Water Plan – Buildout Onsite Without Fire Flow Model Results**. Nodes were placed at each building service point.

The buildout with fire flow model node, pipe and network exhibits are shown in **Appendix F – Potable Water Plan – Buildout Onsite With Fire Flow Model Results**. Nodes were placed at service points and fire hydrant locations for each proposed building of the Proposed Project. The four (4) fire hydrants (FH-71, FH-72, FH-73, and FH-74) are the farthest from the points of connection each have a demand of 1,000 gpm.

VI. CONCLUSIONS

Based on the information contained within this Potable Water Master Plan and the model analysis of the system, the following conclusions are noted:

- The near-term system without fire flow meets the 50 psi pressure at the lowest pressure building connection (70 psi).
- The near-term system with fire flow meets the 20 psi pressure at the lowest pressure fire hydrant (60 psi).
- The buildout system without fire flow is slightly below the 50 psi pressure at the lowest pressure building connection (45 psi). The Proposed Project approximately matches the points of connection, the points of connection pressure varies 46 to 52 psi.
- The buildout system with fire flow meets the 20 psi pressure at the lowest pressure fire hydrant (34 psi).

EXHIBITS

VICINITY

EXHIBIT 1
PROJECT LOCATION
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE,
PLACER COUNTY, CALIFORNIA
SHEET 1 OF 1 NOVEMBER 19, 2021

LM LAUGENOUR AND MEIKLE
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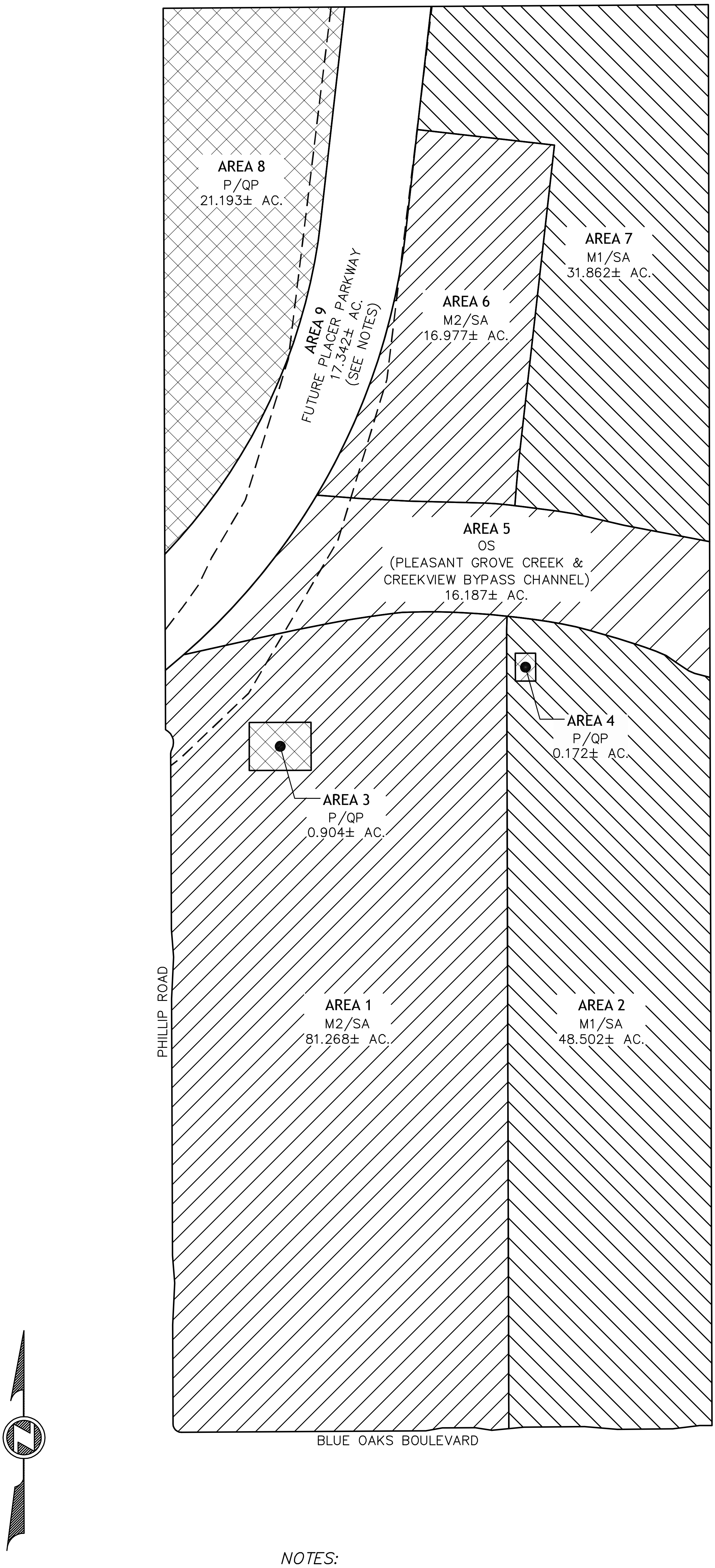
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662-4602

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH01-Project Location



0 200 400 800

LM

SCALE: 1"=400'

NOTES:

1. *EXISTING PLACER PARKWAY AREA DENOTED BY DASHED LINE.*
   (— — — — — — — — — — — — — —)
2. *REVISED PLACER PARKWAY AREA (BY AKT) USED FOR CALCULATING HIGHEST POSSIBLE UTILITY DEMANDS.*

EXHIBIT 2
LAND USE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA

SHEET 1 OF 1 *OCTOBER 28, 2021*

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P.O. BOX 828, WOODLAND, CALIFORNIA 95776 ·FAX: (530) 662–4602

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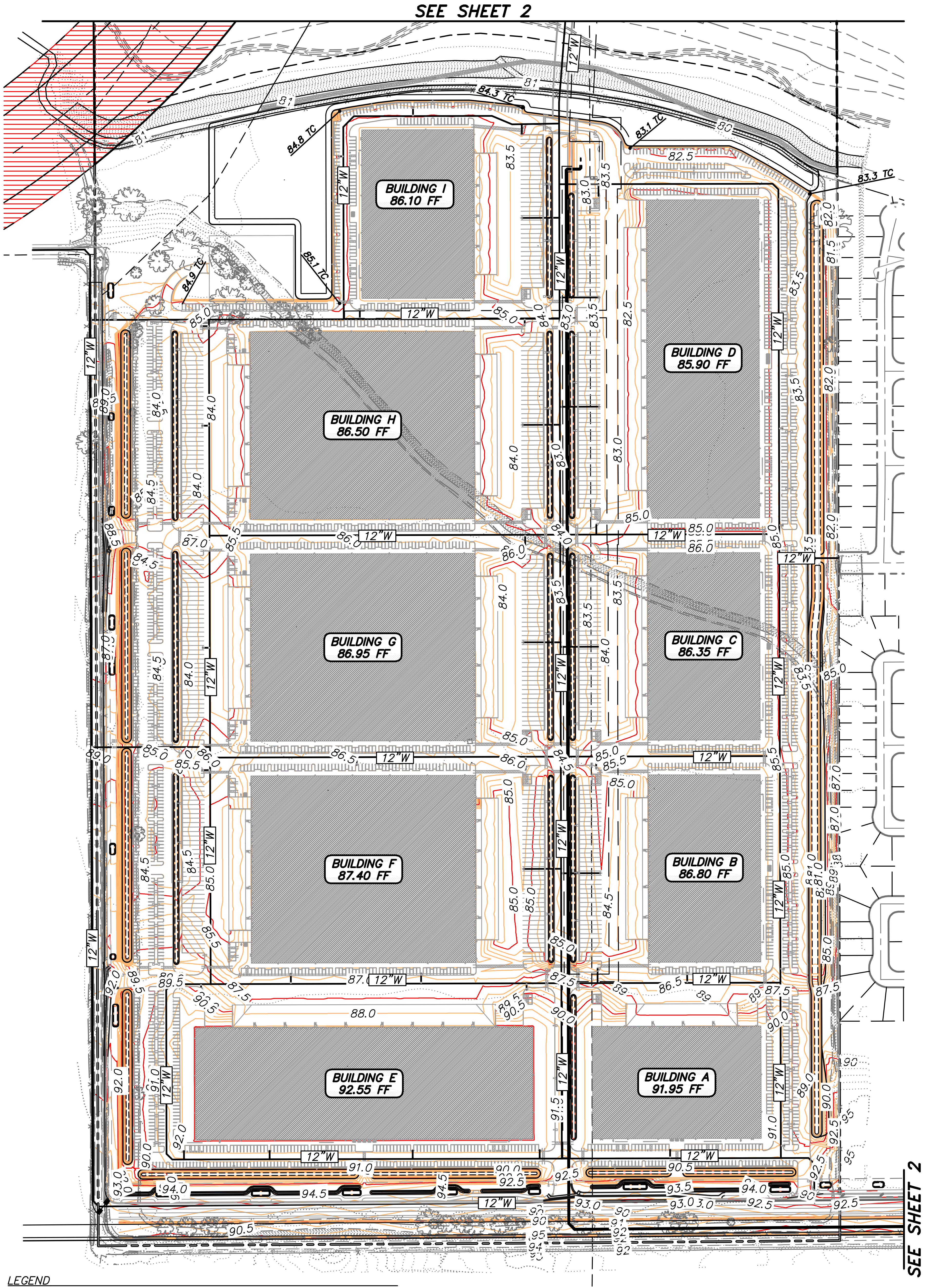

LEGEND

84.9 TC	FINISHED TOP OF CURB ELEVATION (NAVD 88)
92.5	FINISHED GRADE ELEVATION CONTOURS (NAVD 88)
89	EXISTING GROUND ELEVATION CONTOURS (NAVD 88)

REGISTERED PROFESSIONAL ENGINEER
NEIL U. BUSCH
No. 68595
CIVIL
STATE OF CALIFORNIA

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 ·PHONE: (530) 662-1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 ·FAX: (530) 662-4602

0 125 250 500
LM
SCALE: 1"=250'

EXHIBIT 2
PROPOSED SITE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK
PHILLIP ROAD,
CITY OF ROSEVILLE, CALIFORNIA
SHEET 1 OF 2 MARCH 1, 2022

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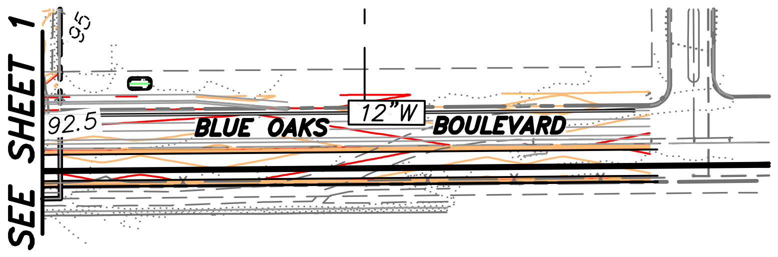

LEGEND

84.9 TC	FINISHED TOP OF CURB ELEVATION (NAVD 88)
92.5	FINISHED GRADE ELEVATION CONTOURS (NAVD 88)
89	EXISTING GROUND ELEVATION CONTOURS (NAVD 88)

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P.O. BOX 828, WOODLAND, CALIFORNIA 95776 ·FAX: (530) 662-4602

0 125 250 500
SCALE: 1"=250'

EXHIBIT 2
PROPOSED SITE MAP
FOR
ROSEVILLE INDUSTRIAL PARK
PHILLIP ROAD,
CITY OF ROSEVILLE, CALIFORNIA
SHEET 2 OF 2 MARCH 1, 2022

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APPENDIX A

TECHNICAL MEMORANDUM – ROSEVILLE INDUSTRIAL PARK RECYCLED WATER STUDY

TECHNICAL MEMORANDUM

TO: Abbie Wertheim, Panattoni Development Company
PREPARED BY: Chris van Lienden, PE
REVIEWED BY: Dave Richardson, PE
DATE: December 8, 2021
RE: Roseville Industrial Park Recycled Water Study

1. BACKGROUND

Woodard & Curran was asked to analyze the impacts of the proposed Roseville Industrial Park development on the City of Roseville's recycled water system. The location of the proposed site is shown in Figure 1. The proposed development includes 9 non-residential areas on the parcel located at 6382 Phillip Rd (234 acres), and would receive recycled water from the City of Roseville's recycled water distribution system through a 24-inch and 6-inch pipeline on Westbrook Boulevard.

The purpose of this TM is to evaluate and document whether the City's recycled water model predicts that the City's recycled water system will have capacity to serve the proposed development.

2. MODEL ASSUMPTIONS

The City of Roseville's recycled water system will require upgrades to serve anticipated future customers. These upgrades are discussed in the City of Roseville's Recycled Water Systems Evaluation Report[1] (2016 RW Systems Evaluation) and include additional tanks at the West Roseville Pump Station site, as well as other upgrades. After the Systems Evaluation was completed, the model of the existing system was updated to reflect new piping, and recalibrated based on flow, pressure, and tank level data conducted in 2020 and described in the City's 2020 Recycled Water System Model Development Report[2] (2020 Model Development Report). The updated model has been used for this evaluation, and has been revised to incorporate existing available supply limitations at the Dry Creek and Pleasant Grove Wastewater Treatment Plants (DCWWTP and PGWWTP).

Two demand scenarios have been considered:

- Near-Term: Demands in the model reflect existing demands as described in the 2020 Model Development Report plus near term customers added to reflect current max day demands in the main pressure zone (8 mgd max day demand), as well as Sierra Vista demands.
- Future: Additional demands added to reflect future Creekview (1.25 mgd) and Amoruso (0.94 mgd) max day demands. For these scenarios, PGWWTP supply has been increased by 2.19 mgd to reflect future sewer flows from those developments.

---

[1] RMC Water & Environment, July 2016, Recycled Water Systems Evaluation
[2] Brown and Caldwell, August 2020, Recycled Water System Model Development Report

To reflect anticipated improvements to serve these additional demands, the model also includes 2 additional tanks and pumping upgrades at the West Roseville Pump Station site (including a parallel 350 linear foot, 24-inch discharge line to Westpark Drive), and a piping extension on Blue Oaks Blvd (approximately 1900 linear feet of 24-inch piping). For modeling purposes, pumping upgrades have been assumed to be sufficient to maintain 75 psi at the discharge from the West Roseville Pump Station. The pumping upgrades would include 1 additional pump under the Near-Term condition, and multiple additional pumps under the Future demand condition.

Projected demands for the Roseville Industrial Park have been added to both demand scenarios based on the peak demand as summarized in Appendix A (280 gpm).

The modeled facilities and the location of the proposed connection of the new development are presented in Figure 1.

3. MODEL RESULTS & CONCLUSIONS

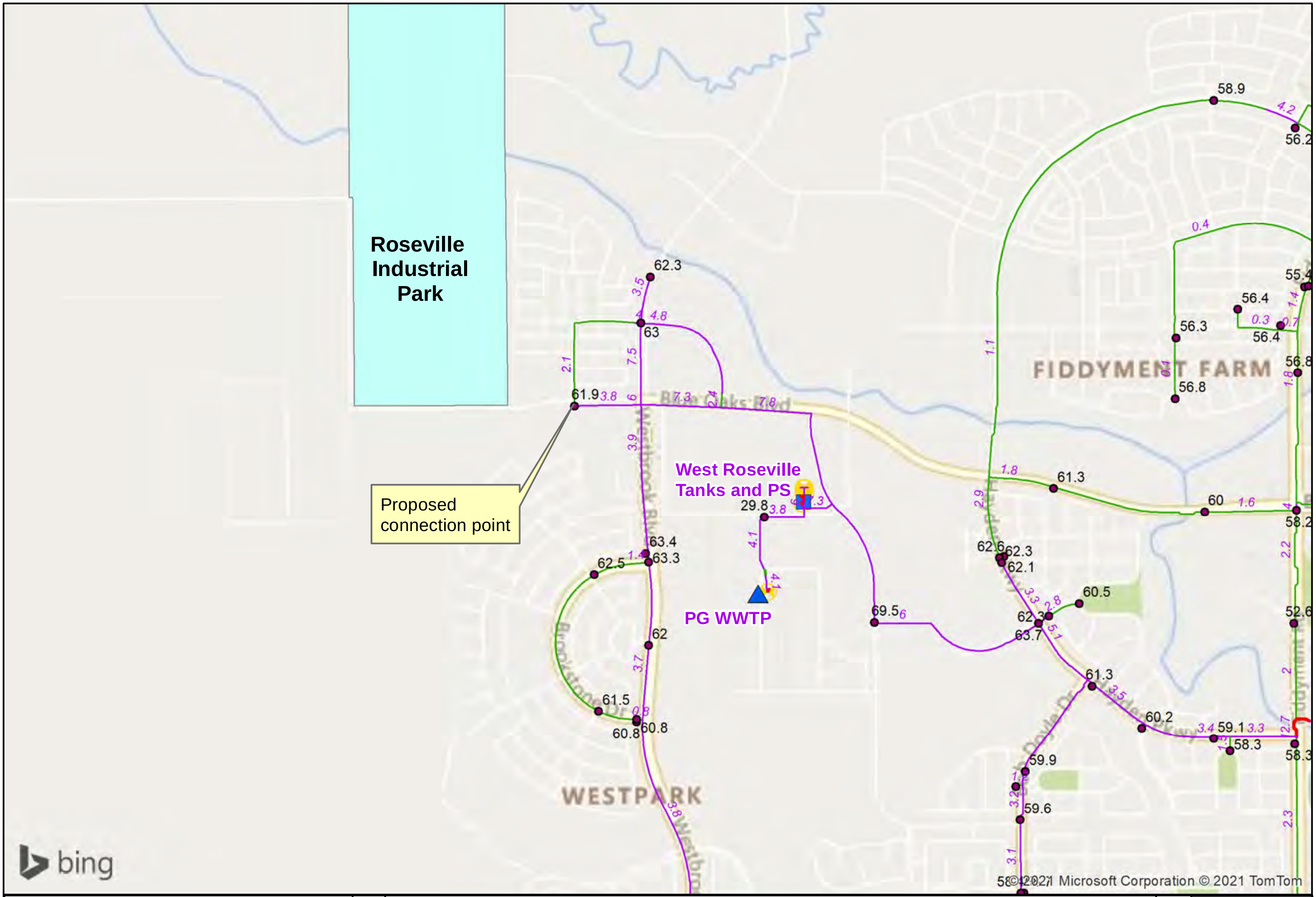
The Roseville Industrial Park demands were applied to the existing 6-inch recycled water main at the corner of Cloud Dance Drive and Blue Oaks Boulevard (the “proposed development connection point” on Figure 1). Based on modeling of the proposed maximum demand, velocities in the 6-inch main would be approximately 3.8 fps, which does not exceed the City’s criteria (see Figure 2).

The model predicts that a connection at this location would see a minimum pressure of 71 psi under peak hour demand conditions for the Near-Term scenario, and 62 psi for the Future scenario. Pipeline velocities do not exceed the City’s criteria under Near-Term or Future demand conditions with the proposed development. Model results under the Future demand condition are presented in Figure 2. Further studies should be performed prior to connecting significant demand for the Creekview and Amoruso UGAs to confirm the anticipated demands and available pressures.

It should be noted that the proposed Roseville Industrial Park demands would increase the pumping capacity upgrades required at the West Roseville Pump Station. Specifically, in the Near-Term demand scenario, pumping capacity would need to increase from 6,780 gpm to 7,060 gpm. Whether that triggers the need for an additional pump depends on the future pumping configuration of the pump station.

Overall, prior to connection of the proposed Roseville Industrial Park and the expanded Sierra Vista demands, it is recommended that the City add approximately 1900 linear feet of 24-inch piping on Blue Oaks Boulevard, add two (2) additional storage tanks (currently sized at 2.2 million gallons and 2.4 million gallons), and add pumping capacity equivalent to one additional pump. The Roseville Industrial Park demand would contribute to the need for the additional storage tanks and piping but would not increase the planned sizing of those facilities.

The proposed development would also contribute to the need for additional pumping capacity at Pleasant Grove WWTP, system-wide storage capacity, and other upgrades as discussed in the 2016 RW Systems Evaluation under buildout conditions. As the demand projections and development timing associated with several of the Urban Growth Areas may have changed since the 2016 RW Systems Evaluation, an update of that report may be needed to describe future system facility requirements.



Legend

< 3 fps
3 - 8 fps
velocity (fps) > 8 fps
Pressure (psi) ● Modeled Demand
🟦 Tank & PS
▲ WWTP

0 0.1 0.2 0.4 Miles

N

WOODARD & CURRAN

Figure 2

Model Results - Future Demands

Roseville Industrial Park
Recycled Water Study

Figure Exported: 12/8/2021 By: cvanlienden Using: C:\00_Projects\Roseville\RW Model\Roseville Industrial Park\Figure 2.mxd

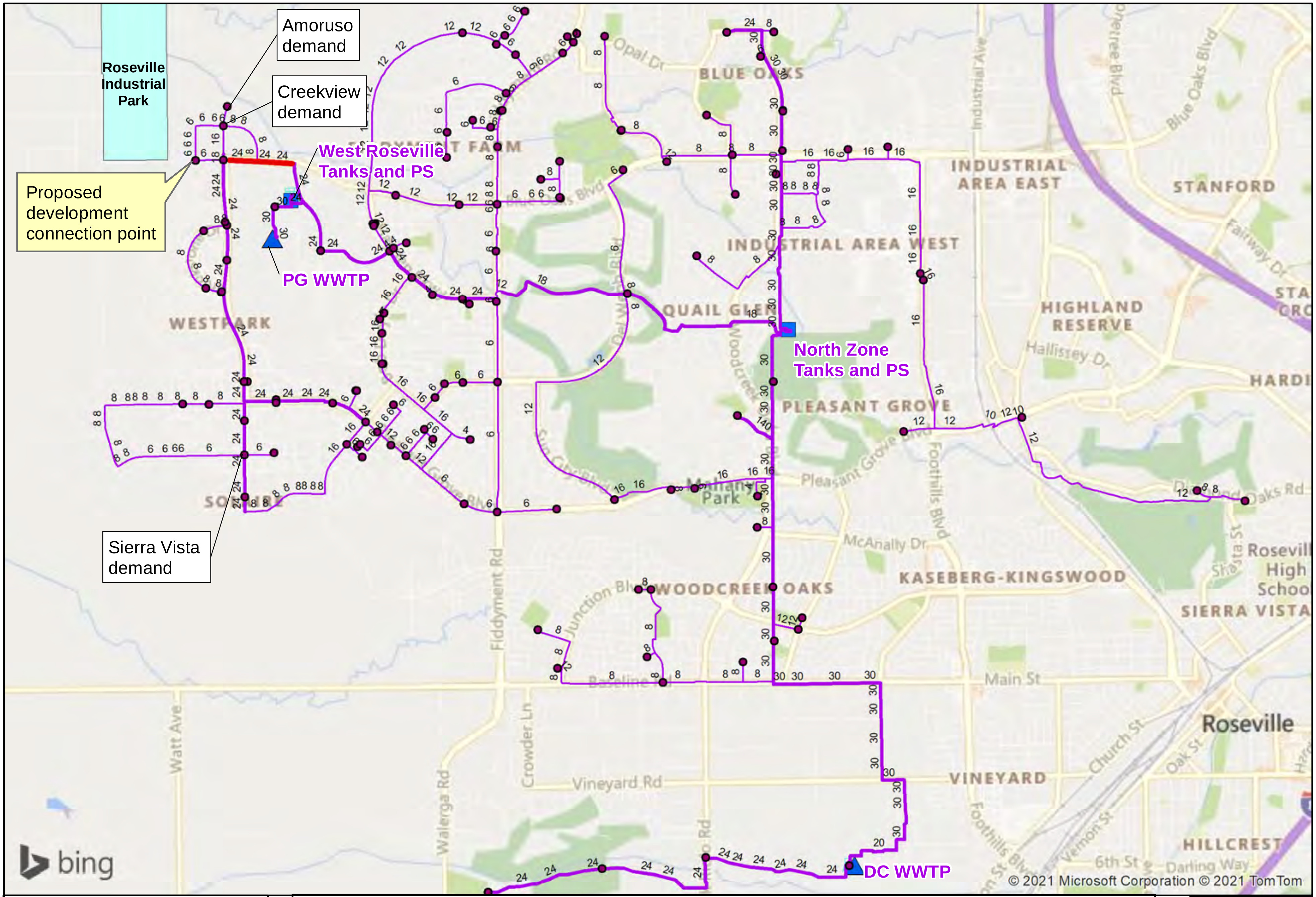


Figure 1

Project Location

Roseville Industrial Park
Recycled Water Study

Legend

🟥 Future pipe added to model

― Pipe < 18 inches

▬ Pipe > 18 inches

● Modeled Demand

■ Tank & PS

▲ WWTP

Miles 0 0.25 0.5 1

N

WOODARD & CURRAN

Project #: 0012092.00 Map Created: November 2021

Figure Exported: 11/24/2021 By: cvanlienden Using: C:\00. Projects\Roseville\RW Model\Roseville Industrial Park\Figure 1.mxd

APPENDIX A – PROPOSED ROSEVILLE INDUSTRIAL LAND USE PLAN, SITE PLAN, AND RECYCLED WATER DEMAND

From: eric@vistaparks.com <eric@vistaparks.com>
Sent: Monday, December 6, 2021 11:08 AM
To: 'Abbie Wertheim' <AWertheim@panattoni.com>; Paymon Fardanesh <pay@lmce.net>
Subject: RE: [EXTERNAL] Roseville Meeting

Abbie,

Attached are 2 irrigation worksheets (1 for the north site and 1 for the south site). These are called WELO Worksheets. They are required on all landscape plans in Roseville.

The city will not approve landscape plans that exceed the Maximum Allowed Water Use (Yellow cells in each file). So, the total volume of irrigation water allowed by the city for these sites is the sum of the numbers in the yellow cells (both sites combined). Total allowed water use is 21,374,794 gallons per year, for the north and south combined. The maximum water use is based on the total irrigated landscape area, which is shown in the orange cells.

My design method typically uses only about 35% of the maximum allowed. I use a design method that uses the least amount of water (point specific drip emitters for plants, and deep well bubblers for trees), compared to other methods of delivering water to plants and trees.

A reliable peak demand number is 280 GPM. This will happen if every building irrigates at the same time of day and on the same day. It represents 1 irrigation valve running for every building at the same time. I cap my volume through an irrigation valve at approximately 20 GPM. 14 buildings running a maxed out irrigation valve at the same time is 280 GPM.

This should make sense to the city.

Thanks,
Eric Dearing
Vista Parks Landscaping Inc.
8264 Barryman Court
Sacramento, CA 95829
P 916-681-2227 f 916-681-2228 c 916-417-9283
eric@vistaparks.com

Roseville Industrial Park North Worksheet

Reference Evapotranspiration (Eto) 52.2

Regular Landscape Areas There are no special landscape areas. Trees count as 25 sq'

Hydrozone#	Plant Factor	Irrigation Method	Irrigation Efficiency	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF X Area	Estimated Total Water Use (GPY)
1	0.2	Drip	0.81	0.25	306,605	76,651	2,480,741
2	0.4	Drip	0.81	0.49	76,651	37,559	1,215,559
3	0.2	Bubbler	0.81	0.25	7,750	1,938	62,705
4	0.4	Bubbler	0.81	0.49	1,650	809	26,166
Total					392,656		3,785,172

Maximum Allowed Water Allowance (MAWA)	5,718,563
Estimated Total Water Use (ETWU)	3,785,172
Average ETAF	0.27
Allowed ETAF	0.45

🟧	Total Landscape Area
🟨	Total Gallons Per Year Allowed Per The Model Water Efficient Landscape Ordinance
🟩	Total Gallons Per Year Projected Per The Projected Irrigation Design Usage

Roseville Industrial Park Worksheet

Reference Evapotranspiration (Eto) 52.2

Regular Landscape Areas There are no special landscape areas. Trees count as 25 sq'

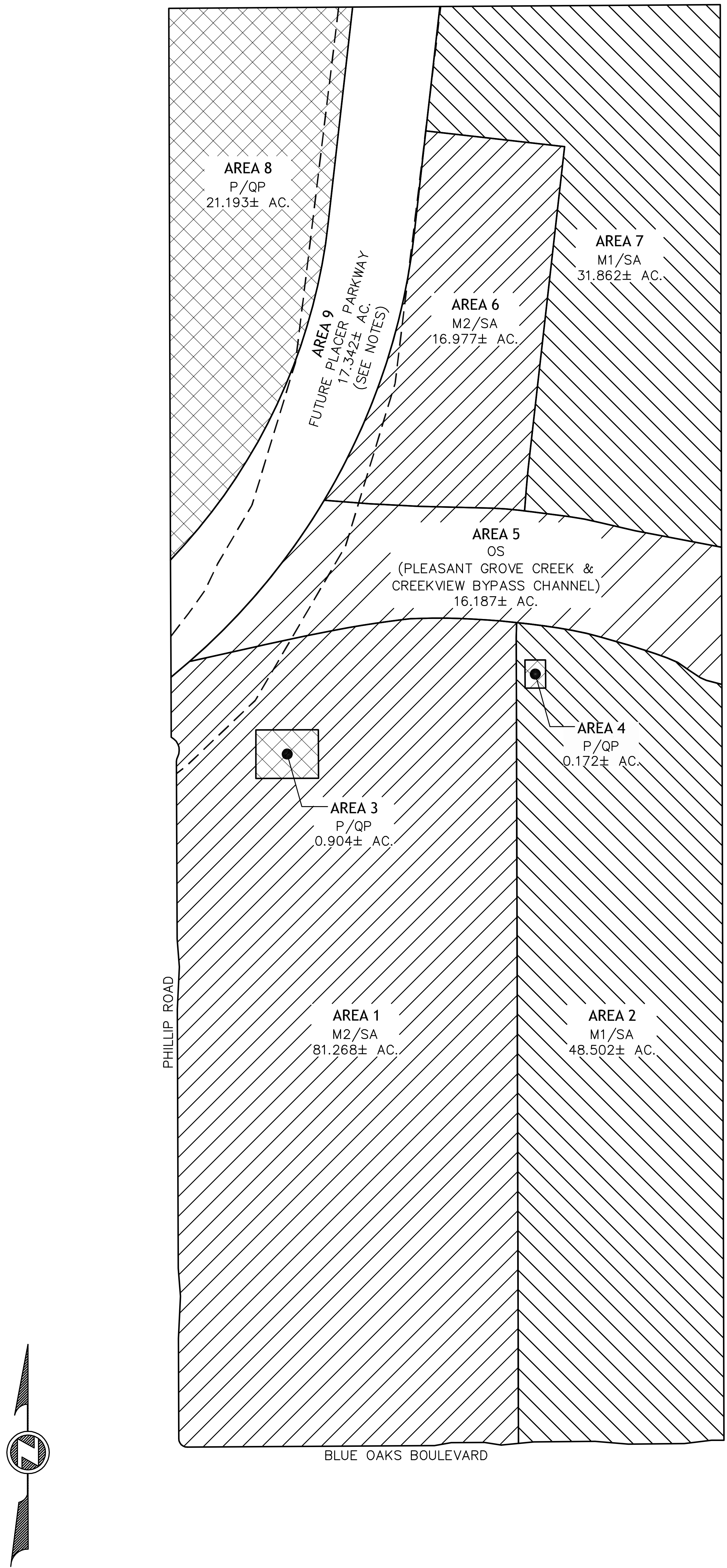
Hydrozone#	Plant Factor	Irrigation Method	Irrigation Efficiency	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF X Area	Estimated Total Water Use (GPY)
1	0.2	Drip	0.81	0.25	848,078	212,020	6,861,799
2	0.4	Drip	0.81	0.49	207,507	101,678	3,290,721
3	0.2	Bubbler	0.81	0.25	12,700	3,175	102,756
4	0.4	Bubbler	0.81	0.49	6,725	3,295	106,647
Total					1,075,010		10,361,923

Maximum Allowed Water Allowance (MAWA)	15,656,231
Estimated Total Water Use (ETWU)	10,361,923
Average ETAF	0.27
Allowed ETAF	0.45

🟧 Total Landscape Area

🟨 Total Gallons Per Year Allowed Per The Model Water Efficient Landscape Ordinance

🟩 Total Gallons Per Year Projected Per The Projected Irrigation Design Usage



0 200 400 800

LM

SCALE: 1"=400'

NOTES:

1. *EXISTING PLACER PARKWAY AREA DENOTED BY DASHED LINE.*
   (– – – – – – – – – – – – – – –)
2. *REVISED PLACER PARKWAY AREA (BY AKT) USED FOR CALCULATING HIGHEST POSSIBLE UTILITY DEMANDS.*

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LAND USE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 1 *OCTOBER 28, 2021*

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0 200 400 800

SCALE: 1"=400'

RECYCLED WATER EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA

SHEET 1 OF 1 NOVEMBER 16, 2021

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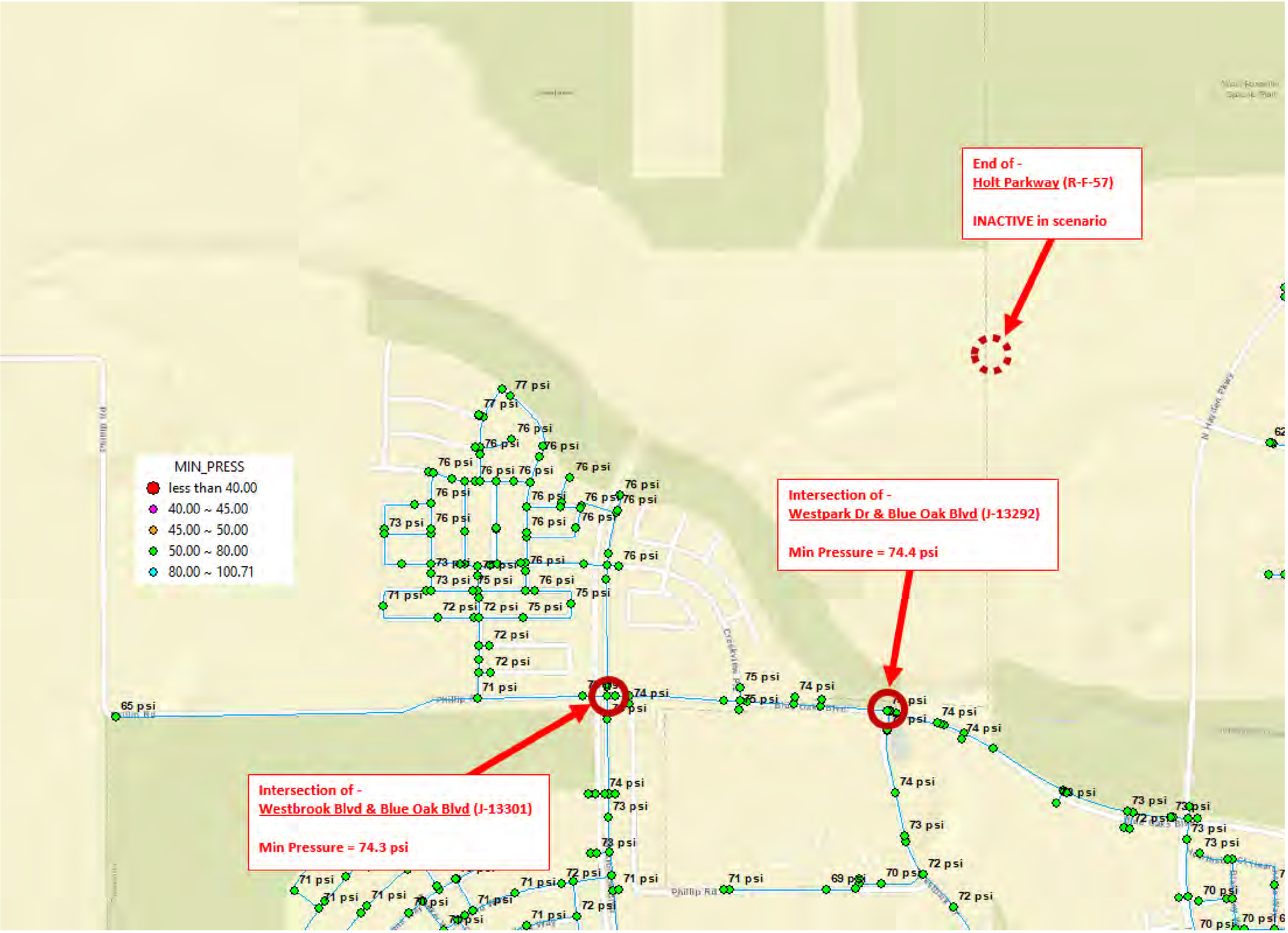
APPENDIX B

