PHILLIP ROAD SITE
WASTEWATER MASTER PLAN

6382 PHILLIP ROAD
ROSEVILLE, CALIFORNIA
(PLANNING APPLICATION 24-1010)

January 22, 2026

Panattoni Development Company, Inc.
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Prepared By:

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I. INTRODUCTION

The Phillip Road Site (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 Phillip Road Site environmental review process.

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 VICINITY:

The Proposed Project is in the northwest portion of the City of Roseville as shown on **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 Proposed Project will advance in multiple phases. It is expected to be completed in six phases. The first four phases are intended to be single family residences, the fifth phase is higher density residential, and the final stage is an Innovation Center.

The first and second phases will be in the easterly half of the project site located south of the Pleasant Grove Bypass Channel. The first phase will include the northerly half of this area and include the main road through the center of the project site, stopping at the southerly boundary of the Bypass Channel.

The third and fourth phases are located to the north of Pleasant Grove Bypass Channel. The third phase will include construction of a bridge crossing the channel.

The fifth phase will be high density residential, located along Blue Oaks Boulevard on the easterly half of the project site.

The final phase will include the Innovation Center located on the westerly portion of the site, south of the Pleasant Grove Bypass Channel.

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.

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 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 Proposed Project are described below and depicted on **Exhibit 2 – Tentative Map**.

- PLACER PARKWAY

  The proposed Placer Parkway will bisect the northerly portion of the Proposed Project.

- 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. 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 (LI), Commercial (CC), Low Density Residential (LDR), High Density Residential (HDR), and Public/Quasi Public (P/QP) 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 land uses are shown on **Exhibit 2 – Tentative Map**.

Each land use generates wastewater flow based on unit factors as designated by the City of Roseville. 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**. A summary of the proposed land use acreages that generate wastewater flows is shown in **Table 2 – Wastewater Generation by Land Use**.

The City of Roseville also has a project called the City of Roseville Environmental Utilities Operations Facility (EU Ops) that is located west of the Phillip Road Site that is planning on connecting to the Phillip Road Site sewer system. A Technical Memorandum was prepared by Jacobs, providing the wastewater flow from EU Ops, see **Appendix C –Technical Memorandum – Sanitary Sewer System Recommendations for City of Roseville Environmental Utilities Operations Facility.** The EU Ops wastewater flows are accounted for in the sizing of the sewer mains and sewer lift station within the Phillip Road Site project.

Table 1
Phillip Road Site
Average Dry Weather Unit Flow Factors

Land Use Designation	Land Use Abbreviation	Flow Rate [1]
Commercial (Community Commercial)	CC	850 gpd/acre
Heavy Industrial	IND[3]	850 gpd/acre
Light Industrial	LI	850 gpd/acre
Mixed Use	MU[3]	2,300 gpd/acre
Public/Quasi-Public	P/QP	660 gpd/acre
Public/Quasi-Public (Schools)	P/QP[3]	170 gpd/acre
Residential 1 DU (Low Density Residential)	LDR	190 gpd/DU
Residential 2 DU (Medium Density Residential)	MDR[3]	190 gpd/DU
Residential Multiple DU (High Density Residential[2])	HDR	2,040 gpd/acre or 130 gpd/DU
Open Space	OS	0 gpd/acre
Parks < 10 Acres	PR	0 gpd/acre
Parks > 10 Acres	PR[3]	10 gpd/acre
Vacant	-	0 gpd/acre

(1) Average Dry Weather Flow Factors per City of Roseville Design and Construction Standards, Section 9 (Sanitary Sewer Design), dated January 2025.

(2) High Density Residential is 2,040 gpd/acre or 130 gpd/DU, whichever factor is greater.

(3) Land uses that are not applicable to the project site.

Table 2
Phillip Road Site
Wastewater Generation by Land Use

Land Use	Land Use Abbreviation	Total Area (Acres)	ADWF (MGD)
Light Industrial	LI	56.144	0.0477
Community Commercial	CC	7.913	0.0067
Low Density Residential	LDR	95.589 or 529 units(2)	0.1005
High Density Residential	HDR	5.860 or 135 units(2)	0.0176
Park	PR	4.914	-
Public/Quasi-Public (Developable Area)	P/QP	1.429(3)	0.0009
Wastewater Generation by Land Use Subtotal:			0.1734
Discharge from Data Center			0.1600
Phillip Road Site Total			**0.3334**
EU Ops			**0.0525**
Total Flow from Site			**0.3859**

(1) Includes 0.160 MGD of discharge from a potential 40MW Data Center.
(2) The wastewater generated is based on the number of dwelling units as it is greater than that calculated by area.
(3) Consists of Public/Quasi-Public area designated for Roseville Electric (1.033 acres) and an area near the proposed bridge for a Sewer Lift Station (0.396 acres).

Parcel LL-5, as shown in **Exhibit 2 – Tentative Map** is assumed to contain a potential 40 MW Data Center which adds approximately 480,000 gpd of peak demand flow for a cooling system. It is anticipated that a third of this flow for the cooling system will be discharged to the wastewater system with the remaining evaporated during the cooling process of the Data Center.

The ADWF from the Proposed Project plus the ADWF from the EU Ops Center combined is 0.386 MGD. The City has verified that the combined ADWF does not cause the sewer main downstream of the connection point to exceed 70% of full depth, crown to crown.

III. WASTEWATER SYSTEM INFRASTRUCTURE

The wastewater system is designed to serve the land uses as shown on **Exhibit 2 – Tentative Map**. 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.**

Industrial users are responsible for design, installation, operation, and maintenance of all pretreatment equipment necessary to comply with applicable standards for industrial waste discharge.

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 is 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.

Wastewater flows from EU OPS are planned to be pumped from a lift station on their site through a dual sewer force main along Phillip Road. It will discharge to a sewer manhole along Phillip Road (on the west side of the Innovation Center) and gravity flow across the Innovation Center conveying to the Phillip Road Site Sewer Lift Station. See Appendix C **– Technical Memorandum – Sanitary Sewer System Recommendations for City of Roseville Environmental Utilities Operations Facility** for detailed information about contributing 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 3 – Wastewater Master Plan.**

IV. RECYCLED WATER

A Recycled Water Master Plan has been prepared regarding the project's use of Recycled Water to serve the project.

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. PIPE 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.

V.C. SEWER PUMP STATION AND FORCE MAIN CRITERIA

The proposed sewer pump station and force main shall comply with Section 9-13 of the City of Roseville Design 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 from EU Ops and the Proposed Project land uses.
- Industrial users are responsible for design, installation, operation, and maintenance of all pretreatment equipment necessary to comply with applicable standards for industrial waste discharge.
- Gravity lines throughout the sanitary system are between 6 feet to 30 feet deep, with sewer laterals not exceeding 15 feet in depth.
- 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.
- The City has confirmed that the City's existing wastewater system has capacity for the Proposed Project in the existing 21-inch sewer main in Westbrook Boulevard. The connection to this pipe is also intended to be crown to crown.

EXHIBITS

VICINITY

0 750 1500 3000

LM

SCALE: 1"=1,500'

EXHIBIT 1
PROJECT LOCATION PLAN
FOR
PHILLIP ROAD SITE

CITY OF ROSEVILLE,
PLACER COUNTY, CALIFORNIA
SHEET 1 OF 1 SEPTEMBER 26, 2025

LM LAUGENOUR AND MEIKLE
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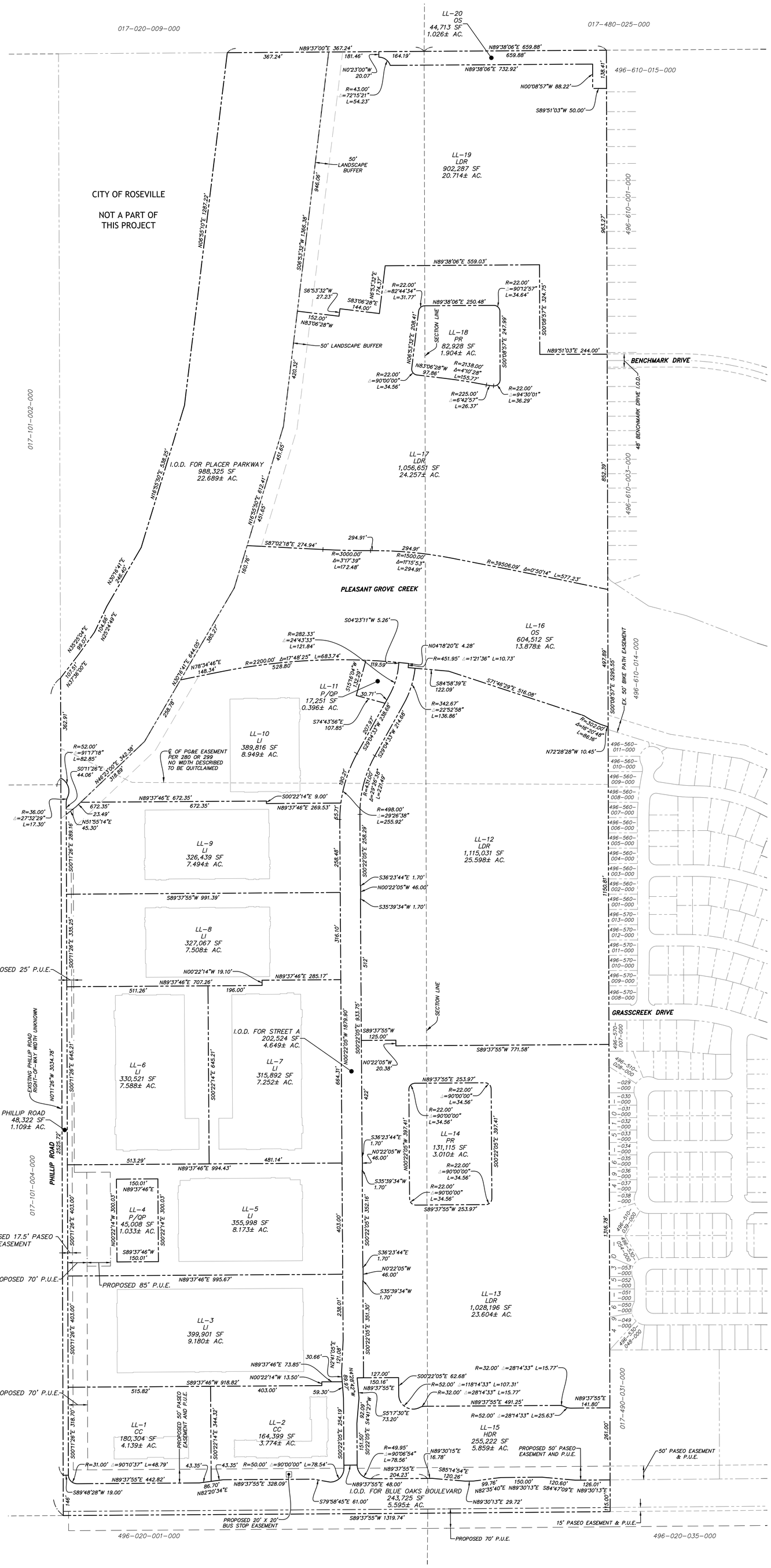
X:\Land Projects\4042-60-4\dwg\4042-60-4_EXH01-Project Location



