

City of Rio Vista, Public Works Department
(CIWQS WDID: 5A480108001 & 5A480104001)

2022 Sewer System Management Plan

Prepared by HydroScience Engineers

Last Updated in October 2011

City Council Adoption: **November XX, 2022**



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INTRODUCTION

INT.A. Sewer System Management Plan

This Sewer System Management Plan (SSMP) for the City of Rio Vista (City) contains a description of the policies, procedures, and activities for the planning, management, operation, and maintenance of the City's sanitary sewer system.

The State Water Resources Control Board (SWRCB) for California has issued statewide requirements for sanitary sewer systems, which include requirements for development of an SSMP. This SSMP is intended to meet the requirements of the Central Valley Regional Water Quality Control Board (RWQCB) and the SWRCB. Specifically, the SSMP follows the General Waste Discharge Requirements for Wastewater Collection Agencies (GWDR), SWRCB Order Number 2006-0003, dated May 2, 2006, and amended by the revised Monitoring and Reporting Program (MRP) in Order WQ 2013-0058-EXEC, dated September 9, 2013.

The structure (element numbering and nomenclature) of this SSMP follows the requirements set forth in the GWDR. The City's waste discharger identification numbers (WDID) in the California Integrated Water Quality System (CIWQS) are 5A480108001 for the Northwest WWTP and 5A480104001 for the Beach WWTP.

INT.B. Sanitary Sewer System Facilities

The City is located adjacent to, and on the northwest side of, the Sacramento River (see **Figure INT-1**). According to the census, the current population is approximately 10,220 people within an area of 7.5 square miles and around 25 percent developed. The last SSMP was completed in 2011, when the population was approximately 7,625 people. The sewer system consists of about 54 miles of gravity sewers, 7.2 miles of force main, 1,206 manholes, and ten pump stations. The sewers range in size from 4-inch to 24-inch diameter.

Sewer service laterals are the responsibility of City from the back of the sidewalk cleanout to the City main. The property owner to maintain and assure serviceability up to the back of the sidewalk cleanout to the property building. The City maintains sewer lines that lie in a street right-of-way or dedicated public easement. Data regarding the exact age of the City's sewer system is inexact; however, some parts of the collection system are estimated to be over 100 years old based on the date the City was incorporated (1893) and the presence of the United States Army starting in 1911, where the facility was initially established as a base for the U.S. Army Corps of Engineers.

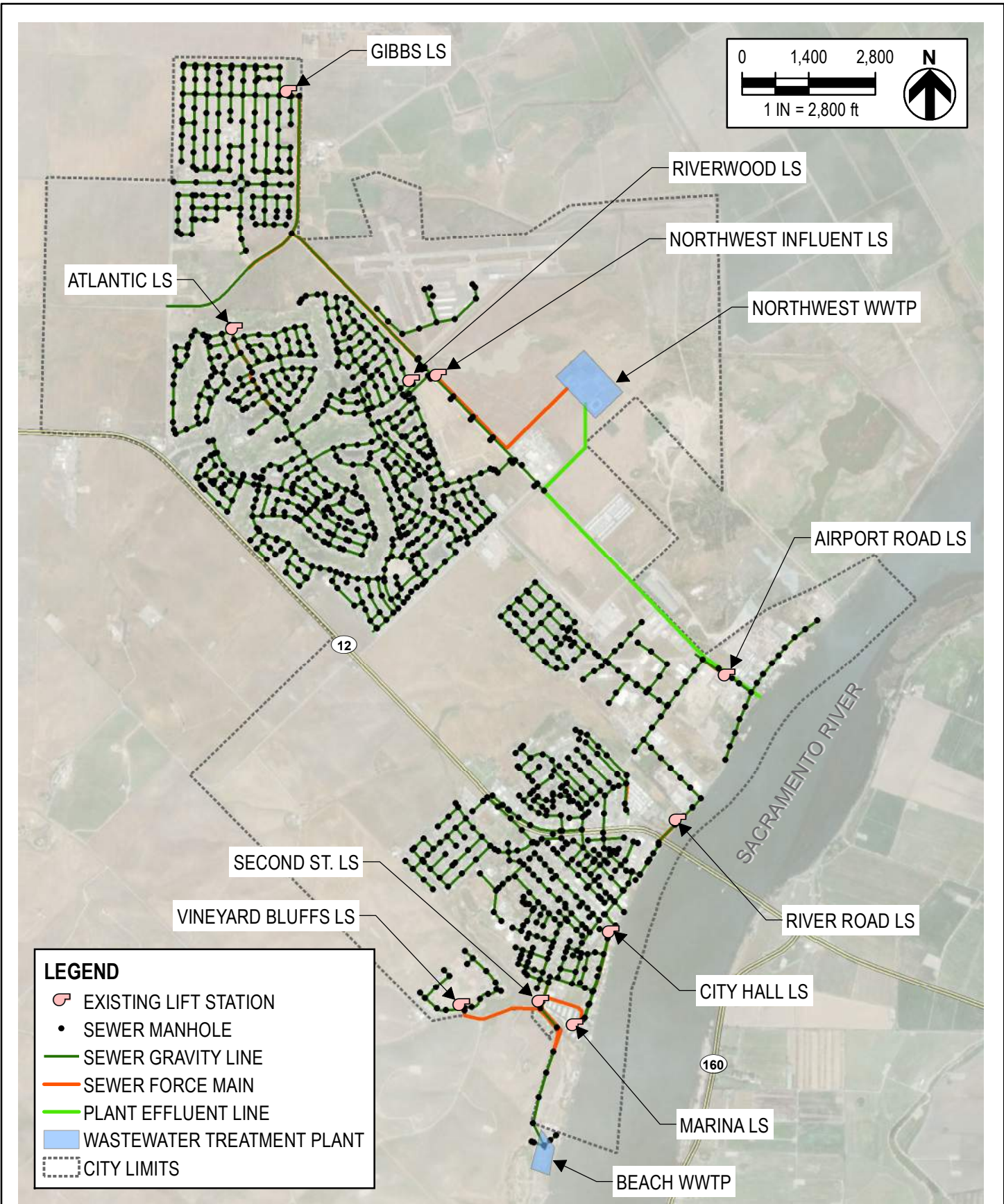


FIGURE INT-1
 CITY OF RIO VISTA
 SEWER SYSTEM MANAGEMENT PLAN
 WASTEWATER COLLECTION SYSTEM

INT.C. Definitions, Acronyms, and Abbreviations

BMP - Best Management Practices

Refers to the procedures employed in commercial kitchens to minimize the quantity of grease that is discharged to the sanitary sewer system. Examples include scraping food scraps into a food scraps bin or garbage can and dry wiping dishes and utensils prior to washing.

Cal OES - California OES Office of Emergency Management

Refers to the California Office of Emergency Management. All Category 1 SSOs greater than or equal to 1,000 gallons must be reported to Cal OES.

CCTV - Closed Circuit Television

Refers to the process and equipment used to inspect the condition of gravity sewers.

CIP - Capital Improvement Plan

Refers to the document that identifies future capital improvements to the City's sanitary sewer system.

City

Refers to the City of Rio Vista.

CIWQS - California Integrated Water Quality System

Refers to the SWRCB online electronic reporting system used to report SSOs, certify completion of the SSMP, and provide information on the sanitary sewer system.

CMMS - Computerized Maintenance Management System

Refers to a database application used manage and document maintenance activities of a collection system.

Consolidation Project

Refers to a wastewater consolidation project which looks at the option to abandon the Beach WWTP and convey all wastewater flow to the Northwest WWTP.

CWEA - California Water Environment Association

FOG - Fats, Oils, and Grease

Refers to fats, oils, and grease typically associated with food preparation and cooking activities that can cause blockages in the sanitary sewer system.

FSE - Food Service Establishment

Refers to commercial or industrial facilities where food is handled/prepared/served that discharge to the sanitary sewer system.

FTE - Full-time Equivalent

Refers to the equivalent of 2,080 paid labor hours per year by a regular, temporary, or contract employee.

GIS - Geographical Information System

Refers to the City's system used to capture, store, analyze, and manage geospatial data associated with the City's sanitary sewer system assets.

GPS - Global Positioning System

Refers to the handheld unit used to determine the longitude and latitude of sanitary sewer overflows for use in meeting CIWQS reporting requirements.

GWDR - General Waste Discharge Requirements

Refers to the SWRCB Order No. 2006-0003, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, dated May 2, 2006, and amended by the revised monitoring and reporting program (Order WQ 2013-0058-EXEC) dated September 9, 2013.

I/I - Infiltration/Inflow

Refers to water that enters the sanitary sewer system from storm water and groundwater and increases the quantity of flow. Infiltration enters through defects in the sanitary sewer system after flowing through soil. Inflow enters the sanitary sewer without flowing through the soil. Typical points of inflow are holes in manhole lids and direct connections to the sanitary sewer (e.g. storm drains, area drains, and roof leaders).

Lateral

Refers to the piping that conveys sewage from a building to the City sewer system. The distinction is sometimes made between the upper lateral (from building to public right-of-way) and the lower lateral (from public right-of-way to the sewer main).

LRO - Legally Responsible Official

Refers to the individual designated by the City to certify SSO reports on the CIWQS system. The LRO must be formally designated by the City and registered with the SWRCB.

MRP - Monitoring and Reporting Program

Refers to the revised monitoring and reporting requirements included in Order WQ 2013-0058-EXEC, dated September 9, 2013.

OERP - Overflow Emergency Response Plan

For the purpose of this SSMP, this plan will be referred to as the Sanitary Sewer Overflow Emergency Response Plan (SSOERP).

O&M - Operations and Maintenance

PACP - Pipeline Assessment and Certification Program

Refers to the National Association of Sewer Service Companies (NASSCO) widely used standard for pipeline defect identification and assessment, providing standardization and consistency to the methods in which pipeline conditions are identified, evaluated and managed.

PM - Preventive Maintenance

Refers to maintenance activities intended to prevent failures of the sanitary sewer system facilities (e.g. cleaning, CCTV, repair).

RVFD - City of Rio Vista Fire Department

RWQCB - Regional Water Quality Control Board

Refers to the Central Valley Regional Water Quality Control Board.

SCADA - Supervisory Control and Data Acquisition

Refers to the system employed by the City that monitors the performance of its pump stations and notifies the operating staff when an alarm condition requires attention.

SECAP - System Evaluation and Capacity Assurance Plan

A CIP designed to assure the hydraulic capacity of key sanitary sewer system elements for peak wet weather conditions.

SSMP - Sewer System Management Plan

Refers to this document, developed as a tool to facilitate management, operation, and maintenance of the sewer collection system in order to reduce and prevent SSOs and mitigate any that occur.

SSO - Sanitary Sewer Overflow

Refers to the overflow or discharge of any quantity of partially treated or untreated wastewater from the sanitary sewer system at any point upstream from the wastewater treatment plant. SSOs are typically caused by blockages, pipe failure, pump station failure, or capacity limitation.

SSO Report

Refers to sanitary sewer overflow report.

SSOERP - Sanitary Sewer Overflow Emergency Response Plan

Refers to the City's SSO Emergency Response Plan, which is a component of this SSMP that addresses the City's response to SSO events.

SWRCB - State Water Resources Control Board

Refers to the California Environmental Protection Agency (EPA) State Water Resources Control Board and staff responsible for protecting the State's water resources.

Wastewater duty

Refers to the City of Rio Vista Wastewater on-call worker.

WWTP - Wastewater Treatment Plant

INT.D. References

INT.D.1. Sewer System Management Plans:

New Requirements for Preparing Sewer System Management Plans, California Regional Water Quality Control Board San Francisco Bay Region letter to Sewer System Authorities, July 7, 2005

www.cwea.org/conferences/sso/Reg2Letter-SSMP0705.pdf

A Guide for Developing and Updating of Sewer System Management Plans (SSMPs), SWRCB, September 2015

https://www.waterboards.ca.gov/water_issues/programs/sso/docs/ssmp_guidance_091015.pdf

INT.D.2. General Order:

State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, SWRCB, May 2, 2006, with Revised Monitoring and Reporting Program, Order WQ-2013-0058-EXEC

www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2006/wqo/wqo2006_0003.pdf

INT.D.3. Revised Monitoring and Reporting Program:

State of California Water Resources Control Board Order No. WQ 2013-0058-EXEC, Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, SWRCB, September 9, 2013.

www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2013/wqo2013_0058exec.pdf

ELEMENT I. GOALS

I.A. Introduction

This section identifies goals the City has set for the management, operation, and maintenance of the sewer system and discusses the role of the SSMP in supporting these goals. These goals provide focus for City staff to continue the high-quality work to implement improvements in the management and maintenance of the City's wastewater collection system.

I.B. Regulatory Requirements

GWDR Provision D.13.(i)

The collection system agency must develop goals to properly manage, operate, and maintain all parts of its wastewater collection system in order to reduce and prevent sanitary sewer overflows (SSOs), as well as to mitigate any SSOs that occur.

I.C. Sewer System Management Plan Goals

Providing safe, responsive, and reliable sewage conveyance is a key component of the goals and objectives of the City's Public Works Department. The City of Rio Vista Public Works Department defines their role being "to operate and maintain existing, as well as plan and design future, public facilities of the City."

The following SSMP goals reflect both the City's defined values and take into consideration the particular location of the City adjacent to the Sacramento River.

- Minimize sanitary sewer overflows.
- Prevent public health hazards.
- Minimize inconveniences by responsibly handling interruptions in service.
- Protect the large investment in wastewater collection system by maintaining adequate capacities and extending useful life.
- Prevent unnecessary damage to public and private property.
- Use funds available for sewer operations in the most efficient manner.
- Convey wastewater to treatment facilities with a minimum of infiltration, inflow, and exfiltration.
- Provide adequate capacity to convey peak flows.
- Perform all operations in a safe manner to avoid personal injury and property damage.
- Minimize impacts on environmentally sensitive waterways, such as the Sacramento River.

- Analyze the future treatment facility consolidation together with the collection system capacity to provide cost effective and efficient projects.

This SSMP supplements and supports the City's existing Maintenance and Operations Program and goals by providing high-level, consolidated guidelines and procedures for all aspects of the City's wastewater system management. The SSMP guides the proper management of the collection system and assists the City in minimizing the frequency and impacts of SSOs by providing direction for appropriate maintenance, capacity management, and emergency response.

ELEMENT II. ORGANIZATION

II.A. Introduction

This section of the SSMP identifies City staff responsible for implementing this SSMP, responding to SSO events, and meeting the SSO notification and reporting requirements. This section also discusses the designation of the Legally Responsible Official (LRO), who is responsible for completing and certifying spill reports submitted to the SWRCB's on-line reporting system (CIWQS). This section fulfills the organization requirement of the SWRCB (Element II) SSMP requirements.

II.B. Regulatory Requirements

GWDR Provision D.13.(ii)

The collection system agency's SSMP must identify:

- (a) The name of the responsible or authorized representative;*
- (b) The names and telephone numbers for management, administration, and maintenance positions responsible for implementing specific measures in the SSMP program. Include lines of authority as shown in an organization chart or similar document with a narrative explanation; and*
- (c) The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board and/or the California Office of Emergency Services (Cal OES)).*

II.C. Organization and Staffing

The organization chart for the management, operation and maintenance of the City's wastewater collections system is shown on **Figure II-1**. General Responsibilities are described below. **Table II-1** is a listing of the key names, position titles, and phone numbers of the people involved in implementing specific measures in the City's SSMP.

Figure II-1: Organization Chart for Public Works

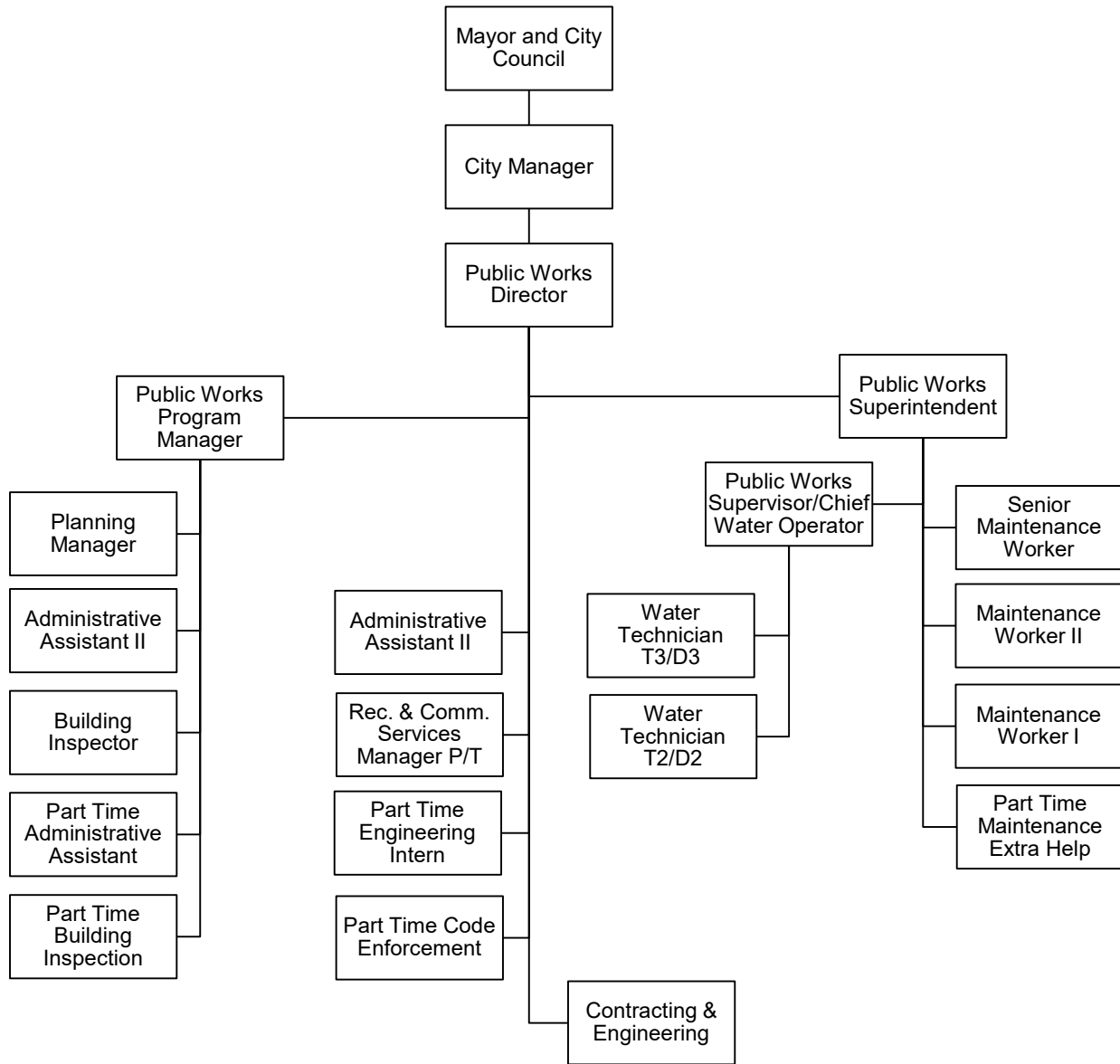


Table II-1: Key City Contact Information

| Position | Contact | Telephone Number |
|-----------------------------|------------------|------------------------|
| Mayor | Ronald Kott | 707-374-6451 |
| Vice Mayor | Rick Dolk | 707-374-6451 |
| Council Member | Edwin Okamura | 707-374-6451 |
| Council Member | Walt Stanish | 707-374-6451 |
| Council Member | Robie Williams | 707-374-6451 |
| Interim City Manager | Phil Carter | 707-374-6451 |
| Assistant City Manager | Jennifer Schultz | 707-374-6451 |
| Public Works Director | Robin Borre | 707-374-6451 ext. 1116 |
| Public Works Superintendent | Greg Malcolm | 707-249-7506 |
| Veolia Management | Manuel Molina | 707-374-2633 |
| Rio Vista Fire Department | - | 707-374-2300 |

II.C.1. Description of General Responsibilities

City Council

The Rio Vista City Council is comprised of a Mayor, a Vice Mayor, and three City Council members who are each elected by the people for staggered four year terms. The City Council meetings are held the first and third Tuesdays of each month at 6:00 p.m. in the Council Chambers in City Hall located at One Main Street in Rio Vista and via Zoom. They also conduct a special Council meeting on the fourth Wednesday of each month at 5:30 p.m. in the same location. Regular Council meetings are televised on local Channel 26.

The City Council appoints the City Manager who is responsible for all the management functions of the City. The City Council also directly hires the city attorney who serves as the City’s primary legal adviser.

City Manager

The Interim City Manager, Phil Carter, is the Chief Executive Officer of the City and also serves as Executive Director of the Redevelopment Agency. As the administrative head of the City Government, the City Manager is responsible for enforcing municipal laws, directing daily operations of the City, overseeing the annual operating budget, and supervising all departments within the City organization. The City Manager also makes recommendations to the City Council on program alternatives and makes sure programs adopted by the Council are implemented.

More specifically, the formal duties of the City Manager include (but are not limited to) the following:

- Appoint employees to the City pursuant to requirements set out in the ordinance.
- Direct and supervise the administration of all departments, offices and agencies of the City.

- Annually prepare, submit, and administer the budget, capital improvement plan and other plans and programs of the City as required by the Council.
- Keep the Council advised of the financial condition, current and future needs of the City.
- Enforce all City laws and ordinances.
- Prepare and submit reports to the Council concerning the needs and operations of City programs, departments, offices and agencies.

In addition, the City Manager oversees the functions of Human Resources and Risk Management, Economic Development, and state and federal grant processing.

Public Works

Robin Borre is the Public Works Director. The role of the Public Works Department is to operate and maintain existing public facilities of the City and to plan and design future facilities. This role is performed in close coordination with the City's Community Development Department to ensure adherence to the City's General Plan and other development regulations, and the City's Police and Fire Departments.

The Public Works Department is responsible for water utility and wastewater utility systems. Other facilities that the Public Works Department is responsible for include, but are not limited to, City streets, sidewalks, street lights, storm drainage systems, street trees and landscaping, traffic signs and markings, and parks.

Greg Malcolm is the Public Works Superintendent. The Public Works Superintendent is responsible for electronic reporting of overflow events associated with lift stations or the wastewater collection system.

Engineering

Cecil Dillon with Dillon & Murphy Engineering is the City Engineer, on a contract basis. The City Engineer provides technical support and engineering analysis and design for City projects.

Veolia Management

The City has an operations, maintenance and management (O&M) services contract with Veolia, a third-party vendor who provides wastewater services to both the Northwest and Beach WWTPs. The Veolia Project Manager, Manuel Molina, manages the delivery of O&M services for the wastewater pump stations and treatment plants.

In the event of an overflow associated with a lift station, the Veolia Project Manager gathers the necessary information and reports it to the Public Works Superintendent.

II.C.2. Legally Responsible Official (LRO)

The City's authorized representative having signatory and certification authority in all wastewater collection system matters is the Public Works Superintendent, Greg Malcolm. The Public Works Director, Robin Borre, is authorized to act in Superintendent's absence.

II.C.3. Responsibility for SSMP Implementation

The Public Works Superintendent is responsible for implementing all elements of this SSMP. The Public Works Superintendent coordinates with the Public Works Director regarding construction of new City-owned sewer facilities. **Table II-2** below identifies the City staff responsibilities for SSMP elements. Vacancies in these positions occur from time to time. Current staff lists can be found on the City web site ([Directory Listings | Rio Vista California \(riovistacity.com\)](http://riovistacity.com)).

Table II-2. City Staff Responsibility for SSMP Elements

| SSMP Element | Responsible Official | Name |
|---|-----------------------------|--------------|
| I – Goals | Public Works Superintendent | Greg Malcolm |
| II – Organization | Public Works Director | Robin Borre |
| III – Legal Authority | Public Works Director | Robin Borre |
| IV – Operations and Maintenance Program | Public Works Superintendent | Greg Malcolm |
| V – Design and Performance Provisions | Engineering | Cecil Dillon |
| VI – SSO Emergency Response Plan | Public Works Superintendent | Greg Malcolm |
| VII – FOG Control Program | Public Works Superintendent | Greg Malcolm |
| VIII – System Evaluation and Capacity Assurance Program | Engineering | Cecil Dillon |
| IX – Monitoring, Measurement, and Program Modifications | Public Works Superintendent | Greg Malcolm |
| X – SSMP Program Audits | Public Works Director | Robin Borre |
| XI – Communication Program | Public Works Director | Robin Borre |

II.C.4. SSO Response and Reporting Chain of Communication

The SSO reporting process is described in **Element VI. SSO Emergency Response Plan**. **Figure VI-1** depicts the chain of communication for responding to and reporting SSOs from the time of observation of an SSO to reporting the SSO to the appropriate agencies.

Table II-1 above lists the contact phone numbers for the parties involved in the chain of communication. **Table II-3** below contains a summary of the contact information for the important County and State agencies which need to be contacted in the event of an SSO.

Table II-3. Important County and State Agency Contact Information

| Contact | Telephone Number |
|--|---|
| Solano County Department of Environmental Health | 707-784-3306 |
| CVWQCB | 916-464-3291 |
| Office of Emergency Services | 800-852-7550 or 916-845-8510 |
| SWRCB Website | http://www.ciwqs/waterboards/ca/gov |

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ELEMENT III. LEGAL AUTHORITY

III.A. Introduction

This section of the SSMP discusses the City's Legal Authority, including the Municipal Code and agreements with other agencies.

III.B. Regulatory Requirements

GWDR Provision D.13.(iii)

The Wastewater Collection System Agency must demonstrate, through collection system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

- (a) Prevent illicit discharges into its wastewater collection system (examples may include infiltration and inflow (I/I), storm water, chemical dumping, unauthorized debris and cut roots, etc.);*
- (b) Require that sewers and connections be properly designed and constructed;*
- (c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the City;*
- (d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages;*
- (e) Enforce any violation of its sewer ordinances;*
- (f) Authority to inspect grease producing dischargers [from GWDR FOG provisions], and*
- (g) Authority to enforce sewer-related ordinances.*

III.C. City of Rio Vista Municipal Code

The City Municipal Code, Chapter 13.08 Article 2, which contains the City's legal authorities, was amended by the City Council with Ordinance 006-2022 on June 7, 2022 with Sections 13.02.250 through 13.08.261. The recent ordinance and municipal code is included in **Appendix III-A**. The legal authorities provided by the Municipal Code and other sources that address the regulatory requirements are summarized in **Table III-1**.

Table III-1. Summary of Legal Authorities in Municipal Code and Other Sources

| GWDR Requirement | Municipal Code Reference | Meets GWDR Requirements |
|--|---|--------------------------------|
| General | | |
| Prevent illicit discharges into the wastewater collection system | Sections 13.08.251 and 13.08.290 | Yes |
| Require that sewers and connections be properly designed and constructed | Section 13.08.280, City Design Standards Section 5 | Yes |
| Require proper installation, testing, and inspection of new and rehabilitated sewers | City Design Standards Section 5 | Yes |
| Maintenance and Inspection, Including Laterals | | |
| Clearly define City responsibility and policies | City Design Standards Section 5 | Yes |
| Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the City | Section 13.08.256 | Yes |
| FOG Source Control | | |
| Requirements to install grease removal devices, design standards for the grease removal devices, maintenance, BMP, record keeping and reporting requirements | Section 13.08.252 | Yes |
| Authority to inspect grease producing facilities | Section 13.08.256 | Yes |
| Limit the discharge of fats, oils, and grease and other debris that may cause blockages | Sections 13.08.251 | Yes |
| Enforcement | | |
| Enforce any violation of sewer ordinances | Sections 1.12.010, 13.08.259, 13.08.260 and 13.08.261 | Yes |

ELEMENT IV. OPERATIONS AND MAINTENANCE PROGRAM

IV.A. Introduction

This section is intended to provide an overview of the City's sewer system operations and maintenance (O&M) program.

IV.B. Regulatory Requirements

GWDR Provision D.13.(iv)

- (a) Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable storm water conveyance facilities;*
- (b) Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;*
- (c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;*
- (d) Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and*
- (e) Provide equipment and replacement part inventories, including identification of critical replacement parts.*

IV.C. Operations and Maintenance Program

RWQCB guidance and GWDR requirements for the O&M Program generally conform to each other. The following descriptions respond first to the SWRCB requirements. RWQCB guidance not addressed by the GWDR requirements follows at the end of this section.

IV.C.1. Collection System Maps

The City has developed a GIS database of the sanitary sewer infrastructure. This database allows the City to maintain an up-to-date map of the sewer system showing manholes, gravity sewers, force mains, and pump stations. The City's GIS database is shown on **Figure INT-1**. A GIS database of the storm drain system has also been developed by the City Engineering since the last SSMP.

IV.C.2. Preventive Operations and Maintenance

The elements of the City's sewer system O&M program include:

- Proactive, preventive, and corrective maintenance of gravity sewers;
- CCTV inspection;
- Rehabilitation and replacement of sewers that are in poor condition; and
- Periodic inspection and preventive maintenance for the pump stations.

Gravity Sewers

With current funding and staffing levels, the City proactively cleans and CCTVs the sewer system every five years. CCTV work is currently contracted with Subtronic Corporation. The City starts a new contract every five years. The City also performs preventative cleaning of sewers with a history of issues, or hot spots, on an enhanced frequency cleaning interval as necessary. The City has one combination (hydro/vacuum) unit used for the cleaning or maintenance of its sewer mains. The combination unit is generally used for the enhanced frequency cleanings.

CCTV Inspection

The CCTV inspection is intended to be performed on a five year schedule by qualified contractors who are certified in the NASSCO PACP coding system that is used internationally to assess and grade the condition of lines.

The collection system inspection is separated based on which facility the flows go to, either the Beach or Northwest facility. The Beach system has been inspected every five years since 2012. The Northwest system was last inspected in 2012 and will start the five-year cycle with the 2022 project as funding is available.

Rehabilitation and Replacement

City crews, or contractors, correct problems identified by CCTV and/or sewer cleaning crews. The CCTV data is given to the City Engineer. The City Engineer reviews the data and identifies projects which are prioritized based on condition, location, size of pipe, and risk. Repairs and replacement projects are added to the annual CIP as needed.

Wastewater Pump/Lift Stations Inspections and Maintenance

Veolia crews inspect the operation of the lift stations daily. Maintenance activities include inspecting the site, verifying pump and motor operation, and logging elevation and run times. The lift stations include SCADA systems to improve the monitoring and efficiency of operation.

IV.C.3. Rehabilitation and Replacement Program

The current budget allows the City to inspect the condition of its gravity sewers on an approximately five-year cycle. The information gathered during condition assessment is used to prioritize individual gravity sewers for repair, rehabilitation, or replacement.

Funding for the Capital Improvement Program is derived from the City's Northwest and Beach Facility Sewer System Funds. Both funds are enterprise funds. Sewer fees are established based on projected needs and are updated periodically. The budget and project description currently included in the City's Capital Improvement Program are listed in **Appendix IV-A**. Additional funding for special projects may be approved by the City Council on a case-by-case basis.

IV.C.4. Training

The City staff receives 40 hours of training per year based on the training course list. Staff is trained for both the water and wastewater systems. The training courses include Hazardous Waste Operations and Emergency Response, Water Distribution, Water Treatment, Traffic Control, Safety, Sewer Overflow & Response, and Defensive Driving. The City also conducts regular staff gatherings onsite to discuss facility operations and maintenance activity and issues.

IV.C.5. Replacement Parts

The City maintains replacement parts for critical equipment in order to minimize facility downtime. The inventory of equipment and replacement parts maintained by the City includes:

- 100 feet of all dimensions of pipe needed in stock with fittings
- Lift stations have backup pumps
- Two portable generators for lift station backup power
- Four portable pumps: Two 3-inch pumps and two 4-inch pumps

Additional mechanical items are purchased as needed.

IV.C.6. Operation and Maintenance Resources

City staff positions that perform maintenance of the collection system facilities are listed in **Table IV-1**. Staffing and resources are split between the water and wastewater systems but are sufficient to maintain services at an acceptable level and to address long-term needs.

Table IV-1. Collection System Staff Maintenance Resources

| Position/Activity | FTEs |
|--|-------------|
| Public Works Supervisor/Chief Water Operator | 1 |
| Senior Maintenance Work | 2 |
| Maintenance Worker I | 4 |
| Maintenance Worker II | 2 |
| Part Time Maintenance Extra Help | 1 |
| Total | 10 |

Some of the major pieces of equipment used to support maintenance activities and for immediate response to SSOs are listed in below:

- Four vehicles with spill kits
- Additional spill kit material in bulk at the Corporation Yard
- One vac truck with jet cleaner
- Two front-end loaders
- One forklift
- One 6-inch pump with equipment
- Traffic control equipment
- Power tools
- Two dump trucks
- One flusher truck
- Ten pick-up vehicles

ELEMENT V. DESIGN AND PERFORMANCE PROVISIONS

V.A. Introduction

The City's design and construction standards are used by City Staff and are communicated to consulting engineers and/or developers at the start of a design process or proposed development.

V.B. Regulatory Requirements

GWDR Provision D.13.(v)

- (a) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and*
- (b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.*

V.C. Design and Construction Standards

Design and construction standards and specifications for the installation of new gravity sanitary sewer mains, service laterals, manholes, lift stations, and force mains are presented in the City's Design Standards, Section 5 – Sewer (**Appendix V-A**). These standards and specifications are also used for rehabilitation of existing sewer system facilities.

The City's current design standards focus on new or replacement facilities; however, other methods of rehabilitation are considered by the City on a case-by-case basis. Such rehabilitation projects are evaluated by experienced and properly licensed professionals and follow generally accepted standards of professional care in design. Rehabilitation methods that the City may consider, as shown to be warranted following a cost-benefit analysis, may include:

- Lining of existing sewers,
- Pipe-bursting for replacement or upsizing of existing sewers, and
- Spray on coating for manholes and wet wells.

Future updates to the City's Design Standards may include standards for rehabilitation alternatives.

V.D. Procedures and Standards for Inspecting and Testing

The City Design Standards (**Appendix V-A**) also include procedures and standards for inspecting and testing sewer system components in *Specifications 5.05*. These inspection and testing standards also apply to replacement projects.

The standards for inspecting and testing sewer components are very limited. The section mentions inspection and testing for sewer lines, but does not including specific testing requirements for manholes, pumping systems or force mains. Future updates to the standards may include expanding this section to include detailed standard inspection and testing procedures for various sewer types (including rehabilitation of sewers), manholes, pumping systems and force mains.

ELEMENT VI. SSO EMERGENCY RESPONSE PLAN

VI.A. Introduction

This section is intended to provide an overview of the City's sewer system operations and maintenance (O&M) program. The detailed City's Sanitary Sewer Overflow Emergency Response Plan (OERP) and Sewer Spill Reporting Packet are provided in **Appendix VI-A**.

VI.A.1. Purpose

The OERP is designed to ensure that every report of a confirmed SSO is immediately dispatched to the appropriate crews. This plan provides a procedure that, when enacted in response to the sewer overflow/spill, will reduce or eliminate public health hazards, prevent unnecessary property damage, and minimize the inconvenience of service interruptions. This plan provides procedures for City staff to follow when responding to, cleaning up, and reporting SSOs.

VI.A.2. Objectives

The primary objectives of the SSOERP are to:

- Protect public health and the environment;
- Protect collection system personnel;
- Protect private and public property;
- Respond quickly to minimize the volume of the SSO;
- Satisfy regulatory agencies and waste discharge permit requirements;
- Minimize enforcement actions against the City; and
- Safeguard the infrastructure of the collection system.

VI.A.3. Safety

Whenever qualified City personnel respond to a report of an overflow/spill, they may encounter an emergency situation that requires immediate action. The most critical aspect of resolving an incident of this nature is to safely and competently perform the actions necessary to return the system or facility to normal operations as soon as possible.

The most important item to remember during this type of incident is that safe operations always take precedence over expediency or shortcuts. Worker and public safety also takes precedence over regulatory notifications and reporting.

Upon arrival at an SSO, the Wastewater Duty person will conduct a hazard assessment to determine potential safety hazards, including the possibility that an SSO may contain unknown hazardous waste or chemicals. On rare occasions, gasoline and industrial solvents are found in sewer systems. If a hazard is suspected, the responding field crew should notify the Rio Vista Fire Department (RVFD) Communications immediately and request the RVFD Hazardous Materials Response Team.

The Public Works Superintendent will also be notified of an SSO as soon as possible. Personnel shall stay clear of any hazards and secure the area from the public.

Depending on the nature or cause of the SSO, personnel may be required to remove a mainline blockage with a hydro-flusher, repair a damaged section of pipeline, or wash/clean a City street. At this point, it is essential that all standard safety procedures and/or duties be followed as deemed appropriate.

Typical responses may require personnel to implement the following types of safety procedures:

- Standard personal protective equipment (PPE);
- Confined space entry procedures;
- Traffic control;
- Heavy equipment operation; and/or
- Adequate communication via two-way radio and/or cellular telephone.

VI.B. Regulatory Requirements

GWDR Provision D.13.(vi)

The collection system agency shall develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

- (a) Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;*
- (b) A program to ensure appropriate response to all overflows;*
- (c) Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, regional water boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the Monitoring and Reporting Program (MRP). All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board Waste Discharge Requirements or National Pollutant Discharge Elimination System (NPDES) permit requirements. The Sewer System Management Plan should identify the officials who will receive immediate notification;*
- (d) Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;*

- (e) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and*
- (f) A program to ensure that all reasonable steps are taken to contain untreated wastewater and prevent discharge of untreated wastewater to Waters of the United States and minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.*

VI.C. Sanitary Sewer Overflow Emergency Response

Procedures for notifying primary responders and regulatory agencies are described in Section 2.1 (Notification) of the City's OERP (**Appendix VI-A**). City employees are required to report all wastewater spills to their supervisor and/or manager, secure the wastewater spill area, follow SSOERP protocol to control or halt the cause of the wastewater spill, and clean the wastewater spill as soon as possible to minimize health hazards to the public and to protect the environment.

- NOTE: Stringent regulatory notification and reporting requirements for SSOs apply, which vary depending on the category of spill. See **Section VI.D. SSO Notification and Reporting** below.
- If industrial toxic substances are involved, any volume must be immediately reported to the RVFD Hazardous Materials Response Team and then reported, as soon as possible, to the CCTV and the RWQCB.

VI.C.1. Internal SSO Communications

- The Wastewater Duty person (or Responder) should document the SSO and notify the Public Works Director and/or the Public Works Superintendent.
- The Public Works Superintendent will notify the Public Works Director, RVFD and Veolia, as needed.
- The Public Works Superintendent will meet with field crew(s) at the site of the SSO event to assess the situation, document the conditions with field logs and photos, and direct recovery and cleanup activities.
- The Public Works Director will generally notify regulatory agencies as described in **Section VI.D. SSO Notification and Reporting** of this section. In the Public Works Director' absence, the Public Works Superintendent will assume this responsibility.

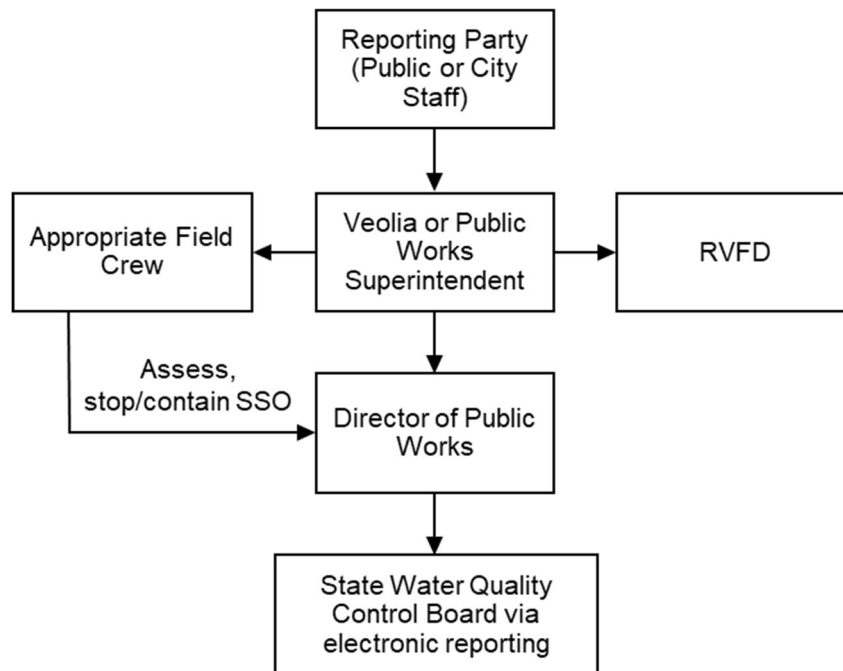
The chain of communication for reporting SSOs is as follows:

- The public or City staff alerts Veolia, or the Public Works Superintendent;
- Veolia or the Public Works Superintendent alerts the appropriate field crew of the SSO;
- Veolia or the Public Works Superintendent alerts the Public Works Director and the RVFD.

- The Public Works Director begins the reporting process as described in WQ 2013-0058-EXEC (see **Appendix VI-B**) and the City’s OERP, both included in this SSMP.
- The field crew addresses the SSO. The required posting for the general public is posted. The SSO is stopped or contained within a restricted area as soon as possible. Depending on the specific conditions, a portable pump may be set up or a pumper truck or vacuum truck may be used to prevent or reduce the overflow until the overflow repairs can be made or the sewer line is unplugged.
- After the immediate containment has been addressed the City’s Public Works Director should be notified.
- The City must provide documentation of the event to the State Water Quality Control Board via electronic reporting. The procedures and timeframes for the electronic reporting are described in WQ 2013-0058-EXEC and the City’s OERP, both of which are included in this SSMP. The written report to the City for completion of the electronic reporting shall be prepared by Veolia, the Public Works Superintendent, or a designee.

Figure VI-1 depicts the chain of communication for responding to an SSO. See **Table II-1** above for a complete listing of ESD employees and contact information.

Figure VI-1. SSO Internal Communications



VI.C.2. Duties and Procedures:

The City's emergency response procedure shall be followed for all minor or major sewage spills or overflows, and spills involving discharge from industries into City's sewer or storm systems.

The OERP is part of the Sewer Spill Reporting Packet which is included in **Appendix VI-A** of this SSMP.

Reporting Procedures

Mandatory notification and reporting requirements are described under **Section VI.D. SSO Notification and Reporting** of this section. In addition, under some circumstances, it may be appropriate to notify the following City Departments:

- Rio Vista Police and Fire Dispatch: (707) 374-2300

Control the Cause of the Wastewater Spill

- (a) Set out absorbent materials to contain the sewage overflow and prevent sewage runoff from entering into the storm system.
- (b) Do whatever is necessary to correct the origin of the wastewater spill, or, if the overflow is caused by a stoppage in the sewer collection main, call for assistance and use the hydro-flushing truck to relieve the stoppage immediately.

Main Line Stoppage and Overflow

- (a) Check downstream manholes to determine between which two manholes the stoppage exists.
- (b) Flush or rod from first clear downstream manhole towards stoppage.
- (c) Capture and remove all debris if possible. If this cannot be done, check the downstream manholes for any sign of restrictions or the possibility of a second mainline stoppage. Where possible, drag or push the debris down to a larger main for better access.
- (d) Immediately flush the area and wash down manholes and street, contain and remove any solid debris. Wash water is contained and disposed of using the Vac truck or washed down the sewer.
- (e) Collect as much of the SSO as possible and dispose back into the sanitary sewer system, estimating how much was captured and placed back into the sanitary sewer system.
- (f) Sanitize affected area if necessary.

Lateral Stoppage

- (a) Check main line - if clear, stoppage must be in private sewer lateral or building plumbing.
- (b) Check lower lateral from right-of-way cleanout to main line. If this line is clear, the property owner should be advised that the lower lines are clear and the problem exists in the upper section of the private sewer lateral or building plumbing and it is the responsibility of the property owner to correct the problem.

- (c) When the cleanout is buried, inaccessible, non-conforming, or non-existent, the resident should be advised that the main line is clear and it is the responsibility of the property owner to clear the blockage in the private lateral. This may require the owner providing or installing appropriate access to the private sewer lateral for servicing.
- (d) If a right-of-way cleanout exists and is accessible, the City may attempt to rod the lateral to the main and clear any stoppage that may exist as a courtesy service. If City staff cannot clear the stoppage, the property owner should be advised that the City lines are clear and it is the responsibility of the property owner to correct the problem in the private plumbing.
- (e) If the stoppage or structural defect is in the portion of the lateral in the public right-of-way, the City may repair the line on a discretionary basis.
- (f) If City staff cannot resolve a lateral stoppage or structural defect, the City will turn the project over to the property owner and the property owner will have to complete the project at their expense.

Clean-up and Mitigation

- (a) To minimize health hazards to the public and to protect the environment, start cleaning the wastewater spill area as soon as possible.
- (b) Inspect the storm drain catch basins to determine whether wastewater has entered the storm system, and to what extent.
- (c) Install air plugs or sandbags in storm lines to contain the discharge and/or wash water. Flush the area with water and vacuum up the excess or pump it back into the sanitary sewer collection system.
- (d) Remove all debris found in the wastewater spill area by vacuuming the surface area and disposing of the material as appropriate.
- (e) Thoroughly inspect the spill area before leaving.

Sampling and Lab Tests

For those SSOs that reach surface waters or drainage channels, that City staff believes may have a significant impact on water quality, and if feasible and safe, water quality samples should be collected. Samples must be taken if the SSO volume to surface waters is estimated to be greater than 50,000 gallons. Whenever possible, samples should be collected by staff who are trained in field sampling procedures.

Ideally, samples should be collected at the point of discharge and at upstream and downstream locations. The upstream location should be far enough from the spill to be unaffected by the spill. The appropriate number and location of downstream samples will depend on various factors including spill volume, volume or flow rate of receiving water, sample access, etc. Ideally, a “near field” downstream sample (e.g., 100-ft downstream) and one or more “far field” samples (e.g., 500-ft, 1000-ft) should be collected. If tidal conditions are such that it is unclear as to what is “upstream” and “downstream” from the discharge location, analysis for conductivity may be useful.

Samples should be analyzed for ammonia, dissolved oxygen, and a bacterial indicator. Field observations should also be made at each sampling location, including any visual evidence of the spill, presence of odor, or evidence of fish kills. Follow-up sampling should be conducted on successive day(s) (or at other appropriate time intervals). Such sampling is used to document when conditions return to normal, or to establish that downstream levels of ammonia and the bacterial indicator are approximately equal or less than upstream levels, or less than the applicable limits for the appropriate beneficial use.

Field crews should exercise their best judgment in deciding whether to conduct sampling and consult with the Public Works Superintendent or Public Works Director. Water quality sampling should not be given precedence over stopping the SSO, worker safety, or protection of public health. However, if sufficient personnel are available, sampling can be conducted in parallel with the clean-up effort.

Sign Posting and Barricading

- (a) To limit public interference with clean-up activities or exposure to spills, secure the area with barricades and/or yellow caution tape.
- (b) If the spill has entered an open creek, post warning signs and secure the area with barricades and/or yellow caution tape. Do not remove the signs or barricades until the results of the lab tests show the area to have returned to background levels.

Recordkeeping and Follow-up Work

- (a) A City of Rio Vista SSO Report Form shall be filled out for all system blockages that result in SSOs. This form is included in the Sewer Spill Reporting Packet included in **Appendix VI-A**. A summary file is kept by the Public Works Superintendent for tracking purposes.
- (b) The affected pipe segment will generally be scheduled for televising, which will aid in determining appropriate follow-up work needed to maintain the segment in a clear condition. The recommended follow-up work will then be scheduled, or the line segment will be added to one of the enhanced frequency cleaning lists (60-day, 90-day, or semi-annual), if needed.
- (c) Any mainline blockage that caused property damage shall be evaluated and placed on an enhanced cleaning list as appropriate.
- (d) Spot repairs, structural pipe repairs, root sawing, and root foaming are other possible follow up results of CCTV work or televising of pipe segments.

VI.D. SSO Notification and Reporting

All confirmed SSOs must be reported to the Public Works Director or designee, who will be responsible for notification and reporting to regulatory agencies. Notification and reporting requirements depend on the type of spill, as described below.

VI.D.1. External SSO Notification and Reporting Procedures

The City must report all SSOs to the SWRCB using the CIWQS. SSOs greater than or equal to 1,000 gallons that reach a drainage channel or surface water, or that occur in a location resulting in discharges to surface water, must also be reported by phone to the Cal OES within two hours as described below.

Category 1 SSOs

Definition:

All discharges of sewage resulting from a failure in the City's sanitary sewer system that:

- Reach a drainage channel and/or surface water; or
- Reach storm drain pipe and are not fully captured and returned to the sanitary sewer system.

Notification & Reporting Requirements:

2-hr Notification:

For any Category 1 SSO greater than or equal to 1,000 gallons, contact Cal OES within two (2) hours of becoming aware of the SSO, at the number(s) indicated below. The Cal OES operator will provide a Control Number and will notify other State agencies of the spill. This is the "Notification" requirement.

California Office of Emergency Services

Telephone: (800) 852-7550 or (916) 262-1621

3-day / 15-day / 45-day Reporting

As soon as possible, but no more than three (3) days after the City has knowledge of the SSO, file a draft report of the SSO using the SWRCB's online reporting database (CIWQS) at <http://ciwqs.waterboards.ca.gov/>.

A final certification must be submitted via CIWQS within fifteen (15) days of the conclusion of SSO response activities. This is the "Reporting" requirement for Category 1 SSOs.

For any Category 1 SSO in which 50,000 gallons or greater is spilled to surface waters, submit a SSO Technical Report within 45 calendar days after the end date of the SSO.

NOTE: A "Data Submitter" may enter data and create an SSO report in CIWQS. However, only a "Legally Responsible Official" (LRO) can certify SSO reports.

Category 2 SSOs

Definition:

All discharges of sewage resulting from a failure in the City's sanitary sewer system that:

- Is 1,000 gallons or greater that does not reach a drainage channel, surface water or storm drain pipe; or

- Discharge to the storm drain system that was fully captured and returned to the sanitary sewer system.

Reporting Requirements:

3-day / 15-day Reporting

As soon as possible, but no more than three (3) days after the City has knowledge of the SSO, file a draft report of the SSO using the SWRCB's online reporting database (CIWQS) at <http://ciwqs.waterboards.ca.gov/>.

A final certification must be submitted via CIWQS within fifteen (15) days of the conclusion of SSO response activities. This is the "Reporting" requirement for Category 2 SSOs.

NOTE: A "Data Submitter" may enter data and create an SSO report in CIWQS. However, only a LRO can certify SSO reports.

Category 3 SSOs

Definition:

All other discharges of sewage resulting from a failure in the City's sanitary sewer system.

Reporting Requirements:

No initial notification is required. A final certified report must be filed using CIWQS within thirty (30) days after the end of the calendar month in which the SSO occurs.

Private Lateral SSOs

Definition:

Sewage discharges caused by blockages or other problems in privately owned sewer laterals.

Reporting Requirements:

Reporting of SSOs from private laterals is **voluntary**. However, private lateral SSOs may be reported at the City's discretion through CIWQS.

No Spill Certification

Even when no SSOs occur during the calendar month, the City must certify through CIWQS that there were no SSOs for the designated month. This "No Spill Certification" must be submitted within thirty (30) days after the end of each calendar month.

CIWQS Questionnaire Annual Update

The City must annually update the CIWQS Collection System Questionnaire, even if there are no changes from the previous year.

Table VI-1 and **Table VI-2** summarize the monitoring, notification, and reporting requirements for SSOs.

Table VI-1. Summary of SSO Definitions

| CATEGORIES | DEFINITIONS [see Section A on page 5 of Order 2006-0003-DWQ, for SSO definition] |
|---|--|
| CATEGORY 1 | Discharges of untreated or partially treated wastewater of <u>any volume</u> resulting from an enrollee’s sanitary sewer system failure or flow condition that: <ul style="list-style-type: none"> • Reach surface water and/or reach a drainage channel tributary to a surface water; or • Reach a Municipal Separate Storm Sewer System (MS4) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond). |
| CATEGORY 2 | Discharges of untreated or partially treated wastewater of <u>1,000 gallons or greater</u> resulting from an enrollee’s sanitary sewer system failure or flow condition that <u>do not</u> reach surface water, a drainage channel, or a MS4 unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly. |
| CATEGORY 3 | All other discharges of untreated or partially treated wastewater resulting from an enrollee’s sanitary sewer system failure or flow condition. |
| PRIVATE LATERAL SEWAGE DISCHARGE (PLSD) | Discharges of untreated or partially treated wastewater resulting from blockages or other problems <u>within a privately owned sewer lateral</u> connected to the enrollee’s sanitary sewer system or from other private sewer assets. PLSDs that the enrollee becomes aware of may be <u>voluntarily</u> reported to the California Integrated Water Quality System (CIWQS) Online SSO Database. |

Table VI-2. Notification, Reporting, Monitoring, and Record Keeping Requirements

| ELEMENT | REQUIREMENT | METHOD |
|--|---|---|
| NOTIFICATION (see section B of MRP) | <ul style="list-style-type: none"> • Within two (2) hours of becoming aware of any Category 1 SSO <u>greater than or equal to 1,000 gallons discharged to surface water or spilled in a location where it probably will be discharged to surface water</u>, notify the California Office of Emergency Services (Cal OES) and obtain a notification control number. | Call Cal OES at: (800) 852-7550 |
| REPORTING (see section C of MRP) | <ul style="list-style-type: none"> • Category 1 SSO: Submit draft report within three business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • Category 2 SSO: Submit draft report within 3 business days of becoming aware of the SSO and certify within 15 calendar days of the SSO end date. • Category 3 SSO: Submit certified report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: Submit within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater are spilled to surface waters. • “No Spill” Certification: Certify that no SSOs occurred within 30 calendar days of the end of the month or, if reporting quarterly, the quarter in which no SSOs occurred. • Collection System Questionnaire: Update and certify every 12 months. | Enter data into the CIWQS Online SSO Database: (http://ciwqs.waterboards.ca.gov/), certified by enrollee’s Legally Responsible Official(s). |
| WATER QUALITY MONITORING (see section D of MRP) | <ul style="list-style-type: none"> • Conduct water quality sampling <u>within 48 hours</u> after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters. | Water quality results are required to be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters. |
| RECORD KEEPING (see section E of MRP) | <ul style="list-style-type: none"> • SSO event records. • Records documenting Sanitary Sewer Management Plan (SSMP) implementation and changes/updates to the SSMP. • Records to document Water Quality Monitoring for SSOs of 50,000 gallons or greater spilled to surface waters. • Collection system telemetry records if relied upon to document and/or estimate SSO Volume. | Self-maintained records shall be available during inspections or upon request. |

VI.E. Equipment

A listing of equipment used by the Public Works Department is included above in Element IV.IV.C.

VI.F. Training

VI.F.1. SSO Response Training

All employees who may have a role in responding to, reporting, and/or mitigating a SSO should receive training on at least an annual basis. All new employees should receive training before being placed in a position where they may have to respond in an independent manner, i.e. without the benefit of accompanying an experienced employee.

Employees are encouraged to participate in SSO response training and exercises offered by CWEA or other sanitation agencies, to the extent these opportunities can be accommodated within the Department's workload schedule.

VI.F.2. Recordkeeping

Records shall be kept of all training provided in support of this Plan. The records for all scheduled training courses and for each overflow emergency response training event or exercise should include date, time, place, content, name of trainer(s), and names of attendees.

ELEMENT VII. FOG CONTROL PROGRAM

VII.A. Introduction

This section of the SSMP evaluates the extent and nature of SSOs related to Fats, Oils, and Grease (FOG), the need for a FOG Control Program, and describes the justification if a FOG Control Program is not deemed necessary.

VII.B. Regulatory Requirements

GWDR Provision D.13.(vii)

The collection system agency shall evaluate its service area to determine whether a FOG control program is needed. If the collection system agency determines that a FOG program is not needed, the collection system agency must provide justification for why it is not needed. If FOG is found to be a problem, the collection system agency must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. The FOG source control program shall include the following as appropriate:

- (a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;*
- (b) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;*
- (c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;*
- (d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the grease removal devices, maintenance requirements, best management practices (BMP) requirements, record keeping and reporting requirements;*
- (e) Authority to inspect grease producing facilities, enforcement authorities, and determination of whether the collection system agency has sufficient staff to inspect and enforce the FOG ordinance;*
- (f) An identification of sewer system sections subject to FOG blockages and the establishment of a cleaning maintenance schedule for each section; and*
- (g) Development and implementation of source control measures, for all sources of FOG discharged to the sewer system, for each sewer system section identified in (f) above.*

VII.C. FOG Evaluation

The City does not have an ongoing problem with FOG or SSOs related to FOG. The City Municipal Code has been amended to include additional language regarding FOG control to prevent FOG becoming an issue in the future. The City does not have a formal FOG Control Program. The detailed justification for not needing a FOG program is provided below.