CITY POTABLE WATER MODEL ANALYSIS

City of Roseville Potable Water Model Results - Near-Term



End of -
Holt Parkway (R-F-57)

INACTIVE in scenario

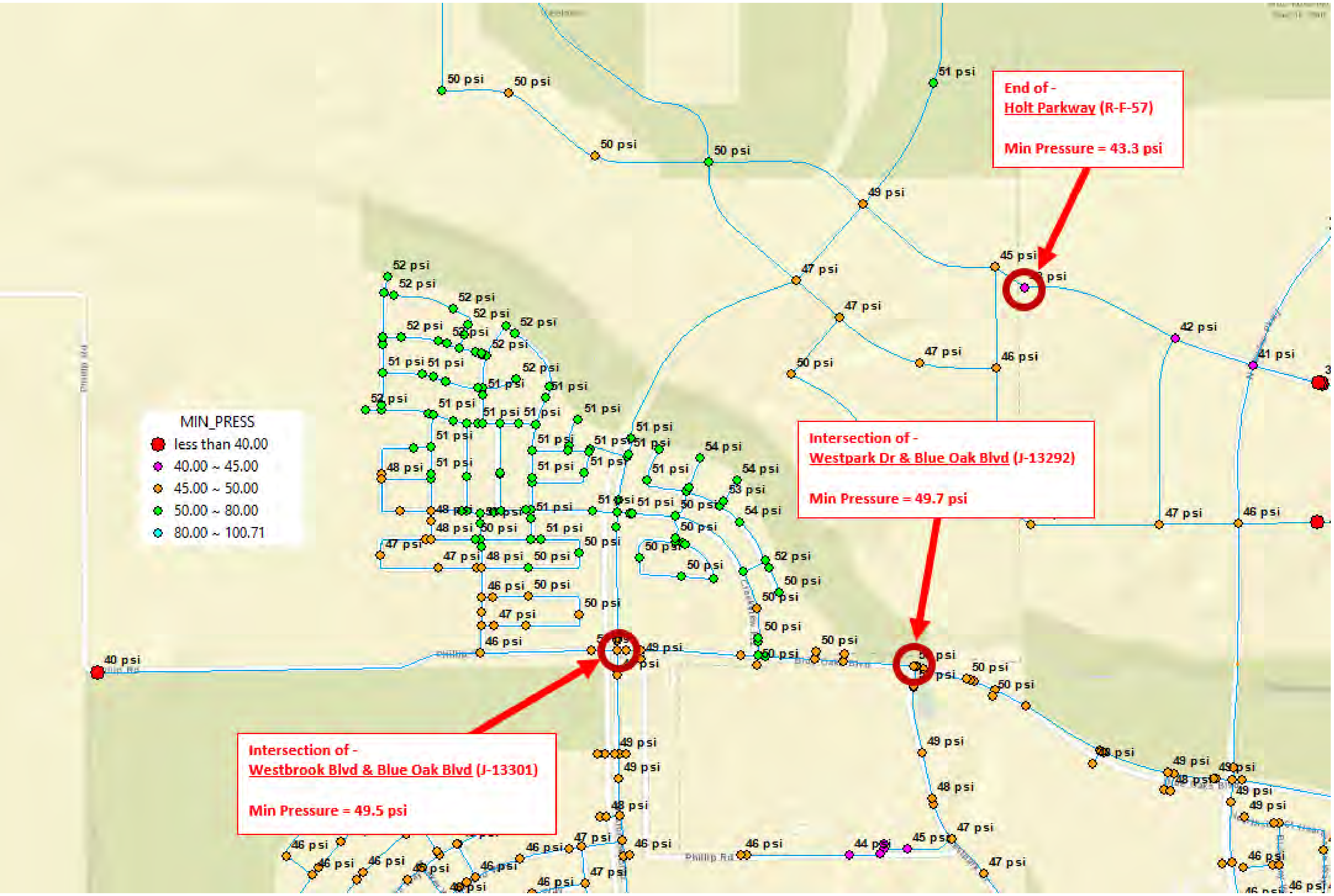
Intersection of -
Westpark Dr & Blue Oak Blvd (J-13292)

Min Pressure = 74.4 psi

Intersection of -
Westbrook Blvd & Blue Oak Blvd (J-13301)

Min Pressure = 74.3 psi

City of Roseville Potable Water Model Results - Buildout



End of -
Holt Parkway (R-F-57)

Min Pressure = 43.3 psi

Intersection of -
Westpark Dr & Blue Oak Blvd (J-13292)

Min Pressure = 49.7 psi

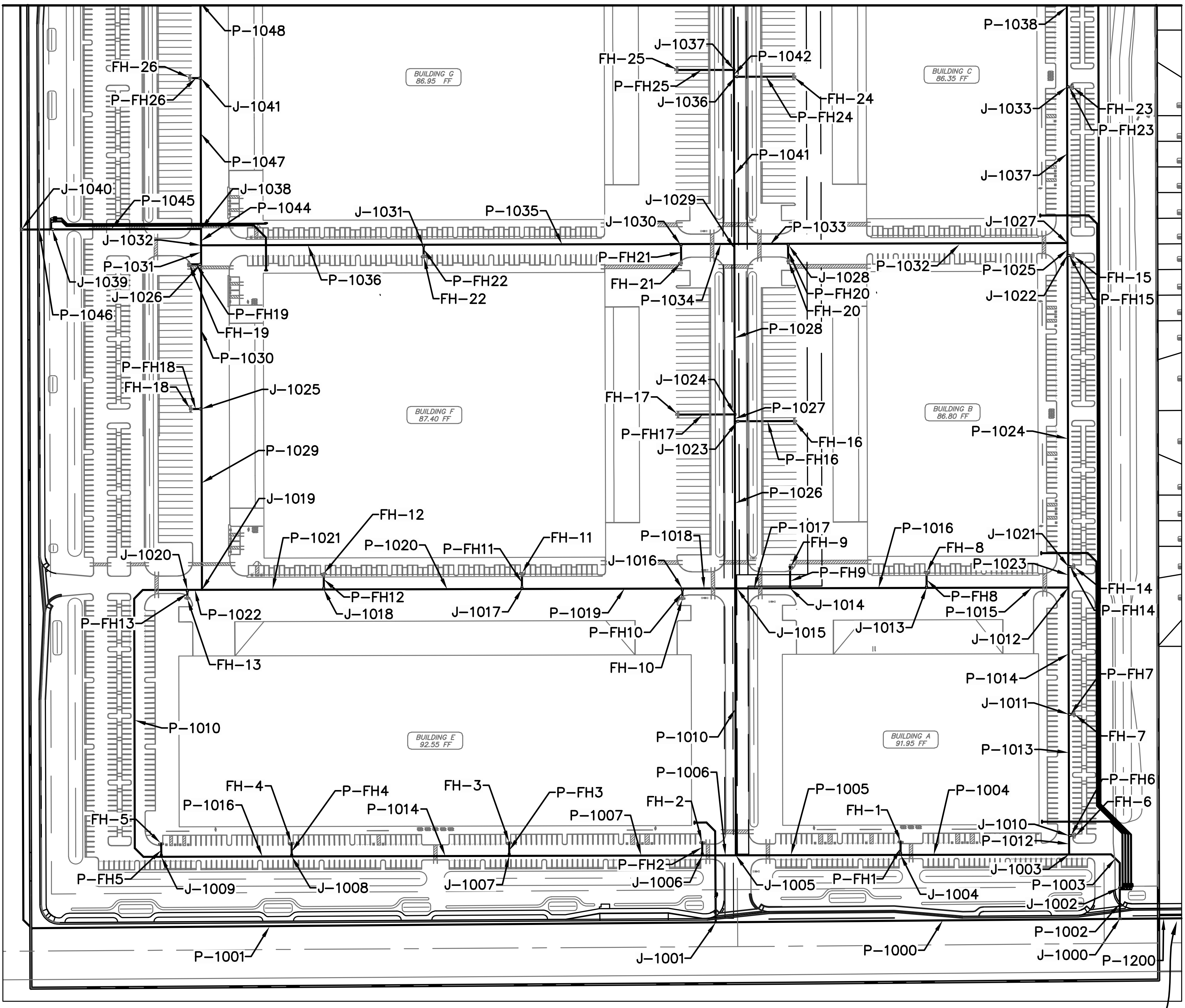
Intersection of -
Westbrook Blvd & Blue Oak Blvd (J-13301)

Min Pressure = 49.5 psi

APPENDIX C

POTABLE WATER PLAN – NEAR-TERM ONSITE WITHOUT FIRE FLOW MODEL RESULTS

SEE SHEET 2



POINT OF CONNECTION IS LOCATED AT THE
INTERSECTION OF BLUE OAK AND CLOUD
DANCE DRIVE. NODE J–1073, PIPE P–R1
AND RESERVIOR R–1 MAKE UP THE
CONNECTION AT THE INTERSECTION.

0 100 200 400

SCALE: 1"=200'

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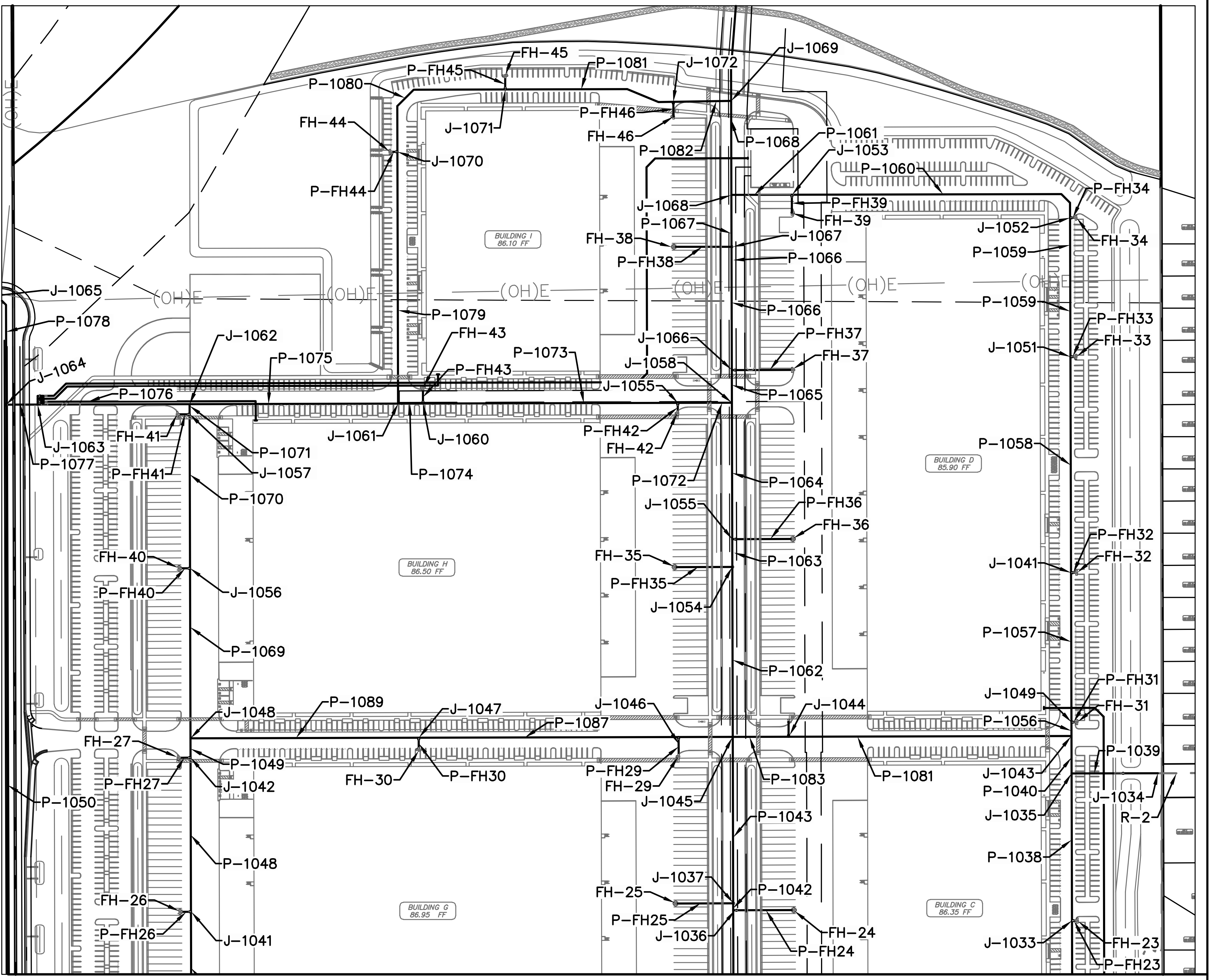
FIRE SYSTEM EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 2 MARCH 01, 2022

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH_Fire Site Plan- Project Site Phase 1.dwg



SEE SHEET 1

0 100 200 400
LM
SCALE: 1"=200'

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FIRE SYSTEM EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA
SHEET 2 OF 2 MARCH 01, 2022

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH_Fire Site Plan- Project Site Phase 1.dwg

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
ACV-3	89.00	0	253.00	71
FH-1	92.00	0	251.50	69
FH-2	93.00	0	251.50	69
FH-3	93.00	0	251.50	69
FH-4	93.00	0	251.50	69
FH-5	93.00	0	251.50	69
FH-6	92.00	0	251.50	69
FH-7	93.00	0	251.50	69
FH-8	88.00	0	251.50	71
FH-9	89.00	0	251.50	70
FH-10	89.00	0	251.50	70
FH-11	88.00	0	251.50	71
FH-12	88.00	0	251.50	71
FH-13	91.00	0	251.50	69
FH-14	88.00	0	251.50	71
FH-15	87.00	0	251.50	71
FH-16	86.00	0	251.50	72
FH-17	86.00	0	251.50	72
FH-18	87.00	0	251.50	71
FH-19	88.00	0	251.50	71
FH-20	87.00	0	251.50	71
FH-21	88.00	0	251.50	71
FH-22	88.00	0	251.50	71
FH-23	87.00	0	251.50	71
FH-24	86.00	0	251.50	72
FH-25	86.00	0	251.50	72
FH-26	86.00	0	251.50	72
FH-27	88.00	0	251.50	71
FH-28	87.00	0	251.50	71
FH-29	87.00	0	251.50	71
FH-30	89.00	0	251.50	70
FH-31	87.00	0	251.50	71
FH-32	86.00	0	251.50	72

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-33	86.00	0	251.50	72
FH-34	86.00	0	251.50	72
FH-35	85.00	0	251.50	72
FH-36	85.00	0	251.50	72
FH-37	85.00	0	251.50	72
FH-38	85.00	0	251.50	72
FH-39	86.00	0	251.50	72
FH-40	86.00	0	251.50	72
FH-41	87.00	0	251.50	71
FH-42	87.00	0	251.50	71
FH-43	87.00	0	251.50	71
FH-44	87.00	0	251.50	71
FH-45	88.00	0	251.50	71
FH-46	86.00	0	251.50	72
J-1000	89.00	0	252.04	71
J-1001	89.80	65	251.84	70
J-1002	89.00	350	252.02	71
J-1003	87.50	0	251.50	71
J-1004	87.60	0	251.50	71
J-1005	88.00	0	251.50	71
J-1006	88.30	0	251.50	71
J-1007	88.25	0	251.50	71
J-1008	88.25	0	251.50	71
J-1009	88.25	0	251.50	71
J-1010	87.80	0	251.50	71
J-1011	87.50	0	251.50	71
J-1012	82.50	0	251.50	73
J-1013	83.00	0	251.50	73
J-1014	83.75	0	251.50	73
J-1015	83.25	0	251.50	73
J-1016	84.50	0	251.50	72
J-1017	83.30	0	251.50	73
J-1018	83.60	0	251.50	73

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1019	85.75	0	251.50	72
J-1020	85.70	0	251.50	72
J-1021	82.50	0	251.50	73
J-1022	82.00	0	251.50	73
J-1023	80.75	0	251.50	74
J-1024	80.75	0	251.50	74
J-1025	82.00	0	251.50	73
J-1026	83.40	0	251.50	73
J-1027	82.00	0	251.50	73
J-1028	82.00	0	251.50	73
J-1030	82.75	0	251.50	73
J-1031	81.75	0	251.50	73
J-1031	83.25	0	251.50	73
J-1032	83.25	0	251.50	73
J-1033	82.00	0	251.50	73
J-1034	74.75	0	251.50	76
J-1035	81.59	0	251.50	74
J-1036	80.25	0	251.50	74
J-1037	80.30	0	251.50	74
J-1038	83.01	0	251.50	73
J-1039	87.35	141	251.39	71
J-1040	89.00	0	251.40	70
J-1041	81.40	0	251.50	74
J-1042	83.00	0	251.50	73
J-1043	81.50	0	251.50	74
J-1044	82.00	0	251.50	73
J-1045	81.60	0	251.50	74
J-1046	82.40	0	251.50	73
J-1047	83.70	0	251.50	73
J-1048	83.00	0	251.50	73
J-1049	81.50	0	251.50	74
J-1050	81.40	0	251.50	74
J-1051	81.40	0	251.50	74

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1052	81.40	0	251.50	74
J-1053	80.50	0	251.50	74
J-1054	80.00	0	251.50	74
J-1055	79.90	0	251.50	74
J-1056	81.00	0	251.50	74
J-1057	82.30	0	251.50	73
J-1058	80.00	0	251.50	74
J-1059	81.50	0	251.50	74
J-1060	82.15	0	251.50	73
J-1061	82.60	0	251.50	73
J-1062	82.25	0	251.50	73
J-1063	83.75	105	251.35	73
J-1064	83.75	0	251.35	73
J-1065	82.00	0	251.35	73
J-1066	80.00	0	251.50	74
J-1067	79.70	0	251.50	74
J-1068	79.60	0	251.50	74
J-1069	80.60	0	251.50	74
J-1070	81.80	0	251.50	73
J-1071	82.60	0	251.50	73
J-1072	81.25	0	251.50	74

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1000	J-1000	J-1001	12.0	130.0	306	0.87	0.000	710	0.20
P-1001	J-1001	J-1040	12.0	130.0	241	0.68	0.000	2,433	0.44
P-1002	J-1000	J-1002	12.0	130.0	355	1.01	0.000	58	0.02
P-1003	J-1002	J-1003	12.0	130.0	5	0.01	0.004	128	0.52
P-1004	J-1003	J-1004	12.0	130.0	2	0.01	0.000	296	0.00
P-1005	J-1004	J-1005	12.0	130.0	2	0.01	0.000	289	0.00
P-1006	J-1005	J-1006	12.0	130.0	1	0.00	0.000	59	0.00
P-1007	J-1006	J-1007	12.0	130.0	1	0.00	0.000	339	0.00
P-1008	J-1007	J-1008	12.0	130.0	1	0.00	0.000	382	0.00
P-1009	J-1008	J-1009	12.0	130.0	1	0.00	0.000	229	0.00
P-1010	J-1009	J-1020	12.0	130.0	1	0.00	0.000	590	0.00
P-1011	J-1015	J-1005	12.0	130.0	-1	0.00	0.000	469	0.00
P-1012	J-1003	J-1010	12.0	130.0	2	0.01	0.000	33	0.00
P-1013	J-1011	J-1010	12.0	130.0	-2	0.01	0.000	213	0.00
P-1014	J-1012	J-1011	12.0	130.0	-2	0.01	0.000	223	0.00
P-1015	J-1013	J-1012	12.0	130.0	-1	0.00	0.000	249	0.00
P-1016	J-1014	J-1013	12.0	130.0	-1	0.00	0.000	239	0.00
P-1017	J-1015	J-1014	12.0	130.0	-1	0.00	0.000	97	0.00
P-1018	J-1016	J-1015	12.0	130.0	-1	0.00	0.000	93	0.00
P-1019	J-1017	J-1016	12.0	130.0	-1	0.00	0.000	282	0.00
P-1020	J-1018	J-1017	12.0	130.0	-1	0.00	0.000	348	0.00
P-1021	J-1019	J-1018	12.0	130.0	-1	0.00	0.000	214	0.00
P-1022	J-1020	J-1019	12.0	130.0	1	0.00	0.000	26	0.00
P-1023	J-1012	J-1021	12.0	130.0	2	0.00	0.000	37	0.00
P-1024	J-1021	J-1022	12.0	130.0	2	0.00	0.000	546	0.00
P-1025	J-1022	J-1027	12.0	130.0	2	0.00	0.000	22	0.00
P-1026	J-1023	J-1015	12.0	130.0	-1	0.00	0.000	294	0.00
P-1027	J-1024	J-1023	12.0	130.0	-1	0.00	0.000	12	0.00
P-1028	J-1031	J-1024	12.0	130.0	-1	0.00	0.000	300	0.00
P-1029	J-1028	J-1031	12.0	130.0	1	0.00	0.000	95	0.00
P-1029	J-1025	J-1019	12.0	130.0	-2	0.00	0.000	318	0.00
P-1030	J-1026	J-1025	12.0	130.0	-2	0.00	0.000	254	0.00
P-1031	J-1032	J-1026	12.0	130.0	-2	0.00	0.000	34	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1032	J-1027	J-1028	12.0	130.0	1	0.00	0.000	491	0.00
P-1034	J-1031	J-1030	12.0	130.0	1	0.00	0.000	93	0.00
P-1035	J-1030	J-1031	12.0	130.0	1	0.00	0.000	452	0.00
P-1036	J-1031	J-1032	12.0	130.0	1	0.00	0.000	391	0.00
P-1037	J-1033	J-1027	12.0	130.0	-1	0.00	0.000	274	0.00
P-1038	J-1035	J-1033	12.0	130.0	-1	0.00	0.000	254	0.00
P-1039	J-1034	J-1035	12.0	130.0	0	0.00	0.000	633	0.00
P-1040	J-1043	J-1035	12.0	130.0	-1	0.00	0.000	65	0.00
P-1041	J-1036	J-1031	12.0	130.0	-1	0.00	0.000	294	0.00
P-1042	J-1037	J-1036	12.0	130.0	-1	0.00	0.000	12	0.00
P-1043	J-1045	J-1037	12.0	130.0	-1	0.00	0.000	288	0.00
P-1044	J-1032	J-1038	12.0	130.0	3	0.01	0.000	28	0.00
P-1045	J-1039	J-1038	12.0	130.0	-2	0.01	0.000	263	0.11
P-1046	J-1040	J-1039	12.0	130.0	139	0.39	0.000	53	0.00
P-1047	J-1038	J-1041	12.0	130.0	0	0.00	0.000	265	0.00
P-1048	J-1041	J-1042	12.0	130.0	0	0.00	0.000	266	0.00
P-1049	J-1042	J-1048	12.0	130.0	0	0.00	0.000	34	0.00
P-1050	J-1040	J-1064	12.0	130.0	103	0.29	0.000	1,142	0.04
P-1051	J-1044	J-1043	12.0	130.0	0	0.00	0.000	488	0.00
P-1052	J-1045	J-1044	12.0	130.0	0	0.00	0.000	97	0.00
P-1053	J-1046	J-1045	12.0	130.0	-1	0.00	0.000	93	0.00
P-1054	J-1047	J-1046	12.0	130.0	-1	0.00	0.000	449	0.00
P-1055	J-1048	J-1047	12.0	130.0	-1	0.00	0.000	394	0.00
P-1056	J-1043	J-1049	12.0	130.0	1	0.00	0.000	24	0.00
P-1057	J-1049	J-1050	12.0	130.0	1	0.00	0.000	258	0.00
P-1058	J-1050	J-1051	12.0	130.0	1	0.00	0.000	373	0.00
P-1059	J-1051	J-1052	12.0	130.0	1	0.00	0.000	240	0.00
P-1060	J-1052	J-1053	12.0	130.0	1	0.00	0.000	513	0.00
P-1061	J-1053	J-1068	12.0	130.0	1	0.00	0.000	105	0.00
P-1062	J-1054	J-1045	12.0	130.0	-1	0.00	0.000	294	0.00
P-1063	J-1055	J-1054	12.0	130.0	-1	0.00	0.000	48	0.00
P-1064	J-1058	J-1055	12.0	130.0	-1	0.00	0.000	236	0.00
P-1065	J-1066	J-1058	12.0	130.0	0	0.00	0.000	57	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1066	J-1067	J-1066	12.0	130.0	0	0.00	0.000	213	0.00
P-1067	J-1068	J-1067	12.0	130.0	0	0.00	0.000	90	0.00
P-1068	J-1069	J-1068	12.0	130.0	-1	0.00	0.000	205	0.00
P-1069	J-1056	J-1048	12.0	130.0	-1	0.00	0.000	294	0.00
P-1070	J-1057	J-1056	12.0	130.0	-1	0.00	0.000	266	0.00
P-1071	J-1062	J-1057	12.0	130.0	-1	0.00	0.000	18	0.00
P-1072	J-1059	J-1058	12.0	130.0	-1	0.00	0.000	96	0.00
P-1073	J-1060	J-1059	12.0	130.0	-1	0.00	0.000	440	0.00
P-1074	J-1061	J-1060	12.0	130.0	-1	0.00	0.000	43	0.00
P-1075	J-1061	J-1062	12.0	130.0	1	0.00	0.000	360	0.00
P-1076	J-1062	J-1063	12.0	130.0	2	0.01	0.001	263	0.15
P-1077	J-1064	J-1063	12.0	130.0	103	0.29	0.000	54	0.00
P-1078	J-1064	J-1065	12.0	130.0	0	0.00	0.000	332	0.00
P-1079	J-1070	J-1061	12.0	130.0	1	0.00	0.000	435	0.00
P-1080	J-1071	J-1070	12.0	130.0	1	0.00	0.000	277	0.00
P-1081	J-1072	J-1071	12.0	130.0	1	0.00	0.000	295	0.00
P-1082	J-1069	J-1072	12.0	130.0	1	0.00	0.000	100	0.00
P-1200	ACV-3	J-1000	12.0	130.0	661	1.88	0.001	814	0.96
P-FH1	J-1004	FH-1	6.0	130.0	0	0.00	0.000	23	0.00
P-FH2	J-1006	FH-2	6.0	130.0	0	0.00	0.000	23	0.00
P-FH3	J-1007	FH-3	6.0	130.0	0	0.00	0.000	23	0.00
P-FH4	J-1008	FH-4	6.0	130.0	0	0.00	0.000	23	0.00
P-FH5	J-1009	FH-5	6.0	130.0	0	0.00	0.000	23	0.00
P-FH6	J-1010	FH-6	6.0	130.0	0	0.00	0.000	10	0.00
P-FH7	J-1011	FH-7	6.0	130.0	0	0.00	0.000	0	0.00
P-FH8	J-1013	FH-8	6.0	130.0	0	0.00	0.000	27	0.00
P-FH9	J-1014	FH-9	6.0	130.0	0	0.00	0.000	38	0.00
P-FH10	J-1016	FH-10	6.0	130.0	0	0.00	0.000	17	0.00
P-FH11	J-1017	FH-11	6.0	130.0	0	0.00	0.000	27	0.00
P-FH12	J-1018	FH-12	6.0	130.0	0	0.00	0.000	27	0.00
P-FH13	J-1020	FH-13	6.0	130.0	0	0.00	0.000	15	0.00
P-FH14	J-1021	FH-14	6.0	130.0	0	0.00	0.000	10	0.00
P-FH15	J-1022	FH-15	6.0	130.0	0	0.00	0.000	10	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-FH16	J-1023	FH-16	6.0	130.0	0	0.00	0.000	105	0.00
P-FH17	J-1024	FH-17	6.0	130.0	0	0.00	0.000	100	0.00
P-FH18	J-1025	FH-18	6.0	130.0	0	0.00	0.000	19	0.00
P-FH19	J-1026	FH-19	6.0	130.0	0	0.00	0.000	22	0.00
P-FH20	J-1028	FH-20	6.0	130.0	0	0.00	0.000	31	0.00
P-FH21	J-1030	FH-21	6.0	130.0	0	0.00	0.000	34	0.00
P-FH22	J-1031	FH-22	6.0	130.0	0	0.00	0.000	21	0.00
P-FH23	J-1033	FH-23	6.0	130.0	0	0.00	0.000	10	0.00
P-FH24	J-1036	FH-24	6.0	130.0	0	0.00	0.000	105	0.00
P-FH25	J-1037	FH-25	6.0	130.0	0	0.00	0.000	100	0.00
P-FH26	J-1041	FH-26	6.0	130.0	0	0.00	0.000	19	0.00
P-FH27	J-1042	FH-27	6.0	130.0	0	0.00	0.000	22	0.00
P-FH28	J-1044	FH-28	6.0	130.0	0	0.00	0.000	26	0.00
P-FH29	J-1046	FH-29	6.0	130.0	0	0.00	0.000	34	0.00
P-FH30	J-1047	FH-30	6.0	130.0	0	0.00	0.000	21	0.00
P-FH31	J-1049	FH-31	6.0	130.0	0	0.00	0.000	10	0.00
P-FH32	J-1050	FH-32	6.0	130.0	0	0.00	0.000	10	0.00
P-FH33	J-1051	FH-33	6.0	130.0	0	0.00	0.000	10	0.00
P-FH34	J-1052	FH-34	6.0	130.0	0	0.00	0.000	10	0.00
P-FH35	J-1054	FH-35	6.0	130.0	0	0.00	0.000	100	0.00
P-FH36	J-1055	FH-36	6.0	130.0	0	0.00	0.000	105	0.00
P-FH37	J-1066	FH-37	6.0	130.0	0	0.00	0.000	105	0.00
P-FH38	J-1067	FH-38	6.0	130.0	0	0.00	0.000	100	0.00
P-FH39	J-1053	FH-39	6.0	130.0	0	0.00	0.000	31	0.00
P-FH40	J-1056	FH-40	6.0	130.0	0	0.00	0.000	19	0.00
P-FH41	J-1057	FH-41	6.0	130.0	0	0.00	0.000	22	0.00
P-FH42	J-1059	FH-42	6.0	130.0	0	0.00	0.000	0	0.00
P-FH43	J-1060	FH-43	6.0	130.0	0	0.00	0.000	0	0.00
P-FH44	J-1070	FH-44	6.0	130.0	0	0.00	0.000	13	0.00
P-FH45	J-1071	FH-45	6.0	130.0	0	0.00	0.000	24	0.00
P-FH46	J-1072	FH-46	6.0	130.0	0	0.00	0.000	25	0.00
P-R1	R-1	ACV-3	12.0	130.0	661	1.88	0.001	1	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-R2	R-2	J-1034	12.0	130.0	0	0.00	0.000	1	0.00

APPENDIX D

POTABLE WATER PLAN – NEAR-TERM ONSITE WITH FIRE FLOW MODEL RESULTS

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	92.00	0	235.53	62
FH-2	93.00	0	235.33	62
FH-3	93.00	0	235.29	62
FH-4	93.00	0	235.24	62
FH-5	93.00	0	235.21	62
FH-6	92.00	0	235.70	62
FH-7	93.00	0	235.56	62
FH-8	88.00	0	235.34	64
FH-9	89.00	0	235.26	63
FH-10	89.00	0	235.22	63
FH-11	88.00	0	235.19	64
FH-12	88.00	0	235.15	64
FH-13	91.00	0	235.13	62
FH-14	88.00	0	235.41	64
FH-15	87.00	0	235.37	64
FH-16	86.00	0	235.09	65
FH-17	86.00	0	235.08	64
FH-18	87.00	0	234.99	64
FH-19	88.00	0	234.88	64
FH-20	87.00	0	235.00	64
FH-21	88.00	0	234.92	64
FH-22	88.00	0	234.89	64
FH-23	87.00	0	235.48	64
FH-24	86.00	0	234.45	64
FH-25	86.00	0	234.43	64
FH-26	86.00	0	234.40	64
FH-27	88.00	0	233.96	63
FH-28	87.00	0	234.13	64
FH-29	87.00	0	233.96	64
FH-30	89.00	0	233.93	63
FH-31	87.00	0	234.87	64
FH-32	86.00	0	233.91	64
FH-33	86.00	0	232.51	63
FH-34	86.00	0	231.62	63
FH-35	85.00	0	232.47	64
FH-36	85.00	0	232.23	64
FH-37	85.00	0	230.82	63
FH-38	85.00	0	230.02	63
FH-39	86.00	1,020	227.32	61
FH-40	86.00	0	233.25	64
FH-41	87.00	0	232.66	63
FH-42	87.00	0	231.02	62
FH-43	87.00	0	230.95	62
FH-44	87.00	1,020	227.27	61
FH-45	88.00	1,020	226.15	60
FH-46	86.00	1,020	226.23	61
J-1000	89.00	0	243.08	67
J-1001	89.80	65	241.18	65
J-1002	89.00	350	242.84	67

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1003	87.50	0	235.72	64
J-1004	87.60	0	235.53	64
J-1005	88.00	0	235.34	64
J-1006	88.30	0	235.33	64
J-1007	88.25	0	235.29	64
J-1008	88.25	0	235.24	64
J-1009	88.25	0	235.21	64
J-1010	87.80	0	235.70	64
J-1011	87.50	0	235.56	64
J-1012	82.50	0	235.42	66
J-1013	83.00	0	235.34	66
J-1014	83.75	0	235.26	66
J-1015	83.25	0	235.23	66
J-1016	84.50	0	235.22	65
J-1017	83.30	0	235.19	66
J-1018	83.60	0	235.15	66
J-1019	85.75	0	235.13	65
J-1020	85.70	0	235.13	65
J-1021	82.50	0	235.41	66
J-1022	82.00	0	235.37	66
J-1023	80.75	0	235.09	67
J-1024	80.75	0	235.08	67
J-1025	82.00	0	234.99	66
J-1026	83.40	0	234.88	66
J-1027	82.00	0	235.37	66
J-1028	82.00	0	235.00	66
J-1029	81.75	0	234.93	66
J-1030	82.75	0	234.92	66
J-1031	83.25	0	234.89	66
J-1032	83.25	0	234.86	66
J-1033	82.00	0	235.48	66
J-1034	74.75	0	250.99	76
J-1035	81.59	0	235.58	67
J-1036	80.25	0	234.45	67
J-1037	80.30	0	234.43	67
J-1038	83.01	0	234.84	66
J-1039	87.35	141	235.39	64
J-1040	89.00	0	235.42	63
J-1041	81.40	0	234.40	66
J-1042	83.00	0	233.96	65
J-1043	81.50	0	234.96	66
J-1044	82.00	0	234.13	66
J-1045	81.60	0	233.97	66
J-1046	82.40	0	233.96	66
J-1047	83.70	0	233.93	65
J-1048	83.00	0	233.91	65
J-1049	81.50	0	234.87	66
J-1050	81.40	0	233.91	66
J-1051	81.40	0	232.51	65