LOT	PROPOSED USE	GENERAL PLAN DESIGNATION	ZONINING	GROSS ACRES±	DWELLING UNITS	DENSITY
LL-1	BUILDING A	CC	C-PD	4.139	–	–
LL-2	BUILDING B	CC	C-PD	3.774	–	–
LL-3	BUILDING C	LI	ITP-PD	9.180	–	–
LL-4	ROSEVILLE ELECTRIC SUBSTATION	P/QP	P/QP	1.033	–	–
LL-5	BUILDING D	LI	ITP-PD	8.173	–	–
LL-6	BUILDING E	LI	ITP-PD	7.588	–	–
LL-7	BUILDING F	LI	ITP-PD	7.252	–	–
LL-8	BUILDING G	LI	ITP-PD	7.508	–	–
LL-9	BUILDING H	LI	ITP-PD	7.494	–	–
LL-10	BUILDING I	LI	ITP-PD	8.949	–	–
LL-11	SANITARY SEWER LIFT STATION	P/QP	P/QP	0.396	–	–
LL-12	VILLAGE 1	LDR	RS/DS	25.598	162	6.33 DU/AC.
LL-13	VILLAGE 2	LDR	RS/DS	23.604	156	6.61 DU/AC.
LL-14	PARK (SOUTH)	PR	PR	3.010	–	–
LL-15	VILLAGE 5	HDR	R3	5.859	135	23.04 DU/AC.
LL-16	PLEASANT GROVE CREEK AND BYPASS CHANNEL	OS	OS	13.878	–	–
LL-17	VILLAGE 3	LDR	RS/DS	24.257	105	4.33 DU/AC.
LL-18	PARK (NORTH)	PR	PR	1.904	–	–
LL-19	VILLAGE 4	LDR	RS/DS	20.714	106	5.12 DU/AC.
LL-20	BIKE TRAIL	OS	OS	1.026	–	–
BLUE OAKS BOULEVARD				5.595	–	–
PHILLIP ROAD				1.109	–	–
STREET A				4.649	–	–
PLACER PARKWAY				22.689	–	–
TOTAL				219.38	664	

NOTE:
SEE SHEET 4 FOR ADDITIONAL UTILITY EASEMENTS.

REGISTERED PROFESSIONAL ENGINEER
BRYAN P. BOYNTON
No. 41804
CIVIL
STATE OF CALIFORNIA

LARGE LOT SUBDIVISION

TENTATIVE MAP

FOR

PHILLIP ROAD SITE

LOCATED IN A PORTION OF THE WEST HALF OF THE WEST HALF OF THE WEST HALF OF SECTION 14, AND A PORTION OF THE EAST HALF OF THE EAST HALF OF THE EAST HALF OF SECTION 15, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN, CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA.

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LEGEND

- TRIBUTARY AREA
- PHILLIP ROAD SITE DUAL SEWER FORCE MAIN
- CITY OF ROSEVILLE EU OPS SEWER FORCE MAIN
- 8" SEWER TRUNK LINE
- 10" SEWER TRUNK LINE
- 12" SEWER TRUNK LINE
- 15" SEWER TRUNK LINE
- 18" SEWER TRUNK LINE
- EXISTING SEWER LINE
- PUBLIC SEWER EASEMENT
- 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)

001* SHED INCLUDES DISCHARGE FROM DATA CENTER

Qp=0.000* PEAK WET WEATHER FLOW (MGD) INCLUDES DISCAHRGE FROM DATA CENTER

EMERGENCY STORAGE VAULT FOR PHILLIP ROAD SITE
REQUIRED STORAGE VOLUME FOR 4 HR = 215,367 GAL

EMERGENCY STORAGE VAULT
(72'X38'X13' DEEP**) = 225,118 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 = 225,118 GAL > 215,367 GAL

CITY OF ROSEVILLE

NOT A PART OF THIS PROJECT

FUTURE PLACER PARKWAY

LL-20
OS
1.026± AC.

PARK 2
PR
1.904± AC.

RES 6
LDR
44.971± AC.
211 DU

BENCHMARK DRIVE

140
Q_A=0.0401
Q_F=0.0802
P_F=3.31
Q_P=0.265

SSMH17
SS22

PLEASANT GROVE CREEK & CREEKVIEW BYPASS CHANNEL

150*
Q_A=0.2259
Q_F=0.4519
P_F=2.51
Q_P=1.292*

SS23
SSPS
P/QP
0.396± AC.
SSMH18
SS21

SFM FROM CITY OF ROSEVILLE EU OPS

BLDG I
LI
8.949± AC.

130
Q_A=0.0076
Q_F=0.0152
P_F=3.58
Q_P=0.054

SS20
SSMH15
SSMH16
15'

135*
Q_A=0.1856
Q_F=0.3712
P_F=2.59
Q_P=1.122*

SS19

110
Q_A=0.0064
Q_F=0.127
P_F=3.59
Q_P=0.046

BLDG H
LI
7.494± AC.

SSFM TRANSITION SSMH02
SSMH10
SS15
SSMH11
30'
SSMH12
SS16
SS17

125*
Q_A=0.1780
Q_F=0.3560
P_F=2.61
Q_P=1.090*

120
Q_A=0.0401
Q_F=0.0802
P_F=3.31
Q_P=0.265

SS18
SSMH14
SSMH13
SS13

090
Q_A=0.0525
Q_F=0.1050
P_F=3.21
Q_P=0.338

095
Q_A=0.0589
Q_F=0.1179
P_F=3.17
Q_P=0.374

100
Q_A=0.0064
Q_F=0.0128
P_F=3.59
Q_P=0.046

115
Q_A=0.0717
Q_F=0.1434
P_F=3.09
Q_P=0.442

BLDG G
LI
7.508± AC.

075*
Q_A=0.0662
Q_F=0.1324
P_F=3.12
Q_P=0.573*

SSMH09
SS14
20'

RES 3
LDR
34.248± AC.
211 DU

BLDG F
LI
7.252± AC.

SS12

BLDG E
LI
7.588± AC.

070
Q_A=0.0062
Q_F=0.0123
P_F=3.59
Q_P=0.044

080
Q_A=0.0064
Q_F=0.0129
P_F=3.59
Q_P=0.046

060*
Q_A=0.0076
Q_F=0.0153
P_F=3.58
Q_P=0.215*

SS11

065*
Q_A=0.0600
Q_F=0.1201
P_F=3.16
Q_P=0.540*

045
Q_A=0.0055
Q_F=0.0110
P_F=3.60
Q_P=0.040

SS09
SSMH07
SS10
SS08
SSMH06
SSMH08

PARK 1
PR
3.010± AC.

050
Q_A=0.0007
Q_F=0.0014
P_F=3.64
Q_P=.005

ELEC
P/QP
1.033± AC.

055*
Q_A=0.0069
Q_F=0.0139
P_F=3.58
Q_P=0.210*

25'

RES 2
LDR
4.919± AC
29 DU

SS07
SS06
SSMH04
SSMH05

040
Q_A=0.0469
Q_F=0.0938
P_F=3.36
Q_P=0.305

035
Q_A=0.0148
Q_F=0.0296
P_F=3.51
Q_P=0.104

RES 1
LDR
11.451± AC.
78 DU

SS05
SSMH03
025
Q_A=0.0176
Q_F=0.0351
P_F=3.49
Q_P=0.123

BLDG C
LI
9.180± AC.

015
Q_A=0.0078
Q_F=0.0156
P_F=3.58
Q_P=0.056

020
Q_A=0.0145
Q_F=0.0291
P_F=3.52
Q_P=0.102

SS03
SS04
SS02
SSMH02
SS01
20'
25'

030
Q_A=0.0321
Q_F=0.0642
P_F=3.37
Q_P=0.216

RES-MULTI
HDR
5.860± AC.
135 DU

010
Q_A=0.0067
Q_F=0.0135
P_F=3.59
Q_P=0.048

BLDG A
CC
4.139± AC.

BLDG B
CC
3.774± AC.

SSMH01

BLUE OAKS BOULEVARD

PHILLIP ROAD

GRASSCREEK DRIVE

CLOUD DANCE DRIVE

WESTBROOK BOULEVARD

EX. 21" SS

SEE LEFT

SEE RIGHT

SSFM TRANSITION SSMH01

EX. 21" SS - WESTBROOK BOULEVARD

847±'

0 75 150 300
SCALE: 1"=150'

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PHILLIP ROAD SITE WASTEWATER MASTER PLAN

SEPTEMBER 26, 2025

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SEE SHEET 13

SEE SHEET 9

SEE SHEET 11

LOT 319 83.91 PAD
LOT 320 84.35 PAD
LOT 321 84.62 PAD
LOT 322 84.86 PAD
LOT 323 85.08 PAD
LOT 324 85.30 PAD
LOT 325 85.52 PAD
LOT 326 85.73 PAD
LOT 327 86.70 PAD
LOT 328 87.03 PAD
LOT 329 87.00 PAD
LOT 330 86.76 PAD
LOT 331 86.43 PAD

BOLLARDS TO BE INSTALLED TO LIMIT ACCESS

POND OVERFLOW

PLEASANT GROVE CREEK

PLEASANT GROVE CREEK BYPASS CHANNEL

STREET A

STREET S

STREET R

STREET Q

STREET B

STREET D

STREET F

ALDERWOOD PLACE

TREATED STORM WATER DISCHARGE POINT

FUTURE BRIDGE OVER CREEK

10' BIKE TRAIL & MAINTENANCE VEHICLE PATH

10' BIKE TRAIL & MAINTENANCE VEHICLE PATH UNDER FUTURE BRIDGE SHALL BE ABOVE THE 2-YEAR WATER SURFACE ELEVATION

TREATED STORM DRAIN DISCHARGE POINT

HATCHING DENOTES PUBLIC UTILITY EASEMENT

CONNECT PROPOSED BIKE TRAIL & MAINTENANCE VEHICLE PATH TO EXISTING PAVED PATH

50.00' BIKE PATH EASEMENT (EE MAPS 97)