The City has 16 potential grease producing facilities, all of which are restaurants. One additional eatery is a bakery. Three of the restaurants have grease interceptors and one of the restaurants has a grease trap which prevents the discharge of FOG to the sewer system. All of the subject facilities have a cooking oil disposal receptacle located in a trash storage area and are monitored by the Solano County Health Department.

In addition to the restaurants, the City has one Endive farming and processing facility, which has been identified as a potential large source of salinity tributary to the Beach WWTP. The City is proactively reaching out to customers to identify point sources that may have contributed to plant upsets in recent years.

VII.D. Municipal Code FOG Restrictions

The City's Municipal Code Chapter 13.08.251, which defines restrictions on waste discharge into the sewer system, states that grease and oil interceptors shall be provided to non-residential users per City discretion. Interceptors are available where needed for the proper handling of wastewater containing excessive amounts of grease and oil. This chapter also contains the following discharge prohibitions related to FOG:

- Wastewater containing concentrations of FOG greater than 100 mg/L without meeting one of the following:
 - Comply with the City's FOG Grease Trap/Interceptor Best Management Program; or
 - Obtain a site-specific discharge limit (concentration based or mass based) to prevent pass through or interference of the Publicly Owned Treatment Works (POTW).
- Wastewater containing concentrations of oil and grease greater than 50 mg/L without meeting one of the following:
 - Develop and implement a best management program to prevent the introduction of petroleum-based oils and greases in amounts that will cause pass through or interference of the POTW; or
 - Obtain a site-specific discharge limit (concentration based or mass based) to prevent pass through or interference of the POTW.

In addition, the City's Municipal Code Chapter 13.08.290 contains the following discharge prohibitions related to FOG:

- Any waste having a pH lower than 6.0 or having any corrosive or detrimental characteristic that may cause injury to wastewater treatment or maintenance personnel or may cause damage to structures, equipment or other physical facilities of the sewerage system.

- Any solids or viscous substances of such size or in such quantity that they may cause obstruction to flow in the sewer or be detrimental to proper wastewater treatment plant operations.
- Any water added for the purpose of diluting wastes which would otherwise exceed applicable maximum concentration limitations.
- Any dispersed biodegradable oils and fats, such as lard, tallow or vegetable oil in excessive concentrations that would tend to cause adverse effects on the sewerage system.
- Any unreasonably large amounts of undissolved or dissolved solids.
- Any wastes with excessively high BOD, COD, or decomposable organic content.
- Any strongly odorous waste or waste tending to create odors.
- Any wastes with a pH high enough to cause alkaline incrustations on sewer walls.
- Any waste having a temperature of 120 degrees Fahrenheit or higher.
- Any waste containing substances that may precipitate, solidify or become viscous at temperatures between 50 degrees Fahrenheit and 100 degrees Fahrenheit.
- Any garbage or waste that is not pulverized sufficiently to pass through a three-eighths inch screen.

Further, according to the City's Municipal Code Chapter 13.08.290:

"No person shall discharge or cause to be discharged to any public sewer which directly or indirectly connects to the city sewerage system any wastes, if in the opinion of the city engineer such wastes may have an adverse or harmful effect on sewers, maintenance personnel, wastewater treatment plant personnel or equipment, treatment plant effluent quality, public or private property, or may otherwise endanger the public, the local environment or create a public nuisance. The city engineer, in determining the acceptability of specific wastes, shall consider the nature of the waste and the adequacy and nature of the collection treatment and disposal system available to accept the waste."

VII.E. Summary

The City has determined that a formal FOG Control Program is not needed at this time, based on the following information:

- The City has relatively few significant sources of FOG.
- The City Code includes discharge prohibitions related to limiting FOG discharges.
- There is routine cleaning to prevent accumulation of any FOG that does enter the sewer system.
- Potential FOG producing facilities are encouraged to implement the following best management practices:
 - Installation of drain screens.
 - Segregation and collection of waste cooking oil.

- Disposal of food waste (all food waste must be disposed of directly into the trash or garbage, and not in sinks).
- Employee Training on the following subjects:
 - How to “dry wipe” pots, pans, dishware and work areas before washing to remove grease.
 - How to properly dispose of food waste and solids in enclosed plastic bags prior to disposal in trash bins or containers to prevent leaking and odors.
 - The location and use of absorption products to clean under fryer baskets and other locations where grease may be spilled or dripped.
 - How to properly dispose of grease or oils from cooking equipment into a grease receptacle such as a barrel or drum without spilling.
- Best management and waste minimization practices are posted conspicuously in food preparation and dishwashing areas at all times.
- Grease control devices (GCDs) must be maintained, as necessary, to prevent odors, cross-contamination, sewer back-ups or SSOs.
- Grease rendering containers must be installed and properly maintained.

There is no record of enforcing the relevant portions of the City’s Code at potential producing facilities for violation of FOG discharge. The City’s sanitary sewer staff observe a residual amount of FOG in the sewer system. This small amount of FOG in the City’s sewer system is removed during routine cleanings and does not accumulate enough to cause blockage or FOG related SSOs.

VII.E.1. Education and Outreach

Mailers are sent to all customers annually to educate the public about FOG as well as other prohibited disposal items.

ELEMENT VIII. SYSTEM EVALUATION AND CAPACITY ASSURANCE PROGRAM

VIII.A. Introduction

This section summarizes the City's wastewater collection system capacity and hydraulic deficiency analyses and outlines the City's programs and activities to provide adequate capacity.

VIII.B. Regulatory Requirements

GWDR Provision D.13.(viii)

The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

- (a) Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events.*
- (b) Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria.*
- (c) Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, inflow and infiltration (I/I) reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.*
- (d) Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.*

VIII.C. System Evaluation and Capacity Assurance Plan (SECAP)

VIII.C.1. System Mapping

The City maintains and regularly updates system maps in GIS. The City Engineer regularly updates sewer asset GIS data with project and CCTV information.

VIII.C.2. Evaluation – Wastewater Consolidation Project

The City is in the process of conducting a Wastewater Consolidation Project, which looks at the option to abandon the Beach WWTP and convey all wastewater flow to the Northwest WWTP. As part of this effort, the City conducted a Flow and Loads Evaluation in April 2022 (see **Appendix VIII-A**). The evaluation includes an analysis of influent loads for both Beach and Northwest WWTPs using data obtained from CIWQS and the City's SCADA database. The influent loads were used in conjunction with population projections and unit flow factors to determine future flows. Future flows are estimated based on the increase in population according to the City's Department of Finance. The findings of the study suggest there is adequate capacity at the Northwest WWTP to treat current and future flows for the entire City.

The City also conducted a Collection System Evaluation in April 2022. The evaluation is included in **Appendix VIII-B**. As part of this evaluation, current and estimated future flow estimates for each sewer-shed within the City were analyzed against current lift station capacities. Since most lift-stations are connected in sequence, flows for individual sewer-sheds were extrapolated based on the estimated ratio of peak flow contributed by each sewer-shed and the total flow data from the Flow and Loads Evaluation.

VIII.C.3. Evaluation - Hydraulic Model

As part of the 2011 SSMP, the City conducted dynamic hydraulic modeling of the existing sewer system under dry and wet weather flows. A 10-year storm was used in modeling the peak wet weather flow conditions. The 2011 SSMP identified a number of system improvements, included in **Appendix VIII-C** (City of Rio Vista 2011 Sewer Evaluation and Capacity Assurance Plan). The improvements have been reviewed and updated as necessary based on current CCTV footage and the City's updated GIS database. The following modifications to the recommendations listed in Section 6.3 of the 2011 SSMP were made:

- Recommendation #1: In 2015, a portion of 8-inch sewer was upsized to 12-inch and existing 15-inch ACP was replaced with 15-inch PVC pipe. The City, after further analysis, found that the flow estimates from the 2011 study were much higher than flows that had been observed.
- Recommendations #2 thru #4 were contingent on the implementation of Recommendation #1 and also utilized flows that were determined to be overestimated, and are therefore not needed.
- The 6-inch pipes identified in Recommendation #5 were incorrectly labeled in the GIS; the existing sewer pipes in this area are 10-inches and do not require upsizing.

The City did not conduct a hydraulic modeling analysis as part of the 2022 SSMP effort; however, the updated flow evaluation described in the section above indicates adequate existing and future sanitary sewer system capacity.

Since the completion of the 2011 SSMP, the City has developed a running five-year projected CIP budget for sewer rehabilitation and repair projects. Specific projects are identified, prioritized, and scheduled within the limitations of the budget. Annual funding is also programmed in the budget to address emergency repairs on an as-needed basis.

VIII.C.4. Design Criteria

The City's Design Standards (see **Appendix V-A**) describe the requirements for the design of sewer mains, service laterals, lift stations and force mains.

VIII.C.5. Capacity Enhancement Measures - Capital Improvement Program



The City's 2011 SSMP effort identified areas of the existing sewer system which need capacity improvements to meet peak flows from a 10-year storm (**Appendix VIII-C**). After the 2011 SSMP was completed, a detailed engineering analysis was conducted by the City Engineer of the existing tributary area and future build out conditions. This analysis determined a revised diameter required for the identified pipe project. This project was constructed in 2015.

The City is currently in the process of updating the General Plan. Once the General Plan is complete, a collection system hydraulic analysis for both existing and future conditions will be done to ensure adequate future capacity as part of the Consolidation Project.

VIII.C.6. Schedule

The City is up-to-date on capacity enhancement projects for the collection system. See **Figure VIII-1** for the City's completed CIP projects from 2010-2021. **Figure VIII-2** presents the proposed CIP sewer pipeline projects and includes a schedule for additional proposed CIP work, including the Beach and Northwest WWTP Consolidation Project. A listing of the annual budgets and project descriptions for Sewer System CIP projects is included as **Appendix IV-A**.

EXHIBIT B

| | |
|---|--------------------------------|
|  | COMPLETED PROJECT 2010-2021 |
|  | COMPLETED SPOT REPAIRS |

- NOTES:
- 1) THE CITY'S SEWER SYSTEM MANAGEMENT PLAN HAS ALSO BEEN COMPLETED
 - 2) CCTV INSPECTION OF ALL THE SEWER COLLECTION SYSTEMS (BEACH WWTP AND NORTHWEST WWTP) HAS ALSO BEEN COMPLETED

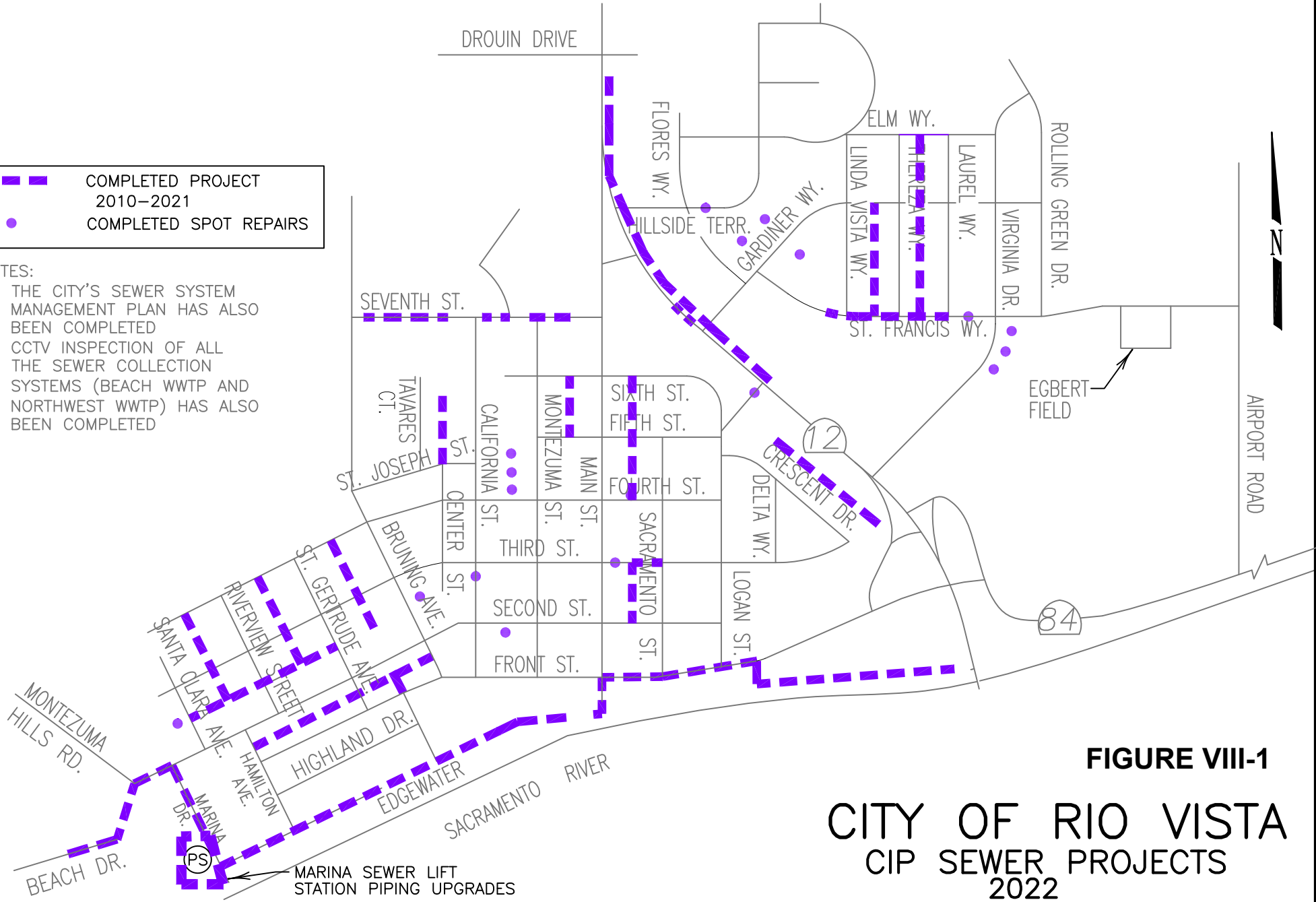


FIGURE VIII-1

CITY OF RIO VISTA CIP SEWER PROJECTS 2022

EXHIBIT B

PROPOSED CIP PROJECT SCHEDULE

- 2022/2023
- 2023/2024
- 2024/2025
- 2025/2026
- 2026/2027

PROPOSED PIPELINE PROJECTS

OTHER PROPOSED WORK

- WASTEWATER PLANTS CONSOLIDATION
- BEACH WWTP COLLECTION SYSTEM CCTV
- MISCELLANEOUS PIPE REPAIRS IDENTIFIED THROUGH CCTV INSPECTION

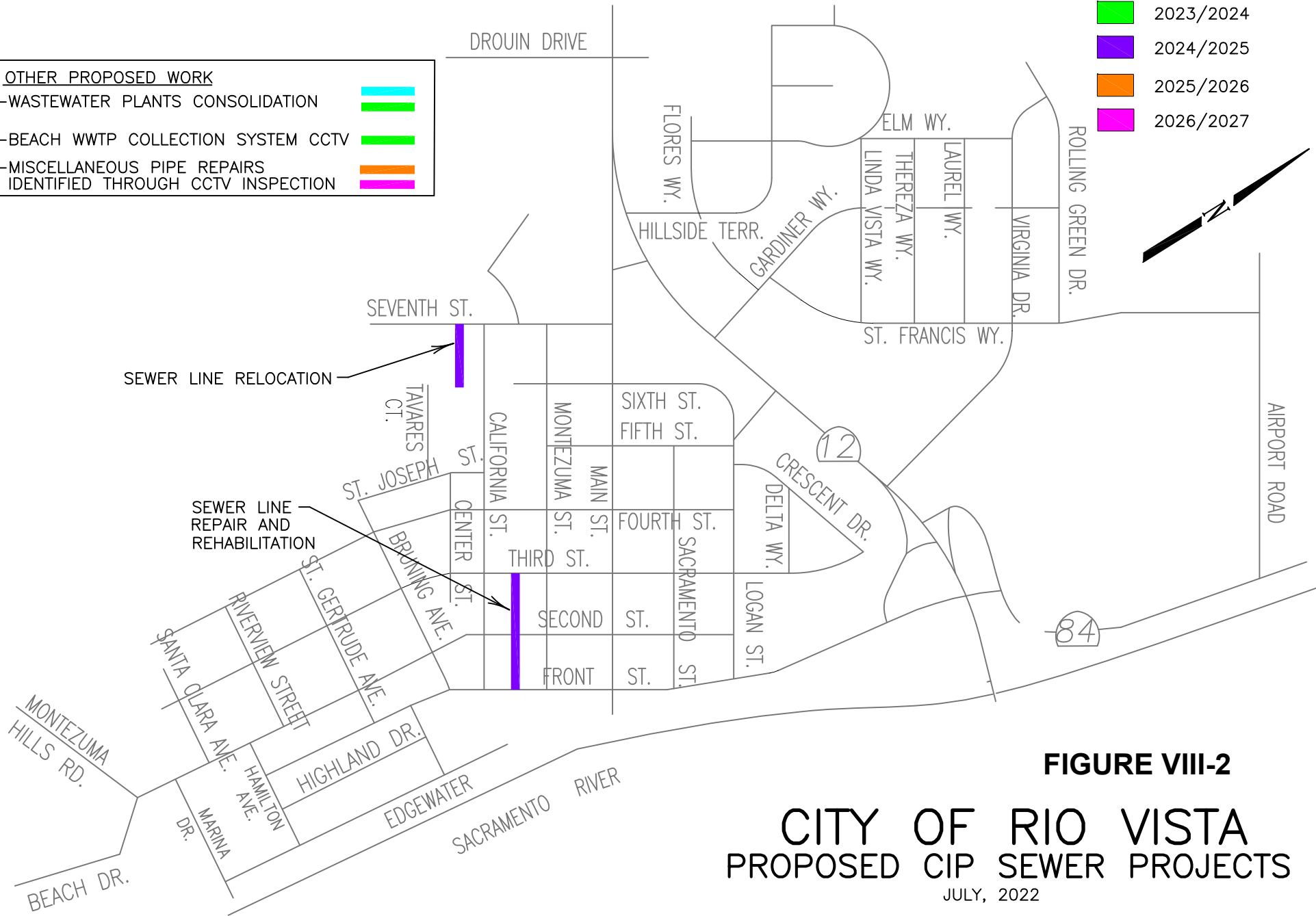


FIGURE VIII-2
CITY OF RIO VISTA
PROPOSED CIP SEWER PROJECTS
 JULY, 2022

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ELEMENT IX. MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

IX.A. Introduction

This section of the SSMP outlines the process that the City will follow to evaluate the effectiveness of the SSMP and to identify updates that may be needed for a more effective program.

IX.B. Regulatory Requirements

GWDR Provision D.13.(x)

The Enrollee shall:

- (a) Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;*
- (b) Monitor the implementation and, where appropriate, measure the effectiveness of each Element of the SSMP;*
- (c) Assess the success of the preventative maintenance program;*
- (d) Update program elements, as appropriate, based on monitoring or performance evaluations; and*
- (e) Identify and illustrate SSO trends, including frequency, location, and volume.*

IX.C. Performance Measures

For each of the 11 elements of the SSMP, the City has developed a set of performance measures that will be used to evaluate the effectiveness of each element. **Table IX-1** outlines each element and its corresponding performance measures.

For the ten-year period between 2011 and 2021, the City averaged less than one SSO per year. There were two years with two SSOs in 2015 and 2016, and there were no SSOs in 2011, 2014, 2018, and 2021.

The causes of SSOs from 2011 to 2021 included construction debris (1), force main rupture (1), pipe failure (1), roots and debris (1), rags/wipes/debris (2), and pump station failure (3). The City implements regular maintenance of the collection system and deploys both chemical and mechanical methods for addressing root intrusion, as needed.

Table IX-1. Performance Measures for Each SSMP Element

| SSMP Element | Performance Measures |
|---|---|
| I – Goals | No measures needed |
| II – Organization | No measures needed |
| III – Legal Authority | No measures needed |
| IV – Operations and Maintenance Program | <ul style="list-style-type: none"> • Number and volume of SSOs • Cause of SSOs • Number of repeat SSOs (based on location) • Number of SSOs due to lift station failure • Staff sewer O&M training |
| V – Design and Performance Provisions | No measures needed |
| VI – SSO Emergency Response Plan | <ul style="list-style-type: none"> • Average response time • Percentage of spill contained compared to total volume of spill |
| VII – FOG Control Program | No measures needed (FOG not a problem) |
| VIII – System Evaluation and Capacity Assurance Program | <ul style="list-style-type: none"> • Number of SSOs due to capacity limitations |
| IX – Monitoring, Measurement, and Program Modifications | No measures needed |
| X – SSMP Program Audits | <ul style="list-style-type: none"> • Date of most recently completed SSMP audit • SSMP requirement review |
| XI – Communication Program | No measures needed |

IX.D. Performance Monitoring and Program Changes

The City will evaluate the performance of its wastewater collection system and SSMP effectiveness annually using the performance measures described above. Results of the evaluation will be recorded on the Biennial SSMP Audit Form. The City will also evaluate the effectiveness of individual SSMP elements. The primary tool for documenting the evaluation will be the SSMP audit. The City will prioritize its actions and initiate changes to this SSMP and the related programs based on the results of the evaluation. Examples of changes that could result from ongoing evaluation include:

- Revisions to frequency of cleaning cycles and/or food service establishment (FSE) inspections based on field observations and CCTV inspections;
- Reprioritization of rehabilitation and replacement projects based on the results of CCTV inspection, manhole inspections, and capacity analysis;
- Implementation of new methods and procedures based on experience developed in-house and from other agencies; and/or
- Increased use of information technology (GIS, GPS, and CMMS) for administrative and field operations.

The Public Works Director retains the SSMP Monitoring and Performance Evaluation Forms. A copy of the most recent SSMP Monitoring and Performance Evaluation Form is included as **Appendix IX-A**.

ELEMENT X. SSMP PROGRAM AUDITS

X.A. Introduction

This section of the SSMP outlines the process that the City will follow to evaluate the effectiveness of the SSMP and to identify updates that may be needed for a more effective program.

X.B. Regulatory Requirements

GWDR Provision D.13.(xi)

As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

X.C. Audits

The City's focus is to continue to provide high quality service to its customers by improving the management, operation, and maintenance of the sanitary sewer system. The development and maintenance of the SSMP will provide direction for the City to effectively reduce and prevent SSOs. To maintain an effective SSMP, the City will perform audits and updates, ranging from quarterly to every other year, of the SSMP elements. The schedule for SSMP evaluation is as follows:

Audits are conducted every two years in the first quarter of the year by the Public Works Director and/or an outside consultant. Other parties may be added to the future audit teams. The Public Works Director retains the audit. A copy of the most recent SSMP Program Audit is included as **Appendix X-A**.

- **Quarterly Evaluation** – The Collection System Supervisor will review and update the City organization chart to include current staff, contact information, position titles, and chain of communication. Any staff training needs or goals will also be reviewed. A form for completing the quarterly evaluation is included as **Appendix X-A**.
- **Annual Evaluation** – Each year, City staff will update the five-year CIP to include any additional improvement projects. The City will also maintain annual records of its sewer system O&M budget and actual O&M costs.
- **Bi-annual Audits** – Every other year, City staff will evaluate the effectiveness and compliance of each SSMP element and document the findings in a report. A form for completing each bi-annual audit is included in **Appendix X-A**.

The criteria for bi-annual audits and SSMP updates will be based on the performance measures outlined in **Table IX-1** of **Element IX**.

X.D. SSMP Updates

The City's SSMP will be reviewed and updated every five years, as required in subsection D.14 of WDR 2006-0003. This reoccurring review process will provide an opportunity for the City to perform a more comprehensive review of the effectiveness and compliance of the SSMP, which may result in modifications to the plan. If any significant changes are made to the SSMP, re-certification by the City Council is required.

Changes made to the SSMP will be documented in the Change Log located in **Appendix X-B**. The Change Log is effective as of adoption of this Revised SSMP. The SSMP formal adoption documents are located in **Appendix X-C**.

ELEMENT XI. COMMUNICATION PROGRAM

XI.A. Introduction

This section of the SSMP outlines the process involved in communicating with interested members of the public regarding the development, implementation, and performance of this plan.

XI.B. Regulatory Requirements

GWDR Provision D.13.(xi)

The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.

The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

XI.C. Communication during SSMP Development and Implementation

XI.C.1. Ongoing Communication of SSMP Development and Updates

The City will communicate regularly with the public on the development, implementation, and performance of the SSMP using the following outreach methods:

- **City of Rio Vista's website (<http://www.rio-vista-ca.com>):** The City maintains a website which provides the latest city-wide announcements, information on the various city departments, City Council agendas and meeting minutes, and additional information for residents. The City will post the final, council-adopted SSMP on the website and provide a means for informing the public on SSMP activities and incorporating public comment.
- **Notices and comment forms:** For residents who do not have access to the City's website, semi-annual SSMP updates and comment forms will be included in residents' sewer bills.
- **Bi-weekly City Council meetings:** The City has bi-monthly City Council meetings which provide a more personal forum for discussion and comment on the progress of the City's SSMP.
- **Printed public copies:** Hardcopies of the City's SSMP will be available for public review and comment. One copy will be at City Hall and an additional copy will be at the City's Public Works Office.

- **Water and Wastewater Monitoring Committee (WWMC) reports:** The City established the WWMC to provide transparency for the citizens of Rio Vista regarding the accounting of income and expenses of the water and wastewater enterprise funds. The WWMC provides quarterly reports that include information on preparations for upcoming projects, including the SSMP. These reports are published through local newspapers, the City’s website, e-mails to the “agenda recipients,” the Rio Vista Chamber of Commerce, City offices, and the public library.

SSO Reporting:

The Public Works Director is the primary person responsible for reporting SSOs to Cal OES. Information on individual SSOs is available to the public through a GIS-based application on the SWRCB’s web site at:

https://www.waterboards.ca.gov/water_issues/programs/sso/sso_map/sso_pub.shtml

Additional regulatory requirements call for the City to communicate with tributary and/or satellite systems. The City does not have any tributary or satellite systems, and therefore is exempt from this requirement.

XI.C.2. Internal Communication

City staff will provide the City Council with quarterly updates about SSMP performance. These briefings will be documented in the City Council minutes. City staff will also regularly meet with operations staff (Veolia) to document sewer system O&M training and performance evaluation.

APPENDIX III-A
City of Rio Vista
Sewer System Management Plan
Ordinance 006-2022 and Municipal Code

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ORDINANCE NO. 006-2022

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF RIO VISTA, CALIFORNIA, AMENDING THE RIO VISTA MUNICIPAL CODE BY REPEALING AND REPLACING CHAPTER 13.08, ARTICLE 2. TO ADOPT AN INDUSTRIAL PRETREATMENT PROGRAM

WHEREAS, the Federal "Clean Water Act" as amended by the Clean Water Act of 1977 (Pub. L. 95-217) and contained in 33 U.S.C., Section 1251 et seq. ("Act"), requires the City of Rio Vista ("City") to adopt an Industrial Pretreatment Program; and

WHEREAS, the City of Rio Vista has already made and will continue to make a substantial financial investment in its wastewater treatment systems to achieve the goals of the Act; and

WHEREAS, the City of Rio Vista seeks to provide for the use of its Publicly Owned Treatment Works ("POTW") by industries served by it without impairment of its normal function of collecting, treating, and discharging domestic wastewater, and without the discharge by the City of Rio Vista POTW of pollutants, which would violate the discharge allowed under its National Pollutant Discharge Elimination System ("NPDES") permit, storm water permit, and applicable rules of all governmental authorities with jurisdiction over such discharges; and

WHEREAS, the City Council finds that, pursuant to California Environmental Quality Act ("CEQA") Guidelines 15378 and California Public Resources Code 21065, the Ordinance is not a "project" because its adoption is not an activity that has the potential for a direct physical change or reasonably foreseeable indirect physical change in the environment.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF RIO VISTA ORDAINS THAT CHAPTER 13.08, ARTICLE 2 OF THE RIO VISTA MUNICIPAL CODE IS HEREBY AMENDED TO READ AS FOLLOWS:

Section 1. Purpose and Authority. The purpose of this Ordinance is to incorporate updated federal and state regulations and definitions, and provide more detailed submittal, locational, and processing requirements for standard wireless facilities.

Section 2. Enactment. Chapter 13.08 Article 2 of the Rio Vista Municipal Code is hereby added to the Rio Vista Municipal Code as follows: Chapter 13.08, Article 2 - Sewer Use Ordinance

(Industrial Pretreatment Program)

13.08.250—GENERAL PROVISIONS

13.08.251—GENERAL SEWER USE REQUIREMENTS

13.08.252—PRETREATMENT OF WASTEWATER

13.08.253—WASTEWATER DISCHARGE PERMITS

13.08.254—WASTEWATER DISCHARGE PERMIT ISSUANCE

13.08.255—REPORTING REQUIREMENTS

13.08.256—COMPLIANCE MONITORING

13.08.257—CONFIDENTIAL INFORMATION

13.08.258—PUBLICATION OF USERS IN SIGNIFICANT NONCOMPLIANCE

13.08.259—ADMINISTRATIVE ENFORCEMENT REMEDIES

13.08.260—JUDICIAL ENFORCEMENT REMEDIES

13.08.261—SUPPLEMENTAL ENFORCEMENT ACTION

13.08.262—MISCELLANEOUS PROVISIONS

CHAPTER 13.08, ARTICLE 2 – SEWER REGULATIONS

13.08.250—GENERAL PROVISIONS

A. Purpose and Policy

This Chapter sets forth uniform requirements for Users, as defined herein, of the Publicly Owned Treatment Works ("POTW") for the City of Rio Vista, California ("City") and enables the City to comply with all applicable State and Federal laws, including the Clean Water Act (33 United States Code [U.S.C.] section 1251 et seq.) and the General Pretreatment Regulations (Title 40 of the *Code of Federal Regulations* [CFR] Part 403). The objectives of this Chapter are:

1. To prevent the introduction of pollutants into the POTW that will interfere with its operation;
2. To prevent the introduction of pollutants into the POTW that will pass through the POTW, inadequately treated, into receiving waters, or otherwise be incompatible with the POTW;
3. To protect both POTW personnel who may be affected by wastewater and sludge in the course of their employment and the general public;
4. To enable the City to comply with its National Pollutant Discharge Elimination System ("NPDES") permit conditions, sludge use and disposal requirements, and any other Federal or State laws to which the POTW is subject.

This Chapter shall apply to all users of the POTW. This Chapter provides the authority for the City to condition or deny any and/or all discharges into the City's POTW. This Chapter authorizes the issuance of wastewater discharge permits; provides for monitoring, compliance, and enforcement activities; establishes administrative review procedures; and requires user reporting.

B. Administration

Except as otherwise provided herein, the Public Works Director, or his/her delegate, shall administer, implement, and enforce the provisions of this Chapter. Any powers granted to or duties imposed upon the Public Works Director may be delegated by the Public Works Director to a duly authorized City employee or contractor.

C. Abbreviations

The following abbreviations, when used in this Chapter, shall have the designated meanings:

BOD – Biochemical Oxygen Demand

BMP – Best Management Practice

BMR – Baseline Monitoring Report

CFR – *Code of Federal Regulations*

CIU – Categorical Industrial User

COD – Chemical Oxygen Demand

EPA – U.S. Environmental Protection Agency

gpd – gallons per day

IU – Industrial User

mg/l – milligrams per liter

NIOSH – National Institute of Occupational Safety and Health

NPDES – National Pollutant Discharge Elimination System

NSCIU – Non-Significant Categorical Industrial User

POTW – Publicly Owned Treatment Works

RCRA – Resource Conservation and Recovery Act

SIU – Significant Industrial User

SNC – Significant Noncompliance

TSS – Total Suspended Solids

U.S.C. – United States Code

D. Definitions

Unless a provision explicitly states otherwise, the following terms and phrases, as used in this Chapter, shall have the meanings hereinafter designated.

1. *Act or "the Act."* The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. section 1251 et seq.
2. *Approval Authority.* The California State Regional Water Quality Control Board, Central Valley Region.
3. *Authorized or Duly Authorized Representative of the User.*
 - (a) If the User is a corporation:
 - (1) The president, secretary, treasurer, or a vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
 - (2) The manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiate and direct other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; can ensure that the necessary systems are established or actions taken to gather complete and accurate information for wastewater discharge permit requirements;

and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

- (b) If the User is a partnership or sole proprietorship: a general partner or proprietor, respectively.
 - (c) If the User is a Federal, State, or local governmental facility: a director or highest official appointed or designated to oversee the operation and performance of the activities of the government facility, or their designee.
 - (d) The individuals described in paragraphs (a) through (c), above, may designate a Duly Authorized Representative if the authorization is in writing, the authorization specifies the individual or position responsible for the overall operation of the facility from which the discharge originates or having overall responsibility for environmental matters for the company, and the written authorization is submitted to the City.
4. *Biochemical Oxygen Demand (BOD)*. The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedures for five (5) days at 20 degrees centigrade, usually expressed as a concentration (e.g., mg/l).
 5. *Best Management Practices (BMPs)*. The schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions listed in 13.08.251A.1 and 2 of this Chapter. BMPs include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage. [Note: BMPs also include alternative means (i.e., management plans) of complying with, or in place of certain established Categorical Pretreatment Standards and effluent limits.]
 6. *Categorical Pretreatment Standard or Categorical Standard*. Any regulation containing pollutant discharge limits promulgated by EPA in accordance with sections 307(b) and (c) of the Act (33 U.S.C. section 1317) that apply to a specific category of users and that appear in 40 CFR Chapter I, Subchapter N, Parts 405-471.
 7. *Categorical Industrial User (CIU)*. An industrial user subject to a categorical pretreatment standard or categorical standard.
 8. *City; The City of Rio Vista, or the City Council of Rio Vista* shall mean the governmental entity, or the person delegated to represent the City in the implementation and enforcement of this Chapter.
 9. *Chemical Oxygen Demand (COD)*. A measure of the oxygen required to oxidize all compounds, both organic and inorganic, in water.
 10. *Control Authority*. The City of Rio Vista
 11. *Daily Maximum*. The arithmetic average of results of all effluent samples for a pollutant collected during a calendar day.
 12. *Daily Maximum Limit*. The maximum allowable discharge limit of a pollutant during a calendar day. Where daily maximum limits are expressed in units of mass, the daily discharge is the total mass discharged over the course of the day. Where daily maximum limits are expressed in terms of a concentration, the daily discharge is the

arithmetic average measurement of the pollutant concentration derived from all measurements taken that day.

13. *Environmental Protection Agency or EPA.* The United States Environmental Protection Agency or, where appropriate, the Regional Water Management Division Director, the Regional Administrator, or other duly authorized official of said agency.
14. *Existing Source.* Any source of discharge that is not a "New Source."
15. *Grab Sample.* A sample that is taken from a waste stream without regard to the flow in the waste stream and over a period of time not to exceed fifteen (15) minutes.
16. *Indirect Discharge or Discharge.* The introduction of pollutants into the POTW from any non-domestic source.
17. *Instantaneous Limit.* The maximum concentration of a pollutant allowed to be discharged at any time, determined from the analysis of any discrete or composite sample collected, independent of the industrial flow rate and the duration of the sampling event.
18. *Interference.* A discharge that, alone or in conjunction with a discharge or discharges from other sources, inhibits or disrupts the POTW, its treatment processes or operations or its sludge processes, use or disposal; and therefore, is a cause of a violation of the City's NPDES permit or of the prevention of sewage sludge use or disposal in compliance with any of the following statutory/regulatory provisions or permits issued hereunder, or any more stringent State or local regulations; section 405 of the Act; the Solid Waste Disposal Act, including Title II commonly referred to as the Resource Conservation and Recovery Act (RCRA); any State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the Solid Waste Disposal Act; the Clean Air Act; the Toxic Substances Control Act; and the Marine Protection, Research, and Sanctuaries Act.
19. *Local Limit.* Specific discharge limits developed and enforced by the City upon industrial or commercial facilities to implement the general and specific discharge prohibitions listed in 40 CFR Part 403.5(a)(1) and (b).
20. *Medical Waste.* Isolation wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, contaminated bedding, surgical wastes, potentially contaminated laboratory wastes, and dialysis wastes.
21. *Monthly Average.* The sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.
22. *Monthly Average Limit.* The highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.
23. *New Source.*
 - (a) Any building, structure, facility, or installation from which there is (or may be) a discharge of pollutants, the construction of which commenced after the publication of proposed Pretreatment Standards under section 307(c) of the Act that will be applicable to such source if such Standards are thereafter promulgated in accordance with that section, provided that:

- (1) The building, structure, facility, or installation is constructed at a site at which no other source is located; or
 - (2) The building, structure, facility, or installation totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or
 - (3) The production or wastewater generating processes of the building, structure, facility, or installation are substantially independent of an existing source at the same site. In determining whether these are substantially independent, factors such as the extent to which the new facility is integrated with the existing plant, and the extent to which the new facility is engaged in the same general type of activity as the existing source, should be considered.
- (b) Construction on a site at which an existing source is located results in a modification rather than a new source if the construction does not create a new building, structure, facility, or installation meeting the criteria of Section (1)(b) or (c) above but otherwise alters, replaces, or adds to existing process or production equipment.
- (c) Construction of a new source as defined under this paragraph has commenced if the owner or operator has:
- (1) Begun, or caused to begin, as part of a continuous onsite construction program
 - (i) any placement, assembly, or installation of facilities or equipment; or
 - (ii) significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for the placement, assembly, or installation of new source facilities or equipment; or
 - (2) Entered into a binding contractual obligation for the purchase of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under this paragraph.
24. *Non-contact Cooling Water.* Water used for cooling that does not come into direct contact with any raw material, intermediate product, waste product, or finished product.
25. *Pass Through.* A discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the City's NPDES permit, including an increase in the magnitude or duration of a violation.
26. *Person.* Any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity, or any other legal entity; or their legal representatives, agents, or assigns. This definition includes all Federal, State, and local governmental entities.

27. *pH*. A measure of the acidity or alkalinity of a solution, expressed in standard units.
28. *Pollutant*. Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, medical wastes, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, municipal, agricultural, and industrial wastes, and certain characteristics of wastewater (e.g., pH, temperature, total suspended solids [TSS], turbidity, color, BOD, COD, toxicity, or odor).
29. *Pretreatment*. The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to, or in lieu of, introducing such pollutants into the POTW. This reduction or alteration can be obtained by physical, chemical, or biological processes; by process changes; or by other means, except by diluting the concentration of the pollutants unless allowed by an applicable pretreatment standard.
30. *Pretreatment Requirements*. Any substantive or procedural requirement related to pretreatment imposed on a user, other than a pretreatment standard.
31. *Pretreatment Standards or Standards*. Pretreatment standards shall mean prohibited discharge standards, categorical pretreatment standards, and local limits.
32. *Prohibited Discharge Standards or Prohibited Discharges*. Absolute prohibitions against the discharge of certain substances; these prohibitions appear in 13.08.251 of this Chapter.
33. *Publicly Owned Treatment Works (POTW)*. A treatment works, as defined by section 212 of the Act (33 U.S.C. section 1292), which is owned by the City. This definition includes any devices and systems used in the collection, storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature and any conveyances, which convey wastewater to a treatment plant.
34. *Regional Board*. The California State Regional Water Quality Control Board, Central Valley Region.
35. *Septic Tank Waste*. Any sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.
36. *Sewage*. Human excrement and gray water (household showers, dishwashing operations, etc.).
37. *Significant Industrial User (SIU)*.

Except as provided in paragraphs (c) and (d) below, an SIU is:

- (a) An industrial user that:
 - (1) Discharges an average of twenty-five thousand (25,000) gpd or more of process wastewater to the POTW (excluding sanitary, non-contact cooling and boiler blowdown wastewater);
 - (2) Contributes a process waste stream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or

- (3) Is designated as such by the City on the basis that it has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or Requirement.
 - (b) *Categorical Industrial User*. An industrial user subject to categorical Pretreatment Standards; or
 - (c) *Non-Significant Categorical Industrial User*. The City may determine that an industrial user subject to categorical pretreatment standards is a *Non-Significant Categorical Industrial User* ("NSCIU") rather than an SIU on a finding that the industrial user never discharges more than 100 gallons per day (gpd) of total categorical wastewater (excluding sanitary, non-contact cooling and boiler blowdown wastewater, unless specifically included in the pretreatment standard) and the following conditions are met:
 - (1) The industrial user, prior to the City's finding, has consistently complied with all applicable categorical pretreatment standards and requirements;
 - (2) The industrial user annually submits the certification statement required in 13.08.255.M. [see 40 CFR Part 403.12(q)], together with any additional information necessary to support the certification statement; and
 - (3) The industrial user never discharges any untreated concentrated wastewater.
 - (d) Upon a finding that a user meeting the criteria in Subsection (a) of this Section has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the City may at any time, on its own initiative or in response to a petition received from an industrial user, and in accordance with procedures in 40 CFR Part 403.8(f)(6), determine that such user should not be considered an SIU.
38. *Slug Load or Slug Discharge*. Any discharge at a flow rate or concentration, which could cause a violation of the prohibited discharge standards in 13.08.251 of this Chapter. A slug discharge is any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge, which has a reasonable potential to cause interference or pass through, or in any other way violate the POTW's regulations, local limits or NPDES permit conditions.
39. *Storm Water*. Any flow occurring during or following any form of natural precipitation, and resulting from such precipitation, including snowmelt.
40. *Total Suspended Solids or Suspended Solids (TSS)*. The total suspended matter that floats on the surface of, or is suspended in, water, wastewater, or other liquid, and that is removable by laboratory filtering.
41. *User*. A source of discharge to the POTW.
42. *Wastewater*. Liquid and water-carried industrial wastes and sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or untreated, which are contributed to the POTW.
43. *Wastewater Treatment Plant or Treatment Plant*. That portion of the POTW which is designed to provide treatment of municipal sewage and industrial waste.

13.08.251—GENERAL SEWER USE REQUIREMENTS

A. Prohibited Discharge Standards

1. *General Prohibitions.* No user shall introduce or cause to be introduced into the POTW any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the POTW whether or not they are subject to categorical pretreatment standards or any other Federal, State, or local pretreatment standards or requirements.
2. *Specific Prohibitions.* No user shall introduce or cause to be introduced into the POTW the following pollutants, substances, or wastewater:
 - (a) Pollutants which create a fire or explosive hazard in the POTW, including, but not limited to, waste streams with a closed-cup flashpoint of less than 140 degrees F (60 degrees C) using the test methods specified in 40 CFR Part 261.21. Closed-cup flashpoint values may be found in the National Institute of Occupational Safety and Health ("NIOSH") *Pocket Guide to Chemical Hazards*;
 - (b) Wastewater having a pH less than 5.0 or more than 10.0, or otherwise causing corrosive structural damage to the POTW or equipment;
 - (c) Solid or viscous substances in amounts which will cause obstruction of the flow in the POTW resulting in Interference but in no case solids greater than one half inch in any dimension;
 - (d) Pollutants, including oxygen-demanding pollutants (BOD, etc.), released in a discharge at a flow rate and/or pollutant concentration which, either singly or by interaction with other pollutants, will cause interference with the POTW;
 - (e) Wastewater having a temperature which will inhibit biological activity in the treatment plant resulting in interference, but in no case wastewater which causes the temperature at the introduction into the treatment plant to exceed 104 degrees F (40 degrees C);
 - (f) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through;
 - (g) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;
 - (h) Trucked or hauled pollutants, except at discharge points designated by the City.
3. *Process & Storage.* Pollutants, substances, or wastewater prohibited by this Section shall not be processed or stored in such a manner that they could be discharged to the POTW.

B. National Categorical Pretreatment Standards

Users must comply with the categorical pretreatment standards found at 40 CFR Chapter I, Subchapter N, Parts 405–471.

C. State Pretreatment Standards

Users must comply with State pretreatment standards.

D. Local Limits

1. Numerical Discharge Limitations

- (a) The following local discharge limits are established to protect against pass through and interference. These numeric discharge limits apply at the point where the wastewater is discharged into the POTW (i.e., "end-of-pipe"). The City may impose mass limitations in addition to, or in place of, the concentration-based limits. Where a user is subject to a categorical pretreatment standard and a local limit for a given pollutant, the more stringent limit or applicable pretreatment standard shall apply.

No user shall discharge wastewater containing pollutants in excess of the following concentrations as daily maximums:

| Pollutant | Daily Maximum Concentration (mg/l) |
|---------------------------------|---|
| Ammonia (as nitrogen) | 50.0 |
| Arsenic | 0.5 |
| Biochemical oxygen demand (BOD) | 400 |
| Cadmium | 0.02 |
| Chromium (total) | 0.01 |
| Copper | 0.5 |
| Cyanides | 0.1 |
| Lead | 0.5 |
| Mercury | 0.001 |
| Nickel | 0.2 |
| Selenium | 5.0 |
| Silver | 0.05 |
| Total suspended solids (TSS) | 400 |
| Zinc | 1.0 |

- (b) *Fat, Oil and Grease (FOG)* – No user shall discharge wastewater containing concentrations of Fats, Oils and Greases (FOG) greater than 100 mg/L without meeting one of the following:

- (1) Comply with City's FOG Grease Trap/Interceptor Best Management Program; or
- (2) Obtain a site-specific discharge limit (concentration based or mass based) to prevent pass through or interference of the POTW. FOG

limits under this provision, shall be issued under a Wastewater Discharge Permit as authorized under this Chapter.

FOG is defined as the n-Hexane Extractable Material (HEM) measured in the EPA Method 1664. FOG represents all sources of fats, oils and greases, including those of animal, vegetable, mineral spirit, and petroleum origin.

- (c) *Oil and Grease (O&G)* – No user shall discharge wastewater containing concentrations of Oil and Grease greater than 50 mg/L without meeting one of the following:
 - (1) Develop and implement a best management program to prevent the introduction of petroleum-based oils and greases in amounts that will cause pass through or interference of the POTW; or
 - (2) Obtain a site-specific discharge limit (concentration based or mass based) to prevent pass through or interference of the POTW. O&G limits under this provision, shall be issued under a wastewater discharge permit as authorized under this Chapter.

O&G is defined as the material measured in EPA Method 1664 following Silica Gel Treatment, n-Hexane Extractable Material. O&G represents only those fats, oils and greases of mineral spirit origin. It does not include fats, oils, and greases of animal or vegetable origin, or the light oils of petroleum origin.

- (d) *Total Dissolved Solids (TDS)* – No user shall discharge wastewater containing concentrations of TDS greater than 800 mg/L without meeting one of the following:
 - (1) Develop and implement a best management program to minimize the TDS pollutants in the user's discharge; or
 - (2) Obtain a site-specific discharge limit (concentration based or mass based) to prevent pass through or interference of the POTW. TDS limits under this provision, shall be issued under a wastewater discharge permit as authorized under this Chapter. The City may, in addition to, or in-place of, TDS limits, establish concentration- or mass-based limits on specific constituents of TDS.

2. Best Management Practices

The City may require users to develop and implement Best Management Practices (BMPs) to comply with the provisions of 13.08.251.A. and D. of this Chapter. BMPs implemented under this paragraph shall become the local limit and enforced as a pretreatment standard.

E. City's Right of Revision

The City reserves the right to establish, by ordinance or in wastewater discharge permits, more stringent standards or requirements on discharges to the POTW. The City reserves the right to establish discharge limitation on pollutants not listed in this Chapter, if in the opinion of the City the pollutant(s) in question have the potential to have an adverse impact on the POTW.

F. Dilution

No user shall ever increase the use of process water, or in any way attempt to dilute a discharge, as a partial or complete substitute for adequate treatment to achieve compliance with a discharge limitation unless expressly authorized by an applicable pretreatment standard or requirement. The City may impose mass limitations on users who are using dilution to meet applicable pretreatment standards or requirements, or in other cases when the imposition of mass limitations is appropriate.

13.08.252—PRETREATMENT OF WASTEWATER

A. Pretreatment Facilities

Users shall provide wastewater treatment as necessary to comply with this Chapter and shall achieve compliance with all categorical pretreatment standards, local limits, and the prohibitions established under this Chapter within the time limitations specified by EPA, the State, or the City, whichever is more stringent. Any facilities necessary for compliance shall be provided, operated, and maintained at the user's expense. Detailed plans describing such facilities and operating procedures shall be submitted to the City for review, and shall be acceptable to the City before such facilities are constructed. The review of such plans and operating procedures shall in no way relieve the user from the responsibility of modifying such facilities as necessary to produce a discharge acceptable to the City under the provisions of this Chapter.

B. Additional Pretreatment Measures

1. Whenever deemed necessary, the City may require Users to restrict their discharge during peak flow periods, designate that certain wastewater be discharged only into specific sewers, relocate and/or consolidate points of discharge, separate sewage waste streams from industrial waste streams, and such other conditions as may be necessary to protect the POTW and determine the user's compliance with the requirements of this Chapter.
2. The City may require any Person discharging into the POTW to install and maintain, on their property and at their expense, a suitable storage and flow-control facility to ensure equalization of flow. A wastewater discharge permit may be issued solely for flow equalization.
3. Grease, oil, and sand interceptors shall be provided when, in the opinion of the City, they are necessary for the proper handling of wastewater containing excessive amounts of grease and oil, or sand; except that such interceptors shall not be required for residential users. All interception units shall be of a type and capacity approved by the City, shall comply with the Fat, Oil and Grease Source Control limitations included in this Chapter, and shall be so located to be easily accessible for cleaning and inspection. Such interceptors shall be inspected, cleaned, and repaired in accordance with by the User at their expense.
4. Users with the potential to discharge flammable substances may be required to install and maintain an approved combustible gas detection meter.

C. Accidental Discharge/Slug Discharge Control Plans

The City shall evaluate whether each SIU needs an accidental discharge/slug discharge control plan or other action to control slug discharges. The City may require any User to develop, submit for approval, and implement such a plan or take such other action that may be necessary to control slug discharges. Alternatively, the City may develop such a plan for

any User. An accidental discharge/slug discharge control plan shall address, at a minimum, the following:

1. Description of discharge practices, including non-routine batch discharges;
2. Description of stored chemicals;
3. Procedures for immediately notifying the City of any accidental or slug discharge, as required by 13.08.255.I. and J. of this Chapter; and
4. Procedures to prevent adverse impact from any accidental or slug discharge. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants, including solvents, and/or measures and equipment for emergency response.

13.08.253—WASTEWATER DISCHARGE PERMITS

A. Wastewater Analysis

When requested by the City, a user must submit information on the nature and characteristics of its wastewater within thirty (30) days of the request. The City may periodically require users to update this information.

B. Wastewater Discharge Permit Requirement

1. No SIU shall discharge wastewater into the POTW without first obtaining a wastewater discharge permit from the City, except that an existing SIU that has filed a timely application pursuant to 13.08.253.E. of this Chapter may continue to discharge for the time period specified therein.
2. The City may require other users to obtain wastewater discharge permits as necessary to carry out the purposes of this Chapter.
3. Any violation of the terms and conditions of a wastewater discharge permit shall be deemed a violation of this Chapter and subjects the wastewater discharge permittee to the sanctions set out in 13.08.259 through 13.08.262 of this Chapter. Obtaining a wastewater discharge permit does not relieve a permittee of its obligation to comply with all Federal and State pretreatment standards or requirements or with any other requirements of Federal, State, and local law.

C. Wastewater Discharge Permitting: Existing Connections

Any user required to obtain a wastewater discharge permit who was discharging wastewater into the POTW prior to the effective date of this Chapter and who wishes to continue such discharges in the future, shall, within ninety (90) days after said date, apply to the City for a wastewater discharge permit in accordance with 13.08.253.E. of this Chapter, and shall not cause or allow discharges to the POTW to continue after one hundred and twenty (120) days of the effective date of this Chapter except in accordance with a wastewater discharge permit issued by the City.

D. Wastewater Discharge Permitting: New Connections

Any user required to obtain a wastewater discharge permit who proposes to begin or recommence discharging into the POTW must obtain such permit prior to the beginning or

recommencing of such discharge. An application for this wastewater discharge permit, in accordance with 13.08.253.E. of this Chapter, must be filed at least ninety (90) days prior to the date upon which any discharge will begin or recommence.

E. Wastewater Discharge Permit Application Contents

1. All Users required to obtain a wastewater discharge permit must submit a permit application. The City may require users to submit all or some of the following information as part of a permit application:
 - (a) Identifying Information.
 - (1) The name and address of the facility, including the name of the operator and owner.
 - (2) Contact information, description of activities, facilities, and plant production processes on the premises;
 - (b) Environmental Permits. A list of any environmental control permits held by or for the facility.
 - (c) Description of Operations.
 - (1) A brief description of the nature, average rate of production (including each product produced by type, amount, processes, and rate of production), and standard industrial classifications of the operation(s) carried out by such user. This description should include a schematic process diagram, which indicates points of discharge to the POTW from the regulated processes.
 - (2) Types of wastes generated, and a list of all raw materials and chemicals used or stored at the facility which are, or could accidentally or intentionally be, discharged to the POTW;
 - (3) Number and type of employees, hours of operation, and proposed or actual hours of operation;
 - (4) Type and amount of raw materials processed (average and maximum per day);
 - (5) Site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, floor drains, and appurtenances by size, location, and elevation, and all points of discharge;
 - (d) Time and duration of discharges;
 - (e) The location for monitoring all wastes covered by the permit;
 - (f) Flow Measurement. Information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from regulated process streams and other streams, as necessary, to allow use of the combined waste stream formula prescribed by 13.08.251.B.3.

(g) Measurement of Pollutants.

- (1) The categorical pretreatment standards applicable to each regulated process and any new categorically regulated processes for existing sources.
- (2) The results of sampling and analysis identifying the nature and concentration, and/or mass, where required by the standard or by the City, of regulated pollutants in the discharge from each regulated process.
- (3) Instantaneous, daily maximum, and long-term average concentrations, or mass, where required, shall be reported.
- (4) The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in 13.08.256.C. of this Chapter. Where the standard requires compliance with a BMP or pollution prevention alternative, the user shall submit documentation as required by the City or the applicable standards to determine compliance with the standard.
- (5) Sampling must be performed in accordance with procedures set out in 13.08.256.D. of this Chapter.

(h) Any requests for a monitoring waiver (or a renewal of an approved monitoring waiver) for a pollutant neither present nor expected to be present in the discharge based on the analytical monitoring for that pollutant over twelve (12) consecutive months without detecting the pollutant at the Minimum Level established by the State in the City's NPDES permit.

(i) Any other information as may be deemed necessary by the City to evaluate the permit application.

2. Incomplete or inaccurate applications will not be processed and will be returned to the user for revision.

F. (Reserved)

G. Application Signatories and Certifications

1. All wastewater discharge permit applications, user reports and certification statements must be signed by an Authorized Representative of the User and contain the certification statement required by 13.08.255. M.
2. If the designation of an Authorized Representative is no longer accurate because a different individual or position has responsibility for the overall operation of the facility or overall responsibility for environmental matters for the company, a new written authorization satisfying the requirements of this Section must be submitted to the City prior to or together with any reports to be signed by an Authorized Representative.
3. A facility determined to be an NSCIU by the City must annually submit the signed certification statement required by 13.08.255. M.

H. Wastewater Permit Decisions

The City will evaluate the data furnished by the user and may require additional information. Within forty-five (45) days of receipt of a complete permit application, the City will determine whether to issue a wastewater discharge permit. The City may deny any application for a wastewater discharge permit.

13.08.254—WASTEWATER DISCHARGE PERMIT ISSUANCE

A. Wastewater Discharge Permit Duration

A wastewater discharge permit shall be issued for a specified time period, not to exceed five (5) years from the effective date of the permit. A wastewater discharge permit may be issued for a period less than five (5) years, at the discretion of the City. Each wastewater discharge permit must indicate a specific date upon which it will expire.

B. Wastewater Discharge Permit Contents

A wastewater discharge permit shall include such conditions as are deemed reasonably necessary by the City to prevent pass through or interference, protect the quality of the water body receiving the treatment plant's effluent, protect worker and public health and safety, facilitate sludge management and disposal, and protect against damage to the POTW.

1. Wastewater discharge permits must contain:

- (a) A statement that indicates the wastewater discharge permit issuance date, expiration date and effective date;
- (b) A statement that the wastewater discharge permit is nontransferable without prior notification to the City, and provisions for furnishing the new owner or operator with a copy of the existing wastewater discharge permit or a modified wastewater discharge permit issued in accordance with 13.08.254.D;
- (c) Effluent limits, including BMPs, based on applicable pretreatment standards;
- (d) Self-monitoring, sampling, reporting, notification, and record-keeping requirements. These requirements shall include an identification of pollutants (or BMPs) to be monitored, sampling location, sampling frequency, and sample type based on Federal, State, and local law;
- (e) The process for seeking a waiver from monitoring for a pollutant neither present nor expected to be present in the discharge in accordance with 13.08.253.B;
- (f) A statement of applicable civil and criminal penalties for violation of pretreatment standards and requirements, and any applicable compliance schedule. Such schedule may not extend the time for compliance beyond that required by applicable Federal, State, or local law;
- (g) Requirements to control slug discharge, if determined by the City to be necessary; and
- (h) Any grant of the monitoring waiver by the City (13.08.253.B) must be included as a condition in the user's wastewater discharge permit.