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1052	81.40	0	231.62	65
J-1053	80.50	0	229.70	65
J-1054	80.00	0	232.47	66
J-1055	79.90	0	232.23	66
J-1056	81.00	0	233.25	66
J-1057	82.30	0	232.66	65
J-1058	80.00	0	231.03	65
J-1059	81.50	0	231.02	65
J-1060	82.15	0	230.95	64
J-1061	82.60	0	230.94	64
J-1062	82.25	0	232.62	65
J-1063	83.75	105	234.37	65
J-1064	83.75	0	234.41	65
J-1065	82.00	0	234.41	66
J-1066	80.00	0	230.82	65
J-1067	79.70	0	230.02	65
J-1068	79.60	0	229.68	65
J-1069	80.60	0	228.66	64
J-1070	81.80	0	228.27	63
J-1071	82.60	0	228.00	63
J-1072	81.25	0	228.15	64
J-1073	89.00	0	252.99	71

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1000	J-1000	J-1001	12.0	130.0	1,029	2.92	0.003	710	1.90
P-1001	J-1001	J-1040	12.0	130.0	964	2.74	0.002	2,433	5.77
P-1002	J-1000	J-1002	12.0	130.0	1,304	3.70	0.004	58	0.24
P-1003	J-1002	J-1003	12.0	130.0	954	2.71	0.056	128	7.12
P-1004	J-1003	J-1004	12.0	130.0	478	1.35	0.001	296	0.19
P-1005	J-1004	J-1005	12.0	130.0	478	1.35	0.001	289	0.19
P-1006	J-1005	J-1006	12.0	130.0	202	0.57	0.000	59	0.01
P-1007	J-1006	J-1007	12.0	130.0	202	0.57	0.000	339	0.04
P-1008	J-1007	J-1008	12.0	130.0	202	0.57	0.000	382	0.05
P-1009	J-1008	J-1009	12.0	130.0	202	0.57	0.000	229	0.03
P-1010	J-1009	J-1020	12.0	130.0	202	0.57	0.000	590	0.08
P-1011	J-1015	J-1005	12.0	130.0	-275	0.78	0.000	469	0.11
P-1012	J-1003	J-1010	12.0	130.0	477	1.35	0.001	33	0.02
P-1013	J-1011	J-1010	12.0	130.0	-477	1.35	0.001	213	0.14
P-1014	J-1012	J-1011	12.0	130.0	-477	1.35	0.001	223	0.14
P-1015	J-1013	J-1012	12.0	130.0	-325	0.92	0.000	249	0.08
P-1016	J-1014	J-1013	12.0	130.0	-325	0.92	0.000	239	0.08
P-1017	J-1015	J-1014	12.0	130.0	-325	0.92	0.000	97	0.03
P-1018	J-1016	J-1015	12.0	130.0	-185	0.53	0.000	93	0.01
P-1019	J-1017	J-1016	12.0	130.0	-185	0.53	0.000	282	0.03
P-1020	J-1018	J-1017	12.0	130.0	-185	0.53	0.000	348	0.04
P-1021	J-1019	J-1018	12.0	130.0	-185	0.53	0.000	214	0.02
P-1022	J-1020	J-1019	12.0	130.0	202	0.57	0.000	26	0.00
P-1023	J-1012	J-1021	12.0	130.0	151	0.43	0.000	37	0.00
P-1024	J-1021	J-1022	12.0	130.0	151	0.43	0.000	546	0.04
P-1025	J-1022	J-1027	12.0	130.0	151	0.43	0.000	22	0.00
P-1026	J-1023	J-1015	12.0	130.0	-415	1.18	0.000	294	0.15
P-1027	J-1024	J-1023	12.0	130.0	-415	1.18	0.000	12	0.01
P-1028	J-1029	J-1024	12.0	130.0	-415	1.18	0.000	300	0.15
P-1029	J-1025	J-1019	12.0	130.0	-388	1.10	0.000	318	0.14
P-1030	J-1026	J-1025	12.0	130.0	-388	1.10	0.000	254	0.11
P-1031	J-1032	J-1026	12.0	130.0	-388	1.10	0.000	34	0.01
P-1032	J-1027	J-1028	12.0	130.0	519	1.47	0.001	491	0.37

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1033	J-1028	J-1029	12.0	130.0	519	1.47	0.001	95	0.07
P-1034	J-1029	J-1030	12.0	130.0	148	0.42	0.000	93	0.01
P-1035	J-1030	J-1031	12.0	130.0	148	0.42	0.000	452	0.03
P-1036	J-1031	J-1032	12.0	130.0	148	0.42	0.000	391	0.03
P-1037	J-1033	J-1027	12.0	130.0	367	1.04	0.000	274	0.11
P-1038	J-1035	J-1033	12.0	130.0	367	1.04	0.000	254	0.10
P-1039	J-1034	J-1035	12.0	130.0	2,408	6.83	0.024	633	15.41
P-1040	J-1043	J-1035	12.0	130.0	-2,040	5.79	0.009	65	0.62
P-1041	J-1036	J-1029	12.0	130.0	-786	2.23	0.002	294	0.48
P-1042	J-1037	J-1036	12.0	130.0	-786	2.23	0.002	12	0.02
P-1043	J-1045	J-1037	12.0	130.0	-786	2.23	0.002	288	0.47
P-1044	J-1032	J-1038	12.0	130.0	535	1.52	0.001	28	0.02
P-1045	J-1039	J-1038	12.0	130.0	258	0.73	0.002	263	0.55
P-1046	J-1040	J-1039	12.0	130.0	399	1.13	0.000	53	0.02
P-1047	J-1038	J-1041	12.0	130.0	794	2.25	0.002	265	0.44
P-1048	J-1041	J-1042	12.0	130.0	794	2.25	0.002	266	0.44
P-1049	J-1042	J-1048	12.0	130.0	794	2.25	0.002	34	0.06
P-1050	J-1040	J-1064	12.0	130.0	565	1.60	0.001	1,142	1.01
P-1051	J-1044	J-1043	12.0	130.0	-807	2.29	0.002	488	0.83
P-1052	J-1045	J-1044	12.0	130.0	-807	2.29	0.002	97	0.17
P-1053	J-1046	J-1045	12.0	130.0	-138	0.39	0.000	93	0.01
P-1054	J-1047	J-1046	12.0	130.0	-138	0.39	0.000	449	0.03
P-1055	J-1048	J-1047	12.0	130.0	-138	0.39	0.000	394	0.03
P-1056	J-1043	J-1049	12.0	130.0	1,233	3.50	0.004	24	0.09
P-1057	J-1049	J-1050	12.0	130.0	1,233	3.50	0.004	258	0.96
P-1058	J-1050	J-1051	12.0	130.0	1,233	3.50	0.004	373	1.39
P-1059	J-1051	J-1052	12.0	130.0	1,233	3.50	0.004	240	0.90
P-1060	J-1052	J-1053	12.0	130.0	1,233	3.50	0.004	513	1.92
P-1061	J-1053	J-1068	12.0	130.0	213	0.61	0.000	105	0.02
P-1062	J-1054	J-1045	12.0	130.0	-1,455	4.13	0.005	294	1.49
P-1063	J-1055	J-1054	12.0	130.0	-1,455	4.13	0.005	48	0.24
P-1064	J-1058	J-1055	12.0	130.0	-1,455	4.13	0.005	236	1.20
P-1065	J-1066	J-1058	12.0	130.0	-1,233	3.50	0.004	57	0.21

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1066	J-1067	J-1066	12.0	130.0	-1,233	3.50	0.004	213	0.80
P-1067	J-1068	J-1067	12.0	130.0	-1,233	3.50	0.004	90	0.34
P-1068	J-1069	J-1068	12.0	130.0	-1,447	4.10	0.005	205	1.03
P-1069	J-1056	J-1048	12.0	130.0	-931	2.64	0.002	294	0.65
P-1070	J-1057	J-1056	12.0	130.0	-931	2.64	0.002	266	0.59
P-1071	J-1062	J-1057	12.0	130.0	-931	2.64	0.002	18	0.04
P-1072	J-1059	J-1058	12.0	130.0	-222	0.63	0.000	96	0.01
P-1073	J-1060	J-1059	12.0	130.0	-222	0.63	0.000	440	0.07
P-1074	J-1061	J-1060	12.0	130.0	-222	0.63	0.000	43	0.01
P-1075	J-1061	J-1062	12.0	130.0	-1,391	3.95	0.005	360	1.68
P-1076	J-1062	J-1063	12.0	130.0	-460	1.30	0.007	263	1.74
P-1077	J-1064	J-1063	12.0	130.0	565	1.60	0.001	54	0.05
P-1078	J-1064	J-1065	12.0	130.0	0	0.00	0.000	332	0.00
P-1079	J-1070	J-1061	12.0	130.0	-1,613	4.58	0.006	435	2.67
P-1080	J-1071	J-1070	12.0	130.0	-593	1.68	0.001	277	0.27
P-1081	J-1072	J-1071	12.0	130.0	427	1.21	0.001	295	0.15
P-1082	J-1069	J-1072	12.0	130.0	1,447	4.10	0.005	100	0.50
P-1200	J-1073	J-1000	12.0	130.0	2,333	6.62	0.012	814	9.91
P-FH1	J-1004	FH-1	6.0	130.0	0	0.00	0.000	23	0.00
P-FH2	J-1006	FH-2	6.0	130.0	0	0.00	0.000	23	0.00
P-FH3	J-1007	FH-3	6.0	130.0	0	0.00	0.000	23	0.00
P-FH4	J-1008	FH-4	6.0	130.0	0	0.00	0.000	23	0.00
P-FH5	J-1009	FH-5	6.0	130.0	0	0.00	0.000	23	0.00
P-FH6	J-1010	FH-6	6.0	130.0	0	0.00	0.000	10	0.00
P-FH7	J-1011	FH-7	6.0	130.0	0	0.00	0.000	10	0.00
P-FH8	J-1013	FH-8	6.0	130.0	0	0.00	0.000	27	0.00
P-FH9	J-1014	FH-9	6.0	130.0	0	0.00	0.000	38	0.00
P-FH10	J-1016	FH-10	6.0	130.0	0	0.00	0.000	17	0.00
P-FH11	J-1017	FH-11	6.0	130.0	0	0.00	0.000	27	0.00
P-FH12	J-1018	FH-12	6.0	130.0	0	0.00	0.000	27	0.00
P-FH13	J-1020	FH-13	6.0	130.0	0	0.00	0.000	15	0.00
P-FH14	J-1021	FH-14	6.0	130.0	0	0.00	0.000	10	0.00
P-FH15	J-1022	FH-15	6.0	130.0	0	0.00	0.000	10	0.00

FlexTable: Pipe Table

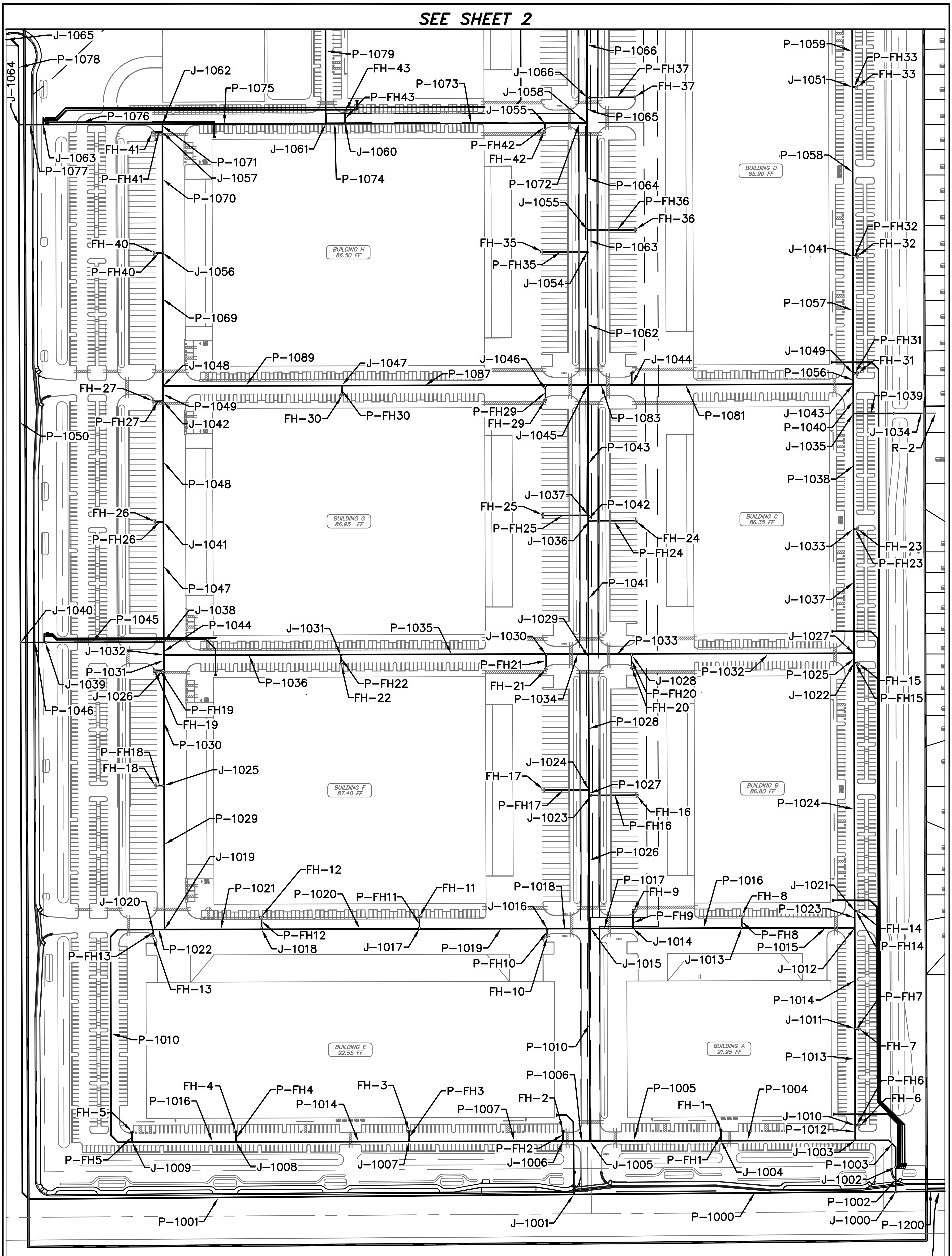
Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-FH16	J-1023	FH-16	6.0	130.0	0	0.00	0.000	105	0.00
P-FH17	J-1024	FH-17	6.0	130.0	0	0.00	0.000	100	0.00
P-FH18	J-1025	FH-18	6.0	130.0	0	0.00	0.000	19	0.00
P-FH19	J-1026	FH-19	6.0	130.0	0	0.00	0.000	22	0.00
P-FH20	J-1028	FH-20	6.0	130.0	0	0.00	0.000	31	0.00
P-FH21	J-1030	FH-21	6.0	130.0	0	0.00	0.000	34	0.00
P-FH22	J-1031	FH-22	6.0	130.0	0	0.00	0.000	21	0.00
P-FH23	J-1033	FH-23	6.0	130.0	0	0.00	0.000	10	0.00
P-FH24	J-1036	FH-24	6.0	130.0	0	0.00	0.000	105	0.00
P-FH25	J-1037	FH-25	6.0	130.0	0	0.00	0.000	100	0.00
P-FH26	J-1041	FH-26	6.0	130.0	0	0.00	0.000	19	0.00
P-FH27	J-1042	FH-27	6.0	130.0	0	0.00	0.000	22	0.00
P-FH28	J-1044	FH-28	6.0	130.0	0	0.00	0.000	26	0.00
P-FH29	J-1046	FH-29	6.0	130.0	0	0.00	0.000	34	0.00
P-FH30	J-1047	FH-30	6.0	130.0	0	0.00	0.000	21	0.00
P-FH31	J-1049	FH-31	6.0	130.0	0	0.00	0.000	10	0.00
P-FH32	J-1050	FH-32	6.0	130.0	0	0.00	0.000	10	0.00
P-FH33	J-1051	FH-33	6.0	130.0	0	0.00	0.000	10	0.00
P-FH34	J-1052	FH-34	6.0	130.0	0	0.00	0.000	10	0.00
P-FH35	J-1054	FH-35	6.0	130.0	0	0.00	0.000	100	0.00
P-FH36	J-1055	FH-36	6.0	130.0	0	0.00	0.000	105	0.00
P-FH37	J-1066	FH-37	6.0	130.0	0	0.00	0.000	105	0.00
P-FH38	J-1067	FH-38	6.0	130.0	0	0.00	0.000	100	0.00
P-FH39	J-1053	FH-39	6.0	130.0	1,020	11.57	0.077	31	2.39
P-FH40	J-1056	FH-40	6.0	130.0	0	0.00	0.000	19	0.00
P-FH41	J-1057	FH-41	6.0	130.0	0	0.00	0.000	22	0.00
P-FH42	J-1059	FH-42	6.0	130.0	0	0.00	0.000	18	0.00
P-FH43	J-1060	FH-43	6.0	130.0	0	0.00	0.000	27	0.00
P-FH44	J-1070	FH-44	6.0	130.0	1,020	11.57	0.077	13	1.00
P-FH45	J-1071	FH-45	6.0	130.0	1,020	11.57	0.077	24	1.85
P-FH46	J-1072	FH-46	6.0	130.0	1,020	11.57	0.077	25	1.92
P-R1	R-1	J-1073	12.0	130.0	2,333	6.62	0.012	1	0.01

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-R2	R-2	J-1034	12.0	130.0	2,408	6.83	0.013	1	0.01

APPENDIX E

POTABLE WATER PLAN – BUILDOUT ONSITE WITHOUT FIRE FLOW MODEL RESULTS



POINT OF CONNECTION IS LOCATED AT THE INTERSECTION OF BLUE OAK AND CLOUD DANCE DRIVE. NODE J-1073, PIPE P-R1 AND RESERVIOR R-1 MAKE UP THE CONNECTION AT THE INTERSECTION.

0 100 200 400

SCALE: 1"=200'

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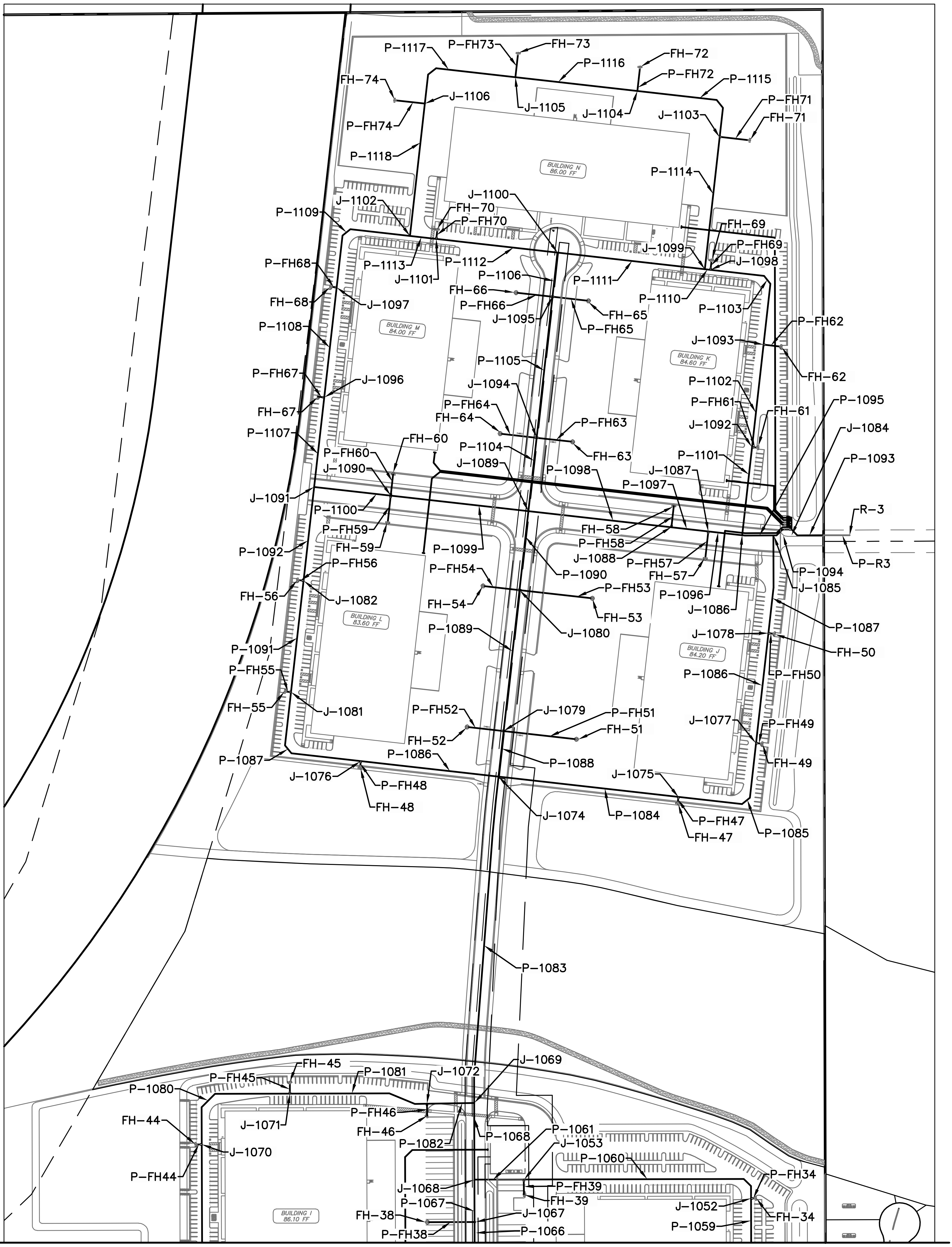
FIRE SYSTEM EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA
SHEET 1 OF 2 MARCH 01, 2022

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH_Fire Site Plan- Project Site.dwg



SEE SHEET 1

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0 100 200 400
LM
SCALE: 1"=200'

FIRE SYSTEM EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA
SHEET 2 OF 2 MARCH 01, 2022

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH_Fire Site Plan- Project Site.dwg

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	92.00	0	194.55	44
FH-2	93.00	0	194.56	44
FH-3	93.00	0	194.56	44
FH-4	93.00	0	194.56	44
FH-5	93.00	0	194.56	44
FH-6	92.00	0	194.55	44
FH-7	93.00	0	194.55	44
FH-8	88.00	0	194.56	46
FH-9	89.00	0	194.56	46
FH-10	89.00	0	194.56	46
FH-11	88.00	0	194.56	46
FH-12	88.00	0	194.56	46
FH-13	91.00	0	194.56	45
FH-14	88.00	0	194.57	46
FH-15	87.00	0	194.59	47
FH-16	86.00	0	194.57	47
FH-17	86.00	0	194.57	47
FH-18	87.00	0	194.56	47
FH-19	88.00	0	194.56	46
FH-20	87.00	0	194.58	47
FH-21	88.00	0	194.57	46
FH-22	88.00	0	194.57	46
FH-23	87.00	0	194.62	47
FH-24	86.00	0	194.57	47
FH-25	86.00	0	194.57	47
FH-26	86.00	0	194.56	47
FH-27	88.00	0	194.56	46
FH-28	87.00	0	194.59	47
FH-29	87.00	0	194.57	47
FH-30	89.00	0	194.57	46
FH-31	87.00	0	194.64	47
FH-32	86.00	0	194.62	47
FH-33	86.00	0	194.60	47
FH-34	86.00	0	194.59	47
FH-35	85.00	0	194.57	47
FH-36	85.00	0	194.57	47
FH-37	85.00	0	194.56	47
FH-38	85.00	0	194.56	47
FH-39	86.00	0	194.56	47
FH-40	86.00	0	194.55	47
FH-41	87.00	0	194.55	47
FH-42	87.00	0	194.56	47
FH-43	87.00	0	194.55	47
FH-44	87.00	0	194.55	47
FH-45	88.00	0	194.55	46
FH-46	86.00	0	194.54	47
FH-47	85.00	0	194.47	47
FH-48	84.00	0	194.47	48
FH-49	85.00	0	194.46	47

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-50	85.00	0	194.46	47
FH-51	84.00	0	194.47	48
FH-52	84.00	0	194.47	48
FH-53	84.00	0	194.47	48
FH-54	84.00	0	194.47	48
FH-55	84.00	0	194.47	48
FH-56	84.00	0	194.47	48
FH-57	85.00	0	194.46	47
FH-58	85.00	0	194.46	47
FH-59	84.00	0	194.46	48
FH-60	84.00	0	194.46	48
FH-61	85.00	0	194.46	47
FH-62	85.00	0	194.46	47
FH-63	85.00	0	194.46	47
FH-64	85.00	0	194.46	47
FH-65	85.00	0	194.46	47
FH-66	85.00	0	194.46	47
FH-67	85.00	0	194.46	47
FH-68	85.00	0	194.46	47
FH-69	85.00	0	194.46	47
FH-70	85.00	0	194.46	47
FH-71	86.00	0	194.46	47
FH-72	86.33	0	194.46	47
FH-73	86.33	0	194.46	47
FH-74	85.32	0	194.46	47
J-1000	89.00	0	194.54	46
J-1001	89.80	65	194.46	45
J-1002	89.00	451	194.53	46
J-1003	87.50	0	194.54	46
J-1004	87.60	0	194.55	46
J-1005	88.00	0	194.56	46
J-1006	88.30	0	194.56	46
J-1007	88.25	0	194.56	46
J-1008	88.25	0	194.56	46
J-1009	88.25	0	194.56	46
J-1010	87.80	0	194.55	46
J-1011	87.50	0	194.55	46
J-1012	82.50	0	194.56	48
J-1013	83.00	0	194.56	48
J-1014	83.75	0	194.56	48
J-1015	83.25	0	194.56	48
J-1016	84.50	0	194.56	48
J-1017	83.30	0	194.56	48
J-1018	83.60	0	194.56	48
J-1019	85.75	0	194.56	47
J-1020	85.70	0	194.56	47
J-1021	82.50	0	194.57	48
J-1022	82.00	0	194.59	49
J-1023	80.75	0	194.57	49

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1024	80.75	0	194.57	49
J-1025	82.00	0	194.56	49
J-1026	83.40	0	194.56	48
J-1027	82.00	0	194.59	49
J-1028	82.00	0	194.58	49
J-1029	81.75	0	194.57	49
J-1030	82.75	0	194.57	48
J-1031	83.25	0	194.57	48
J-1032	83.25	0	194.56	48
J-1033	82.00	0	194.62	49
J-1034	74.75	0	196.00	52
J-1035	81.59	0	194.66	49
J-1036	80.25	0	194.57	49
J-1037	80.30	0	194.57	49
J-1038	83.01	0	194.56	48
J-1039	87.35	144	194.34	46
J-1040	89.00	0	194.34	46
J-1041	81.40	0	194.56	49
J-1042	83.00	0	194.56	48
J-1043	81.50	0	194.64	49
J-1044	81.40	0	194.59	49
J-1045	81.60	0	194.58	49
J-1046	82.40	0	194.57	49
J-1047	83.70	0	194.57	48
J-1048	83.00	0	194.56	48
J-1049	81.50	0	194.64	49
J-1050	81.40	0	194.62	49
J-1051	81.40	0	194.60	49
J-1053	80.50	0	194.56	49
J-1054	80.00	0	194.57	50
J-1055	79.90	0	194.57	50
J-1056	81.00	0	194.55	49
J-1057	82.30	0	194.55	49
J-1058	81.50	0	194.56	49
J-1058	80.00	0	194.56	50
J-1060	82.15	0	194.55	49
J-1061	82.60	0	194.55	48
J-1062	81.40	0	194.59	49
J-1062	82.25	0	194.55	49
J-1063	83.75	104	194.54	48
J-1064	83.75	0	194.35	48
J-1066	80.00	0	194.56	50
J-1067	79.70	0	194.56	50
J-1067	80.00	0	194.47	50
J-1068	79.60	0	194.56	50
J-1069	80.60	0	194.54	49
J-1070	81.80	0	194.55	49
J-1071	82.60	0	194.55	48
J-1072	81.25	0	194.54	49

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1073	89.00	0	195.00	46
J-1074	79.40	0	194.47	50
J-1076	79.40	0	194.47	50
J-1077	79.60	0	194.46	50
J-1078	79.60	0	194.46	50
J-1079	78.50	0	194.47	50
J-1080	78.80	0	194.47	50
J-1081	79.30	0	194.47	50
J-1082	79.30	0	194.47	50
J-1083	86.00	0	194.45	47
J-1084	79.00	178	194.45	50
J-1085	79.00	0	194.45	50
J-1086	79.40	0	194.46	50
J-1087	79.80	0	194.46	50
J-1088	79.80	0	194.46	50
J-1089	79.70	0	194.46	50
J-1090	79.40	0	194.46	50
J-1091	78.90	0	194.46	50
J-1092	80.00	0	194.46	50
J-1093	80.00	0	194.46	50
J-1094	79.80	0	194.46	50
J-1095	80.15	0	194.46	49
J-1096	79.60	0	194.46	50
J-1097	79.60	0	194.46	50
J-1098	80.40	0	194.46	49
J-1099	80.40	0	194.46	49
J-1100	80.90	0	194.46	49
J-1101	80.30	0	194.46	49
J-1102	80.10	0	194.46	49
J-1103	81.00	0	194.46	49
J-1104	81.00	0	194.46	49
J-1105	81.00	0	194.46	49
J-1106	82.00	0	194.46	49
J-1107	82.00	0	194.35	49

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-390	J-1037	FH-25	6.0	130.0	0	0.00	0.000	100	0.00
P-1000	J-1000	J-1001	12.0	130.0	183	0.52	0.000	710	0.08
P-1001	J-1001	J-1040	12.0	130.0	118	0.34	0.000	2,433	0.12
P-1002	J-1000	J-1002	12.0	130.0	260	0.74	0.000	58	0.01
P-1003	J-1002	J-1003	12.0	130.0	-191	0.54	0.000	128	0.02
P-1004	J-1003	J-1004	12.0	130.0	-81	0.23	0.000	296	0.01
P-1005	J-1004	J-1005	12.0	130.0	-81	0.23	0.000	289	0.01
P-1006	J-1005	J-1006	12.0	130.0	-26	0.08	0.000	59	0.00
P-1007	J-1006	J-1007	12.0	130.0	-26	0.08	0.000	339	0.00
P-1008	J-1007	J-1008	12.0	130.0	-26	0.08	0.000	382	0.00
P-1009	J-1008	J-1009	12.0	130.0	-26	0.08	0.000	229	0.00
P-1010	J-1009	J-1020	12.0	130.0	-26	0.08	0.000	590	0.00
P-1011	J-1015	J-1005	12.0	130.0	55	0.16	0.000	469	0.01
P-1012	J-1003	J-1010	12.0	130.0	-109	0.31	0.000	33	0.00
P-1013	J-1011	J-1010	12.0	130.0	109	0.31	0.000	213	0.01
P-1014	J-1012	J-1011	12.0	130.0	109	0.31	0.000	223	0.01
P-1015	J-1013	J-1012	12.0	130.0	-1	0.00	0.000	249	0.00
P-1016	J-1014	J-1013	12.0	130.0	-1	0.00	0.000	239	0.00
P-1017	J-1015	J-1014	12.0	130.0	-1	0.00	0.000	97	0.00
P-1018	J-1016	J-1015	12.0	130.0	-11	0.03	0.000	93	0.00
P-1019	J-1017	J-1016	12.0	130.0	-11	0.03	0.000	282	0.00
P-1020	J-1018	J-1017	12.0	130.0	-11	0.03	0.000	348	0.00
P-1021	J-1019	J-1018	12.0	130.0	-11	0.03	0.000	214	0.00
P-1022	J-1020	J-1019	12.0	130.0	-26	0.08	0.000	26	0.00
P-1023	J-1012	J-1021	12.0	130.0	-110	0.31	0.000	37	0.00
P-1024	J-1021	J-1022	12.0	130.0	-110	0.31	0.000	546	0.02
P-1025	J-1022	J-1027	12.0	130.0	-110	0.31	0.000	22	0.00
P-1026	J-1023	J-1015	12.0	130.0	65	0.18	0.000	294	0.00
P-1027	J-1024	J-1023	12.0	130.0	65	0.18	0.000	12	0.00
P-1028	J-1029	J-1024	12.0	130.0	65	0.18	0.000	300	0.00
P-1029	J-1025	J-1019	12.0	130.0	15	0.04	0.000	318	0.00
P-1030	J-1026	J-1025	12.0	130.0	15	0.04	0.000	254	0.00
P-1031	J-1032	J-1026	12.0	130.0	15	0.04	0.000	34	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1032	J-1027	J-1028	12.0	130.0	86	0.25	0.000	491	0.01
P-1033	J-1028	J-1029	12.0	130.0	86	0.25	0.000	95	0.00
P-1034	J-1029	J-1030	12.0	130.0	51	0.15	0.000	93	0.00
P-1035	J-1030	J-1031	12.0	130.0	51	0.15	0.000	452	0.00
P-1036	J-1031	J-1032	12.0	130.0	51	0.15	0.000	391	0.00
P-1037	J-1033	J-1027	12.0	130.0	196	0.56	0.000	274	0.03
P-1038	J-1035	J-1033	12.0	130.0	196	0.56	0.000	254	0.03
P-1039	J-1034	J-1035	12.0	130.0	498	1.41	0.009	149	1.34
P-1040	J-1043	J-1035	12.0	130.0	-302	0.86	0.000	65	0.02
P-1041	J-1036	J-1029	12.0	130.0	30	0.08	0.000	294	0.00
P-1042	J-1037	J-1036	12.0	130.0	30	0.08	0.000	12	0.00
P-1043	J-1045	J-1037	12.0	130.0	30	0.08	0.000	288	0.00
P-1044	J-1032	J-1038	12.0	130.0	36	0.10	0.000	28	0.00
P-1045	J-1039	J-1038	12.0	130.0	-13	0.04	0.001	263	0.22
P-1046	J-1040	J-1039	12.0	130.0	131	0.37	0.000	53	0.00
P-1047	J-1038	J-1041	12.0	130.0	22	0.06	0.000	265	0.00
P-1048	J-1041	J-1042	12.0	130.0	22	0.06	0.000	266	0.00
P-1049	J-1042	J-1048	12.0	130.0	22	0.06	0.000	34	0.00
P-1050	J-1040	J-1064	12.0	130.0	-12	0.03	0.000	1,142	0.00
P-1051	J-1044	J-1043	12.0	130.0	-179	0.51	0.000	488	0.05
P-1052	J-1045	J-1044	12.0	130.0	-179	0.51	0.000	97	0.01
P-1053	J-1046	J-1045	12.0	130.0	-61	0.17	0.000	93	0.00
P-1054	J-1047	J-1046	12.0	130.0	-61	0.17	0.000	449	0.01
P-1055	J-1048	J-1047	12.0	130.0	-61	0.17	0.000	394	0.01
P-1056	J-1043	J-1049	12.0	130.0	123	0.35	0.000	24	0.00
P-1057	J-1049	J-1050	12.0	130.0	123	0.35	0.000	258	0.01
P-1058	J-1050	J-1051	12.0	130.0	123	0.35	0.000	373	0.02
P-1059	J-1051	J-1062	12.0	130.0	123	0.35	0.000	240	0.01
P-1060	J-1062	J-1053	12.0	130.0	123	0.35	0.000	513	0.03
P-1061	J-1053	J-1068	12.0	130.0	123	0.35	0.000	105	0.01
P-1062	J-1054	J-1045	12.0	130.0	-89	0.25	0.000	294	0.01
P-1063	J-1055	J-1054	12.0	130.0	-89	0.25	0.000	48	0.00
P-1064	J-1058	J-1055	12.0	130.0	-89	0.25	0.000	236	0.01