SEWER LIFT STATION

MIN. 15' WIDE MAINTENANCE ACCESS TO BIORETENTION BASIN WITH 4:1 MAX. SLOPE

15.0' SANITARY SEWER EASEMENT

LOT 20 82.25 PAD
LOT 21 81.60 PAD
LOT 22 81.16 PAD
LOT 23 80.98 PAD
LOT 24 80.81 PAD
LOT 25 80.82 PAD
LOT 26 80.94 PAD
LOT 27 80.81 PAD
LOT 28 80.61 PAD
LOT 29 80.54 PAD
LOT 30 80.50 PAD
LOT 31 80.50 PAD
LOT 32 80.50 PAD
LOT 33 80.50 PAD
LOT 34 80.50 PAD
LOT 35 80.53 PAD
LOT 36 80.53 PAD
LOT 37 80.50 PAD
LOT 18 82.94 PAD
LOT 19 82.75 PAD
LOT 10 82.38 PAD
LOT 11 82.35 PAD
LOT 12 82.11 PAD
LOT 13 81.93 PAD
LOT 14 81.76 PAD
LOT 15 81.58 PAD
LOT 16 81.41 PAD
LOT 17 81.23 PAD
LOT 9 82.25 PAD
LOT 8 82.08 PAD
LOT 7 81.89 PAD
LOT 6 81.96 PAD
LOT 5 82.18 PAD
LOT 4 82.23 PAD
LOT 3
LOT 118 82.56 PAD
LOT 117 82.12 PAD
LOT 116 81.93 PAD
LOT 115 81.76 PAD
LOT 114 81.58 PAD
LOT 113 81.41 PAD
LOT 112 81.31 PAD
LOT 105 82.44 PAD
LOT 106 82.10 PAD
LOT 107 81.91 PAD
LOT 108 81.74 PAD
LOT 109 81.56 PAD
LOT 110 81.39 PAD
LOT 111 81.29 PAD
LOT 119 81.14 PAD
LOT 120 81.08 PAD
LOT 121 81.01 PAD
LOT 122 80.79 PAD
LOT 123 80.79 PAD
LOT 124 81.02 PAD
LOT 125 81.07 PAD
LOT 126
LOT 151 80.72 PAD
LOT 150 80.50 PAD
LOT 149 80.50 PAD
LOT 148 80.50 PAD
LOT 147 80.50 PAD
LOT 146 80.53 PAD
LOT 145 80.38 PAD
LOT 98
LOT 99
LOT 100
LOT 101
LOT 102
LOT 103
LOT 104

LOT 24 PAD ELEV=80.5 (88) PAD ELEV=78.3 (29)
LOT 23 PAD ELEV=80.6 (88) PAD ELEV=78.4 (29)
LOT 22 PAD ELEV=80.8 (88) PAD ELEV=78.6 (29)
LOT 21 PAD ELEV=80.8 (88) PAD ELEV=78.6 (29)
LOT 20 PAD ELEV=80.6 (88) PAD ELEV=78.4 (29)
LOT 19 PAD ELEV=80.5 (88) PAD ELEV=78.3 (29)
LOT 18 PAD ELEV=80.5 (88) PAD ELEV=78.3 (29)

LANDS OF ANTHEM UNITED DOC-2019-0050339-00 CREEKVIEW DEVELOPMENT APN: 017-490-017

PROPERTY LINE

0 20 40 80
SCALE: 1"=40'

LEGEND

GENERAL DIRECTION OF RUNOFF

BIORETENTION

OVERLAND RELEASE PATH

EMERGENCY STORAGE VAULT FOR PHILLIP ROAD SITE
REQUIRED STORAGE VOLUME FOR 4 HR = 215,367 GAL

EMERGENCY STORAGE VAULT
(72'X38'X13' DEEP**) = 225,118 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 = 225,118 GAL > 215,367 GAL

REGISTERED PROFESSIONAL ENGINEER
BRYAN P. BONINO
No. 41804
CIVIL
STATE OF CALIFORNIA

CONCEPTUAL GRADING, DRAINAGE, & UTILITIES PLAN

TENTATIVE MAP
FOR
PHILLIP ROAD SITE

LOCATED IN A PORTION OF THE WEST HALF OF THE WEST HALF OF SECTION 14, AND A PORTION OF THE EAST HALF OF THE EAST HALF OF SECTION 15, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN, CITY OF ROSEVILLE, PLACER COUNTY, 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

SEPTEMBER 26, 2025

X:\Land Projects\4042-60-4\dwg\4042-60-4_TM-206.dwg

APPENDIX A

WASTEWATER FLOWS BY NODE

WASTERWATER FLOWS BY NODE

PHILLIP ROAD SITE- COMPLETE BUILDOUT

Shed #	Contributing Sheds	Upstream Node	Downstream Node	850 GPD/ACRE[a]		660 GPD/ACRE[a]		2040 GPD/ACRE[a]		130 GPD/UNIT[a]		190 GPD/UNIT[a]		Cumulative Q (ADWF)[b] (MGD)	Safety Factor[c]	Factored Flow[d]	Peaking Factor[e]	Design Flow Q (PWWF)[f][h] (MGD)	Pipe Name	Min Pipe Size[i] (in)	Min Pipe Slope[i] (ft/ft)
				Area (Acre)	Q (ADWF)[b] (mgd)	Area (Acre)	Q (ADWF)[b] (mgd)	Area (Acre)	Q (ADWF)[b] (mgd)	UNITS	Q (ADWF)[b] (mgd)	UNITS	Q (ADWF)[b] (mgd)								
SOUTH OF PLEASANT GROVE CREEK																					
010	-	BLDG A & B	SSMH01	7.913	0.0067	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0067	2.0	0.0135	3.59	0.048	-	-	-
-	010	SSMH01	SSMH02	-	-	-	-	-	-	-	-	-	-	0.0067	2.0	0.0135	3.59	0.048	SS01	8	0.0035
015	015	BLDG C	SSMH02	9.180	0.0078	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0078	2.0	0.0156	3.58	0.056	SS02	8	0.0035
020	010-020	SSMH02	SSMH03	-	-	-	-	-	-	-	-	-	-	0.0145	2.0	0.0291	3.52	0.102	SS03	8	0.0035
025	025	RES-MULTI	SSMH03	0.000	0.0000	0	0.0000	2040[g]	0.0120	135[g]	0.0176	0	0.0000	0.0176	2.0	0.0351	3.49	0.123	SS04	8	0.0035
030	010-030	SSMH03	SSMH05	-	-	-	-	-	-	-	-	-	-	0.0321	2.0	0.0642	3.37	0.216	SS05	8	0.0035
035	035	RES 1	SSMH04	0.000	0.0000	0	0.0000	0	0.0000	0	0.0000	78	0.0148	0.0148	2.0	0.0296	3.51	0.104	-	-	-
-	-	SSMH04	SSMH05	-	-	-	-	-	-	-	-	-	-	0.0148	2.0	0.0296	3.51	0.104	SS06	8	0.0035
040	010-040	SSMH05	SSMH08	-	-	-	-	-	-	-	-	-	-	0.0469	2.0	0.0938	3.26	0.305	SS07	10	0.0025
045	045	RES 2	SSMH06	0.000	0.0000	0	0.0000	0	0.0000	0	0.0000	29	0.0055	0.0055	2.0	0.0110	3.60	0.040	-	-	-
-	-	SSMH06	SSMH08	-	-	-	-	-	-	-	-	-	-	0.0055	2.0	0.0110	3.60	0.040	SS08	8	0.0035
050	050	ELEC	SSMH07	0.000	0.0000	1.033	0.0007	0	0.0000	0	0.0000	0	0.0000	0.0007	2.0	0.0014	3.64	0.005	SS09	8	0.0035
-	055	BLDG D	-	8.173	0.0069	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0069	2.0	0.0139	3.58	0.050	-	-	-
-	055	BLDG D	-	DISCHARGE DUE TO ANTICIPATED 0.48 MGD WATER CONSUMPTION OF A 40MW DATA CENTER[h]										-	-	-	-	0.160	-	-	-
055	055	BLDG D	SSMH07	-	-	-	-	-	-	-	-	-	-	0.0069	2.0	0.0139	3.58	0.210	-	-	-
060	055-060	SSMH07	SSMH08	-	-	-	-	-	-	-	-	-	-	0.0076	2.0	0.0153	3.58	0.215	SS10	8	0.0035
065	010-065	SSMH08	SSMH09	-	-	-	-	-	-	-	-	-	-	0.0600	2.0	0.1201	3.16	0.540	SS11	10	0.0025
070	070	BLDG F	SSMH09	7.252	0.0062	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0062	2.0	0.0123	3.59	0.044	SS12	8	0.0035
075	010-075	SSMH09	SSMH14	-	-	-	-	-	-	-	-	-	-	0.0662	2.0	0.1324	3.12	0.573	SS13	10	0.0025
080	080	BLDG E	SSMH11	7.588	0.0064	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0064	2.0	0.0129	3.59	0.046	SS14	8	0.0035
090	090	EU OPS	SSMH10	-	-	-	-	-	-	-	-	-	-	0.0525	2.0	0.1050	3.21	0.338	-	-	-
-	-	SSMH10	SSMH11	-	-	-	-	-	-	-	-	-	-	0.0525	2.0	0.1050	3.21	0.338	SS15	8	0.0035
095	080-095	SSMH11	SSMH12	-	-	-	-	-	-	-	-	-	-	0.0589	2.0	0.1179	3.17	0.374	SS16	10	0.0025
100	100	BLDG G	SSMH12	7.508	0.0064	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0064	2.0	0.0128	3.59	0.046	-	-	-
110	110	BLDG H	SSMH12	7.494	0.0064	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0064	2.0	0.0127	3.59	0.046	-	-	-
115	080-115	SSMH12	SSMH14	-	-	-	-	-	-	-	-	-	-	0.0717	2.0	0.1434	3.09	0.442	SS17	10	0.0025
120	120	RES 3	SSMH13	0.000	0.0000	0	0.0000	0	0.0000	0	0.0000	211	0.0401	0.0401	2.0	0.0802	3.31	0.265	-	-	-
-	120	SSMH13	SSMH14	0.000	0.0000	0	0.0000	0	0.0000	0	0.0000		0.0000	0.0401	2.0	0.0802	3.31	0.265	SS18	8	0.0035
125	010-125	SSMH14	SSMH16	-	-	-	-	-	-	-	-	-	-	0.1780	2.0	0.3560	2.61	1.090	SS19	15	0.0015
130	130	BLDG I	SSMH15	8.949	0.0076	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0.0076	2.0	0.0152	3.58	0.054	-	-	-
-	130	SSMH15	SSMH16	-	-	-	-	-	-	-	-	-	-	0.0076	2.0	0.0152	3.58	0.054	SS20	6	0.0050
135	010-135	SSMH16	SSMH20	-	-	-	-	-	-	-	-	-	-	0.1856	2.0	0.3712	2.59	1.122	SS21	15	0.0015
NORTH OF PLEASANT GROVE CREEK																					
140	140	RES 4-6	SSMH16	0	0.0000	0	0.0000	0	0.0000	0	0.0000	211	0.0401	0.0401	2.0	0.0802	3.31	0.265	SS22	8	0.0035
-	150	SSPS	SSMH19	0	0.0000	0.396	0.0003	0	0.0000	0	0.0000	0	0.0000	0.0003	2.0	0.0005	3.65	0.002	-	-	-
150	010-150	SSMH 19	SSPS	-	-	-	-	-	-	-	-	-	-	0.2259	2.0	0.4519	2.51	1.292	SS23	15	0.0015
AVERAGE DAILY FLOW FROM DATA CENTER														0.1600							
TOTAL														0.3859				1.292	-	-	-