2. Wastewater discharge permits may contain, but need not be limited to, the following conditions:
 - (a) Limits on the average and/or maximum rate of discharge, time of discharge, and/or requirements for flow regulation and equalization;
 - (b) Requirements for the installation of pretreatment technology, pollution control, or construction of appropriate containment devices, designed to reduce, eliminate, or prevent the introduction of pollutants into the POTW;
 - (c) Requirements for the development and implementation of spill control plans or other special conditions including BMPs necessary to adequately prevent accidental, unanticipated, or non-routine discharges;
 - (d) Development and implementation of waste minimization plans to reduce the amount of pollutants discharged to the POTW;
 - (e) The unit charge or schedule of user charges and fees for the management of the wastewater discharged to the POTW;
 - (f) Requirements for installation and maintenance of inspection and sampling facilities and equipment, including flow measurement devices;
 - (g) A statement that compliance with the wastewater discharge permit does not relieve the permittee of responsibility for compliance with all applicable Federal and State pretreatment standards, including those which become effective during the term of the wastewater discharge permit;
 - (h) A compliance schedule for obtaining compliance to the terms and conditions of permit, including the construction of pretreatment systems needed to attain full compliance, even if the original pretreatment system was designed to meet compliance but failed to perform as designed and modifications are required to meet full compliance; or
 - (i) Other conditions as deemed appropriate by the City to ensure compliance with this Chapter, and State and Federal laws, rules, and regulations.

C. Permit Issuance Process

1. The City is not required to provide public notice of wastewater permit issuance.
2. Permit Appeals. The user may petition the City to reconsider the terms of a wastewater discharge permit within thirty (30) days of notice of its issuance ("Request for Reconsideration").
 - (a) Failure to submit a timely petition for review shall be deemed to be a waiver of the administrative appeal.
 - (b) In its petition, the appealing party must indicate the wastewater discharge permit provisions objected to, the reasons for this objection, and the alternative condition, if any, it seeks to place in the wastewater discharge permit.
 - (c) The effectiveness of the wastewater discharge permit shall not be stayed pending the appeal.

- (d) If the City fails to act within thirty (30) days, a Request for Reconsideration shall be deemed to be denied. Decisions not to reconsider a wastewater discharge permit, not to issue a wastewater discharge permit, or not to modify a wastewater discharge permit shall be considered final administrative actions for purposes of judicial review.
- (e) Aggrieved parties seeking judicial review of the final administrative wastewater discharge permit decision must do so by filing a complaint with the Solano County Superior Court within sixty (60) days of the effective date of the wastewater discharge permit.

D. Permit Modification

The City may modify a wastewater discharge permit for good cause, including, but not limited to, the following reasons:

1. To incorporate any new or revised Federal, State, or local pretreatment standards or requirements;
2. To address significant alterations or additions to the user's operation, processes, or wastewater volume or character since the time of the wastewater discharge permit issuance;
3. A change in the POTW that requires either a temporary or permanent reduction or elimination of the authorized discharge;
4. Information indicating that the permitted discharge poses a threat to the City's POTW, personnel, or the receiving waters;
5. Violation of any terms or conditions of the wastewater discharge permit;
6. Misrepresentations or failure to fully disclose all relevant facts in the wastewater discharge permit application or in any required reporting;
7. To correct typographical or other errors in the wastewater discharge permit; or
8. To reflect a transfer of the facility ownership or operation to a new owner or operator where requested in accordance with 13.08.254.E.

E. Wastewater Discharge Permit Transfer

Wastewater discharge permits shall not be transferred to a new owner or operator. A new owner or operator must submit a wastewater discharge permit application at least ninety (90 days) prior to initiating discharge to the POTW.

F. Wastewater Discharge Permit Revocation

The City may revoke a wastewater discharge permit for good cause, including, but not limited to, the following reasons:

1. Failure to notify the City of changes to the wastewater prior to the changed discharge;
2. Failure to provide prior notification to the City of changed conditions pursuant to 13.08.255.E. of this Chapter;

3. Misrepresentation or failure to fully disclose all relevant facts in the wastewater discharge permit application;
4. Falsifying self-monitoring reports and certification statements;
5. Tampering with monitoring equipment;
6. Refusing to allow the City timely access to the facility premises and records;
7. Failure to meet effluent limitations;
8. Failure to pay fines;
9. Failure to pay sewer charges;
10. Failure to meet compliance schedules;
11. Failure to complete a wastewater survey or the wastewater discharge permit application;
12. Failure to provide advance notice of the transfer of business ownership of a permitted facility;
13. Violation of any pretreatment standard or requirement, or any terms of the wastewater discharge permit or this Chapter;
14. Wastewater discharge permits shall be void upon cessation of operations or transfer of business ownership; or
15. All wastewater discharge permits issued to a user are void upon the issuance of a new wastewater discharge permit to that user.

G. Wastewater Discharge Permit Renewal

Users with an expiring wastewater discharge permit shall apply for wastewater discharge permit renewal by submitting a complete permit application, in accordance with 13.08.253 of this Chapter, no less than sixty (60) days prior to the expiration of the user's existing wastewater discharge permit.

13.08.255—REPORTING REQUIREMENTS

A. Baseline Monitoring Reports

1. Within either one hundred eighty (180) days after the effective date of a categorical pretreatment standard, or the final administrative decision on a category determination under 40 CFR Part 403.6(a)(4), whichever is later, existing CIUs currently discharging to or scheduled to discharge to the POTW shall submit to the City a report which contains the information required by 13.08.255.A.2. At least ninety (90) days prior to commencement of their discharge, new sources, and sources that become CIUs subsequent to the promulgation of an applicable categorical standard, shall submit to the City a report which contains the information listed in paragraph 2, below. A new source shall report the method of pretreatment it intends to use to meet applicable categorical standards. A new source also shall give estimates of its anticipated flow and quantity of pollutants to be discharged.

2. Users described above shall submit the information set forth below.
- (a) All information required in the user's wastewater discharge permit and as required in the categorical pretreatment standards.
 - (b) Measurement of pollutants.
 - (1) The user shall take a minimum of one representative sample to compile that data necessary to comply with the requirements of this paragraph.
 - (2) Samples should be taken immediately downstream from pretreatment facilities if such exist or immediately downstream from the regulated process if no pretreatment exists. If other wastewaters are mixed with the regulated wastewater prior to pretreatment the user should measure the flows and concentrations necessary to allow use of the combined waste stream formula in 40 CFR Part 403.6(e) to evaluate compliance with the pretreatment standards. Where an alternate concentration or mass limit has been calculated in accordance with 40 CFR Part 403.6(e) this adjusted limit along with supporting data shall be submitted to the City;
 - (3) Sampling and analysis shall be performed in accordance with 13.08.256;
 - (4) The City may allow the submission of a baseline report which utilizes only historical data so long as the data provides information sufficient to determine the need for industrial pretreatment measures;
 - (5) The baseline report shall indicate the time, date and place of sampling and methods of analysis, and shall certify that such sampling and analysis is representative of normal work cycles and expected pollutant discharges to the POTW.
 - (c) Compliance Certification. A statement, reviewed by the user's Authorized Representative as defined in 13.08.250.D. and certified by a qualified professional, indicating whether pretreatment standards are being met on a consistent basis, and, if not, whether additional operation and maintenance (O&M) and/or additional pretreatment is required to meet the pretreatment standards and requirements.
 - (d) Compliance Schedule. If additional pretreatment and/or O&M will be required to meet the pretreatment standards, the shortest schedule by which the user will provide such additional pretreatment and/or O&M must be provided. The completion date in this schedule shall not be later than the compliance date established for the applicable pretreatment standard. A compliance schedule pursuant to this Section must meet the requirements set out in 13.08.255.B of this Chapter.
 - (e) Signature and Report Certification. All baseline monitoring reports must be certified in accordance with 13.08.255.M of this Chapter and signed by an Authorized Representative as defined in 13.08.250.D.3. of this Chapter.

B. Compliance Schedule Progress Reports

The following conditions shall apply to the compliance schedule required by 13.08.253 and 13.08.259.D. of this Chapter:

1. The schedule shall contain progress increments in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to meet the applicable pretreatment standards (such events include, but are not limited to, hiring an engineer, completing preliminary and final plans, executing contracts for major components, commencing and completing construction, and beginning and conducting routine operation);
2. No increment referred to above shall exceed nine (9) months;
3. The user shall submit a progress report to the City no later than fourteen (14) days following each date in the schedule and the final date of compliance including, as a minimum, whether or not it complied with the increment of progress, the reason for any delay, and, if appropriate, the steps being taken by the user to return to the established schedule; and
4. In no event shall more than nine (9) months elapse between such progress reports to the City.

C. Reports on Compliance with Categorical Pretreatment Standard Deadline

Within ninety (90) days following the date for final compliance with applicable categorical pretreatment standards, or in the case of a new source following commencement of the introduction of wastewater into the POTW, any user subject to such pretreatment standards and requirements shall submit to the City a report containing the information described in 13.08.253.E. of this Chapter. For Users subject to equivalent mass or concentration limits established in accordance with the procedures in 13.08.251.B., this report shall contain a reasonable measure of the user's long-term production rate. For all other Users subject to categorical pretreatment standards expressed in terms of allowable pollutant discharge per unit of production (or other measure of operation), this report shall include the User's actual production during the appropriate sampling period. All compliance reports must be signed and certified in accordance with 13.08.255.M. of this Chapter. All sampling will be done in conformance with 13.08.256.

D. Periodic Compliance Reports

1. All SIUs are required to submit periodic compliance reports even if they have been designated a NSCIU under the provisions of 13.08.253. Except as specified in 13.08.255.D., all SIUs must, at a frequency determined by the City, submit no less than twice per year (July and January, or on dates specified) reports indicating the nature, concentration of pollutants in the discharge which are limited by pretreatment standards and the measured or estimated average and maximum daily flows for the reporting period. In cases where the pretreatment standard requires compliance with a BMP or pollution prevention alternative, the user must submit documentation required by the City or the pretreatment standard necessary to determine the compliance status of the user.
2. The City may authorize a CIU to forego sampling of a pollutant regulated by a categorical pretreatment standard if the user has demonstrated through sampling and other technical factors that the pollutant is neither present nor expected to be present in the discharge, or is present only at background levels from intake water

and without any increase in the pollutant due to activities of the user. This authorization is subject to the following conditions:

- (a) The waiver may be authorized where a pollutant is determined to be present solely due to sanitary wastewater discharged from the facility provided that the sanitary wastewater is not regulated by an applicable categorical standard and otherwise includes no process wastewater.
 - (b) The monitoring waiver is valid only for the duration of the effective period of the wastewater discharge permit, but in no case longer than five (5) years. The user must submit a new request for the waiver before the waiver can be granted for each subsequent wastewater discharge permit.
 - (c) In making a demonstration that a pollutant is not present, the user must provide data from at least one sampling of the facility's process wastewater prior to any treatment present at the facility that is representative of all wastewater from all processes.
 - (d) The request for a monitoring waiver must be signed in accordance with, and include the certification statement in 13.08.255.M. (40 CFR Part 403.6(a)(2)(ii)).
 - (e) Non-detectable sample results may be used only as a demonstration that a pollutant is not present if an EPA-approved method from 40 CFR Part 136 with the lowest minimum detection level for that pollutant was used in the analysis.
 - (f) Any grant of the monitoring waiver by the City must be included as a condition in the user's wastewater discharge permit. The reasons supporting the waiver and any information submitted by the user in its request for the waiver must be maintained by the City for three (3) years after expiration of the waiver.
 - (g) Upon approval of the monitoring waiver and revision of the user's wastewater discharge permit by the City, the user must certify on each report with a statement that there has been no increase in the pollutant in its waste stream due to activities of the user.
 - (h) In the event that a waived pollutant is found to be present or is expected to be present because of changes that occur in the user's operations, the user must immediately comply with the monitoring requirements of the permit or other more frequent monitoring requirements imposed by the City and notify the City.
 - (i) This provision does not supersede certification processes and requirements established in categorical pretreatment standards, except as otherwise specified in the categorical pretreatment standard.
3. All periodic compliance reports must be signed and certified in accordance with 13.08.255.M. of this Chapter.
 4. All wastewater samples must be representative of the user's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a user to keep its monitoring facility in good working order shall not be grounds for the user to claim that sample results are unrepresentative of its discharge.

5. If a user subject to the reporting requirement in this section monitors any regulated pollutant at the appropriate sampling location more frequently than required by the City, using the procedures prescribed in 13.08.256 of this Chapter, the results of this monitoring shall be included in the report.

E. Reports of Changed Conditions

Each user must notify the City of any changes to the user's operations or system which might alter the nature, quality, or volume of its wastewater at least fifteen (15) days before the change.

1. The City may require the user to submit such information as may be deemed necessary to evaluate the changed condition, including the submission of a wastewater discharge permit application under 13.08.253 of this Chapter.
2. The City may issue a wastewater discharge permit under 13.08.254 of this Chapter or modify an existing wastewater discharge permit under 13.08.254.D. of this Chapter in response to changed conditions or anticipated changed conditions.

F. Reports of Potential Problems

1. In the case of any discharge, including, but not limited to, accidental discharges, discharges of a non-routine, episodic nature, a non-customary batch discharge, a slug discharge or slug load, that might cause potential problems for the POTW, the user shall immediately telephone and notify the City of the incident. This notification shall include the location of the discharge, type of waste, concentration and volume, if known, and corrective actions taken by the user.
2. Within five (5) days following such discharge, the user shall, unless waived by the City, submit a detailed written report describing the cause(s) of the discharge and the measures to be taken by the user to prevent similar future occurrences. Such notification shall not relieve the user of any expense, loss, damage, or other liability which might be incurred as a result of damage to the POTW, natural resources, or any other damage to person or property; nor shall such notification relieve the user of any fines, penalties, or other liability which may be imposed pursuant to this Chapter.
3. A notice shall be permanently posted on the user's bulletin board or other prominent place advising employees who to call in the event of a discharge described in 13.08.255.F.1, above. Employers shall ensure that all employees, who could cause such a discharge to occur, are advised of the emergency notification procedure.
4. SIUs are required to notify the City immediately of any changes at its facility affecting the potential for a slug discharge.

G. Reports from Unpermitted Users

All users not required to obtain a wastewater discharge permit shall provide appropriate reports to the City as the City may require.

H. Notice of Violation/Repeat Sampling and Reporting

If sampling performed by a user indicates a violation, the user must notify the City within twenty-four (24) hours of becoming aware of the violation. The user shall also repeat the sampling and analysis and submit the results of the repeat analysis to the City within thirty (30) days after becoming aware of the violation. Re-sampling by the user is not required if

the City performs sampling at the user's facility at least once a month, or if the City performs sampling at the user between the time when the initial sampling was conducted and the time when the user or the City receives the results of this sampling, or if the City has performed the sampling and analysis in lieu of the user.

If the City performed the sampling and analysis in lieu of the user, the City will perform the repeat sampling and analysis unless it notifies the user of the violation and requires the user to perform the repeat sampling and analysis.

I. Notification of the Discharge of Hazardous Waste

1. Any user who commences the discharge of hazardous waste shall notify the POTW, the EPA Regional Waste Management Division Director, and State hazardous waste authorities, in writing, of any discharge into the POTW of a substance which, if otherwise disposed of, would be a hazardous waste under 40 CFR Part 261. Such notification must include the name of the hazardous waste as set forth in 40 CFR Part 261, the EPA hazardous waste number, and the type of discharge (continuous, batch, or other). If the user discharges more than one hundred (100) kilograms of such waste per calendar month to the POTW, the notification also shall contain the following information to the extent such information is known and readily available to the user: an identification of the hazardous constituents contained in the wastes, an estimation of the mass and concentration of such constituents in the waste stream discharged during that calendar month, and an estimation of the mass of constituents in the waste stream expected to be discharged during the following twelve (12) months. All notifications must take place no later than one hundred and eighty (180) days after the discharge commences. Any notification under this paragraph need be submitted only once for each hazardous waste discharged. However, notifications of changed conditions must be submitted under 13.08.255.E. of this Chapter. The notification requirement in this Section does not apply to pollutants already reported by users subject to categorical pretreatment standards under the self-monitoring requirements of 13.08.255.B. of this Chapter.
2. Dischargers are exempt from the requirements of paragraph 1, above, during a calendar month in which they discharge no more than fifteen (15) kilograms of hazardous wastes, unless the wastes are acute hazardous wastes as specified in 40 CFR Parts 261.30(d) and 261.33(e). Discharge of more than fifteen (15) kilograms of non-acute hazardous wastes in a calendar month, or of any quantity of acute hazardous wastes as specified in 40 CFR Parts 261.30(d) and 261.33(e), requires a one-time notification. Subsequent months during which the user discharges more than such quantities of any hazardous waste do not require additional notification.
3. In the case of any new regulations under section 3001 of RCRA identifying additional characteristics of hazardous waste or listing any additional substance as a hazardous waste, the user must notify the City, the EPA Regional Waste Management Waste Division Director, and State hazardous waste authorities of the discharge of such substance within ninety (90) days of the effective date of such regulations.
4. In the case of any notification made under this Section, the user shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical.

5. This provision does not create a right to discharge any substance not otherwise permitted to be discharged by this Chapter, a permit issued there under, or any applicable Federal or State law.

J. Reporting Spills and Slug Discharges

1. The user is required to immediately report a chemical spill and/or a slug discharge to the City wastewater treatment plant. This notification shall include the location of the discharge, type of waste, concentration, and volume, if known, and corrective actions taken by the user.
2. Within five (5) days following such discharge, the user shall, unless waived by the City, submit a detailed written report describing the cause(s) of the discharge and the measures to be taken by the user to prevent similar future occurrences. Such notification shall not relieve the user of any expense, loss, damage, or other liability which might be incurred as a result of damage to the POTW, natural resources, or any other damage to person or property; nor shall such notification relieve the user of any fines, penalties, or other liability which may be imposed pursuant to this ordinance.
3. SIUs are required to notify the City immediately of any changes at its facility affecting the potential for a slug discharge.

K. Date of Receipt of Reports

Written reports will be deemed to have been submitted on the date postmarked. For reports, which are not mailed, postage prepaid, into a mail facility serviced by the United States Postal Service, the date of receipt of the report shall govern.

L. Recordkeeping

Users subject to the reporting requirements of this Chapter shall retain, and make available for inspection and copying, all records of information obtained pursuant to any monitoring activities required by this Chapter, any additional records of information obtained pursuant to monitoring activities undertaken by the user independent of such requirements, and documentation associated with BMPs established under 13.08.251.D.2. Records shall include the date, exact place, method, and time of sampling, and the name of the person(s) taking the samples; the dates analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses. These records shall remain available for a period of at least three (3) years. This period shall be automatically extended for the duration of any litigation concerning the user or the City, or where the user has been specifically notified of a longer retention period by the City.

M. Certification Statements

1. Certification of Permit Applications, User Reports, and Initial Monitoring Waiver— The following certification statement is required to be signed and submitted by users submitting wastewater discharge permit applications in accordance with 13.08.253; users submitting baseline monitoring reports under 13.08.255.A.; users submitting reports on compliance with the categorical pretreatment standard deadlines under 13.08.255.C.; users submitting periodic compliance reports required by 13.08.255.D.; and users submitting an initial request to forego sampling of a pollutant on the basis of 13.08.254.D. The following certification statement must be signed by an Authorized Representative as defined in 13.08.250.D.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. Annual Certification for NSCIUs—A facility determined to be an NSCIU by the City pursuant to 13.08.250.D. must annually submit the following certification statement signed in accordance with the signatory requirements in of 13.08.255.M. This certification must accompany an alternative report required by the City:

"Based on my inquiry of the person or persons directly responsible for managing compliance with the categorical Pretreatment Standards under 40 CFR Part _____, I certify that, to the best of my knowledge and belief that during the period from _____, _____ to _____, _____ [months, days, year]:

'(a) The facility described as _____ [facility name] met the definition of a Non-Significant Categorical Industrial User as described in 13.08.250.D of the City of Rio Vista Municipal Code;

'(b) The facility complied with all applicable Pretreatment Standards and requirements during this reporting period; and (c) the facility never discharged more than 100 gallons of total categorical wastewater on any given day during this reporting period.

'This compliance certification is based on the following information.

_____”

3. Certification of Pollutants Not Present

Users that have an approved monitoring waiver based on 13.08.254.B. must certify on each report with the following statement that there has been no increase in the pollutant in its waste stream due to activities of the user:

"Based on my inquiry of the person or persons directly responsible for managing compliance with the Pretreatment Standard for 40 CFR Part _____ [specify applicable National Pretreatment Standard part(s)], I certify that, to the best of my knowledge and belief, there has been no increase in the level of _____ [list pollutant(s)] in the wastewaters due to the activities at the facility since filing of the last periodic report under 13.08.255.D of the City of Rio Vista Municipal Code."

13.08.256—COMPLIANCE MONITORING

- A. Right of Entry: Inspection and Sampling

The City shall have the right to enter the premises of any user to determine whether the user is complying with all requirements of this Chapter and any wastewater discharge permit or order issued hereunder. Users shall allow the City ready access to all parts of the

premises for the purposes of inspection, sampling, records examination and copying, and the performance of any additional duties.

1. Where a user has security measures in force which require proper identification and clearance before entry into its premises, the user shall make necessary arrangements with its security guards so that, upon presentation of suitable identification, the City shall be permitted to enter without delay for the purposes of performing specific responsibilities.
2. The City shall have the right to set up on the user's property, or require installation of, such devices as are necessary to conduct sampling and/or metering of the user's operations.
3. The City may require the user to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the user at its own expense. All devices used to measure wastewater flow and quality shall be calibrated annually to ensure their accuracy.
4. Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the user at the written or verbal request of the City and shall not be replaced. The costs of clearing such access shall be borne by the user.
5. Unreasonable delays in allowing the City access to the user's premises shall be a violation of this Chapter.

B. Search Warrants

If the City has been refused access to a building, structure, or property, or any part thereof, and is able to demonstrate probable cause to believe that there may be a violation of this Chapter, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program of the City designed to verify compliance with this Chapter or any permit or order issued hereunder, or to protect the overall public health, safety and welfare of the community, the City may seek issuance of a search warrant from the Solano County Superior Court.

C. Analytical Requirements

All pollutant analyses, including sampling techniques, to be submitted as part of a wastewater discharge permit application or report shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto, unless otherwise specified in an applicable categorical Pretreatment Standard. If 40 CFR Part 136 does not contain sampling or analytical techniques for the pollutant in question, or where the Central Valley Water Board determines that the 40 CFR Part 136 sampling and analytical techniques are inappropriate for the pollutant in question, sampling and analyses shall be performed by using validated analytical methods or any other applicable sampling and analytical procedures, including procedures suggested by the City or other parties approved by the Central Valley Water Board.

D. Sample Collection

1. **Representative Samples:** Samples collected to satisfy reporting requirements must be based on data obtained through appropriate sampling and analysis performed during the period covered by the report, based on data that is representative of conditions occurring during the reporting period.

2. Except as indicated in paragraphs 3 and 4 below, the user must collect wastewater samples using 24-hour flow-proportional composite sampling techniques, unless time-proportional composite sampling or grab sampling is authorized by the City. Where time-proportional composite sampling or grab sampling is authorized by the City, the samples must be representative of the discharge. Using protocols (including appropriate preservation) specified in 40 CFR Part 136 and appropriate EPA guidance, multiple grab samples collected during a 24-hour period may be composited prior to the analysis as follows: for cyanide, total phenols, and sulfides the samples may be composited in the laboratory or in the field; for volatile organics and oil and grease, the samples may be composited in the laboratory. Composite samples for other parameters unaffected by the compositing procedures as documented in approved EPA methodologies may be authorized by the City, as appropriate. In addition, grab samples may be required to show compliance with instantaneous limits.
3. Samples for oil and grease, temperature, pH, cyanide, total phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.
4. For sampling required in support of baseline monitoring and 90-day compliance reports required in 13.08.255.C, a minimum of four (4) grab samples must be used for pH, cyanide, total phenols, oil and grease, sulfide and volatile organic compounds for facilities for which historical sampling data do not exist; for facilities for which historical sampling data are available, the City may authorize a lower minimum. For the reports required by paragraphs 13.08.255.D, the user is required to collect the number of grab samples necessary to assess and assure compliance by with applicable pretreatment standards and requirements.

13.08.257—CONFIDENTIAL INFORMATION

Information and data on a user obtained from reports, surveys, wastewater discharge permit applications, wastewater discharge permits, and monitoring programs, and from the City's inspection and sampling activities, shall be available to the public without restriction, unless the user specifically requests, and is able to demonstrate to the satisfaction of the City, that the release of such information would divulge information, processes, or methods of production entitled to protection as trade secrets under applicable State law. Any such request must be asserted at the time of submission of the information or data. When requested and demonstrated by the user furnishing a report that such information should be held confidential, the portions of a report which might disclose trade secrets or secret processes shall not be made available for inspection by the public, but shall be made available immediately upon request to governmental agencies for uses related to the NPDES program or pretreatment program, and in enforcement proceedings involving the person furnishing the report. Wastewater constituents and characteristics and other effluent data, as defined at 40 CFR Part 2.302 shall not be recognized as confidential information and shall be available to the public without restriction.

13.08.258—PUBLICATION OF USERS IN SIGNIFICANT NONCOMPLIANCE

The City shall publish annually, in a newspaper of general circulation that provides public notice within the jurisdictions served by the POTW, a list of the users which, at any time during the previous twelve (12) months, were in significant noncompliance with applicable pretreatment standards and requirements.

The term significant noncompliance shall be applicable to all SIUs (or any other user that violates paragraphs (C), (D) or (H) of this Section) and shall mean:

- A. Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all the measurements taken for the same pollutant parameter taken during a six (6) month period exceed (by any magnitude) a numeric pretreatment standard or requirement, including instantaneous limits as defined in 13.08.251;
- B. Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of wastewater measurements taken for each pollutant parameter during a six (6) month period equals or exceeds the product of the numeric pretreatment standard or requirement including instantaneous limits, as specified in 13.08.251 multiplied by the applicable criteria (1.4 for BOD, TSS, fats, oils and grease, and 1.2 for all other pollutants except pH);
- C. Any other violation of a pretreatment standard or requirement as defined by 13.08.251 (daily maximum, long-term average, instantaneous limit, or narrative standard) that the City determines has caused, alone or in combination with other discharges, interference or pass through, including endangering the health of POTW personnel or the general public;
- D. Any discharge of a pollutant that has caused imminent endangerment to the public or to the environment, or has resulted in the City's exercise of its emergency authority to halt or prevent such a discharge;
- E. Failure to meet, within ninety (90) days of the scheduled date, a compliance schedule milestone contained in a wastewater discharge permit or enforcement order for starting construction, completing construction, or attaining final compliance;
- F. Failure to provide within forty-five (45) days after the due date, any required reports, including baseline monitoring reports, reports on compliance with categorical pretreatment standard deadlines, periodic self-monitoring reports, and reports on compliance with compliance schedules;
- G. Failure to accurately report noncompliance; or
- H. Any other violation(s), which may include a violation of BMPs, which the City determines will adversely affect the operation or implementation of its pretreatment program.

13.08.259—ADMINISTRATIVE ENFORCEMENT REMEDIES

A. Notification of Violation

When the City finds that a user has violated, or continues to violate, any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, the City may serve upon that user a written Notice of Violation. Within thirty (30) days of the receipt of such notice, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted by the User to the City. Submission of such a plan in no way relieves the User of liability for any violations occurring before or after receipt of the Notice of Violation. Nothing in this Section shall limit the authority of the City to take any action, including emergency actions or any other enforcement action, without first issuing a Notice of Violation.

B. Consent Orders

The City may enter into consent orders, assurances of compliance, or other similar documents establishing an agreement with any User responsible for noncompliance. Such documents shall include specific action to be taken by the user to correct the noncompliance within a time period specified by the document. Such documents shall have

the same force and effect as the administrative orders issued pursuant to 13.08.259.D. and E herein and shall be judicially enforceable.

C. Show Cause Hearing

The City may order a User which has violated, or continues to violate, any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, to appear before the City and show cause why the proposed enforcement action should not be taken. Notice shall be served on the User specifying the time and place for the meeting, the proposed enforcement action, the reasons for such action, and a request that the User show cause why the proposed enforcement action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least thirty (30) days prior to the hearing. Such notice may be served on any Authorized Representative of the User as defined in 13.08.250.D. and required by 13.08.253. A show cause hearing shall not be a bar against, or prerequisite for, taking any other action against the User.

D. Compliance Orders

When the City finds that a User has violated, or continues to violate, any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, the City may issue an order to the User responsible for the discharge directing that the user come into compliance within a specified time. If the User does not come into compliance within the time provided, sewer service may be discontinued unless adequate treatment facilities, devices, or other related appurtenances are installed and properly operated. Compliance orders also may contain other requirements to address the noncompliance, including additional self-monitoring and BMPs designed to minimize the amount of pollutants discharged to the sewer. A compliance order may not extend the deadline for compliance established for a pretreatment standard or requirement, nor does a compliance order relieve the User of liability for any violation, including any continuing violation. Issuance of a compliance order shall not be a bar against, or a prerequisite for, taking any other action against the User.

E. Cease and Desist Orders

When the City finds that a User has violated, or continues to violate, any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, or that the User's past violations are likely to recur, the City may issue an order to the User directing it to cease and desist all such violations and directing the user to:

1. Immediately comply with all requirements; and
2. Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation, including halting operations and/or terminating the discharge. Issuance of a cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the user.

F. Administrative Fines

1. When the City finds that a User has violated, or continues to violate, any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, the City may fine such User in an amount not to exceed one thousand dollars (\$1,000) per violation, per day. In the case of monthly or other long-term average discharge limits, fines shall be assessed for each day during the period of violation.

2. Unpaid charges, fines, and penalties shall, after sixty (60) calendar days, be assessed an additional penalty of twenty-five percent (25%) of the unpaid balance, and interest shall accrue thereafter at a rate of one percent (1%) per month. A lien against the user's property shall be sought for unpaid charges, fines, and penalties.
3. Users desiring to dispute such fines must file a written request for the City to reconsider the fine along with full payment of the fine amount within thirty (30) days of being notified of the fine. Subject to the City's sole discretion, where a request has merit, the City may convene a hearing on the matter. In the event the User's appeal is successful, the payment, together with any interest accruing thereto, shall be returned to the User. The City may add the costs of preparing administrative enforcement actions, such as notices and orders, to the fine.
4. Issuance of an administrative fine shall not be a bar against, or a prerequisite for, taking any other action against the User.

G. Emergency Suspensions

The City may immediately suspend a User's discharge, after informal notice to the User, whenever such suspension is necessary to stop an actual or threatened discharge, which reasonably appears to present, or cause an imminent or substantial endangerment to the health or welfare of persons. The City may also immediately suspend a User's discharge, after notice and opportunity to respond, that threatens to interfere with the operation of the POTW, or which presents, or may present, an endangerment to the environment.

1. Any User notified of a suspension of its discharge shall immediately stop or eliminate its contribution. In the event of a User's failure to immediately comply voluntarily with the suspension order, the City may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the POTW, its receiving stream, or endangerment to any individuals. The City may allow the User to recommence its discharge when the user has demonstrated to the satisfaction of the City that the period of endangerment has passed, unless the termination proceedings in 13.08.259.H. of this Section are initiated against the User.
2. A User that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement, describing the causes of the harmful contribution and the measures taken to prevent any future occurrence, to the City prior to the date of any show cause or termination hearing under paragraph C or H of this Section.

Nothing in this Section shall be interpreted as requiring a hearing prior to any emergency suspension under this Section.

H. Termination of Discharge

In addition to the provisions in this Section of the Chapter, any User who violates the following conditions is subject to discharge termination:

1. Violation of wastewater discharge permit conditions;
2. Failure to accurately report the wastewater constituents and characteristics of its discharge;
3. Failure to report significant changes in operations or wastewater volume, constituents, and characteristics prior to discharge;

4. Refusal of reasonable access to the user's premises for the purpose of inspection, monitoring, or sampling; or
5. Violation of the pretreatment standards in 13.08.251 of this Chapter.

Such User will be notified of the proposed termination of its discharge and be offered an opportunity to show cause under 13.08.259.C. why the proposed action should not be taken. Exercise of this option by the City shall not be a bar to, or a prerequisite for, taking any other action against the user.

13.08.260—JUDICIAL ENFORCEMENT REMEDIES

A. Injunctive Relief

When the City finds that a User has violated, or continues to violate, any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, the City may petition the Superior Court of Solano County through the City's Attorney for the issuance of a temporary or permanent injunction, as appropriate, which restrains or compels the specific performance of the wastewater discharge permit, order, or other requirement imposed by this Chapter on activities of the user. The City may also seek such other action as is appropriate for legal and/or equitable relief, including a requirement for the User to conduct environmental remediation. A petition for injunctive relief shall not be a bar against, or a prerequisite for, taking any other action against a user.

B. Civil Penalties

1. A User who has violated, or continues to violate, any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement shall be liable to the City for a maximum civil penalty of \$1,000 per violation, per day. In the case of a monthly or other long-term average discharge limit, penalties shall accrue for each day during the period of the violation.
2. The City may recover reasonable attorneys' fees, court costs, and other expenses associated with enforcement activities, including sampling and monitoring expenses, and the cost of any actual damages incurred by the City.
3. In determining the amount of civil liability, the Court shall take into account all relevant circumstances, including, but not limited to, the extent of harm caused by the violation, the magnitude and duration of the violation, any economic benefit gained through the user's violation, corrective actions by the user, the compliance history of the User, and any other factor as justice requires.
4. Filing a suit for civil penalties shall not be a bar against, or a prerequisite for, taking any other action against a user.

C. Criminal Prosecution

1. A User who willfully or negligently violates any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement shall, upon conviction, be guilty of a misdemeanor, punishable by a fine of not more than \$1,000 per violation, per day, or imprisonment for not more than three (3) years, or both.
2. A User who willfully or negligently introduces any substance into the POTW which causes personal injury or property damage shall, upon conviction, be guilty of a

misdemeanor and be subject to a penalty of at least \$1,000 or be subject to imprisonment for not more than three (3) years, or both. This penalty shall be in addition to any other cause of action for personal injury or property damage available under State law.

3. A User who knowingly makes any false statements, representations, or certifications in any application, record, report, plan, or other documentation filed, or required to be maintained, pursuant to this Chapter, wastewater discharge permit, or order issued hereunder, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this Chapter shall, upon conviction, be punished by a fine of not more than \$1,000 per violation, per day, or imprisonment for not more than three (3) years, or both.
4. In the event of a second conviction, a User shall be punished by a fine of not more than \$1,000 per violation, per day, or imprisonment for not more than three (3) years, or both.

D. Remedies Nonexclusive

The remedies provided for in this Chapter are not exclusive. The City may take any, all, or any combination of these actions against a noncompliant user. Enforcement of pretreatment violations will generally be in accordance with the City's Enforcement Response Plan. However, the City may take other action against any User when the circumstances warrant. Further, the City is empowered to take more than one enforcement action against any noncompliant user.

13.08.261—SUPPLEMENTAL ENFORCEMENT ACTION

A. Performance Bonds

The City may decline to issue or reissue a wastewater discharge permit to any User who has failed to comply with any provision of this Chapter, a previous wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, unless such user first files a satisfactory bond, payable to the City, in a sum not to exceed a value determined by the City to be necessary to achieve consistent compliance.

B. Liability Insurance

The City may decline to issue or reissue a wastewater discharge to any User who has failed to comply with any provision of this Chapter, a previous wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, unless the User first submits proof that it has obtained financial assurances sufficient to restore or repair damage to the POTW caused by its discharge.

C. Payment of Outstanding Fees and Penalties

The City may decline to issue or reissue a wastewater discharge permit to any User who has failed to pay any outstanding fees, fines or penalties incurred as a result of any provision of this Chapter, a previous wastewater discharge permit, or order issued hereunder.

D. Water Supply Severance

Whenever a User has violated or continues to violate any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, water service to the user may be severed. Service will

recommence, at the user's expense, only after the user has satisfactorily demonstrated its ability to comply.

E. Public Nuisances

A violation of any provision of this Chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement is hereby declared a public nuisance and shall be corrected or abated as directed by the City. Any person(s) creating a public nuisance shall be subject to the provisions of the City of Rio Vista Municipal Code governing such nuisances, including reimbursing the City for any costs incurred in removing, abating, or remedying said nuisance.

13.08.262—MISCELLANEOUS PROVISIONS

A. Pretreatment Charges and Fees

The City may adopt reasonable fees for reimbursement of costs of setting up and operating the City's Pretreatment Program, which may include:

1. Fees for wastewater discharge permit applications including the cost of processing such applications;
2. Fees for monitoring, inspection, and surveillance procedures including the cost of collection and analyzing a user's discharge, and reviewing monitoring reports and certification statements submitted by users;
3. Fees for reviewing and responding to accidental discharge procedures and construction;
4. Fees for filing appeals;
5. Fees to recover administrative and legal costs (not included in paragraph A.2. of this Section) associated with the enforcement activity taken by the City to address User noncompliance; and
6. Other fees as the City may deem necessary to carry out the requirements contained herein. These fees relate solely to the matters covered by this Chapter and are separate from all other fees, fines, and penalties chargeable by the City.

B. Severability

If any provision of this Chapter is invalidated by any court of competent jurisdiction, the remaining provisions shall not be affected and shall continue in full force and effect.

Section 3. Severability.

The provisions of this Ordinance are hereby declared to be severable if any provision, clause, word, sentence or paragraph of sections, or the application thereof to any person, establishment, or circumstances, shall be held invalid. Such invalidity shall not result in the invalidity of the entire Ordinance which can be given effect without the invalid provision or application. The Rio Vista City Council hereby declares that it would have adopted this Ordinance irrespective of the invalidity of any particular portion thereof.

Section 4. Effective Date and Publication.

This Ordinance shall take effect thirty (30) days after its adoption. The City Clerk is hereby directed to publish a summary of the Ordinance within fifteen (15) days after passage in a newspaper of general circulation published in the City of Rio Vista.


I, **PAM CARONONGAN, INTERIM CITY CLERK OF THE CITY OF RIO VISTA, HEREBY CERTIFY** this Ordinance was introduced at a regular meeting of the Rio Vista City Council on **May 3, 2022** and **PASSED and ADOPTED** by the City Council of the City of Rio Vista at a regular meeting on **June 7, 2022**.

AYES:

NOES:

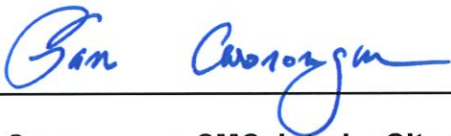
ABSENT:

ABSTAIN:



Ronald Kott, Mayor

ATTEST:



Pam Caronongan, CMC, Interim City Clerk

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*This code is current through Ordinance 001-2022 and the February 2022 code supplement

Rio Vista, California Municipal Code

Title 13 PUBLIC SERVICES

Chapter 13.08 SEWER SERVICE SYSTEM

Article 2. Sewer Regulations

13.08.250 Restrictions on waste discharge into sewer system.

13.08.260 Prohibition of harmful chemicals.

13.08.270 Unauthorized use of sewer service.

13.08.280 Approval of plans for sewerage construction.

13.08.290 Prohibited discharges.

13.08.250 Restrictions on waste discharge into sewer system.

No industrial waste shall be discharged into the sanitary sewer system if the same, in the opinion of the director of public works, such discharge:

- A. Exceeds the capacity of the sewer system or any part thereof;
- B. Causes damage to or excessive maintenance of the sewer system;
- C. Endangers the public or city personnel or results in a nuisance;

D. Causes or contributes to any violation by the city, through its operation of the sewer system of any applicable law of the federal government or the state, or rule, regulation or order of the department of public health, or the water pollution board of the state. (Prior code § 22-5.1)

13.08.260 Prohibition of harmful chemicals.

It is unlawful and a public nuisance for any person to discharge harmful chemicals, crankcase oil, grease or other petroleum products, feathers, flesh, rags or other substances which will or will tend to obstruct operation of the sewage system of the city. (Prior code § 22-5.2)

13.08.270 Unauthorized use of sewer service.

Unauthorized use of sewer service shall be defined as:

A. Dumping of solid or liquid material into the sewer system by way of a manhole or other opening into the system without first obtaining a permit from the city to do so;

B. Connecting up to the system without first paying to the city the applicable connection fee and obtaining the proper permit therefrom;

C. Discharging or causing to be discharged any rainwater, storm water, groundwater, street drainage, subsurface drainage, yard drainage, water from yard fountains, ponds or lawn sprays or any other uncontaminated water into any sewerage facility which directly or indirectly discharges to facilities owned by the city.

Any unauthorized use as defined hereinabove shall subject the person or persons responsible therefor to be charged a connection fee.

Any unauthorized use as defined hereinabove shall be a general misdemeanor punishable by a fine of not more than five hundred dollars (\$500.00) and/or six months in the county jail. (Prior code § 22-5.3)

13.08.280 Approval of plans for sewerage construction.

No person, other than employees of the city, persons contracting to do work for the city, or maintenance workers of the local sewerage agency, shall construct or cause to be constructed, or alter or cause to be altered, any public sewer, lateral sewer, house connection or industrial connection sewer over six inches in diameter, sewage pumping plant, pollution control plant, or other sewerage facility within the city where existing or proposed wastewater flows will discharge directly or indirectly to facilities of the city without first obtaining approval of sewerage construction plans from the city engineer.

The applicant shall submit to the city engineer for approval, construction plans and such specifications and other details as required to describe fully the proposed sewerage facility. The plans shall have been prepared under the supervision of and shall be signed by an engineer of suitable training registered in the state of California. (Prior code § 22-5.4)

13.08.290 Prohibited discharges.

A. No person shall discharge or cause to be discharged to a public sewer which directly or indirectly connects to the city sewerage systems, the following wastes:

1. Any gasoline, benzene, naphtha, solvent motor oil or any liquid, solid or gas that would cause or tend to cause flammable or explosive conditions to result in the sewerage system;

2. Any waste containing toxic or poisonous solids, liquids or gases in such quantities that alone or in combination with other waste substances, may create a hazard for humans, animals or local environment, interfere detrimentally with wastewater treatment process, cause a public nuisance or cause any hazardous conditions to occur in the sewerage system;

3. Any waste having a pH lower than 6.0 or having any corrosive or detrimental characteristic that may cause injury to wastewater treatment or maintenance personnel or may cause damage to structures, equipment or other physical facilities of the sewerage system;

4. Any solids or viscous substances of such size or in such quantity that they may cause obstruction to flow in the sewer or be detrimental to proper wastewater treatment plant operations. These objectionable substances include, but are not limited to, asphalt, dead animals, offal, ashes, sand, mud, straw, industrial process shavings, metal, glass, rags, feathers, tar, plastics, wood, whole blood, paunch manure, bones, hair and fleshings, entrails, paper dishes, paper cups, milk containers, or other similar paper products, either whole or ground;
5. Any rainwater, storm water, groundwater, street drainage, subsurface drainage, roof drainage, yard drainage, water from yard fountains, ponds or lawn sprays or any other uncontaminated water;
6. Any water added for the purpose of diluting wastes which would otherwise exceed applicable maximum concentration limitations;
7. Any nonbiodegradable cutting oils, commonly called soluble oil, which form persistent water emulsions;
8. Any excessive concentrations of nonbiodegradable oil, petroleum oil or refined petroleum products;
9. Any dispersed biodegradable oils and fats, such as lard, tallow or vegetable oil in excessive concentrations that would tend to cause adverse effects on the sewerage system;
10. Any waste with an excessively high concentration of cyanide;
11. Any unreasonably large amounts of undissolved or dissolved solids;
12. Any wastes with excessively high BOD, COD or decomposable organic content;
13. Any strongly odorous waste or waste tending to create odors;
14. Any wastes containing over 0.1 milligram/litter or dissolved sulfides;
15. Any wastes with a pH high enough to cause alkaline incrustations on sewer walls;
16. Any substance promoting or causing the promotion of toxic gases;
17. Any waste having a temperature of one hundred twenty (120) degrees Fahrenheit or higher;
18. Any wastes requiring an excessive quantity of chlorine or other chemical compound used for disinfection purposes;
19. Any excessive amounts of chlorinated hydrocarbon or organic phosphorus type compounds;
20. Any excessive amounts of deionized water steam condensate or distilled water;
21. Any waste containing substances that may precipitate, solidify or become viscous at temperatures between fifty (50) degrees Fahrenheit and one hundred (100) degrees Fahrenheit;
22. Any waste producing excessive discoloration of wastewater or treatment plant effluent;

23. Any garbage or waste that is not pulverized sufficiently to pass through a three-eighths inch screen;

24. Any wastes containing excessive quantities of iron, boron, chromium, phenols, plastic resins, copper, nickel, zinc, lead, mercury, cadmium, selenium, arsenic, or any other objectionable materials toxic to humans, animals, the local environment or to biological or other wastewater treatment processes;

25. Any blow-down or bleed water from cooling towers, or other evaporative cooler exceeding one-third of the makeup water;

26. Any single pass cooling water;

27. Any excessive quantities of radioactive material wastes;

28. Recognizable portions of the human anatomy.

No person shall discharge or cause to be discharged to any public sewer which directly or indirectly connects to the city sewerage system any wastes, if in the opinion of the city engineer such wastes may have an adverse or harmful effect on sewers, maintenance personnel, wastewater treatment plant personnel or equipment, treatment plant effluent quality, public or private property, or may otherwise endanger the public, the local environment or create a public nuisance. The city engineer, in determining the acceptability of specific wastes, shall consider the nature of the waste and the adequacy and nature of the collection treatment and disposal system available to accept the waste.

B. The maximum permissible quantities of concentrations of certain constituents in industrial wastewater flow shall be as follows:

| Toxicants | Maximum Allowable Concentration (mg/per liter) |
|---|---|
| Aluminum | 5.0 |
| Ammonia (as nitrogen) | 20.0 |
| Antimony | 5.0 |
| Arsenic, arsenicals | 0.5 |
| Barium | 5.0 |
| Beryllium | 1.0 |
| Bromine, chlorine and iodine (total) | 10.0 |
| Boron | 1.0 |
| Cadmium | 0.02 |
| Total identifiable chlorinated hydrocarbons | 0.002 (trace) |
| Chromium (total) | 0.01 |
| Cobalt | 1.0 |

| Toxicants | Maximum Allowable Concentration (mg/per liter) |
|------------------------|---|
| Copper | 0.5 |
| Cyanides | 0.1 |
| Fatty acids | 5.0 |
| Fluorides | 2.0 |
| Formaldehydes | 5.0 |
| Iron | 5.0 |
| Lead | 0.5 |
| Manganese | 1.0 |
| Mercury | 0.001 |
| Phenol and derivatives | 0.5 |
| Nickel | 0.2 |
| Selenium | 5.0 |

| Toxicants | Maximum Allowable Concentration (mg/per liter) |
|------------------|---|
| Silver | 0.05 |
| Zinc | 1.0 |

(Prior code § 22-5.5)

Contact:

City Clerk: 707-374-6451

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APPENDIX IV-A
City of Rio Vista
Sewer System Management Plan
Sewer System CIP Summary – Budgets and Descriptions

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Study Session
May 26, 2022



ANNUAL BUDGET
CITY OF RIO VISTA, CALIFORNIA
FISCAL YEAR 2022-2023



CITYWIDE FUND BALANCE SUMMARY

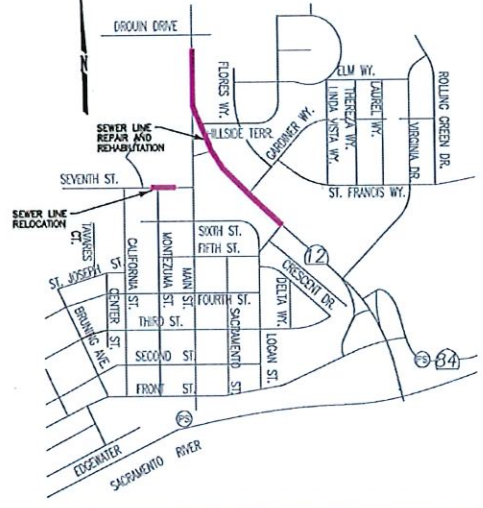
| Fund No. | Fund Name | Fund Balance at | FY 21/22 Projected | | Fund Balance at | FY 22/23 Proposed | | Fund Balance at |
|------------------------------|--|----------------------|--------------------|---------------------|----------------------|-------------------|---------------------|----------------------|
| | | 6/30/21 | Revenues | Expenditures | 6/30/22 | Revenues | Expenditures | 6/30/23 |
| GENERAL FUND | | | | | | | | |
| 002 | Measure O | \$ - | \$ 1,358,000 | \$ (1,358,000) | \$ (0) | \$ 1,382,000 | \$ (1,382,016) | \$ (16) |
| 010 | General Fund | 6,568,973 | 7,642,356 | (7,020,561) | 7,190,767 | 8,003,047 | (8,513,354) | 6,680,460 |
| | Subtotal General Fund | 6,568,973 | 9,000,356 | (8,378,561) | 7,190,767 | 9,385,047 | (9,895,370) | 6,680,444 |
| 022 | General Plan | 160,810 | 13,690 | (168,500) | 6,000 | 9,217 | (8,000) | 7,217 |
| 052 | Transient Occupancy Tax | 38,791 | 25,030 | (30,470) | 33,350 | 20,030 | (35,000) | 18,380 |
| | Total General Fund per Audit Report | 6,768,573 | 9,039,076 | (8,577,532) | 7,230,117 | 9,414,294 | (9,938,370) | 6,706,042 |
| CAPITAL OUTLAY FUNDS | | | | | | | | |
| 012 | Vehicle Replacement | 132,617 | 148,250 | (221,024) | 59,844 | 439,665 | (439,439) | 60,070 |
| 050 | Storm Drain | 96,819 | 29,092 | (37,068) | 88,842 | 29,792 | (70,081) | 48,553 |
| 051 | Capital Projects | 240,814 | 3,045,427 | (809,675) | 2,476,566 | 5,983,501 | (8,396,763) | 63,304 |
| 053 | Roadway Impact | 274,526 | 531,316 | (12,750) | 793,092 | 600 | (400,000) | 393,692 |
| 054 | Parks and Recreation | 794,299 | 292,980 | (602,075) | 485,205 | 95,843 | (96,799) | 484,249 |
| 056 | Municipal Improvements | 6,277,564 | 826,365 | (185,550) | 6,918,378 | 409,811 | (4,852,247) | 2,475,943 |
| 060 | Hazardous Waste | 545,442 | 166,000 | (144,627) | 566,816 | 106,000 | (157,038) | 515,778 |
| 065 | Landfill Closure | 1,933,113 | 403,800 | (118,451) | 2,218,462 | 403,800 | (742,814) | 1,879,447 |
| 076 | Army Base | (69,836) | 20,365 | (20,850) | (70,320) | 29,985 | (30,563) | (70,899) |
| | Total Capital Outlay Funds | 10,225,359 | 5,463,595 | (2,152,069) | 13,536,884 | 7,498,996 | (15,185,743) | 5,850,138 |
| DEBT SERVICE FUND | | | | | | | | |
| 040 | Firehouse Bonds | 2,032 | 1 | - | 2,033 | - | - | 2,033 |
| | Total Debt Service Fund | 2,032 | 1 | - | 2,033 | - | - | 2,033 |
| SPECIAL REVENUE FUNDS | | | | | | | | |
| 017 | Law Enforcement Grant | 93,282 | 184,758 | (219,034) | 59,006 | 150,100 | (180,000) | 29,106 |
| 018 | Asset Forfeiture | 1,284 | 5 | - | 1,289 | 5 | - | 1,294 |
| 019 | ATOD Grant | - | 57,495 | (57,495) | 0 | 60,315 | (60,315) | (0) |
| 025 | Gas Tax | 390,830 | 481,064 | (734,982) | 136,912 | 532,117 | (657,721) | 11,308 |
| 031 | Developers Revolving | 59,798 | 14,498 | (44,448) | 29,848 | 124,617 | (124,617) | 29,848 |
| 033 | Commercial Rehabilitation Loan | 62,665 | 80 | (62,603) | 142 | - | - | 142 |
| 034 | CDBG Housing Rehabilitation | 128,016 | 160 | (127,886) | 290 | - | - | 290 |
| 038 | Personnel Services District - Fire | 251,716 | 477,109 | (517,544) | 211,282 | 491,409 | (550,855) | 151,835 |
| 039 | Personnel Services District - Police | 184,774 | 477,299 | (563,321) | 98,752 | 491,599 | (562,133) | 28,218 |
| 055 | Liberty Main & Operation Svc District | 1,547,158 | 629,425 | (478,541) | 1,698,041 | 645,981 | (495,973) | 1,848,050 |
| 091 | Street Projects | 0 | 0 | - | 0 | 140,000 | (140,000) | 0 |
| | Total Special Revenue Funds | 2,719,522 | 2,321,894 | (2,805,854) | 2,235,562 | 2,636,143 | (2,771,614) | 2,100,091 |
| ENTERPRISE FUNDS | | | | | | | | |
| 032 | Transit | 531,847 | 579,001 | (579,001) | 531,847 | 966,426 | (1,102,046) | 396,226 |
| 075 | Business Park | 1,349,518 | 23,528 | (102,846) | 1,270,200 | 23,444 | (863,976) | 429,668 |
| 080 | Water System | 4,119,332 | 3,314,454 | (4,851,834) | 2,581,952 | 3,162,680 | (4,838,349) | 906,283 |
| 081 | Water Project - Capital Outlay | 0 | 2,007,870 | (2,007,870) | 0 | 1,646,383 | (1,646,383) | 0 |
| 084 | Airport | (749,529) | 1,152,536 | (1,246,965) | (843,959) | 251,988 | (312,271) | (904,242) |
| 085 | Beach Facility | 3,428,080 | 2,965,053 | (3,363,314) | 3,029,819 | 2,892,000 | (4,369,817) | 1,552,002 |
| 086 | NW Facility | 1,818,236 | 2,152,702 | (2,850,417) | 1,120,521 | 2,088,000 | (2,463,904) | 744,617 |
| 087 | NW Sewer Project - Capital Outlay | 0 | 250,000 | (250,000) | 0 | 150,590 | (150,590) | 0 |
| 088 | Beach Sewer Project - Capital Outlay | - | 800,000 | (800,000) | - | 3,818,575 | (3,818,575) | - |
| | Total Enterprise Funds | 10,497,484 | 13,245,144 | (16,052,248) | 7,690,380 | 15,000,087 | (19,565,912) | 3,124,554 |
| AGENCY FUNDS | | | | | | | | |
| 041 | Community Facilities District 2006-1 | 451,098 | 521,881 | (525,397) | 447,582 | 521,881 | (526,609) | 442,854 |
| 042 | Riverview Point Assessment District | 243,840 | 140 | (149,193) | 94,787 | 46,673 | (141,460) | 0 |
| 043 | Riverview Point Bond Reserve | 46,625 | 48 | - | 46,673 | - | (46,673) | 0 |
| 044 | Riverwalk CFD | 65,865 | - | - | 65,865 | - | (12,000) | 53,865 |
| 045 | Summerset Improvement | 154,600 | - | (154,600) | (0) | - | - | (0) |
| 046 | Summerset Assessment District | 17,404 | - | (17,404) | (0) | - | - | (0) |
| 049 | Community Facilities District 2004-1 | 241,511 | 299,297 | (310,532) | 230,275 | 299,297 | (297,832) | 231,740 |
| 095 | Liberty CFD | 1,310,388 | 808,554 | (810,304) | 1,308,639 | 808,554 | (809,574) | 1,307,619 |
| | Total Agency Funds | 2,531,331 | 1,629,920 | (1,967,431) | 2,193,820 | 1,676,405 | (1,834,148) | 2,036,077 |
| TOTAL FUNDS | | \$ 32,744,302 | | | \$ 32,888,797 | | | \$ 19,818,935 |

| | Capital Project | Enterprise Funds | | | | TOTALS |
|---|------------------|------------------|------------------|----------------|------------------|-------------------|
| | Capital Projects | Water | Water CIP | NW Sewer CIP | Beach Sewer CIP | |
| Revenues | | | | | | |
| Intergovernmental - Grants | 602,552 | | | | | 602,552 |
| American Rescue Plan Funding | | | | | 2,141,752 | 2,141,752 |
| | <u>602,552</u> | <u>-</u> | <u>-</u> | <u>-</u> | <u>2,141,752</u> | <u>2,744,304</u> |
| Expenditures | | | | | | |
| To appropriate new funds | | | | | | |
| CC002 City Hall ADA Remodel - Council Chambers/Office | 30,000 | | | | | 30,000 |
| CC004 New Accounting System | 400,000 | | | | | 400,000 |
| PW006 ABM Energy Savings Improvement Project | 137,510 | | | 70,590 | | 208,100 |
| PW018 Highway Safety Improvement Program - Pedestrian Crossing - Cycle 9 | 184,600 | | | | | 184,600 |
| PW022 LGI 18 Acre New Park Phase I | 96,799 | | | | | 96,799 |
| PW025 Promenade Park Shade Structures | 177,952 | | | | | 177,952 |
| PW026 Highway Safety Improvement Program - Pedestrian Crossing - Cycle 10 - Near School | 240,000 | | | | | 240,000 |
| PW027 4th Street & Bruning Ave Drainage/ Pedestrian Improvement | 159,150 | | | | | 159,150 |
| PW028 New Fire Station - Modular Building & Pavement | 4,700,000 | | | | | 4,700,000 |
| SW006 2020/2021 Sewer CIP | | | | | 156,823 | 156,823 |
| SW008 CCTV Trilogy Wastewater Lines | | | | 30,000 | | 30,000 |
| SW011 Wastewater Collection System Upgrade | | | | | 170,000 | 170,000 |
| SW012 Beach & NW Wastewater Plants Consolidation | | | | 50,000 | 3,491,752 | 3,541,752 |
| WT007 Well #16 Scada Integration and Upgrades | | | 14,562 | | | 14,562 |
| WT008 2020/2021 Water CIP | | | 416,461 | | | 416,461 |
| WT009 Well Replacement Plan - Study - CIP Preliminary | | 9,174 | | | | 9,174 |
| WT010 Waterline Replacement - Continue | | | 415,360 | | | 415,360 |
| WT011 Water System Project | | | 800,000 | | | 800,000 |
| | <u>6,126,011</u> | <u>9,174</u> | <u>1,646,383</u> | <u>150,590</u> | <u>3,818,575</u> | <u>11,750,733</u> |
| Other Sources/Uses | | | | | | |
| Transfer in - Gas Tax 2105 | 130,000 | | | | | 130,000 |
| Transfer in - Storm Drain | 29,150 | | | | | 29,150 |
| Transfer in - Parks and Recreation | 96,799 | | | | | 96,799 |
| Transfer in - Municipal Improvement | 4,730,000 | | | | | 4,730,000 |
| Transfer in - Water | 400,000 | | 1,646,383 | | | 2,046,383 |
| Transfer in - Beach Facility | - | | | | 1,676,823 | 1,676,823 |
| Transfer in - NW Facility | - | | | 118,129 | | 118,129 |
| Capital Project Fund | 137,510 | | | | | 137,510 |
| Other Financing Sources / Loans | - | | | 32,461 | | 32,461 |
| Water | | 9,174 | | | | 9,174 |
| | <u>5,523,459</u> | <u>9,174</u> | <u>1,646,383</u> | <u>150,590</u> | <u>1,676,823</u> | <u>9,006,429</u> |
| Net Annual Activity | - | - | - | - | - | - |

Infrastructure: Sewer

Project Name: 2020/2021 SEWER CIP PROJECT **Project # :** SW006

Project Budget: \$856,823
Status: Ongoing
Department: Public Works
Location: Highway 12 from near Drouin Drive to 5th Street, 7th Street from Morgan Lane to near Main Street
Descriptions: Repair and rehabilitate various size sewer lines on Highway 12, abandon old sewer line in front yards and replace with new sewer line in 7th Street.



| Cumulative Appropriation by Funding Source | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|--|-------------|----------|----------|----------|----------|---------|
| 85 Beach Facility - Plant | 700,000 | 156,823 | | | | 856,823 |

| | | | | | | |
|--------------|----------------|----------------|--|--|--|----------------|
| Total | 700,000 | 156,823 | | | | 856,823 |
|--------------|----------------|----------------|--|--|--|----------------|

| Expenditures | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|----------------------|-------------|----------|----------|----------|----------|---------|
| 88-Design | 48,800 | - | | | | 48,800 |
| 88-Construction | 630,000 | 136,823 | | | | 766,823 |
| 88-Construction Mgmt | 21,200 | 20,000 | | | | 41,200 |

| | | | | | | |
|--------------|----------------|----------------|--|--|--|----------------|
| Total | 700,000 | 156,823 | | | | 856,823 |
|--------------|----------------|----------------|--|--|--|----------------|

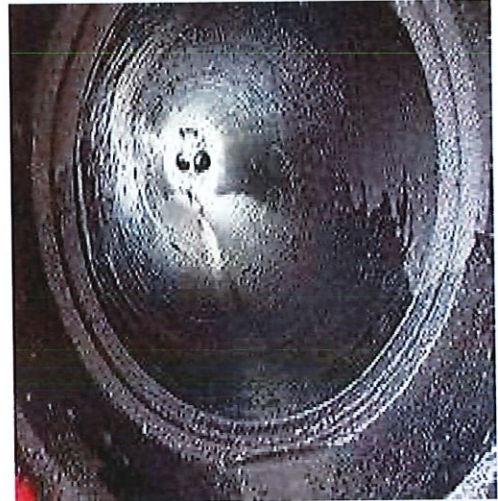
Remaining budget: -

Comments: Construction is ongoing and expected to be completed in 2022.
 Contractor = ASTA Construction

Infrastructure: Sewer

Project Name: CCTV TRILOGY WASTEWATER LINES **Project # :** SW008

Project Budget: \$280,000
Status: Ongoing
Department: Public Works
Location: 3000 Airport Road - NW plant
Descriptions: NWWTP Collection System CCTV



| Cumulative Appropriation by Funding Source | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|--|-------------|----------|----------|----------|----------|---------|
| 86 NW Facility - Plant | 250,000 | 30,000 | | | | 280,000 |

| | | | | | | |
|--------------|----------------|---------------|--|--|--|----------------|
| Total | 250,000 | 30,000 | | | | 280,000 |
|--------------|----------------|---------------|--|--|--|----------------|

| Expenditures | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|----------------------|-------------|----------|----------|----------|----------|---------|
| 87-Design | 10,000 | - | | | | 10,000 |
| 87-Construction | 225,000 | 17,000 | | | | 242,000 |
| 87-Construction Mgmt | 15,000 | 13,000 | | | | 28,000 |

| | | | | | | |
|--------------|----------------|---------------|--|--|--|----------------|
| Total | 250,000 | 30,000 | | | | 280,000 |
|--------------|----------------|---------------|--|--|--|----------------|

Remaining budget: -

Comments: Contractor = Subtronic Corporation

Infrastructure: Sewer

Project Name: WASTEWATER COLLECTION SYSTEM UPGRADE **Project # :** SW011

Project Budget: \$270,000

Status: Construction

Department: Public Works

Location: Citywide

Descriptions: The City had been in discussion with the Water and Wastewater Committee regarding the need to move forward with planning the future of the Beach Plant and possible routes for diverting wastewater flows to the Northwest Plant.