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1065	J-1066	J-1058	12.0	130.0	-22	0.06	0.000	57	0.00
P-1066	J-1067	J-1066	12.0	130.0	-22	0.06	0.000	213	0.00
P-1067	J-1068	J-1067	12.0	130.0	-22	0.06	0.000	90	0.00
P-1068	J-1069	J-1068	12.0	130.0	-144	0.41	0.000	205	0.01
P-1069	J-1056	J-1048	12.0	130.0	-83	0.24	0.000	294	0.01
P-1070	J-1057	J-1056	12.0	130.0	-83	0.24	0.000	266	0.01
P-1071	J-1062	J-1057	12.0	130.0	-83	0.24	0.000	18	0.00
P-1072	J-1058	J-1058	12.0	130.0	-67	0.19	0.000	96	0.00
P-1073	J-1060	J-1058	12.0	130.0	-67	0.19	0.000	440	0.01
P-1074	J-1061	J-1060	12.0	130.0	-67	0.19	0.000	43	0.00
P-1075	J-1061	J-1062	12.0	130.0	33	0.09	0.000	360	0.00
P-1076	J-1062	J-1063	12.0	130.0	116	0.33	0.000	263	0.01
P-1077	J-1064	J-1063	12.0	130.0	-12	0.03	0.004	54	0.19
P-1078	J-1064	J-1107	12.0	130.0	0	0.00	0.000	332	0.00
P-1079	J-1070	J-1061	12.0	130.0	-34	0.10	0.000	435	0.00
P-1080	J-1071	J-1070	12.0	130.0	-34	0.10	0.000	277	0.00
P-1081	J-1072	J-1071	12.0	130.0	-34	0.10	0.000	295	0.00
P-1082	J-1069	J-1072	12.0	130.0	-34	0.10	0.000	100	0.00
P-1083	J-1069	J-1074	12.0	130.0	178	0.50	0.000	692	0.07
P-1084	J-1074	J-1067	12.0	130.0	68	0.19	0.000	383	0.01
P-1085	J-1067	J-1077	12.0	130.0	68	0.19	0.000	273	0.00
P-1086	J-1077	J-1078	12.0	130.0	68	0.19	0.000	234	0.00
P-1086	J-1074	J-1076	12.0	130.0	45	0.13	0.000	293	0.00
P-1087	J-1078	J-1085	12.0	130.0	68	0.19	0.000	207	0.00
P-1087	J-1076	J-1081	12.0	130.0	45	0.13	0.000	283	0.00
P-1088	J-1074	J-1079	12.0	130.0	65	0.18	0.000	97	0.00
P-1089	J-1080	J-1079	12.0	130.0	-65	0.18	0.000	300	0.00
P-1090	J-1089	J-1080	12.0	130.0	-65	0.18	0.000	168	0.00
P-1091	J-1081	J-1082	12.0	130.0	45	0.13	0.000	237	0.00
P-1092	J-1082	J-1091	12.0	130.0	45	0.13	0.000	200	0.00
P-1093	J-1083	J-1084	12.0	130.0	0	0.00	0.000	328	0.00
P-1094	J-1085	J-1084	12.0	130.0	178	0.50	0.000	43	0.00
P-1095	J-1085	J-1086	12.0	130.0	-110	0.31	0.000	66	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1096	J-1086	J-1087	12.0	130.0	-66	0.19	0.000	72	0.00
P-1097	J-1087	J-1088	12.0	130.0	-66	0.19	0.000	79	0.00
P-1098	J-1088	J-1089	12.0	130.0	-66	0.19	0.000	305	0.01
P-1099	J-1090	J-1089	12.0	130.0	21	0.06	0.000	293	0.00
P-1100	J-1091	J-1090	12.0	130.0	21	0.06	0.000	163	0.00
P-1101	J-1086	J-1092	12.0	130.0	-44	0.12	0.000	188	0.00
P-1102	J-1092	J-1093	12.0	130.0	-44	0.12	0.000	218	0.00
P-1103	J-1093	J-1098	12.0	130.0	-44	0.12	0.000	265	0.00
P-1104	J-1094	J-1089	12.0	130.0	-20	0.06	0.000	156	0.00
P-1105	J-1095	J-1094	12.0	130.0	-20	0.06	0.000	300	0.00
P-1106	J-1100	J-1095	12.0	130.0	-20	0.06	0.000	94	0.00
P-1107	J-1091	J-1096	12.0	130.0	24	0.07	0.000	191	0.00
P-1108	J-1096	J-1097	12.0	130.0	24	0.07	0.000	234	0.00
P-1109	J-1097	J-1102	12.0	130.0	24	0.07	0.000	259	0.00
P-1110	J-1098	J-1099	12.0	130.0	-44	0.12	0.000	12	0.00
P-1111	J-1099	J-1100	12.0	130.0	-30	0.08	0.000	314	0.00
P-1112	J-1101	J-1100	12.0	130.0	10	0.03	0.000	258	0.00
P-1113	J-1102	J-1101	12.0	130.0	10	0.03	0.000	56	0.00
P-1114	J-1099	J-1103	12.0	130.0	-14	0.04	0.000	282	0.00
P-1115	J-1103	J-1104	12.0	130.0	-14	0.04	0.000	252	0.00
P-1116	J-1104	J-1105	12.0	130.0	-14	0.04	0.000	259	0.00
P-1117	J-1105	J-1106	12.0	130.0	-14	0.04	0.000	252	0.00
P-1118	J-1106	J-1102	12.0	130.0	-14	0.04	0.000	282	0.00
P-1200	J-1073	J-1000	12.0	130.0	444	1.26	0.001	814	0.46
P-FH1	J-1004	FH-1	6.0	130.0	0	0.00	0.000	23	0.00
P-FH2	J-1006	FH-2	6.0	130.0	0	0.00	0.000	23	0.00
P-FH3	J-1007	FH-3	6.0	130.0	0	0.00	0.000	23	0.00
P-FH4	J-1008	FH-4	6.0	130.0	0	0.00	0.000	23	0.00
P-FH5	J-1009	FH-5	6.0	130.0	0	0.00	0.000	23	0.00
P-FH6	J-1010	FH-6	6.0	130.0	0	0.00	0.000	10	0.00
P-FH7	J-1011	FH-7	6.0	130.0	0	0.00	0.000	10	0.00
P-FH8	J-1013	FH-8	6.0	130.0	0	0.00	0.000	27	0.00
P-FH9	J-1014	FH-9	6.0	130.0	0	0.00	0.000	38	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-FH10	J-1016	FH-10	6.0	130.0	0	0.00	0.000	17	0.00
P-FH11	J-1017	FH-11	6.0	130.0	0	0.00	0.000	27	0.00
P-FH12	J-1018	FH-12	6.0	130.0	0	0.00	0.000	27	0.00
P-FH13	J-1020	FH-13	6.0	130.0	0	0.00	0.000	15	0.00
P-FH14	J-1021	FH-14	6.0	130.0	0	0.00	0.000	10	0.00
P-FH15	J-1022	FH-15	6.0	130.0	0	0.00	0.000	10	0.00
P-FH16	J-1023	FH-16	6.0	130.0	0	0.00	0.000	105	0.00
P-FH17	J-1024	FH-17	6.0	130.0	0	0.00	0.000	100	0.00
P-FH18	J-1025	FH-18	6.0	130.0	0	0.00	0.000	19	0.00
P-FH19	J-1026	FH-19	6.0	130.0	0	0.00	0.000	22	0.00
P-FH20	J-1028	FH-20	6.0	130.0	0	0.00	0.000	31	0.00
P-FH21	J-1030	FH-21	6.0	130.0	0	0.00	0.000	34	0.00
P-FH22	J-1031	FH-22	6.0	130.0	0	0.00	0.000	22	0.00
P-FH23	J-1033	FH-23	6.0	130.0	0	0.00	0.000	10	0.00
P-FH24	J-1036	FH-24	6.0	130.0	0	0.00	0.000	105	0.00
P-FH26	J-1041	FH-26	6.0	130.0	0	0.00	0.000	19	0.00
P-FH27	J-1042	FH-27	6.0	130.0	0	0.00	0.000	22	0.00
P-FH28	J-1044	FH-28	6.0	130.0	0	0.00	0.000	26	0.00
P-FH29	J-1046	FH-29	6.0	130.0	0	0.00	0.000	34	0.00
P-FH30	J-1047	FH-30	6.0	130.0	0	0.00	0.000	21	0.00
P-FH31	J-1049	FH-31	6.0	130.0	0	0.00	0.000	10	0.00
P-FH32	J-1050	FH-32	6.0	130.0	0	0.00	0.000	10	0.00
P-FH33	J-1051	FH-33	6.0	130.0	0	0.00	0.000	10	0.00
P-FH34	J-1062	FH-34	6.0	130.0	0	0.00	0.000	10	0.00
P-FH35	J-1054	FH-35	6.0	130.0	0	0.00	0.000	100	0.00
P-FH36	J-1055	FH-36	6.0	130.0	0	0.00	0.000	105	0.00
P-FH37	J-1066	FH-37	6.0	130.0	0	0.00	0.000	105	0.00
P-FH38	J-1067	FH-38	6.0	130.0	0	0.00	0.000	100	0.00
P-FH39	J-1053	FH-39	6.0	130.0	0	0.00	0.000	31	0.00
P-FH40	J-1056	FH-40	6.0	130.0	0	0.00	0.000	19	0.00
P-FH41	J-1057	FH-41	6.0	130.0	0	0.00	0.000	22	0.00
P-FH42	J-1058	FH-42	6.0	130.0	0	0.00	0.000	18	0.00
P-FH43	J-1060	FH-43	6.0	130.0	0	0.00	0.000	27	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-FH44	J-1070	FH-44	6.0	130.0	0	0.00	0.000	13	0.00
P-FH45	J-1071	FH-45	6.0	130.0	0	0.00	0.000	24	0.00
P-FH46	J-1072	FH-46	6.0	130.0	0	0.00	0.000	25	0.00
P-FH47	J-1067	FH-47	6.0	130.0	0	0.00	0.000	14	0.00
P-FH48	J-1076	FH-48	6.0	130.0	0	0.00	0.000	15	0.00
P-FH49	J-1077	FH-49	6.0	130.0	0	0.00	0.000	13	0.00
P-FH50	J-1078	FH-50	6.0	130.0	0	0.00	0.000	13	0.00
P-FH51	J-1079	FH-51	6.0	130.0	0	0.00	0.000	155	0.00
P-FH52	J-1079	FH-52	6.0	130.0	0	0.00	0.000	78	0.00
P-FH53	J-1080	FH-53	6.0	130.0	0	0.00	0.000	155	0.00
P-FH54	J-1080	FH-54	6.0	130.0	0	0.00	0.000	78	0.00
P-FH55	J-1081	FH-55	6.0	130.0	0	0.00	0.000	13	0.00
P-FH56	J-1082	FH-56	6.0	130.0	0	0.00	0.000	13	0.00
P-FH57	J-1087	FH-57	6.0	130.0	0	0.00	0.000	57	0.00
P-FH58	J-1088	FH-58	6.0	130.0	0	0.00	0.000	45	0.00
P-FH59	J-1090	FH-59	6.0	130.0	0	0.00	0.000	57	0.00
P-FH60	J-1090	FH-60	6.0	130.0	0	0.00	0.000	45	0.00
P-FH61	J-1092	FH-61	6.0	130.0	0	0.00	0.000	13	0.00
P-FH62	J-1093	FH-62	6.0	130.0	0	0.00	0.000	38	0.00
P-FH63	J-1094	FH-63	6.0	130.0	0	0.00	0.000	77	0.00
P-FH64	J-1094	FH-64	6.0	130.0	0	0.00	0.000	78	0.00
P-FH65	J-1095	FH-65	6.0	130.0	0	0.00	0.000	77	0.00
P-FH66	J-1095	FH-66	6.0	130.0	0	0.00	0.000	79	0.00
P-FH67	J-1096	FH-67	6.0	130.0	0	0.00	0.000	13	0.00
P-FH68	J-1097	FH-68	6.0	130.0	0	0.00	0.000	13	0.00
P-FH69	J-1098	FH-69	6.0	130.0	0	0.00	0.000	21	0.00
P-FH70	J-1101	FH-70	6.0	130.0	0	0.00	0.000	21	0.00
P-FH71	J-1103	FH-71	6.0	130.0	0	0.00	0.000	64	0.00
P-FH72	J-1104	FH-72	6.0	130.0	0	0.00	0.000	51	0.00
P-FH73	J-1105	FH-73	6.0	130.0	0	0.00	0.000	51	0.00
P-FH74	J-1106	FH-74	6.0	130.0	0	0.00	0.000	65	0.00
P-R1	R-1	J-1073	12.0	130.0	444	1.26	0.001	1	0.00
P-R2	R-2	J-1034	12.0	130.0	498	1.41	0.001	1	0.00

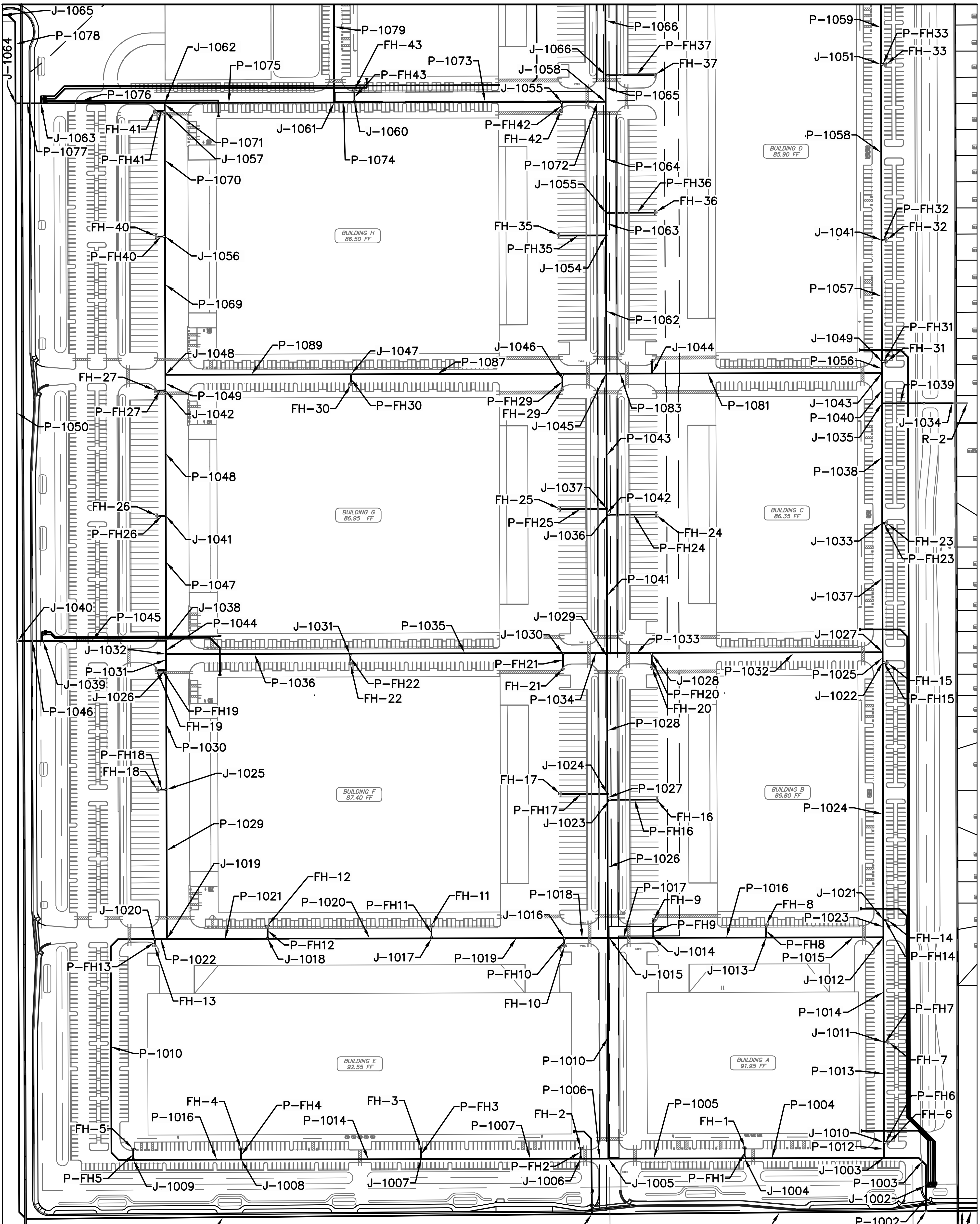
FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-R3	R-3	J-1083	12.0	130.0	0	0.00	0.000	1	0.00

APPENDIX F

POTABLE WATER PLAN – BUILDOUT ONSITE WITH FIRE FLOW MODEL RESULTS

SEE SHEET 2



POINT OF CONNECTION IS LOCATED AT THE
INTERSECTION OF BLUE OAK AND CLOUD
DANCE DRIVE. NODE J-1073, PIPE P-R1
AND RESERVIOR R-1 MAKE UP THE
CONNECTION AT THE INTERSECTION.

0 100 200 400

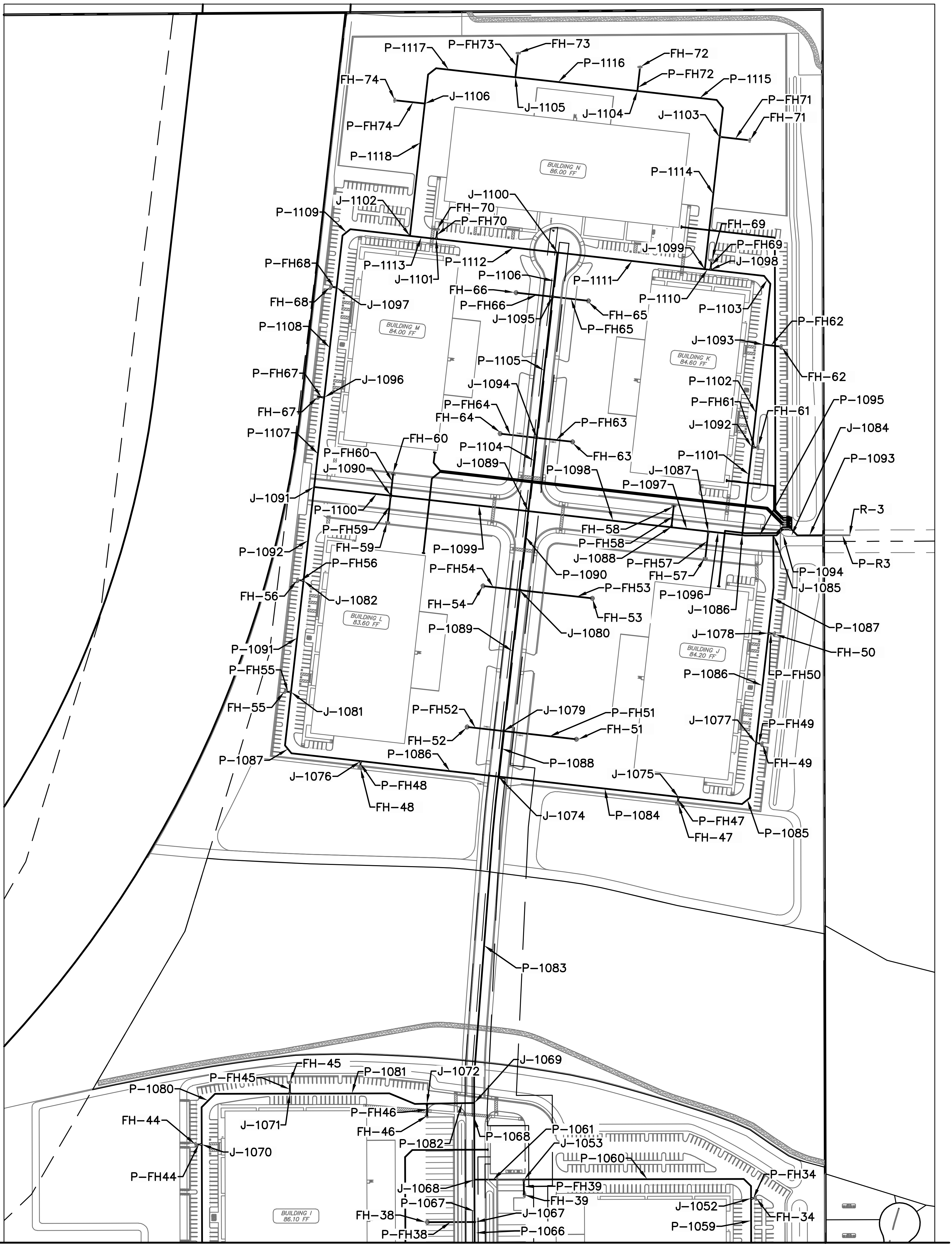
SCALE: 1"=200'

FIRE SYSTEM EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 2 MARCH 01, 2022

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 · PHONE: (530) 662-1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662-4602

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH_Fire Site Plan- Project Site.dwg



SEE SHEET 1

LM LAUGENOUR AND MEIKLE
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608 COURT STREET, WOODLAND, CALIFORNIA 95695 · PHONE: (530) 662-1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662-4602

0 100 200 400
LM
SCALE: 1"=200'

FIRE SYSTEM EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 2 OF 2 MARCH 01, 2022

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH_Fire Site Plan- Project Site.dwg

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-1	92.00	0	186.91	41
FH-2	93.00	0	186.84	41
FH-3	93.00	0	186.82	41
FH-4	93.00	0	186.80	41
FH-5	93.00	0	186.79	41
FH-6	92.00	0	186.97	41
FH-7	93.00	0	186.92	41
FH-8	88.00	0	186.83	43
FH-9	89.00	0	186.81	42
FH-10	89.00	0	186.79	42
FH-11	88.00	0	186.78	43
FH-12	88.00	0	186.77	43
FH-13	91.00	0	186.76	41
FH-14	88.00	0	186.86	43
FH-15	87.00	0	186.83	43
FH-16	86.00	0	186.74	44
FH-17	86.00	0	186.74	44
FH-18	87.00	0	186.71	43
FH-19	88.00	0	186.67	43
FH-20	87.00	0	186.71	43
FH-21	88.00	0	186.68	43
FH-22	88.00	0	186.67	43
FH-23	87.00	0	186.86	43
FH-24	86.00	0	186.51	43
FH-25	86.00	0	186.50	43
FH-26	86.00	0	186.49	43
FH-27	88.00	0	186.33	43
FH-28	87.00	0	186.39	43
FH-29	87.00	0	186.33	43
FH-30	89.00	0	186.32	42
FH-31	87.00	0	186.64	43
FH-32	86.00	0	186.32	43
FH-33	86.00	0	185.86	43
FH-34	86.00	0	185.56	43
FH-35	85.00	0	185.83	44
FH-36	85.00	0	185.75	44
FH-37	85.00	0	185.26	43
FH-38	85.00	0	184.93	43
FH-39	86.00	0	184.92	43
FH-40	86.00	0	186.06	43
FH-41	87.00	0	185.83	43
FH-42	87.00	0	185.35	43
FH-43	87.00	0	185.34	43
FH-44	87.00	0	184.72	42
FH-45	88.00	0	184.32	42
FH-46	86.00	0	183.90	42
FH-47	85.00	0	176.18	39
FH-48	84.00	0	175.74	40
FH-49	85.00	0	176.12	39

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
FH-50	85.00	0	176.06	39
FH-51	84.00	0	176.00	40
FH-52	84.00	0	176.00	40
FH-53	84.00	0	175.14	39
FH-54	84.00	0	175.14	39
FH-55	84.00	0	175.22	39
FH-56	84.00	0	174.79	39
FH-57	85.00	0	175.20	39
FH-58	85.00	0	175.09	39
FH-59	84.00	0	174.51	39
FH-60	84.00	0	174.51	39
FH-61	85.00	0	174.36	39
FH-62	85.00	0	173.26	38
FH-63	85.00	0	173.96	38
FH-64	85.00	0	173.96	38
FH-65	85.00	0	172.61	38
FH-66	85.00	0	172.61	38
FH-67	85.00	0	173.67	38
FH-68	85.00	0	172.75	38
FH-69	85.00	0	171.93	38
FH-70	85.00	0	171.81	38
FH-71	86.00	1,020	164.22	34
FH-72	86.33	1,020	164.53	34
FH-73	86.33	1,020	164.53	34
FH-74	85.32	1,020	164.09	34
J-1000	89.00	0	189.79	44
J-1001	89.80	65	189.06	43
J-1002	89.00	451	189.64	44
J-1003	87.50	0	186.98	43
J-1004	87.60	0	186.91	43
J-1005	88.00	0	186.84	43
J-1006	88.30	0	186.84	43
J-1007	88.25	0	186.82	43
J-1008	88.25	0	186.80	43
J-1009	88.25	0	186.79	43
J-1010	87.80	0	186.97	43
J-1011	87.50	0	186.92	43
J-1012	82.50	0	186.86	45
J-1013	83.00	0	186.83	45
J-1014	83.75	0	186.81	45
J-1015	83.25	0	186.80	45
J-1016	84.50	0	186.79	44
J-1017	83.30	0	186.78	45
J-1018	83.60	0	186.77	45
J-1019	85.75	0	186.76	44
J-1020	85.70	0	186.76	44
J-1021	82.50	0	186.86	45
J-1022	82.00	0	186.83	45
J-1023	80.75	0	186.74	46

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1024	80.75	0	186.74	46
J-1025	82.00	0	186.71	45
J-1026	83.40	0	186.67	45
J-1027	82.00	0	186.83	45
J-1028	82.00	0	186.71	45
J-1029	81.75	0	186.68	45
J-1030	82.75	0	186.68	45
J-1031	83.25	0	186.67	45
J-1032	83.25	0	186.66	45
J-1033	82.00	0	186.86	45
J-1034	74.75	0	196.00	52
J-1035	81.59	0	186.88	46
J-1036	80.25	0	186.51	46
J-1037	80.30	0	186.50	46
J-1038	83.01	0	186.65	45
J-1039	87.35	144	187.01	43
J-1040	89.00	0	187.03	42
J-1041	81.40	0	186.49	45
J-1042	83.00	0	186.33	45
J-1043	81.50	0	186.67	46
J-1044	81.40	0	186.39	45
J-1045	81.60	0	186.34	45
J-1046	82.40	0	186.33	45
J-1047	83.70	0	186.32	44
J-1048	83.00	0	186.31	45
J-1049	81.50	0	186.64	45
J-1050	81.40	0	186.32	45
J-1051	81.40	0	185.86	45
J-1053	80.50	0	184.92	45
J-1054	80.00	0	185.83	46
J-1055	79.90	0	185.75	46
J-1056	81.00	0	186.06	45
J-1057	82.30	0	185.83	45
J-1058	81.50	0	185.35	45
J-1058	80.00	0	185.35	46
J-1060	82.15	0	185.34	45
J-1061	82.60	0	185.34	44
J-1062	81.40	0	185.56	45
J-1062	82.25	0	185.81	45
J-1063	83.75	104	186.07	44
J-1064	83.75	0	186.82	45
J-1066	80.00	0	185.26	46
J-1067	79.70	0	184.93	46
J-1067	80.00	0	176.18	42
J-1068	79.60	0	184.79	46
J-1069	80.60	0	183.75	45
J-1070	81.80	0	184.72	45
J-1071	82.60	0	184.32	44
J-1072	81.25	0	183.90	44

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1073	89.00	0	194.99	46
J-1074	79.40	0	176.28	42
J-1076	79.40	0	175.74	42
J-1077	79.60	0	176.12	42
J-1078	79.60	0	176.06	42
J-1079	78.50	0	176.00	42
J-1080	78.80	0	175.14	42
J-1081	79.30	0	175.22	42
J-1082	79.30	0	174.79	41
J-1083	86.00	0	192.99	46
J-1084	79.00	178	189.79	48
J-1085	79.00	0	176.01	42
J-1086	79.40	0	175.30	41
J-1087	79.80	0	175.20	41
J-1088	79.80	0	175.09	41
J-1089	79.70	0	174.66	41
J-1090	79.40	0	174.51	41
J-1091	78.90	0	174.42	41
J-1092	80.00	0	174.36	41
J-1093	80.00	0	173.26	40
J-1094	79.80	0	173.96	41
J-1095	80.15	0	172.61	40
J-1096	79.60	0	173.67	41
J-1097	79.60	0	172.75	40
J-1098	80.40	0	171.93	40
J-1099	80.40	0	171.87	40
J-1100	80.90	0	172.19	39
J-1101	80.30	0	171.81	40
J-1102	80.10	0	171.72	40
J-1103	81.00	0	169.14	38
J-1104	81.00	0	168.46	38
J-1105	81.00	0	168.46	38
J-1106	82.00	0	169.10	38
J-1107	82.00	0	186.82	45

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-390	J-1037	FH-25	6.0	130.0	0	0.00	0.000	100	0.00
P-1000	J-1000	J-1001	12.0	130.0	615	1.74	0.001	710	0.73
P-1001	J-1001	J-1040	12.0	130.0	550	1.56	0.001	2,433	2.04
P-1002	J-1000	J-1002	12.0	130.0	1,033	2.93	0.003	58	0.16
P-1003	J-1002	J-1003	12.0	130.0	582	1.65	0.021	128	2.65
P-1004	J-1003	J-1004	12.0	130.0	285	0.81	0.000	296	0.07
P-1005	J-1004	J-1005	12.0	130.0	285	0.81	0.000	289	0.07
P-1006	J-1005	J-1006	12.0	130.0	119	0.34	0.000	59	0.00
P-1007	J-1006	J-1007	12.0	130.0	119	0.34	0.000	339	0.02
P-1008	J-1007	J-1008	12.0	130.0	119	0.34	0.000	382	0.02
P-1009	J-1008	J-1009	12.0	130.0	119	0.34	0.000	229	0.01
P-1010	J-1009	J-1020	12.0	130.0	119	0.34	0.000	590	0.03
P-1011	J-1015	J-1005	12.0	130.0	-166	0.47	0.000	469	0.04
P-1012	J-1003	J-1010	12.0	130.0	296	0.84	0.000	33	0.01
P-1013	J-1011	J-1010	12.0	130.0	-296	0.84	0.000	213	0.06
P-1014	J-1012	J-1011	12.0	130.0	-296	0.84	0.000	223	0.06
P-1015	J-1013	J-1012	12.0	130.0	-182	0.52	0.000	249	0.03
P-1016	J-1014	J-1013	12.0	130.0	-182	0.52	0.000	239	0.03
P-1017	J-1015	J-1014	12.0	130.0	-182	0.52	0.000	97	0.01
P-1018	J-1016	J-1015	12.0	130.0	-105	0.30	0.000	93	0.00
P-1019	J-1017	J-1016	12.0	130.0	-105	0.30	0.000	282	0.01
P-1020	J-1018	J-1017	12.0	130.0	-105	0.30	0.000	348	0.01
P-1021	J-1019	J-1018	12.0	130.0	-105	0.30	0.000	214	0.01
P-1022	J-1020	J-1019	12.0	130.0	119	0.34	0.000	26	0.00
P-1023	J-1012	J-1021	12.0	130.0	115	0.33	0.000	37	0.00
P-1024	J-1021	J-1022	12.0	130.0	115	0.33	0.000	546	0.03
P-1025	J-1022	J-1027	12.0	130.0	115	0.33	0.000	22	0.00
P-1026	J-1023	J-1015	12.0	130.0	-243	0.69	0.000	294	0.05
P-1027	J-1024	J-1023	12.0	130.0	-243	0.69	0.000	12	0.00
P-1028	J-1029	J-1024	12.0	130.0	-243	0.69	0.000	300	0.06
P-1029	J-1025	J-1019	12.0	130.0	-224	0.64	0.000	318	0.05
P-1030	J-1026	J-1025	12.0	130.0	-224	0.64	0.000	254	0.04
P-1031	J-1032	J-1026	12.0	130.0	-224	0.64	0.000	34	0.01

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1032	J-1027	J-1028	12.0	130.0	287	0.81	0.000	491	0.12
P-1033	J-1028	J-1029	12.0	130.0	287	0.81	0.000	95	0.02
P-1034	J-1029	J-1030	12.0	130.0	78	0.22	0.000	93	0.00
P-1035	J-1030	J-1031	12.0	130.0	78	0.22	0.000	452	0.01
P-1036	J-1031	J-1032	12.0	130.0	78	0.22	0.000	391	0.01
P-1037	J-1033	J-1027	12.0	130.0	172	0.49	0.000	274	0.03
P-1038	J-1035	J-1033	12.0	130.0	172	0.49	0.000	254	0.02
P-1039	J-1034	J-1035	12.0	130.0	1,304	3.70	0.061	149	9.11
P-1040	J-1043	J-1035	12.0	130.0	-1,132	3.21	0.003	65	0.21
P-1041	J-1036	J-1029	12.0	130.0	-452	1.28	0.001	294	0.17
P-1042	J-1037	J-1036	12.0	130.0	-452	1.28	0.001	12	0.01
P-1043	J-1045	J-1037	12.0	130.0	-452	1.28	0.001	288	0.17
P-1044	J-1032	J-1038	12.0	130.0	302	0.86	0.000	28	0.01
P-1045	J-1039	J-1038	12.0	130.0	163	0.46	0.001	263	0.36
P-1046	J-1040	J-1039	12.0	130.0	307	0.87	0.000	53	0.02
P-1047	J-1038	J-1041	12.0	130.0	465	1.32	0.001	265	0.16
P-1048	J-1041	J-1042	12.0	130.0	465	1.32	0.001	266	0.16
P-1049	J-1042	J-1048	12.0	130.0	465	1.32	0.001	34	0.02
P-1050	J-1040	J-1064	12.0	130.0	243	0.69	0.000	1,142	0.21
P-1051	J-1044	J-1043	12.0	130.0	-450	1.28	0.001	488	0.28
P-1052	J-1045	J-1044	12.0	130.0	-450	1.28	0.001	97	0.06
P-1053	J-1046	J-1045	12.0	130.0	-93	0.26	0.000	93	0.00
P-1054	J-1047	J-1046	12.0	130.0	-93	0.26	0.000	449	0.01
P-1055	J-1048	J-1047	12.0	130.0	-93	0.26	0.000	394	0.01
P-1056	J-1043	J-1049	12.0	130.0	682	1.93	0.001	24	0.03
P-1057	J-1049	J-1050	12.0	130.0	682	1.93	0.001	258	0.32
P-1058	J-1050	J-1051	12.0	130.0	682	1.93	0.001	373	0.47
P-1059	J-1051	J-1062	12.0	130.0	682	1.93	0.001	240	0.30
P-1060	J-1062	J-1053	12.0	130.0	682	1.93	0.001	513	0.64
P-1061	J-1053	J-1068	12.0	130.0	682	1.93	0.001	105	0.13
P-1062	J-1054	J-1045	12.0	130.0	-809	2.29	0.002	294	0.50
P-1063	J-1055	J-1054	12.0	130.0	-809	2.29	0.002	48	0.08
P-1064	J-1058	J-1055	12.0	130.0	-809	2.29	0.002	236	0.40