(a) From Table 1 - Average Dry Weather Unit Flow Factors of Section 9-2 of the City of Roseville Design Standards. (January 2025)
(b) ADWF = Average Dry Weather Unit Flow Factors
(c) Saftey Factor is 2.0 from Section 9-3 from the City of Roseville Design Standards. (January 2025)
(d) Factored Flow = Safety Factor x Cumulative ADWF
(e) Peaking Factor from Figure SS-1 of Section 9-3 of the City of Roseville Design Standards. (Janurary 2025)
(f) Design Flow/Peak Wet Weather Factored Flow = Factored Flow x Peaking Factor
(g) High Density Residential is either 2,040 GPD/ACRE or 130 GPD/DU, whichever is greater. For RES-MULTI, the DU provided greater Average Daily Waste Flow
(h) 1/3 of water consumed from the anticipated 40MW data center is assumed to be discharged as waste water. The 0.160 MGD is added to Design Flow for pipe sizing purposes. See blue highlighted table cells for Design Flow for these locations.
(i) Pipe size and slope determined from Table 2 of Section 9-4 from the City of Roseville Design Standards. (January 2025)

APPENDIX B

EMERGENCY STORAGE CALCULATIONS

Lift Station Emergency Storage Calculation

Phillip Road Site - Complete Buildout

ONLY UTILIZING THE ONSITE STORAGE VAULT FOR 4 HRS OF STORAGE

	Values	Notes
Buildout Phase - PWWF Design Flow	1.292 mgd 897 gpm	See Appendix B - Wastewater Flows by Node
Storage Capacity @ PWWF	4 hrs	City of Roseville Design Requirement
Required Storage System Volume @ PWWF	215,367 gal	Wet Well + Vault
Controling Manhole Rim Elevation	78.66 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	
15" Gravity Sewer Invert Elevation	58.56 ft	
Lead Pump "On" Elevation	57.56 ft	
Wet Well Storage Section Height	21.10 ft	Controlling manhole minum Lead Pump On Elevation
Wet Well Capacity	530.30 cf 3,967 gal	Section Height * Wet Well Internal Area
Wet Well Time to Fill	4.42 min 0.07 hrs	

Collection System - Available Storage Capacity in Emergency Storage Vault		
Depth	13 ft	Assumes 13' deep structure with only utilizing 11' depth for storage (1 ft for freeboard to top of structure, and 1 ft for slope of bottom of concrete structure)
Length	72 ft	
Width	38 ft	
Emergency Vault Capacity	30,096 cf 225,118 gal	Capacity of Emergency Storage Vault with only utilizing 11' depth for storage (1 ft for freeboard to top of structure, and 1 ft for slope of bottom of concrete structure)
Time to Fill	250.87 min 4.18 hrs	

Required Storage System Volume @ PWWF	215,367 gal	Wet Well + Vault
Available Storage in Vault + Wet Well	229,085 gal	
Total Time to Fill Collection + Wet Well	4.25 hrs	Below controling manhole elevation
Remaining Available Onsite Storage Volume @ PWWF	13,718 gal	Available storage remaining after 4 hours

APPENDIX C

TECHNICAL MEMORANDUM – SANITARY SEWER SYSTEM RECOMMENDATIONS FOR CITY OF ROSEVILLE ENVIRONMENTAL UTILITIES OPERATIONS FACILITY

Technical Memorandum - Sanitary Sewer System Recommendations

Date: January 23, 2025

Project name: Roseville Environmental Utilities Operations Facility

Jacobs Engineering Group Inc.
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833-2937
United States

Executive Summary

Three alternatives were evaluated to address domestic wastewater and industrial wastewater discharges for the phased development of the City of Roseville (City) Environmental Utilities Operations (EU Ops) Facility. Routing domestic and industrial wastewater from EU Ops and neighboring properties to a shared public sewer system within a public utilities easement to the Pleasant Grove Wastewater Treatment Plant (WWTP) is the recommended and likely only currently feasible alternative because:

- Placer County's permitting capabilities (1) do not include industrial facilities and are limited to residential and small commercial developments and (2) are limited to flows equal to or less than 10,000 gallons per day
- Past experience with the California State Water Resources Control Board, Central Valley Region (Regional Board) has indicated their desire to regionalize wastewater treatment plants (WWTPs) throughout California to reduce and/or minimize the number of WWTPs as opposed to constructing and permitting new, relatively small WWTP. Furthermore, assuring regulatory discharge permitting is problematic at this time and is likely to occur later after the construction and startup of all industrial components and the production of representative industrial wastewater characteristics.

This technical memorandum presents the recommended estimates for dry and wet weather biochemical oxygen demand (BOD) and total suspended solids (TSS) loads, peak wet weather flows, and sizes the onsite sewer system and off-site force main based on average dry and wet sewer discharge flows provided by HDR. The recommendations are summarized in a process flow diagram that illustrates how the domestic and industrial flows will be routed and treated prior to the pump station and force mains. A cost estimate for this alternative is also provided.

Selected Alternative

Three alternatives were evaluated to address domestic wastewater and industrial wastewater discharges for the phased development of the EU Ops Facility. The alternatives included:

1) On site septic tanks, pumped out periodically, with waste disposed offsite at a local wastewater plant septage receiving station. Under this alternative, domestic and industrial wastewater would

undergo pretreatment and stored onsite in pond(s) until it can be pumped into trucks and hauled offsite for further treatment and disposal. The pond(s) would likely be lined and aerated.

2) On site septic system to treat and dispose of domestic wastewater via an onsite disposal (e.g., spray) field. The septic tank would require periodic cleaning using vactor trucks. Industrial wastewater would be handled separately and conveyed into wastewater pond(s) for treatment and storage until it can be pumped into trucks and hauled offsite for further treatment and disposal. The pond(s) would likely be lined and aerated.

3) On site sewer lift station(s) and sewer lines collected at an onsite lift station, then pumped offsite to the city sewer. For this alternative, the industrial wastewater could be added to the domestic lines or contained in a lined, and likely aerated, wastewater pond(s), which would then be drained intermittently to sewer.

Alternatives 1 and 2 are dependent on obtaining a septic system permit. Permitting a septic system for this facility is complex since the wastewater flows for this site are too high to be covered by the State On-site Water Treatment Systems (OWTS) or County Local Agency Management Program (LAMP):

- In general, septic systems for residential and light industrial follow a process based on approval by Placer County Environmental Health, which would likely not be applicable to this project but were investigated to determine applicability. Jacobs confirmed general limitations for the LAMP permit with Laura Rath from Placer County during an online meeting on April 26, 2024. The requirements included the restriction that only domestic waste may go to septic systems and that only one on-site septic tank is allowed per parcel, for up to 200 gallons per day of domestic wastewater serving up to 24 people per day. These restrictions impact the ability to implement Alternatives 1 and 2, specifically due to the number of employees for the initial phase of the project exceeding the County's limitations for the use of on-site septic tanks and the need to discharge industrial wastewater.

- Additionally, as previously indicated, an industrial scale septic system permit would likely fall under state RWQCB permitting, which is not expected to be feasible based on site soil, groundwater conditions, and policy. The wastewater flows for this site are too high to be covered by the State OWTS or County LAMP program. The permit for this system, if achievable, would be obtained from the State via a specific order issued by the Regional Water Quality Control Board (RWQCB), subject to revision every 5 years (for discharges to water) or 10 years (for discharges to land).

Based on the information from Placer County and the high feasibility of Alternative 3, routing domestic and industrial wastewater from EU Ops and possibly neighboring properties to a shared public sewer system within a public utilities easement to the Pleasant Grove WWTP is the recommended and likely only currently feasible alternative.

The size and cost of any shared lift station and force main could possibly be shared amongst the developers and public utilities to pump wastewater from all the properties to the Pleasant Grove WWTP. The design for this option is based on the sewer loads provided by HDR for the ultimate expansion (2058) which includes the Corporation Yard.

Domestic, Industrial, and Washdown Discharge Flows

Three types of wastewater discharges are addressed in this technical memorandum: domestic, industrial, and washdown.

Domestic discharges are composed of building plumbing drainage (i.e., toilets, sinks, building drains) from facilities such as the Waste Transfer Facility (WTF), Materials Recovery Facility (MRF), Organics Transfer, Scale House, and Corporation Yard.

Industrial discharges are from wet material received at the WTF, MRF, and Organics Transfer, as well as floor washdown from the WTF and MRF.

Washdown discharges are from washing fleet vehicles and bins and include the discharge from the fire protection pond. The fire protection pond discharge is expected to be very infrequent and therefore is not included in the estimated flows or pollutant loads for five-day BOD or TSS described below.

Estimated Domestic Wastewater Discharges

The estimated average daily Domestic flows for future development is based on 20 gallons per day per employee (gpd/p) using the total number of employees estimated for each facility at the ultimate buildout (year 2058) which includes the Corporation Yard.

Table 1 shows the estimated number of employees by facility in Column 2, with the corresponding estimated Domestic discharges from each facility in Column 3. The total number of estimated employees shown at the bottom of Table 1 in Columns 2 and 3 is 489 and the total estimated average daily Domestic discharge flow is 9,780 gpd.