The selected engineering firm will work with the City to determine the most efficient path to reroute flows from the Beach Plant to the Northwest Plant. They will help plan and design the new route, lift stations, and upgrades to the Northwest Plant. After the design work is accomplished, and once the City secures funding, they will assist the City with advertising and bidding the project.



| Cumulative Appropriation by Funding Source | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|--|-------------|----------|----------|----------|----------|---------|
| 85 Beach Facility - Plant | 100,000 | 170,000 | | | | 270,000 |

| Total | 100,000 | 170,000 | 0 | 0 | 0 | 270,000 |
|-------|---------|---------|---|---|---|---------|
|-------|---------|---------|---|---|---|---------|

| Expenditures | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|--------------------------|-------------|----------|----------|----------|----------|---------|
| 88-Prelim Design/Studies | 100,000 | 170,000 | | | | 270,000 |

| Total | 100,000 | 170,000 | 0 | 0 | 0 | 270,000 |
|-------|---------|---------|---|---|---|---------|
|-------|---------|---------|---|---|---|---------|

Remaining budget: -

Comments : Resolution 2021-079 - Hydrosience Engineers, Inc.

Infrastructure: Sewer

Project Name: WASTEWATER PLANTS CONSOLIDATION **Project # :** SW012

Project Budget: \$3,541,752

Status: New

Department: Public Works

Location: Beach and Northwest Wastewater

Descriptions: Continuation of Project# SW011

Design and construction - To reroute flows from the Beach Plant to the Northwest Plant, and consolidate the plants.

The remaining balance of the American Rescue Plan Act Funding is proposed to be used in this project.



| Cumulative Appropriation by Funding Source | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|--|-------------|-----------|----------|----------|----------|-----------|
| 51 Grants/Loans/Others | - | 2,141,752 | | | | 2,141,752 |
| 85 Beach Facility - Plant | | 1,350,000 | | | | 1,350,000 |
| 86 NW Facility - Plant | | 50,000 | | | | 50,000 |

| | | | | | | |
|--------------|--|------------------|--|--|--|------------------|
| Total | | 3,541,752 | | | | 3,541,752 |
|--------------|--|------------------|--|--|--|------------------|

| Expenditures | Prior years | FY 22-23 | FY 23-24 | FY 24-25 | FY 25-26 | Total |
|-----------------|-------------|-----------|----------|----------|----------|-----------|
| 88-Design | - | 2,000,000 | | | | 2,000,000 |
| 88-Construction | - | - | | | | - |
| 88-Other Costs | - | 1,541,752 | | | | 1,541,752 |

| | | | | | | |
|--------------|--|------------------|--|--|--|------------------|
| Total | | 3,541,752 | | | | 3,541,752 |
|--------------|--|------------------|--|--|--|------------------|

Remaining budget: -

Comments: Project budget is the funding set aside for this consolidation project in FY 2022/23, and not the total project costs.

Facilities: Sewer

Project Name: WASTEWATER OPERATIONS, MAINTENANCE & MANAGEMENT SERVICE CONTRACT **Project # :** MM001

Calendar Year Budget: \$1,684,345

Status: Ongoing

Department: Public Works

Location: Beach and Northwest lift stations and plants

Descriptions: The City Council approved a new rate structure in 2009-10 for the Beach and the Northwest lift stations and wastewater treatment plants for the ongoing maintenance and identified certain equipment be repaired and/or replaced each fiscal year.
 Northwest Lift Stations - Atlantic Pump Station clean out lift station each quarter, generator service, instrumentation controls upgrade, Supervisory Controls and Data Acquisition (SCADA) systems upgrade, and back up batteries (8). Riverwood Lift Station - clean out wet sump, emergency generator service, and instrumentation controls.



| Cumulative Appropriation by Funding Source | FY 18-19 | FY 19-20 | FY 20-21 | FY 21-22 | FY 22-23 | Total |
|--|------------------|------------------|------------------|------------------|------------------|------------------|
| 85 Beach Facility - Lift Station | 888,599 | 958,490 | 952,017 | 973,052 | 985,351 | 4,757,509 |
| 86 NW Facility - Lift Station | 613,590 | 638,992 | 675,347 | 690,270 | 698,994 | 3,317,193 |
| Total | 1,502,189 | 1,597,482 | 1,627,364 | 1,663,322 | 1,684,345 | 8,074,702 |

| Expenditures | FY 18-19 | FY 19-20 | FY 20-21 | FY 21-22 | FY 22-23 | Total |
|----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 85-Other Costs | 888,599 | 958,490 | 952,017 | 973,052 | 985,351 | 4,757,509 |
| 86-Other Costs | 613,590 | 638,992 | 675,347 | 690,270 | 698,994 | 3,317,193 |
| Total | 1,502,189 | 1,597,482 | 1,627,364 | 1,663,322 | 1,684,345 | 8,074,702 |

Remaining budget: -

Comments : List of equipment to be repaired or replaced include for Beach collection System - Marina Lift Station Pumps 1 and 3; Vineyard lift station - overhaul Pump 2, clean out wet sump, emergency generator servicing, instrumentation controls upgrade; Airport Road - overhaul Pump 2, clean out wet sump; River Road lift Station - overhaul Pump 1, clean out wet sump, instrumentation controls upgrade; City Hall Lift Station - overhaul Pump 1, clean out wet sump, generator service, and instrumentation controls upgrade; Second Street Lift Station - Wet sump cleaning .

Facilities: Sewer

Project Name: WASTEWATER OPERATION/MAINTENANCE - ADDITIONAL WORK **Project # :** MM002

Calendar Year Budget: \$650,000
Status: Ongoing
Department: Public Works
Location: Beach and Northwest lift stations and plants
Descriptions: The City Council approved a new sewer rate structure to maintain both the Beach and Northwest Wastewater Treatment Plant (NWWTP) maintenance, repairs, and replacement of various equipment for each year. The identified items for Preliminary Treatment includes new bar screen at the head works, Grit pump repairs, Grit screen (screw conveyor) repairs, new influent sampler, and electrical instrumentation. Primary Treatment includes overhaul Pumps 1, 2, and rebuild Pumps 1, and 2, and instrumentation upgrade.



| Cumulative Appropriation by Funding Source | FY 18-19 | FY 19-20 | FY 20-21 | FY 21-22 | FY 22-23 | Total |
|--|----------|----------|----------|----------|----------|-----------|
| 85 Beach Facility - Lift Station | 253,385 | 202,340 | 288,075 | 317,652 | 250,000 | 1,311,452 |
| 86 NW Facility - Lift Station | 487,819 | 409,658 | 429,639 | 424,553 | 400,000 | 2,151,669 |

| | | | | | | |
|--------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Total | 741,204 | 611,998 | 717,714 | 742,205 | 650,000 | 3,463,121 |
|--------------|----------------|----------------|----------------|----------------|----------------|------------------|

| Expenditures | FY 18-19 | FY 19-20 | FY 20-21 | FY 21-22 | FY 22-23 | Total |
|----------------|----------|----------|----------|----------|----------|-----------|
| 85-Other Costs | 253,385 | 202,340 | 288,075 | 317,652 | 250,000 | 1,311,452 |
| 86-Other Costs | 487,819 | 409,658 | 429,639 | 424,553 | 400,000 | 2,151,669 |

| | | | | | | |
|--------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Total | 741,204 | 611,998 | 717,714 | 742,205 | 650,000 | 3,463,121 |
|--------------|----------------|----------------|----------------|----------------|----------------|------------------|

Remaining budget: 0

Comments : Solids Digestion/Solids De-watering -clean Aerobic Digester, empty sludge drying beds #1 & #4, empty Sludge Drying Beds #5 & 7. Chlorination/Dechlorination - Chlorine Tank and associated piping cleaning, SBS tank and associated piping cleaning, spare chemical pump repairs, flash Mixer repairs, instrumentation controls upgrade, on-line analyzers, contact tank cleaning, and Disinfection System Upgrades. Misc. - generator services, Plant Pump #2 repairs, various permit requirements and studies to renew NPDES Permit, Sanitary Management Wastewater Plan review/implementation, and various regulatory certificates (air quality, others), building maintenance, and grounds and landscaping.

SCHEDULE OF INTERFUND TRANSFERS

| Transfer Out from Fund | Transfer In to Fund | Purpose | FY 21/22 Projected | FY22/23 Proposed |
|------------------------------------|---|---|-----------------------|---------------------|
| Transfer Out | Transfer In | | | |
| General Fund | Transit | Potential farebox penalty | 8,000 | 8,000 |
| General Fund | ATOD Grant | Offset expenditure not covered by grants in prior years | - | - |
| Gas Tax | Capital Projects | 4th and Bruning Intersection Improvement | - | 125,000 |
| Transit | NW Facility | Rental for Office Space | 12,000 | 12,000 |
| Personnel Services District - Fire | Vehicle Replacement | Fire Dept Vehicle Reserve | 35,000 | 78,000 |
| Personnel Services District - Fire | Vehicle Replacement | Funding for Battalion Chief Command Vehicle | 63,000 | - |
| Riverview Point Bond Reserve | Riverview Point Assessment District | Fund Closeout - Final Payment for Bonds | - | 46,673 |
| Summerset Improvement | General Fund | Fund Closeout - Transfer balance to General Fund | 143,350 | - |
| Summerset Assessment District | General Fund | Fund Closeout - Transfer balance to General Fund | 16,154 | - |
| Storm Drain | Capital Projects | 4th and Bruning Intersection Improvement | - | 29,150 |
| Capital Projects | Various Funds | Use of American Rescue Plan Fund - Essential Worker Premium Pay | 39,000 | - |
| Parks and Recreation | Capital Projects | Promenade Park Shade | 43,898 | - |
| Parks and Recreation | Capital Projects | LGI Dog and Neighborhood Park Improvement | 501,777 | - |
| Parks and Recreation | Capital Projects | LGI 18 Acre New Park Phase I | - | 96,799 |
| Municipal Improvements | General Fund | Energy Saving Project Loan Payment - City Hall | 120,550 | 122,247 |
| Municipal Improvements | Capital Projects | City Hall Improvement | 65,000 | 30,000 |
| Municipal Improvements | Capital Projects | New Fire Station - Modular Building & Pavement | - | 4,700,000 |
| Landfill Closure | General Fund | Excess Franchise Fee to fund General Operation | - | 560,000 |
| Business Park | General Fund | Additional support for Code Enforcement Services | - | 20,000 |
| Business Park | General Fund | Master Fee Schedule Study and Update | - | 50,000 |
| Business Park | General Fund | Development Impact Fees Study and Update | - | 50,000 |
| Business Park | General Fund | Additional support for Alcohol Tobacco & Other Drugs Education | 15,000 | 15,000 |
| Business Park | General Fund | Recreational Activities at Parks | - | 15,000 |
| Business Park | Vehicle Replacement | Police Vehicle Replacement | - | 311,415 |
| Army Base | General Fund | Interfund loan repayment | 7,175 | 5,388 |
| Water | Vehicle Replacement | Fire Dept Vehicle Reserve | 25,000 | 25,000 |
| Water | Water Project - Capital Outlay | Funding Source for Water CIP Projects | 2,007,870 | 1,646,383 |
| Water | Capital Projects | Funding for New Accounting System Software | - | 400,000 |
| Water | Capital Projects | Public Works Office & Corp Yard Improvement | 15,000 | - |
| Airport | General Fund | Interfund loan repayment | 19,079 | 2,726 |
| Beach Facility | Capital Projects | Public Works Office & Corp Yard Improvement | 7,500 | - |
| Beach Facility | Water | Interfund loan repayment | 20,680 | 20,680 |
| Beach Facility | Parks and Recreation | Interfund loan repayment | 5,170 | 5,170 |
| Beach Facility | Municipal Improvements | Interfund loan repayment | 117,175 | 117,175 |
| Beach Facility | Beach Sewer Project - Capital Outlay | Funding Source for Beach Facility CIP Projects | 800,000 | 3,818,575 |
| NW Facility | Capital Projects | Public Works Office & Corp Yard Improvement | 7,500 | - |
| NW Facility | Roadway Impact | Settlement Agreement with Shea Home - Roadway Impact fee offset with by EDU purchase | 379,000 | - |
| NW Facility | NW Sewer Project - Capital Outlay | Funding Source for NW Facility CIP Projects | 250,000 | 118,129 |
| Total Interfund Transfers | | | \$ 4,723,879 | \$12,428,508 |

**REVENUE DETAILS BY FUND
FY 22-23 PROPOSED BUDGET**

| REVENUES | | | | | | |
|--|---|----------------------|----------------------------|-------------------------|----------------------------------|------------------|
| Account Number | Account Name | FY 2020-21 Actual | FY 2021-22 Final Budget | FY 2021-22 Projected | FY 2022-23 Proposed Budget | Change |
| FUND 76 ARMY BASE | | | | | | |
| 076-0560-5601 | Interest Income | 93 | 100 | 16 | 10 | (90) |
| 076-0560-5603 | Rent - Real Property | 1,800 | 4,800 | 6,800 | 4,800 | - |
| 076-0590-5920 | Reimbursement - Dept of Water Resources | 6,810 | 13,549 | 13,549 | 25,175 | 11,626 |
| TOTAL ARMY BASE FUND | | 8,703 | 18,449 | 20,365 | 29,985 | 11,536 |
| FUND 80 WATER SYSTEM | | | | | | |
| 080-0550-5501 | Forfeitures/Penalties | 42,104 | 30,000 | 30,000 | 30,000 | - |
| 080-0560-5601 | Interest Income | 31,305 | 35,000 | 11,000 | 11,000 | (24,000) |
| 080-0560-5303 | Asset Sales | - | 460 | 460 | - | (460) |
| 080-0570-5753 | Grant Revenues | 22,500 | 81,582 | 81,582 | - | (81,582) |
| 080-0580-5808 | Utility Service Fees | 3,032,608 | 3,000,000 | 3,100,000 | 3,100,000 | 100,000 |
| 080-0580-5810 | Interim Water Fees - Construction | - | 29,396 | 29,396 | - | (29,396) |
| 080-0580-5814 | Water Reconnect Fee | 150 | 29,306 | 29,306 | 1,000 | (28,306) |
| 080-0590-5920 | Miscellaneous Revenue | 8,116 | 2,376 | 2,376 | - | (2,376) |
| 080-0590-5990 | Transfer In - CIP Completed | 1,532,820 | - | - | - | - |
| 080-0590-5990 | Transfer In | - | 30,334 | 30,334 | 20,680 | (9,654) |
| TOTAL WATER SYSTEM FUND | | 4,669,604 | 3,238,454 | 3,314,454 | 3,162,680 | (75,774) |
| FUND 81 WATER CONSTRUCTION | | | | | | |
| 081-0590-5990 | Transfer In | 838,776 | 2,529,254 | 2,007,870 | 1,646,383 | (882,870) |
| TOTAL WATER CONSTRUCTION FUND | | 838,776 | 2,529,254 | 2,007,870 | 1,646,383 | (882,870) |
| FUND 84 AIRPORT | | | | | | |
| 084-0550-5501 | Forfeitures/Penalties | 199 | 374 | 551 | 300 | (74) |
| 084-0560-5601 | Interest Income | 1,302 | 600 | 600 | 500 | (100) |
| 084-0560-5603 | Rent - Real Property | 30,181 | 34,246 | 34,246 | 35,559 | 1,313 |
| 084-0560-5608 | Rent - Airport Hangars | 185,670 | 183,629 | 183,629 | 183,530 | (99) |
| 084-0560-5610 | Rent - Airport Tie-Downs | 1,586 | 1,600 | 1,500 | 1,300 | (300) |
| 084-0570-5753 | Grant Revenues | 81,250 | 783,466 | 900,668 | - | (783,466) |
| 084-0570-5755 | Grant Revenues - State Match | 10,000 | 47,574 | 10,000 | 10,000 | (37,574) |
| 084-0580-5907 | Sales - Airport Fuel | 189,154 | 160,000 | 160,000 | 160,000 | - |
| 084-0580-5908 | Cost of Sales - Fuel | (159,919) | (139,200) | (139,200) | (139,200) | - |
| 084-0590-5990 | Transfer In | - | 542 | 542 | - | (542) |
| TOTAL AIRPORT FUND | | 339,422 | 1,072,831 | 1,152,536 | 251,988 | (820,842) |
| FUND 85 BEACH DRIVE - SEWER SYSTEM | | | | | | |
| 085-0550-5501 | Forfeitures/Penalties | 27,202 | 24,000 | 24,000 | 24,000 | - |
| 085-0560-5601 | Interest Income | 22,898 | 9,000 | 8,600 | 8,000 | (1,000) |
| 085-0570-5753 | Grant Revenues | 11,250 | - | 58,184 | - | - |
| 085-0580-5803 | Utility Service Fees - Residential | 2,415,771 | 2,400,000 | 2,410,000 | 2,410,000 | 10,000 |
| 085-0580-5804 | Utility Service Fees - Commercial | 375,440 | 400,000 | 450,000 | 450,000 | 50,000 |
| 085-0580-5806 | Sewer Connection Fees | - | 6,611 | 6,611 | - | (6,611) |
| 085-0590-5920 | Miscellaneous Revenue | - | - | 1,746 | - | - |
| 085-0590-5990 | Transfer In | 324,553 | 5,912 | 5,912 | - | (5,912) |
| TOTAL BEACH DRIVE SEWER SYSTEM FUND | | 3,177,112 | 2,845,523 | 2,965,053 | 2,892,000 | 46,477 |
| FUND 86 NW - SEWER SYSTEM | | | | | | |
| 086-0550-5501 | Forfeitures/Penalties | 14,867 | 11,000 | 11,000 | 11,000 | - |
| 086-0560-5601 | Interest Income | 17,609 | 6,000 | 5,300 | 5,000 | (1,000) |
| 086-0570-5753 | Grant Revenues | 11,250 | - | 58,184 | - | - |
| 086-0580-5803 | Utility Service Fees - Residential | 2,026,167 | 2,000,000 | 2,020,000 | 2,020,000 | 20,000 |
| 086-0580-5804 | Utility Service Fees - Commercial | 29,477 | 31,000 | 40,000 | 40,000 | 9,000 |
| 086-0590-5990 | Transfer In | 12,000 | 16,472 | 16,472 | 12,000 | (4,472) |

**REVENUE DETAILS BY FUND
FY 22-23 PROPOSED BUDGET**

| REVENUES | | | | | | |
|--|---|----------------------|----------------------------|-------------------------|----------------------------------|------------------|
| Account Number | Account Name | FY 2020-21 Actual | FY 2021-22 Final Budget | FY 2021-22 Projected | FY 2022-23 Proposed Budget | Change |
| 086-0590-5990 | Transfer In - CIP Completed | 953,248 | - | - | - | - |
| 086-0590-5920 | Misc Revenue | - | - | 1,746 | - | - |
| TOTAL NW SEWER SYSTEM FUND | | 3,064,617 | 2,064,472 | 2,152,702 | 2,088,000 | 23,528 |
| FUND 87 NW SEWER - CAPITAL OUTLAY | | | | | | |
| 087-0590-5425 | Other Financing Source - Bank Loan | - | - | - | 32,461 | 32,461 |
| 087-0590-5990 | Transfer In | 1,212,593 | 330,000 | 250,000 | 118,129 | (211,871) |
| TOTAL NW SEWER - CAPITAL OUTLAY | | 1,212,593 | 330,000 | 250,000 | 150,590 | (179,410) |
| FUND 88 BEACH SEWER - CAPITAL OUTLAY | | | | | | |
| 088-0590-5990 | Transfer In | 207,584 | 2,476,823 | 800,000 | 3,818,575 | 1,341,752 |
| TOTAL BEACH SEWER - CAPITAL OUTLAY | | 207,584 | 2,476,823 | 800,000 | 3,818,575 | 1,341,752 |
| FUND 91 STREET PROJECTS | | | | | | |
| 091-0570-5753 | Grant Revenue | - | - | - | 140,000 | 140,000 |
| TOTAL STREET PROJECTS | | 0 | - | 0 | 140,000 | 140,000 |
| FUND 95 LIBERTY COMMUNITY FACILITIES DISTRICT | | | | | | |
| 095-0560-5601 | Interest Income | 762 | 500 | 150 | 150 | (350) |
| 095-0510-5101 | Property Tax | 805,459 | 809,896 | 809,896 | 809,896 | (0) |
| 095-0510-5199 | Administration Charges by Solano County | (1,314) | (1,492) | (1,492) | (1,492) | (0) |
| TOTAL LIBERTY COMMUNITY FACILITIES DISTRICT | | 804,907 | 808,904 | 808,554 | 808,554 | (350) |
| TOTAL REVENUES | | 34,334,786 | 34,655,726 | 31,699,629 | 36,225,925 | 1,570,199 |

APPENDIX V-A
City of Rio Vista
Sewer System Management Plan
City Design Standards

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**DESIGN STANDARDS
&
STANDARD PLANS
2015**



**DEPARTMENT OF PUBLIC WORKS
ONE MAIN STREET
RIO VISTA, CALIFORNIA**

RESOLUTION NO. 2015-082

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIO VISTA
ADOPTING UPDATED DESIGN STANDARDS AND STANDARD PLANS 2015, FOR
THE DESIGN, CONSTRUCTION AND REPAIRS OF PUBLIC UTILITIES AND
INFRASTRUCTURE WITHIN THE CITY**

WHEREAS, the Original Standards were adopted in 1983 by Council Resolution 83-45, and;

WHEREAS, Amendments to the Standards were made in 1985, 1990 and 1995 by City Council Resolutions, and;

WHEREAS, The Standards have not been revised in 20 years and are in need of updating, and;

WHEREAS, The project budget was \$70,000.00 and the project costs totaled \$67,000.00 and;

WHEREAS, the funding for the project was supplied by 8 different sources as identified in the Council Agenda Report, and;

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF RIO VISTA that the City Council does hereby adopt the updated Design Standards and Standard Plans 2015, for the design, construction and repairs of public utilities and infrastructure within the City.

PASSED, ADOPTED AND APPROVED the 1st day of December, 2015 by the following roll call vote:

AYES: Council Members Boulware, Kott, McCracken, Vice Mayor Hampton,
& Mayor Richardson
NOES: None
ABSENT: None
ABSTAIN: None

ATTEST:



Marni Rittburg, Deputy City Clerk



DESIGN STANDARDS

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500 Water

- 501 Water Service 1" to 2"
- 502 Double Check Detector Assembly
- 503 Reduced Pressure Backflow Preventer
- 504 Air Valve Assembly
- 505 Typical Valve and Water Main Installation 6" thru 12"
- 506 2" Blowoff
- 507 Fire Hydrant Lateral and Valve Assembly
- 508 Hydrant Marker (Blue Dot) Locations
- 509 Thrust Block Bearing Area Detail

600 Street Lights

- 601 Street Light Service Point
- 602 Standard Street Light
- 603 Intersection Lighting
- 604 Street Light Conduits & Conductors Encasement
- 605 Roadway Illumination

SECTION 1 PURPOSE AND DEFINITIONS

1.01 PURPOSE

The purpose of these Design Standards is to provide certain minimum standards for the design, construction, repair and alteration of streets, roadways, alleys, drainage, sewerage, parks, landscaping, irrigation, water supply facilities and all appurtenances thereto, within the City of Rio Vista, where any portion of such improvement is to be dedicated to the City of Rio Vista and accepted for operation and/or maintenance. Any items which are not included in these Standards shall be designed in accordance with the State Highway Design Manual, State Traffic Manual, Subdivision Ordinance or Zoning Ordinance as hereinafter defined, the General Plan, Master Plans, and any applicable Specific Plan of the City of Rio Vista, generally accepted engineering practice, or as directed by the City Engineer.

1.02 DEFINITIONS

In these Design Standards, the Standard Construction Specifications and the Standard Details, the intent and meaning of the terms that are used shall be as defined in the General Conditions of the Standard Specifications, except as modified or added hereafter.

- A. CITY - Shall mean the City of Rio Vista, a municipal corporation.
- B. CITY ENGINEER - Shall mean the City Engineer of the City of Rio Vista, California, or his/her representative.
- C. CONSULTING ENGINEER - Any person or persons, firm, partnership, or corporation legally authorized to practice Civil Engineering in the State of California who prepares or submits improvement plans and specifications to the Community Development Department of the City of Rio Vista for approval.
- D. DESIGN - Shall mean street alignment, grade, geometric section, and structural section; sanitary sewer alignment, grade, and size; water system alignment, size, valving, and fire hydrant location; storm drain alignment, grade, and size; and miscellaneous improvements as required by the City Engineer.
- E. DEVELOPER - Shall mean any person, firm, corporation, partnership or association engaged in the development of property in part or in whole by the placing of any improvements thereon, whether the property was previously developed in whole, in part, or at all.
- F. EASEMENT - Shall mean an easement dedicated to the City or Public Utility, which shall be continuing and irrevocable unless formally abandoned.

- G. **ENGINEERING DIVISION** - Shall mean the Engineering Division of the Public Works Department of the City of Rio Vista.
- H. **GRADING ORDINANCE** – Shall mean the “Grading Ordinance” of the City Code as adopted by the City Council of the City of Rio Vista.
- I. **IMPROVEMENTS** - Refers to street work, sidewalk, curb, gutter driveways, water mains, sanitary sewer, storm drainage, street lighting, traffic signals, public utilities, landscaping, irrigation, parks, fences and other facilities to be constructed or installed by the developer within an existing or future public right of way or easement and other improvements which the City Engineers office is responsible for performing plan checking and inspection.
- J. **LATEST EDITION** - Shall mean the most recent edition of the subject document, which has been adopted by the City of Rio Vista.
- K. **MANUAL OF TRAFFIC CONTROLS** - Shall mean the “Manual of Traffic Controls for Construction and Maintenance Work Zones”, of the State of California, Department of Transportation, latest edition.
- L. **PUBLIC IMPROVEMENT PLANS** - Plans prepared for construction of public improvements required of subdivisions and all other work performed within the City right-of-way or easements.
- M. **RECORD DRAWING** – Plan sheet(s) depicting the “as-built” condition of all public improvements constructed including, but not limited to, water, sewer and storm drain improvements including plans & profiles; and curb, gutter sidewalk, roadway and landscaping improvements.
- N. **SITE DEVELOPMENT PLANS** - Plans for construction of improvements for commercial, industrial, and multi-family development located outside of City right-of-way or easements.
- O. **SOILS REPORT** - Shall mean a report as prepared by any person or persons, firm, partnership, or corporation legally licensed to prepare “Soils Reports” in the State of California.
- P. **SOILS (GEOTECHNICAL) ENGINEER** – Shall mean any person or persons, firm, partnership or corporation legally licensed and qualified to perform Geotechnical Engineering in the State of California.
- Q. **STANDARD CONSTRUCTION SPECIFICATIONS** - Shall mean the “Standard Construction Specifications” of the City of Rio Vista, latest edition.
- R. **STANDARD DETAILS** - Shall mean the “Standard Details” of the City of Rio Vista.

- S. STATE HIGHWAY DESIGN MANUAL - Shall mean the “Highway Design Manual” of the State of California Department of Transportation, latest edition.
- T. STATE TRAFFIC MANUAL - Shall mean the “Traffic Manual” of the State of California, Department of Transportation, latest edition.
- U. STATE STANDARD SPECIFICATIONS - Shall mean the “Standard Specifications” of the State of California, Department of Transportation, latest edition, unless otherwise stated.
- V. STATE STANDARD DETAILS- Shall mean the “Standard Plans” of the State of California, Department of Transportation, latest edition, unless otherwise stated.
- W. SUBDIVISION ORDINANCE - Shall mean the “Subdivision Ordinance” of the City Code as adopted by the City Council of the City of Rio Vista.
- X. ZONING ORDINANCE - Shall mean the “Zoning Ordinance” of the City Code as adopted by the City Council of the City of Rio Vista.

SECTION 2 GENERAL REQUIREMENTS

2.01 GENERAL

Complete plans and specifications for all proposed improvements including any necessary dedications for rights-of-way and easements shall be submitted to the Engineering Division of the Public Works Department for approval and must receive the required approval prior to the beginning of construction of any such improvements. This shall apply where it is the intent that any portion of such improvement will be dedicated to and accepted by the City of Rio Vista. Such plans shall be prepared by or under the supervision of a Registered Civil Engineer in accordance with the provisions of "Professional Engineer's Act", Division 3, Chapter 7 of the Business and Professions Code, relating to the practice of Civil Engineering.

2.02 PREPARATION OF IMPROVEMENT PLANS

A. Public Improvement Plans

Public improvement plans shall be prepared for public improvements required of subdivisions and all other work performed within City rights-of-way or easements that is in excess of minor work. For the purposes of this section, minor work shall consist generally of the construction, or the removal and replacement of curbs, gutters, sidewalks or driveways; minor street widening; connections to existing water, sewer or storm drainage facilities adjacent to site development; and utility-related work.

1. Form of Public improvement plans.

The following requirements apply to the form of public improvement plans. A separate title sheet shall not be required when the total number of sheets of improvement plans is fewer than three. If a title sheet is not required, the following requirements shall still apply to the improvement plans except those identified by an asterisk (*).

a. Dimensions

Improvement plans shall be clearly and legibly drawn in ink on engineering mylar (polyester film, 3 mil), 24 inches by 36 inches in dimension, with a 1-1/2 inch wide clear margin on the left edge and 1-inch wide margins on all other edges, or as otherwise approved by the City Engineer.

b. Scale

Horizontal scale shall be 1 inch = 40 feet; vertical scale shall be 1 inch = 4 feet, or as otherwise approved by the City Engineer.

2. Title Sheet

- a. Name of subdivision or project.
- b. Vicinity map
- c. Index of sheets.
- d. City Engineer's signature block.
- e. Complete legend showing all abbreviations and symbols.
- f. Title Block – located along lower edge or right edge of paper.
- g. General and special notes relating to construction methods. The following note shall be included in the General Notes: "All work shall conform to the City of Rio Vista Standard Specifications".
- h. Names, addresses and telephone numbers of the project soils engineer(s), developer's representative, design engineer(s), Community Development Department Representative and all affected public utility companies and reclamation district representative's.
- i. Design Engineer's stamp and signature.
- j. "USA Call Before You Dig" Note

3. Street Plan and Profile Sheets

- a. Plan view of each street to be improved shall be shown on separate sheets and shall include existing improvements and contours/elevations within 100 feet of the project boundary, proposed improvements and future improvements if known. Improvements to be shown shall include sidewalk, curbs, gutters, driveways, sewer mains, water mains, water service and sewer lateral locations, storm drains, manholes, joint utility trench locations, public utility vault locations, lot utility service locations, valves, fire hydrants, fencing, barricades, monuments, survey stationing, face of curb data for all curves and other data as required by the City Engineer. Distinct elevations shall be shown along the face of curb at all beginning and end of curves, all curb returns, and all grade breaks. The survey stationing shall normally read from left to right with the north arrow pointing either to the top or right edge of the sheet. All stationing shall be a continuation of existing improvements where possible.
- b. Profile view of each street shall be shown immediately below its plan view. The profile shall include existing and proposed street centerlines, sewer mains, storm drains, water mains, public utility mains, all utility crossings, and gutter flow lines. Distinct elevations shall be shown on the street centerline and top of curb at 50-foot stations and grade break points, manhole and catch basin inverts, and water main crossings with other utilities. Rates of grades shall be shown on all profile lines. Elevations of the hydraulic grade line for the 10-year and 100-year frequency storms shall be shown at all locations of storm drain manholes, catch basins and drain inlets.

4. Signing and Striping Plan

All existing and proposed traffic signing and striping shall be shown on a plan view and on separate sheets from all other improvements. The scale shall be 1 inch equals 40 feet, or as otherwise approved by the City Engineer. Signing and striping to be shown shall include all existing and proposed traffic striping, pavement markings, pavement markers, regulatory signs and warning signs. All existing signing and striping within at least 200 feet of the project limits shall also be shown.

5. Street lighting Plan

The street lighting plan shall include the location of proposed electroliers, service point(s), pull boxes, conduit run showing wire size and length, wiring diagrams, and the mounting height and arm length of the proposed electrolier/pole assembly. The street lighting plan shall be drawn on a separate sheet with a minimum scale of 1" inch equals 40' feet, or as otherwise approved by the City Engineer.

B. Grading Plan

1. Requirements

When required by the Grading Ordinance a grading plan shall be prepared. The plan shall be drawn to scale and shall be of sufficient clarity to indicate the nature and extent of the work proposed. The plan shall also provide sufficient information to determine that the proposed work conforms to the provisions of the Grading Ordinance, as adopted by the City Council, and all relevant laws, other ordinances and regulations. The plans shall include, as a minimum, the following information:

- a. The boundaries of the site and accurate contours of existing grades and details of terrain and drainage area.
- b. Dimensions, elevations and finish contours to be achieved by the grading;
- c. Proposed elevations along the back of sidewalk at all grade breaks, and at the projected intersection of each side lot line or every 100 feet, whichever is less;
- d. Locations, species and sizes of heritage and significant trees, and temporary and permanent facilities to protect and ensure the preservation of said trees;
- e. All existing and proposed surface and subsurface drainage facilities including drain inlets, underground pipes, and surface swales and channels, and any other drainage improvements proposed to be constructed with, or as a part of the proposed work, together with proposed grades and slopes;
- f. Locations of existing and proposed buildings or structures on the site, including proposed pad and finished floor elevations;

g. Existing grades and elevations of adjoining properties adequate to define existing drainage patterns, the location of any buildings or structures on land of adjacent owners which are within 15 feet of the property or which may be impacted by the proposed grading operations.

h. Typical Lot Detail

2. Separate Approval

The developer, design consultant, or contractor has the option to request approval of a grading plan for issuance of a grading permit prior to issuance of a building permit. The grading plan shall at a minimum contain the information listed above and will be reviewed and approved by the City Engineer in accordance with the City's Grading Ordinance. Upon approval, the grading plans will be stamped "Approved For Grading Only" by the City Engineer and the applicant will be issued a grading permit to proceed with grading of the proposed site. However, no construction in excess of grading will be permitted until approval of the public improvement plans have been obtained.

3. Grading Plans

Performance securities submitted for issuance of the grading permits will not be released until the grades shown on the approved grading plans, whether they are subgrade elevations or finished grade elevations have been certified in writing by a registered civil engineer or licensed land surveyor.

4. Other Plans

Other plans that may be incorporated in the public improvement plans include, but are not necessarily limited to, landscaping and irrigation; retaining, decorative or sound walls; joint utility trench; erosion control; specific road closure and detour; and traffic signal plans. The City Engineer on a case-by-case basis will establish specific requirements for these plans.

C. Site Development Plans

Site development plans shall be prepared for on-site commercial, industrial and multifamily residential developments.

1. Form of Site Development Plans

The following requirements apply to the form of site development plans.

- a. Plans shall be clearly and legibly drawn at horizontal scale of 1" inch=40 feet or as otherwise approved by the City Engineer.

- b. Existing and proposed building pad and finished floor elevations. In addition, the improvement plans shall include the existing or proposed top back of curb or sidewalk and crown of street elevations along the entire frontage of the proposed site at 50-foot intervals and at the property boundaries of the site.
- c. All existing and proposed underground utilities including, but not necessarily limited to, water, sanitary sewer, and storm drainage including their connections to the public systems. This shall include the existing and proposed invert and rim elevations at all manholes, drain inlets, and catch basins.
- d. All existing and proposed improvements within the street right-of-way including but not limited to sidewalk, curb and gutter, street lights, fire hydrants, drive ways, water laterals and meters, water backflow preventers, sanitary sewer services and clean-outs/sampling manholes, and any other public appurtenances.
- e. All on-site surface improvements including curbing, pavement, gutters, fencing, barrier walls and walkways, with appropriate typical cross sections.
- f. Individual lot and adjacent land drainage. Adjacent lot grades shall be shown for a minimum of twenty-five feet from the project boundary with adequate detail to define existing drainage patterns.
- g. Locations and widths of all existing and proposed driveways.
- h. Existing and proposed contours and grades, trees including species and size (existing only), wells, ditches, and other landmarks important to the construction of the proposed improvements or as required by the City Engineer.
- i. Site plans for tenant improvements including projects involving minor modifications and/or additions to existing buildings, structures, surface improvements, and underground utilities shall also include:
 - 1. Current assessors parcel number of the subject parcel(s).
 - 2. Owner information and street address of the proposed tenant improvement.
- j. Design Engineer's stamp and signature.
- k. Required General Notes as listed below:
 - 1. All public improvement construction shall conform to the City of Rio Vista Standard Specifications and shall be subject to a City Encroachment Permit.
 - 2. All underground water, sewer, and storm drain systems including their appurtenances within the building site property up to within five (5) feet of the building shall conform to the City of Rio Vista Standard Specifications and shall be inspected by the City Engineer with the exception of

underground fire lines located on the private side of the public fire backflow preventer.

3. Work shall include replacement of all broken public sidewalk, curb and gutter. This work should take place when there is no further need for encroachment of heavy equipment over walks and prior to City approval of the building for occupancy. The City Engineers Inspector will mark all broken curb, gutter and sidewalk for replacement upon request.
4. The City Engineers Inspector will inspect the main water service tap and lateral, the domestic meter assembly and the domestic and fire backflow assemblies.
5. Pavement design by a Soils Engineer shall be required. The minimum surface slope shall be 1%. Written certification of pavement grade by a licensed Civil Engineer or Land Surveyor, and certification of the structural section and compaction by a Geotechnical Engineer shall be required prior to the issuance of building permit final or a Certificate of Occupancy.
6. The Geotechnical Engineer shall be on-site to monitor all grading operations. The Geotechnical Engineer shall provide written certification that the site grading was performed in accordance with the Soils Report by (No.) prior to issuance of a Certificate of Occupancy.
7. All utility work including electrical, gas, telephone, and cable TV shall be subject to an Encroachment Permit. Normally, the utility companies obtain separate permits for their work. It is the responsibility of the applicant to ensure that this has been done prior to beginning work.
8. All underground facilities shall be located by the appropriate agencies prior to any excavation. This shall be initiated through Underground Service Alert (U.S.A.) by calling (800) 227-2600.
9. The Contractor is responsible for temporary erosion control, at all times. Temporary erosion control shall consist of, but not be limited to, constructing such facilities and taking such measures as are necessary to prevent, control and abate water, mud and erosion damage to public and private property as a result of the project. By October 15th of each year, or earlier if conditions warrant, such temporary erosion control features as are necessary to prevent damage during the forthcoming winter season shall be constructed and functioning. Mud and silt shall be settled out of the storm runoff before said runoff leaves the construction site or enters the City storm drain systems, or a natural channel. Any project shall comply with all requirements and permits from the Regional Water Quality Control Board.

10. Any water entering the sanitary sewer system to be constructed under the approved plans shall not be discharged to the existing city sewer system. Plugs shall be installed in existing manholes as necessary to permit pumping the new system clear of water and debris prior to acceptance by the City. Care shall be exercised in locating plugs to avoid interrupting service to existing connections. Mechanical plugs or mortar and brick must be used. Inflatable devices are not allowed.

2.03 SUBMISSION OF IMPROVEMENT PLANS

A. Public Improvements Plans:

A minimum of three sets of prints of public improvement plans shall be submitted to the City Engineer for checking to insure compliance with these Standards, City Ordinances, and generally accepted engineering practice. Submitted plans shall include, as a minimum, an itemized engineer's cost estimate, drainage calculations, sewer calculations, and a soils report including proposed street structural section design. Additional materials that may be required for submission include technical specifications, test data, materials lists, legal descriptions and grant deeds for right-of-way and easement dedications, and other materials as required by the City Engineer. The City Engineer may also require the submission of a network analysis for the water distribution system.

B. Site Development Plans

Three sets of prints of improvement plans for site development of commercial, industrial and multi-family uses shall be submitted to the Building Department for the City Engineers approval at the time the application is made for a building permit. The following requirements also apply to building permits for single family and duplex dwellings, except items 1, 2, and 3 below may be omitted at the discretion of the City Engineer. Site development Plans shall be designed and constructed in conformance with Division II of these Standard Specifications. In addition to the improvement plans, the following shall also be submitted directly to the Engineering Division.

1. An itemized engineer's cost estimate of improvements to be constructed within public rights-of-way or easements, which are to be accepted for operation and/or maintenance by the City. The unit costs of improvements in the engineer's estimate shall be subject to approval by the City.
2. An itemized engineer's cost estimate of all on-site grading, paving, water, sewer, and storm drain improvements which shall be designed and constructed in accordance with Division II of these Standard Specifications. This unit costs of this is also subject to approval by the City.

3. Payment of the Plan checking and inspection fee, in accordance with the Engineering Division fee schedule adopted by the City Council, based on the estimated cost of improvements from items 1 and 2 above.
4. One copy each of the plumbing plan and floor plan for the proposed building which includes an itemized listing of proposed plumbing fixtures to be removed and/or installed, including type and quantity.
5. Two copies of the soils report prepared by a registered geotechnical engineer for the proposed project. The report shall include a recommendation for on-site pavement design, and street pavement sections. The pavement sections for public streets shall be based upon traffic indices specified in Division I, Section 3 of these Standard Specifications. On-site pavement design shall be based upon traffic indices specified in Division II, Section 2 of these Standard Specifications.
6. One copy of each on-site storm drainage calculations for a 10-year and a 100-year frequency storm. Calculations shall be completed in accordance with Division I, Section 4 of these Standard Specifications.
7. One copy of sewer calculations for the proposed on-site sanitary sewer system/prepared in accordance with Division I, Section 5 of these Standard Specifications.
8. A completed application for an industrial discharge permit (if required). Provided with this application shall be the estimated quantity and strength (in BOD, COD, and Suspended Solids) of average sanitary sewer flows from the project.

C. Grading Plans

Three (3) sets of prints of grading plans shall be provided to the City Engineer for approval. The City Engineer will review and approve the grading plans in accordance with the City's Grading Ordinance for all on-site development projects. In addition, the following shall also be submitted:

1. One copy of the soils report prepared by a registered geotechnical engineer for the proposed project.
2. One copy each of the on-site drainage calculations for both a 10-year frequency storm and a 100-year frequency storm in accordance with Division I, Section 4 of the Standard Specifications.
3. The application, plan checking, and inspection fee shall be paid at the time the application is submitted.

2.04 SUBMISSION OF SOILS REPORTS

Soils Reports shall be submitted in 8-1/2 x 11 inch bound folders. The analysis shall, as a minimum, include a map of the subject area showing proposed and existing streets, contours and location and type of soils samples obtained. The results of all field data and laboratory tests shall also be included. Design for proposed street sections shall be part of the report. Street structural section design shall include recommendations for: natural subgrade, geotextile fabric, subbase, base and pavement compaction and thickness to achieve design strength.

2.05 PLAN CHECKING AND INSPECTION FEES

Payment for plan checking and inspection fees shall be made at the initial plan submittal for public improvement and site development plans. This payment shall be 100 percent of the estimated total amount of the plan check and inspection fee, in accordance with the fee schedule adopted by the City Council, and is nonrefundable.

2.06 SUBMISSION OF SUBDIVISION FINAL AND PARCEL MAPS

Three sets of prints of the parcel or final map shall be submitted for review to the City Engineer. Payment of the map checking fee deposit shall be made at the time of the initial submittal of the map. This payment shall conform to the fee schedule adopted by the City Council, and is non-refundable. All maps shall be submitted in conformance with the requirements specified within the City of Rio Vista Subdivision Ordinance.

2.07 CITY REVIEW AND APPROVAL OF IMPROVEMENT PLANS AND SUBDIVISION MAPS

A. City Review Time

Following submittal of a complete application, as determined by the City Engineer, a minimum of 20 working days shall be allowed for review of public improvement plans, site development plans and parcel or final maps. Additional time may be required depending on the extent and nature of the improvements, and the current workload of the City Engineers staff. At the time plans or maps are submitted, the submitting individual or firm may inquire if additional review time will be required.

B. Alterations to Plans or Maps

1. Should alterations or revisions be required to the plans or maps submitted, one copy will be returned to the consulting engineer with the required corrections indicated thereon. At such time as the consulting engineer has made the necessary revisions, the plans or map shall again be submitted (3 copies of plans, 3 copies of maps) for checking. The corrected or “marked” set of plans

or map shall be returned with the plan resubmittal. If the plans or map being resubmitted contain revisions or alterations other than those required by the City Engineer on previous corrections, the consulting engineer shall bring those revisions or alterations to the attention of the City Engineer.

2. If resubmitted plans do not contain corrections as shown on the previous "marked" set, or if the plans do not conform to these Standard specifications, or are not in keeping with the standards of the profession, the plans may be returned unmarked and unapproved. Public improvement plans shall not be considered approved until the City Engineer has signed in the approval block on the plans. Site development plans shall not be considered approved until the City Engineer has stamped them "Approved" and all Engineering fees have been paid.

C. Review By Other Agencies

1. If proposed storm drainage improvements are to be dedicated to a Reclamation District, or if any site improvements will affect Reclamation District facilities, the consulting engineer shall obtain approval of the Reclamation District prior to obtaining approval from the City Engineer. Reclamation District approval of improvement plans shall be indicated by the signature of an appropriate representative of the district on the title page.
2. Should the Improvement Plans be subject to review and approval by other regulatory agencies such as Caltrans, written approval from these agencies shall be provided to the City Engineer prior to plan approval.

D. Requirements Following Approval of Improvement Plans

1. Immediately after formal approval of the plans by the City Engineer, 3 copies shall be provided to the City Engineer for use by the City during construction. Additional copies of reduced improvement plans (11" x 17" or 18" x 26") may be required by the City Engineer at his/her discretion and shall be furnished by the developer or his representative to the City without cost.

E. Exceptions

1. Excepted from approval are any features of the plans that are contrary to, in conflict with, or do not conform to these Design Standards, the Standard Construction Specifications, the Standard Details, any California State Law, City of Rio Vista Ordinance or Resolution, or generally accepted engineering practice, in keeping with the standards of the profession, even though such errors, omissions or conflicts may have been overlooked by the City Engineer.

2.08 REVISIONS TO CITY APPROVED PUBLIC IMPROVEMENT PLANS

A. Developer Requested Changes

Should changes to public improvement plans be requested during construction, the Consulting Engineer shall first obtain the consent of the City Engineer.

1. Procedure

Procedure for obtaining approval by the City Engineer shall be as follows:

- a. The Engineer shall submit the proposed change shown in red.
- b. Following review and approval by the City Engineer of the proposed change, the Engineer shall submit the current approved plan in reproducible form showing the proposed change.
- c. The City Engineer will indicate approval for the change by initialing the plans in the revision block.
- d. Following return of the reproducible plan to the Engineer, the Engineer shall provide two sheets for each plan sheet affected by the change.
- e. The original proposal shall not be eradicated from the plans but shall be lined out.
- f. In the event that eradicating the original proposal is necessary to maintain clarity of the plans, approval must first be obtained from the City Engineer.
- g. The changes shall be clearly shown on the plans with the changes and approval by the City Engineer noted on a revision signature block.
- h. The changes shall be identified by the revision number in a triangle delineated on the plans adjacent to the change and on the revision signature block.

B. Changes Requested by City Engineer

The City Engineer may order changes in the plans in order to complete the necessary facilities or to conform to these Standard Specifications, or accepted engineering standards. The procedure for making changes in the plans ordered by the City Engineer shall conform to the above outlined process.

C. Minor Changes

Minor changes during construction, which do not affect the basic design of the improvements, may be made upon the authorization of the City Engineer without formally revising the plans. All minor changes shall be shown on record drawings submitted to the City upon project completion.

2.09 REVISIONS TO CITY APPROVED SITE DEVELOPMENT PLANS

A. Developer Requested Changes

Should changes to site development plans be requested during construction, the developer/contractor shall resubmit the affected plan sheets for approval by the City. In addition, the developer/contractor shall pay additional plan check and inspection fees, as determined by the City. The additional fee shall be paid in advance of providing additional plan checking and inspection services and charged per the current Fee Schedule.

1. Procedure

Revisions to the plans shall be made in the following manner:

- a. The original proposal shall not be eradicated from the plans but shall be lined out.
- b. The revision shall be clouded and shall be identified by a revision number in a triangle delineated on the plans adjacent to the change and on the revision signature block.
- c. The City Engineer will review each individual revision. Upon approval, of the proposed revision, the developer/contractor shall submit three (3) additional sets of revised plans, which will be stamped "Revision Approved by the City Engineer".

B. Minor Revisions

Upon approval by the City Engineer, minor revisions may be identified on a record drawing to be submitted in an acceptable format prior to permit being finalized.

2.10 INSPECTION OF IMPROVEMENTS

A. Commencement of Work

1. Public improvement plans signed by the City Engineer as approved constitute authority to work within City rights-of-way or easements. Minor work within City rights of way or easements, as defined in Section 2.02A of these Design Standards, may be performed following the

issuance of an encroachment permit by the City of Rio Vista.

2. The contractor shall provide written notice to the City Engineer of the intent to begin construction at least 48 hours prior to beginning construction. A pre-construction meeting shall be held with the City prior to beginning of construction. It shall be the responsibility of the contractor to arrange this meeting.

B. General Requirements

1. Any improvement proposed to be accepted by the City for ownership, maintenance and/or operation responsibility shall be subject to inspection and testing by the City Engineer's Inspector, representing the City of Rio Vista. The City Inspector will observe the progress and quality of the work and determine, in general, if the work is proceeding in accordance with the approved plans and these Standard Specifications. The City Inspector shall not be required to make comprehensive or continuous inspections to check the quality of the work, and shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the work. Visits and observations made by the City Inspector shall not relieve the Contractor of his obligation to conduct comprehensive inspections of the work and to furnish proper materials, labor, equipment and tools, and perform acceptable work, and to provide adequate safety precautions, in conformance with the approved plans and these Standard Specifications.
2. Whenever the Contractor varies the period during which work is carried on each day, he shall give due notice to the City Inspector so that proper City inspection may be provided. Any work done in the absence of the City Inspector shall be subject to rejection. Work performed without inspection may be required to be removed and replaced under proper inspection and the entire cost of removal and replacing, including the cost of City-furnished materials used in the work, shall be borne by the contractor, regardless of whether or not the work exposed is found to be defective.
3. Proper facilities for safe access for inspection to all parts of the work shall at all times be maintained by the Contractor/Developer for the necessary use of the City Inspector and other agents of the City, and agents of the Federal, State, or local governments at all reasonable hours for inspection by such agencies to ascertain compliance with laws and regulations.

C. Final Inspection

1. Within ten working days after receiving the request for final inspection from the Contractor/Developer, the City Inspector shall inspect the work.