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1065	J-1066	J-1058	12.0	130.0	-769	2.18	0.002	57	0.09
P-1066	J-1067	J-1066	12.0	130.0	-769	2.18	0.002	213	0.33
P-1067	J-1068	J-1067	12.0	130.0	-769	2.18	0.002	90	0.14
P-1068	J-1069	J-1068	12.0	130.0	-1,451	4.12	0.005	205	1.04
P-1069	J-1056	J-1048	12.0	130.0	-558	1.58	0.001	294	0.25
P-1070	J-1057	J-1056	12.0	130.0	-558	1.58	0.001	266	0.23
P-1071	J-1062	J-1057	12.0	130.0	-558	1.58	0.001	18	0.02
P-1072	J-1058	J-1058	12.0	130.0	-40	0.11	0.000	96	0.00
P-1073	J-1060	J-1058	12.0	130.0	-40	0.11	0.000	440	0.00
P-1074	J-1061	J-1060	12.0	130.0	-40	0.11	0.000	43	0.00
P-1075	J-1061	J-1062	12.0	130.0	-697	1.98	0.001	360	0.47
P-1076	J-1062	J-1063	12.0	130.0	-139	0.39	0.001	263	0.26
P-1077	J-1064	J-1063	12.0	130.0	243	0.69	0.014	54	0.75
P-1078	J-1064	J-1107	12.0	130.0	0	0.00	0.000	332	0.00
P-1079	J-1070	J-1061	12.0	130.0	-737	2.09	0.001	435	0.63
P-1080	J-1071	J-1070	12.0	130.0	-737	2.09	0.001	277	0.40
P-1081	J-1072	J-1071	12.0	130.0	-737	2.09	0.001	295	0.42
P-1082	J-1069	J-1072	12.0	130.0	-737	2.09	0.001	100	0.14
P-1083	J-1069	J-1074	12.0	130.0	2,187	6.21	0.011	692	7.47
P-1084	J-1074	J-1067	12.0	130.0	282	0.80	0.000	383	0.09
P-1085	J-1067	J-1077	12.0	130.0	282	0.80	0.000	273	0.07
P-1086	J-1077	J-1078	12.0	130.0	282	0.80	0.000	234	0.06
P-1086	J-1074	J-1076	12.0	130.0	839	2.38	0.002	293	0.54
P-1087	J-1078	J-1085	12.0	130.0	282	0.80	0.000	207	0.05
P-1087	J-1076	J-1081	12.0	130.0	839	2.38	0.002	283	0.52
P-1088	J-1074	J-1079	12.0	130.0	1,066	3.02	0.003	97	0.28
P-1089	J-1080	J-1079	12.0	130.0	-1,066	3.02	0.003	300	0.86
P-1090	J-1089	J-1080	12.0	130.0	-1,066	3.02	0.003	168	0.48
P-1091	J-1081	J-1082	12.0	130.0	839	2.38	0.002	237	0.43
P-1092	J-1082	J-1091	12.0	130.0	839	2.38	0.002	200	0.37
P-1093	J-1083	J-1084	12.0	130.0	2,071	5.87	0.010	328	3.20
P-1094	J-1085	J-1084	12.0	130.0	-1,893	5.37	0.320	43	13.78
P-1095	J-1085	J-1086	12.0	130.0	2,175	6.17	0.011	66	0.71

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-1096	J-1086	J-1087	12.0	130.0	727	2.06	0.001	72	0.10
P-1097	J-1087	J-1088	12.0	130.0	727	2.06	0.001	79	0.11
P-1098	J-1088	J-1089	12.0	130.0	727	2.06	0.001	305	0.43
P-1099	J-1090	J-1089	12.0	130.0	-431	1.22	0.001	293	0.16
P-1100	J-1091	J-1090	12.0	130.0	-431	1.22	0.001	163	0.09
P-1101	J-1086	J-1092	12.0	130.0	1,448	4.11	0.005	188	0.95
P-1102	J-1092	J-1093	12.0	130.0	1,448	4.11	0.005	218	1.10
P-1103	J-1093	J-1098	12.0	130.0	1,448	4.11	0.005	265	1.33
P-1104	J-1094	J-1089	12.0	130.0	-1,363	3.87	0.004	156	0.70
P-1105	J-1095	J-1094	12.0	130.0	-1,363	3.87	0.004	300	1.35
P-1106	J-1100	J-1095	12.0	130.0	-1,363	3.87	0.004	94	0.42
P-1107	J-1091	J-1096	12.0	130.0	1,270	3.60	0.004	191	0.75
P-1108	J-1096	J-1097	12.0	130.0	1,270	3.60	0.004	234	0.92
P-1109	J-1097	J-1102	12.0	130.0	1,270	3.60	0.004	259	1.02
P-1110	J-1098	J-1099	12.0	130.0	1,448	4.11	0.005	12	0.06
P-1111	J-1099	J-1100	12.0	130.0	-612	1.74	0.001	314	0.32
P-1112	J-1101	J-1100	12.0	130.0	-750	2.13	0.001	258	0.38
P-1113	J-1102	J-1101	12.0	130.0	-750	2.13	0.001	56	0.08
P-1114	J-1099	J-1103	12.0	130.0	2,060	5.84	0.010	282	2.73
P-1115	J-1103	J-1104	12.0	130.0	1,040	2.95	0.003	252	0.69
P-1116	J-1104	J-1105	12.0	130.0	20	0.06	0.000	259	0.00
P-1117	J-1105	J-1106	12.0	130.0	-1,000	2.84	0.003	252	0.64
P-1118	J-1106	J-1102	12.0	130.0	-2,020	5.73	0.009	282	2.63
P-1200	J-1073	J-1000	12.0	130.0	1,647	4.67	0.006	814	5.20
P-FH1	J-1004	FH-1	6.0	130.0	0	0.00	0.000	23	0.00
P-FH2	J-1006	FH-2	6.0	130.0	0	0.00	0.000	23	0.00
P-FH3	J-1007	FH-3	6.0	130.0	0	0.00	0.000	23	0.00
P-FH4	J-1008	FH-4	6.0	130.0	0	0.00	0.000	23	0.00
P-FH5	J-1009	FH-5	6.0	130.0	0	0.00	0.000	23	0.00
P-FH6	J-1010	FH-6	6.0	130.0	0	0.00	0.000	10	0.00
P-FH7	J-1011	FH-7	6.0	130.0	0	0.00	0.000	10	0.00
P-FH8	J-1013	FH-8	6.0	130.0	0	0.00	0.000	27	0.00
P-FH9	J-1014	FH-9	6.0	130.0	0	0.00	0.000	38	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-FH10	J-1016	FH-10	6.0	130.0	0	0.00	0.000	17	0.00
P-FH11	J-1017	FH-11	6.0	130.0	0	0.00	0.000	27	0.00
P-FH12	J-1018	FH-12	6.0	130.0	0	0.00	0.000	27	0.00
P-FH13	J-1020	FH-13	6.0	130.0	0	0.00	0.000	15	0.00
P-FH14	J-1021	FH-14	6.0	130.0	0	0.00	0.000	10	0.00
P-FH15	J-1022	FH-15	6.0	130.0	0	0.00	0.000	10	0.00
P-FH16	J-1023	FH-16	6.0	130.0	0	0.00	0.000	105	0.00
P-FH17	J-1024	FH-17	6.0	130.0	0	0.00	0.000	100	0.00
P-FH18	J-1025	FH-18	6.0	130.0	0	0.00	0.000	19	0.00
P-FH19	J-1026	FH-19	6.0	130.0	0	0.00	0.000	22	0.00
P-FH20	J-1028	FH-20	6.0	130.0	0	0.00	0.000	31	0.00
P-FH21	J-1030	FH-21	6.0	130.0	0	0.00	0.000	34	0.00
P-FH22	J-1031	FH-22	6.0	130.0	0	0.00	0.000	22	0.00
P-FH23	J-1033	FH-23	6.0	130.0	0	0.00	0.000	10	0.00
P-FH24	J-1036	FH-24	6.0	130.0	0	0.00	0.000	105	0.00
P-FH26	J-1041	FH-26	6.0	130.0	0	0.00	0.000	19	0.00
P-FH27	J-1042	FH-27	6.0	130.0	0	0.00	0.000	22	0.00
P-FH28	J-1044	FH-28	6.0	130.0	0	0.00	0.000	26	0.00
P-FH29	J-1046	FH-29	6.0	130.0	0	0.00	0.000	34	0.00
P-FH30	J-1047	FH-30	6.0	130.0	0	0.00	0.000	21	0.00
P-FH31	J-1049	FH-31	6.0	130.0	0	0.00	0.000	10	0.00
P-FH32	J-1050	FH-32	6.0	130.0	0	0.00	0.000	10	0.00
P-FH33	J-1051	FH-33	6.0	130.0	0	0.00	0.000	10	0.00
P-FH34	J-1062	FH-34	6.0	130.0	0	0.00	0.000	10	0.00
P-FH35	J-1054	FH-35	6.0	130.0	0	0.00	0.000	100	0.00
P-FH36	J-1055	FH-36	6.0	130.0	0	0.00	0.000	105	0.00
P-FH37	J-1066	FH-37	6.0	130.0	0	0.00	0.000	105	0.00
P-FH38	J-1067	FH-38	6.0	130.0	0	0.00	0.000	100	0.00
P-FH39	J-1053	FH-39	6.0	130.0	0	0.00	0.000	31	0.00
P-FH40	J-1056	FH-40	6.0	130.0	0	0.00	0.000	19	0.00
P-FH41	J-1057	FH-41	6.0	130.0	0	0.00	0.000	22	0.00
P-FH42	J-1058	FH-42	6.0	130.0	0	0.00	0.000	18	0.00
P-FH43	J-1060	FH-43	6.0	130.0	0	0.00	0.000	27	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-FH44	J-1070	FH-44	6.0	130.0	0	0.00	0.000	13	0.00
P-FH45	J-1071	FH-45	6.0	130.0	0	0.00	0.000	24	0.00
P-FH46	J-1072	FH-46	6.0	130.0	0	0.00	0.000	25	0.00
P-FH47	J-1067	FH-47	6.0	130.0	0	0.00	0.000	14	0.00
P-FH48	J-1076	FH-48	6.0	130.0	0	0.00	0.000	15	0.00
P-FH49	J-1077	FH-49	6.0	130.0	0	0.00	0.000	13	0.00
P-FH50	J-1078	FH-50	6.0	130.0	0	0.00	0.000	13	0.00
P-FH51	J-1079	FH-51	6.0	130.0	0	0.00	0.000	155	0.00
P-FH52	J-1079	FH-52	6.0	130.0	0	0.00	0.000	78	0.00
P-FH53	J-1080	FH-53	6.0	130.0	0	0.00	0.000	155	0.00
P-FH54	J-1080	FH-54	6.0	130.0	0	0.00	0.000	78	0.00
P-FH55	J-1081	FH-55	6.0	130.0	0	0.00	0.000	13	0.00
P-FH56	J-1082	FH-56	6.0	130.0	0	0.00	0.000	13	0.00
P-FH57	J-1087	FH-57	6.0	130.0	0	0.00	0.000	57	0.00
P-FH58	J-1088	FH-58	6.0	130.0	0	0.00	0.000	45	0.00
P-FH59	J-1090	FH-59	6.0	130.0	0	0.00	0.000	57	0.00
P-FH60	J-1090	FH-60	6.0	130.0	0	0.00	0.000	45	0.00
P-FH61	J-1092	FH-61	6.0	130.0	0	0.00	0.000	13	0.00
P-FH62	J-1093	FH-62	6.0	130.0	0	0.00	0.000	38	0.00
P-FH63	J-1094	FH-63	6.0	130.0	0	0.00	0.000	77	0.00
P-FH64	J-1094	FH-64	6.0	130.0	0	0.00	0.000	78	0.00
P-FH65	J-1095	FH-65	6.0	130.0	0	0.00	0.000	77	0.00
P-FH66	J-1095	FH-66	6.0	130.0	0	0.00	0.000	79	0.00
P-FH67	J-1096	FH-67	6.0	130.0	0	0.00	0.000	13	0.00
P-FH68	J-1097	FH-68	6.0	130.0	0	0.00	0.000	13	0.00
P-FH69	J-1098	FH-69	6.0	130.0	0	0.00	0.000	21	0.00
P-FH70	J-1101	FH-70	6.0	130.0	0	0.00	0.000	21	0.00
P-FH71	J-1103	FH-71	6.0	130.0	1,020	11.57	0.077	64	4.92
P-FH72	J-1104	FH-72	6.0	130.0	1,020	11.57	0.077	51	3.92
P-FH73	J-1105	FH-73	6.0	130.0	1,020	11.57	0.077	51	3.92
P-FH74	J-1106	FH-74	6.0	130.0	1,020	11.57	0.077	65	5.00
P-R1	R-1	J-1073	12.0	130.0	1,647	4.67	0.006	1	0.01
P-R2	R-2	J-1034	12.0	130.0	1,304	3.70	0.004	1	0.00

FlexTable: Pipe Table

Label	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)	Headloss (ft)
P-R3	R-3	J-1083	12.0	130.0	2,071	5.87	0.010	1	0.01

Roseville Industrial Park
Recycled Water Master Plan

PHILLIP ROAD
ROSEVILLE, CALIFORNIA
(PLANNING APPLICATION 21-0193)

January 5, 2022

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Table of Contents

Tables

Exhibit:

Appendices:

I. INTRODUCTION

The Roseville Industrial Park Project (Proposed Project) Recycled Water Master Plan (Plan) has been prepared at the request of Panattoni Development Company, Inc. (PDC) to meet the City of Roseville's (City) utility demand planning requirements and in support of the Environmental Impact Report (EIR) for the Proposed Project.

Proposed land uses, tributary areas, irrigation generation rates, peaking factors are used to size the recycled water facilities for the project. The project will connect to the recycled water line located in Blue Oaks Boulevard at the intersection with Cloud Dance Drive.

The purposes of this Recycled Water Plan Master Plan are as follows:

- Estimate the expected recycled water system demand for the Proposed Project during Phase 1 and complete build out.
- Determine impacts on the neighboring Creekview Specific Plan Area (CVSP) and Amoruso Ranch Specific Plan Area (ARSP).
- Size recycled water system main pipelines for the Proposed Project.

I.A. PROJECT VICINITY:

The Proposed Project Area is located in the northwest edge of the City of Roseville as shown on **Exhibit 1 – Project Location Plan**. Pleasant Grove Creek and the Pleasant Grove Bypass Channel dissect the Proposed Project.

The southern portion of the Proposed Project will be the first area to be constructed. It is bounded by the extension of Blue Oaks Boulevard to the south, Phillip Road to the west, the Pleasant Grove Bypass Channel to the north, and the Creekview Subdivision to the east.

The northern portion of the Specific Plan Area will be constructed after the southern portion. It is bounded by the Pleasant Grove Creek to the south, the future Placer Parkway to the west, the Amoruso Specific Plan to the north, and the Creekview Subdivision to the east.

I.B. PRE-DEVELOPMENT CONDITIONS:

The Proposed Project site is an undeveloped agricultural parcel that was originally planted during the 1950's, maintained in rice production through the 1990's, and has been planted in irrigated crops until the present.

The Pleasant Grove Creek Bypass Channel was constructed south of Pleasant Grove Creek during the summer of 2019 to augment flood mitigation/control in this area.

A 10-foot to 15-foot escarpment runs in a southeasterly direction from the Phillip Road entrance of the property's southern portion of the site to its eastern boundary, demarcating an elevation change between the southern and norther portions of the southern portion of the site.

The portion of the property north of Pleasant Grove Creek is also currently active cultivation and irrigated with water from a long-established irrigation canal along the northern boundary.

I.C. PROPOSED PROJECT AREA DEVELOPMENT OPPORTUNITIES & CONSTRAINTS:

The Proposed Project Area land use plan is influenced by several factors, including the physical setting, land use, circulation considerations, and public policies. Two significant aspects that influence the development of the land use plan are described below and depicted on **Exhibit 2 – Land Use Plan.**

- PLACER PARKWAY

  The proposed Placer Parkway will bisect the northerly portion of the Proposed Project Area. Due to the limited area and difficulty with getting utility and roadways across Placer Parkway, the northwesterly portion of the site will remain open space.

- PLEASANT GROVE CREEK AND PLEASANT GROVE CREEK BYPASS CHANNEL

  The existing Pleasant Grove Creek and newly constructed Pleasant Grove Creek Bypass Channel divides the Proposed Project Area. The area south of these two features will be constructed first. A bridge will be needed in the future to access the area to the north when it is developed.

II. RECYCLED WATER STUDY PROCESS

The Recycled Water Study is used to determine the demand and distribution pipelines for the Proposed Project. The typical methodology used is based on the City of Roseville's Environmental Utilities Department. However, the Proposed Project will use an alternate method to determine the design flow of the irrigation system. The project has progressed to the point that the Landscape designer has produced a preliminary irrigation layout. The design shall be entirely drip or other low flow methods, no sprinklers.

The irrigation system will use one irrigation controller per proposed building. Each of the irrigation controllers allow no more than 20 gpm. There are 14 total buildings included in the Proposed Project. Therefore, the maximum design irrigation demand will be 280 gpm. The proposed design flow is much less, approximately 30% of the typical methodology used by the City to design specific plans. The developer has accepted that the total project area will be limited to the 280 gpm maximum irrigation demand.

III. RECYCLED WATER SYSTEM INFRASTRUCTURE

III.A. SYSTEM DESCRIPTION:

The recycled water system is designed to serve the Land Use Plan shown in **Exhibit 2 – Land Use Plan.** The recycled water system, comprised of 6-inch pipes, has been designed to convey recycled water flows within the Proposed Project Area, **Exhibit 3 – Recycle Water Site Plan.**

The Proposed Project's main transmission line connects to the existing 6-inch pipe at the intersection of Blue Oaks Boulevard and Cloud Dance Drive. A 6-inch pipe continues west along Blue Oaks Boulevard to the main North-South Road of the Proposed Project Site. The 6-inch pipe follows this Road to the most northerly portion of the project on the north side of Pleasant Grove Creek. All the proposed buildings and areas needing irrigation water will have service connections off this 6-inch main pipeline.

III.B. SYSTEM DESIGN CRITERIA:

The recycled water system will be operated and owned by the City of Roseville. The City is responsible for all maintenance and operations downstream and including the water meters. Each individual property owner is responsible for all onsite maintenance and operations upstream of the water meter.

The City has established a set of design standards for the recycled water systems that they will operate and maintain. Their goal is to maintain operations to all customers on a consistent basis. See **Table 1 – City Operational Criteria** for the City of Roseville Recycled Water Operational Criteria.

TABLE 1

City Operational Criteria

Condition	Operation Value
Minimum Residual Pressure at System PHD	60 psi
Maximum Residual Pressure over Irrigation Period	100 psi
Maximum Pipe Velocity	5.0 fps
Maximum Head Loss per 1,000 Feet of Pipe	5.0 ft

IV. RECYCLED WATER SUPPLY

The Proposed Project anticipates receiving a commitment for recycled water from the City for a minimum amount equal to the average dry weather flow (ADWF) generated and conveyed by the Proposed Project to the Pleasant Grove Wastewater Treatment Plant. The Proposed Project will generate an ADWF of 0.153 MGD and anticipates receiving this minimum volume of recycled water from the City. See **Table 2 – Available Recycled Water Supply** for a summary of the recycled water supply.

TABLE 2

Available Recycled Water Supply

Location	Sewer Average Dry weather flow (ADWF) [(a)] (mgd)	Annual Recycled Water Supply (acre-feet/year)	Monthly Recycled Water Supply (acre-feet/month)
Proposed Project	0.153	169.0	14.1
(a) Average Dry Weather flow was determined in the Roseville Industrial Park Wastewater Master Plan			

The recycled water demand is shown in **Table 3 – Recycled Water Demand Without Conservation**.

TABLE 3

Recycled Water Demand Without Conservation

Location	Annual Recycled Water Demand (acre-feet/year)	Peak Demand Month (July) (acre-feet/month)
Proposed Project	65.6	5.5
(a) The sum of Project Surface Area * Irrigated Surface Area Factor from Table 3		

A monthly comparison of recycled water supply and recycled water demand is shown in **Table 4 – Comparison of Recycled Water Demand & Recycled Water Supply.**

TABLE 4

Comparison of Recycled Water Demand & Recycled Water Supply

Month	Recycle Water Demand+2% (acre-feet)	Recycle Water Supply (acre-feet)	Surplus/Deficit Supply (acre-feet)	Supplemental Demand Required (Y/N)
January	5.6	14.1	+8.5	Y
February	5.6	14.1	+8.5	Y
March	5.6	14.1	+8.5	Y
April	5.6	14.1	+8.5	Y
May	5.6	14.1	+8.5	Y
June	5.6	14.1	+8.5	Y
July	5.6	14.1	+8.5	Y
August	5.6	14.1	+8.5	Y
September	5.6	14.1	+8.5	Y
October	5.6	14.1	+8.5	Y
November	5.6	14.1	+8.5	Y
December	5.6	14.1	+8.5	Y
Total	**65.6**	**169.2**		

The proposed irrigation demand is lower than the proposed recycled water supplied by the waste systems of the development. Therefore, no additional irrigation water is required to be bought and used to supplement the recycled water supply.

Woodard and Curran supplied a technical memorandum (see **Appendix A – Technical Memorandum**) analyzing the proposed recycle water demand impacts on the existing system. According to their memo, the proposed project would require an additional pump. And the proposed project would contribute to the additional storage tanks needed, but would not increase the planned sizing. The city is planning on adding two storage tanks, a 2.2 million gallon tank and a 2.4 million gallon tank.

At the time of this Report, the City of Roseville does not have the capacity in their Recycled Water system to connect the proposed Roseville Industrial Park. The infrastructure will be sized on the assumption the future City expansion of the system will accommodate the design flows shown below. Until that expansion, the irrigation system will be connected to the potable water system. The City has not provided a time table for the proposed expansions. Please see the Technical Memorandum produced by Woodard & Curran (**Appendix A – Technical Memorandum – Roseville Industrial Park Recycled Water Study)** for the proposed expansions.

V. HYDRAULIC MODEL ANALYSIS

V.A. HYDRAULIC MODEL ANALYSIS CRITERIA

The following procedure was used for the preliminary assumptions used for the modeling of the recycled water system proposed in the Proposed Project Recycled Water Master Plan:

- A Hazen Williams "C" factor of 130 was used for all pipes in the recycled water system.
- Steady state condition.
- Operation demand flows increased by 2% to account for system losses.
- Connection Pressure, 71 psi Near-Term and 62 psi Future scenarios per Woodard & Curran Technical Memorandum, dated December 8, 2021 (**Appendix A – Technical Memorandum – Roseville Industrial Park Recycled Water Study).**
- Minimum pressure of 50 psi at service connections.
- Velocity in pipes shall not exceed 8 fps.
- Minimum size is 6-inch pipe.
- Project Datum (NAVD 88) = As-built Plans (NGVD 29) + (+/-) 2'

V.B. HYDRAULIC MODEL SCENARIOS

The Technical Memo provided by Woodard & Curran (**Appendix A – Technical Memorandum – Roseville Industrial Park Recycled Water Study)** analyzed two different scenarios:

- **Near-Term**: Demands in the model reflect existing demands as described in the 2020 Model Development Report plus near term customers added to reflect current maximum day demands in the main pressure zone (8 mgd maximum day demand), as well as Sierra Vista demands.

- **Future**: Additional demands added to reflect future Creekview (1.25 mgd) and Amoruso (0.94 mdg) maximum day demands. For these scenarios, Pleasant Grove Wastewater Treatment Plant (PGWWTP) supply has been increased by 2.19 mgd to reflect future sewer flows from those developments.

The point of connection was modeled using a reservoir with a water surface height set above the assumed pipe elevation to create a constant pressure. The water surface height is the connection pressure supplied by Woodard & Curran (**Appendix A – Technical Memorandum – Roseville Industrial Park Recycled Water Study).** It is assumed that the existing system can supply the needed volume of water at the constant pressure.

V.C. HYDRAULIC MODEL RESULTS

The Near Term model node, pipe and network exhibits are shown in **Appendix B - Recycled Water Plan – Near Term Onsite Model Results**. Nodes were placed at service points for each proposed building of the Proposed Project. The farthest service connection and the lowest pressure is at the far north end of the Proposed Project. The pressure calculated at this point of connection is 63 psi.

The Future model node, pipe and network exhibits are shown in **Appendix C – Recycled Water Plan – Future Onsite Model Results**. Nodes were placed the service points for each proposed building of the Proposed Project. The farthest service connection and the lowest pressure is at the far north end of the Proposed Project. The pressure calculated at this point of connection is 54 psi.

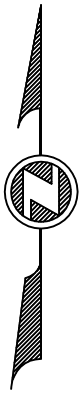
VI. CONCLUSIONS

Based on the information contained within this Recycle Water Master Plan the following conclusions are noted:

- The Near Term system meets the 50 psi pressure at the points of connection (63 psi).
- The Future system meets the 50 psi pressure the points of connection (54 psi).
- The maximum velocity within the network is 3.24 fps, located in the sections of pipes between the point of connection to the first service connection.

EXHIBITS

VICINITY



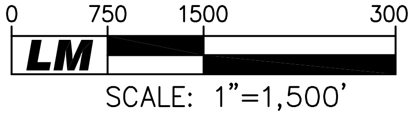


EXHIBIT 1

PROJECT LOCATION

FOR

ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE,
PLACER COUNTY, CALIFORNIA
SHEET 1 OF 1 NOVEMBER 19, 2021

LM LAUGENOUR AND MEIKLE
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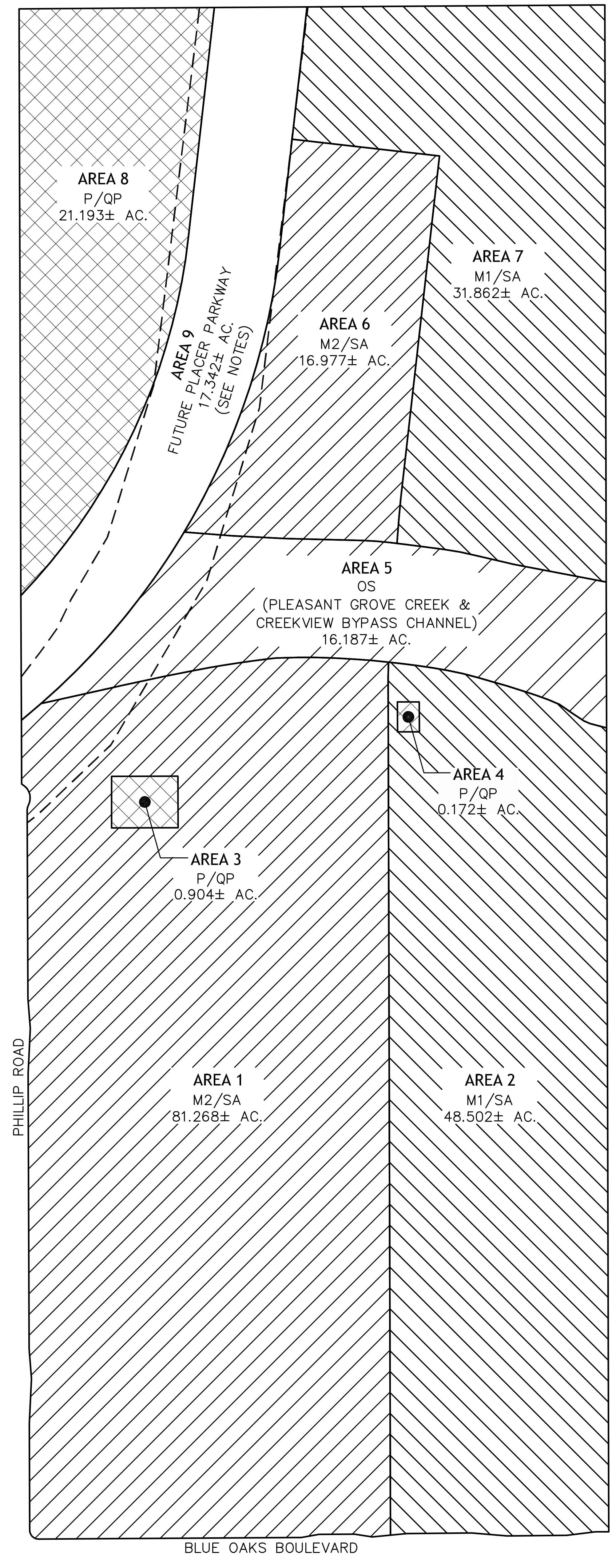

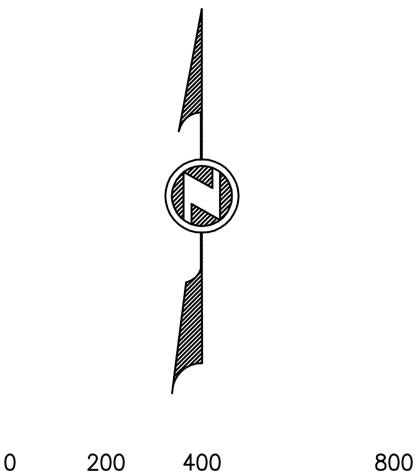

SCALE: 1"=400'

NOTES:

1. *EXISTING PLACER PARKWAY AREA DENOTED BY DASHED LINE.*
   (— — — — — — — — — — — — — —)
2. *REVISED PLACER PARKWAY AREA (BY AKT) USED FOR CALCULATING HIGHEST POSSIBLE UTILITY DEMANDS.*

EXHIBIT 2

LAND USE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 1 OCTOBER 28, 2021

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MOST DISTANT SERVICE
NEAR TERM = 63 PSI
FUTURE = 54 PSI

POINT OF CONNECTION
NEAR TERM = 71 PSI
FUTURE = 62 PSI
PER WOODARD & CURRAN
TECHNICAL MEMORANDUM

EXHIBIT 3

RECYCLED WATER SITE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 1 JANUARY 7, 2022

0 200 400 800
SCALE: 1"=400'

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APPENDIX A

TECHNICAL MEMORANDUM – ROSEVILLE INDUSTRIAL PARK RECYCLED WATER STUDY

TECHNICAL MEMORANDUM

TO: Abbie Wertheim, Panattoni Development Company

PREPARED BY: Chris van Lienden, PE

REVIEWED BY: Dave Richardson, PE

DATE: December 8, 2021

RE: Roseville Industrial Park Recycled Water Study

1. BACKGROUND

Woodard & Curran was asked to analyze the impacts of the proposed Roseville Industrial Park development on the City of Roseville's recycled water system. The location of the proposed site is shown in Figure 1. The proposed development includes 9 non-residential areas on the parcel located at 6382 Phillip Rd (234 acres), and would receive recycled water from the City of Roseville's recycled water distribution system through a 24-inch and 6-inch pipeline on Westbrook Boulevard.

The purpose of this TM is to evaluate and document whether the City's recycled water model predicts that the City's recycled water system will have capacity to serve the proposed development.

2. MODEL ASSUMPTIONS

The City of Roseville's recycled water system will require upgrades to serve anticipated future customers. These upgrades are discussed in the City of Roseville's Recycled Water Systems Evaluation Report[1] (2016 RW Systems Evaluation) and include additional tanks at the West Roseville Pump Station site, as well as other upgrades. After the Systems Evaluation was completed, the model of the existing system was updated to reflect new piping, and recalibrated based on flow, pressure, and tank level data conducted in 2020 and described in the City's 2020 Recycled Water System Model Development Report[2] (2020 Model Development Report). The updated model has been used for this evaluation, and has been revised to incorporate existing available supply limitations at the Dry Creek and Pleasant Grove Wastewater Treatment Plants (DCWWTP and PGWWTP).

Two demand scenarios have been considered:

- Near-Term: Demands in the model reflect existing demands as described in the 2020 Model Development Report plus near term customers added to reflect current max day demands in the main pressure zone (8 mgd max day demand), as well as Sierra Vista demands.
- Future: Additional demands added to reflect future Creekview (1.25 mgd) and Amoruso (0.94 mgd) max day demands. For these scenarios, PGWWTP supply has been increased by 2.19 mgd to reflect future sewer flows from those developments.

---

[1] RMC Water & Environment, July 2016, Recycled Water Systems Evaluation

[2] Brown and Caldwell, August 2020, Recycled Water System Model Development Report

To reflect anticipated improvements to serve these additional demands, the model also includes 2 additional tanks and pumping upgrades at the West Roseville Pump Station site (including a parallel 350 linear foot, 24-inch discharge line to Westpark Drive), and a piping extension on Blue Oaks Blvd (approximately 1900 linear feet of 24-inch piping). For modeling purposes, pumping upgrades have been assumed to be sufficient to maintain 75 psi at the discharge from the West Roseville Pump Station. The pumping upgrades would include 1 additional pump under the Near-Term condition, and multiple additional pumps under the Future demand condition.

Projected demands for the Roseville Industrial Park have been added to both demand scenarios based on the peak demand as summarized in Appendix A (280 gpm).

The modeled facilities and the location of the proposed connection of the new development are presented in Figure 1.

3. MODEL RESULTS & CONCLUSIONS

The Roseville Industrial Park demands were applied to the existing 6-inch recycled water main at the corner of Cloud Dance Drive and Blue Oaks Boulevard (the "proposed development connection point" on Figure 1). Based on modeling of the proposed maximum demand, velocities in the 6-inch main would be approximately 3.8 fps, which does not exceed the City's criteria (see Figure 2).

The model predicts that a connection at this location would see a minimum pressure of 71 psi under peak hour demand conditions for the Near-Term scenario, and 62 psi for the Future scenario. Pipeline velocities do not exceed the City's criteria under Near-Term or Future demand conditions with the proposed development. Model results under the Future demand condition are presented in Figure 2. Further studies should be performed prior to connecting significant demand for the Creekview and Amoruso UGAs to confirm the anticipated demands and available pressures.

It should be noted that the proposed Roseville Industrial Park demands would increase the pumping capacity upgrades required at the West Roseville Pump Station. Specifically, in the Near-Term demand scenario, pumping capacity would need to increase from 6,780 gpm to 7,060 gpm. Whether that triggers the need for an additional pump depends on the future pumping configuration of the pump station.

Overall, prior to connection of the proposed Roseville Industrial Park and the expanded Sierra Vista demands, it is recommended that the City add approximately 1900 linear feet of 24-inch piping on Blue Oaks Boulevard, add two (2) additional storage tanks (currently sized at 2.2 million gallons and 2.4 million gallons), and add pumping capacity equivalent to one additional pump. The Roseville Industrial Park demand would contribute to the need for the additional storage tanks and piping but would not increase the planned sizing of those facilities.

The proposed development would also contribute to the need for additional pumping capacity at Pleasant Grove WWTP, system-wide storage capacity, and other upgrades as discussed in the 2016 RW Systems Evaluation under buildout conditions. As the demand projections and development timing associated with several of the Urban Growth Areas may have changed since the 2016 RW Systems Evaluation, an update of that report may be needed to describe future system facility requirements.