Estimated Industrial Discharges

Material received at the WTF, MRF, and Organics Transfer Facility will have residual moisture that will be collected and discharged to the sewer system. A discharge for each facility is estimated based on 6.9% by weight of material received and an expected annual tonnage of material. Columns 4 and 5 of Table 1 show the estimated tons of material or number of vehicles or units along with the estimated industrial discharge. As shown at the bottom of Table 1 in Column 5, the total estimated average daily industrial discharge flow is 59,544 gpd. However, the fire protection pond discharge is expected to be very infrequent and fleet vehicle and bin washing are not considered to be industrial discharges and therefore are not included in the recommended industrial discharge flow of 42,877 gpd.

Estimated Washdown Discharges

Fleet vehicle and bin washing are considered to be washdown discharges and low in BOD and are therefore separated from the other discharges described above. The total estimated average daily washdown discharge flow is 6,780 gpd.

The truck and bin wash areas are typically a concrete pad sloped to a trench drain or area drain in the center, with screens or strainers, and perimeter surrounded by a secondary containment curb. Often the vehicle wash outside perimeter is equipped with rumble grating to remove debris from truck tires.

Washdown flows drain through an oil-water separator and collect in a sump that is pumped out or is gravity drained to the main sewer trunk line.

Estimated Fire Protection Discharge:

Fire protection pond discharge is expected to be very infrequent and therefore is not included in any of the discharge estimates provided above.

If the fire protection system is needed and used, the fire water flow of one million gallons will be contained in a retention pond and discharged over a two-month timeframe.

Table 1. Wastewater Discharge and Estimated Flows and Pollutant Loads - Utlimate

Column 1A	1B	2	3	4	5	6	7	8	9	10	11	12	13
		Sewer Discharges		Industrial Discharges					Estimated Dry and Wet Weather Loads, lb/d				
Source (Flow Category)	Source (Building)	Staff	Sewer Discharge (gpd)	Tons of material or Number of Vehicles or units	Industrial Discharge (gpd) Wet Weather	Dry Weather Total Sanitary plus Industrial (gpd)	Wet Weather Sanitary plus Industrial discharges at peak daily flow	Assumptions	Dry BOD	Dry TSS	Wet BOD	Wet TSS	Source/Comments
Waste Transfer Facility	MRF	13	260	350,000	15,886	3,437	16,146	Sewer: reflects 20 gpd per person, Industrial: reflects 6.9% by weight of materials arriving daily	22.49	27.89	109.4	136.0	Sewer Discharge assumed to be equal to Metcalf & Eddy, High Strength Concentrations of 350 and 400 mg BOD and TSS, respectively/L for dry and wet. Industrial discharges assumed to be equal to MRF discharge; concentrations of 820 and 1020 mg BOD and TSS, respectively /L for wet and dry
Materials Recovery Facility	MRF	71	1420	210,000	9,531	3,326	10,951	Sewer: reflects 20 gpd per person, Industrial: reflects 6.9% by weight of materials arriving daily	17.18	20.95	69.3	85.8	Sewer Discharge assumed to be equal to Metcalf & Eddy, High Strength Concentrations of 350 and 400 mg BOD and TSS, respectively/L for dry and wet. Industrial Discharges assumed to be equal to MRF Data (this workbook) - maximum concentrations of 820 and 1020 for both dry and wet
Organics Transfer only	MRF	11	220	156,000	7,081	1,636	7,301	Sewer: reflects 20 gpd per person, Industrial: reflects 6.9% by weight of materials arriving daily	10.33	12.78	49.1	61.0	Sewer Discharge assumed to be equal to Metcalf & Eddy, High Strength Concentrations of 350 and 400 mg BOD and TSS, respectively/L for dry and wet. Industrial discharges assumed to be equal to MRF discharge; concentrations of 820 and 1020 mg BOD and TSS, respectively /L for wet and dry
Scale House	Scale House	8	160	NA	NA	160	160	Sewer: reflects 20 gpd per person, Industrial: reflects 6.9% by weight of materials arriving daily	0.47	0.53	0.5	0.5	Sewer Discharge assumed to be equal to Metcalf & Eddy, High Strength Concentrations of 350 and 400 mg BOD and TSS, respectively/L
WTF Washdown	MRF	NA	NA	NA	1800	1800	1,800	Washdown assumed to occur quarterly, but for peak wet weather, assumes it occurs on one day.	5.25	6.00	5.3	6.0	Assumed to be eqivalent to High Strength Wastewater (conservative estimate) Metcalf & Eddy, High Strength Concentrations of 350 and 400 mg BOD and TSS, respectively/L
MRF Washdown	MRF	NA	NA	NA	1800	1800	1,800	Washdown assumed to occur quarterly, but for peak wet weather, assumes it occurs on one day.	5.25	6.00	5.3	6.0	Assumed to be eqivalent to High Strength Wastewater (conservative estimate) Metcalf & Eddy, High Strength Concentrations of 350 and 400 mg BOD and TSS, respectively/L
Compost Facility Drainage	N/A	NA	NA	NA	NA			Not included. Assumed to be zero discharge from this use.					
Corporation Yard Sanitary Sewer Flow	Shop/Repair, BS TS Water Utility, Wash Facility, EU FS and RA, EU Fleet Admin	386	7720	NA	NA	7720	7720	Assumes all Corp staff use 20 gpd/p	22.53	25.75	22.5	25.8	Assumed to be equal to Metcalf & Eddy, High Strength Concentrations of 350 and 400 mg BOD and TSS, respectively/L
Corporation Yard Wash Down	N/A	N/A	NA	NA	NA			Assumed non-contact stormwater, discharged to surface after detention for peak storm event					
Laydown Area/Totes Discharge	N/A	N/A	NA	NA	NA			Assumed non-contact stormwater, discharged to surface after detention for peak storm event					
Fleet Vehicles Serviced at site	Wash Facility	NA	NA	379	4860	4860	4860	Assumes ea truck washed twice weekly at 45 g discharge per wash	0.41	4.09	0.4	4.1	Assumed to be equal to Metcalf & Eddy, Maximum Stormwater Runoff Concentrations of 10 and 101 mg BOD and TSS, respectively/L
Bin Wash	Wash Facility	NA	NA	NA	1920	1920	1920	Assumes 4 bin stations, operating 4 GMP each for 2 hr per day (no recovery)	0.16	1.62	0.2	1.6	Assumed to be equal to Metcalf & Eddy, Maximum Stormwater Runoff Concentrations of 10 and 101 mg BOD and TSS, respectively/L
Fire Protection Pond Discharge	Fire Water Drainage Pond	NA	NA	NA	16,667	2,778	16,667	One M gallons of contact water discharged over a two month timeframe					
Total		489	9,780	716,379	59,544	29,437	69,324		84	106	262	327	

LEGEND

Columns 1-8 provided by HDR.

Sanitary Sewer: Estimated number of employees and flows provided by HDR.

Industrial: Estimated tons of material or number of vehicles or units and flows provided by HDR.

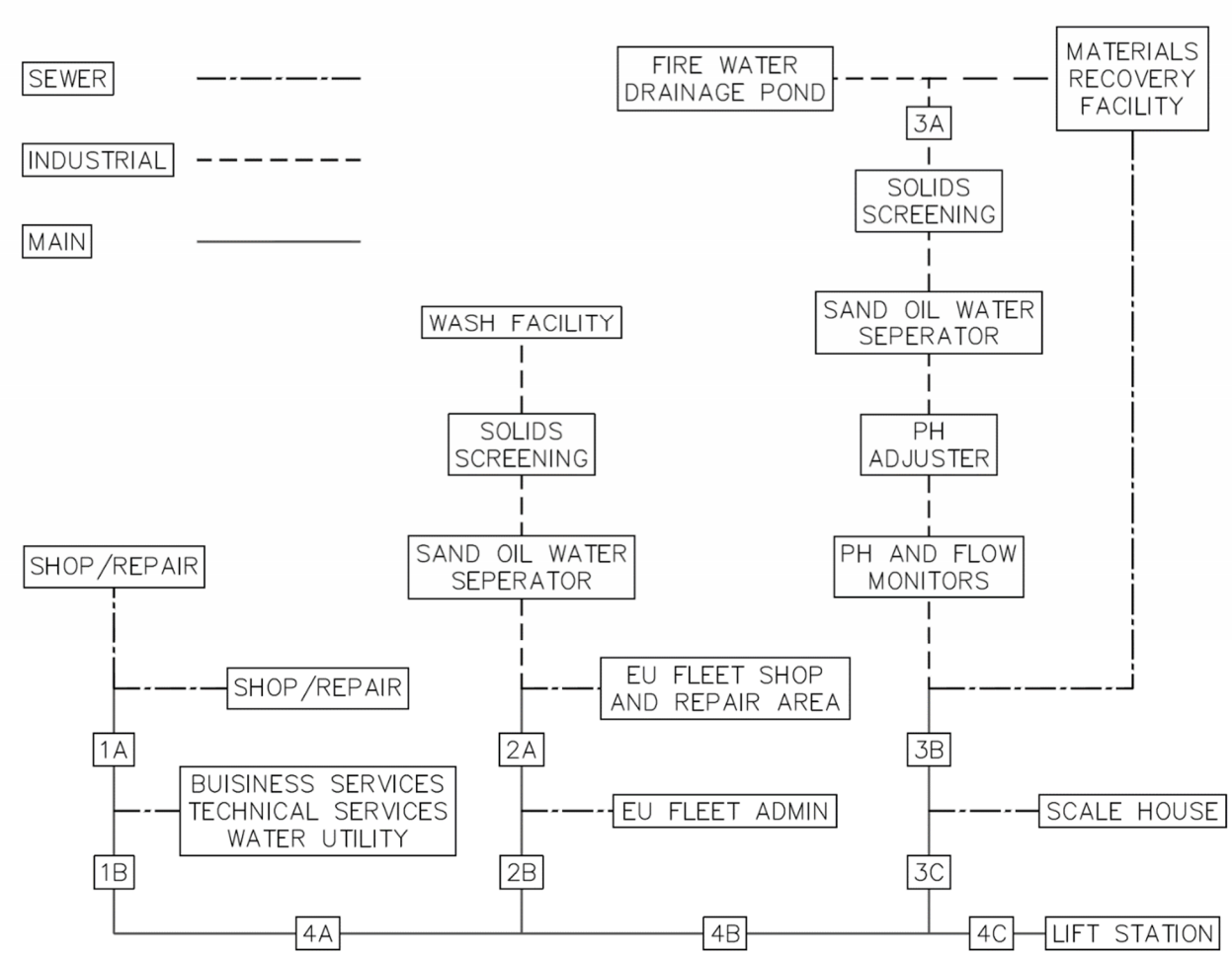
Washdown: Estimated tons of material or number of vehicles or units and flows provided by HDR.