The contractor shall correct defects or deficiencies in a diligent manner. At such time that the corrective work is complete, a second inspection shall be made by the City Inspector within ten working days to determine if all work has been completed and the previously mentioned defects have been corrected and completed in accordance with the approved plans and these Standard Specifications. Any further inspections by the City Inspector to correct any remaining defects or deficiencies will be subject to additional inspection fees in accordance with the adopted City Fee Schedule. Not until all such work has been completed will the improvements be considered for acceptance.

D. Overtime Inspection Services

1. Any inspection services performed beyond normal working hours, or on weekends or holidays, either at the request of the contractor/developer or at the discretion of the City Engineer, shall constitute overtime inspection work. Payment of fees in addition to the normal plan checking and inspection fees shall be made for these services. The amount of the additional fees shall conform to the fee schedule for plan checking and inspection fees as adopted by the City Council. If the overtime services are provided at the request of the contractor/developer, requests and payment shall be made at least 48 hours in advance. Granting of the request to provide overtime inspection shall be at the sole discretion of the City Engineer and shall be subject to the availability of inspection personnel. In addition, payment of fees for overtime inspection services directed by the City Engineer shall be paid prior to acceptance of the work by the City.

2.11 RECORD DRAWINGS PRIOR TO FORMAL ACCEPTANCE OF THE IMPROVEMENTS BY CITY COUNCIL

A. Requirements

It shall be the responsibility of the developer or his representative to provide record drawings of public improvement plans prepared in accordance with these Standard Specifications and Section 16.44.060 of the Subdivision Ordinance. One mylar (polyester film, 3 mil) sepia copy (with matte surface up) and one digital copy shall be filed with the City Engineer's Office for City records.

All digital files shall be submitted in a format that is readable and importable by industry standard GIS software, this includes GIS layers or Computer Aided Drafting (CAD). All digital files shall use State Plane Coordinate System, NAD 83 California State Plane, Zone II, US Foot.

2.12 ACCEPTANCE OF IMPROVEMENTS

A. General

No improvements will be accepted by the City until all improvements required of the contractor, subdivision, or development project have been completed and approved by the City Engineer.

B. Public Improvement Plans

Acceptance of improvements for which public improvement plans were required will be signified by notification in writing from the City Engineer.

C. Site Development Plans

1. Backflow Certification

All backflow devices inspected by the City Engineer shall be tested and approved by a certified tester prior to any permit final or Certificate of Occupancy.

2. Pavement/Compaction Certification

Pavement structural section and compaction of base and subbase materials shall be verified in writing by a registered geotechnical engineer prior to any permit final or Certificate of Occupancy.

3. Lines and Grades Certification

a. Written certification that the lines and grades, including minimum pad elevations as appropriate, have been constructed to match those on the approved grading plan shall be received from a registered Civil Engineer or licensed Land Surveyor prior to any permit final or Certificate of Occupancy.

b. Performance securities submitted for issuance of the grading permits will not be released until the grades shown on the approved grading plans, whether they are subgrade elevations or finished grade elevations have been certified.

4. Utility Work Certification

Prior to acceptance of subdivision improvements by the City, the City Engineer must receive letters from each utility company indicating that all required utility work had been completed to the satisfaction of the company.

5. General

a. Site Development

1. Acceptance of all improvements for which an encroachment, grading, or any other permit was issued by the City Engineer will be signified by the signature of the City Engineers Inspector on the permit. -
2. The Inspector's signature on any or all site development Engineering permits does not constitute automatic the City Engineers approval of a building permit final or a Certificate of Occupancy.

b. Subdivision Improvements

1. Subdivision improvements shall be formally accepted by City Council upon completion of all requirements.

SECTION 3 STREET DESIGN

3.01 GENERAL

1. All streets shall be designed in accordance with accepted engineering principles and shall conform to these Design Specifications. Any deviation shall require approval of the City Engineer.
2. The right-of-way widths and typical sections for the various streets shall conform to the City of Rio Vista Standard Plans 202 and 203.

Cul-de-sac streets shall have a turn-around at the end with a minimum radius on the right-of-way of 50 feet. The reversing curves at the beginning of the turn around shall also be 50 feet radius, see Standard Plans 204 and 205.

In the case where a specific plan for an area has been established, such plan may supersede these standards.

3. The Traffic Index may be changed at the discretion of the City Engineer if traffic warrants a different value.
4. Actual design of horizontal curves shall be based on the design speed of the street as determined by the City Engineer. Use of expanded corners shall be limited to projected low volume residential, commercial and industrial streets and conditions where conformance to minimum horizontal length of centerline radius is not practical, and shall be subject to the approval of the City Engineer.
5. Sidewalk width shall be measured from top back of curb to back of walk for both rolled and vertical curbs, and shall not include width of the curb.
6. Rural roads may only be constructed when providing access to properties zoned for Rural or Agricultural uses with a minimum one-acre lot size. They shall be dealt with on case-by-case basis.
7. An intersection curb return radius may be adjusted, at the discretion of the City Engineer, to accommodate signal timing. Property line radius at intersections shall be consistent with adjacent streets or as otherwise approved by the City Engineer. Where unlike streets intersect, the largest curb return radius shall apply.

3.02 STRUCTURAL SECTION

A. Design

Street sections shall be calculated based on "R" values reported in a "soils

report" and obtained from material gathered from the level of the proposed subgrade using the State of California Department of Transportation design method. The geotechnical engineer may submit for treatment of the subgrade material with lime or cement if suitable soils exist.

3.03 OPEN TRENCHING

A. Moratorium

Open trench may be prohibited on all newly paved and newly overlaid streets and reconstructed streets as determined by the City Engineer. Potholing in these prohibited areas shall only be allowed upon prior approval of the City Engineer.

B. Backfill

Open trenches within City right-of-way shall be backfilled per Standard Detail 101 of these standards.

C. Permit Required

All open trenching within City right-of-way shall be subject to a City Encroachment Permit.

D. Horizontal and Vertical Alignment:

Dry utilities shall be placed to avoid utility conflicts, with sufficient depth and horizontal separation from other utilities, as approved by the City Engineer.

3.04 PARTIAL STREETS

A. Streets shall be improved full width within subdivision boundaries. Off-site streets improvements may be required.

B. Allowances

At the discretion of the City Engineer, partial streets may be permitted along the boundary of a subdivision or other private development where the full right-of-way cannot be dedicated. When permitted, the developer shall, as a minimum, dedicate sufficient right-of-way and construct a full 1/2 street section for the appropriate class of street indicated above along the frontage of the development and 14-foot wide paved roadway with 4-foot wide gravel shoulder along the opposite side. Construction of partial streets shall be limited to residential streets only.

3.05 GEOMETRICS

A. Horizontal Alignment

1. Intersection Angle

Streets shall intersect at right angles if possible. With approval of the City Engineer, 5° from right angle will be allowed. Curved streets shall have at least 50 feet of centerline tangent from the project curb line of the intersection street.

2. Opposing Streets

All streets shall have centerlines directly opposite each other or be separated by at least 150 feet. The minimum distance between streets entering a restricted access street shall be as provided by a specific plan adopted by the planning commission and city council of the City of Rio Vista.

3. Street Curvature

Design of curved arterial and collector streets shall be based on the state of California Department of Transportation Highway Design Manual. The minimum radius of curvature of centerlines shall be 850 feet on arterials and 500 feet on collectors. Minimum radius on other streets shall be 250 feet. There shall be tangent between reversing curves of at least 150 feet on thoroughfare, arterial and collector streets, and 50 feet on all other streets. In special cases, street curvature may be modified with approval of the City Engineer.

4. Cul-De-Sac

The maximum length of a cul-de-sac street, from the center of intersecting street to center of turn around shall be 350 feet. Where longer cul-de-sac streets are required other special conditions may be required by the City Engineer.

5. Curb Return Radii

Residential and non-residential – minimum radius shall be 25 feet.

Commercial – In downtown area the minimum radius shall be 15 feet. In other areas the radius shall be determined by the City Engineer.

Industrial – minimum radius shall be 30 feet.

6. Minor Streets

Minor streets shall be designated that their use by through traffic will be discouraged.

7. Block Lengths

Block lengths shall not exceed 600 feet.

B. Curve Data Requirements

Curve data for street centerline, right-of-way, and face of curb alignment shall be tabulated in a box shown on the improvement plans. Curve data shall include curve length and radius.

C. Gutter Slope

Gutter flow line grades shall have a minimum slope of 0.003 ft/ft. Maximum grades shall be determined by the City Engineer on a case-by-base basis.

D. Curb Returns

The minimum fall around returns shall be 0.20 feet.

E. Cross Slope

Cross slope on all streets shall be as shown on the Standard Details. Any deviation from these standard cross slopes shall be subject to the approval of the City Engineer. For new construction, the maximum cross slope shall be 2%. For reconstruction projects, the maximum cross slope may be increased to 2% - 4% with special approval by the City Engineer.

F. Vertical Curves

The minimum vertical curve length allowable at the intersection of two grades shall be 50 feet. Actual design of the vertical curve shall be based on the design speed of the street and stopping sight distance and shall conform to the State Highway Design Manual unless otherwise specifically approved by the City Engineer. However, vertical curves may be omitted where the algebraic difference in grades does not exceed 1.0 percent.

G. Vertical Control

All vertical control shall be based upon current City, County, or U.S.G.S. datum. Placement of new bench marks as required by the City Engineer shall be based upon City datum. A minimum of two (2) new bench marks shall be set per new development, unless waived by City Engineer.

H. Stopping Sight Distance

The minimum stopping sight distance over any segment of the roadway on any street shall conform to the State Highway Design Manual unless otherwise specifically approved by the City Engineer. No obstructions shall be located closer than 25 feet from the intersection of the right-of-way line extensions unless specifically approved by the City Engineer.

I. Dead-End Length

All new residential, commercial and industrial cul-de-sacs may not exceed 350 feet in length as measured from the centerline of the intersecting street to the radius point of the cul-de-sac bulb. Any longer dead end routes shall be specifically approved by the City Engineer.

Turnarounds (cul-de-sac bulbs) shall be provided on any dead-end road in excess of 150 feet in length as measured from the centerline of the intersecting street. The cul-de-sac radius and bulb transition geometrics shall be as shown on the Standard Details.

J. Additional Lanes

At intersections, additional right-of-way or reduction of landscaping within the median or adjacent to the right-of-way boundary may be required to accommodate additional left-turn, right turn, or through lanes.

3.06 APPURTENANCES

A. Driveways.

The following driveway standards are not applicable to the controlled access highways where access is limited by deed restrictions or other controls.

The number and width of permitted driveways is regulated by the Public Works Department and shall be based on the needs of the parcel served. They shall not be detrimental to the abutting street capacity, safety, and/or efficiency.

Driveway width is measured at the curb line, and includes only the widths of the fully depressed section.

1. Widths

- a. Maximum – Driveway width shall not be greater than 20 feet for residential and 35 feet for commercial and industrial driveways.

The total width of commercial and industrial driveways shall not exceed 60 percent of the frontage.

- b. Minimum – The minimum width of a single residential driveway shall be 10 feet and 25 feet for a commercial or industrial driveway.

2. Distance from curb returns

- a. Intersecting streets – The driveway transition shall not be permitted closer than 25 feet from the projected curb line of the intersection street and no closer than 10 feet from the nearest BCR and ECR.

Commercial and industrial driveways on arterials may be prohibited within 100 feet from the projected right-of-way line of the intersecting street where the intersection is presently or in planned for signalization, or intersection capacity is critical.

- b. Alley – The driveway transition shall be permitted no closer than 10 feet from the projected intersecting alley curb face and no closer than 2 feet from the nearest alley BCR and ECR.

- 3. Distance from utility or safety devices – The driveway transitions shall clear all public facilities such as electroliers traffic standards, utility poles, fire hydrants, and street tress by a minimum of 3 feet. Any relocation of public facilities required to maintain such clearance shall be at the expense of the owner who is installing the driveway.
- 4. Distance between driveways – A minimum of 4 feet of full curb height shall be maintained between the transitions of adjoining residential driveways.
- 5. Common use driveways – Common use driveways may be submitted in special cases.
- 6. Parking lots – Design shall conform to standard details 226-227.
- 7. Grade – Driveway grades shall be designed to keep the automobile from dragging or “hanging up” on the street or driveway.

B. Parking

For all single-family parcels, at least one on-street parking space, 21 feet in length measured along the face of curb, shall be provided for each single- family lot along the street frontage of the lot. The parking space shall not encroach within any driveway, including the driveway transitions. This requirement does not apply to cul-de-sac bulbs or expanded corner bulbs.

C. Valley Gutters

Valley gutters will not be allowed within the public right of way or public easement unless otherwise approved by the City Engineer.

D. Curb, Gutter, Sidewalk and Driveways

Curb, gutter and sidewalk shall be installed in conformance with the City of Rio Vista Construction Specifications and Standards Plans.

1. Curb and gutter shall be installed along all frontage. Placement shall conform to existing unless otherwise directed by the City Engineer.
2. The minimum widths of sidewalks shall be 4 feet in residential areas. Sidewalk requirements in other areas shall be established on an individual subdivisions basis and shall be approved by the City Engineer.
3. Handicap ramps shall be installed at curb returns at all intersections, and at all other locations specified by the City Engineer.
4. Projections of side yard lot lines shall be clearly marked with a “+” chiseled or sawcut in the concrete at the top edge of the back of sidewalk.
5. All new streets, including residential streets, shall be constructed with curb and gutter conforming to the Standard Details.
6. For retrofit sidewalk construction, any existing improvements located in the sidewalk area including, but not necessarily limited to, joint poles, fire hydrants, street lights, meter boxes, and utility vaults shall be relocated to the back of sidewalk unless otherwise approved by the City Engineer.
7. Where existing curb, gutter, sidewalk and driveways do not meet the current City Standards and are in need of repairs, it shall be the developer's responsibility to remove and replace the necessary curb, gutter and sidewalk. Where curb, gutter, sidewalk and/or driveways are removed, the concrete shall be removed to the nearest expansion, weakened plane or construction joint or sawed at the nearest score line to the minimum depth of 1 ½ inches.

E. Survey Monuments

1. Survey monuments shall be installed at the following locations:
 - a. On the public street centerline at intersections, and at the beginning and end of all curves and at the centerline radius of all cul-de-sac bulbs and expanded corners.

- b. At all subdivision boundary corners and at intersections of the subdivision boundary with public street centerlines.
 - c. At any other locations necessary to enable the subdivision boundaries to be retraced or re-established as determined by the City Engineer.
2. All monuments within the street right of way shall conform to the Standard Details and shall clearly show the registration number of the licensed Civil Engineer or Land Surveyor under whose responsible direction they were placed.

F. Signing, Barricades, and Striping

1. Street names shall be subject to approval by the Planning Commission at the time of tentative Map approval, and shall be shown on the tentative map submitted to the Community Development Department.
2. Street name and all regulatory and warning signs shall be installed by the developer or subdivider at his expense.
3. Permanent barricades shall be installed where improvements cover only a portion of the ultimate development or as directed by the City Engineer. The barricade shall be constructed, erected, painted and signed in accordance with the Standard Details.
4. All striping shall be thermoplastic unless otherwise specified by the City Engineer.

G. Easements

Public utility, sewer, water, drainage, landscaping, fence and all other public easements shall be located as required by the utility companies, these Design Standards, and as directed by the City Engineer.

H. Streetscapes

1. Median sections less than or equal to 4 feet shall be paved or filled with materials subject to approval of the City Engineer. The remainder of the median shall be landscaped.

I. Bike Lanes

1. On-street bike lanes are required as outlined in the Standard Details. The minimum width of bike lanes shall be 6 feet. Bike lane width requirements may increase resulting from design speed as determined by the City Engineer.

J. Emergency Access

1. At least two connections with an existing, improved public street, or with a future street extension approved by the City, shall be provided for all proposed roadways, except when the dead-end length of the roadway does not exceed 350 feet.
2. When the secondary access is to be provided with a future street extension, then a temporary emergency access road or acceptable alternative shall be required as determined by the City Engineer and the City Fire Department. Temporary emergency access roads shall have a minimum paved width of 20 feet and have a minimum structural section of 2" AC over 4" AB. A Knox lock or opticom lock may be required on gates per the City Engineer and the City Fire Department. Gates shall be provided at all points of access to public streets as approved by the City Engineer and the City Fire Department. Said roads shall be contained within an emergency access easement.

SECTION 4 STORM DRAINAGE

4.01 GENERAL

These standards shall provide minimum requirements for the design of Storm Drainage and related appurtenances within the City of Rio Vista rights of way and easements. The design criteria of proposed improvements not included in these standards shall be subject to the approval of the City Engineer.

4.02 STORM DRAIN DESIGN

A. Submittal of drainage calculations

Drainage calculations are required for any new subdivision or development. Submittal of drainage calculations shall include the following items:

1. Hydrology with hydraulic calculations together with assumptions, charts, tables, references, and method uses.
2. A plan preferably 1"=100' scale, showing proposed street system, existing and proposed drainage system, tributary sub-areas (including offsite drainage), and peak flow of all pipes.
3. A plan showing the hydraulic grade line (HGL), the proposed storm drain including slopes and sizes and top of curb profile. Elevations should be shown at all changes in slope of the top of curb.

B. Design Flow

The rational Method ($Q=CIA$) shall be used to determine the quantity of runoff (Q) in designing a storm drain system.

Minimum values for the coefficient of runoff and time of concentration are as follows:

| <u>Land Use</u> | <u>C Factor</u> | <u>Tc (Minutes)</u> |
|-------------------------------|------------------------|----------------------------|
| Parks | 0.20 | 30 |
| R-1 and R-2 (residential) | 0.40 | 25 |
| R-GA, R-MD, R-HD (Apartments) | 0.50 | 20 |
| Schools and Churches | 0.50 | 20 |
| Commercial | 0.80 | 10 |
| Industrial | 0.90 | 10 |
| | | |
| <u>Surface</u> | | |
| Pavement | 0.95 | |
| Roofs | 0.80 | |
| Compacted Earth | 0.75 | |
| Lawn and Open Area | 0.20 | |

A maximum roof to gutter time of 25 minutes should be used for parcels under 1 acre. The acre (A) shall be the tributary drainage area in acres.

The area (A) shall be the tributary drainage area in acres Manning's formula shall be used to determine the relation of design flow, slope, velocity and pipe diameter. The friction factor "N" shall be 0.013 for all types of pipe.

The storm frequency to be used in drainage system design will be the storm frequency applicable for the design point under consideration. The following guidelines give a general rule for determining applicable design storm frequency. The actual storm frequency used will be specified at the discretion of the City Engineer.

1. 10 year storm

The drainage system for the 10 year storm is to be designed to minimize inconvenience, protect against minor damage, and reduce maintenance costs.

Improvements to be designed for the 10 year storm shall generally include local drainage facilities for residential, commercial, office, and industrial development. This will almost always include all closed conduit design and minor, channel sections.

2. 50 year and 100 year storm

The drainage system for the 50 and 100 year storms are to be designed to protect against loss of life or substantial property damage. Improvements requiring 100 year design capacity are open channels and detention basins. Minor channels

and closed conduit systems shall also meet the requirements for the 100 year storm as specified in these standards.

4.03 HYDRAULICS

A. General

1. All storm drain pipelines and open channels shall be designed for the above specified frequencies. For the 10-year frequency storm, storm drain pipelines shall be designed without static head at all entrances unless specifically permitted by the City Engineer. In no case will less than one (1) foot of freeboard be permitted between top of curb and hydraulic gradient of the 10-year frequency design flow.
2. An overland release path for flows generated by a 100-year frequency storm shall be clearly delineated on the plans. Structural pad elevations shall be constructed a minimum of one foot above the highest top back of curb elevation across property frontage on public streets.

B. Design Criteria

The following criteria shall be followed in all hydraulic computations unless otherwise approved in writing from the City Engineer.

1. Manning's formula shall be used to compute capacities of all open and closed conduits other than culverts.
2. King's formula shall be used to compute capacities of all culverts. (Refer to King's Handbook of Hydraulics and California Department of Transportation nomograph for the solution of King's formula).
3. The "n" values to be used in Manning's formula shall conform to the following:

A roughness coefficient, $n = 0.015$ is used for sizing conduits when no allowance is made for minor losses (head loss at inlets, bends, junctions, expansions, etc.). If minor losses are accounted for, a roughness coefficient, $n = 0.013$ or per manufacturer's recommendations may be used.

4. Min. Inside Diameter - 12 inches
5. Min. Velocity - 2 feet per second when flowing half full regardless of the slope of the hydraulic grade line. Pipes with lower velocities shall use available fall and have the specific approval of the City Engineer.
6. Max. Velocity -Based on pipe or channel conditions and available head. (Generally shall not exceed 10 feet per second for pipelines).

7. The Engineer, in the design of the system, shall account for all losses in head at junctions, bends, manholes, entrances, and outlets, and at any other location where a change in direction or restriction to flow occurs which would tend to create a loss in available energy when required by the City Engineer.

4.04 ALIGNMENT

- A. Pipelines for storm drainage shall be straight between manholes, junction boxes, and/or catch basins except under the following conditions:
 1. The inside pipe diameter is equal to or greater than 24 inches.
 2. Minimum radius of curvature is equal to or greater than 200 feet. In no case will the radius of curvature be less than the manufacturer's recommendations for the particular pipe size under consideration.
- B. Drainage pipelines shall be located in the street whenever possible. The location of storm drainage pipelines in new streets shall be two (2') feet north or west of and parallel with the centerline of the street, unless otherwise approved by the City Engineer. Meandering and unnecessary angular changes of pipelines shall be avoided. Angular changes in alignment shall be no less than 90 degrees with the downstream section of the storm drain main.
- C. All laterals intersecting with the mainline or manhole shall have an alignment that provides an angle of intersection with the downstream section of the storm drain main of no less than 90 degrees.
- D. Joint deflection shall not exceed 80% of the manufacturer recommendations.
- E. When a change in pipe diameter occurs, the top-of-pipe elevations of the inflow and outflow pipes shall match whenever possible unless specifically approved by the City Engineer. This does not apply to catch basin laterals.

4.05 COVER REQUIREMENTS

- A. All storm drain pipe alignments shall be designed to allow a minimum of 3 feet of cover as measured from the top of finished grade to the inside top of pipe in residential streets and 3.5 in all other streets. If, for sound engineering reasons, 3 feet of cover cannot be obtained, the pipe shall either be encased in concrete or provided with a concrete cover as specified by the City Engineer.
- B. Catch basin laterals that have less than 18 inches of cover shall be encased in concrete.
- C. A minimum vertical clearance of 3 inches shall be maintained between a sanitary sewer or other underground utility.

- D. When crossing a water main it is desirable that the sanitary sewer be installed below the water main with a clearance of 12 inches. When a crossing is necessary, State Health Department Standards shall be adhered to.

4.06 Pipe

- A. The minimum size for storm drain shall be 12” diameter. All catch basin laterals shall have a minimum diameter of 12”
- B. The following standard pipe materials shall be used for storm drain construction and shall conform to the appropriate American Society of Testing and Materials (ASTM) and American Water Works Association (AWWA) specifications (latest revision)

| <u>Pipe Material</u> | <u>Specifications</u> |
|--------------------------------|-----------------------|
| Concrete Pipe | ASTM C14 |
| High Density Polyethylene pipe | ASTM F2306, F2648 |
| Reinforced concrete pipe | ASTM C76 |

**HDPE pipe is not allowed for a diameters greater than 15 inches unless specifically approved by the City Engineer.

- C. Cast-in-place concrete pipe, 36” and larger, may be used when specifically approved by the City Engineer. Cast-in-place pipe will not normally be permitted in existing streets.
- D. Storm drain joints shall be designed and installed to minimize infiltration and to prevent the entrance of roots throughout the life of the system.
- E. Joining of pipe sections of unlike materials shall be accomplished using approved band seals or couplers. Other joining methods shall not be used unless approved by the City Engineer.

4.07 APPURTENANCES

- A. Manholes
 - 1. All storm drain manholes shall be constructed in accordance with the Standard Details.
 - 2. Manholes shall be located at junction points, changes in gradient, changes in conduit size and on curved alignments at the BC and EC of the curve and at no more than 300-foot intervals along the curve. For straight alignments, the spacing of manholes shall not exceed 500 feet for 12” to 33” pipe and 750 feet for 33” pipe and over.
 - 3. Whenever, at manholes, a change in the size of pipe, or a change in the alignment of 20 degrees or more occurs, the flow line of the incoming pipe shall

be a minimum of 0.12 feet above the flow line of the outgoing pipe. The invert elevations in and out of the proposed manhole shall be shown on the improvement plans.

B. Junction Boxes

Junction boxes constructed on storm drainage conduits greater than 60 inches in diameter shall be of special design requiring approval by the City Engineer.

C. Saddle Manholes

All saddle manholes shall be constructed in accordance with the Standard Details. Saddle manholes will be allowed to be constructed on storm drain conduit 36 inches or greater in diameter provided that no junction exists with any other storm drain conduit at the manhole as determined by the City Engineer.

D. Catch Basins/Inlets

Catch Basins/Inlets shall conform to the Standard Details. Catch basins/inlets shall be designed and spaced such that they intercept and fully contain the 10- year storm. Catch basins/inlets shall be installed so that the length of flow in the gutter does not exceed 600 feet. All catch basin/inlets shall be stamped with a Drainage Inlet Marker," Medallion type, per Caltrans Std. D71. It should read "No Dumping, Drains to River."

E. Siphons

Inverted siphons will not be permitted.

F. Valley Gutters

Valley gutters will not be permitted to cross any streets, unless approved by the City Engineer.

G. Subdrainage

Subdrain facilities shall be provided when required by the City Engineer.

H. Box Culverts

Shall be required when specified by the City Engineer and designed on an individual basis.

I. Headwalls, Wingwalls, Endwalls, etc.

Shall be considered on an individual basis, and in general, designed in accordance with Section 51 of the State Standard Specifications.

J. Drainage Pump Stations

May be permitted on an individual basis with the written approval of the City Engineer.

K. On-Site Drainage

All developed areas shall connect on-site drainage into City of Rio Vista drainage system. A stormwater cleaning/filtering unit is required.

L. Private Storm Drain Connections

The minimum size for private storm drain connections shall be 12 inch diameter.

The pipe shall conform to the storm drain pipe specifications. A reasonably accessible structure shall be provided on the private storm drain connection within 10 feet of the street or alley right of way.

Private storm drain connections shall be tied into alley or street catch basin or manholes.

M. Contributing Drainage Areas

Areas not shown as future development in the general plan shall be considered as undeveloped. The Solano County Flood Control Design Criteria handbook may be used in computing runoff from these areas. All other areas shown as developed in the future, shall be addressed under these standards.

N. Retention Basins

Retention basins shall only be allowed with special permission of the City Council after review and report by the City Engineer.

4.08 OPEN CHANNELS

A. Definition

1. For the purposes of these Design Standards, a ditch shall be classified as an open channel when its capacity exceeds 25 cfs.

B. Design Criteria

1. Drainage may not be conveyed through a development in open channels without the written approval of the City Engineer. Open channels shall be designed in accordance with the following:
 - a. Velocity range shall be 2.5 to 6.0 feet per second in unlined open channels and 3.0 to 12.0 feet per second in lined open channels.
 - b. Channel lining shall be either finished concrete, sacked concrete, or doweled and sacked concrete. The minimum weight of sacked concrete shall be 60 pounds.
 - c. All open channels shall be designed to carry the 100-year frequency flood.

Per Section 4.02, the hydraulic grade line of the 10-year and 100-year storms shall be calculated and plotted on all channel profiles. All computations,

including a narrative of the design shall be clearly documented and submitted to the City Engineer for approval.

- d. Freeboard shall be a minimum of 1.0 feet for the 100-year event and comply with the latest FEMA regulations.
- e. Side slopes shall be 3 feet horizontal to 1-foot vertical or flatter and the minimum bottom width of the channel shall be twice channel depth.
- f. Profile of existing channels for a minimum of 1,000 feet at each end of the development shall be shown on the construction plans to establish an average profile grade.
- g. Easement widths shall not be less than the width of the channel plus 4 feet on one side and 14 feet on the opposite side. A twelve-foot wide gravel road, serviceable for year around use, shall be constructed along one side of the channel.
- h. Special headwalls, endwalls, reinforced concrete transitions to culvert crossings, rip-rap, concrete aprons, energy dissipators, and other hydraulic devices shall be installed where required. All such devices shall be shown on the plans and approved prior to construction.

SECTION 5 SANITARY SEWERS

5.01 GENERAL

A. Submittal Requirements

1. Sanitary sewer system design within a developing area shall conform to the General Plan, Master Sewer Plan, and any applicable Specific Plan of the City of Rio Vista and include provisions for size and capacity to adequately convey all domestic and industrial waste that can be reasonably anticipated under conditions of full ultimate development. Engineering calculations to support the sewer system design shall be submitted to the City Engineer for approval. The calculations shall include:
 - a. Map indicating service area within the sewer system including any future contributing development with projected land use, zoning, and any physical features contributing to the sewer system design.
 - b. Sanitary sewer waste volumes either existing or proposed within the service area of the system.
 - c. Size and slope of each pipe between appurtenant structures.
 - d. Invert/rim elevations of each pipe and appurtenant structure.
 - e. Storm water shall not be connected or discharged into a sanitary sewer. Industrial waste maybe connected or discharged into a sanitary sewer with approval of the City Engineer. All installations shall be made in conformance with Construction Specifications approved by the City Engineer.

5.02 PIPE DIAMETER

A. Public Mains

1. The minimum size of any new public sewer main shall be 6 inches in diameter.

B. Residential Services

1. The minimum lateral size is 4 inches where grade requirements can be met and the intended use is to serve single family or duplex residences.

C. Non-Residential Services

1. Six-inch or larger laterals shall be installed where intended use is industrial, commercial or greater than single family or duplex residential flows.

5.03 DESIGN

A. Flow Calculation

The design sanitary sewer flow shall be computed using the following formula:

$$QD = QP + I$$

Where: QD = design flow (eq.5-1)

I = Infiltration and inflow

QP = peak flow

And: QP = $Q_{ave} * PF$ (eq. 5-2)

Where: Q_{ave} = Average Flow

PF = Peaking Factor

1. Residential Flow

a. Average flow (Q_{ave}) shall be based upon the following criteria:

- 1. 3.0 persons per single family dwelling unit
- 2. 2.5 persons per multi family dwelling unit
- 3. 100 gallons per person per day

b. Peaking Factor (PF) shall be 3

c. Infiltration and Inflow (I) shall be added to the design flow at the rate of 1000 gallons per acre. If a project contains an unusually high footage of sewer pipe, the City Engineer may increase the infiltration rate.

2. Non-Residential Flow

a. Average Flow (Q) shall be based upon the following criteria:

- 1. Other Commercial 1500 gpad*
- 2. Prof. Office/Bus Park 1500 gpad

3. Recreation 500 gpad
4. Schools 4.25 gpd/student
5. Light Industrial 2000 gpad
6. Heavy Industrial (case-by-case basis)

* (gallons per gross acre per day)

NOTES:

1. High volume generators such as restaurants shall be considered on a case-by-case basis.
 2. Multi-story structures will be considered on a case-by-case basis.
- b. Peaking Factor (PF) shall be based upon the following criteria
1. Industrial = 2
 2. Non-Industrial = 3
- c. Infiltration & Inflow (I) shall be the same as for residential flows.

B. Pipe Capacity

1. Manning's Formula [$Q = A (1.49/n) R^{2/3} S^{1/2}$] shall be used to determine pipe capacity. The "n" value shall be 0.013 or the pipe manufacturer's recommendation. Manning's "n" values, which are less than 0.013 shall require City Engineer approval and shall only be allowed if minor losses are accounted for.
2. All main sewers shall be sized to carry the design flows at a maximum of 70% of pipe capacity.

C. Velocity

1. Sewer velocity shall be equal to or greater than 2 feet per second for all sewers when flowing full. Maximum velocity should be 10 fps.

D. Pipe Cover and Clearances

1. Minimum pipe cover and clearance shall be maintained in the design of sanitary sewers. If certain conditions exist which make it impractical to meet the minimum cover and clearance requirements, the conditions and locations shall be specifically noted above the sewer profile on the plans. Each location not meeting the minimum cover and clearance requirements will require special approval. Any planned condition being specially approved with less than

minimum cover will require special pipe, bedding and/or backfill as approved by the City Engineer.

2. Main and trunk sewers shall have a minimum depth of 4 feet as measured from the top of the pipe to the finished grade.
3. Laterals shall have a minimum depth of 3 feet from the top of the pipe to finished grade.
4. Pipe shall be laid with a minimum of 12 inches vertical clearance below water lines and 6 inches clearance from all other improvements and utilities, unless otherwise approved by the City Engineer. Other utilities shall not, under any circumstances, be installed immediately over and parallel to any sanitary sewer line installation.

E. Horizontal Alignment

1. Sewer mains and trunks shall be located 12 feet north or west of and parallel with the street centerline unless otherwise approved by the City Engineer.
2. Alignment of sanitary sewer mains shall be straight between manholes. Whenever it is essential that a curved alignment be used, a minimum radius of 200 feet shall be required, but shall be greater whenever possible. The radius and delta of all curves shall be indicated on the plans adjacent to the curve.
3. The deflection in the joint between any two successive pipe sections shall not exceed eighty (80) percent of the maximum deflection as recommended in writing by the pipe manufacturer.
4. Minimum horizontal separation between parallel sewer and water mains shall be 10 feet.

F. Lateral Sewers

1. Laterals are those portions of the sewer system between the sewer main and the portions of the sewer maintained by the property owner. The usual location of the line separating responsibility of the City and property owner is the back of sidewalk cleanout. In all cases, City maintained sewer lines will lie in a street right-of-way or dedicated public easement. In all new subdivision work, the house lateral line and cleanout from the sewer to the property line shall be installed at the time the sewer main is constructed. Each lateral line shall be referenced to the Improvement Plan stationing.
2. All laterals, from property line or edge of easement to the point of connection with the main line or a manhole shall have an alignment that provides an angle of intersection with the downstream section of the main sewer of no less than 90 degrees.

3. The maximum deflection at any one point in a lateral, not including fittings at saddle or wye connection to main sewer or at angle points having cleanouts, shall be 22-1/2° (1/16 bend) and any two consecutive deflections (bends) shall not be less than 2 feet apart.
4. For single family and duplex uses, cleanouts shall be provided on the lateral sewer at the back of sidewalk as shown on the Standard Details.
5. For sewer laterals 6 inches and larger in diameter, manholes shall be provided at or near the street right of way line.
6. Sewer laterals shall be installed with a minimum of five (5) foot horizontal separation from water services for all single family and duplex uses.
7. Laterals shall connect to the main at manholes whenever possible. Laterals for residential properties located within cul-de-sacs shall be connected at a manhole.
8. A single sewer connection shall not serve more than one parcel. Each individual parcel shall have a separate sewer connection.

G. Pipe

1. The following standard pipe materials shall be used for gravity flow wastewater line construction and shall conform to the appropriate American Society of Testing and Materials (ASTM) and American Water Works Associates (AWWA) specifications (Latest revision).

| <u>Pipe Material</u> | <u>Specifications</u> |
|--|----------------------------------|
| PVC – SDR35, SDR26 | ASTM D3034, F679 |
| Ductile iron pipe w/polyethylene lining and encasement | ASTM A746, ASTM D1248, AWWA C105 |

*Lining shall be 30 mil minimum, encasement 8 mil minimum.

2. Joints and fittings shall be selected and installed to minimize infiltration and to prevent the entrance of roots throughout the life of the system. Ductile Iron pipe joints and fittings shall conform to AWWA C110 or other approved joint for wastewater applications. Joints for PVC pipe shall be bell and spigot conforming to ASTM D3212.
3. Joining of pipe sections of unlike materials shall be accomplished using approved band seals or couplers. Other joining methods shall not be used unless approved by the City Engineer.

H. House service

The minimum house service shall be 4 inch and shall be installed in conformance with Standard Detail 401.

I. Appurtenances - Manholes

1. Along straight alignments of mains, the maximum spacing for manholes shall be 400 feet for pipe 10 inches and under and 600 feet for pipe 12 inches and over. Where the location of two manholes is determined by intersecting lines, the distances between intervening manholes shall be approximately equal.
2. Sewers constructed on curved alignments where 200' feet < radius < 400' feet shall have additional manholes placed per the following criteria:
 - a. Where curve length < 50' feet; no additional manholes required
 - b. Where 50' feet < curve length < 150' feet; a manhole shall be required at either the BC or the EC
 - c. Where curve length > 150' feet; a manhole shall be required at the BC and the EC and at 300 ft intervals along the length of the curve.
3. Whenever, at manholes, a change in the size of pipe, or a change in the alignment of 20 degrees or more occurs, the flow line of the incoming pipe shall be a minimum of .12 feet above the flow line of the outgoing pipe. The invert elevations in and out of the proposed manhole shall be shown on the improvement plans.
4. Manholes shall be used at the termination of all sewer mains including cul-de-sacs. Cleanouts may be installed at the upstream end of mains, which are proposed to be extended in the future on an approved development plan.

J. Unusual Design

1. Special design of sewer force mains, siphons or other unusual features or structures shall be subject to the approval of the City Engineer.

5.04 LIFT STATIONS AND FORCE MAINS

A. Requirements

Where extreme hardship conditions prevail, and a substantial area cannot be sewer by gravity sewers in accordance with these standards, a sewage pumping station may be installed. No sewer design shall rely on a pumping facility without prior approval of the City Engineer.

B. Lift Station Design

Lift stations, where allowed, shall incorporate the following features:

1. Pumps or other devices shall be duplex. Minimum desirable size is 4 inches. Maximum velocity in suction is 5 ft/sec. Pumps shall be capable of passing 3 inch solids.
2. Capacity shall be provided to handle ultimate peak flow from the tributary area with the largest pump out of service. Stage installation of pumps is allowed providing space is provided for future installations. Where slide mount submersible pumps are used, a duplex installation of 100% design capacity may be used if a spare pump assembly is supplied to the City complete. Where design flows exceed 1.0 cfs, a low flow pump shall be provided in addition to the design rated pumps. The low flow pump shall have a capacity of 5%-10% of the design flow and shall operate as the lead pump.
3. Access to pump station and to wet well shall be provided with locks keyed to City Master.
4. A lifting loop over pump/motor, or similar provisions for removal of pump shall be provided.
5. Pump station and wet well shall be lighted.
6. The wet well rim electrical panel shall be above the 100 year flood elevation.
7. Pump curves, operating voltage, and phasing, horsepower, etc. shall be in accordance with approved submittal of Caltrans Standard Specifications.
8. Submersible pumps shall be capable of running air without damage. Moisture sensing circuit breakers in terminal changer shall be incorporated into submersible pumps.
9. A NEMA, weatherproof outdoor enclosure shall be provided for controls. Electric service shall be provided by underground conduit to the utility service pedestal.
10. Lift station and SCADA system controls shall be approved by the City Engineer and shall be by solid state programmable controller with sensor (or equal) with LED digital readout with purge and clean capacities and automatic pump alternating. A standby battery and charger shall be supplied. The battery is to be able to operate the controller for two weeks with the external power source removed. An adjustable time delay before any restart shall be incorporated which allows delays from 1 to 10 minutes. Switches for manually operating the pumps shall be included.

11. An on site alarm with exterior lights and horn with battery backup, including switchable power failure, and low water and high water sensors shall be provided.
12. An automatic telephone dialer and message capability for all alarms shall be installed.
13. Each sewer pump shall have gate valve and check valve on the discharge piping.
14. Access and work area of pump stations shall be paved with minimum 2" AC on 4" AB.
15. A six (6) foot high chain link fence or masonry wall approved by the City Engineer shall be constructed to enclose the pump station.
16. A means of dewatering force mains shall be provided.
17. The lift station shall not be in City road right-of-ways except with permission from the City Engineer.
18. The interior of the structure, all machinery, piping, and exterior below grade shall be painted.
19. The City shall be provided with three complete sets of manufacturer's brochures, technical data, O & M manuals, schematics, wiring diagrams, etc., for all equipment and controls.

C. Structural

Structures shall be reinforced concrete, fiberglass, fusion epoxy coated or galvanized steel. In residential areas, structures shall be below ground. Provide a hatch suitable for the removal and replacement of major equipment components. Hatches shall be spring loaded (Bilco type) with metal provided.

D. Mechanical and Piping

All design shall satisfy the minimum requirements of the State Health Code. A reduced pressure principle device is required on all domestic water connections. A 1" metered connection is to be provided adjacent to the station. Provide an automatic sump pump (slope floor to pump) with check valve in discharge pipe wet well. Provide standby pumping capacity equal to the largest single unit. Make provisions for standby emergency power connection for use during power outages. Sump pumps and air blowers shall be easily removable for maintenance.

E. Electrical

All electrical installations shall comply with the National Electric Code and Division of Industrial Safety requirements, and City Code. Use enclosed prefabricated electrical panels mounted above ground level outside the pump station. Provide running time meters for all motors (use reset type). Provide explosion-proof electrical appurtenances below ground or an approved type disconnect and time delay. Provide separate blower system with in all electrical panels located below ground. Provide an approved type alternator and float switches. A manual switch shall be mounted at motor height. Adequate lighting and electrical outlets shall be provided. Outlets shall be mounted at motor height. Color code all wiring and piping. (National Standard Coding.)

F. Force Main Design

Force Mains shall be designed in accordance with good engineering practice. Maximum velocity shall be 10 ft/sec. Minimum velocity shall be 2 ft/sec. Preferred pipe material shall be PVC C900, Class 150, DR18 pipe and shall be green or brown.

5.05 TESTING OF SEWER SYSTEMS

- A. Prior to acceptance, all Sanitary Sewers are to be balled and flushed, pressure tested, mandrelled and video inspected. The pressure test shall be 4 lbs. for 4 minutes with no loss.

5.06 OFFSITE IMPROVEMENTS

The subdivider may require to build improvements or to pay a fee established by the City for the development of sewage disposal facilities or for the improvement of any existing sewage disposal system and the construction of transmission lines from the proposed improvements to the site of disposal.

SECTION 6 WATER SYSTEM

6.01 GENERAL

System Description

The existing City of Rio Vista water system supplies treated water within the developed areas of the City. It consists of water wells, storage tanks, booster stations and several miles of pipe ranging from 4" to 12".

6.02 DESIGN REQUIREMENTS

A. General

Water system design within a development area shall conform to the General Plan, Master Water Plan, and any applicable Specific Plan of the City of Rio Vista, and shall be capable of transmitting and distributing adequate flows and maintaining sufficient pressures based on anticipated conditions of full ultimate development. All improvements including extensions, replacements, and repairs shall conform to the requirements of the Uniform Plumbing Code, the Uniform Fire Code, California Health & Safety Code, American Water Works Association Standards, the Water Code of the City of Rio Vista, these Design Standards, Standard Construction Specifications and Standard Details of the City of Rio Vista.

B. Layout of Mains

1. The distribution system, whenever possible, shall employ the "Gridiron System" of water circulation so as to allow pressure equalization. Dead end water mains shall require specific approval by the City Engineer. In no case shall the dead end length of water mains exceed 500 feet.
2. All water pipelines designed for the transmission or distribution of domestic water supply shall be constructed and installed within public streets unless such construction or installation is determined to be impractical by the City Engineer. All water lines that lie outside of public streets shall be in a water easement or public utility/service easement (PUE/PSE).
3. The location of the water main in any street shall be ten (10') feet from and parallel with street centerline on the southerly or easterly side of the street unless otherwise approved by the City Engineer.
4. No case shall there be less than 10 feet horizontal clearance to a sanitary sewer, storm drain, or industrial waste line.
5. Curved water mains are not allowed in curved streets when curvature does not exceed manufacturer's recommendations.

C. Sizes

The minimum size water main shall be 8 inches in diameter. In all cases, water mains shall be of sufficient size to meet fire flow requirements or as directed by City Engineer.

D. Vertical Alignment

1. The minimum cover on water mains shall be 42 inches. When crossing a sanitary sewer or storm line it is desirable that the water main be installed above with a clearance of 12 inches. The minimum vertical clearance of 6 inches shall be maintained between a sanitary sewer or storm drain.
2. The invert elevations shall be shown on all water main improvement plans.
3. All high points within the system shall be located at fire hydrant locations insofar as practicable.

E. Pipe Materials

1. Allowable materials shall be as specified in the following table.

| <u>Pipe Material</u> | <u>Specifications</u> |
|--|------------------------------|
| PVC, C900, CL150, CL200 | AWWA C900 |
| PVC, C905, CL165 | AWWA C905 |
| Ductile Iron Pipe with cement lining and polyethylene encasement | AWWA C151 AWWA C104, C105 |

*Ductile Iron pipe shall have a minimum working pressure of 150 psi.

2. When a ferrous material (i.e.; ductile iron) is used for a new water line, the City Engineer may require that the soil within the vicinity of the new water line be tested for corrosive potential. If it is determined that the soil is corrosive to the material being placed, the new water system must be protected by a corrosion control system. The corrosion control system must be designed by a licensed corrosion engineer and shall be submitted to the City Engineer for approval.

F. Valves

1. The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a transmission main, or necessitate the removal from service a length of pipe greater than 500 feet. Additionally, in no case shall more than two fire hydrants be removed from service. The valves should be so located that any section of main can be shut down without going to more than three locations to close valves. Gate valves shall be Mueller 2360 series resilient wedge valves or approved equal.
2. All tees shall have three valves.
3. All crosses shall have four valves.

4. Valves, incorporating a blowoff device, or a fire hydrant, shall be installed at the terminus of all dead-end water mains.
5. A valve shall be installed on services immediately off the main for services 4” inches and greater in diameter.
6. Air Release valves shall be installed at high points in the vertical alignment of all water mains. The vertical alignment of water mains shall be designed to minimize this requirement.
7. Blow-off valves shall be installed at all dead ends of water mains.
8. Bollards or markers shall be installed at all valves and fittings when located in unpaved areas.

G. Fire Hydrants

1. Fire Hydrants shall be supplied from the largest available main.
2. Fire Hydrants shall be fed from 2 directions unless specifically approved by the City Engineer and Fire Chief.
3. Fire hydrant spacing and distribution shall be determined as follows:
 - a. The maximum hose lay shall be 200 feet in high density, commercial, industrial zoning or high-value districts, with a maximum spacing of 400 feet.
 - b. The maximum hose lay shall be 250 feet in residential areas with maximum spacing of 500 feet.
 - c. On divided streets, planned divided streets or highways, the above spacing shall apply to both sides of the street.
 - d. A fire hydrant shall be located within 200 radius point of all cul-de-sacs.
 - e. Distribution main, fire hydrants and fire flow requirements shall conform to the recommended Standards of Insurance Services Office. Refer to “guide for Determination of Required Fire Flow” published by Insurance Services Office.
4. Fire flow and fire hydrant distribution, including the number of hydrants required and specific locations, shall be approved by the City Engineer and Fire Chief.
5. Fire hydrants shall be class 960 or approved equal and shall be installed in conformance with Standard Details 507 & 508.

H. Services

1. In all new subdivisions, the residential service line shall be located a minimum of 5 feet from the side yard property line. Service lines from the water main to the property line shall be installed at the time the main is constructed to avoid frequent cutting of the street, unless otherwise approved by the City Engineer. They shall be polyethylene pipe conforming to applicable standards.
2. Service lines to existing buildings shall be installed so as to make the most direct connection to the existing structure.
3. A single domestic service connection shall not serve more than one parcel. Separate parcels shall be supplied water through separate service connections.
4. More than one domestic service shall not be supplied to a single property for the purpose of avoiding water connection charges. Water meters shall be sized consistent with the water service size. Backflow prevention devices shall be sized as necessary.
5. Minimum service line diameter to single family residences shall be 1 inch. Services to schools, commercial, industrial or multi-family units shall be sized according to demand. 2-1/2 inch or 3 inch diameter line sizes shall not be allowed within public right-of-way or easements.
6. For commercial, industrial or multi-family developments, a separate service line must be utilized for fire and domestic services.
7. For public irrigation systems, the City may consider the installation of a turbo type meter and/or varying meter and line sizes.

I. Cross Connections

1. Attention is directed to Title 17, Chapter V, Sections 7583 to 7622, inclusive, of the California Administrative Code, regulating the construction of cross connections between drinking water systems and other sources of water. All construction shall be in strict compliance with said regulations and all applicable City Ordinances. The addition of a backflow prevention device to any water system supplying an automatic fire sprinkler system shall cause the automatic sprinkler system to be recalculated. It is the responsibility of the property owner to ensure that all sprinkler system requirements are met after installation of the device.

2. Backflow prevention devices shall be installed on all commercial, industrial, multifamily fire, domestic, and irrigation services as shown in the Standard Details.

J. Anchors

Concrete anchors, thrust blocks, or mechanical joint restraints, if approved by the City Engineer shall be provided at all bends, behind tees, fire hydrants, crosses (which are valved in such a manner that they can be used as tees) and valves, as shown in the Standard Details.

K. Fittings

Standard approved fittings shall be used at all bends of 11-1/4 degrees and greater. Deflections shall not exceed 80% of manufacturer's recommended maximum values.

L. Cover Requirements

Water mains and services shall be installed at a depth which will provide a minimum of 42 inches from the top of the pipe to finished grade.

SECTION 7 STREET LIGHTING

7.01 GENERAL

A. General Requirements

These specifications shall cover the design and installation of street lights. The design and installation shall conform to these Design Standards, and the Standard Details.

B. Submittal Requirements

1. The Consulting Engineer shall show the existing and proposed street lighting system on separate street light plans of the project improvement plans.

The plans shall include the following items:

- a. Location of electroliers.
 - b. Location of service points.
 - c. Location of pull boxes.
 - d. Intensity of luminaries.
 - e. Conduit size, lengths, and runs.
 - f. Wire size, lengths, and runs.
 - g. Mounting height and arm length.
 - h. Service Voltage and wiring diagram.
2. The Consulting Engineer shall submit two (2) copies of the street light plans to the City for preliminary review. The Consulting Engineer shall then obtain service locations, service voltages and identification numbers from the Pacific Gas and Electric Company (PG&E).

After the Consulting Engineer receives the service locations, he shall determine the wire size and length of each conduit run. These items may be shown in tabular form or denoted next to each conduit run on the plans.

The cost for all PG&E services shall be paid for by the developer or contractor. This shall include the PG&E connection charge for energizing street lights.

7.02 DESIGN

A. Spacing, Intensity and Pole Heights

Street lights shall have the maximum spacing, distribution, mast arm length, intensity and pole heights according to the type of street on which they are to be installed.

Light spacing for streets with a width of 60 feet or more is based on a one -sided arrangement and that spacing for narrower streets is based on a two -sided arrangement. The one-sided spacing arrangement is a system whereby the street light spacing relates to the distance between street lights all on the same side of the street. The two -sided arrangement relates to the distance between street lights taking into consideration the street lights on both sides of the street. The actual constructed street width shall be the controlling factor for determination of street light spacing rather than the street classifications (arterial, collector, etc.)

1. The following steps shall be taken to determine the appropriate spacing and location for street lights.
 - a. Identify the nearest intersections each way from the street light location being planned. Determine the location of the street lights at the intersections in conformance with the design standards.
 - b. Determine the distance between the adjacent intersection requiring lights and then divide the distance into equal spaces.
 - c. Compare the light locations to intersecting property line, driveways and other obstructions as follows:
 1. If the location falls close to a property line and it can be adjusted to the property line while staying within the maximum spacing allowed, then the adjustment should be made.
 2. Generally, street lights should be situated at intersecting property lines for residential lots and parcels with minimal frontage (75 feet or less). The light spacing may have to be unbalanced, with additional lights being added to attain this and still comply with the maximum spacing allowed.
 - a. Variations to these requirements may be approved on an individual basis by the City Engineer.

B. Location of Street Lights

1. On streets with separated sidewalks, street lights shall be located two (2) feet behind the face of curb.
2. On streets with monolithic curb, gutter, and sidewalk, street lights shall be located at the back of sidewalk. The edge of the pole foundation shall meet the back of sidewalk.
3. Where there is only curb and gutter, the street light shall be located two (2) feet from the face of curb.
4. In cul-de-sacs, a street light shall be located within the bulb area.

5. For intersection lighting refer to Standard Detail #603.
6. Street Lights shall be placed on the outer edge of curves.
7. Street Lights shall be placed adjacent to bus stop shelters.

C. Lighting Distribution Pattern

1. All street lighting shall be as listed in the Standard Details.

D. Pull Boxes

1. Pull boxes shall be spaced at a maximum of 200 feet.
2. One pull box shall be located next to each electrolier unless there is a secondary electric service whose pull box is located within 8' feet of the electrolier and such electrolier is singularly serviced.
3. One pull box shall be located at each side of all street crossings.
4. Pull boxes shall be placed immediately behind the sidewalk in sidewalk areas or 3-5 feet behind the back of curb in non-sidewalk areas.
5. Pull boxes shall be located at any angle point greater than 45 degrees.

E. Ballasts

All street lights shall have a regulator type ballast.

F. Voltage Drop Calculations

Voltage drop calculations shall be submitted whenever four (4) or more lights are served from a single source point. The calculations shall be done in accordance with the Standard Details. The maximum permissible voltage drop is 5%.

G. Photocells

A photocell shall be included on each separate luminaire.

H. Service

All street light systems shall have underground service provided. Service points shall be provided within a utility easement immediately adjacent to or within the right-of-way and shall be open and easily accessible to the street frontage.

1. Types of service are as follows:
 - a. A direct underground service consists of one or two lights being served from a single service point. The service point may be in the form of a service pullbox installed by the Developer, which is connected to a secondary splice box provided by PG&E.

- b. A multiple service is three or more lights being served from a single service point. The service point shall be in the form of a service pullbox installed by the Developer. Multiple systems shall have a State Standard Type III-AF service equipment enclosure (Anodized Aluminum Cabinet) located adjacent to the service point.

I. Conduit Fill

1. The National Electric Code limits the portion of the conduits cross section that can be occupied by conductors to the following:
 - a. One (1) Conductor - 53%
 - b. Two (2) Conductors - 31%
 - c. Three (3) or more conductors - 40%
2. As a practical limit projects for new construction/installation should be designed with 26% of the conduit x-section occupied by conductors. Standard Detail #609 lists conductor sizes and available conduit area.

J. Conduit Locations

1. In separated sidewalk locations, conduit shall be placed under the front edge of the sidewalk closest to the street.
2. In monolithic curb, gutter and sidewalk locations, conduit shall be located under the back edge of sidewalk farthest from the street.

SECTION 1 GENERAL INFORMATION

1.01 PURPOSE

This Division specifies design and construction requirements for site improvements constructed on private property within the City of Rio Vista.

The purpose of applying the City of Rio Vista Standard Specifications to private site developments is to ensure that minimum standards of construction are maintained to protect the health, safety, and general welfare of the public. These standards are intended to minimize the potential of: contamination to the potable water system by cross-connections; ground water intrusion into the sanitary sewer and storm drainage systems; ground water contamination resulting from leakage of sanitary sewer systems; damage to habitable structures caused by flooding; and structural failure of pavement area subjected to vehicle loads.

SECTION 2 DESIGN REQUIREMENTS

2.01 PAVEMENT AND STRUCTURAL SECTION REQUIREMENTS

- A. Pavement structural section design by a soils engineer shall be required on all private development projects. The design for structural sections shall be part of a Soils Report. The report shall be submitted in 8 ½ x 11 inch bound folder and include recommendations for: natural subgrade, geotextile fabric, subbase, base, and pavement compaction and thickness, and other requirements to achieve design strength.
- B. The minimum traffic index (T.I.) required for on-site pavement structural sections subjected mainly to vehicular traffic shall be 4.0. The minimum traffic index (T.I.) required for on-site pavement structural sections subjected mainly to truck traffic shall be 6.0. However, it is recommended that the developer/owner of the project design and construct a pavement structural section that provides maximum strength and durability for the projects' anticipated traffic loads.
- C. The minimum cross-slope of all pavement shall be one percent (1%).
- D. The Soils Engineer shall be on-site to monitor parking lot grading and to certify compaction and thickness of all components of the pavement structural section.
- E. Written certification of pavement grade by a registered civil engineer or licensed land surveyor and written certification of the structural section and compaction by a geotechnical engineer shall be required prior to the issuance of a Certificate of Occupancy. A Certificate of Occupancy will not be issued for any building if the pavement structural section or compaction does not conform to the requirements specified in the Soils Report.

NOTE: Pavement and Structural Section requirements shall not apply to single-family homes and duplexes.

2.02 STORM DRAINAGE DESIGN REQUIREMENTS

- A. Storm drain run-off from surfaces on-site and outside the City rights-of-way shall be routed to the City underground storm drain system via on-site catch basins and an underground system. It shall travel through a storm water filtering unit before reaching the City system. No surface run-off shall be routed to an adjoining private property unless approved by the City and authorized by a reciprocal drainage and maintenance easement or agreement. The pavement at the driveway entrance(s) to the project may be constructed so as to allow storm drainage to cross the driveway apron provided that the high point of the pavement is situated a maximum distance of thirty (30) feet measured from the back of driveway apron or sidewalk. The project engineer is encouraged to apply Low Impact Development (LID) principles to storm drain design.