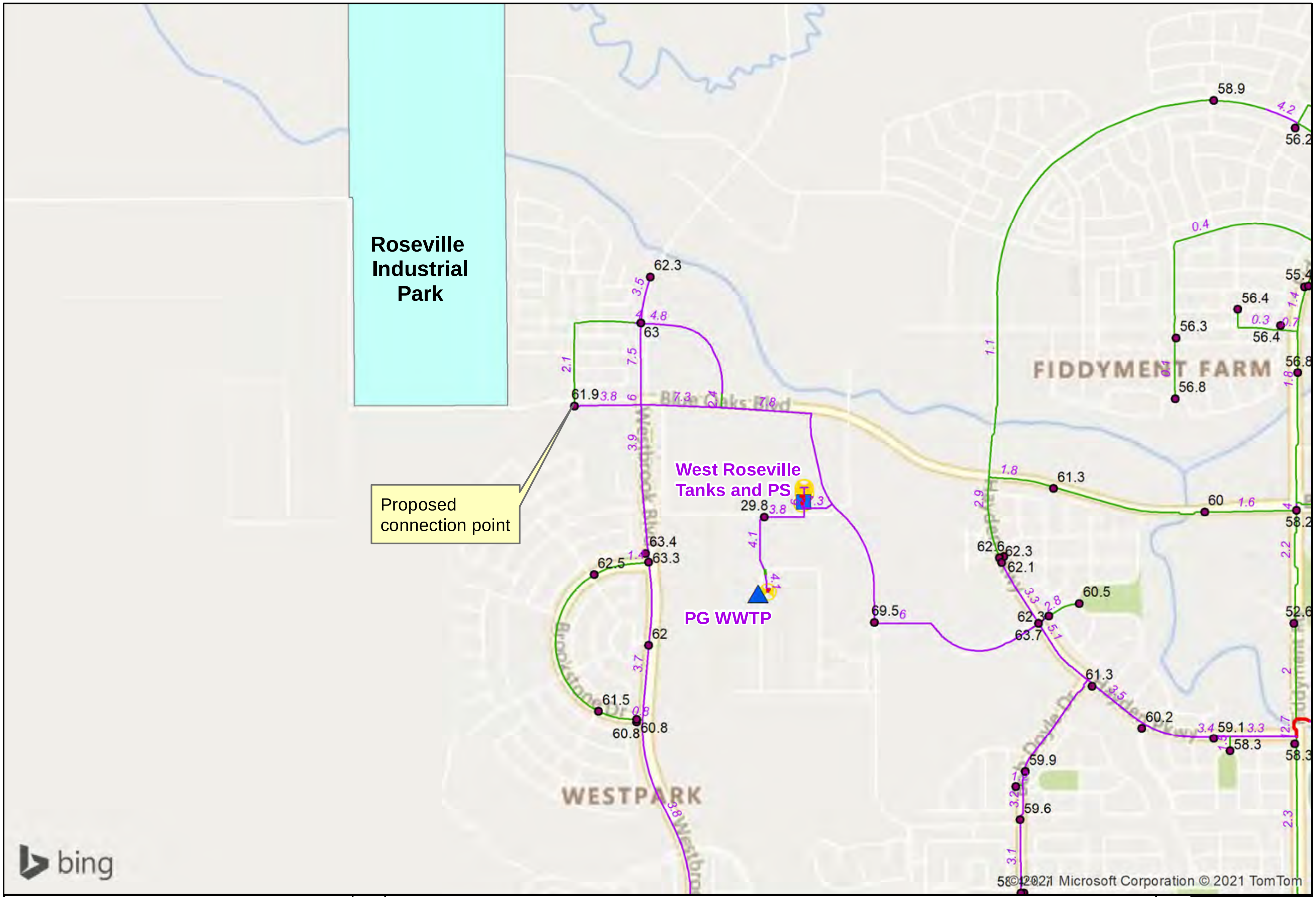


Figure 2

Model Results - Future Demands

Roseville Industrial Park
Recycled Water Study

Legend

- < 3 fps
- 3 - 8 fps
- *velocity (fps)* > 8 fps
- ● Pressure (psi) Modeled Demand
- ■ Tank & PS
- ▲ WWTP

0 0.1 0.2 0.4 Miles

N

WOODARD &CURRAN

Project #: 0012092.00 Map Created: December 2021

Figure Exported: 12/8/2021 By: cvanlienden Using: C:\00_Projects\Roseville\RW Model\Roseville Industrial Park\Figure 2.mxd

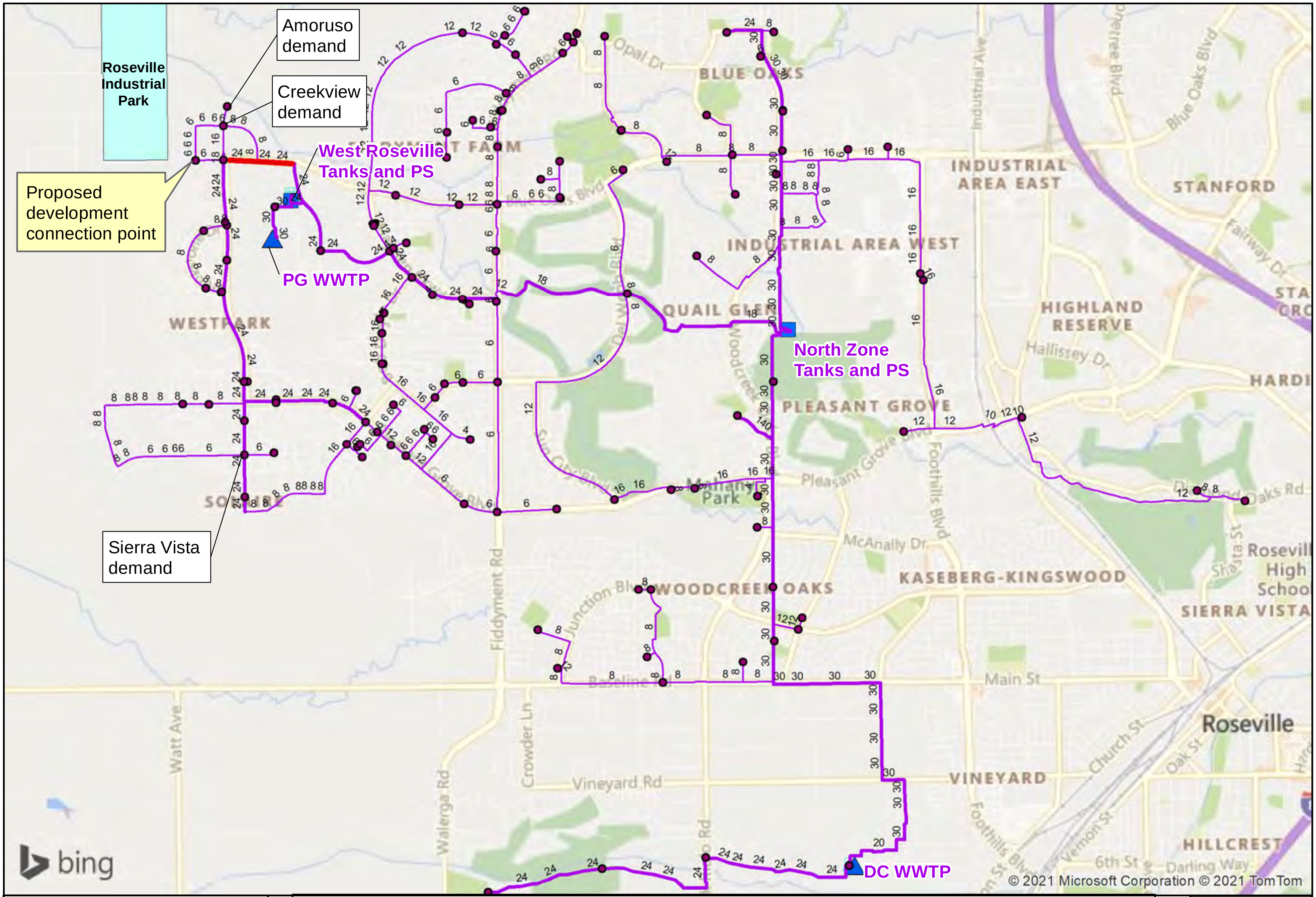


Figure 1

Project Location

Roseville Industrial Park
Recycled Water Study

Legend

- 🟥 Future pipe added to model
- Pipe < 18 inches
- Pipe > 18 inches
- ● Modeled Demand
- 🟦 Tank & PS
- ▲ WWTP

Miles
0 0.25 0.5 1

N

WOODARD &CURRAN

Project #: 0012092.00 Map Created: November 2021

Figure Exported: 11/24/2021 By: cvanlienden Using: C:\00. Projects\Roseville\RW Model\Roseville Industrial Park\Figure 1.mxd

APPENDIX A – PROPOSED ROSEVILLE INDUSTRIAL LAND USE PLAN, SITE PLAN, AND RECYCLED WATER DEMAND

From: eric@vistaparks.com <eric@vistaparks.com>
Sent: Monday, December 6, 2021 11:08 AM
To: 'Abbie Wertheim' <AWertheim@panattoni.com>; Paymon Fardanesh <pay@lmce.net>
Subject: RE: [EXTERNAL] Roseville Meeting

Abbie,

Attached are 2 irrigation worksheets (1 for the north site and 1 for the south site). These are called WELO Worksheets. They are required on all landscape plans in Roseville.

The city will not approve landscape plans that exceed the Maximum Allowed Water Use (Yellow cells in each file). So, the total volume of irrigation water allowed by the city for these sites is the sum of the numbers in the yellow cells (both sites combined). Total allowed water use is 21,374,794 gallons per year, for the north and south combined. The maximum water use is based on the total irrigated landscape area, which is shown in the orange cells.

My design method typically uses only about 35% of the maximum allowed. I use a design method that uses the least amount of water (point specific drip emitters for plants, and deep well bubblers for trees), compared to other methods of delivering water to plants and trees.

A reliable peak demand number is 280 GPM. This will happen if every building irrigates at the same time of day and on the same day. It represents 1 irrigation valve running for every building at the same time. I cap my volume through an irrigation valve at approximately 20 GPM. 14 buildings running a maxed out irrigation valve at the same time is 280 GPM.

This should make sense to the city.

Thanks,
Eric Dearing
Vista Parks Landscaping Inc.
8264 Barryman Court
Sacramento, CA 95829
P 916-681-2227 f 916-681-2228 c 916-417-9283
eric@vistaparks.com

Roseville Industrial Park North Worksheet

Reference Evapotranspiration (Eto) 52.2

Regular Landscape Areas There are no special landscape areas. Trees count as 25 sq'

Hydrozone#	Plant Factor	Irrigation Method	Irrigation Efficiency	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF X Area	Estimated Total Water Use (GPY)
1	0.2	Drip	0.81	0.25	306,605	76,651	2,480,741
2	0.4	Drip	0.81	0.49	76,651	37,559	1,215,559
3	0.2	Bubbler	0.81	0.25	7,750	1,938	62,705
4	0.4	Bubbler	0.81	0.49	1,650	809	26,166
Total					392,656		3,785,172

Maximum Allowed Water Allowance (MAWA)	5,718,563
Estimated Total Water Use (ETWU)	3,785,172
Average ETAF	0.27
Allowed ETAF	0.45

🟧	Total Landscape Area
🟨	Total Gallons Per Year Allowed Per The Model Water Efficient Landscape Ordinance
🟩	Total Gallons Per Year Projected Per The Projected Irrigation Design Usage

Roseville Industrial Park Worksheet

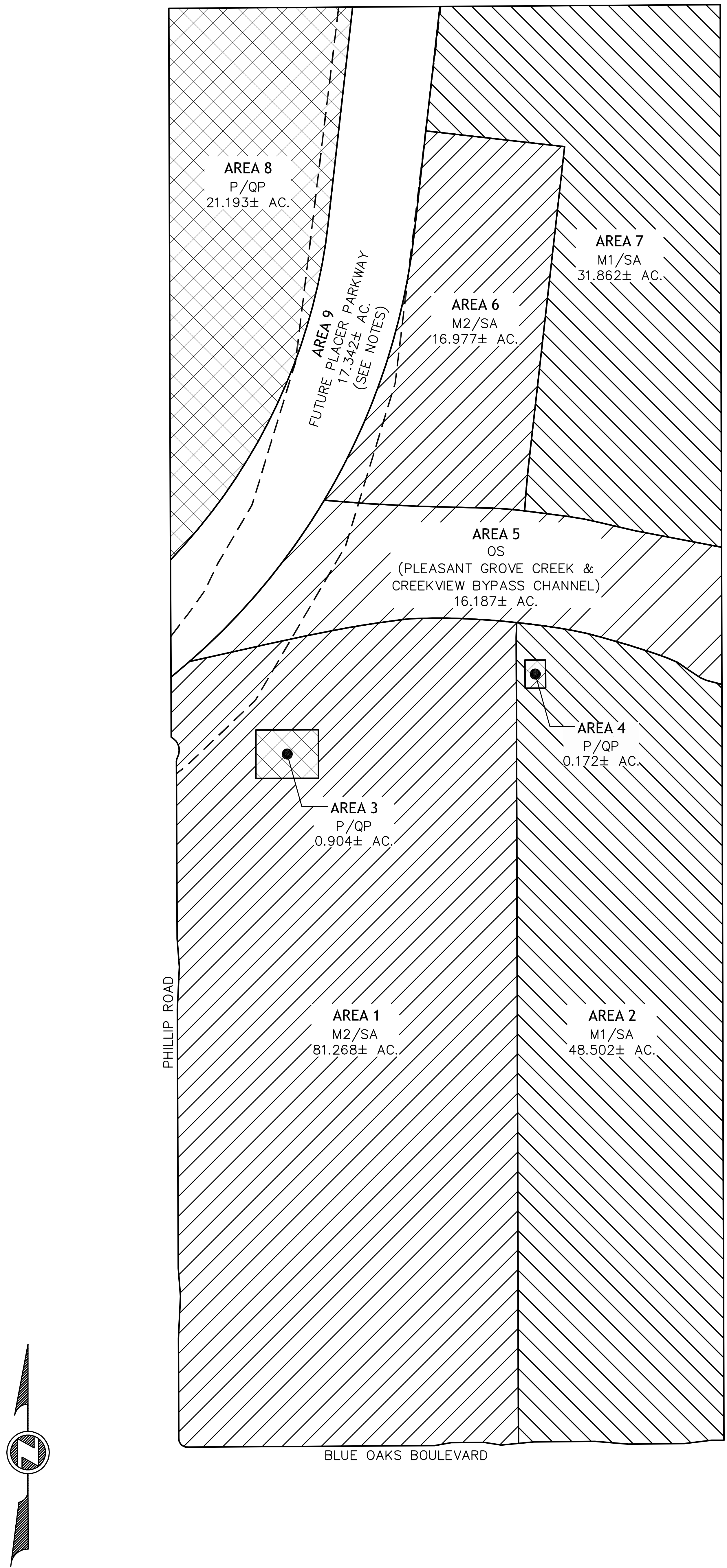
Reference Evapotranspiration (Eto) 52.2

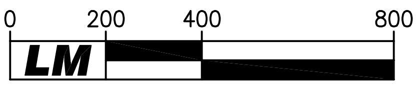
Regular Landscape Areas There are no special landscape areas. Trees count as 25 sq'

Hydrozone#	Plant Factor	Irrigation Method	Irrigation Efficiency	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF X Area	Estimated Total Water Use (GPY)
1	0.2	Drip	0.81	0.25	848,078	212,020	6,861,799
2	0.4	Drip	0.81	0.49	207,507	101,678	3,290,721
3	0.2	Bubbler	0.81	0.25	12,700	3,175	102,756
4	0.4	Bubbler	0.81	0.49	6,725	3,295	106,647
Total					1,075,010		10,361,923

Maximum Allowed Water Allowance (MAWA)	15,656,231
Estimated Total Water Use (ETWU)	10,361,923
Average ETAF	0.27
Allowed ETAF	0.45

🟧	Total Landscape Area
🟨	Total Gallons Per Year Allowed Per The Model Water Efficient Landscape Ordinance
🟩	Total Gallons Per Year Projected Per The Projected Irrigation Design Usage





SCALE: 1"=400'

NOTES:

1. *EXISTING PLACER PARKWAY AREA DENOTED BY DASHED LINE. (– – – – – – – – – – – – – – –)*
2. *REVISED PLACER PARKWAY AREA (BY AKT) USED FOR CALCULATING HIGHEST POSSIBLE UTILITY DEMANDS.*

LAND USE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 1 OCTOBER 28, 2021

LM LAUGENOUR AND MEIKLE
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SCALE: 1"=400'

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RECYCLED WATER EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 1 NOVEMBER 16, 2021

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APPENDIX B

RECYCLED WATER PLAN – NEAR TERM ONSITE MODEL RESULTS

FlexTable: Pipe Table

Label	Length (User Defined) (ft)	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/ft)
P-500	1,576	6.0	PVC	130.0	286	3.24	11.48	0.007
P-501	175	6.0	PVC	130.0	286	3.24	1.27	0.007
P-502	474	6.0	PVC	130.0	265	3.01	3.01	0.006
P-503	7	6.0	PVC	130.0	265	3.01	0.04	0.006
P-504	49	6.0	PVC	130.0	245	2.78	0.27	0.005
P-505	21	6.0	PVC	130.0	224	2.55	0.10	0.005
P-506	575	6.0	PVC	130.0	204	2.31	2.25	0.004
P-507	19	6.0	PVC	130.0	184	2.08	0.06	0.003
P-508	579	6.0	PVC	130.0	163	1.85	1.50	0.003
P-509	15	6.0	PVC	130.0	143	1.62	0.03	0.002
P-510	575	6.0	PVC	130.0	122	1.39	0.87	0.002
P-511	1,157	6.0	PVC	130.0	102	1.16	1.25	0.001
P-512	112	6.0	PVC	130.0	102	1.16	0.12	0.001
P-513	10	6.0	PVC	130.0	82	0.93	0.01	0.001
P-514	614	6.0	PVC	130.0	61	0.69	0.26	0.000
P-515	10	6.0	PVC	130.0	41	0.46	0.00	0.000
P-516	426	6.0	PVC	130.0	20	0.23	0.02	0.000

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
J-500	87.65	0	65	237.53
J-A	85.69	20	64	233.20
J-B	83.62	20	65	232.84
J-C	81.21	20	65	230.53
J-D	80.74	20	64	229.01
J-E	86.12	0	64	233.25
J-F	83.84	20	65	232.94
J-G	81.42	20	65	230.59
J-H	80.93	20	64	229.04
J-I	79.56	20	64	228.13
J-J	79.07	20	64	226.76
J-K	79.79	20	63	226.50
J-L	79.03	20	64	226.75
J-LANDSCAPE	88.85	20	64	236.26
J-LANDSCAPE 2	79.12	0	64	226.88
J-M	79.83	20	63	226.49
J-N	80.86	20	63	226.47

SEE SHEET 1

0 100 200 400

SCALE: 1"=200'

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RECYCLED WATER EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA
SHEET 2 OF 2 JANUARY 5, 2022

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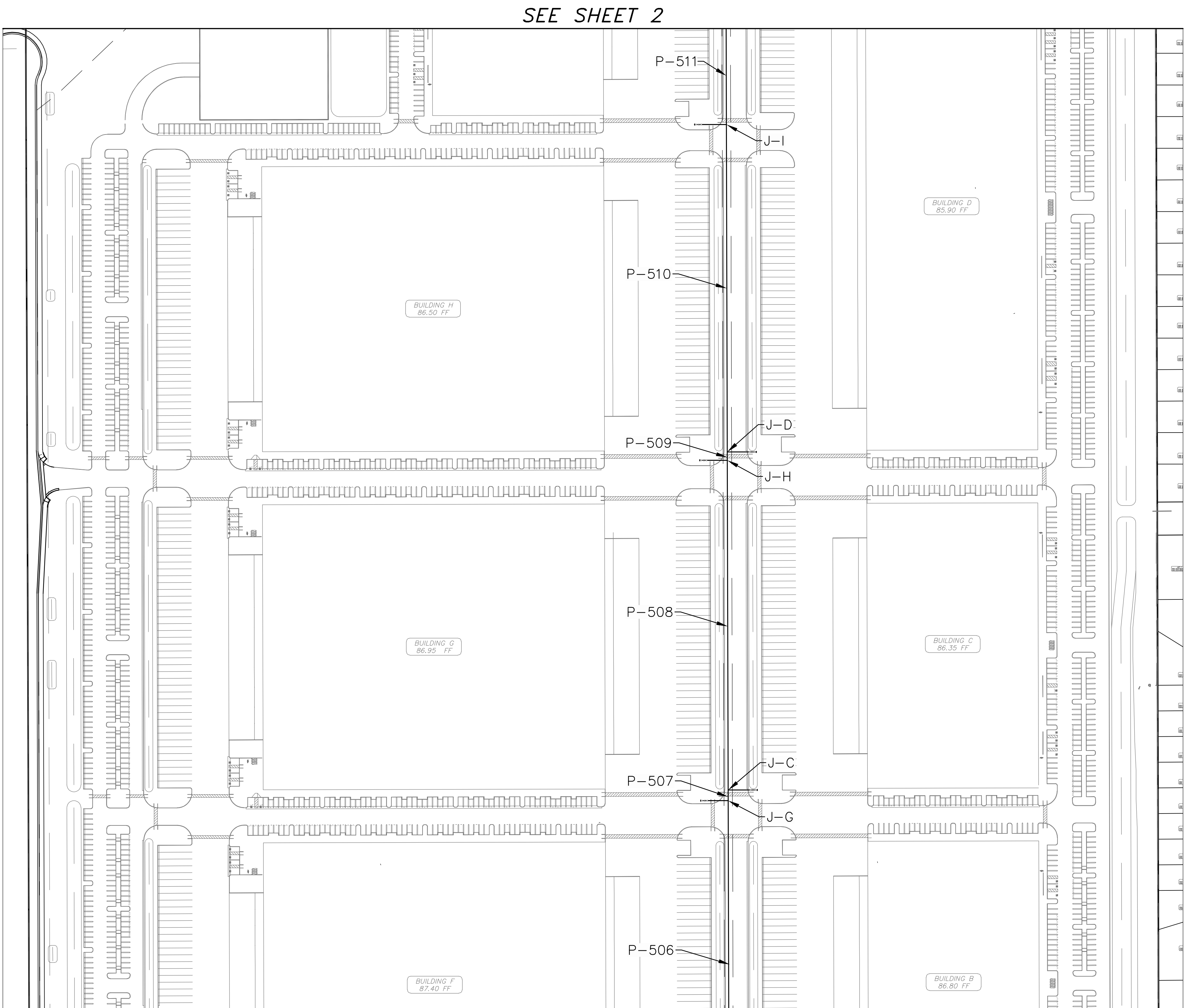

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RECYCLED WATER EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 2 JANUARY 5, 2022

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APPENDIX C

RECYCLED WATER PLAN – FUTURE ONSITE MODEL RESULTS

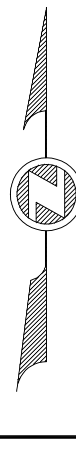
FlexTable: Pipe Table

Label	Length (User Defined) (ft)	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/ft)
P-500	1,576	6.0	PVC	130.0	286	3.24	11.48	0.007
P-501	175	6.0	PVC	130.0	286	3.24	1.27	0.007
P-502	474	6.0	PVC	130.0	286	3.24	3.45	0.007
P-503	7	6.0	PVC	130.0	265	3.01	0.04	0.006
P-504	49	6.0	PVC	130.0	245	2.78	0.27	0.005
P-505	21	6.0	PVC	130.0	224	2.55	0.10	0.005
P-506	575	6.0	PVC	130.0	204	2.31	2.25	0.004
P-507	19	6.0	PVC	130.0	184	2.08	0.06	0.003
P-508	579	6.0	PVC	130.0	163	1.85	1.50	0.003
P-509	15	6.0	PVC	130.0	143	1.62	0.03	0.002
P-510	575	6.0	PVC	130.0	122	1.39	0.87	0.002
P-511	1,157	6.0	PVC	130.0	102	1.16	1.25	0.001
P-512	112	6.0	PVC	130.0	102	1.16	0.12	0.001
P-513	10	6.0	PVC	130.0	82	0.93	0.01	0.001
P-514	614	6.0	PVC	130.0	61	0.69	0.26	0.000
P-515	10	6.0	PVC	130.0	41	0.46	0.00	0.000
P-516	426	6.0	PVC	130.0	20	0.23	0.02	0.000

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
J-500	87.65	0	56	216.74
J-A	85.69	20	55	211.97
J-B	83.62	20	55	211.61
J-C	81.21	20	55	209.30
J-D	80.74	20	55	207.77
J-E	86.12	20	54	212.02
J-F	83.84	20	55	211.70
J-G	81.42	20	55	209.36
J-H	80.93	20	55	207.80
J-I	79.56	20	55	206.90
J-J	79.07	20	55	205.53
J-K	79.79	20	54	205.26
J-L	79.03	20	55	205.52
J-LANDSCAPE	88.85	0	55	215.47
J-LANDSCAPE 2	79.12	0	55	205.65
J-M	79.83	20	54	205.26
J-N	80.86	20	54	205.24

SEE SHEET 1



0 100 200 400

SCALE: 1"=200'

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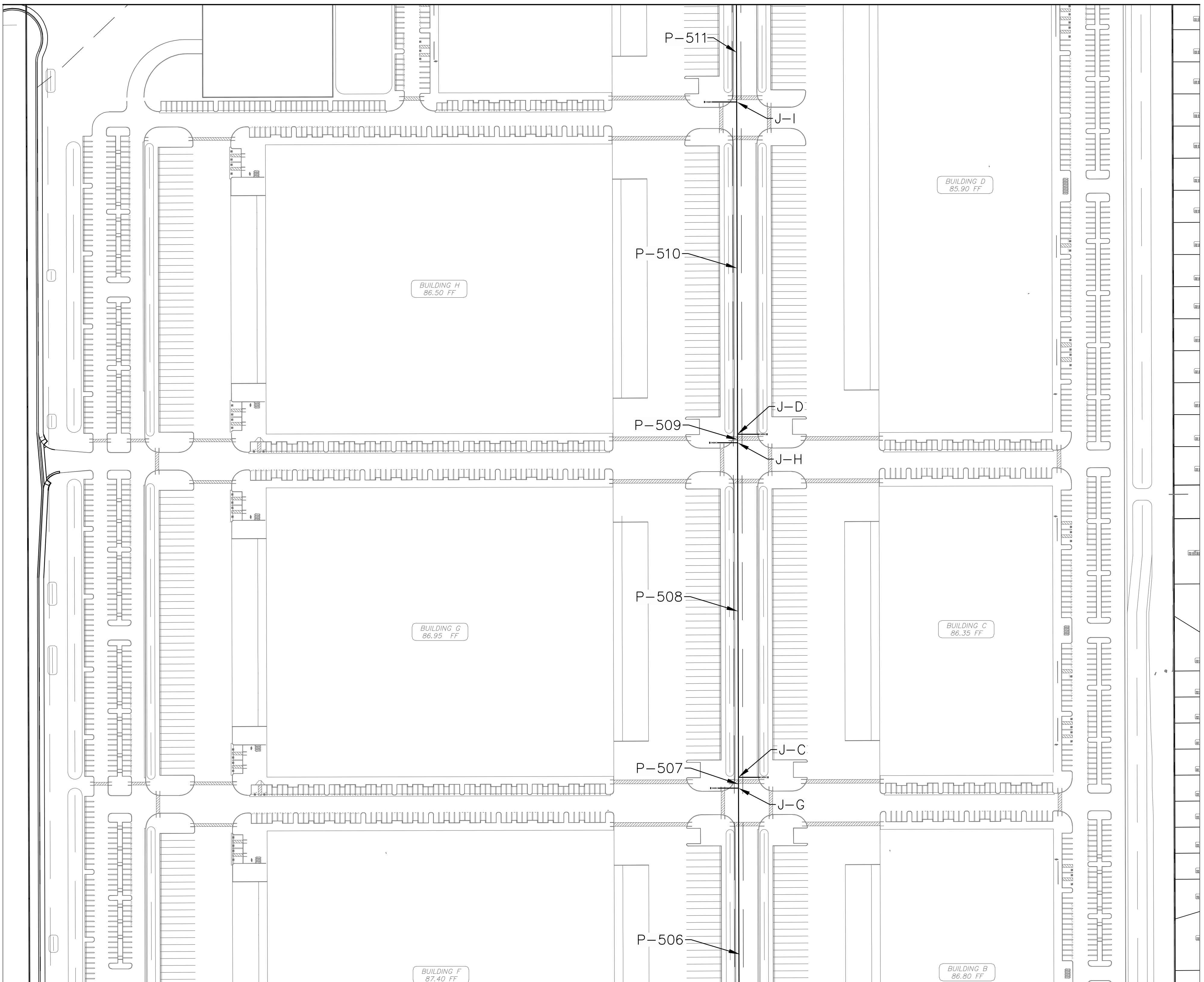
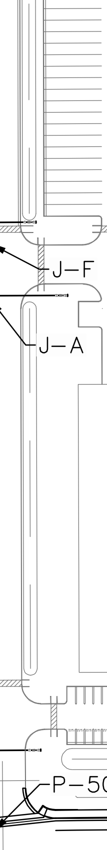
RECYCLED WATER EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 2 OF 2 JANUARY 5, 2022

X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH_Recycled Water Plan- Project Site.dwg

SEE SHEET 2





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LM

SCALE: 1"=200'

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RECYCLED WATER EXHIBIT
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA
SHEET 1 OF 2 JANUARY 5, 2022

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Roseville Industrial Park
Wastewater Master Plan

@

PHILLIP ROAD
ROSEVILLE, CALIFORNIA
(PLANNING APPLICATION 21-0193)

March 7, 2022

Panattoni Development Company, Inc.
8775 Folsom Boulevard, Suite 200
Sacramento, CA 95826
(916) 340-2424

Prepared By:

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Table of Contents

Tables

Exhibits:

Appendices:

I. INTRODUCTION

The Roseville Industrial Park Project (Proposed Project) Wastewater Master Plan (Plan) has been prepared at the request of Panattoni Development Company, Inc. (PDC) to meet the City of Roseville's (City) utility demand planning requirements and in support of the Environmental Impact Report (EIR) for the Proposed Project.

Proposed land uses, tributary areas, wastewater generation rates, and peaking factors are used to size the sanitary sewer facilities for the Proposed Project. The proposed topography will require the use of a pump station and dual force main to carry wastewater flows to the existing gravity system in Westbrook Boulevard for conveyance to the Pleasant Grove Wastewater Treatment Plant.

I.A. PROJECT LOCATION:

The Proposed Project is located in the northwest portion of the City, as shown in **Exhibit 1 – Vicinity Map**, and is within the City's service area. Pleasant Grove Creek and the Pleasant Grove Creek Bypass Channel dissect the site.

The southern portion of the Proposed Project site will be the first area to be constructed. It is bounded by the extension of Blue Oaks Boulevard to the south, Phillip Road to the west, the Pleasant Grove Creek Bypass Channel to the north, and the Creekview Subdivision to the east.

The northern portion of the Proposed Project will be constructed after the southern portion. It is bounded by the Pleasant Grove Creek to the south, the Al Johnson Wildlife Area to the west, the Amoruso Specific Plan to the north, and the Creekview Subdivision to the east. The future Placer Parkway alignment is proposed to dissect the northern portion of the Proposed Project site as shown in **Exhibit 2 – Land Use Plan**.

I.B. PRE-DEVELOPMENT CONDITIONS:

The Proposed Project site is an undeveloped agricultural parcel that was originally planted during the 1950's, was maintained in rice production through the 1990's, and has been planted in irrigated crops until the present.

The Pleasant Grove Creek Bypass Channel was constructed south of Pleasant Grove Creek during the summer of 2019 to augment flood mitigation/control in this area. A 10-foot to 15-foot escarpment runs in a southeasterly direction from the Phillip Road entrance of the property's southern portion of the site to its eastern boundary, demarcating an elevation change between the southern and northern portions of the southern portion of the site.

The portion of the property north of Pleasant Grove Creek is also currently active cultivation and irrigated with water from a long-established irrigation canal along the northern boundary.

I.C. PROPOSED PROJECT AREA DEVELOPMENT OPPORTUNITIES AND CONSTRAINTS:

The Proposed Project Land Use Plan is influenced by several factors, including the physical setting, land use, circulation considerations, and public policies. Two significant aspects that influence the development of the Land Use Plan are described below and depicted on **Exhibit 2 – Land Use Plan.**

- PLACER PARKWAY

  The proposed Placer Parkway will bisect the northerly portion of the Proposed Project site. Due to the limited area and difficulty with getting utility and roadways across Placer Parkway, the northwesterly portion of the site will be designated as Public/Quasi-Public land use.

- PLEASANT GROVE CREEK AND PLEASANT GROVE CREEK BYPASS CHANNEL

  The existing Pleasant Grove Creek and newly constructed Pleasant Grove Creek Bypass Channel divides the Proposed Project site. The area south of these two features will be constructed first. A bridge will be needed in the future to access the area to the north when it is developed.

II. WASTEWATER STUDY PROCESS

The Proposed Project site will consist of Light Industrial/Special Area Overlay (M1/SA) and General Industrial/Special Area Overlay (M2/SA) land uses. There will be a sewer pump station located at the project site which will be classified as Public/Quasi-Public (P/QP) land use. The Proposed Project site Land Use Plan is shown in **Exhibit 2 – Land Use Plan.**

Each land use generates wastewater flow based on unit factors as designated by the City. The Average Dry Weather Flows (ADWF) Unit Flow Factors that are used for the Proposed Project are shown below in **Table 1 – Average Dry Weather Unit Flow Factors.**.

Table 1
Roseville Industrial Park
Wastewater Master Plan
Average Dry Weather Unit Flow Factors

Land Use	Land Use Abbreviation	Flow Rate (1)
Light Industrial/Special Area Overlay	M1/SA	850 gpd/acre
General Industrial/Special Area Overlay	M2/SA	850 gpd/acre
Public/Quasi-Public	P/QP	660 gpd/acre

(1) Average Dry Weather Flow Factors per City of Roseville Design and Construction Standards, Section 9 (Sanitary Sewer Design), dated January 2019

A summary of the proposed land use acreages that generate wastewater flows is shown in **Table 2 – Wastewater Generation by Land Use**.

Table 2
Roseville Industrial Park
Wastewater Master Plan
Wastewater Generation by Land Use

Land Use	Land Use Abbreviation	Total Area (Acres)	ADWF (mgd)
Light Industrial/Special Area Overlay	M1/SA	80.364	0.068
General Industrial/Special Area Overlay	M2/SA	98.245	0.084
Public/Quasi-Public (Developable Area)	P/QP	1.076 (1)	0.001
Public/Quasi-Public (Undevelopable Area)	P/QP	21.193 (2)	--
TOTAL		**200.878**	**0.153**

(1) Consists of Public/Quasi-Public areas southeast of the Future Placer Parkway that can be served by the Proposed Project infrastructure.

(2) Consists of Public/Quasi-Public areas northwest of the Future Placer Parkway that cannot be served by the Proposed Project infrastructure.

III. WASTEWATER SYSTEM INFRASTRUCTURE

The wastewater system is designed to serve the Land Use Plan**.** The wastewater system, comprised of gravity trunk pipelines and a lift station, has been designed to collect wastewater flows within the Proposed Project site as shown in **Exhibit 3 – Wastewater Master Plan.**

Wastewater flows from the northern portion of the site are conveyed by gravity pipelines to a lift station located south of the Pleasant Grove Creek Bypass Channel, within a P/QP parcel, on the southern portion of the Proposed Project site. The gravity sewer main will need to be constructed under the Pleasant Grove Creek and Pleasant Grove Creek Bypass Channel per City of Roseville Standards with piles.

The wastewater flows from the southern portion of the site are also conveyed to this lift station. Area topography and the distance required for conveyance of wastewater flows to the Pleasant Grove Wastewater Treatment Plant prevent the use of gravity flow. See **Appendix A – Wastewater Flows by Node** for detailed information about each pipe and contributing sheds, peaking factors, and design flows.

The sewer lift station will be designed with a submersible pump in a manhole-type wet well and will meet the City's Design Standards. A vault is required within the sewer lift station parcel to provide four-hour emergency storage for the wastewater system. See **Exhibit 4 – Utility Plan** for the layout of the Sewer Pump Station. **Appendix B – Emergency Storage Calculations** contains information on the storage volume provided by the vault.

A dual force main will be constructed from the lift station, south along the Project Site's central corridor toward Blue Oaks Boulevard. It will then follow along Blue Oaks Boulevard to the east and then south along Westbrook Boulevard. A new sewer manhole will be constructed on the west side of Westbrook Boulevard and a gravity pipe will then convey flows to a new sewer manhole in Westbrook Boulevard to connect to the existing 21-inch sewer pipe. The location of the sewer manhole in Westbrook Boulevard was selected based on the As-built Plans to provide proper clearances from the existing 72-inch storm drain line in Westbrook Boulevard. See **Exhibit 5 – Wastewater Force Main Routing.**

Woodard & Curran studied the proposed wastewater flows generated from the Proposed Project and determined by updating the City Model, to account for the flows from the Proposed Project, that the existing 21-inch sewer line had adequate capacity at this location, see **Appendix C – Roseville Industrial Park Sewer Capacity Evaluation.** The City has agreed that the proposed connection can connect to the existing sewer line, crown to crown.