Columns 9-13 developed by Jacobs.

Process Flow Diagram and Sewer System Sizing

Per Section 9-10 of the Roseville Design Standards, the Environmental Utilities Director was consulted to determine the appropriate pre-treatment. Figure 1 illustrates the flow path of the sewer and industrial /washdown discharge from each source to the lift station, including the appropriate pre-treatment.

Figure 1. Process Flow Diagram

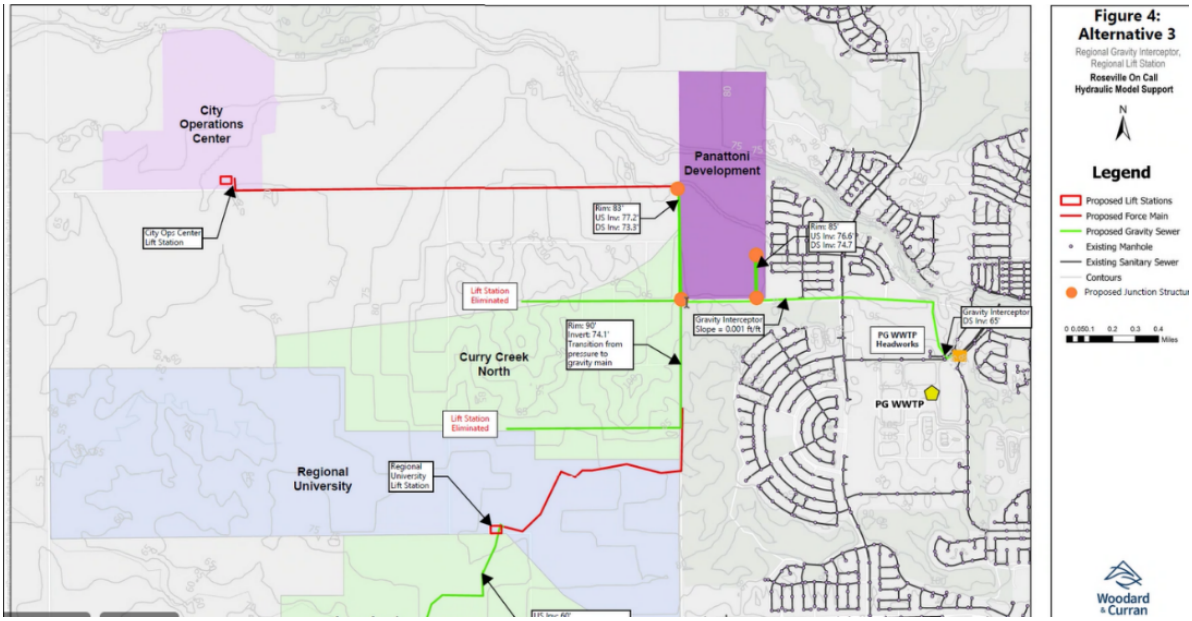


The values in Table 2, below, were calculated using the following process, as outlined by the Roseville Design Standards. The Process Flow Diagram (Figure 1) was used to assign the discharge flows from each building in Table 1 to their appropriate pipe section (totaled in column 2). A safety factor of 2 was then applied to the total flow in each pipe section (column 3) as well as a peaking factor, determined using Figure SS-1 of Section 9 of the Roseville Design Standards (column 4). A minimum scouring velocity of 2ft/s was selected and a fill percentage of 90% assumed to determine the minimum pipe size necessary to convey the peak flow (column 6). Many of the minimum pipe sizes are below the 6-inch minimum required in Section 9 of the Roseville Design Standards. Therefore, each pipe was assigned an ideal design size with that minimum in mind (column 7). A separate calculation was completed to ensure the flow from the Fire Water Drainage Pond could be treated and conveyed along with the normal site flows.

Table 2. Gravity Pipe Flows

1	2	3	4	5	6	7
Gravity Pipe	Average Flow (gpd)	Average Flow Safety Factor (gpd)	Peak Flow (gpd)	Peak Flow (gpm)	Min Calc Size (in)	Proposed Size (in)
1A	1,930	3,860	13,985	29	2.6	6
1B	3,860	7,720	13,985	29	2.6	6
2A	8,710	17,419	31,259	65	3.8	6
2B	10,640	21,279	38,062	79	4.2	6
3A	36,098	72,196	125,46	261	7.7	8
3B	37,998	75,996	131,77	275	7.9	8
3C	38,158	76,316	132,30	276	7.9	8
4A	3,860	7,720	13,985	29	2.6	6
4B	14,500	28,999	51,647	108	4.9	6
4C	52,497	104,995	179,04	373	9.2	10

Figure 2. Off-Site Sewer Routing



Domestic, industrial and wastewater flows will drain from each of the facility buildings or areas, either by gravity or sump pumps, to a common 10-inch gravity sewer trunk line routed through the property. The site is located west and lower in elevation than the Pleasant Grove WWTP, so the site will require a lift station to pump flows via a dual (including redundant line) force main to the City's sewer main, which is in Westbrook Boulevard, approximately 3 miles east of the site.

The lift station will be designed to have a capacity of 4 hours of peak flow (~90,000 gallons) and an outgoing scouring velocity of 4 ft/s, in accordance with Table 3 of Section 9 of the Roseville Design Standards. The standards also require a lead/lag pump, standby pump, and standby outflow line.

Excess Capacity

The sewer system sizing is based on the ultimate buildout of the EU Ops Facility and wet weather flows. However, due to the phased development of the EU Ops Facility, there are lower flows that need to be considered in the initial and interim build-out, the most stringent of which is the initial build-out estimates during dry weather.

The gravity pipe size requirements in the Roseville Design Standards result in the following excess capacity for the ultimate and initial build-out:

- In the ultimate build-out, during wet weather, the 10-inch gravity main will provide 1.19x the capacity needed for the flow entering the lift station.
- In the initial build-out, during dry weather, the 10-inch gravity main will provide more than 11.4x the capacity needed for the flow entering the lift station.

During the initial build-out period, maintenance will have to incorporate a regular flushing plan using the clean-outs along all the gravity lines. This will offset the issues caused by low scouring velocities in the lines. In the ultimate build-out, the flushing plan can be adjusted to address only some of the lines. Namely, the plan can be limited to the pipes that have a calculated minimum size lower than the Roseville Design Standards minimum pipe size of 6 inches (See Table 2, column 6).

Based on an 6-inch pipe and 40 minutes of flow to maintain a flushing velocity of 4ft/s, the lift station needs to hold approximately 12,685 gallons of capacity. That capacity equates to 5.5 hours of incoming flow in initial, dry weather conditions and 34 minutes in ultimate, wet weather conditions. Table 3 in Section 9 of the Roseville Design Standards requires a storage capacity of 4 hours at peak wet weather flow, which is ~90,000 gallons, and provides 3.35x the capacity needed.

Given the long spans between pumps in the initial dry weather condition, there is an increased potential for solids deposition at the bottom of the tank which could cause storage limitations and eventually impede the pump's ability to reach target flow rates. This will be further evaluated during concept design.

Waste Characterization and Recommended BOD and TSS Loads

BOD and TSS pollutant loads were developed from the discharge flows described in Table 1. Columns 9 through 13 in Table 1 describe the methodology discussed and reviewed by HDR during development and reviewed with City of Roseville staff on September 30, 2024.

As shown in Table 1, the discharges have been color-coded according to the following characteristics:

- Domestic Discharge: Considered to be equivalent or close to high strength wastewater concentration with BOD and TSS concentrations of 350 and 400 mg/L, respectively, as described by Metcalf & Eddy, 4th Edition of Wastewater Engineering Treatment and Reuse, Table 3-15.
- Industrial Discharge: Assumed to be equal to the maximum monthly BOD and TSS concentrations of 820 and 1,020 mg/L, respectively, as obtained from HDR (Materials Recovery Facility Analytical Results).
- Washdown Discharge: Considered to be low in BOD and equivalent to stormwater runoff concentrations of 10 and 101 mg/L BOD and TSS, respectively, as described by Metcalf & Eddy, 4th Edition of Wastewater Engineering Treatment and Reuse, Table 3-19.

Estimated dry and wet weather BOD and TSS loads in pounds per day (lb/d) were developed and are shown in Columns 9-12 of Table 1. As shown at the bottom of Table 1, the total dry and wet weather BOD and TSS loads are estimated to be:

- Dry Weather: 84 lb BOD/d and 106 lb TSS/d
- Wet Weather: 262 lb/BOD/d and 327 lb TSS/d

A comparison of the estimated Domestic discharge loads and typical residential per capital BOD and TSS loading rates was conducted. Comparison results indicated that the estimated loads were consistent with typical residential loading rates since most on-site employees, on average, only spend about 8 hours during the week at the facility as opposed to driving routes or completing other off-site work.

Flows are expected to be conveyed and treated at the Pleasant Grove WWTP. Comparison of the estimated BOD and TSS loads shown in Table 1 with estimated Pleasant Grove WWTP capacity indicates that these loads are considered minor relative to Pleasant Grove WWTP's capacity.

Cost Estimate

The total capital cost to construct the selected alternative, Alternative 3, is $14,902,600. The cost estimate accounts for installation of approximately 23,650 Linear Feet (LF) of total piping from the EU Ops Facility to the Pleasant Grove WWTP and includes one new lift station with one 90,000 Gallon Holding Tank and two 325 gpm pumps (one main and one standby). Total piping includes approximately 1,000 LF of 10-inch VCP piping, 1,000 LF of 8-inch VCP piping, 4,000 LF of 6-inch VCP Piping (service line areas), and 17,650 LF of 6-inch Ductile Iron Pipe force main to the Pleasant Grove WWTP.

The cost estimate also includes the treatment systems shown in the process flow diagram in Figure 1:

- Two Solids Screening Units
- Two Sand Oil Separators
- One pH Adjustor
- One PH Adjuster and Flow Monitor

The estimate of probable cost provided in this technical memorandum is based on the limited information and concepts available at the time and was priced to the best of our ability using standard estimating practice, available information provided by the City of Roseville and HDR, and the conceptual status of the project. Given the preliminary and conceptual status, Jacobs does not guarantee that these estimates will align with any subsequent concepts and/or submittals and/or actual construction costs. Also of note is that this estimate does not factor in contractor availability and other items, which can have a significant impact on actual construction cost.

Full documentation for the cost estimate is provided in Appendix B.