- B. Roof drains shall not be discharged through the public street curb but shall be dissipated in the landscape area close to the building or connected directly to the on-site underground storm drain system.
- C. The finished floor elevation of all habitable areas of commercial, industrial, and multi-family residential structures shall be at least twelve (12) inches above the 100-year frequency storm hydraulic grade line elevation as determined by a storm drainage analysis. If such analysis is waived by the City Engineer, the finished floor elevation shall be a minimum of twelve (12) inches above the highest top of street curb elevation along the frontage of the site. In the absence of street curbs, the elevation of the crown of street shall be used.
- D. The design of all underground storm drain systems including their appurtenances within the building site property and up to within five (5) feet of the building shall conform to Division I, Section 4 of the City of Rio Vista Standard Specifications except for the following additions and modifications:
 - 1. Section 4.03B; Design Criteria: (4). The minimum inside diameter of on-site storm drainage pipe shall be eight (8) inches.
 - 2. Section 4.05A; Cover Requirements: Pipe depths, other than RCP, to finish grade and/or subgrade shall be in conformance with the specifications of the pipe manufacturer.
 - 3. Section 4.07A; Manholes: (2). All on-site storm drain manholes shall be constructed in accordance with the Standard Details. There are no City requirements for the spacing of on-site storm drain manholes. However, future maintenance and accessibility should be considered during design of the system.
 - 4. Section 4.07B; Junction boxes: Junction boxes for on-site drainage shall be reinforced concrete.
 - 5. Section 4.07.D; Catch Basins/Inlets: Drain inlets for on-site storm drainage shall be 12 inches in the least dimension. The maximum area draining into one inlet shall be one (1) acre. All inlets for on-site use that are not included in the Standard Details shall be clearly shown and dimensioned on the plans. All grates shall be designed to provide adequate safety for automobile traffic, bicycles and pedestrians.
 - 6. Section 4.07F; Valley Gutters: Valley gutters may be used for on-site drainage provided that a minimum slope of 0.003 feet per foot is maintained.

7. Pipe Materials and Use Conditions: Pipe materials and construction procedures for on-site storm drainage shall conform to these specifications unless otherwise approved by the City Engineer.
8. On-site underground storm drainage systems may be shown in plain view only, unless otherwise requested by the City Engineer.
9. The hydraulic grade line elevations for the design storm shall be shown on the site improvements plans at all locations of on-site drain inlets, catch basins and manholes wherever the hydraulic grade lines are above the top of the pipe.
10. The Consulting Engineer shall be responsible for designing a grading plan, which insures that storm waters flow through a development in a manner that will not flood habitable structures in the event of malfunction or overloading of the drainage system.
11. All Storm Drainage calculations shall be signed and stamped by a California registered civil engineer prior to approval by the City.

2.03 SANITARY SEWER DESIGN REQUIREMENTS

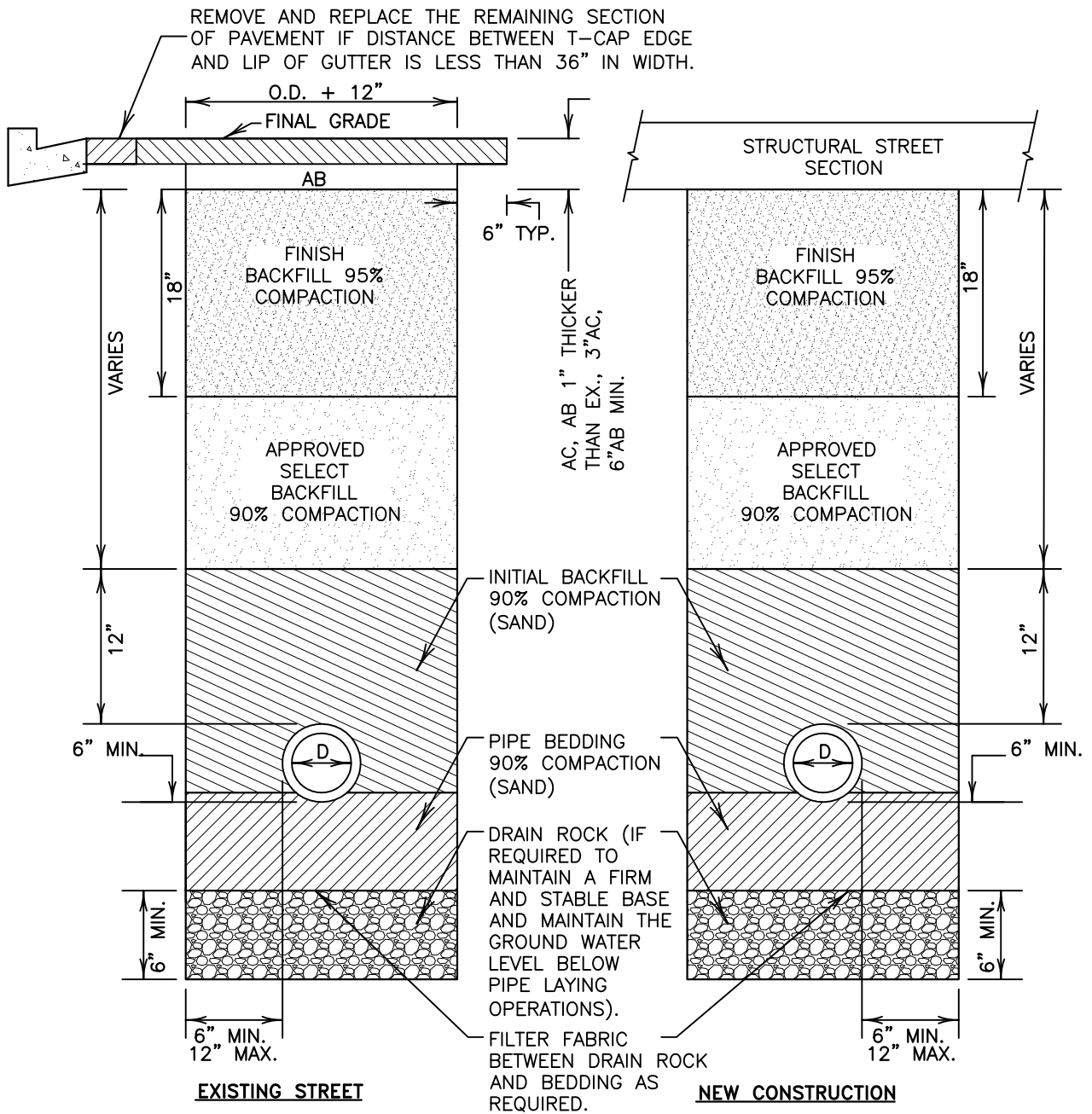
- A. The design of all underground sanitary sewer systems including their appurtenances within the building site property and up to within five (5) feet of the building shall conform to Division I, Section 5 of the City of Rio Vista Standard Specifications except for the following modifications and additions:
 1. Section 5.02A; Pipe Diameter: the minimum size of any on-site sanitary sewer main shall be four (4) inches in diameter.
 2. Section 5.03D; Pipe Cover and Clearances: Pipe depths to finish grade and/or subgrade must be in conformance with the specifications of the pipe manufacturer.
 3. Section 5.03I; Appurtenances: All on-site sanitary sewer manholes shall be constructed in accordance with the Standard Details. There are no City requirements for the spacing of on-site sanitary sewer manholes. However, future maintenance and accessibility should be considered.
 4. Pipe material and construction procedure for on-site sanitary sewer systems shall conform to these specifications unless otherwise approved by the City Engineer.
 5. All Sanitary Sewer Design Calculations shall be signed and stamped by a California registered civil engineer prior to approval by the City.

6. Facilities with the potential to generate fats, oils or grease will be required to install an interceptor prior to connection to City system. Said interceptor shall be approved by the City.

2.04 WATER SYSTEM DESIGN REQUIREMENTS

- A. The design of all underground water systems including their appurtenances within the building site property and up to within five (5) feet of the building shall conform to Division I, Section 6 of the City of Rio Vista Standard Specifications except for the following modifications and additions:
 1. Section 6.02C; Sizes: There are no City requirements for minimum size of on-site water mains. Water mains shall be sized to meet domestic, fire sprinkler and fire flow requirements.
 2. Section 6.02E; Pipe Materials: Pipe materials and construction procedures for on-site water mains shall conform to these specifications unless otherwise approved by the City Engineer.
 3. Section 6.02L; Cover Requirements: Minimum cover over private fire mains shall not be less than 36” inches beneath paved sections subject to vehicle traffic loads and not less than 48” inches under railroad tracks as measured from the top of pipe to finish grade.
 4. On-site fire lines: The Engineering Division will plan check and inspect the portion of the underground fire line from the tap at the City main up through and including the last ell at the downstream end of the backflow device.
 5. Backflow Certifications: All backflow devices inspected by the City Engineer shall be tested and approved by a certified tester prior to any permit final or Certificate of Occupancy.
 6. On-site fire hydrants: On-site fire hydrants shall be jointly inspected and approved by the City Engineer and the Building Inspection Department prior to any permit final or Certificate of Occupancy. On-site hydrants shall conform to these Design Standards, and Standard Detail.

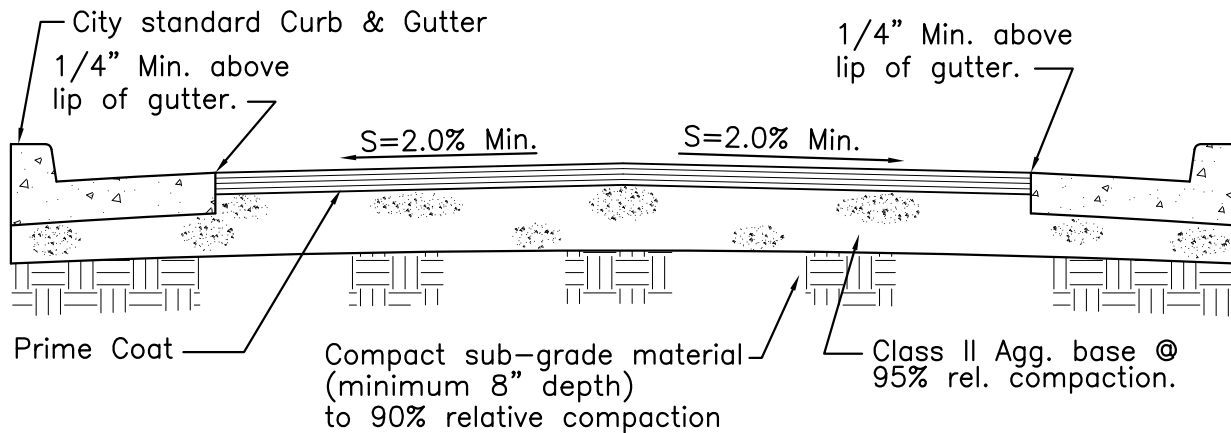
STANDARD PLANS



NOTES:

- A. IN EXISTING STREETS, A TEMPORARY LAYER (3" MINIMUM) OF ASPHALT CUT BACK SHALL BE PLACED TO GRADE ON TOP OF THE FINISH BACKFILL AND MAINTAINED UNTIL PERMANENT PAVING IS INSTALLED.
- B. PONDING OR JETTING PERMITTED TO THE TOP OF PIPE IF APPROVED BY SOILS ENGINEER.
- C. ALL EXISTING PAVEMENT SHALL BE NEATLY CUT TO LINE PRIOR TO TRENCH EXCAVATION.
- D. INITIAL BACKFILL SHALL BE MECHANICALLY CONSOLIDATED UNDER HAUNCHES OF THE PIPE.
- E. PIPE BEDDING SHALL BE A MINIMUM OF 6 INCHES
- F. THE MAXIMUM LENGTH OF OPEN TRENCH SHALL BE THE DISTANCE NECESSARY TO ACCOMODATE THE AMOUNT OF PIPE WHICH CAN BE INSTALLED IN A SINGLE DAY.
- G. PLACEMENT OF SPOIL MATERIALS ON THE PAVED STREET WILL NOT BE ALLOWED.
- H. STEEL PLATES WILL BE ALLOWED TO COVER AN OPEN TRENCH UP TO A MAXIMUM LENGTH OF 50 FEET. PLATES SHALL BE SECURED AS NECESSARY AND HAVE COLD MIX PLACED AROUND ALL EDGES. NON-SKID PLATES ARE REQUIRED IN ALL PAVED AREAS.
- I. ALTERNATE BACKFILL MATERIAL AND METHODS SHALL BE SUBJECT TO APPROVAL BY THE CITY ENGINEER.

| | | | | | |
|------------------|---------------|----|--|---------------|------------|
| NO. | REVISION DATE | BY | TRENCH BACKFILL | APPROVED BY: | DECEMBER |
| | | | | CECIL DILLON | 2015 |
| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | DATE |
| CHECKED BY: CD | | | | RCF 25835 | |
| SCALE: NONE | | | | STANDARD | 101 |
| DATE: 03/2015 | | | | PLAN NO. | |



- NOTE:**
1. TRAFFIC INDEXED (T.I.) SHOWN ON STREET SECTIONS ARE MINIMUMS. ALL STRUCTURAL SECTIONS SHALL BE BASED ON A 20 YEAR DESIGN LIFE AS DETERMINED BY EXISTING R-VALUE AND T.I. WHICH SHALL INCLUDE ANTICIPATED TRAFFIC AS WELL AS EXISTING TRAFFIC CONDITIONS. STRUCTURAL SECTIONS ARE PER A QUALIFIED SOILS ENGINEER'S REPORT AND SUBJECT TO THE CITY ENGINEERS APPROVAL.
 2. WHERE EXISTING FACILITIES MUST MATCH THE CROSS SLOPE MAY VARY BETWEEN 2% AND 4%.
 3. SEE DRAWINGS 202-216 FOR CURB AND GUTTER, SIDEWALK AND DRIVEWAYS.

| NO. | REVISION | DATE | BY |
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| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

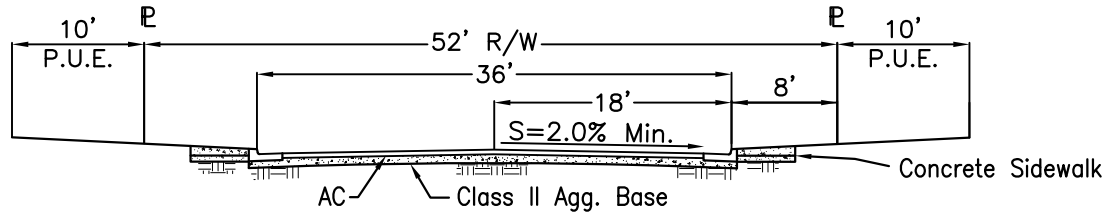
TYPICAL STREET SECTION REQUIREMENTS

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

| | |
|---------------|----------|
| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |

STANDARD
PLAN NO. **201**

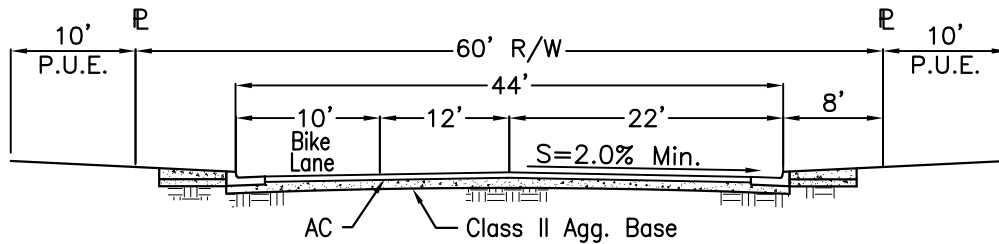
P.U.E. = Public Utility Easement



Minor/Local

T.I. = 6.5 Minimum
Design Speed = 25 M.P.H.

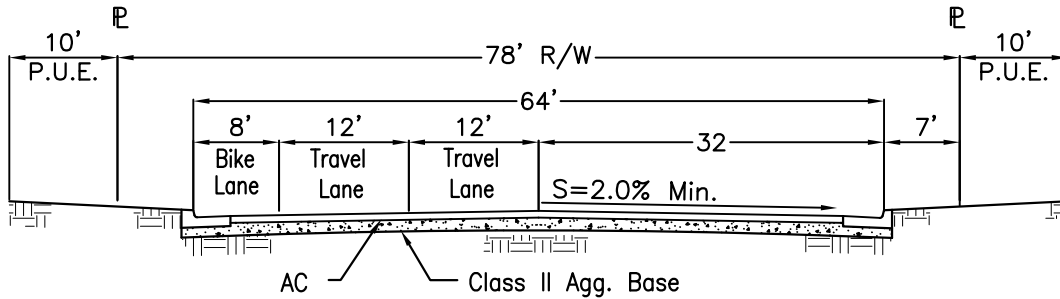
P.U.E. = Public Utility Easement



Collector

T.I. = 6.5 Minimum
Design Speed = 35 M.P.H.

P.U.E. = Public Utility Easement



Major/Industrial

T.I. = 8.0 Minimum
Design Speed = 35 M.P.H.

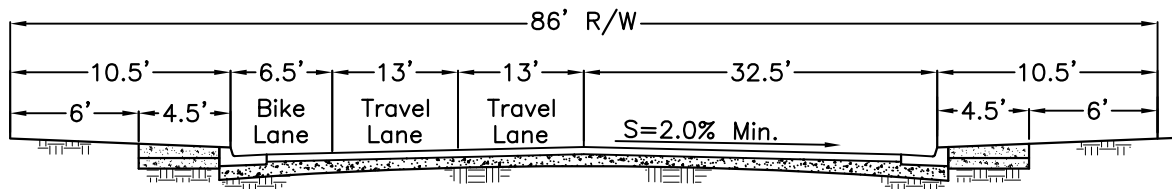
| NO. | REVISION | DATE | BY |
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| | | | |
| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

STREET SECTION

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

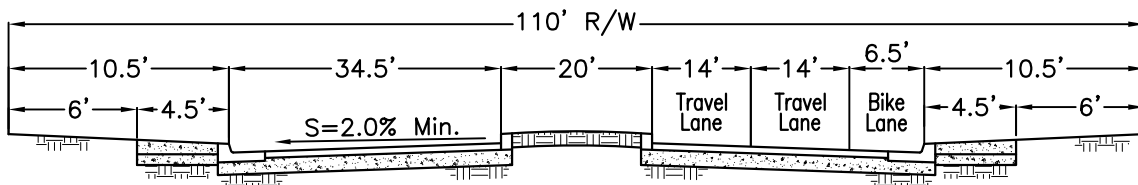
APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835 DATE

STANDARD PLAN NO. 202



T.I. = 8.0 Minimum
 Design Speed = 45 M.P.H.
 No Parking

4-Lane Undivided Arterial



T.I. = 8.0 Minimum
 Design Speed = 45 M.P.H.
 No Parking

4-Lane Divided Arterial

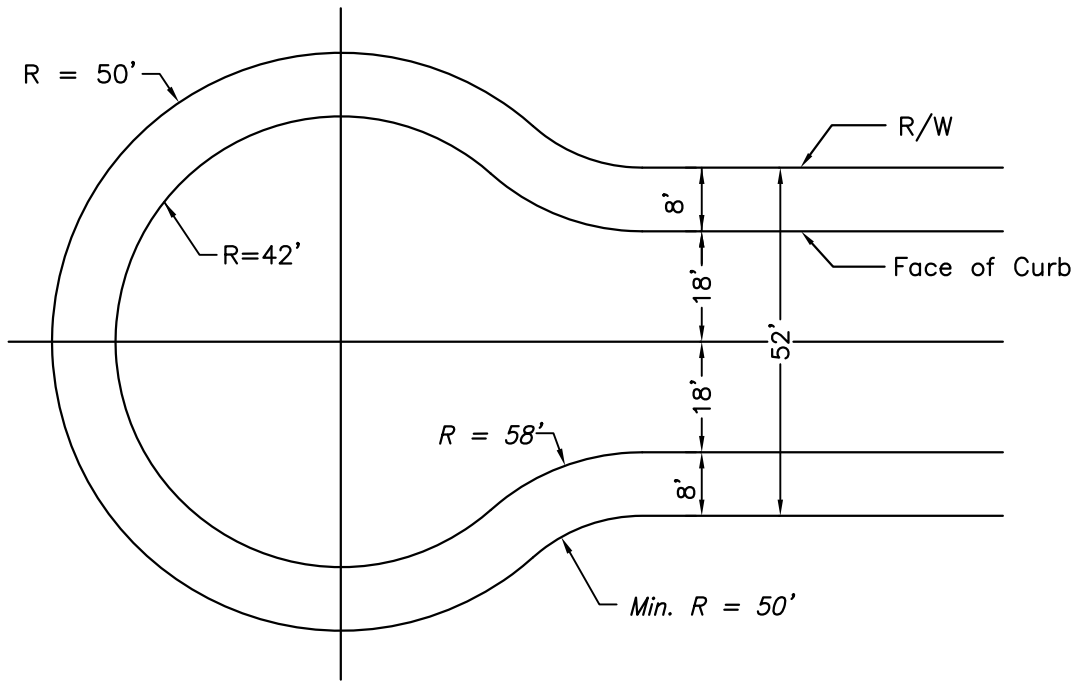
| NO. | REVISION | DATE | BY |
|------------------|----------|------|----|
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

STREET SECTION

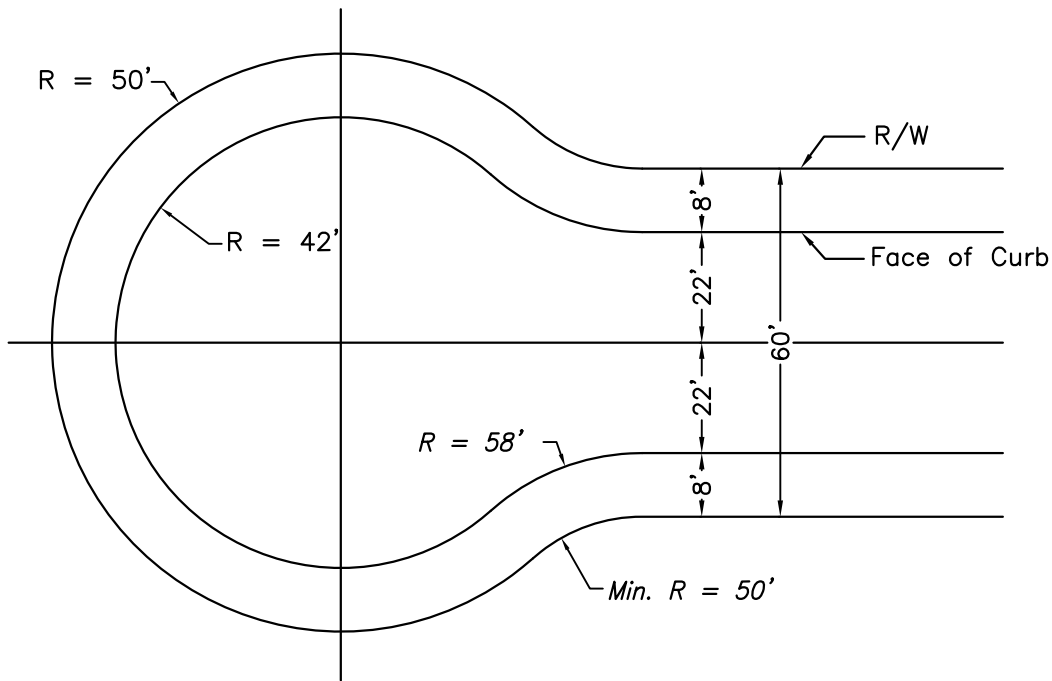
CITY OF RIO VISTA
 DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
 CITY ENGINEER DATE
 RCF 25835

STANDARD PLAN NO. 203



Minor/Local Cul-De-Sac



Collector Cul-De-Sac

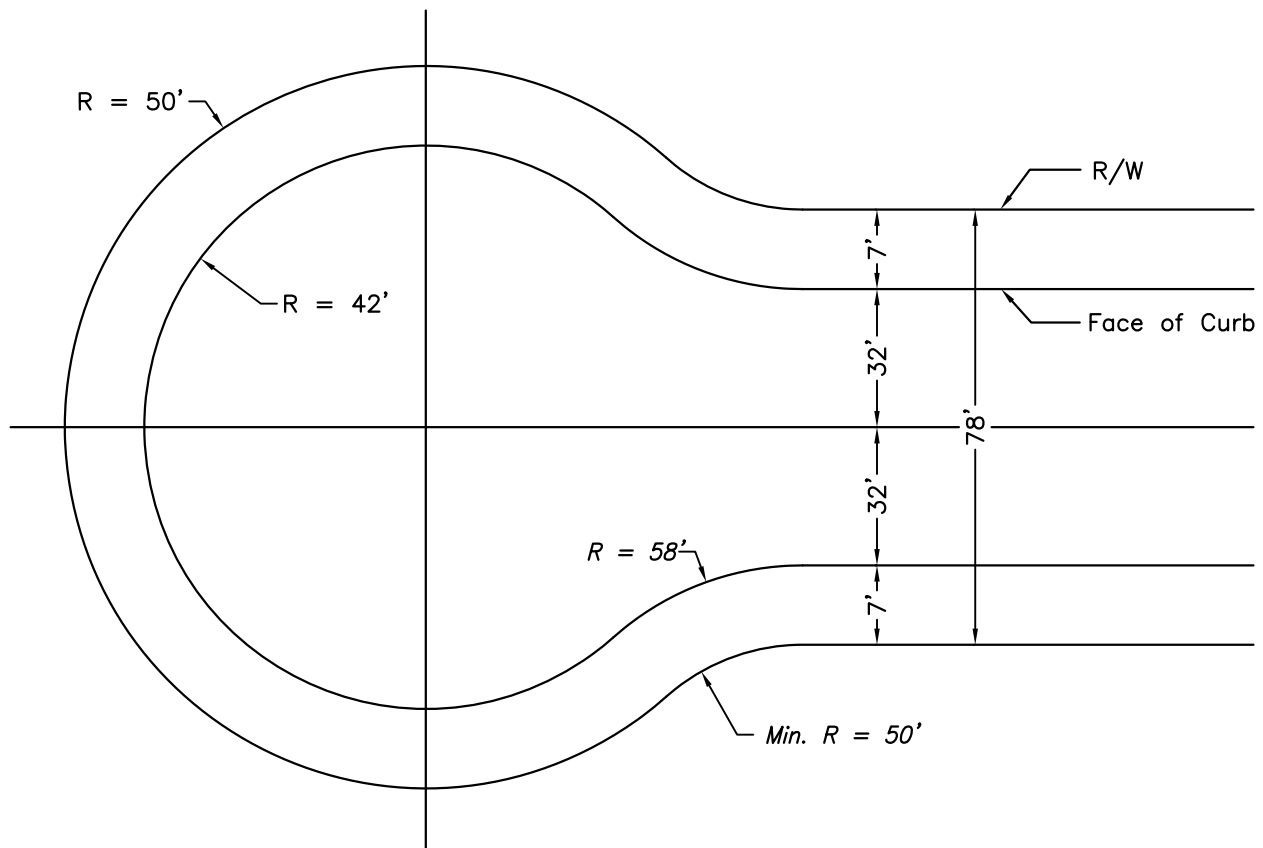
| NO. | REVISION | DATE | BY |
|------------------|----------|------|----|
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| | | | |
| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

CUL-DE-SAC TURN AROUND

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

| | |
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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |

STANDARD
PLAN NO. **204**



Industrial Cul-De-Sac

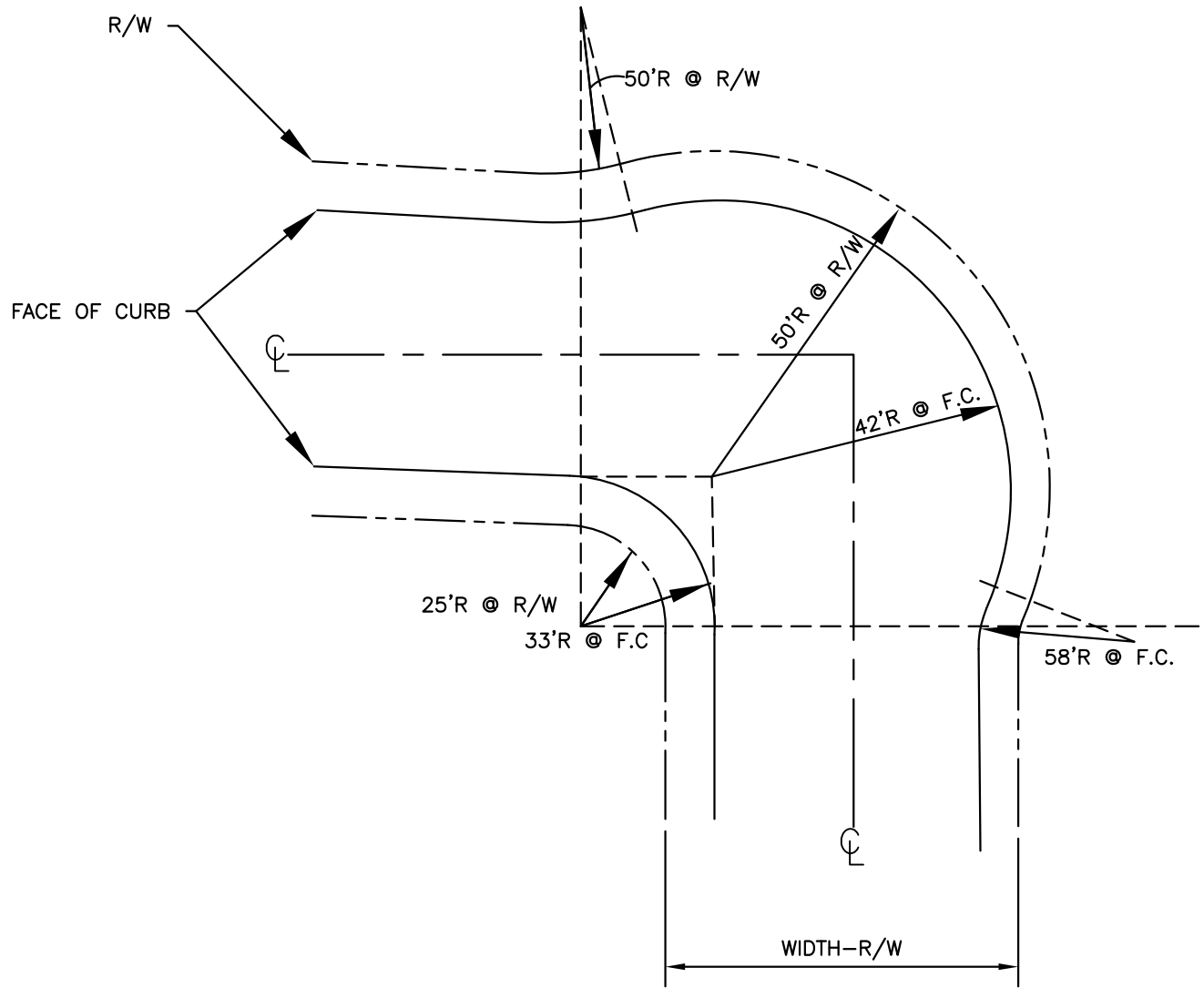
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

CUL-DE-SAC TURN AROUND

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER DATE
RCE 25835

STANDARD PLAN NO. **205**



STANDARD EXPANDED CORNER

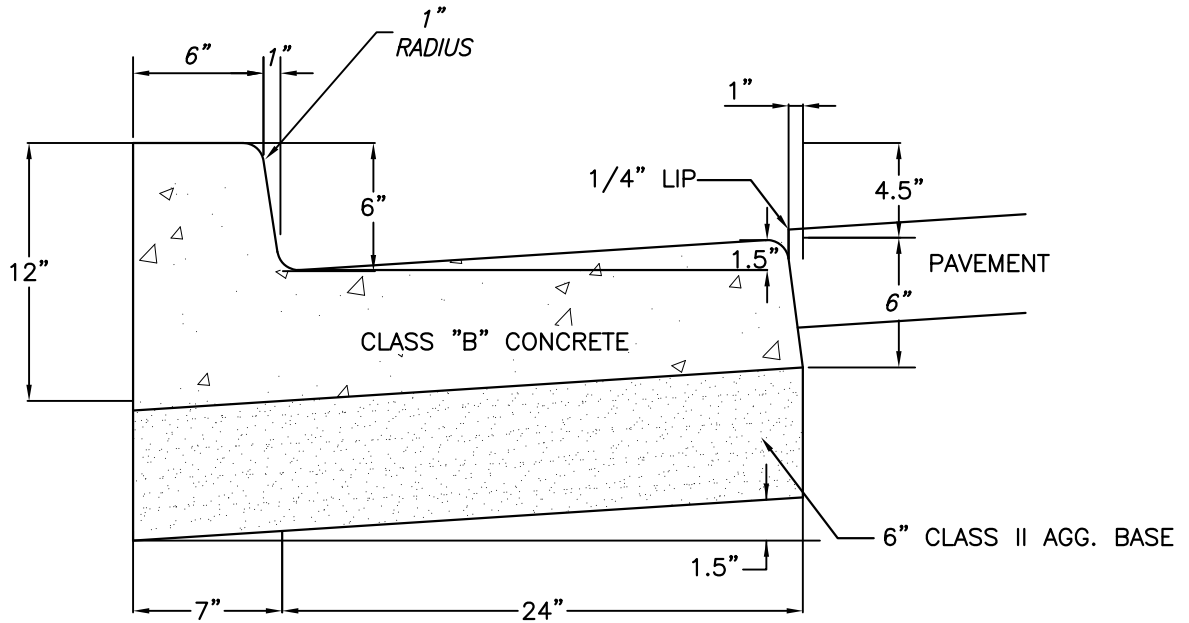
| NO. | REVISION | DATE | BY |
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| DRAWN BY: BH, NR | | | |
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| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

**MINOR & LOCAL ROADS
EXPANDED CORNER**

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
 CITY ENGINEER DATE
 RCE 25835

STANDARD PLAN NO. **206**

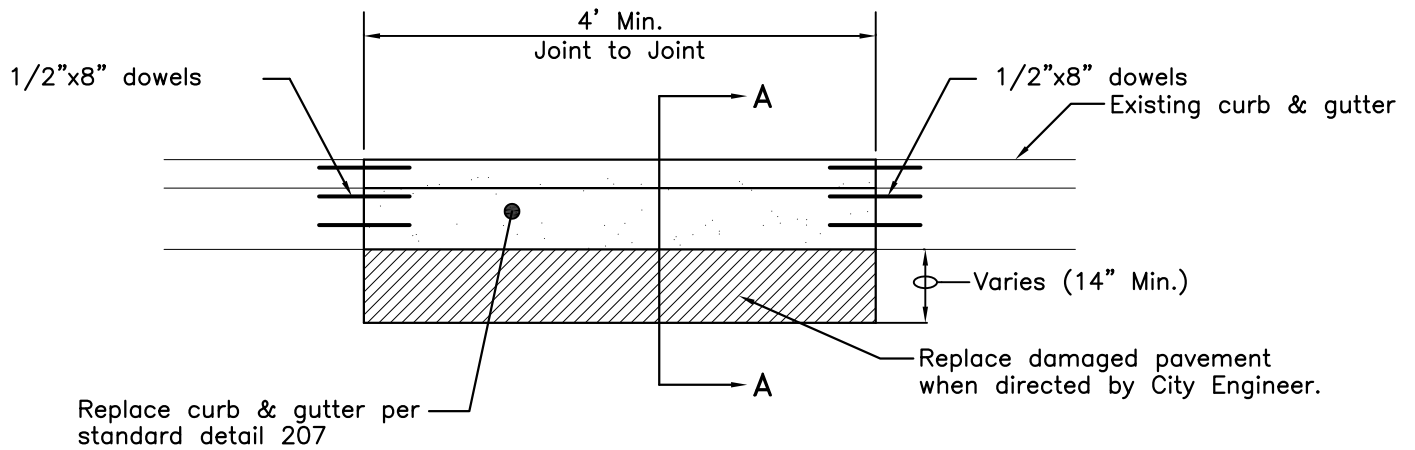


TYPICAL SECTION

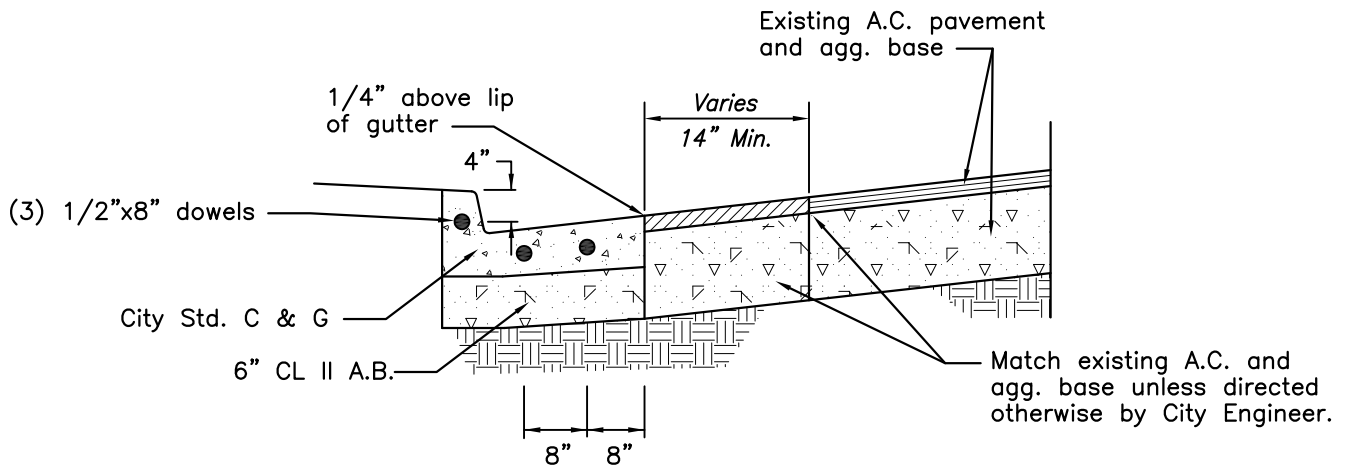
NOTE:

1. EXPANSION JOINTS SHALL BE PLACED AS FOLLOWS:
 - A. ON EACH SIDE OF THE DRIVEWAY.
 - B. ON EACH END OF THE RADIUS.
 - C. AT A MAXIMUM DISTANCE OF 60 FEET
2. A 1 1/4" DEEP WEAKENED PLANE JOINT SHALL BE PLACED EVERY 10 FEET.

| | | | | | |
|--|---------------|----|--|---|------------------------------|
| NO. | REVISION DATE | BY | CURB AND GUTTER | APPROVED BY: CECIL DILLON CITY ENGINEER RCF 25835 | DECEMBER 2015 DATE |
| DRAWN BY: BH, NR CHECKED BY: CD SCALE: NONE DATE: 03/2015 | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | STANDARD PLAN NO. 207 | |



PLAN:



SECTION A-A

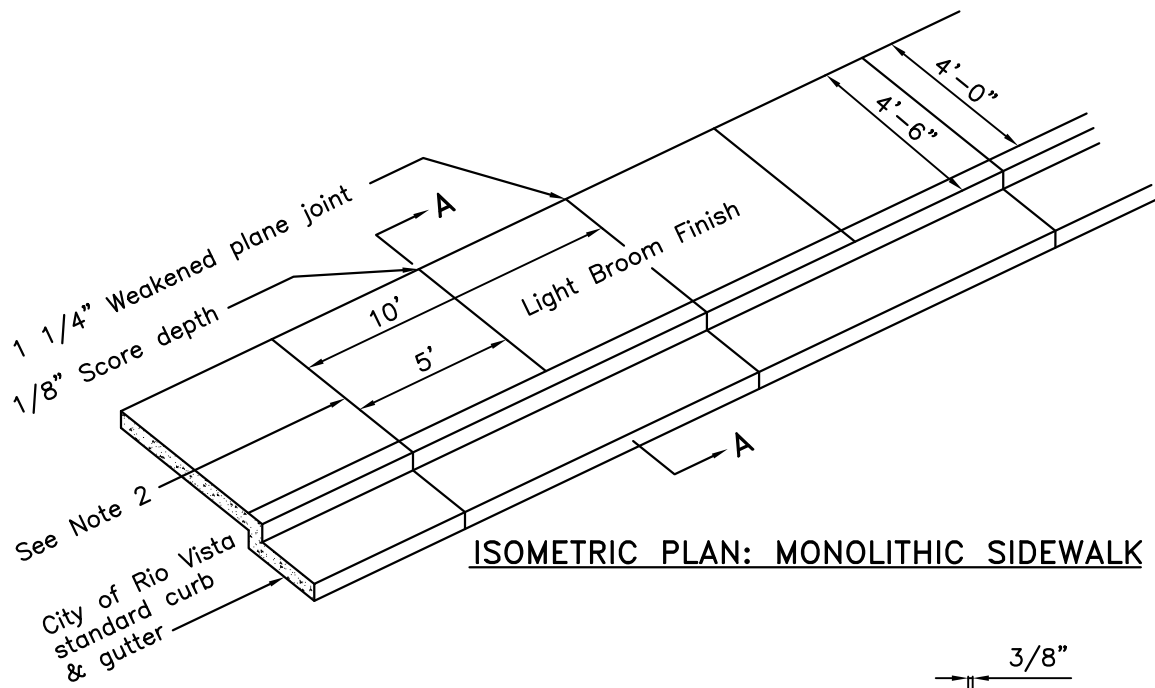
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| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

**CURB AND GUTTER REPLACEMENT
IN EXISTING STREETS**

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER RCF 25835 DATE

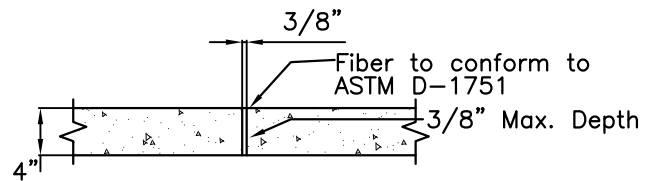
STANDARD PLAN NO. **208**



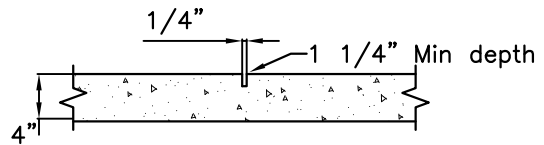
ISOMETRIC PLAN: MONOLITHIC SIDEWALK

NOTES:

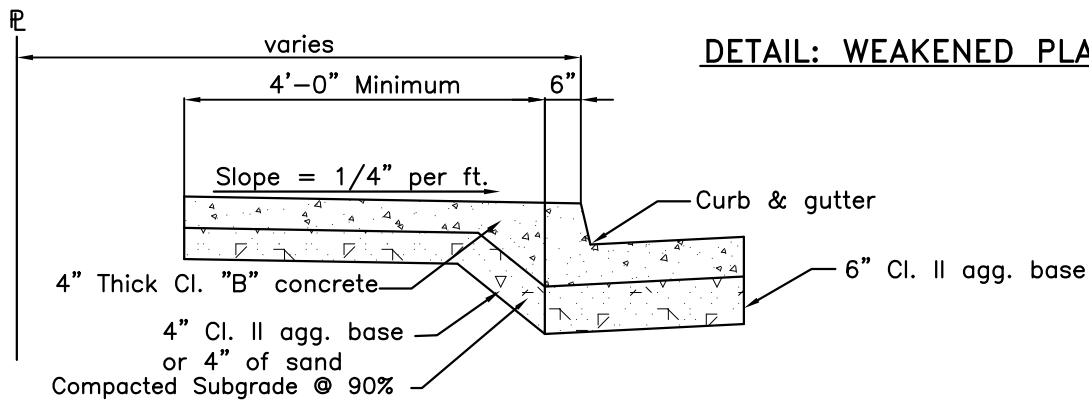
1. EXPANSION JOINTS SHALL BE PLACED AS FOLLOWS:
 - A. ON EACH SIDE OF DRIVEWAY
 - B. AT A MAXIMUM DISTANCE OF 60 FEET
2. A 1 1/4" WEAKENED PLANE JOINT SHALL BE PLACED EVERY 10' AND A 1/8" SCORE LINE EVERY 5'



DETAIL: EXPANSION JOINT



DETAIL: WEAKENED PLANE JOINT



SECTION A-A

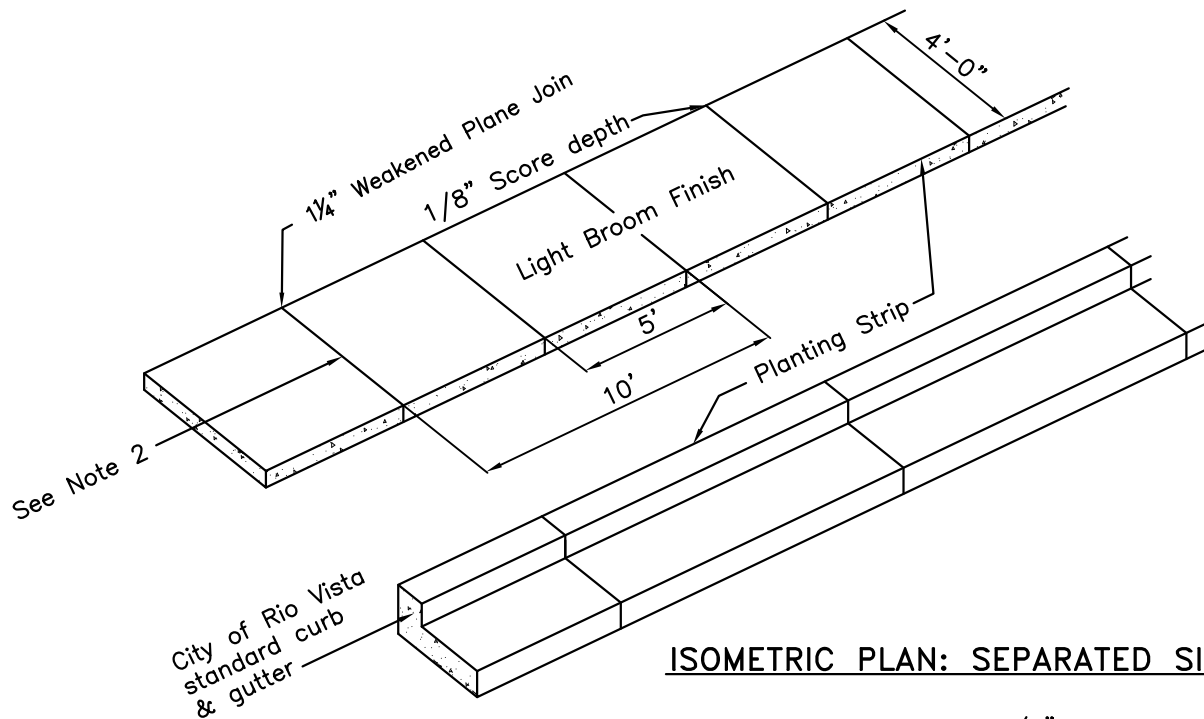
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

MONOLITHIC SIDEWALK

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835 DATE

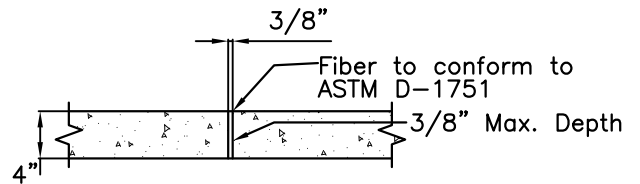
STANDARD PLAN NO. **209**



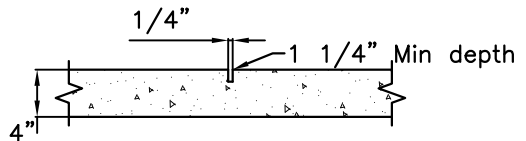
ISOMETRIC PLAN: SEPARATED SIDEWALK

NOTES:

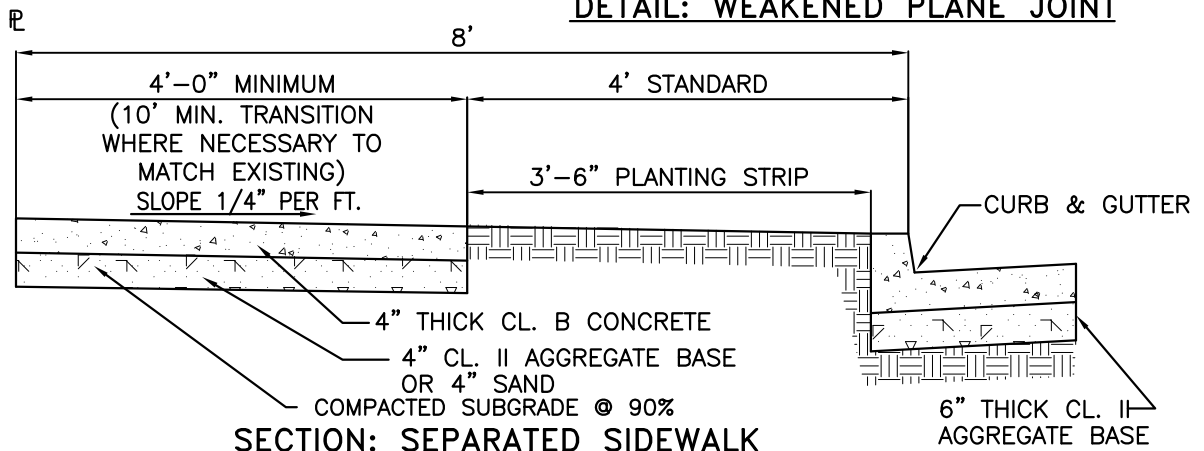
1. EXPNSION JOINTS SHALL BE PLACED AS FOLLOWS:
 - A. ON EACH SIDE OF DRIVEWAY
 - B. AT A MAXIMUM DISTANCE OF 60 FEET
2. A 1/4" WEAKENED PLANE JOINT SHALL BE PLACED EVERY 10' AND A 1/8" SCORE LINE EVERY 5'



DETAIL: EXPANSION JOINT



DETAIL: WEAKENED PLANE JOINT



SECTION: SEPARATED SIDEWALK

| NO. | REVISION | DATE | BY |
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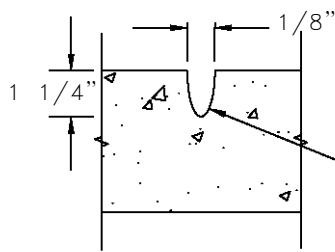
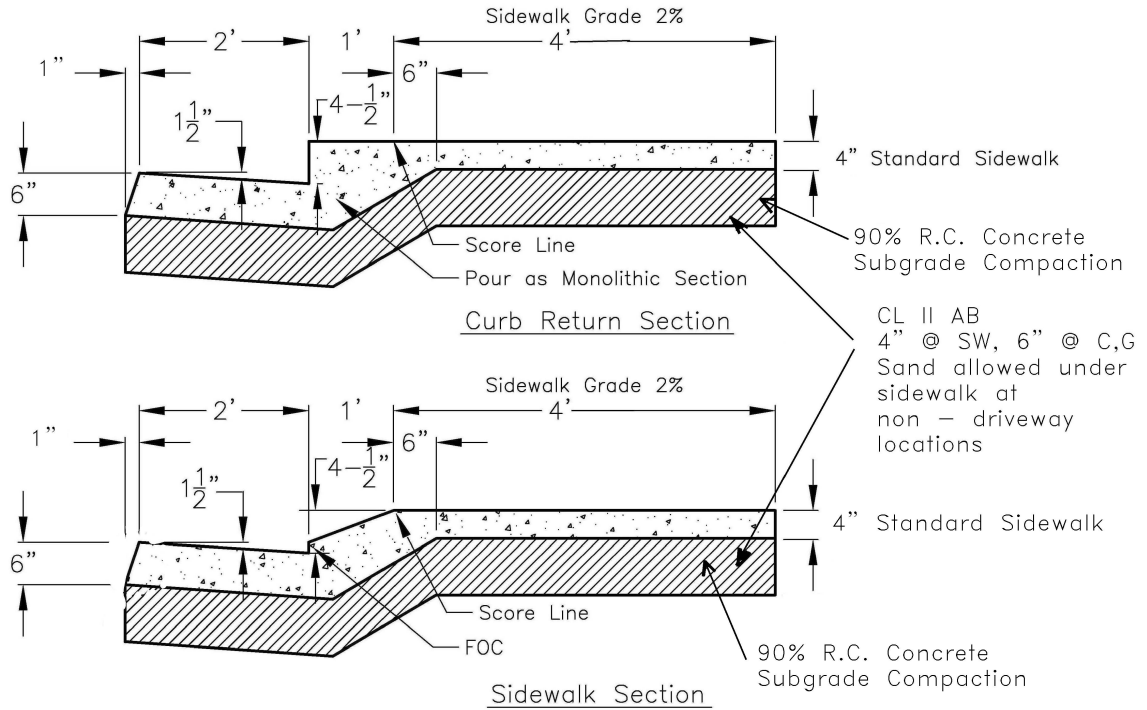
DRAWN BY: BH, NR
 CHECKED BY: CD
 SCALE: NONE
 DATE: 03/2015

SEPARATED SIDEWALK

CITY OF RIO VISTA
 DEPARTMENT OF PUBLIC WORKS

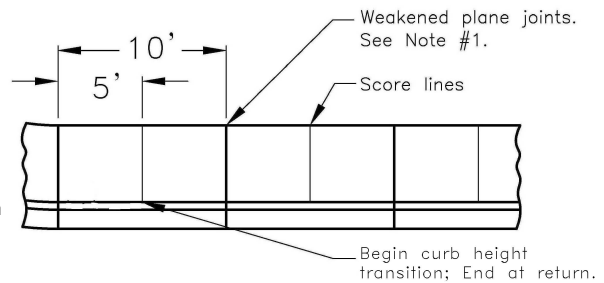
APPROVED BY: **CECIL DILLON** DECEMBER 2015
 CITY ENGINEER DATE
 RCF 25835

STANDARD PLAN NO. 210



Detail
Weakened Plane Joint

If joint is greater than 1/4" wide it shall be filled with petrolastic material.



Plan - transition from rolled curb to vertical curb

NOTES:

1. CONSTRUCT WEAKENED PLANE JOINTS AT 10'.
2. USE IMPERVIOUS MEMBRANE CURE. BROOM FINISH
3. CLASS B CONCRETE PER SECTION 90 OF STATE STANDARD SPECIFICATIONS, 1-1/2" MAX. AGGREGATE.
4. CONSTRUCT EXPANSION JOINTS AT 60' MAX. AND AT BCR AND ECR.
5. ALL EXPOSED EDGES SHALL BE ROUNDED TO 1" RADIUS.