IV. RECYCLED WATER

The Proposed Project anticipates receiving a commitment for recycled water from the City for a minimum amount equal to the average dry weather flow (ADWF) generated and conveyed by the Proposed Project to the Pleasant Grove Wastewater Treatment Plant. The Proposed Project will generate an ADWF of 0.153 MGD and anticipates receiving this minimum volume of recycled water from the City.

V. HYDRAULIC MODEL ANALYSIS

V.A. HYDRAULIC MODEL ANALYSIS CRITERIA:

The following procedure was used for the preliminary design and analysis of the wastewater system proposed in the Proposed Project Wastewater Master Plan:

- The primary wastewater generation areas within the plan area were delineated.
- A sewer trunk system alignment was defined to collect wastewater flows within the project area. The gravity system was placed within the proposed road system wherever feasible.
- Node points were inserted into the sewer system alignment to define flow collection points within the sewer system.
- The land use areas, with their respective generation rates, were assigned a manhole node to tie into the trunk system.
- Proposed land use acreages for each node point of connection were tabulated.

- Wastewater flows, including average dry weather flows, factored flows, and peak wet weather flows were calculated at each point using the design methodology defined in Section 9 – Sanitary Sewer Design, of the City of Roseville Design and Construction Standards.
- Average dry weather flows were calculated using the Average Dry Weather Unit Flow Factors for the land use types.
- Factored flows were calculated by multiplying average dry weather flows by a factor of safety of 2.0.
- Peak wet weather flows within the trunk system were calculated by summing factored flows at the nodes along the trunk system alignment and applying appropriate peaking factors from the Peaking Factor Curve shown in Figure SS-1 of Section 9 of the City of Roseville Design and Construction Standards.
- Trunk system pipe sizes were initially sized based on peak wet weather flows and pipe capacities based on minimum pipe slopes.
- Preliminary pipe inverts were calculated and compared to proposed finished grades to verify the ability of the gravity system to serve the tributary areas.

V.B. PIPING SIZING CRITERIA

The proposed pipe size diameters were selected using the following pipe criteria:

- A Manning’s “n” value of 0.013 was used for all pipe-sizing calculations.
- Pipes 10 inches and less in diameter and pipes with lateral connections are designed to have a maximum depth of flow 70% of the pipe diameter.
- Pipes 12 inches and larger with no lateral connections are designed to flow full.
- Pipe sizes have been selected assuming pipes will be installed at minimum slopes.
- The minimum slope for a pipe is a slope that yields a minimum 2 feet per second velocity when flowing at design capacity.
- Pipes proposed to be placed deeper than 20 feet shall conform to the pipe manufacturer’s construction recommendations and comply with the City of Roseville Improvement Standards.

VI. CONCLUSIONS

Based on the information contained within this Wastewater Master Plan the following conclusions are noted:

- ➢ The proposed wastewater system accommodates the anticipated flows for the Proposed Project based on the Land Use Plan.
- ➢ The existing City wastewater system has capacity for the Proposed Project in the existing 21-inch sewer main in Westbrook Boulevard. The connection to this pipe can be crown to crown.

- Gravity lines throughout the sanitary system are between 6 feet to 30 feet deep.
- The proposed pipe network meets the City Standards for velocities (minimum 2 fps, maximum 10 fps) for all pipes in excess of 6-inch diameter.
- Minimum 6-inch diameter pipe mains at minimum slope near end runs do not allow for velocities of 2 fps or greater until tributary flows meet a minimum generation rate of 89 gpm.

EXHIBITS

VICINITY

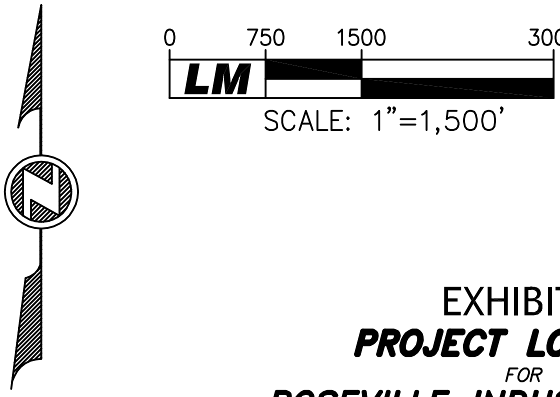

EXHIBIT 1
PROJECT LOCATION
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE,
PLACER COUNTY, CALIFORNIA
SHEET 1 OF 1 NOVEMBER 19, 2021

LM LAUGENOUR AND MEIKLE
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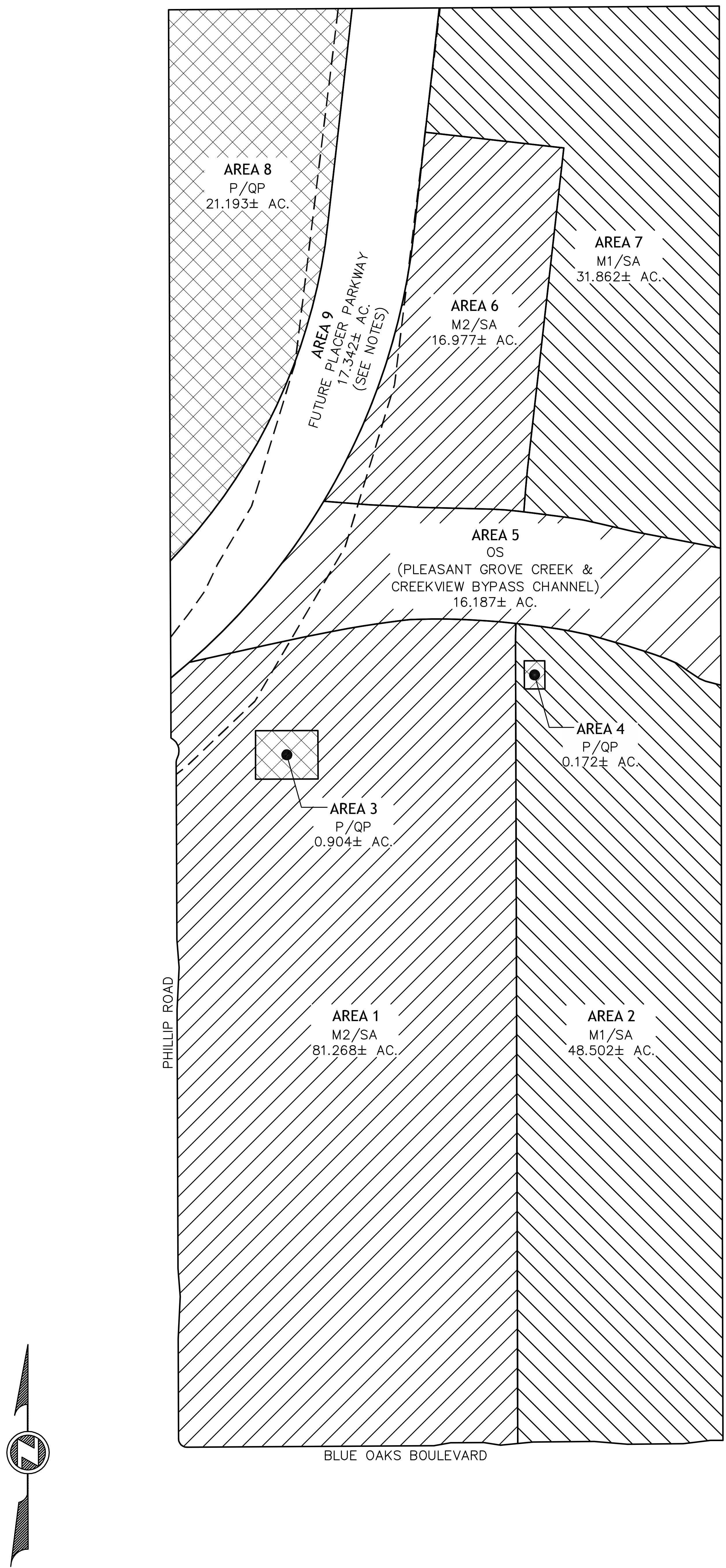
X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH01-Project Location



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LM

SCALE: 1"=400'

NOTES:

1. *EXISTING PLACER PARKWAY AREA DENOTED BY DASHED LINE.*
   (– – – – – – – – – – – – – – –)
2. *REVISED PLACER PARKWAY AREA (BY AKT) USED FOR CALCULATING HIGHEST POSSIBLE UTILITY DEMANDS.*

EXHIBIT 2
LAND USE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA
SHEET 1 OF 1 OCTOBER 28, 2021

LM LAUGENOUR AND MEIKLE
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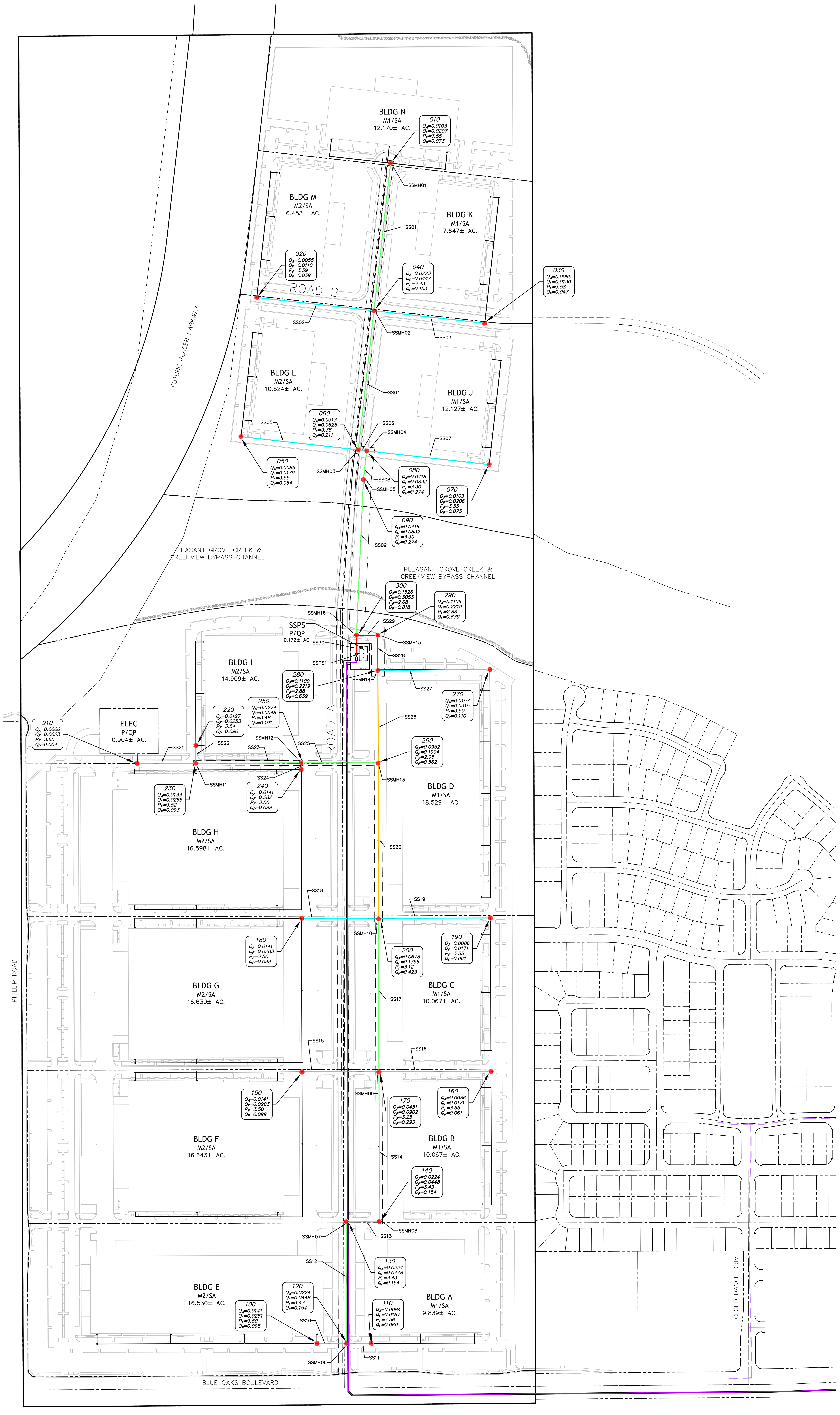

LEGEND

— - - — - - —	TRIBUTARY AREA
—	SEWER FORCE MAIN
—	6" SEWER TRUNK LINE
—	8" SEWER TRUNK LINE
—	10" SEWER TRUNK LINE
—	12" SEWER TRUNK LINE
—	FUTURE SEWER FORCE MAIN
— — —	EXISTING SEWER LINE
BLDG A M1	BUILDING ID AND LAND USE DESIGNATION
●	NODE POINT
001 Q_A=0.000 Q_F=0.000 P_F=0.000 Q_P=0.000	SHED Q_A=AVERAGE DRY WEATHER FLOW (MGD) Q_F=FACTORED FLOW (MGD) P_F=PEAKING FACTOR Q_P=PEAK WET WEATHER FLOW (MGD)

N

0 75 150 300
LM
SCALE: 1"=150'

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EXHIBIT 3

WASTEWATER
MASTER PLAN

SHEET 1 OF 1

MARCH 4, 2022

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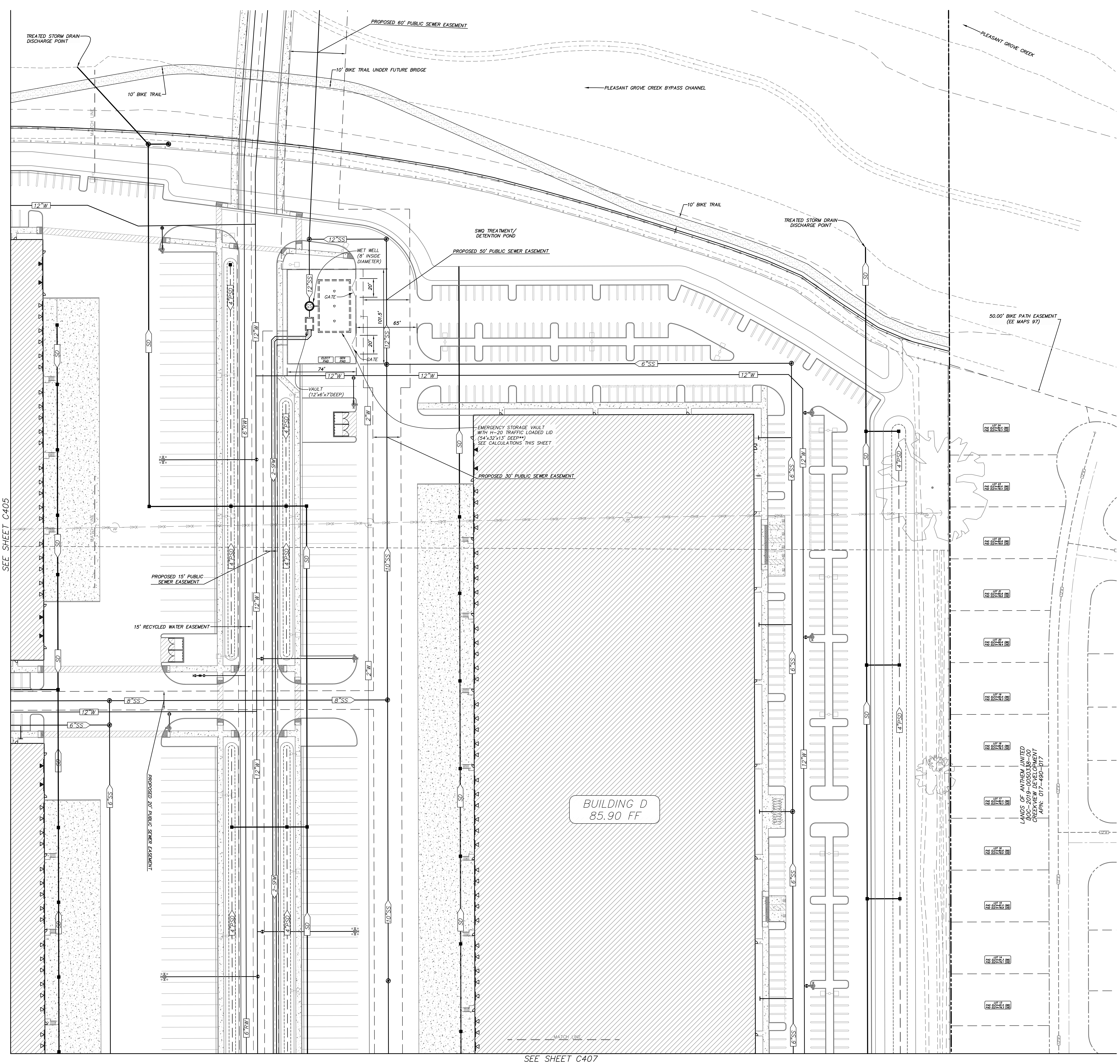
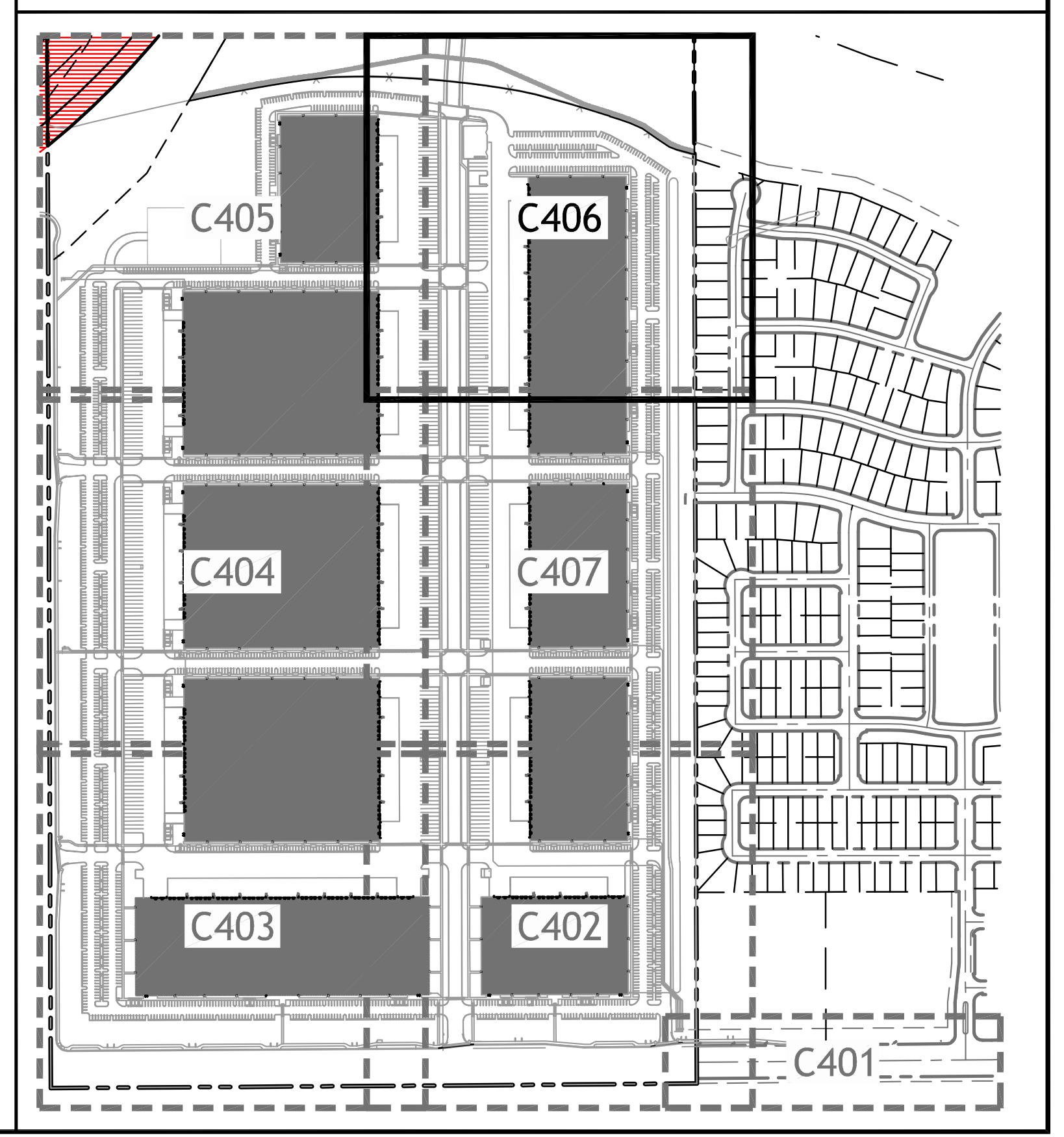


EMERGENCY STORAGE VAULT
REQUIRED STORAGE VOLUME FOR 4 HR = 136,333 GAL

EMERGENCY STORAGE VAULT
(54'X32'X13' DEEP**) = 142,180 GAL
** ASSUMES 13' DEEP STRUCTURE BUT ONLY UTILIZING 11' DEPTH FOR STORAGE (1 FOOT FOR FREEBOARD TO TOP OF STRUCTURE AND 1 FOOT FOR SLOPE OF BOTTOM OF CONCRETE STRUCTURE)

EMERGENCY STORAGE VAULT = 142,180 GAL > 136,333 GAL

KEY PLAN



ROSEVILLE INDUSTRIAL PARK

PHILLIP ROAD
ROSEVILLE, CA 95747

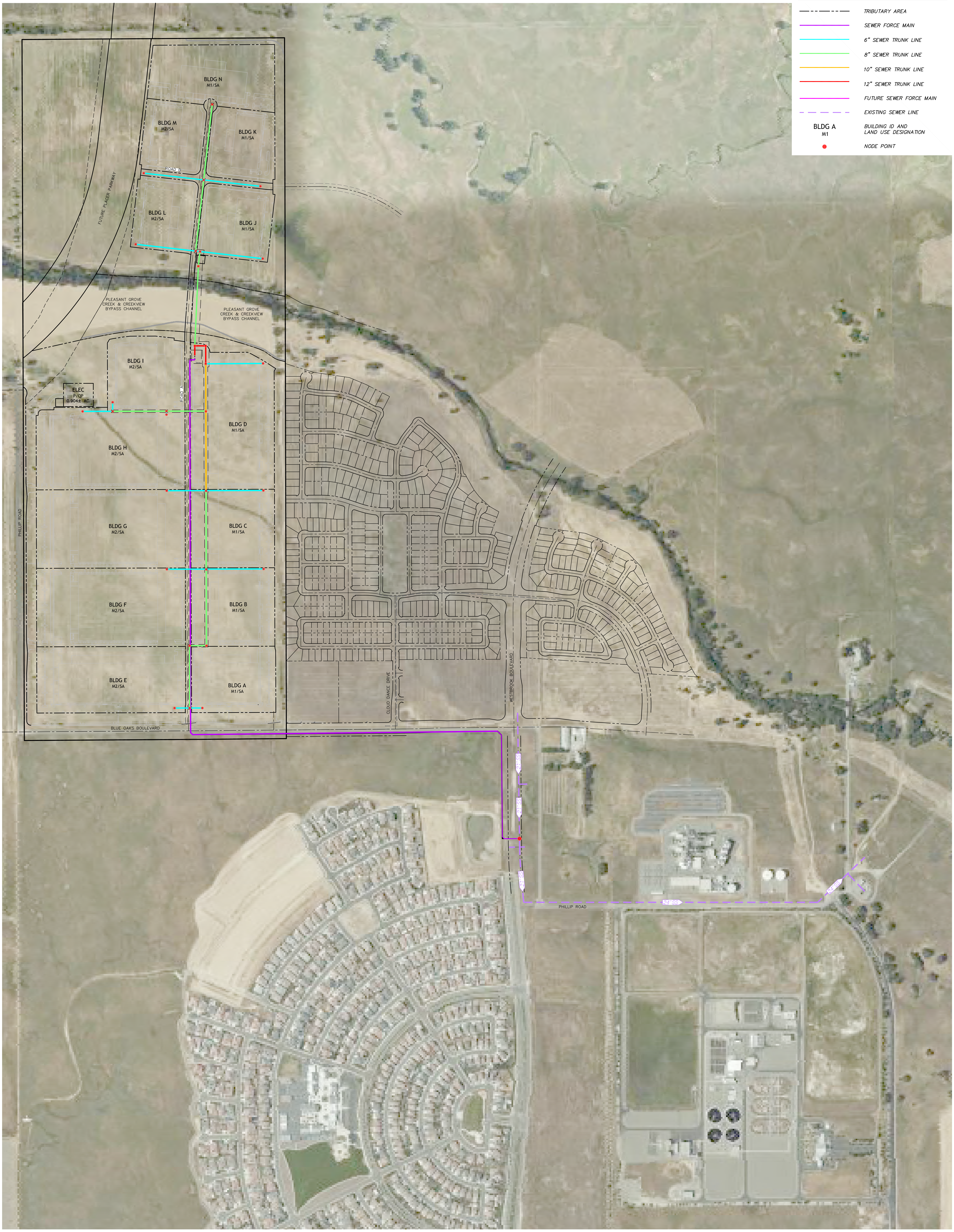
JOB NO.	4042-60-2
SCALE	AS NOTED
DATE	-
CHECKED BY	PF
DRAWN BY	PJ

UTILITIES PLAN

EXHIBIT 5

C406

SHEET 20 OF 36



LEGEND

—·—·—	TRIBUTARY AREA
━	SEWER FORCE MAIN
━	6" SEWER TRUNK LINE
━	8" SEWER TRUNK LINE
━	10" SEWER TRUNK LINE
━	12" SEWER TRUNK LINE
━	FUTURE SEWER FORCE MAIN
– – –	EXISTING SEWER LINE
BLDG A M1	BUILDING ID AND LAND USE DESIGNATION
●	NODE POINT

0 125 250 500

SCALE: 1"=250'

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EXHIBIT 5

WASTEWATER FORCE MAIN ROUTING

SHEET 1 OF 1

MARCH 4, 2022

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APPENDIX A

WASTEWATER FLOWS BY NODE

				850 GPD/ACRE		660 GPD/ACRE										
Shed #	Contributing Sheds	Upstream Node	Downstream Node	Area (Acre)	Q (ADWF) (mgd)	Area (Acre)	Q (ADWF) (mgd)	Cumulative Q (ADWF) (mgd)	Safety Factor	Factored Flow	Peaking Factor	Design Flow Q(PWWF) (mgd)	Pipe Name	Min Pipe Size (in)	Min Pipe Slope (ft/ft)	% Full Q(PWWF) (d/D)
NORTH OF PLEASANT GROVE CREEK																
010	010	Bldg N	SSMH01	12.170	0.0103	0	0.0000	0.0103	2.0	0.0207	3.55	0.073	-	6	0.0050	37%
-	010	SSMH01	SSMH02	-	-	-	-	0.0103	2.0	0.0207	3.55	0.073	SS01	8	0.0035	27%
020	020	Bldg M	SSMH02	6.453	0.0055	0	0.0000	0.0055	2.0	0.0110	3.59	0.039	SS02	6	0.0050	26%
030	030	Bldg K	SSMH02	7.647	0.0065	0	0.0000	0.0065	2.0	0.0130	3.58	0.047	SS03	6	0.0050	29%
040	010 - 040	SSMH02	SSMH03	-	-	-	-	0.0223	2.0	0.0447	3.43	0.153	SS04	8	0.0035	40%
050	050	Bldg L	SSMH03	10.524	0.0089	0	0.0000	0.0089	2.0	0.0179	3.55	0.064	SS05	6	0.0050	34%
060	010 - 060	SSMH03	SSMH04	-	-	-	-	0.0313	2.0	0.0625	3.38	0.211	SS06	8	0.0035	48%
070	070	Bldg J	SSMH04	12.127	0.0103	0	0.0000	0.0103	2.0	0.0206	3.55	0.073	SS07	6	0.0050	37%
080	010 - 080	SSMH04	SSMH05	-	-	-	-	0.0416	2.0	0.0832	3.30	0.274	SS08	8	0.0035	56%
090	010 - 090	SSMH05	SSMH15	-	-	-	-	0.0416	2.0	0.0832	3.30	0.274	SS09	8	0.0035	56%
SOUTH OF PLEASANT GROVE CREEK																
100	100	Bldg E	SSMH06	16.53	0.0141	0	0.0000	0.0141	2.0	0.0281	3.50	0.098	SS10	6	0.0050	43%
110	110	Bldg A	SSMH06	9.839	0.0084	0	0.0000	0.0084	2.0	0.0167	3.56	0.060	SS11	6	0.0050	33%
120	100 - 120	SSMH06	SSMH07	-	-	-	-	0.0224	2.0	0.0448	3.43	0.154	SS12	8	0.0035	40%
130	100 - 130	SSMH07	SSMH08	-	-	-	-	0.0224	2.0	0.0448	3.43	0.154	SS13	8	0.0035	40%
140	100 - 140	SSMH08	SSMH09	-	-	-	-	0.0224	2.0	0.0448	3.43	0.154	SS14	8	0.0035	40%
150	150	Bldg F	SSMH09	16.643	0.0141	0	0.0000	0.0141	2.0	0.0283	3.50	0.099	SS15	6	0.0050	43%
160	160	Bldg B	SSMH09	10.067	0.0086	0	0.0000	0.0086	2.0	0.0171	3.55	0.061	SS16	6	0.0050	33%
170	100 - 170	SSMH09	SSMH10	-	-	-	-	0.0451	2.0	0.0902	3.25	0.293	SS17	8	0.0035	58%
180	180	Bldg G	SSMH10	16.63	0.0141	0	0.0000	0.0141	2.0	0.0283	3.50	0.099	SS18	6	0.0050	43%
190	190	Bldg C	SSMH10	10.067	0.0086	0	0.0000	0.0086	2.0	0.0171	3.55	0.061	SS19	6	0.0050	33%
200	100 - 200	SSMH10	SSMH13	-	-	-	-	0.0678	2.0	0.1356	3.12	0.423	SS20	10	0.0025	56%
210	210	Elec Station	SSMH11	0	0.0000	0.904	0.0006	0.0006	2.0	0.0012	3.65	0.004	SS21	6	0.0020	15%

Shed #	Contributing Sheds	Upstream Node	Downstream Node	850 GPD/ACRE		660 GPD/ACRE		Cumulative Q (ADWF) (mgd)	Safety Factor	Factored Flow	Peaking Factor	Design Flow Q(PWWF) (mgd)	Pipe Name	Min Pipe Size (in)	Min Pipe Slope (ft/ft)	% Full Q(PWWF) (d/D)
				Area (Acre)	Q (ADWF) (mgd)	Area (Acre)	Q (ADWF) (mgd)									
220	220	Bldg I	SSMH11	14.909	0.0127	0	0.0000	0.0127	2.0	0.0253	3.54	0.090	SS22	6	0.0050	39%
230	210 - 230	SSMH11	SSMH12	-	-	-	-	0.0133	2.0	0.0265	3.52	0.093	SS23	8	0.0020	30%
240	240	Bldg H	SSMH12	16.598	0.0141	0	0.0000	0.0141	2.0	0.0282	3.50	0.099	SS24	6	0.0050	43%
250	210 - 250	SSMH12	SSMH13	-	-	-	-	0.0274	2.0	0.0548	3.48	0.191	SS25	8	0.0020	44%
260	100 - 260	SSMH13	SSMH14	-	-	-	-	0.0952	2.0	0.1904	2.95	0.562	SS26	10	0.0020	67%
270	270	Bldg D	SSMH14	18.529	0.0157	0	0.0000	0.0157	2.0	0.0315	3.50	0.110	SS27	6	0.0050	46%
280	100 - 280	SSMH14	SSMH15	-	-	-	-	0.1109	2.0	0.2219	2.88	0.639	SS28	12	0.0020	57%
290	100 - 290	SSMH15	SSMH16	-	-	-	-	0.1109	2.0	0.2219	2.88	0.639	SS29	12	0.0020	57%
300	010 - 300	SSMH16	SSPS1	0	0.0000	0.172	0.0001	0.1526	2.0	0.3053	2.68	0.818	SS30	12	0.0020	67%

APPENDIX B

EMERGENCY STORAGE CALCULATIONS

Lift Station Emergency Storage Calculation

Roseville Industrial Project - Complete Buildout

ONLY UTILIZING THE ONSITE STORAGE VAULT FOR 4 HRS OF STORAGE

	Values	Notes
Buildout Phase - PWWF Design Flow	0.818 mgd	See Appendix B - Wastewater Flows by Node
Buildout Phase - PWWF Design Flow	568 gpm	See Appendix B - Wastewater Flows by Node
Storage Capacity @ PWWF	4 hrs	City of Roseville Design Requirement
Required Storage System Volume @ PWWF	136,333 gal	Wet Well + Manholes + Pipeline + Vault
Controling Manhole Rim Elevation	82.30 ft	Lowest Manhole Rim (SSMH03)

PWWF Analysis - Buildout **Lift Station Wet Well - Available Storage Capacity**		
Wet Well Internal Diameter	8 ft	
Lift Station Rim Elevation	83.50 ft	
12" Gravity Sewer Invert Elevation	52.76 ft	
Lead Pump "On" Elevation	51.76 ft	
Wet Well Storage Section Height	30.54 ft	Controlling manhole minum Lead Pump On Elevation
Wet Well Capacity	1535.25 cf	Section Height * Wet Well Internal Area
Wet Well Capacity	11,484 gal	
Wet Well Time to Fill	20.22 min	
Wet Well Time to Fill	0.34 hrs	

Collection System - Available Storage Capcity		
Gravity Sewer Manhole Diameter	4 ft	
Surcharge Buffer	0 ft	
Maximum Surcharge Elevation	82.30 ft	
Sewer Manholes	0 gal	Capacity from sewer manholes invert to Max Surcharge
Sewer Pipeline	0 gal	Capacity in pipes below Max Surcharge
Combined Collection Storage	0 gal	Sewer Manholes + pipelines
Collection System Time to Fill	.00 min	
Collection System Time to Fill	.00 hrs	

Available Storage in Collection + Wet Well	0 gal	
Total Time to Fill Collection + Wet Well	.00 hrs	Below controling manhole elevation
Remaining Onsite Storage Volume @ PWWF	136,333 gal	Required to fulfill 4-hrs of storage
Remaining Onsite Storage Time @ PWWF	4.00 hrs	Required to fulfill 4-hrs of storage

APPENDIX C

ROSEVILLE INDUSTRIAL PARK SEWER CAPACITY EVALUATION

TECHNICAL MEMORANDUM

TO: Abbie Wertheim, Panattoni Development Company

PREPARED BY: Nery Barrera

REVIEWED BY: Chris van Lienden, PE

DATE: December 10, 2021

RE: Roseville Industrial Park Sewer Capacity Evaluation

1. BACKGROUND

Woodard & Curran was asked to analyze the impacts of the proposed Roseville Industrial Park proposed development on the City of Roseville's sewer system. The location of the proposed site is shown in Figure 1. The proposed development includes 9 non-residential areas on parcel 6382 Phillip Rd (234 acres) within the City of Roseville, and would discharge sewer flows into City-owned sewers. The proposed land uses of the 9 areas in the proposed development are industrial (M1 and M2), Open space (OS), and public/quasi-public (P/QP) as shown in Appendix A. A conceptual site plan is included in Appendix B, indicating two possible options. Option 1 would discharge sewer flows through a force main further upstream than Option 2 and would therefore be more conservative. Therefore, this option was used in this analysis.

A sewer model including all of the sewers in the City was recently developed as part of the 2017 City of Roseville Sewer Model Update (2017 Model Update). Subsequently, a capacity evaluation of the SPWA trunk sewers was also conducted for the 2020 South Placer Wastewater Authority Systems Evaluation (2020 Systems Evaluation), which also updated flow projections from Placer County and SPMUD (the City indicated that flow projections from the 2017 Model Update were sufficiently up to date). Future flows estimated as part of those studies did not include any flows from the location of the proposed development.