Table 3.4 shows the long-term operational costs for Alternative 3. These costs are based on monthly city fees from the City of Roseville Utility Rate Study, May 2023 by IB Consulting, Table 4 Variable Rate1. The variable rate for FY 2025 (commercial metered customer class) is $4.9776/ccf or $0.0067/gal. A yearly fee was calculated assuming seven dry months and five wet months in a year.

Table 3.1

Condition	Estimated (gal/day)	Peaked (gal/day)
Initial Dry	5,135	18,557
Initial Wet	14,793	52,676
Ultimate Dry	26,499	93,118
Ultimate Wet	52,497	179,043

Table 3.2

	2024	2025
$ / ccf	$4.6958	$4.9776
$ / gal	$0.0063	$0.0067

Table 3.3

2025	Phase	Months	gal / month	$ / month	$ / Year
Estimated	Initial	Dry	154,039	$1,024.99	$21,940
		Wet	443,796	$2,953.06	
	Ultimate	Dry	794,972	$5,289.81	$89,427
		Wet	1,574,920	$10,479.65	
Peaked with Safety Factor	Initial	Dry	556,707	$3,704.37	$78,507
		Wet	1,580,282	$10,515.33	
	Ultimate	Dry	2,793,535	$18,588.41	$308,824
		Wet	5,371,280	$35,740.94	

Table 3.4 Lifecycle Costs

Alternative	Installation Cost	O&M Cost (Ultimate)
3 - Piped Force Main to WWTP	$3,097,500	$60,000/ month

Table 4: Proposed Wastewater Rates

Monthly Fixed Charges ($/ Month)		
Customer Class	FY 2024	FY 2025
Residential	$50.42	$53.45
Commercial - Metered	$50.42	$53.45
Commercial - Flat	$50.42	$53.45

Variable Rate ($/ccf)		
Customer Class	FY 2024	FY 2025
Commercial - Metered	$4.6958	$4.9776

[1] O&M Cost indicated is an estimate of monthly sewer fees; fee is based on City of Roseville Utility Rate Study, May 2023 by IB Consulting, Table 4 Variable Rate, Microsoft Word - City of Roseville - FY 2024 Water-Recycled-Wastewater Rate Study Report v1 $13,057/month

Summary

Recommended estimates for dry and wet weather BOD and TSS loads, peak wet weather flows, and onsite sewer system and off-site force main sizing were provided in this technical memorandum. The process flow diagram (Figure 1) summarizes how the Domestic and industrial/washdown flows will be routed and treated prior to the pump station and force mains.

The recommended estimates for dry and wet weather BOD and TSS loads and the sizing of the onsite sewer system and off-site force main are conservative estimates based on the following assumptions that can be further refined during concept design:

- Characterizations for domestic discharge, industrial discharge, and washdown discharge
- Refinement of assumptions for flow estimates from each building (currently flow rates represent multiple buildings)
- Revisiting 6.9% water by weight of material received assumption from Western Placer Waste Management Authority

Appendix A

Minimum Design Values

Chan, Eunice

From: Samuelson, Dave <dsamuelson@roseville.ca.us>
Sent: Tuesday, October 22, 2024 12:15 PM
To: Fisk, Elijah
Cc: Chan, Eunice; Schmidt, Keith
Subject: [EXTERNAL] RE: Design Standard Locations

Elijah, See responses below in red.

Thanks,

David Samuelson
Senior Engineer
Environmental Utilities Dept.- Engineering

(916) 746-1708
Corporation Yard | 2005 Hilltop Circle | Roseville, CA 95747

From: Fisk, Elijah <Elijah.Fisk@jacobs.com>
Sent: Tuesday, October 22, 2024 10:38 AM
To: Samuelson, Dave <dsamuelson@roseville.ca.us>
Cc: Chan, Eunice <Eunice.Chan@jacobs.com>
Subject: Design Standard Locations

Dave,
Thanks for the call. Here are the questions I had.

1. Minimum size for gravity service lines 6”
2. Minimum size for gravity main lines 8”
3. Minimum size for force mains 4”
4. Number of pumps in the lift station and they configuration with the lines going out including valve placement 2 pumps see other email showing configuration.
5. Design velocity of gravity lines 2-10 fps
6. Design velocity of force mains 3-5 fps for normal flow.

Elijah Fisk, EIT | Jacobs | Civil/Environmental Engineer
M: +1 303.885.5911 | Elijah.Fisk@jacobs.com
6440 Millrock Dr | Salt Lake City, UT 84121 | United States

Appendix B

Cost Estimate Documentation

COST ESTIMATE SUMMARY

Site: Roseville Utility Planning
Location: City of Roseville, California
Phase: Option 3 - Piped to WWTP (Conveyance Pipeline from EU Yard to WWTP)
Estimate: Capital Cost Estimate (-30% to +50%)
Date: January 2025

Description: Option 3 consists of the following elements: Installation of approximately 23,650 Linear Feet (total) of Ductile Iron Pipe (DIP) and Vitrified Clay Pipe (VCP) from the Environmental Utilities (EU) Yard to the Pleasant Grove Waste Water Treatment Plant (WWTP), including 1 New Pump Station. Total piping includes the following: Section 1 - 1,000 LF of 6" VCP; Section 2 - 1,000 LF of 6" VCP; Section 3 - 1,000 LF of 8" VCP; Section 4 - 2,000 LF of 6" VCP and 1,000 LF of 10" VCP; and 17,650 LF of 6" lined ductile iron piping to the WWTP. Includes installation of 1 New Pump Station, 2 each 160 gpm pumps (1 main plus 1 standby) and New Treatment Systems including 2 each Solids Screening Units, 2 each Sand Oil Separators, 1 pH Adjustor, 1 pH + Flow Monitor, and 1 each 90,000-gallon tank.