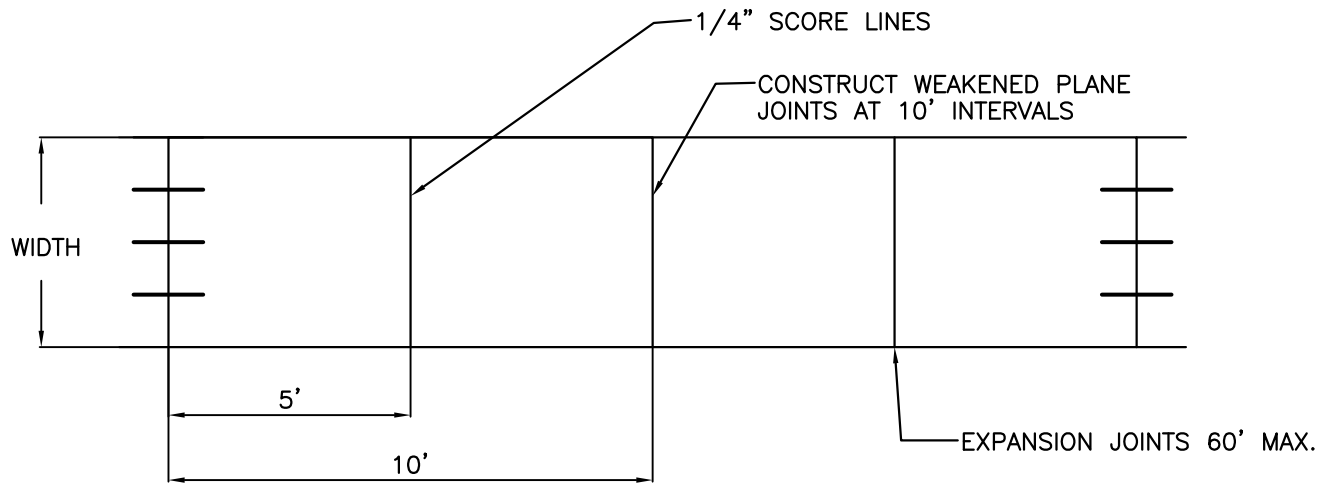
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| DRAWN BY: BH, NR | | | |
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| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

**ROLLED CURB, GUTTER
& SIDEWALK**

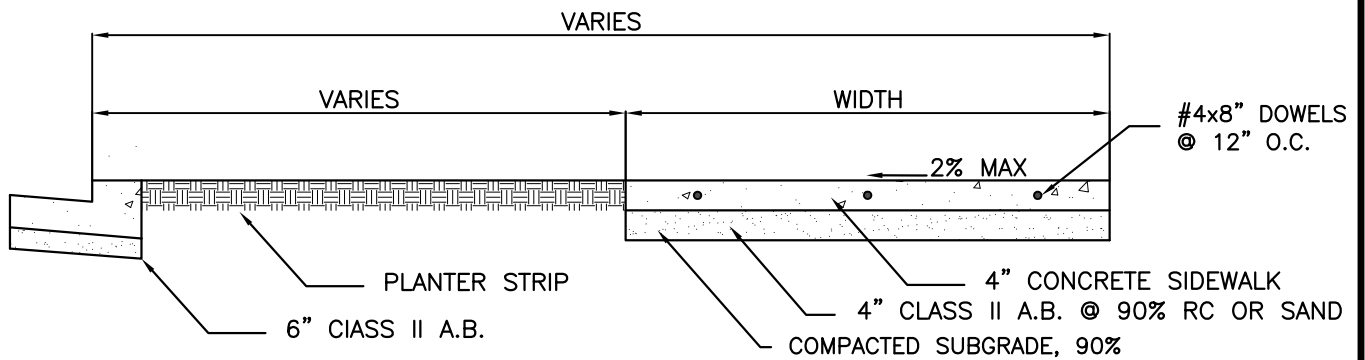
CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835 DATE

STANDARD PLAN NO. **211**

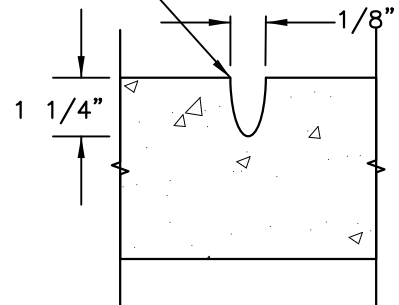


PLAN



SIDEWALK DETAIL

IF JOINT IS GREATER THAN 1/4" WIDE IT SHALL BE FILLED WITH PETROLASTIC MATERIAL



WEAKENED PLANE JOINT DETAIL

NOTES:

1. MATCH WIDTH WITH ADACENT EXISTING SIDEWALK. FOR REPLACEMENT LESS THAN 11' MATCH SCORING PATTERN.
2. CONCRETE SHALL BE 2500 PSI @ 28 DAYS. MAX 4" SLUMP. FOR JOBS LESS THAN ONE YARD, NO STATIC TRAILER MIX, MIXER TRAILER MAY BE USED.
3. ALL REAPIRS TO SIDEWALK OR CURB SHALL BE SAWCUT AT THE NEAREST SCORE LINES OR JOINT AND COMPLETELY REMOVED OR REPLACED.
4. LIGHT BROOM FINISH.
5. IMPERVIOUS MEMBRANE CURE.

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| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

SIDEWALK REPAIR

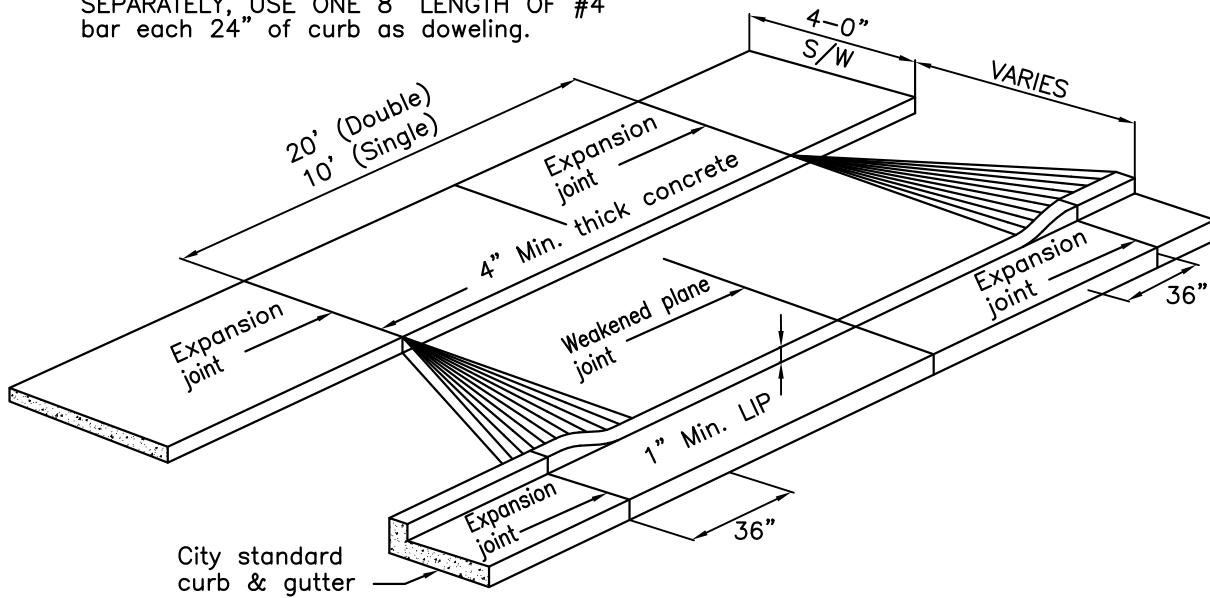
CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835 DATE

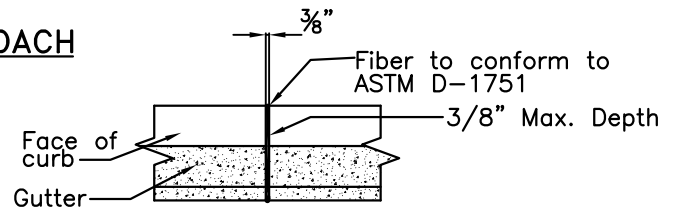
STANDARD PLAN NO. **212**

NOTE:

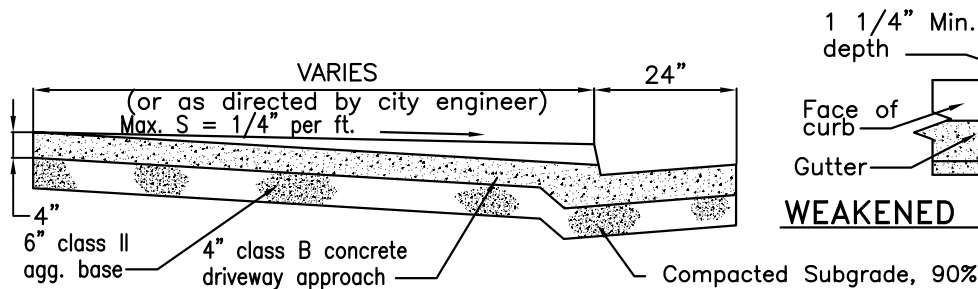
WHEN GUTTER AND APPROACH ARE POURED SEPARATELY, USE ONE 8" LENGTH OF #4 bar each 24" of curb as doweling.



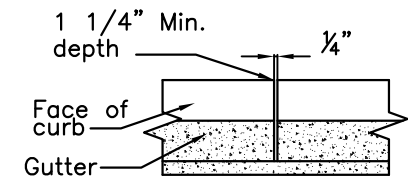
ISOMETRIC PLAN: DRIVEWAY APPROACH



DETAIL: EXPANSION JOINT



SECTION: DRIVEWAY APPROACH



WEAKENED PLANE JOINT

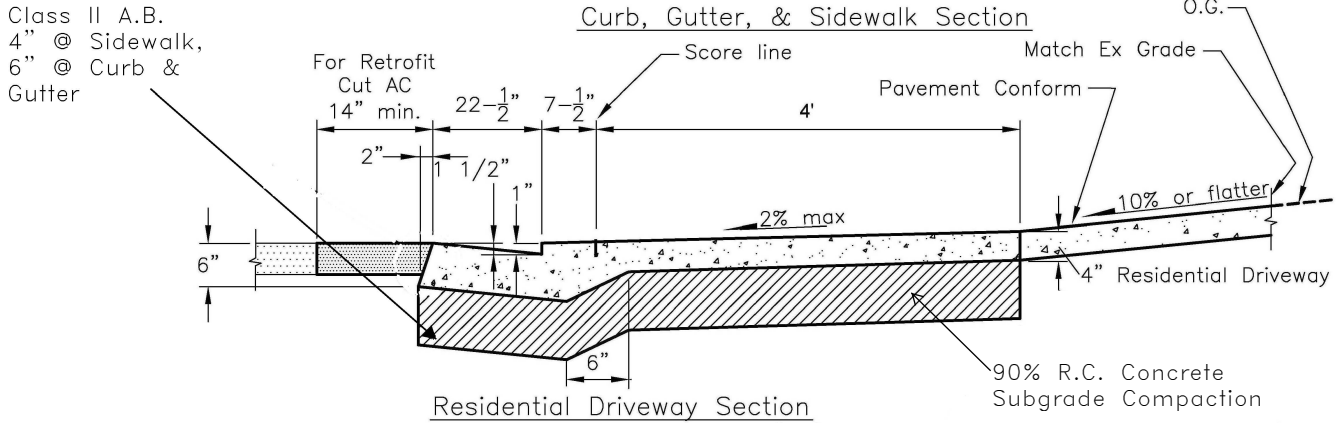
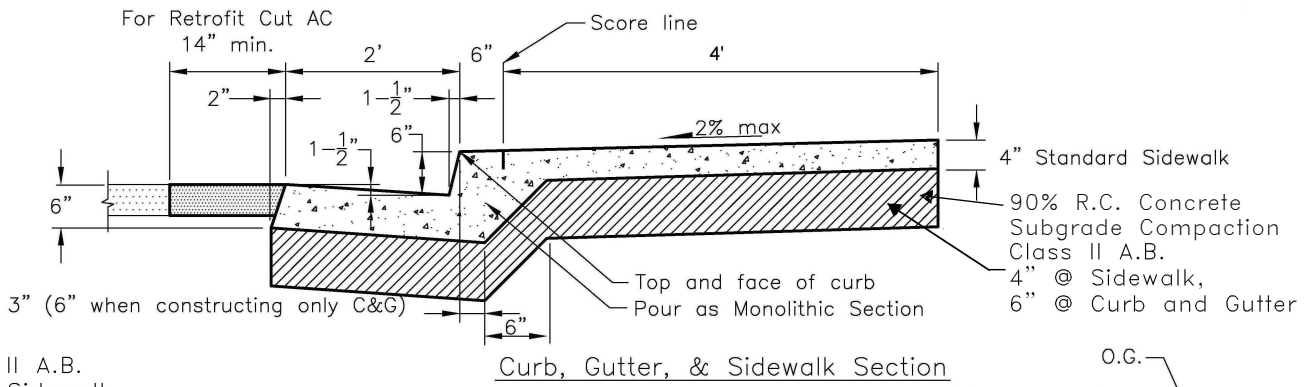
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| DRAWN BY: BH, NR | | | |
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| DATE: 03/2015 | | | |

RESIDENTIAL DRIVEWAY AT SEPARATED SIDEWALK

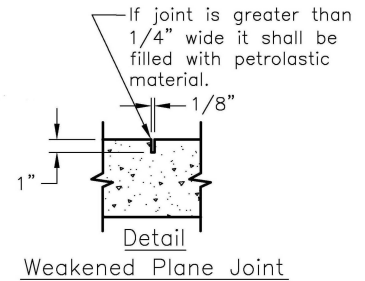
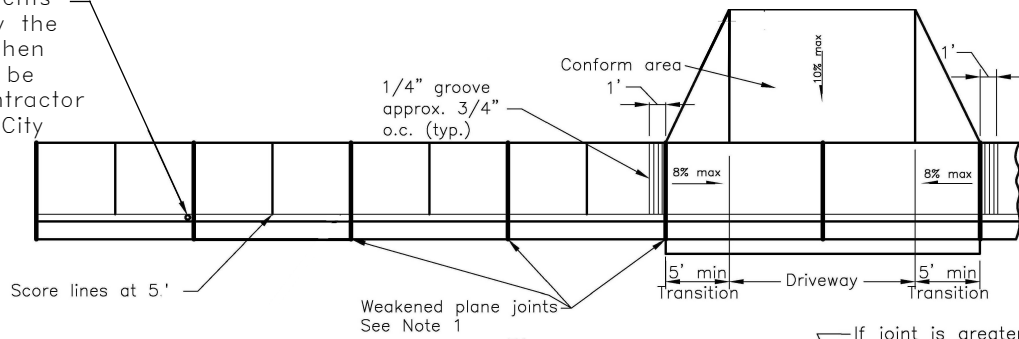
CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER RCF 25835 DATE

STANDARD PLAN NO. **213**



Bench Mark monuments will be furnished by the City of Rio Vista, when required, and shall be installed by the contractor as directed by the City Engineer.



NOTES:

1. CONSTRUCT WEAKENED PLANE JOINTS AT 10', AND AT ENDS OF TRANSITION & CENTERLINE OF DRIVEWAY.
2. USE IMPERVIOUS MEMBRANE CURE. BROOM FINISH
3. CLASS "B" CONCRETE PER SECTION 90 OF STATE STANDARD SPECIFICATIONS, 1-1/2" MAX. AGGREGATE.
4. CONSTRUCT EXPANSION JOINTS AT 60' MAX.
5. ALL EXPOSED EDGES SHALL BE ROUNDED TO 1" RADIUS.
6. 4" SAND ALLOWED UNDER SIDEWALK AT NON-DRIVEWAY LOCATIONS.

| NO. | REVISION | DATE | BY |
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

**VERTICAL-TYPE CURB,
GUTTER, SIDEWALK AND
RESIDENTIAL DRIVEWAY**

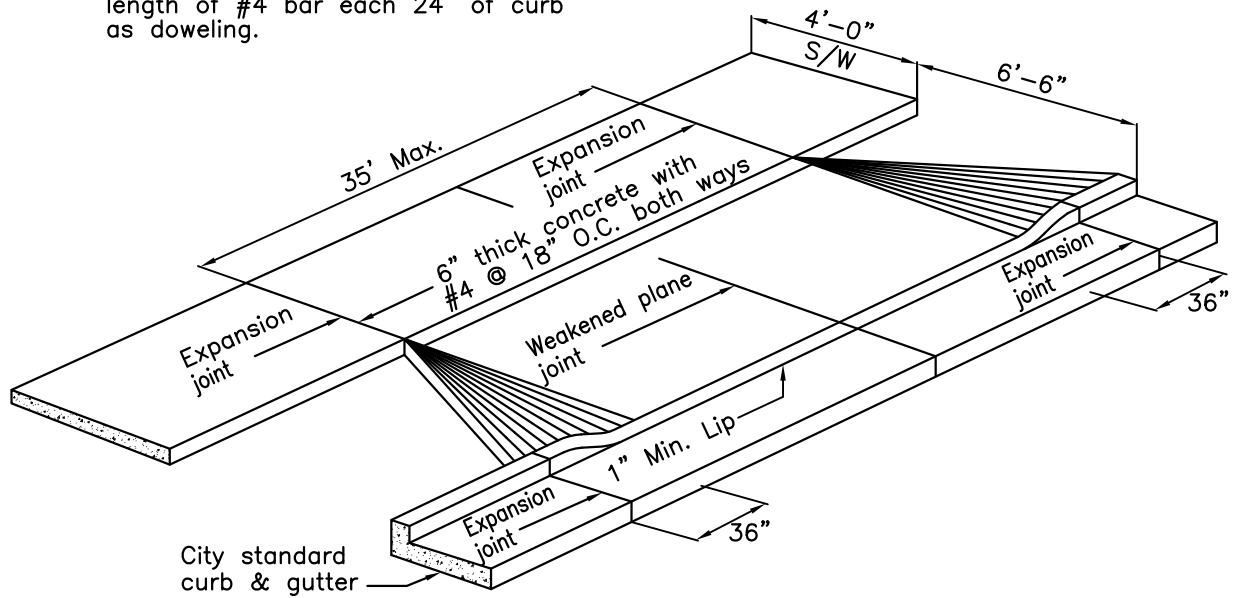
**CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS**

APPROVED BY: **CECIL DILLON**
CITY ENGINEER
RCF 25835

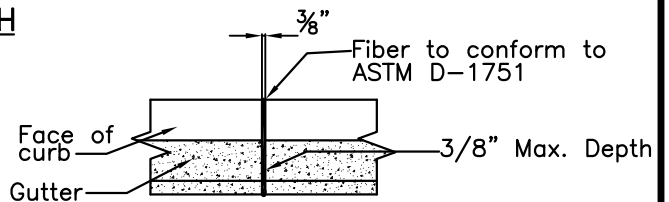
DECEMBER 2015
DATE

STANDARD PLAN NO. 214

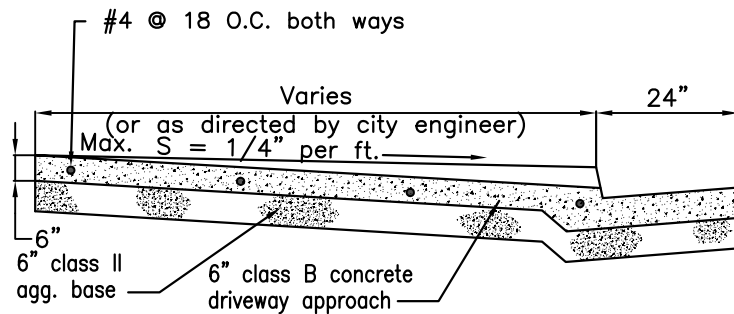
NOTES: 1. When driveway and gutter approach are poured separately, use one 8" length of #4 bar each 24" of curb as doweling.



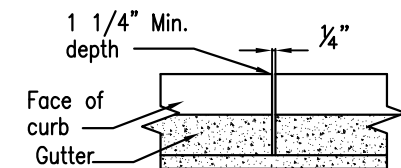
ISOMETRIC PLAN: DRIVEWAY APPROACH



DETAIL: EXPANSION JOINT



SECTION: DRIVEWAY APPROACH



WEAKENED PLANE JOINT

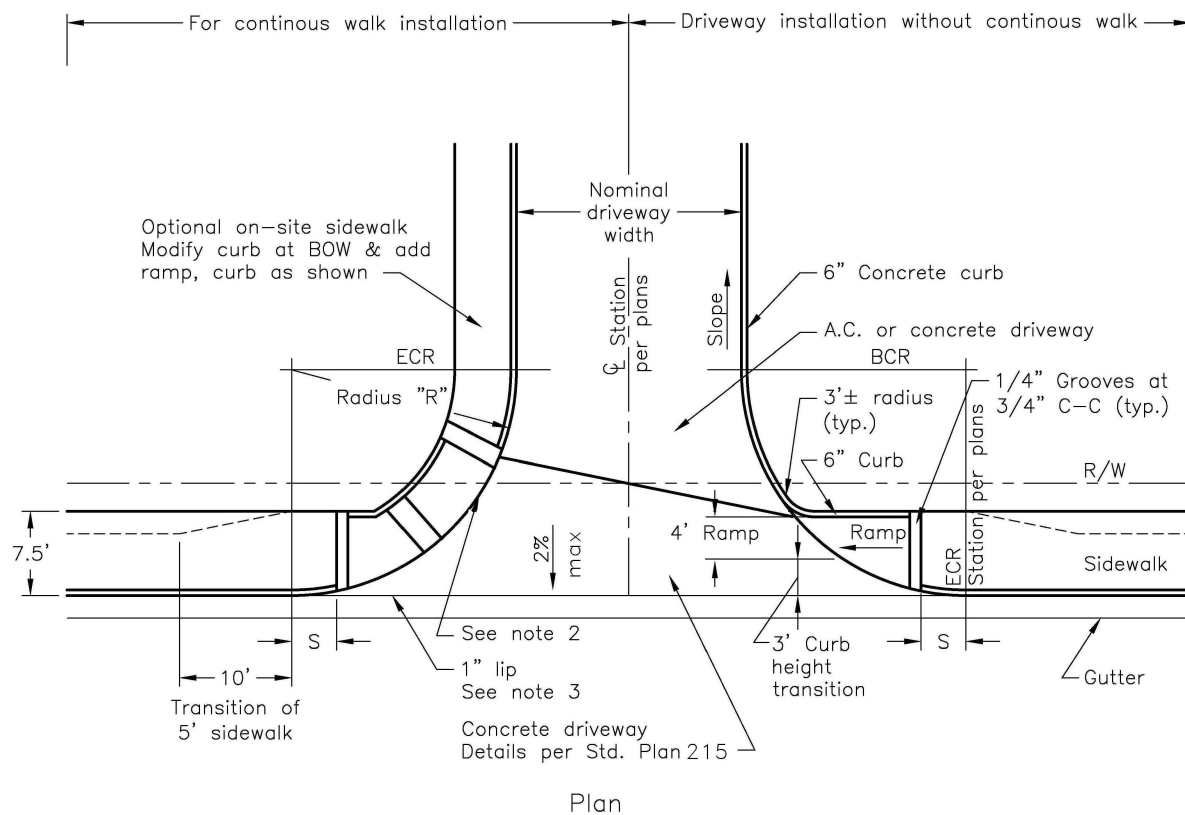
| NO. | REVISION | DATE | BY |
|------------------|----------|------|----|
| | | | |
| | | | |
| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

**COMMERCIAL AND INDUSTRIAL
DRIVEWAY WITH SEPARATED SIDEWALK**

**CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS**

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER RCF 25835 DATE

STANDARD PLAN NO. **215**



| "R" | "S" |
|-----|-----|
| 15' | 3' |
| 20' | 4' |
| 25' | 5' |
| 30' | 6' |
| 35' | 7' |

NOTES:

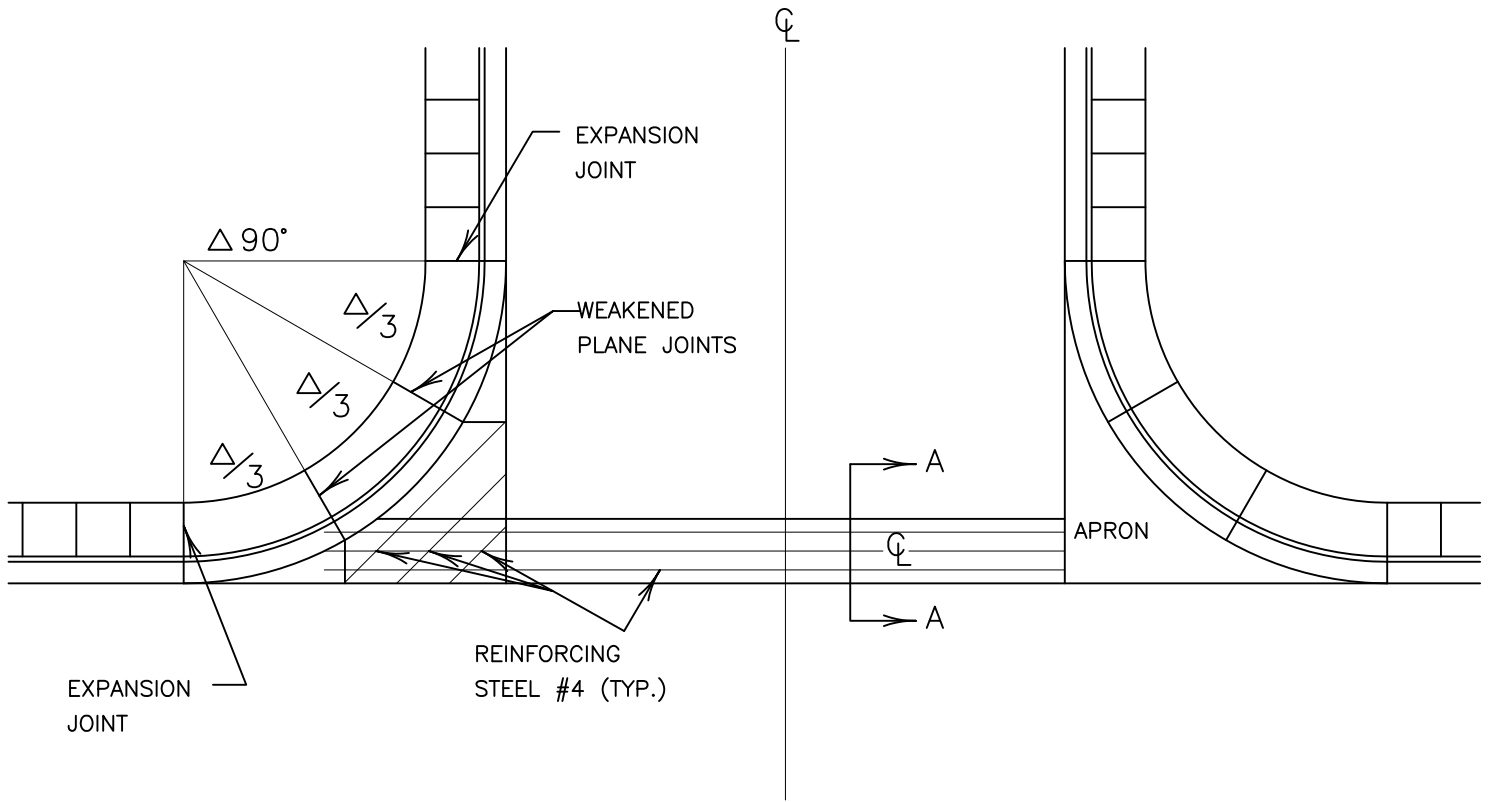
1. SPECIAL COMMERCIAL DRIVEWAY TO BE USED ONLY WHERE REQUIRED OR SPECIFICALLY APPROVED BY THE PUBLIC WORKS DIRECTOR.
2. SEE STANDARD PLAN 218 FOR WHEELCHAIR RAMP DETAILS.
3. PROVIDE IN-LINE CATCH BASIN IF DEPTH OF FLOW IN GUTTER EXCEEDS 3"
4. RAMPS TO COMPLY WITH THE MOST UP TO DATE ADA STANDARDS

| NO. | REVISION | DATE | BY |
|------------------|----------|------|----|
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

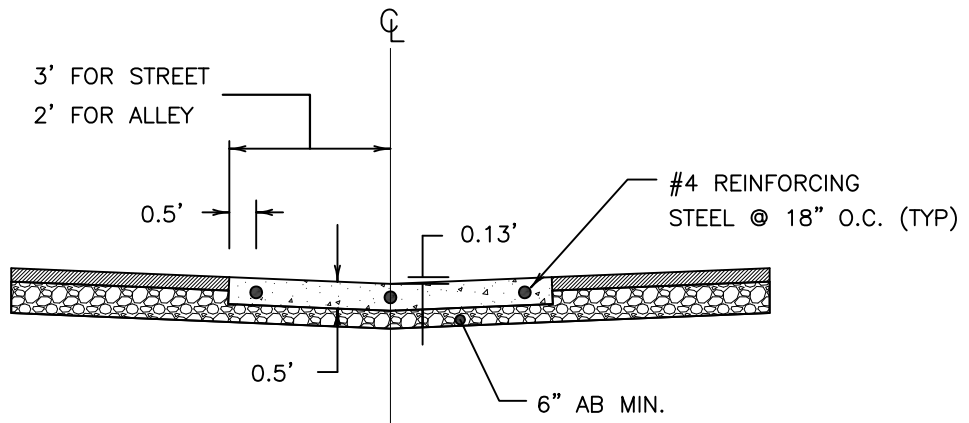
SPECIAL COMMERCIAL DRIVEWAY

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

| | |
|-------------------|------------|
| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD PLAN NO. | 216 |



PLAN VIEW



DETAIL A-A

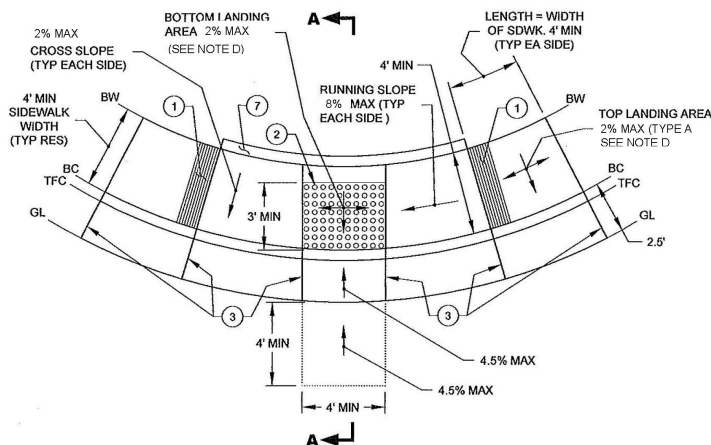
NOTE:

1. VALLEY GUTTERS ALLOWED BY SPECIAL PERMISSION ONLY
2. LAP ALL REINFORCING STEEL 30 TIMES DIAMETERS.

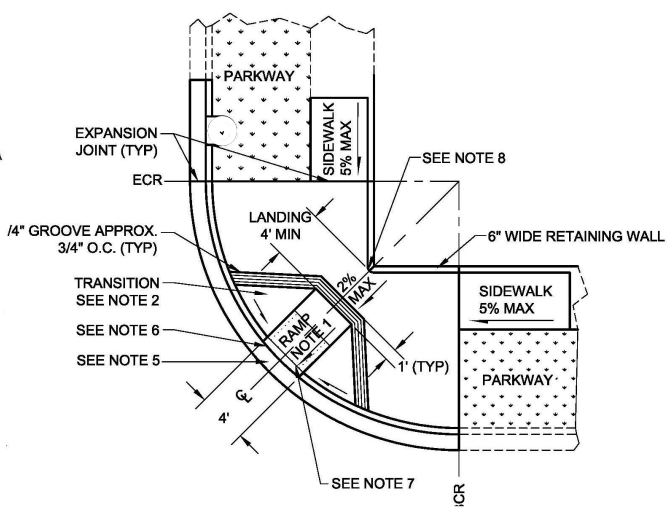
| NO. | REVISION DATE | BY |
|------------------|---------------|----|
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| | | |
| DRAWN BY: BH, NR | | |
| CHECKED BY: CD | | |
| SCALE: NONE | | |
| DATE: 03/2015 | | |

| | |
|----------------------------|--|
| VALLEY GUTTER | |
| CITY OF RIO VISTA | |
| DEPARTMENT OF PUBLIC WORKS | |

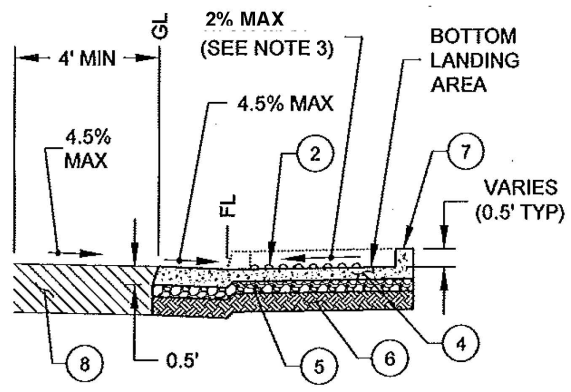
| | |
|----------------------------|---------------|
| APPROVED BY: | DECEMBER 2015 |
| CECIL DILLON | DATE |
| CITY ENGINEER RCE 25835 | |
| STANDARD PLAN NO. | 217 |



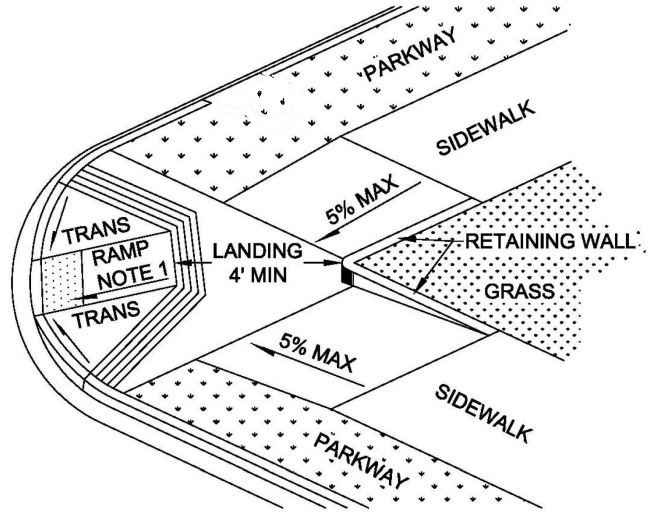
HANDICAP RAMP 1



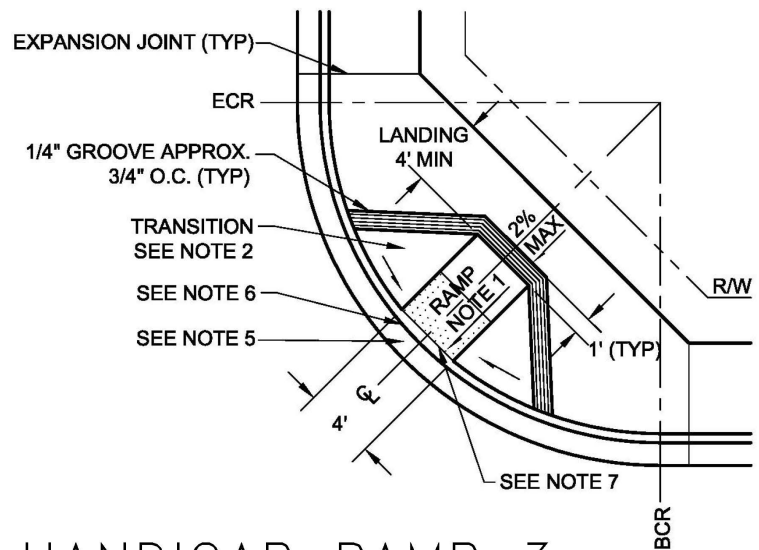
HANDICAP RAMP 2



HANDICAP RAMP 1, SECTION A-A



HANDICAP RAMP 2 ISOMETRIC



HANDICAP RAMP 3

| | | | | | | |
|------------------|----------|------|----|--|---------------|------------|
| NO. | REVISION | DATE | BY | HANDICAP RAMP | APPROVED BY: | DECEMBER |
| | | | | | CECIL DILLON | 2015 |
| | | | | | CITY ENGINEER | DATE |
| DRAWN BY: BH, NR | | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | RCF 25835 | |
| CHECKED BY: CD | | | | | | |
| SCALE: NONE | | | | | STANDARD | 218 |
| DATE: 03/2015 | | | | | PLAN NO. | |

NOTES FOR HANDICAP RAMP 1:

- A. SLOPES MAY BE CHECKED WITH A 2-FOOT SMART LEVEL.
- B. RAMPS SHALL HAVE A HEAVY BROOM FINISH TRANSVERSE TO THEIR SLOPE.
- C. NO PULLBOX, UTILITY VAULT, UTILITY POLE, MANHOLE OR SIMILAR APPURTENANCE SHALL BE LOCATED WITHIN THE RAMP AREA WITHOUT PRIOR WRITTEN APPROVAL BY THE CITY ENGINEER.
- D. THE LANDING AREA SLOPE SHALL NOT EXCEED 2% IN ANY DIRECTION.
- E. TRANSITIONS TO SIDEWALK, GUTTER, AND STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGE.
- F. RAMP SHALL BE DESIGNED AND CONSTRUCTED SUCH THAT WATER DOES NOT ACCUMULATE ON RAMP.
- G. THE LEADING EDGE OF THE DETECTABLE WARNING SURFACE SHALL BE LOCATED 6" TO 8" FROM THE GUTTER FLOW-LINE. DETECTABLE WARNING SURFACES SHALL BE INSTALLED PARALLEL TO THE PATH OF TRAVEL, AND SHALL EXTEND THE FULL WIDTH OF THE LANDING AREA. AND A MINIMUM DEPTH OF 3' FROM THE LEADING EDGE TOWARDS THE BACK OF THE LANDING AREA.
1. 12" BORDER WITH 1/4" GROOVES 3/4" ON CENTER PLACED ADJACENT LEVEL SIDEWALK (AKA TOP LANDING AREA), NOT ON SLOPED CURB RAMP. (SEE STANDARD DETAIL 221).
2. DETECTABLE WARNING SURFACE (SEE STANDARD DETAIL 221 AND NOTE G ABOVE).
3. DEEP TOOL JOINT-1 1/2" MIN DEPTH.
4. 4" CLASS 2 CONCRETE
5. 6" CLASS II AB PROCESSED TO 95% RELATIVE COMPACTION.
6. 6" SUBGRADE OR CLASS II AB PROCESSED TO 95% RELATIVE COMPACTION.
7. 6" WIDE RETAINING CURB WITH VARIABLE HEIGHT ALONG RUNNING SLOPE.
8. STRUCTURAL STREET SECTION PER DESIGN STANDARDS.

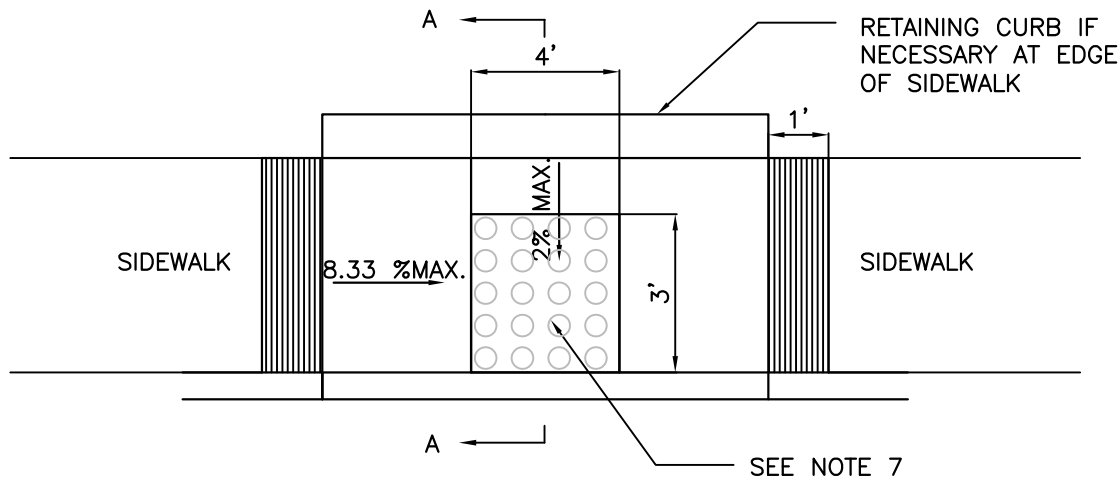
NOTES FOR HANDICAP RAMP 2:

1. RAMP SLOPE FROM 1:12 MAXIMUM TO 1:15 MINIMUM.
2. TRANSITION SLOPE 1:10 MAXIMUM.
3. CENTER RAMP ON MIDPOINT OF CURB RETURN.
4. THE CONCRETE FINISH OF THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.
5. THE GUTTER PAN ACROSS THE ROUTE OF TRAVEL, FROM THE RAMP TO THE STREET, SHALL HAVE A MAXIMUM SLOPE OF 5%.
6. ALL HANDICAP RAMPS SHALL HAVE NO LIP AND 1/4" DEEP SCORELINE ACROSS THE RAMP AT GUTTER FLOWLINE.
7. DETECTABLE WARNING SURFACE TO BE INSTALLED 6" TO 8" FROM GUTTER FLOWLINE AND EXTEND 36 INCHES MINIMUM IN THE DIRECTION OF TRAVEL AND THE FULL WIDTH OF THE CURB RAMP.
8. RETAINING WALL AT BACK OF RAMP SHALL BE CONSTRUCTED WITH A 6" RADIUS AT THE CORNER AND MAINTAIN EXISTING BACK OF WALK ELEVATIONS.
9. REFER TO STANDARD DETAIL 221 FOR RAISED TRUNCATED DOME DETAILS.

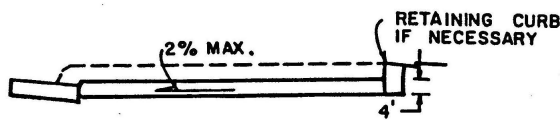
NOTES FOR HANDICAP RAMP 3:

1. RAMP SLOPE 1:12 MAXIMUM.
2. TRANSITION SLOPE 1:10 MAXIMUM.
3. CURB RETURN RADIUS PER PLANS. CENTER OF RAMP ON MIDPOINT OF CURB RETURN.
4. THE CONCRETE FINISH OF THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.
5. THE GUTTER PAN ACROSS THE ROUTE OF TRAVEL, FROM THE RAMP TO THE STREET, SHALL HAVE A MAXIMUM SLOPE OF 5%.
6. ALL HANDICAP RAMPS SHALL HAVE NO LIP AND 1/4" DEEP SCORELINE ACROSS THE RAMP AT GUTTER FLOWLINE.
7. DETECTABLE WARNING SURFACE TO BE INSTALLED 6" TO 8" FROM GUTTER FLOWLINE AND EXTEND 36 INCHES MINIMUM IN THE DIRECTION OF TRAVEL AND THE FULL WIDTH OF THE CURB RAMP.
9. REFER TO STANDARD DETAIL 221 FOR RAISED TRUNCATED DOME DETAILS.

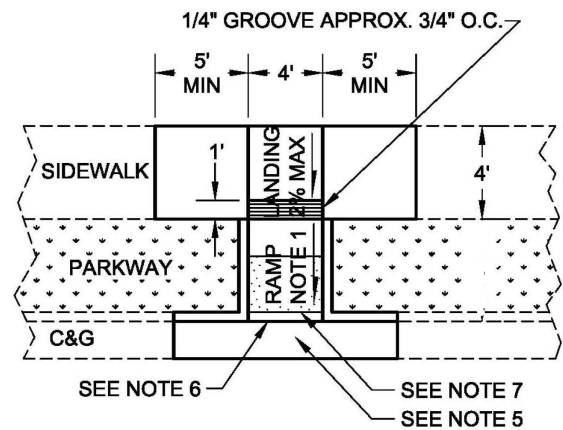
| | | | | | | |
|------------------|----------|------|----|--|---------------|----------|
| NO. | REVISION | DATE | BY | HANDICAP RAMP NOTES | APPROVED BY: | DECEMBER |
| | | | | | CECIL DILLON | 2015 |
| DRAWN BY: BH, NR | | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | DATE |
| CHECKED BY: CD | | | | | RCE 25835 | |
| SCALE: NONE | | | | | STANDARD | 219 |
| DATE: 03/2015 | | | | | PLAN NO. | |



MIDBLOCK 1



MIDBLOCK 1 SECTION A-A



MIDBLOCK 2

NOTES FOR MIDBLOCK 1 & MIDBLOCK 2:

1. RAMP SLOPE 1:12 MAXIMUM.
2. TRANSITION SLOPE 1:10 MAXIMUM.
3. CURB RETURN RADIUS PER PLANS. CENTER OF RAMP ON MIDPOINT OF CURB RETURN.
4. THE CONCRETE FINISH OF THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.
5. THE GUTTER PAN ACROSS THE ROUTE OF TRAVEL, FROM THE RAMP TO THE STREET, SHALL HAVE A MAXIMUM SLOPE OF 4.5%.
6. ALL HANDICAP RAMPS SHALL HAVE NO LIP AND 1/4" DEEP SCORELINE ACROSS THE RAMP AT GUTTER FLOWLINE.
7. DETECTABLE WARNING SURFACE TO BE INSTALLED 6" TO 8" FROM GUTTER FLOWLINE AND EXTEND 36 INCHES MINIMUM IN THE DIRECTION OF TRAVEL AND THE FULL WIDTH OF THE CURB RAMP.
9. REFER TO STANDARD DETAIL 221 FOR RAISED TRUNCATED DOME DETAILS.

| NO. | REVISION | DATE | BY |
|------------------|----------|------|----|
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

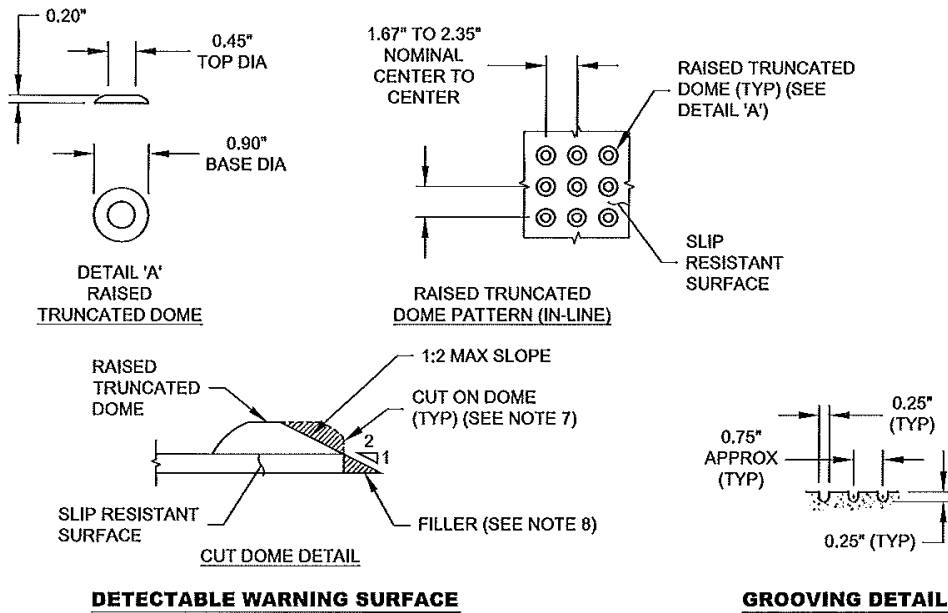
HANDICAP RAMP NOTES

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: CECIL DILLON
CITY ENGINEER
RCE 25835

DECEMBER 2015
DATE

STANDARD PLAN NO. 220




DETECTABLE WARNING SURFACE

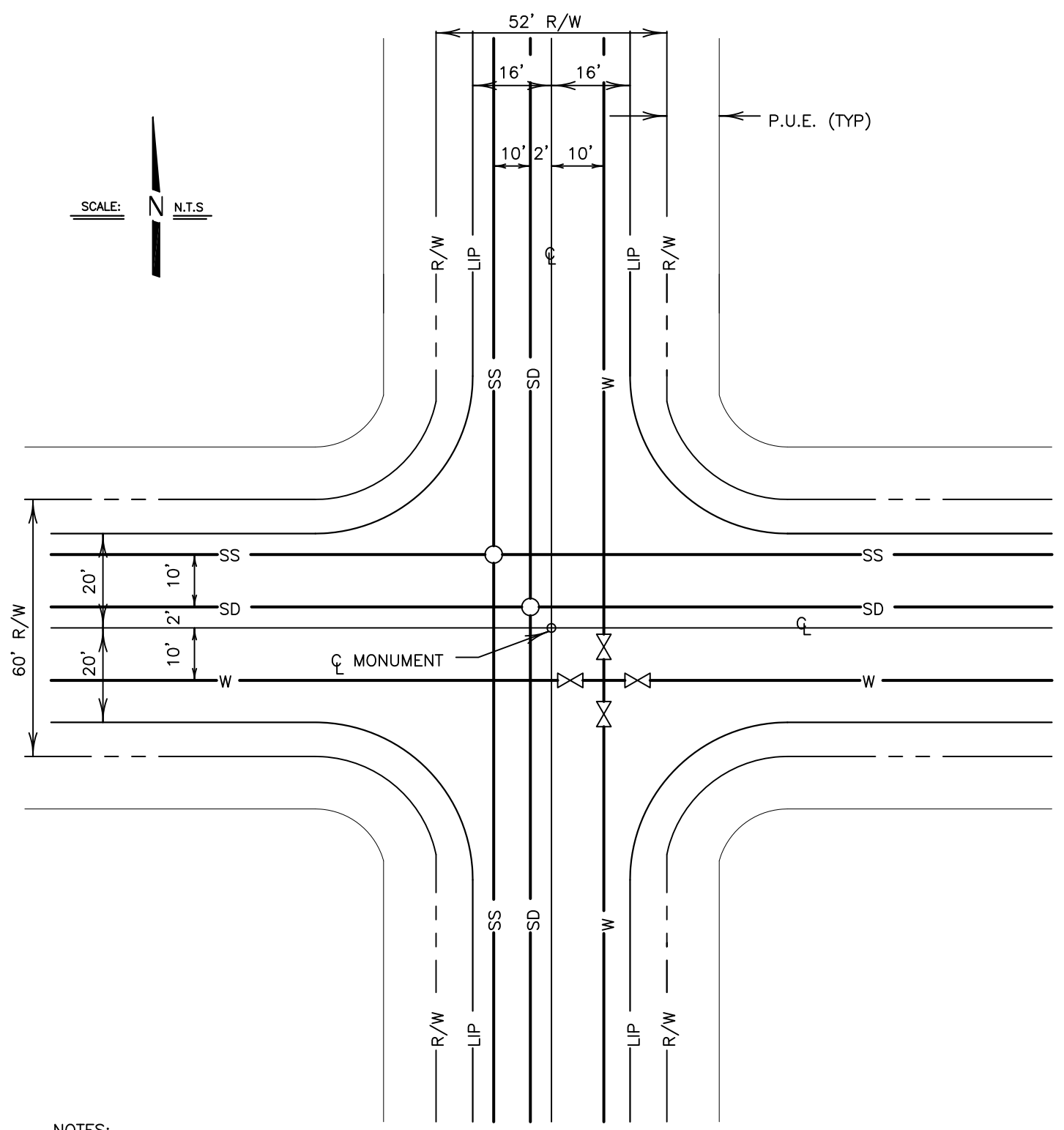
GROOVING DETAIL

NOTES:

1. DETECTABLE WARNING SURFACES SHALL BE PRE-FABRICATED VITRIFIED POLYMER COMPOSITE MATERIAL, AS MANUFACTURED BY ARMOR-TILE, OR APPROVED EQUAL.
2. TRUNCATED DOMES SHALL HAVE DIMENSIONS OF 0.20" HEIGHT, 0.9" BASE DIAMETER, AND BE SPACED AT 1.67" ON CENTER TO 2.35" ON CENTER.
3. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY BY AT LEAST 70% WITH ADJACENT SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. STANDARD COLOR FOR THE DETECTABLE WARNING SURFACE SHALL BE FEDERAL YELLOW (NO.33538) UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
4. DETECTABLE WARNING SURFACES SHALL BE SLIP RESISTANT.
5. DETECTABLE WARNING PAD INSTALLATIONS SHALL UTILIZE CAST-IN-PLACE PRODUCTS AND INSTALLATION METHOD FOR ALL NEW INSTALLATIONS WITHOUT EXCEPTIONS. SURFACE MOUNT PRODUCTS AND INSTALLATION METHOD MAY BE USED FOR RETROFIT SITUATIONS WITH PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER. ALL PRODUCTS AND INSTALLATION METHODS SHALL CONFORM TO THESE SPECIFICATIONS AND DETAILS AND MANUFACTURER RECOMMENDATIONS.
6. ALL DETECTABLE WARNING PRODUCTS MUST COME WITH A 5-YEAR WARRANTY FOR SHAPE, COLOR FASTNESS, SOUND-ON-CANE ACOUSTIC QUALITY, RESILIENCE AND ATTACHMENT. WARRANTY MUST STATE THAT PRODUCT AND ATTACHMENT WILL NOT DEGRADE SIGNIFICANTLY FOR 5 YEARS, I.E. MUST RETAIN AT LEAST 90% OF ITS ORIGINAL APPROVED DESIGN CHARACTERISTICS.
7. THE EDGE OF THE DETECTABLE SURFACE SHALL HAVE A BEVELED EDGE SLOPE AT 1:2 MAXIMUM. WHEN THE DETECTABLE SURFACE EDGE IS CUT AND THE RESULTING EDGE IS NOT FLUSH WITH THE SURFACE OF THE CURB RAMP, THE EDGE SHALL BE BEVELED OR CONFORMED WITH AN APPROVED FILLER AT 1:2 MAXIMUM SLOPE, IN ACCORDANCE WITH THE APPROVED DETECTABLE SURFACE MANUFACTURER'S REQUIREMENTS.

| | | | | | |
|------------------|---------------|----|---|---------------|------------------|
| NO. | REVISION DATE | BY | CURB RAMP GROOVINGS AND DETECTABLE WARNING SURFACE | APPROVED BY: | DECEMBER 2015 |
| | | | | CECIL DILLON | DATE |
| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | |
| CHECKED BY: CD | | | | RCE 25835 | |
| SCALE: NONE | | | | STANDARD | 221 |
| DATE: 03/2015 | | | | PLAN NO. | |

SCALE:  N.T.S.