The purpose of this TM is to evaluate and document whether the updated sewer model predicts that existing City sewers will have capacity for the proposed development.

2. MODEL RESULTS & CONCLUSIONS

Wastewater flow projections for the proposed development were estimated based on the Average Dry Weather Flow (ADWF) unit flow factor of 850 gallons per day per acre (gpd/acre) for Industrial-type areas and 660 gpd/acre for public/quasi-public-type areas, resulting in an ADWF of 166,515 gpd. Modeled flows from the proposed development are summarized in Table 1.

Table 1: Modeled Roseville Industrial Park Sewer Loads

Area Number	Type	Area (acres)	Average Dry Weather Flow Unit Factor (gpd/acre)	Average Dry Weather Flow (mgd)
1	M2	81.268	850	69,078
2	M1	48.502	850	41,227
3	P/QP	0.904	660	597
4	P/QP	0.172	660	114
5	OS	16.187	0	0
6	M2	16.977	850	14,430
7	M1	31.862	850	27,083
8	P/QP	21.193	660	13,987
9	FUTURE PLACER PARKWAY	17.342	0	0
Total		234.407		166,515

For this evaluation, simulations representing peak wet weather flow (PWWF) under buildout land use conditions have been performed. Specifically, the 24-inch sewer connecting to this site would also convey flows from the proposed Creekview and Amoruso Urban Growth Areas, and have also been applied to the sewer. Projected rainfall-dependent infiltration and inflow (RDI/I) based on the City's standard 10-year 24-hour design event was applied to the ADWF to estimate PWWF.

City of Roseville design standards specify that pipes 10-inch diameter or less should have maximum depth of flow under design conditions of 0.7 times the diameter (d/D < 0.7). Pipes larger than 10-inches should have a d/D < 1.0. A profile indicating model results under buildout conditions without the development are indicated in Figure 2. Model results indicating d/D performance for each pipe segment for all scenarios is included in Appendix B. As indicated in Figure 2 and Appendix C, the model predicts that all pipe segments would have d/D < 1.

Based on these results, the findings indicate that there is adequate capacity in the existing sewers downstream of the proposed development.

The 12-inch sewer gravity main that would connect to the existing sewer main is proposed to connect at the crown of the existing pipe. There are no concerns with connection at the crown of the existing pipe versus the invert.

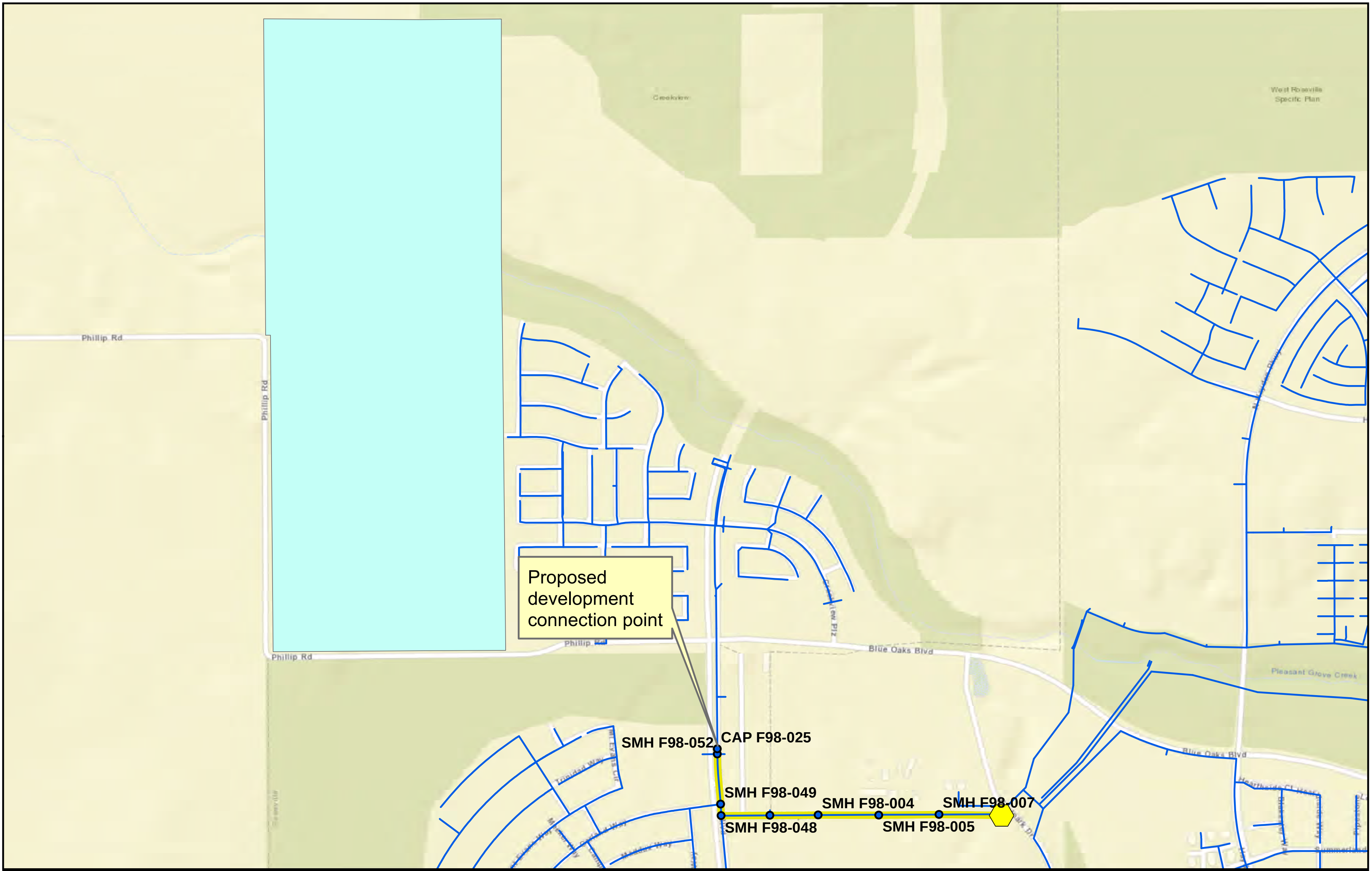


Figure 1
Proposed Development Location and Downstream Sewers

Legend

● Manhole downstream of development

⬢ Pleasant Grove WWTP

— Sewer line

▬ Sewer downstream of development

▨ Proposed development

N

0 500 1,000 1,500 Feet

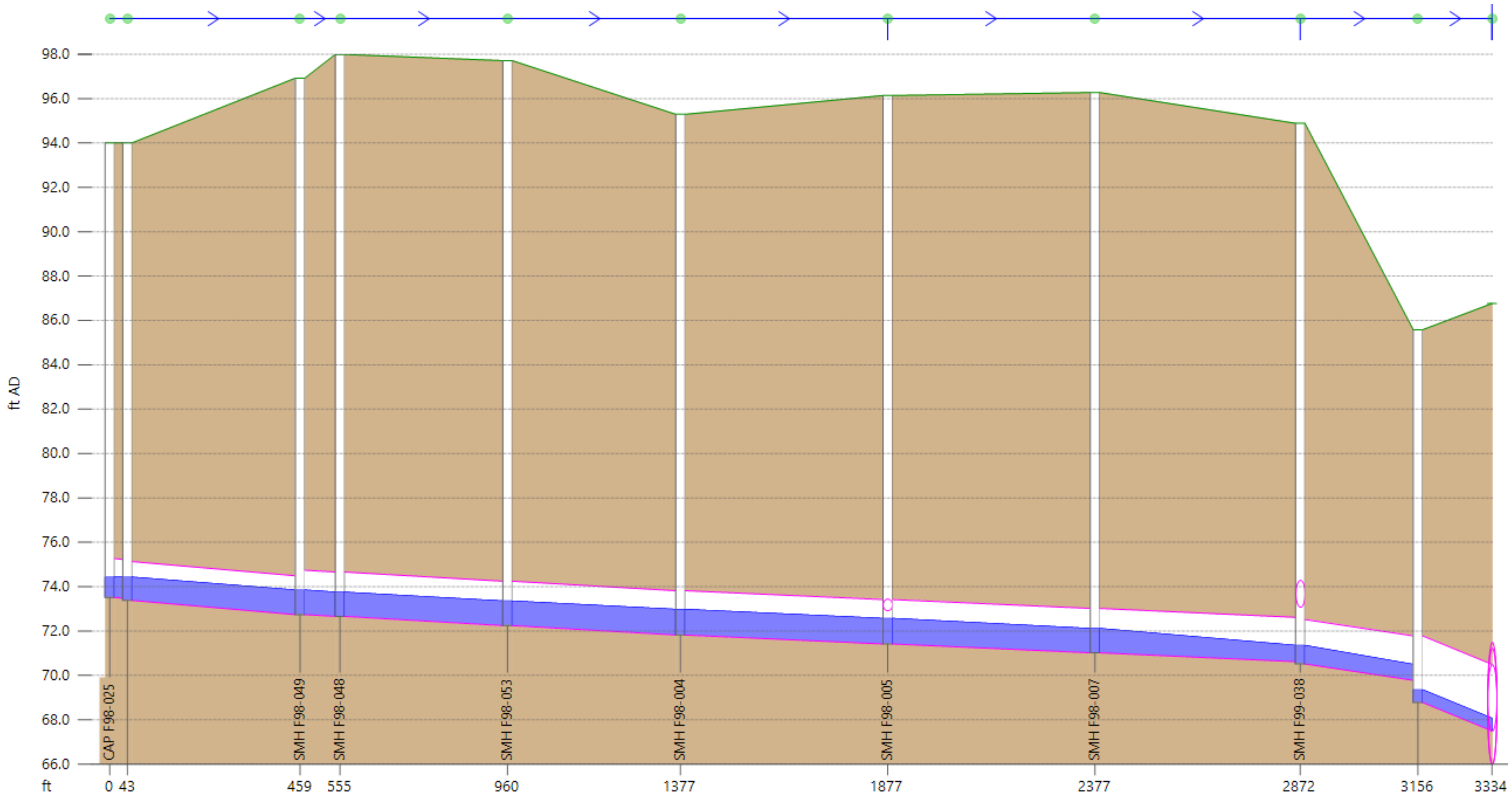
WOODARD & CURRAN

Project #: 0012092.00
Map Created: September 2021

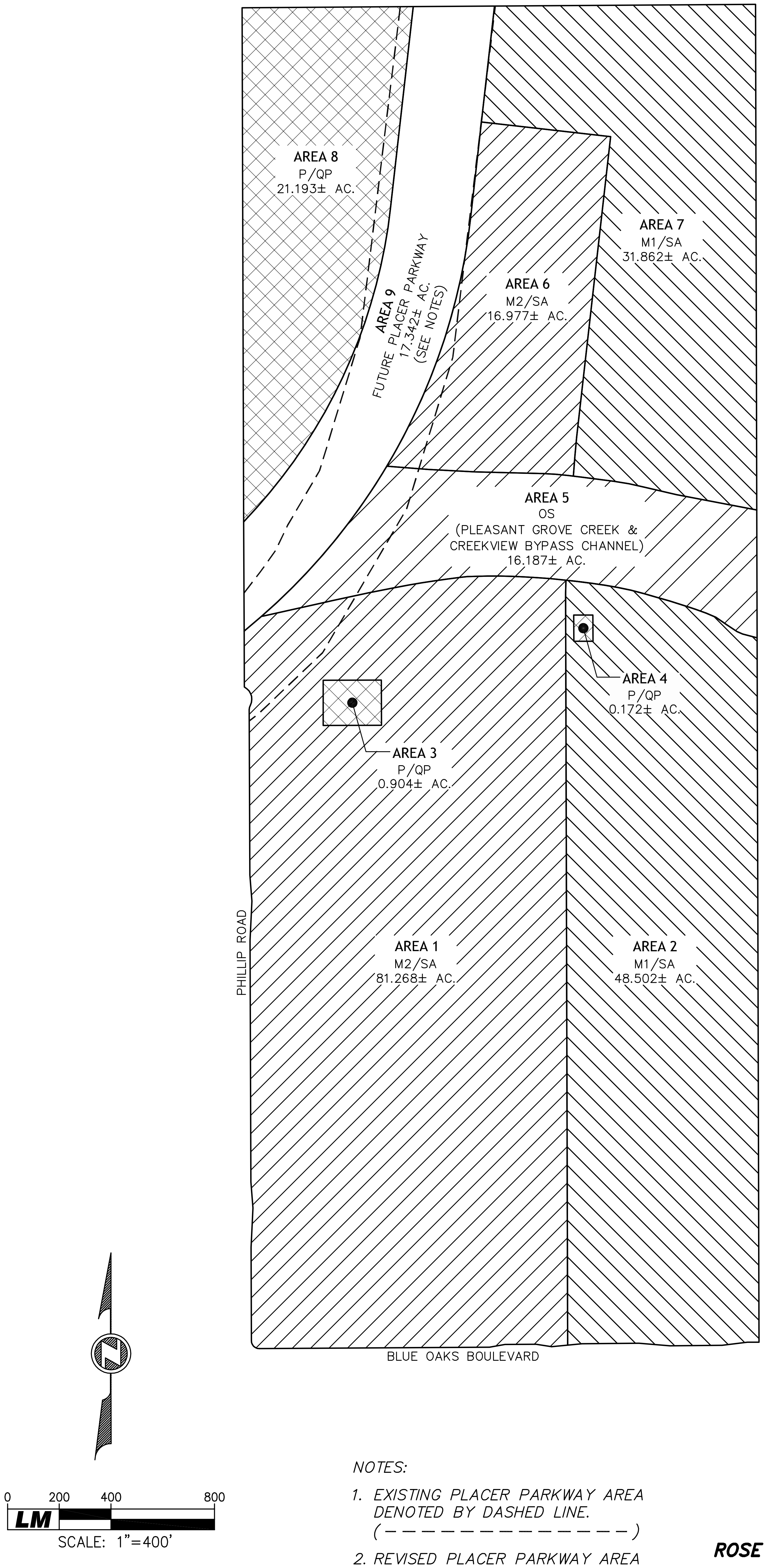
Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

Figure Exported: 9/23/2021 By: nbarreralopez Using: \\woodardcurran.net\shared\Projects\0012092.00 Panattoni Dev Co Roseville Industrial Park\wip\GIS\MXDs\Figure1_Project_Area.mxd

Figure 2 –Hydraulic Profile (Downstream portion from manhole CAP F98-025 to Pleasant Grove WWTP)



APPENDIX A – PROPOSED LAND USE MAP



NOTES:

1. *EXISTING PLACER PARKWAY AREA DENOTED BY DASHED LINE. (— — — — — — — — — — — — — — —)*
2. *REVISED PLACER PARKWAY AREA (BY AKT) USED FOR CALCULATING HIGHEST POSSIBLE UTILITY DEMANDS.*

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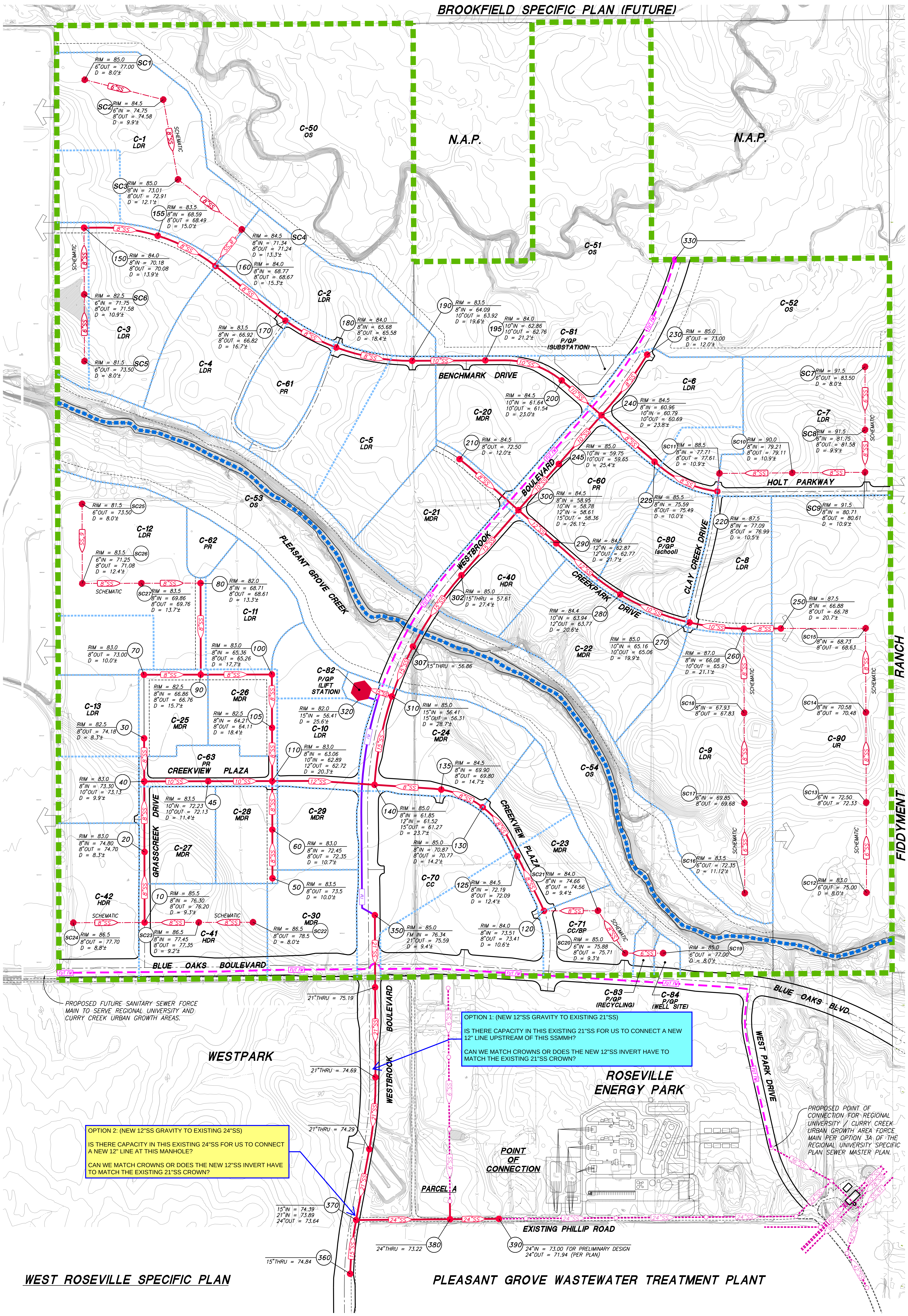
LAND USE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY,
CALIFORNIA
SHEET 1 OF 1 OCTOBER 28, 2021

X:\Land Projects\4042–60–2\dwg\4042–60–2_EXH_Land Use.dwg

APPENDIX B – SEWER FACILITY MAP



OPTION 1: (NEW 12"SS GRAVITY TO EXISTING 21"SS)

IS THERE CAPACITY IN THIS EXISTING 21"SS FOR US TO CONNECT A NEW 12" LINE UPSTREAM OF THIS SSMMH?

CAN WE MATCH CROWNS OR DOES THE NEW 12"SS INVERT HAVE TO MATCH THE EXISTING 21"SS CROWN?

OPTION 2: (NEW 12"SS GRAVITY TO EXISTING 24"SS)

IS THERE CAPACITY IN THIS EXISTING 24"SS FOR US TO CONNECT A NEW 12" LINE AT THIS MANHOLE?

CAN WE MATCH CROWNS OR DOES THE NEW 12"SS INVERT HAVE TO MATCH THE EXISTING 21"SS CROWN?

LEGEND

🟩	MAJOR SHED BOUNDARY
▬	MAJOR SHED LINE
┅	MINOR SHED LINE
FM	SEWER FORCE MAIN
SS	SEWER TRUNK LINE
FUT FM	FUTURE SEWER FORCE MAIN
EX.SS	EXISTING SEWER LINE
8"SS	SCHEMATIC SEWER LINE
FD-10 LDR	PARCEL ID AND LAND USE DESIGNATION
●	NODE POINT

250
RIM = 85.5
8"IN = 100.87
8"OUT = 100.77
NODE NUMBER

TABLE 1 - PIPELINE CAPACITY SUMMARY

PIPE DIAMETER	MINIMUM SLOPE	0.7 FULL mgd	1.0 FULL mgd
6"	0.005	0.21	0.25
8"	0.0035	0.38	0.46
10"	0.0025	0.59	0.70
12"	0.002	0.86	1.02
15"	0.0015	1.35	1.61
18"	0.0012	1.96	2.35
21"	0.001	2.71	3.23
24"	0.0008	3.46	4.13

▨ = USED FOR PRELIMINARY DESIGN

NOTES:

1. COVER FROM TOP OF PIPE TO FLOW LINE OF CREEK CROSSINGS IS 3.0' MIN.
2. PIPES 15" AND LARGER, AND FORCE MAINS, HAVE BEEN SIZED BASED ON HYDRAULIC MODELING.
3. RIM GRADES ARE BASED ON A PRELIMINARY CONCEPTUAL GRADING PLAN FOR THE CREEKVIEW SPECIFIC PLAN AREA AND ARE SUBJECT TO CHANGE DURING THE IMPROVEMENT PLAN DESIGN AND APPROVAL PROCESS.
4. PIPE INVERTS HAVE BEEN CALCULATED BASED ON MINIMUM SLOPES TO MAXIMIZE THE AREA WHICH CAN BE SERVED BY GRAVITY FLOW AND TO MAXIMIZE THE SEPARATION BETWEEN THE TOP OF PIPE AND SWALE FLOWLINES AT CREEK CROSSINGS.

   PIPE INVERTS ARE SUBJECT TO CHANGE DURING THE IMPROVEMENT PLAN DESIGN AND APPROVAL PROCESS. PIPE INVERTS MAY BE RAISED TO REDUCE PIPE DEPTHS. PROVIDED WASTEWATER SHEDS ARE NOT AFFECTED AND GRADE SEPARATIONS ARE MAINTAINED AT CREEK CROSSINGS.
5. MINOR WASTEWATER SHED BOUNDARY ADJUSTMENTS MAY BE NECESSARY DURING FINAL UTILITY AND GRADING DESIGN, SUBJECT TO THE REVIEW AND APPROVAL OF THE CITY OF ROSEVILLE.
6. THE GRAVITY SEWER PIPE SHOWN CROSSING PLEASANT GROVE CREEK ON THIS EXHIBIT IS SCHEMATIC AND IS SHOWN SOLELY TO DEPICT THE CROSSING OF THE CREEK BY THE SEWER SYSTEM. DURING FINAL DESIGN, THE SANITARY SEWER ALIGNMENT AT THE CREEK CROSSING WILL BE ESTABLISHED SUBJECT TO THE REVIEW AND APPROVAL OF THE CITY OF ROSEVILLE. THE FINAL PIPE ALIGNMENT, WHICH WILL NOT LIE BENEATH THE ROADWAY / CREEK CROSSING, WILL INSTEAD BE PLACED ADJACENT TO THE ROADWAY CROSSING, EITHER JUST UPSTREAM OR DOWNSTREAM OF THE DRAINAGE STRUCTURE OR BRIDGE AT THE CREEK CROSSING.

NORTH
0 100 200 400
SCALE: 1"=200'

CREEKVIEW SPECIFIC PLAN

PRELIMINARY SANITARY SEWER MANHOLE DATA

CVSP BASE + URBAN RESERVE + BROOKFIELD CONDITION

SCALE: 1"=200'
NOVEMBER 30, 2010

MacKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1552 Eureka Road, Suite 100, Roseville, CA 95661 (916) 773-1189

EXHIBIT 4
SHEET 1 OF 1

APPENDIX C – MODEL RESULTS

Model Results

From MH ID	To MH ID	Pipe Diameter (in)	Pipe Length (ft)	Pipe Slope (%)	Peak Wet Weather Flow (mgd)	Pipe d/D. Buildout + Proposed Development
SMH F98-052	SMH F98-049	21	416.5	0.154	0.57	0.63
SMH F98-049	SMH F98-048	24	96.2	0.083	0.46	0.55
SMH F98-048	SMH F98-053	24	404.3	0.102	0.48	0.55
SMH F98-053	SMH F98-004	24	416.9	0.102	0.48	0.58
SMH F98-004	SMH F98-005	24	500	0.08	0.43	0.58
SMH F98-005	SMH F98-007	24	500	0.08	0.43	0.57
SMH F98-007	SMH F99-038	24	495.1	0.081	0.44	0.55
SMH F99-038	SMH F99-039	24	284	0.261	0.76	0.41
SMH F99-039	SMH F99-016	36	178.6	0.717	1.23	0.19

ROSEVELLE INDUSTRIAL PARK
SPECIFIC PLAN AREA

Water Conservation Plan

@

PHILLIP ROAD
ROSEVILLE, CALIFORNIA
(PLANNING APPLICATION 21-0193)

March 7, 2022

Panattoni Development Company, Inc.
8775 Folsom Boulevard, Suite 201
Sacramento, CA 95826
(916) 340-2424

Prepared By:

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 · PHONE: (530) 662-1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662-4602

Table of Contents

Tables

Exhibits:

I. INTRODUCTION

The Roseville Industrial Park Specific Plan (Proposed Project) Area Water Conservation Plan (WC Plan) has been prepared at the request of Panattoni Development Company, Inc. (Panattoni) to meet the City of Roseville's (City) requirements and in support of the RIPSP process.

This Plan identifies baseline water usage, water conservation methods, and estimated water demand reductions. This WC Plan has been developed in conformance with the City of Roseville's Water Efficient Landscape Ordinance (WELO) as a minimum.

I.A. PROJECT VICINITY:

The Proposed Project Area is located in the northwest edge for the City of Roseville as shown on **Exhibit 1 – Project Location**. Pleasant Grove Creek and the Pleasant Grove Creek Bypass Channel dissect the Specific Plan Area.

The southern portion of the Specific Plan Area will be the first area to be constructed. It is bounded by the extension of Blue Oaks Boulevard to the south, Phillip Road to the west, the Pleasant Grove Creek Bypass Channel to the north, and the Creekview Subdivision to the east.

The northern portion of the Specific Plan Area will be constructed after the southern portion. It is bounded by the Pleasant Grove Creek to the south, the future Placer Parkway to the west, the Amoruso Specific Plan to the north, and the Creekview subdivision to the east.

I.B. PRE-DEVELOPMENT CONDITIONS:

The Proposed Project site is an undeveloped agricultural parcel that was originally planted during the 1950's, was maintained in rice production through the 1990's and has been planted in irrigated crops until the present.

The Pleasant Grove Bypass Channel was constructed south of Pleasant Grove Creek during the summer of 2019 to augment flood mitigation/control in this area.

A 10-foot to 15-foot escarpment runs in a southeasterly direction from the Phillip Road entrance of the property's southern portion of the site to its eastern boundary, demarcating an elevation change between the southern and norther portions of the southern portion of the site.

The portion of the property north of Pleasant Grove Creek is also currently active cultivation and irrigated with water from a long-established irrigation canal along the northern boundary.

I.C. PROPOSED PROJECT AREA DEVELOPMENT OPPORTUNITIES & CONSTRAINTS:

The Proposed Project Area Land Use Plan is influenced by several factors, including the physical setting, land use, circulation considerations, and public policies. Two significant aspects that influence the development of the Land Use Plan are described below and depicted on **Exhibit 2 – Land Use Plan.**

- Placer Parkway

  The proposed Placer Parkway will bisect the northerly portion of the Proposed Project Area. Due to the limited area and difficulty with getting utility and roadways across Placer Parkway, the northwesterly portion of the site will remain open space.

- Pleasant Grove Creek and Creekview Bypass Channel

  The existing Pleasant Grove Creek and newly constructed Pleasant Grove Creek Bypass Channel dived the Proposed Project Area. The area south of these two features will be constructed first. A bridge will be needed in the future to access the area to the north when it is developed.

II. BASELINE WATER USAGE

Laugenour and Meikle (LM) is preparing the Potable Water Master Plan and the Recycled Water Master Plan for the Proposed Project. The water demands estimated for the project include both the potable and recycled water demands. The total water demands within the Proposed Project Area have been calculated utilizing the City's demand factors as shown in the following **Table 1**. **Land Use Water Demands**:

TABLE 1. LAND USE WATER DEMANDS

General Plan Land Use	Unit Demand Factor	Acres (acres)	Demand (ac-ft/year)	Irrigated Surface Area Factor(1)	Irrigated Annual Demand (ac-ft/year)(2)
Light Industrial (M1)	2598 gpd/acre	80.36	233.9	0.3	87.3
Industrial (M2)	2562 gpd/acre	98.25	282.0	0.3	106.7
Public/Quasi-Public (Sewer Lift Station/Drainage)	1780 gpd/acre	1.07	2.1	0.5	1.2
Public/Quasi-Public (NW Parcel)	-	21.19	-		
TOTAL		**200.87**	**518.0**		**195.2**
TOTAL + 2% System Losses			**528.4**		**199.1**

(1)Irrigated Surface Area Factor is consistent the WRSP Recycled Water Study (May 2003)

(2)Irrigated Annual demand = Acres * Irrigated Surface Area Factor *3.62 ft

III. METHODS FOR REDUCING WATER CONSUMPTION

Many water conservation methods are used as part of this proposed project. There are many conservation measures and equipment that are already required, i.e. low flow appliances. Below is a discussion of additional methods to reduce water demand for irrigation.

Irrigation accounts for all of the recycled water demand for the Roseville Industrial Park. The irrigation demand for the industrial land use is shown in **Table 1. Land Use Water Demands**. The irrigation demand is taken solely from the recycled water system.

III.A. LIMITING AMOUNT OF TURF:

The largest demand for irrigation is turf. Turf areas will not be used and low water plants will replace them. The low water plants use approximately 30% as much water as turf does. Therefore, a significant reduction in irrigation will be expected. The irrigation system will be entirely a drip system. The project has progressed to the point that the Landscape designer has produced a preliminary irrigation layout. The design shall be entirely drip or other low flow methods, no sprinklers.

III.B. SMART IRRIGATION CONTROLLERS:

The smart irrigation controllers will control flow rate of each zone and determine when irrigation times are needed. The irrigation schedule and application rates will change based on weather and time of the year. The controllers will also limit the flow for each zone to 20 gpm.

IV. SUMMARY

The total estimated volume of water conservation is shown in **Table 2. Irrigation Conservation** which details estimate of water conservation.

TABLE 2. IRRIGATION CONSERVATION

General Plan Land Use	Total Irrigation Demand (AC-FT/YR)(1)	Recycled Water Savings (AC-FT/YR)
Light Industrial	32.8	54.5
Industrial	32.8	73.9
TOTAL	**65.6**	**128.4**

(1)Total Irrigation Demand does not include Public/Quasi Public Land Use.

TABLE 3. PERCENT REDUCTION IN WATER DEMAND

Total Water Demand (includes 2%)	Water Conservation Reduction	Percent Water Demand Reduction
528.4	128.4	24.3%

Based off these conservation measures, a savings of 20.2% is expected, as shown in **Table 3. Precent Reduction in Water Demand**.

EXHIBITS

VICINITY

SCALE: 1"=1,500'

EXHIBIT 1
PROJECT LOCATION
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE,
PLACER COUNTY, CALIFORNIA
SHEET 1 OF 1 NOVEMBER 19, 2021

LM LAUGENOUR AND MEIKLE
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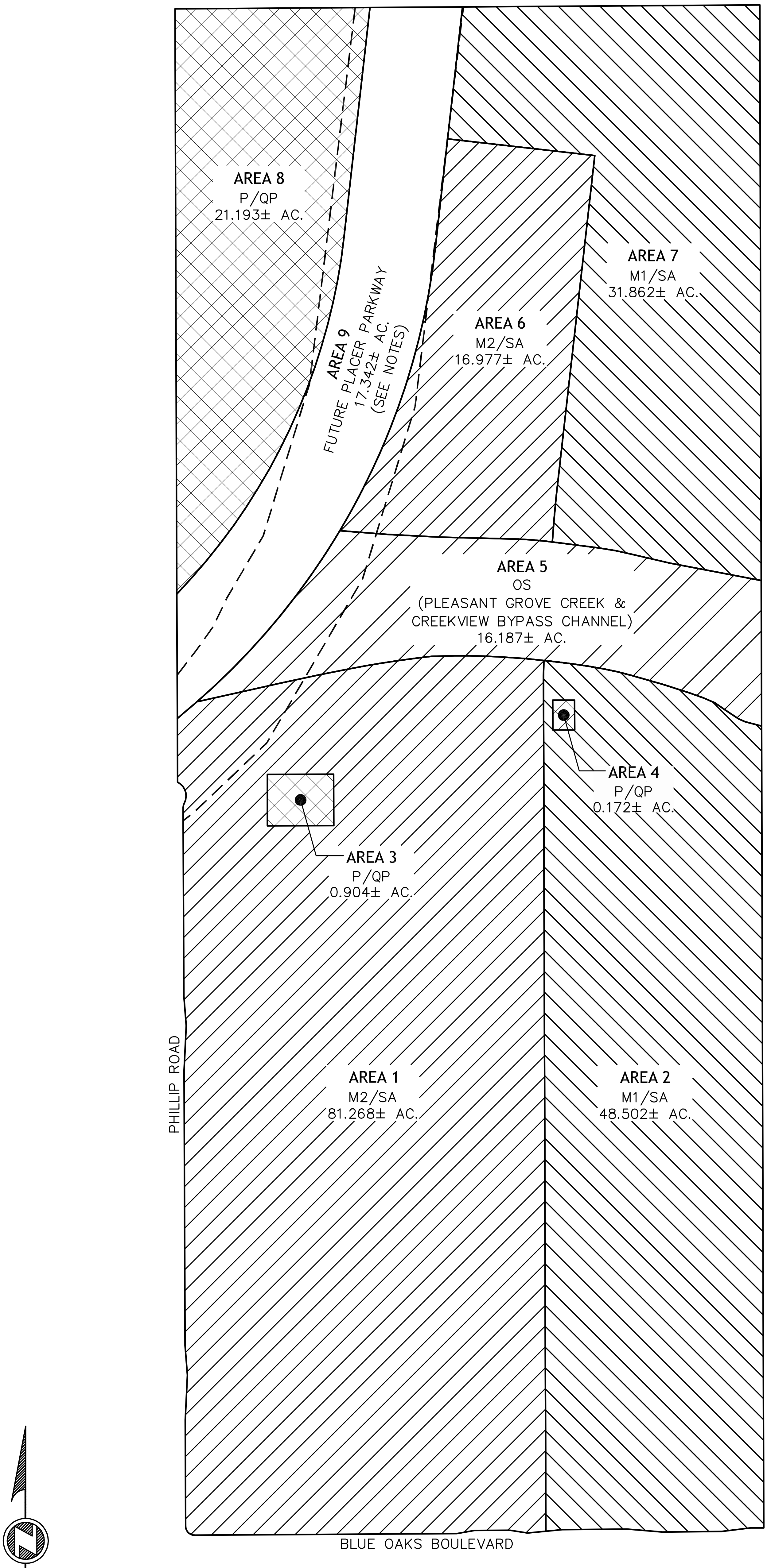
X:\Land Projects\4042-60-2\dwg\4042-60-2_EXH01-Project Location



0 200 400 800

LM

SCALE: 1"=400'

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NOTES:

1. *EXISTING PLACER PARKWAY AREA DENOTED BY DASHED LINE. (– – – – – – – – – – – – – – –)*
2. *REVISED PLACER PARKWAY AREA (BY AKT) USED FOR CALCULATING HIGHEST POSSIBLE UTILITY DEMANDS.*

EXHIBIT 2
LAND USE PLAN
FOR
ROSEVILLE INDUSTRIAL PARK

CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA
SHEET 1 OF 1 OCTOBER 28, 2021

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