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
1 Submittals / Plans / Permits					
Submittals and Plans (Work Plan, H&S Plan, Quality Control Plan)	1	LS	$30,650	$30,650	Pricing is per RSMeans #01 31 13.20 and includes Work plan, Health and Safety plan, Permits, etc.
Traffic Control Plan	1	LS	$10,000	$10,000	Pricing is based on project similar in nature.
Permitting	1	LS	$25,000	$25,000	Pricing is based on project similar in nature.
Connection Fees	1	LS	$25,000	$25,000	Connection Fees for New Pipeline Installation to WWTP
SUBTOTAL				**$90,650**	
2 Mobilization/Demobilization					
Mobilization/Site Setup	1	LS	$35,000	$35,000	Pricing based on project similar in nature. Includes RSMeans Crews.
Utility Locate	5	DY	$1,800	$9,000	Pricing based on RSMeans Crew #A-6
Pre-Construction Survey	5	DAY	$2,400	$12,000	Pricing based on RSMeans #01 71 23.13 (1200)
Temporary Facilities	12	MO	$3,500	$42,000	Office trailers, storage facilities, utilities including sanitary and water facilities, and internet. Pricing based on project similar in nature.
Contractor Support/Indirects	12	MO	$25,000	$300,000	This includes Surveyor (Grade control), QC, contractor home office support. Pricing based on project similar in nature.
Site Teardown and Demobilization	1	LS	$20,000	$20,000	Pricing based on project similar in nature. Includes RSMeans Crews
SUBTOTAL				**$418,000**	
3 Pre-Remediation Site Work					
Silt Fence and Erosion Control Measures	5,000	LF	$8.00	$40,000	Installation, maintenance, and removal (around the stream and HHRA soil Exceedance area). Pricing is per recent project similar in nature.
Clearing and Grubbing (along roadway)	2	AC	$5,900.00	$11,800	Pricing is per RSMeans #31 11 10.10 (0020)
Road improvements	1,000	FT	$26.00	$26,000	For onsite transport of imported and excavated soils. Pricing is per RSMeans.
Fencing/Signs/Gates	0	LF	$41.00	$0	Pricing is per RSMeans for 6 ft. high Chain Link Fence (6 ga. wire, galv steel).
SUBTOTAL				**$77,800**	
3 Installation of new Pump Station and Treatment System					
Superintendent	100	Hour	$85	$8,500	Pricing is per RSMeans #01 31 13.20 (0260)
Operator - Excavator	100	Hour	$75	$7,500	Pricing is per RSMeans Crew #B-12E
Operator - Boom truck	80	Hour	$75	$6,000	Pricing is per RSMeans Crew #A-3H
Pipefitters (2)	200	Hour	$75	$15,000	Pricing is per RSMeans Crew #Q-1
Laborers (2)	200	Hour	$65	$13,000	Pricing is per RSMeans Crew #B-1F
Electrician with vehicle	40	Hour	$105	$4,200	Pricing is per RSMeans Crew #R-1
Excavator	100	Hour	$65	$6,500	Pricing is per RSMeans Crew #B-12E
Boom Truck	80	Hour	$110	$8,800	Pricing is per RSMeans Crew #A-3H
Packaged Pump Station	1	Each	$400,000	$400,000	Pricing is based on a Pump Station similar in size to the EU Operations Center's based on information from Roseville EU.
Treatment System - Sand Oil Separator (750 gallon)	1	Each	$12,170	$12,170	Pricing is from Interceptorsdirect.com for Sand Oil Separators (1 - 750 gallon) including delivery
Treatment System - Sand Oil Separator (500 gallon)	1	Each	$9,810	$9,810	Pricing is from Interceptorsdirect.com for Sand Oil Separators (1 - 500 gallon) including delivery
Treatment System - Solids Screening Equipment (2 each)	2	Each	$15,000	$30,000	Pricing includes 1 Solids Screening Unit with delivery
Treatment System - Mechanical Piping, pumps, valves (2 each)	2	Each	$22,800	$45,600	Pricing is from RSMeans #23 21 23.13 (5190)
Treatment System - PH Adjuster and PH + Flow Monitor (1 each)	1	Each	$5,020	$5,020	Pricing is from wecofilters.com for 1 each pH Adjusting System including tax.
Treatment System - Purchase and Delivery of 90,000-gallon Holding Tank	1	LS	$247,500	$247,500	Pricing is per Internet search and includes delivery
Treatment System - Crane w/crew to offload 90,000-gallon steel tank	1	LS	$15,000	$15,000	Pricing is based on project similar in nature.
Treatment System - Electrical and Controls	1	LS	$45,000	$45,000	Pricing is based on project similar in nature.
Treatment System - Miscellaneous supplies	1	LS	$5,000	$5,000	Pricing is based on project similar in nature.
SUBTOTAL				**$884,600**	
4 Installation of new 10-inch, 8-inch, and 6-inch Vitrified Clay Pipe (VCP); and 6-inch Ductile Iron Pipe (DIP) to WWTP					
Traffic Control - Flagger personnel and signage	120	Days	$1,525.00	$183,000	Pricing is per recent project similar in nature. Includes 2 Traffic control flaggers @ 10 hours/day, pickup truck, plus signage and barricades.
Vitrified Clay Pipe (VCP) - 10-inch (Section 4) - Labor and Equipment for Installation of piping	8	Day	$11,830.00	$94,640	Pricing is per RSMeans Crew #B-10T, #B-12B, #B-54E, and #E-22 and per recent projects in the Sacramento, CA Area (Includes Superintendent, Equipment Operators, Pipefitters, Skilled Laborers, Excavator, Front-end Loader, Rock Trencher equipment) (Production Rate = 125 LF per day)
Vitrified Clay Pipe (VCP) - 10-inch - Travel - Per Diem	8	Day	$2,124.00	$16,992	Pricing is per gsa.gov for Travel - Per Diem Lodging and M&IE for Sacramento, CA for crew of 9 people
Vitrified Clay Pipe (VCP) - 10-inch - Various small equipment and tools	8	Day	$1,000.00	$8,000	Pricing is per recent project similar in nature
Vitrified Clay Pipe (VCP) - 10-inch (Section 4)	1,000	LF	$24.40	$24,400	Pricing is per pipe supply company and includes 7.25% tax (Production Rate = 200 LF per day)
Vitrified Clay Pipe (VCP) Fittings - 10-inch (Section 4)	5	Each	$355.00	$1,775	Pricing is per RSMeans #33 14 13.35 (1500)
Vitrified Clay Pipe (VCP) Valves - 10-inch (Section 4)	2	Each	$1,825.00	$3,650	Pricing is per RSMeans #23 05 23.30 (0610)
Delivery of 10-inch VCP	1	LS	$500.00	$500	Pricing is per pipe supply company (minimum charge)
					Estimated Unit Cost for Installation of 10-inch VCP = $150/LF
Vitrified Clay Pipe (VCP) - 8-inch (Section 3) - Labor and Equipment for Installation of piping	7	Day	$11,830.00	$82,810	Pricing is per RSMeans Crew #B-10T, #B-12B, #B-54E, and #E-22 and per recent projects in the Sacramento, CA Area (Includes Superintendent, Equipment Operators, Pipefitters, Skilled Laborers, Excavator, Front-end Loader, Rock Trencher equipment) (Production Rate = 150 LF per day)
Vitrified Clay Pipe (VCP) - 8-inch - Travel - Per Diem	7	Day	$2,124.00	$14,868	Pricing is per gsa.gov for Travel - Per Diem Lodging and M&IE for Sacramento, CA for crew of 9 people
Vitrified Clay Pipe (VCP) - 8-inch - Various small equipment and tools	7	Day	$1,000.00	$7,000	Pricing is per recent project similar in nature
Vitrified Clay Pipe (VCP) - 8-inch (Section 3)	1,000	LF	$17.20	$17,200	Pricing is per pipe supply company and includes 7.25% tax (Production Rate = 260 LF per day)
Vitrified Clay Pipe (VCP) Fittings - 8-inch (Section 3)	5	Each	$259.00	$1,295	Pricing is per RSMeans #33 14 13.35 (1400)
Vitrified Clay Pipe (VCP) Valves - 8-inch (Section 3)	2	Each	$1,475.00	$2,950	Pricing is per RSMeans #23 05 23.30 (0600)
Delivery of 8-inch VCP	1	LS	$500.00	$500	Pricing is per pipe supply company (minimum charge)
					Estimated Unit Cost for Installation of 8-inch VCP = $127/LF
Vitrified Clay Pipe (VCP) - 6-inch (Sections 1,2, and 4) - Labor and Equipment for Installation of piping	25	Day	$11,830.00	$295,750	Pricing is per RSMeans Crew #B-10T, #B-12B, #B-54E, and #E-22 and per recent projects in the Sacramento, CA Area (Includes Superintendent, Equipment Operators, Pipefitters, Skilled Laborers, Excavator, Front-end Loader, Rock Trencher equipment) (Production Rate = 160 LF per day)
Vitrified Clay Pipe (VCP) - 6-inch - Travel - Per Diem	25	Day	$2,124.00	$53,100	Pricing is per gsa.gov for Travel - Per Diem Lodging and M&IE for Sacramento, CA for crew of 9 people
Vitrified Clay Pipe (VCP) - 6-inch - Various small equipment and tools	25	Day	$1,000.00	$25,000	Pricing is per recent project similar in nature
Vitrified Clay Pipe (VCP) - 6-inch (Sections 1, 2, and 4)	4,000	LF	$12.90	$51,600	Pricing is per pipe supply company and includes 7.25% tax (Production Rate = 320 LF per day)
Vitrified Clay Pipe (VCP) Fittings - 6-inch (Sections 1, 2, and 4)	20	Each	$191.00	$3,820	Pricing is per RSMeans #33 14 13.35 (1300)
Vitrified Clay Pipe (VCP) Valves - 6-inch (Sections 1, 2, and 4)	6	Each	$1,050.00	$6,300	Pricing is per RSMeans #23 05 23.30 (0590)
Delivery of 6-inch VCP	2	EA	$500.00	$1,000	Pricing is per pipe supply company (2 loads)
					Estimated Unit Cost for Installation of 6-inch VCP = $110/LF
Ductile Iron Piping (DIP) - 6-inch (to WWTP) - Labor and Equipment for Installation of piping	295	Day	$11,830.00	$3,489,850	Pricing is per RSMeans Crew #B-10T, #B-12B, #B-54E, and #E-22 and per recent projects in the Sacramento, CA Area (Includes Superintendent, Equipment Operators, Pipefitters, Skilled Laborers, Excavator, Front-end Loader, Rock Trencher equipment) (Production Rate = 60 LF per day due to excavating in rocky conditions for pipeline installation)
Ductile Iron Pipe (DIP) - 6-inch - Travel - Per Diem	295	Day	$2,124.00	$626,580	Pricing is per gsa.gov for Travel - Per Diem Lodging and M&IE for Sacramento, CA for crew of 9 people
Ductile Iron Piping (DIP) - 6-inch - Various small equipment and tools	295	Day	$1,125.00	$331,875	Pricing is per recent project similar in nature
Ductile Iron Piping (DIP) - 6-inch (to WWTP)	17,650	LF	$40.00	$706,000	Pricing is per Ferguson Waterworks Co.
Ductile Iron Pipe (DIP) Fittings - 6-inch (to WWTP)	20	Each	$487.50	$9,750	Pricing is per RSMeans #33 14 13.15 (8400)
Ductile Iron Pipe (DIP) Valves - 6-inch (to WWTP)	10	Each	$2,070.00	$20,700	Pricing is per F.W. Webb Company for a 6" ball valve cast iron
Delivery of 6-inch Ductile Iron pipe	18	Load	$1,250.00	$22,500	Pricing is per Freight/Delivery company (estimated 1,000 LF per load)
					Estimated Unit Cost for Installation of 6-inch DIP = $295/LF
Transition from gravity to pressure Manhole	1	EA	$40,000.00	$40,000	Pricing is based on a information received from the Roseville EU representative for recent contractor estimates in the area.
Casing for crossings	600	LF	$75.00	$45,000	Pricing is per recent project similar in nature. Note: Assumes that all road crossings will only involve trenching. No directional drilling or jack & boring will
Dump Truck w/Driver	400	Hour	$130.00	$52,000	Pricing is per RSMeans Crew #B-34B
Import Fill	2,630	LCY	$40.00	$105,200	Pricing is per RSMeans #31 23 23.16 (0100)
Dump Fees	5,610	Tons	$45.00	$252,450	Pricing is per recent project similar in nature
Electrician with vehicle	80	Hour	$105.00	$8,400	Pricing is per RSMeans Crew #R-1
Conduit/wire/panels	2	Each	$20,000.00	$40,000	Pricing is per recent project similar in nature
Power hookup	2	EA	$40,000	$80,000	Pricing is per recent project similar in nature
SUBTOTAL				**$6,726,455**	

COST ESTIMATE SUMMARY

Site: Roseville Utility Planning
Location: City of Roseville, California
Phase: Option 3 - Piped to WWTP (Conveyance Pipeline from EU Yard to WWTP)
Estimate: Capital Cost Estimate (-30% to +50%)
Date: January 2025

Description: Option 3 consists of the following elements: Installation of approximately 23,650 Linear Feet (total) of Ductile Iron Pipe (DIP) and Vitrified Clay Pipe (VCP) from the Environmental Utilities (EU) Yard to the Pleasant Grove Waste Water Treatment Plant (WWTP), including 1 New Pump Station. Total piping includes the following: Section 1 - 1,000 LF of 6" VCP; Section 2 - 1,000 LF of 6" VCP; Section 3 - 1,000 LF of 8" VCP; Section 4 - 2,000 LF of 6" VCP and 1,000 LF of 10" VCP; and 17,650 LF of 6" lined ductile iron piping to the WWTP. Includes installation of 1 New Pump Station, 2 each 160 gpm pumps (1 main plus 1 standby) and New Treatment Systems including 2 each Solids Screening Units, 2 each Sand Oil Separators, 1 pH Adjustor, 1 pH + Flow Monitor, and 1 each 90,000-gallon tank.

5 Post-Remediation Site Work						
Seed Pipeline Areas		3	AC	$4,240	$12,720	Pricing is per RSMeans #32 92 19.14 (5400)
Post Construction Surveying and As-Builts		10	DAY	$2,400	$24,000	Pricing based on RSMeans #01 71 23.13 (1200)
	SUBTOTAL				**$36,720**	
6 Final Construction Completion Report						
Final Construction Completion Report		1	LS	$45,000	$45,000	Pricing is based on project similar in nature.
	SUBTOTAL				**$45,000**	
	TOTAL				**$8,279,225**	
Contingency		25%		$8,279,225	$2,069,800	Per EPA Guidance Document (2000), pp. 5-10 and 5-11 (15% Scope and 10% Bid Contingency).
	TOTAL				**$10,349,025**	
Health and Safety		2%		$10,349,025	$207,000	Pricing based on project similar in nature.
Performance Bond		2%		$10,349,025	$207,000	Percentage per RSMeans.
Engineering Services during Construction		8%		$10,349,025	$827,900	Percentage is based on recent projects similar in nature in this area.
Construction Management		12%		$10,349,025	$1,241,900	Percentage is based on recent projects similar in nature in this area.
Overhead and Profit		20%		$10,349,025	$2,069,800	Percentage per RSMeans #01 31 13.80 (0200)
Total Capital Costs					**$14,902,600**	