NOTES:

1. ANY DEVIATION FROM THE STANDARD LOCATION SHALL BE APPROVED BY THE CITY ENGINEER.
2. THIS STANDARD SHALL APPLY TO NEW DEVELOPMENTS.
3. FRANCHISE UTILITIES TELEPHONE, GAS, ELECTRICAL, TELEVISION CABLE, ETC. SHALL BE LOCATED IN THE P.U.E. AREA.

| NO. | REVISION | DATE | BY |
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

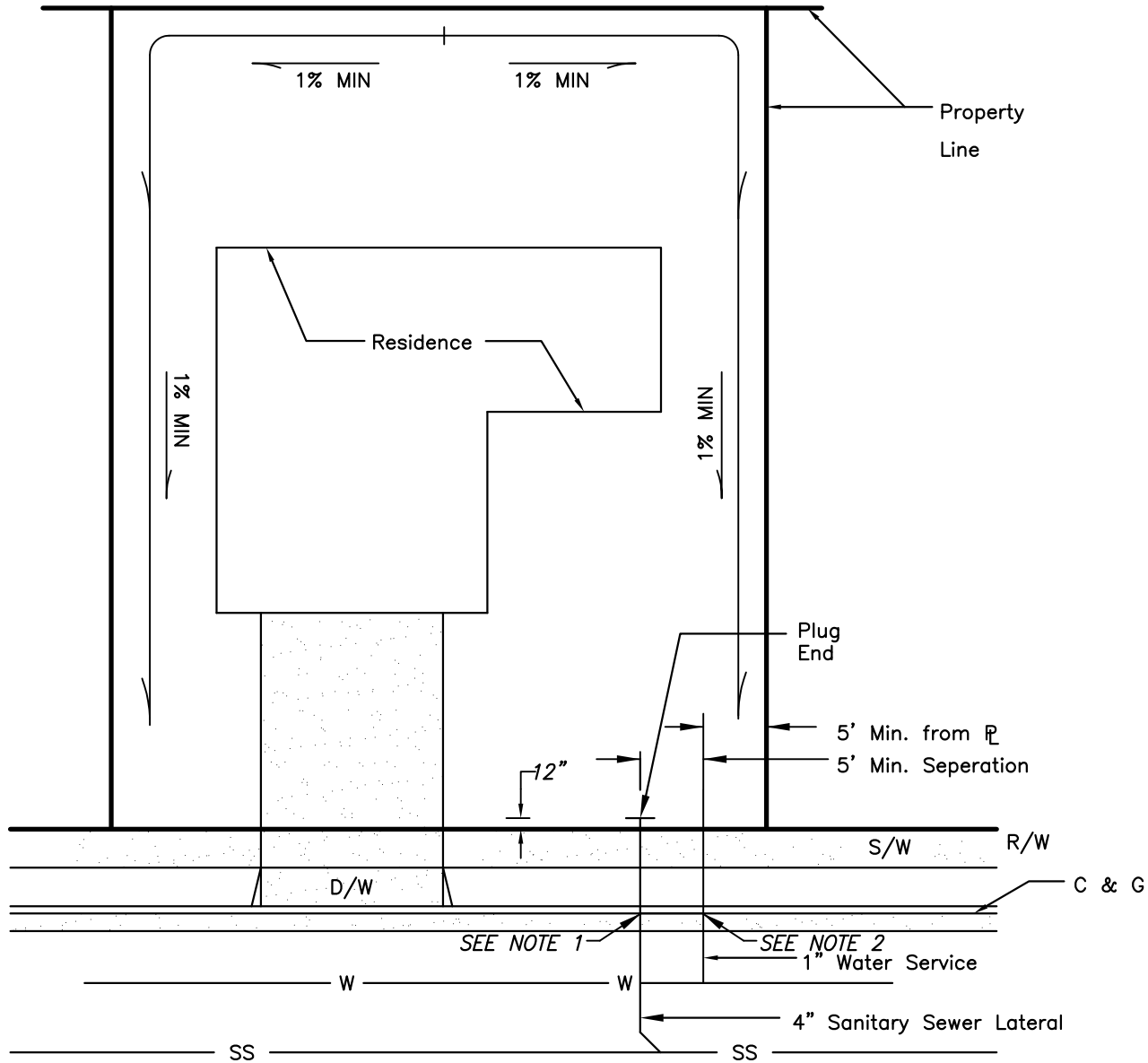
**STANDARD UTILITY LOCATION
IN STREET**

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835

DATE

STANDARD PLAN NO. **222**

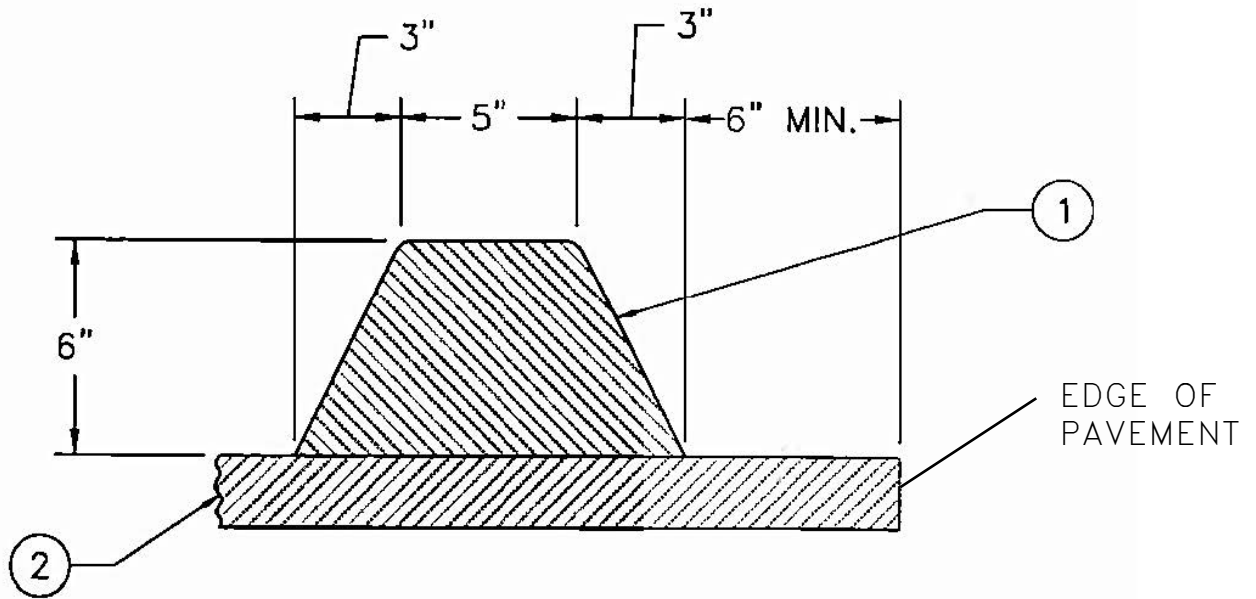


PLAN: LOT UTILITY LOCATION

NOTES:

1. A 2"x2" LETTER "S" SHALL BE STAMPED, CHISELED, CUT, ETC. ON THE TOP OF ALL CONCRETE CURBS ON ALL SANITARY SEWER LATERALS DIRECTLY ABOVE THE LOCATION WHERE THE LATERAL CROSSES THE FLOW LINE OF THE GUTTER.
2. A 2"x2" LETTER "W" SHALL BE STAMPED, CHISELED, CUT, ETC. ON THE TOP OF ALL CONCRETE CURBS ON ALL WATER SERVICES DIRECTLY ABOVE THE LOCATION WHERE THE SERVICE CROSSES THE FLOW LINE OF THE CONCRETE GUTTER.

| | | | | | |
|------------------|---------------|----|---|----------------------------------|------------------|
| NO. | REVISION DATE | BY | TYPICAL UTILITY SERVICE LAYOUT | APPROVED BY: | DECEMBER 2015 |
| | | | | CECIL DILLON | DATE |
| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | |
| CHECKED BY: CD | | | | RCF 25835 | |
| SCALE: NONE | | | | STANDARD PLAN NO. 223 | |
| DATE: 03/2015 | | | | | |



1. ASPHALT CONCRETE DIKE SHALL BE INSTALLED IN CONFORMANCE WITH SECTION 39-1.14 OF THE STATE STANDARD SPECIFICATIONS.

2. ASPHALT CONCRETE PAVEMENT.

NOTES:

A. ASPHALTIC EMULSION SHALL BE USED BETWEEN DIKE AND AC PAVEMENT.

| NO. | REVISION | DATE | BY |
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| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

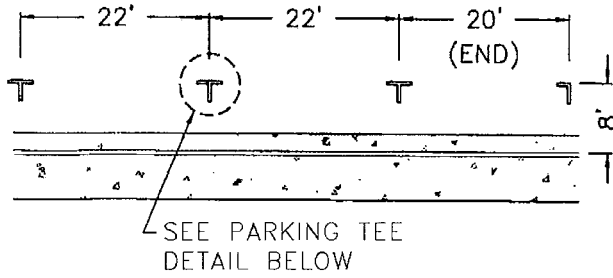
ASPHALT CONCRETE DIKE

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

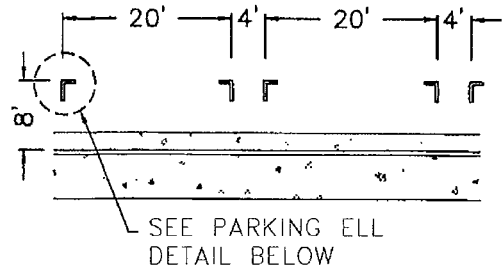
APPROVED BY: CECIL DILLON
CITY ENGINEER
RCE 25835
DECEMBER 2015
DATE

STANDARD PLAN NO. 224

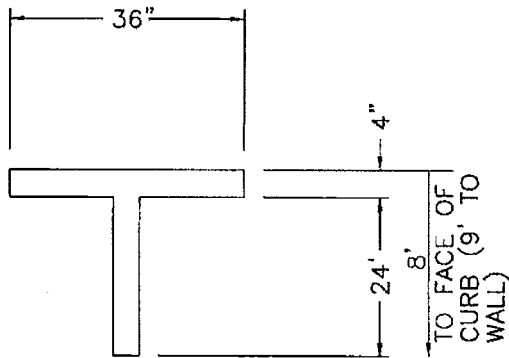
CURB PARKING



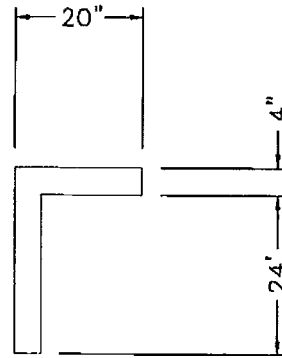
INTERIOR AND END



PAIRED PARKING



PARKING TEE

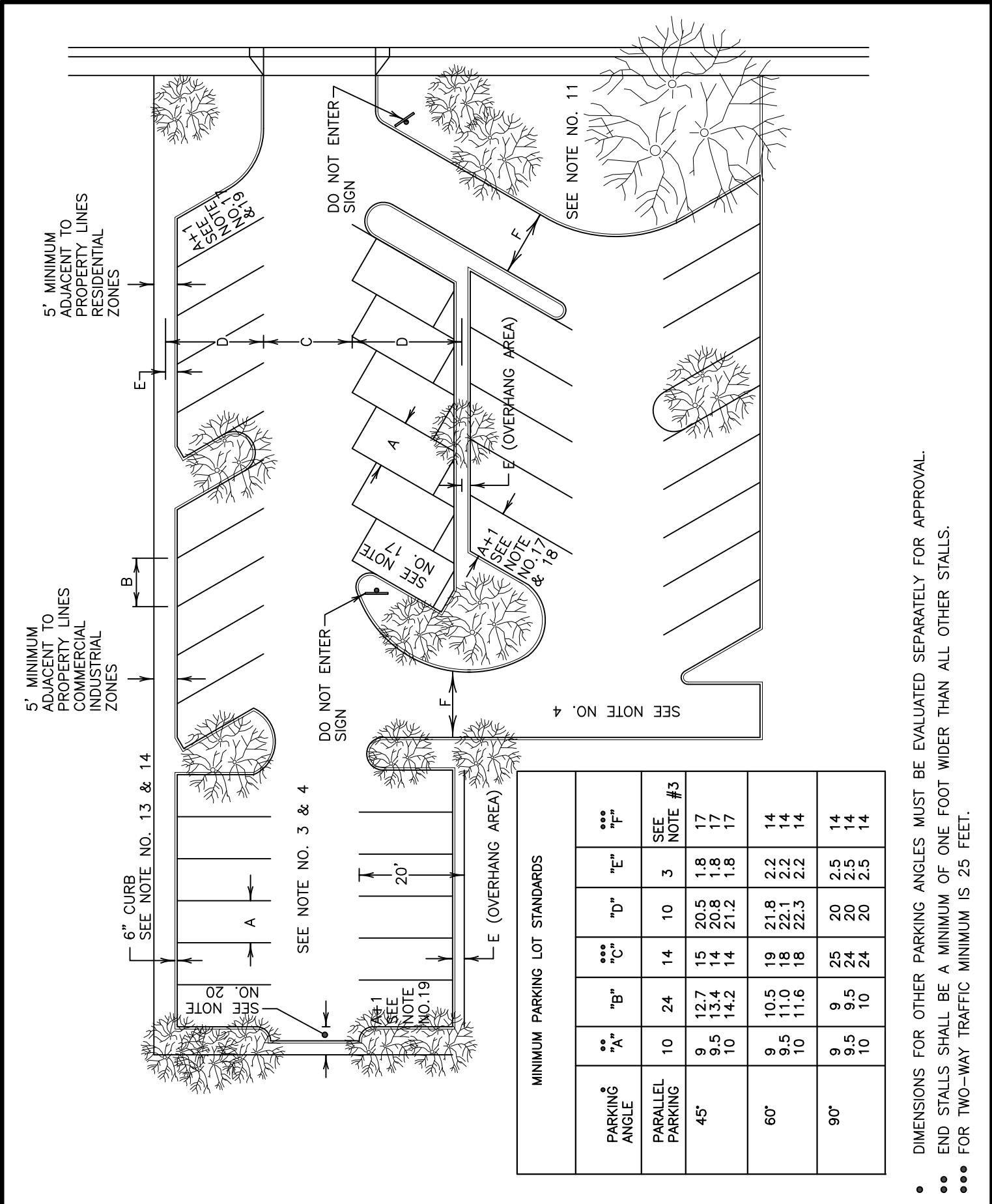


PARKING ELL

NOTES:

STRIPING FOR PARKING SPACE DELINEATION SHALL BE THERMOPLASTIC.

| | | | | | |
|------------------|---------------|----|---|-------------------------------------|------------------|
| NO. | REVISION DATE | BY | PARALLEL PARKING SPACES CITY STREET | APPROVED BY: CECIL DILLON | DECEMBER 2015 |
| | | | | CITY ENGINEER RCE 25835 | DATE |
| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | STANDARD PLAN NO. 225 | |
| CHECKED BY: CD | | | | | |
| SCALE: NONE | | | | | |
| DATE: 03/2015 | | | | | |



MINIMUM PARKING LOT STANDARDS

| PARKING ANGLE | •• "A" | ••• "B" | ••• "C" | "D" | "E" | ••• "F" |
|------------------|----------------|----------------------|----------------|----------------------|-------------------|----------------|
| PARALLEL PARKING | 10 | 24 | 14 | 10 | 3 | SEE NOTE #3 |
| 45° | 9 9.5 10 | 12.7 13.4 14.2 | 15 14 14 | 20.5 20.8 21.2 | 1.8 1.8 1.8 | 17 17 17 |
| 60° | 9 9.5 10 | 10.5 11.0 11.6 | 19 18 18 | 21.8 22.1 22.3 | 2.2 2.2 2.2 | 14 14 14 |
| 90° | 9 9.5 10 | 9 9.5 10 | 25 24 24 | 20 20 20 | 2.5 2.5 2.5 | 14 14 14 |

- DIMENSIONS FOR OTHER PARKING ANGLES MUST BE EVALUATED SEPARATELY FOR APPROVAL.
- END STALLS SHALL BE A MINIMUM OF ONE FOOT WIDER THAN ALL OTHER STALLS.
- FOR TWO-WAY TRAFFIC MINIMUM IS 25 FEET.

| NO. | REVISION | DATE | BY |
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| DRAWN BY: BH, NR | | | |
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| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

PARKING STANDARDS

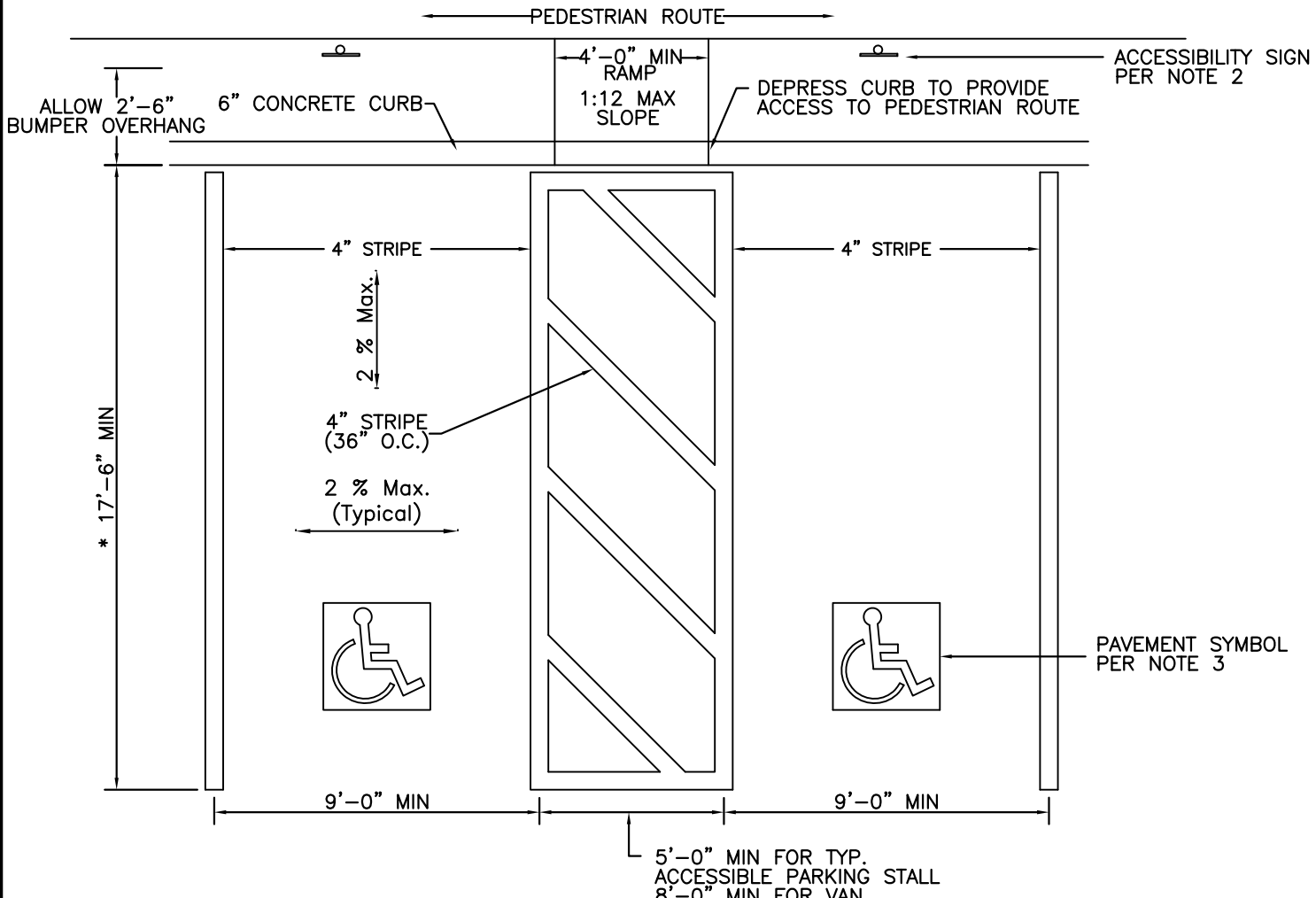
CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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|-------------------|------------|
| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD PLAN NO. | 226 |

PARKING STANDARD NOTES

1. A MINIMUM NUMBER OF PARKING SPACES REQUIRED IS ESTABLISHED BY THE CITY OF RIO VISTA ZONING ORDINANCE.
2. ALL PARKING STALLS SHALL BE MARKED IN A ACCEPTABLE MANNER.
3. LOTS DESIGNED FOR MORE THAN FOUR CARS MUST HAVE TWO-WAY ACCESS
4. WHERE TWO PARKING ANGLES ARE TO BE USED IN A SINGLE LOT, THEY SHALL BE LOCATED IN SEPARATE AREAS OF THE LOT (CITY CAN MAKE EXCEPTIONS IF VALID CIRCUMSTANCES EXIST).
5. ANY PARKING LAYOUT NECESSITATING A CUL-DE-SAC OR SIMILAR TYPE OF TURNING FACILITY FOR REVERSING DIRECTION OF TRAVEL IN ORDER TO EXIT FROM THE AREA OR ANY PARKING SPACES WILL GENERALLY BE DISCOURAGED, AND IT SHOULD BE APPROVED BY THE CITY STAFF PRIOR TO THE INCORPORATION INTO THE PLAN.
6. RESIDENTIAL PARKING FOR MORE THAN FOUR CARS AND PARKING IN COMMERCIAL AND INDUSTRIAL AREAS SHALL NOT BE DESIGNED TO REQUIRE BACKING OUT ONTO ANY PUBLIC STREET RIGHT-OF-WAY.
7. TWO-WAY TRAFFIC AISLES SHALL BE A MINIMUM OF 24 FEET WIDE.
8. PARKING OR BACKING AREA WITHIN A PARKING LOT SHALL NOT EXTEND INTO THE PUBLIC RIGHT-OF-WAY.
9. WHEN A LONG DRIVEWAY HAVING ONLY A SINGLE INGRESS IS NECESSARY WITHIN A DEVELOPMENT, PROVISIONS SHOULD BE MADE FOR THE MANEUVERING OF EMERGENCY VEHICLES AND THE ARRANGEMENT APPROVED BY CITY STAFF PRIOR TO ITS INCORPORATION INTO THE PLAN.
10. ALL PARKING LOTS SHALL HAVE AN ADEQUATE STRUCTURAL SECTION AND SHALL BE PAVED WITH A MINIMUM OF TWO INCHES OF ASPHALT CONCRETE.
11. ALL UNUSABLE AREAS SHALL BE LANDSCAPED WHERE PRACTICAL.
12. LANDSCAPED AREAS WITHIN OR ADJACENT TO THE PARKING AREA SHALL PROVIDE FOR A MINIMUM OF ONE SHADE TREE FOR EVERY FOUR PARKING STALLS. DEPENDING ON TYPE AND SIZE OF SHADE TREE, REQUIREMENTS MAY BE MODIFIED BY THE CITY.
13. SIX-INCH HIGH CONCRETE CURBS SHALL SEPARATE ALL PAVED AND LANDSCAPED AREAS.
14. THE CONCRETE CURBING SHALL BE USED AS WHEEL STOPS WHERE POSSIBLE. THE USE OF BUMPER BLOCKS IS DISCOURAGED.
15. LANDSCAPED AREAS SHALL BE PROVIDED BETWEEN ASPHALT AREAS AND ALL BUILDING STRUCTURES AND FENCES AND PROPERTY LINES. HARDSCAPING MAY BE USED WHERE PEDESTRIAN ACCESS IS A NECESSITY AS DETERMINED BY THE CITY.
16. LANDSCAPING SHALL CONFORM TO THE CITY OF RIO VISTA LANDSCAPE GUIDELINES.
17. END STALLS SHOULD BE PROTECTED FROM THE TURNING MOVEMENT OF OTHER VEHICLES.
18. HANDICAPPED STALLS SHALL BE A MINIMUM OF NINE FEET WIDE PLUS AN ADJACENT FIVE FOOT MINIMUM ACCESS ZONE, PER TITLE 24, CHAPTER 2-7102, CALIFORNIA ADMINISTRATIVE CODE. VAN ACCESSIBLE STALLS SHALL HAVE A MINIMUM 8 FOOT ADJACENT ACCESS ZONE.
19. END STALLS ADJACENT TO CURBINGS SHALL BE A MINIMUM OF TEN FEET WIDE.
20. DEAD END 90° PARKING SHALL BE PROVIDED WITH ADEQUATE TURNING ROOM.
21. PARKING REQUIREMENTS FOR THE INTERIOR OF PARKING LOTS ON INDUSTRIAL LOTS SURROUNDED SOLELY BY HEAVY INDUSTRIALLY ZONED PROPERTIES MAY BE MODIFIED BY THE CITY.
22. ALL OFF-STREET PARKING STALLS SHALL BE PAVED.
23. ALL LANDSCAPED AREAS TO BE WITHOUT LAWN.

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| NO. | REVISION DATE | BY | PARKING STANDARD NOTES | APPROVED BY: | DECEMBER |
| | | | | CECIL DILLON | 2015 |
| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | DATE |
| CHECKED BY: CD | | | | RCE 25835 | |
| SCALE: NONE | | | | STANDARD | 227 |
| DATE: 03/2015 | | | | PLAN NO. | |



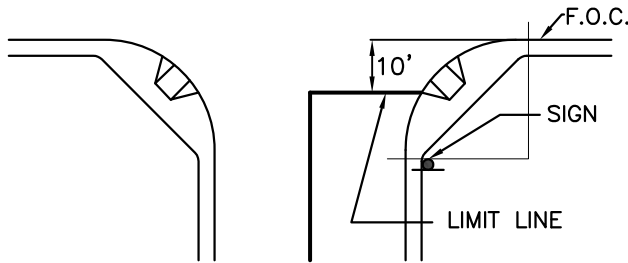
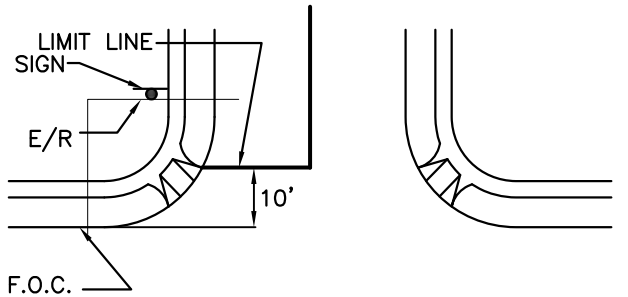
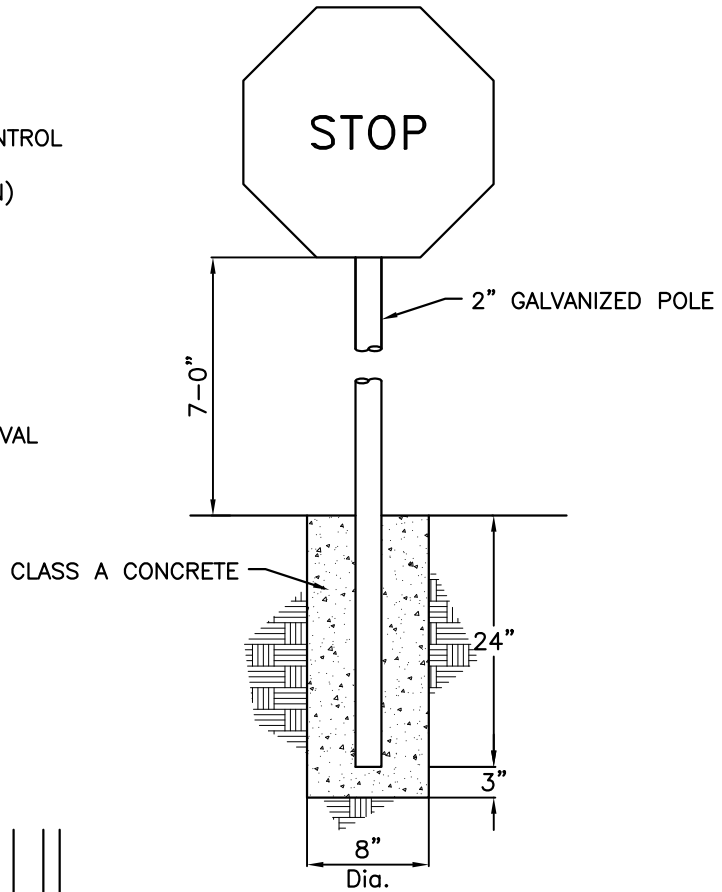
NOTES:

1. ONE IN EVERY EIGHT ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, SHALL BE SERVED BY AN ACCESS AISLE 8' WIDE MINIMUM AND SHALL BE DESIGNATED VAN ACCESSIBLE.
 2. EACH PARKING SPACE RESERVED FOR PERSONS WITH PHYSICAL DISABILITIES SHALL BE IDENTIFIED BY A REFLECTORIZED SIGN IN ACCORDANCE WITH STATE STANDARD SIGN R99. VAN ACCESSIBLE PARKING SPACES SHALL BE IDENTIFIED BY REFLECTIVE SIGNS IN ACCORDANCE WITH STATE STANDARD SIGN R99 AND R99A. SIGNS SHALL BE POSTED AT A MINIMUM HEIGHT OF 80 INCHES FROM THE BOTTOM OF THE SIGN TO THE PARKING SPACE FINISH GRADE.
 3. PAVEMENT SYMBOL SHALL BE PER MUTCD CALIFORNIA EDITION.
 4. AN ADDITIONAL SIGN (17"x22") SHALL BE INSTALLED AT EACH ENTRANCE TO THE PARKING LOT. THE SIGN SHALL READ AS FOLLOWS: "UNAUTHORIZED VEHICLES PARKED IN DESIGNATED ACCESSIBLE SPACES NOT DISPLAYING DISTINGUISHING PLACARDS OR LICENSE PLATES ISSUED FOR PERSONS WITH DISABILITIES MAY BE TOWED AWAY AT OWNER'S EXPENSE. TOWED VEHICLES MAY BE RECLAIMED BY TELEPHONING THE CITY OF RIO VISTA POLICE DEPARTMENT"
 5. IF OVERHANG ENCROACHES ONTO A PEDESTRIAN AREA, PEDESTRIAN AREA SHALL HAVE A MINIMUM 4'-0" CLEAR WIDTH.
- * PARKING STALL SHALL BE 20'-0" LONG IF 2'-6" CURB OVERHANG IS NOT PROVIDED.

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| NO. | REVISION DATE | BY | HANDICAP PARKING LAYOUT | APPROVED BY: | DECEMBER 2015 |
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| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | |
| CHECKED BY: CD | | | | RCE 25835 | |
| SCALE: NONE | | | | STANDARD PLAN NO. 228 | |
| DATE: 03/2015 | | | | | |

NOTES:

1. STOP SIGNS SHALL BE MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES CALIFORNIA SUPPLEMENT) STANDARD R1-1 (30" BY 30" SIGN)
2. STREET-SIDE EDGE OF SIGN SHALL BE NOT LESS THAN 12" FROM FACE OF CURB.
3. ALL SIGNS ARE TO BE INSTALLED USING THEFT-PROOF HARDWARE
4. LIMIT LINES MAY BE AT AN ALTERNATIVE LOCATION WITH APPROVAL BY THE CITY.



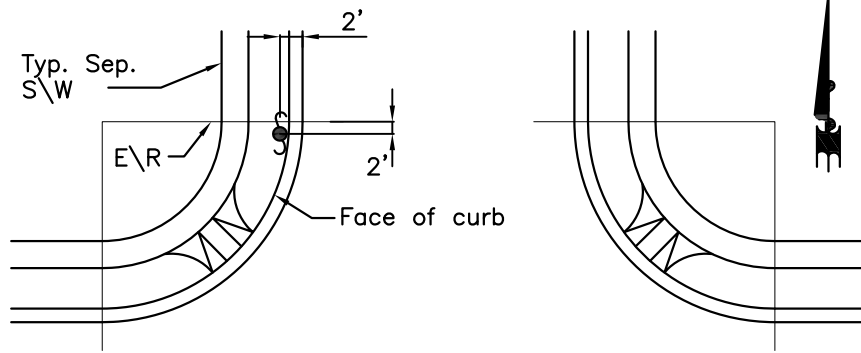
SIGN & LIMIT LINE LOCATION

| NO. | REVISION | DATE | BY |
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| DATE: 03/2015 | | | |

STANDARD STOP SIGN

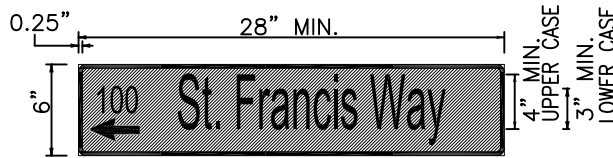
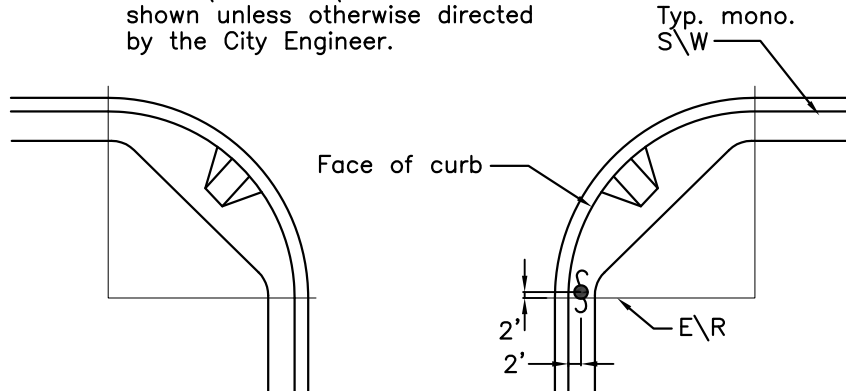
CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD PLAN NO. | 229 |



STREET SIGN PLACEMENT

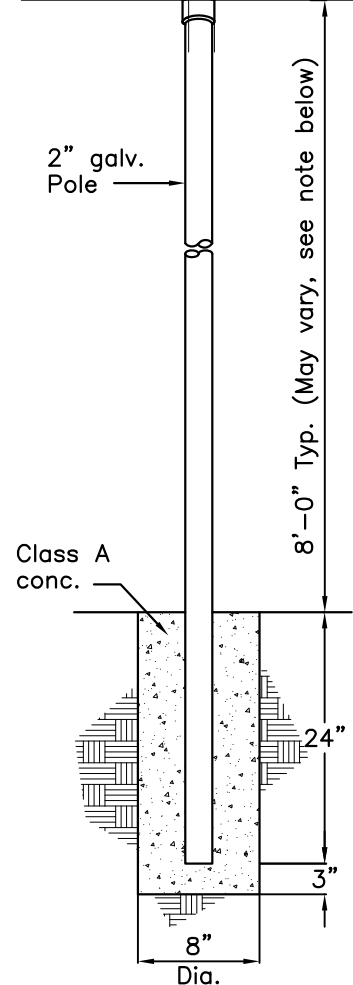
NOTE: Street signs shall be placed at the N\W and S\E corners as shown unless otherwise directed by the City Engineer.



STREET SIGN DETAIL
NOT TO SCALE

NOTES:

1. GIL SANS CONDENSED FONT, COLOR WHITE.
2. FONT HEIGHT SHALL BE 4" UPPER CASE AND 3" LOWER CASE.
3. SIGN WIDTH SHALL BE 28" MIN.
4. SIGN HEIGHT SHALL BE 6".
5. SIGN BACKGROUND SHALL BE BLUE.



SPECIFICATIONS

1. ALL SIGNS SHALL CONFORM TO THE LATEST VERSION OF MUTCD-CA.
2. SIGN PLATES SHALL BE "SCOTCHLITE" REFLECTIVE SHEETING APPLIED TO DEGREASED AND ETCHED FB 118, .080 ALUMINUM BY 3M CO. OR EQUAL.
3. STREET NAME TO BE 4" UPPER CASE LETTERS WITH 3" LOWER CASE LETTERS. AVE., BLVD., CT., DR., PL., ST., & RD., MAY BE USED, LANE AND WAY NOT TO BE ABBREVIATED.
4. MOUNTING HARDWARE SHALL BE HAWKINS V14F-(HD)SL SERIES ALUMINUM HIGH TENSILE ALLOY BRACKETS OR APPROVED EQUAL.
5. THE BACKGROUND, LEGEND, AND BORDER OF THE SIGN SHALL BE HIGH INTENSITY PRISMATIC RETROREFLECTIVE VINYL SHEETING CONFORMING TO ASTM D4956, TYPE IV. THE BACKGROUND SHALL BE BLUE AND THE LEGEND AND BORDER SHALL BE WHITE.
6. STREET NAMES SIGNS SHALL BE LOCATED N/W AND S/E AS DIRECTED ABOVE.

NOTE:

WHEN STOP SIGN OR ANY OTHER SIGN ARE TO BE INSTALLED ON STREET SIGN POLE, HEIGHT OF SIGN SHALL HAVE PRECEDENCE. A 7'-0" MINIMUM CLEARANCE FROM BOTTOM OF SIGN TO TOP OF GROUND SHALL BE REQUIRED.

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| DATE: 03/2015 | | | |

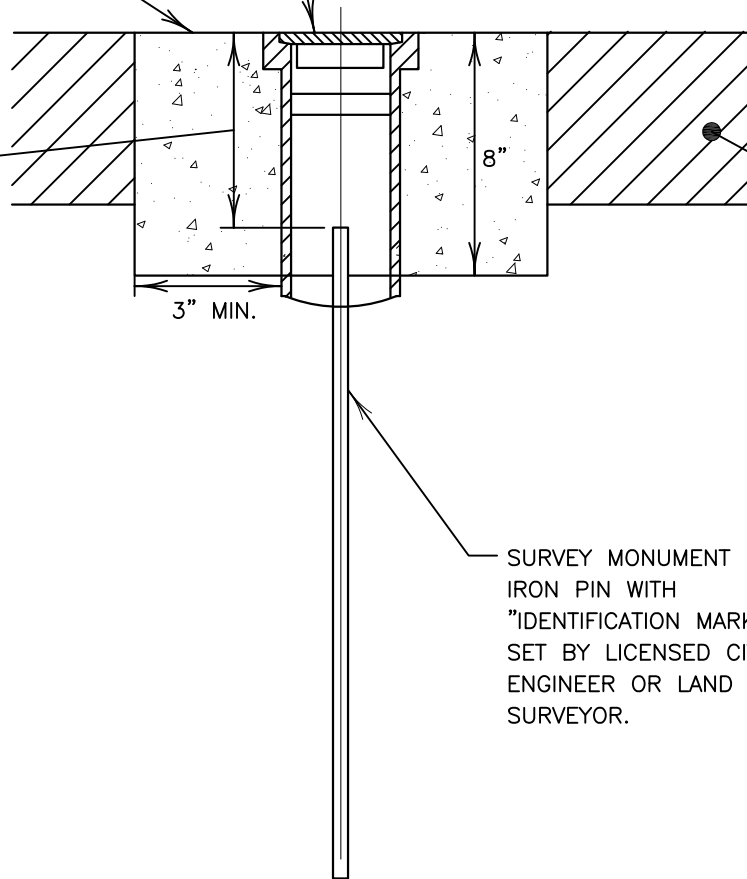
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| <p>STANDARD STREET SIGN</p> | |
| <p>CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS</p> | |

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD PLAN NO. | 230 |

FRAME AND COVER: G5 CHRISTY TRAFFIC RATED BOX OR APPROVED EQUAL. LID SHALL BE STAMPED "SURVEY MONUMENT"

SET FRAME TO GRADE

6" MIN.
12" MAX



EXISTING
STRUCTURAL SECTION

3" MIN.

SURVEY MONUMENT
IRON PIN WITH
"IDENTIFICATION MARKS"
SET BY LICENSED CIVIL
ENGINEER OR LAND
SURVEYOR.

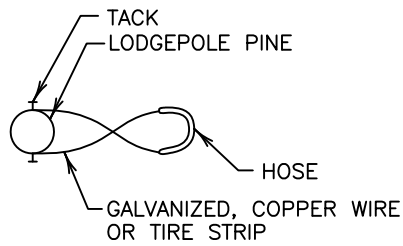
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| DATE: 03/2015 | | | |

STANDARD MONUMENT

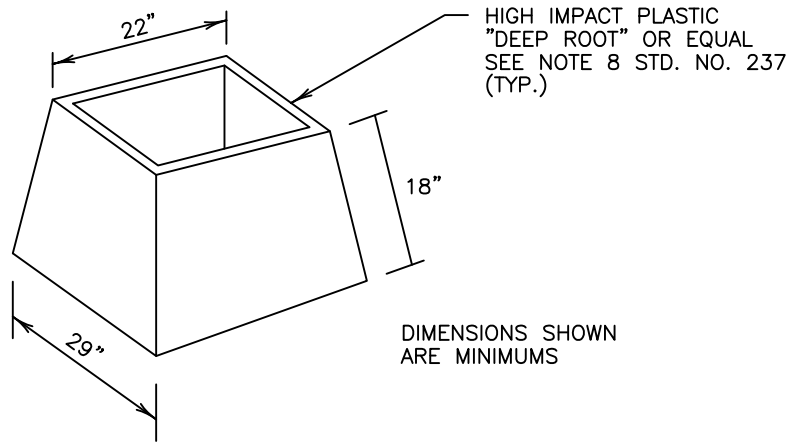
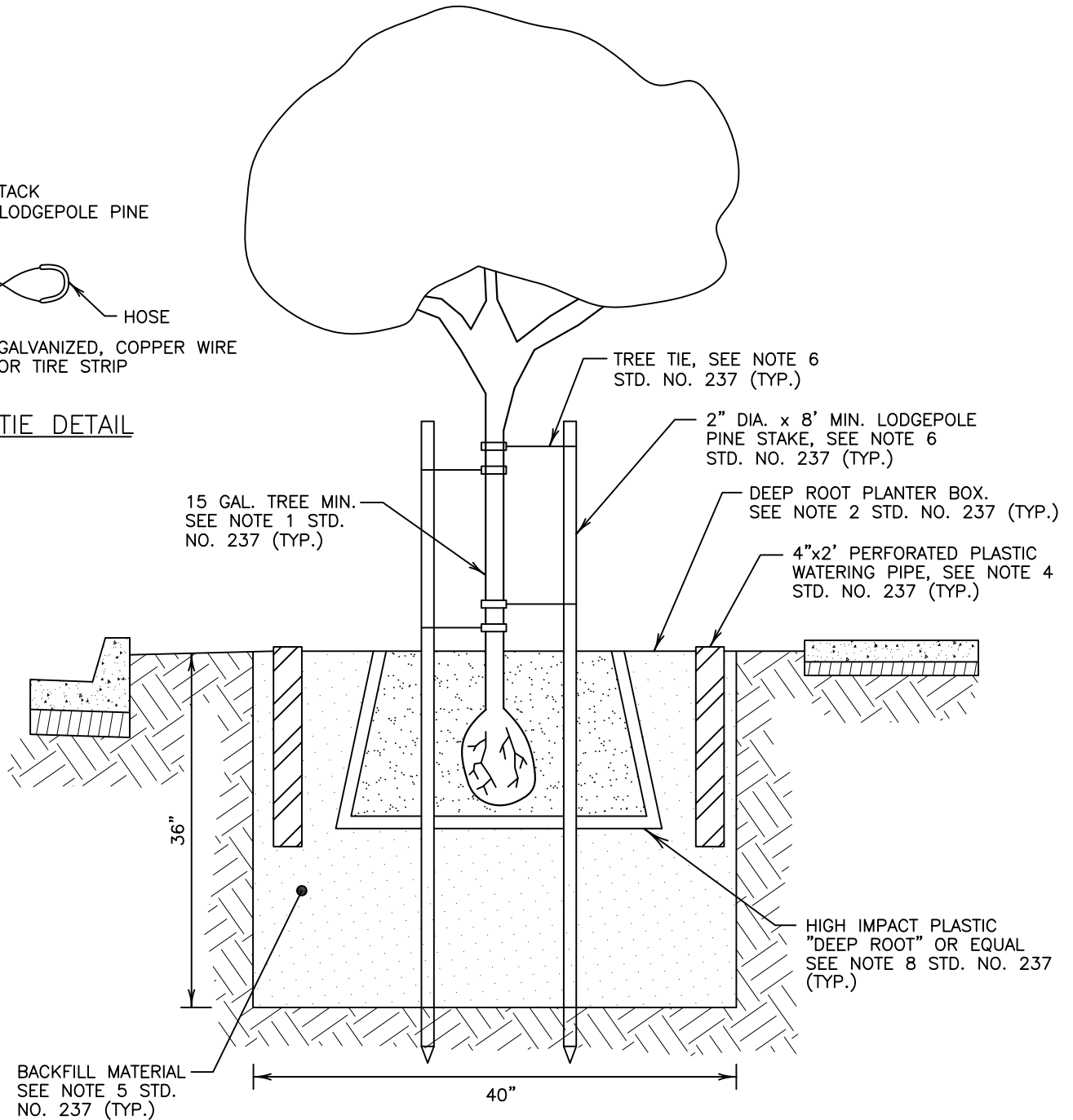
CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: CECIL DILLON
CITY ENGINEER
RCE 25835
DECEMBER 2015
DATE

STANDARD PLAN NO. 231



TREE TIE DETAIL



| NO. | REVISION | DATE | BY |
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| DRAWN BY: BH, NR | | | |
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| DATE: 03/2015 | | | |

TREE PLANTING

CITY OF RIO VISTA
 DEPARTMENT OF PUBLIC WORKS

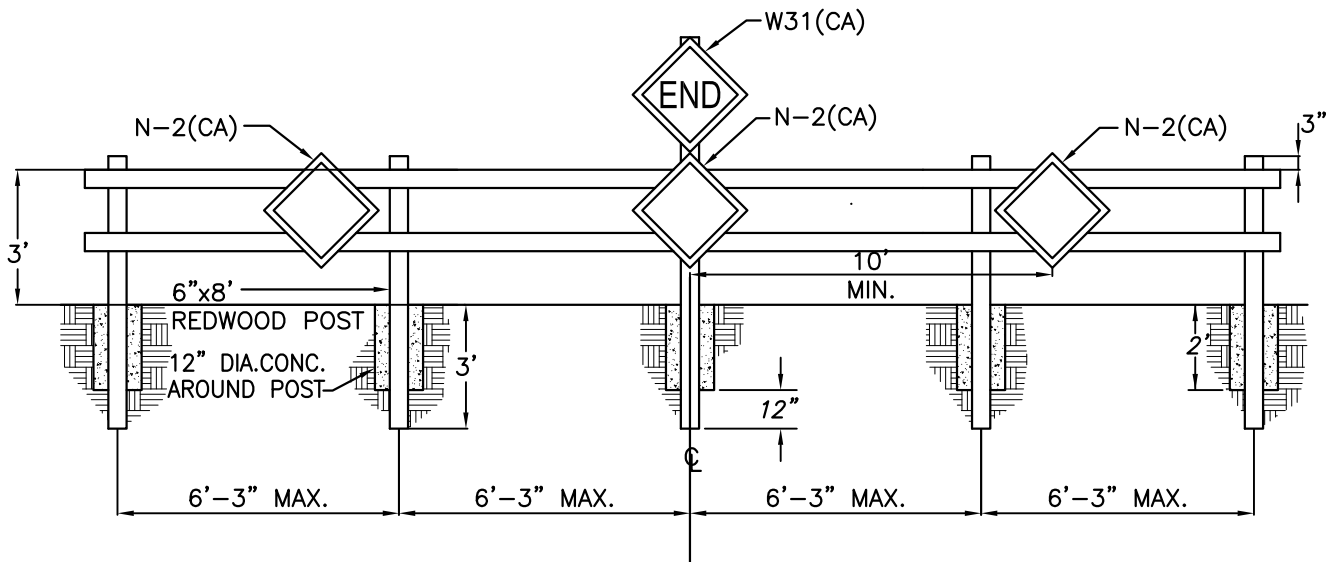
APPROVED BY: **CECIL DILLON** DECEMBER 2015
 CITY ENGINEER DATE
 RCF 25835

STANDARD PLAN NO. **232**

GENERAL NOTES:

1. TREES SHALL BE A SIZE NOT LESS THAN 8 FT. IN HEIGHT NOR LESS THAN 1 INCH CALIPER. A TREE MAY BE REJECTED IF IT IS NOT OF A SHAPE OR CONDITION ACCEPTABLE TO THE CITY OF RIO VISTA
2. THE TREE SHALL BE PLANTED IN DEEP ROOT PLANTER BOX. THE PLANTER BOX MUST BE A MINIMUM OF 22 INCHES AT THE TOP, 29 INCHES AT THE BOTTOM AND 18 INCHES DEEP.
3. THE TREE SHALL BE PLANTED IN A HOLE 40 INCHES SQUARE BY 36 INCHES DEEP.
4. INSTALL TWO 24" DEEP WATERING PERFORATED PLASTIC PIPES AS SHOWN. FILL PIPES WITH 3/4 INCH CLEAN DRAIN ROCK.
5. TREES SHALL BE PLANTED IN A MIXTURE OF 1/2 NATIVE SOIL AND 1/2 LEAF MOLD OR REDWOOD MULCH.
6. TREES SHALL BE STAKED WITH TWO 2 INCH BY 8 FT. MINIMUM LODGE POLE PINE STAKES OR EQUAL. STAKES SHALL BE COATED WITH GREEN PRESERVATIVE STAIN. TREES SHALL BE TIED WITH "GRO STRAIT" TREE TIES, OR SIMILAR.
7. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. APART TO A MAXIMUM OF 50 FT. APART DEPENDING ON THE TYPE OF THE TREE. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. FROM CURB RETURNS, 15 FT. FROM STREET LIGHTS AND 6 FT. FROM DRIVEWAYS, SEWER LATERALS AND WATER SERVICES OR AS OTHERWISE APPROVED BY THE CITY OF RIO VISTA.
8. DEEP ROOT PLANTER SHALL BE FABRICATED FROM A HIGH DENSITY AND HIGH IMPACT PLASTIC SUCH AS POLYVINYL CHLORIDE, ABS OR POLYETHYLENE AND HAVE A MINIMUM THICKNESS OF 0.06 INCH. THE PLASTIC SHALL HAVE 1/2 INCH HIGH RAISED VERTICAL RIBS ON THE INNER SURFACE SPACED NOT MORE THAN SIX (6) INCHES APART.

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| NO. | REVISION | DATE | BY | TREE PLANTING NOTES | APPROVED BY: | DECEMBER |
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| DRAWN BY: BH, NR | | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | DATE |
| CHECKED BY: CD | | | | | RCE 25835 | |
| SCALE: NONE | | | | | STANDARD | 233 |
| DATE: 03/2015 | | | | PLAN NO. | | |



END OF ROAD WAY

NOTES:

1. INSTALL 6"x8' REDWOOD OR PRESSURE TREATED DOUGLAS FIR POSTS NO MORE THAN 6'-3" APART AND NO LESS THAN 3' INTO THE GROUND.
2. POUR A 12" DIAMETER CONCRETE COLLAR AROUND EACH POST TO A DEPTH OF 12" ABOVE THE POST BASE.
3. CROSSBARS SHALL BE 2"x6" DOUGLAS FIR SELECT, WITH A MINIMUM LENGTH OF 16'.
4. ATTACH CROSSBAR WITH 1/2"x8" GALVANIZED BOLTS. 2 MINIMUM AT EACH POST. USE 4 BOLTS AT SPLICE.
5. PAINT WITH NO LESS THAN 2 COATS OF OUTSIDE WHITE HI-GLOSS ENAMEL PAINT.
6. INSTALL (3) - 18" (TYPE N-2(CA)) REFLECTORS. INSTALL (1) - W31(CA) AS SHOWN.
7. BARRICADE TO EXTEND TO BACK OF SIDEWALK WHEN SIDEWALK PRESENT.

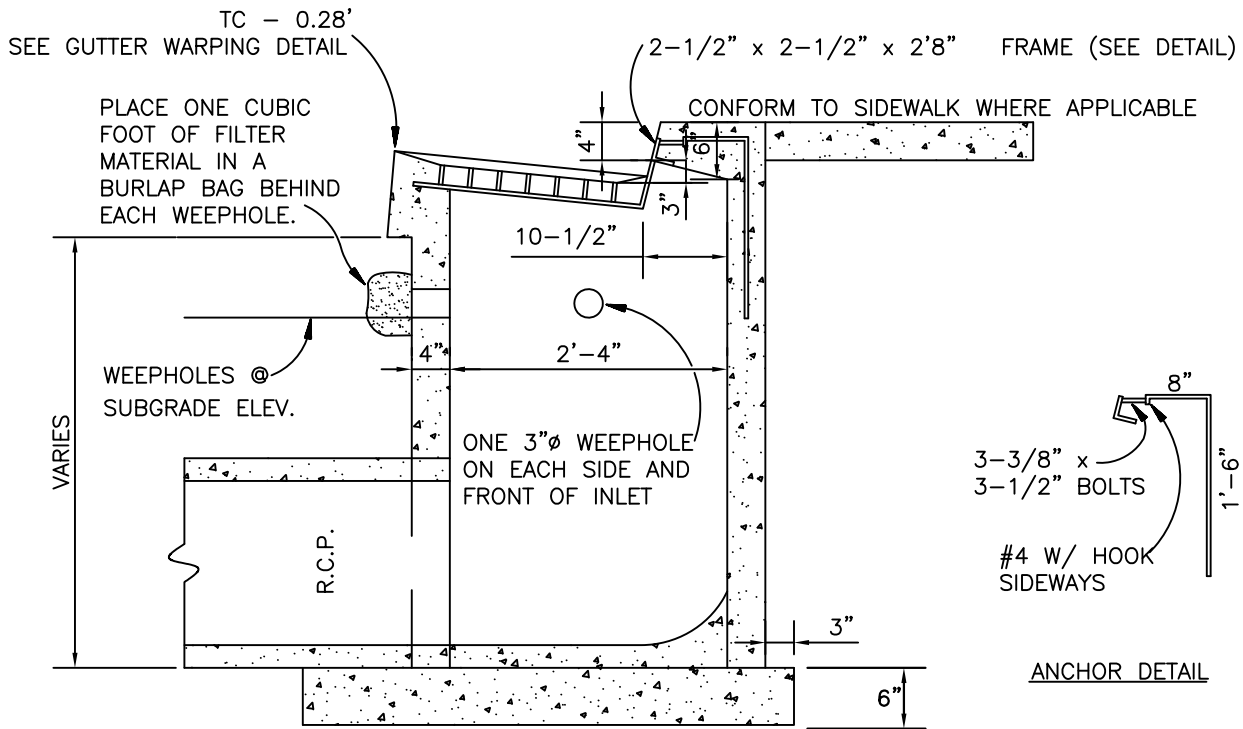
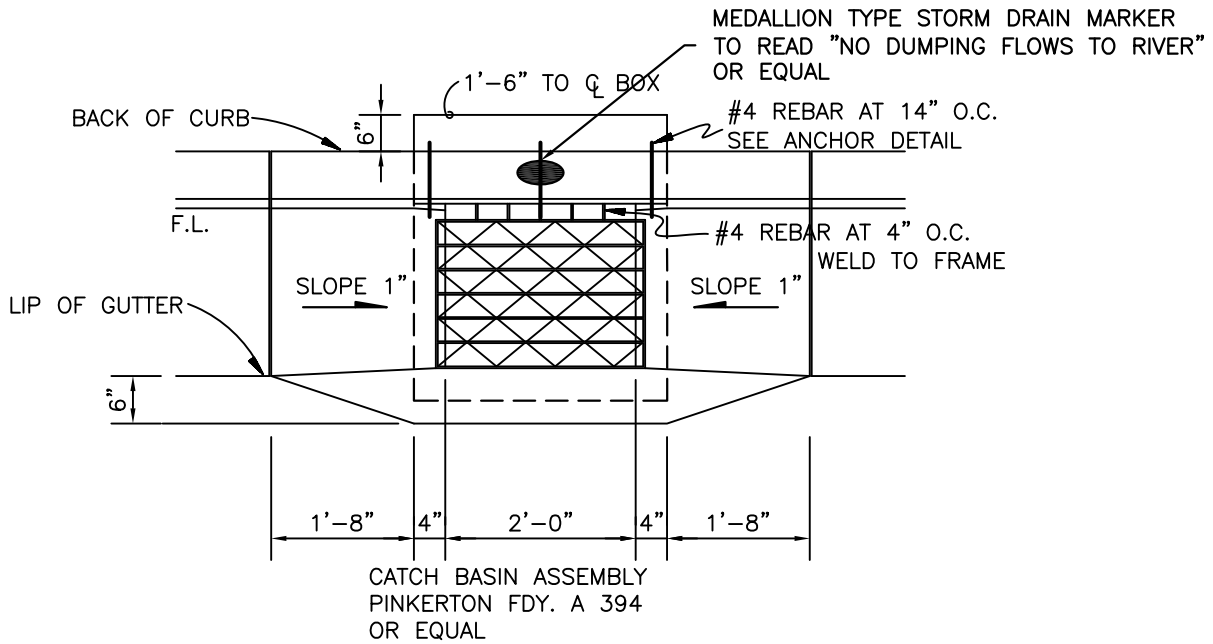
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| DATE: 03/2015 | | | |

STANDARD BARRICADE

CITY OF RIO VISTA

DEPARTMENT OF PUBLIC WORKS

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD PLAN NO. | 234 |



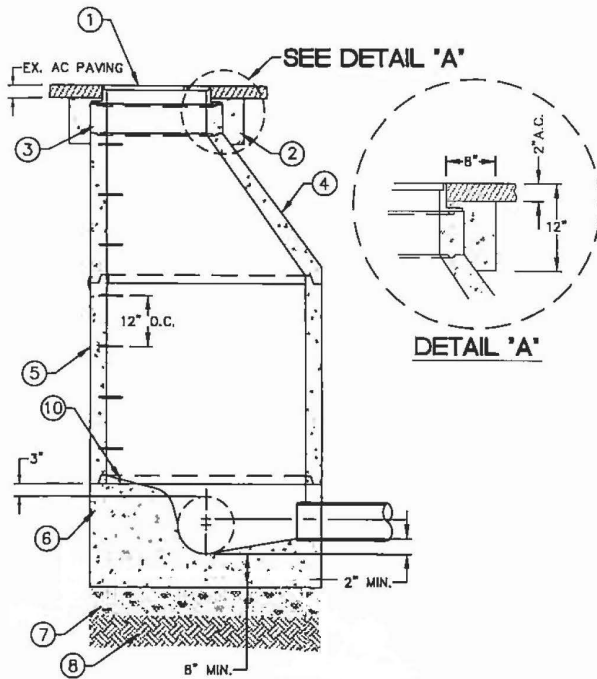
CATCH BASIN DETAIL

NOT TO SCALE

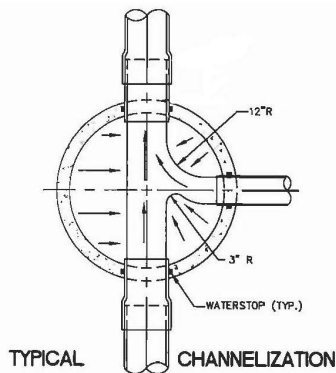
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| CATCH BASIN | |
| CITY OF RIO VISTA | |
| DEPARTMENT OF PUBLIC WORKS | |

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD PLAN NO. | 301 |



1. FRAME COVER, D & L SUPPLY 1024 MARKED "STORM DRAIN" WITH PICK HOLE.
2. CLASS "A" CONCRETE COLLAR WITH 2" AC.
3. STANDARD TWENTY FOUR (24) INCH DIAMETER MANHOLE GRADE RINGS, THREE (3) INCH MINIMUM EIGHTEEN (18) INCH MAXIMUM NECK HEIGHT FROM CONE TO FINISH GRADE.
4. STANDARD FORTY EIGHT (48) INCH ECCENTRIC MANHOLE REDUCER CONE. COPOLYMER POLYPROPYLENE STEPS REQUIRED @ 12" O.C FOR MANHOLES DEEPER THAN FIVE (5) FEET.
5. STANDARD FORTY EIGHT (48) INCH DIAMETER MANHOLE BARREL SECTION, CONFORMING TO ASTM C478-LATEST REVISION, WITH FOUR (4) INCH MINIMUM WALL THICKNESS. COPOLYMER POLYPROPYLENE STEPS REQUIRED FOR MANHOLES MORE THAN FIVE (5) FEET.
6. CLASS "A", CAST -IN-PLACE OR PRECAST CONCRETE BASE.
7. SIX (6) INCHES MINIMUM 3/4 INCH CRUSHED ROCK PER ASTM D448 #67
8. UNDISTURBED SOIL.
9. FOUR (4) INCHES PER FOOT MINIMUM SLOPE.



NOTES:

- A. COUNTRY OF ORIGIN SHALL BE CLEARLY AND PERMANENTLY SHOWN ON TOP SURFACE OF THE FRAME AND COVER IN ACCORDANCE WITH THE TRADE AND TARIFF ACT OF 1984.
- B. DATE OF MANUFACTURE SHALL BE CLEARLY AND PERMANENTLY INDICATED ON THE COVER AND TOP OF THE FRAME.
- C. SEATING SURFACE SHALL BE CLOSELY MACHINED TO NOMINAL DIMENSIONS WITH TOLERANCES NOT TO EXCEED $\pm 1/64$ INCH.
- D. THE WEIGHT OF THE FRAME SHALL BE 140LBS., ± 10 LBS.
- E. THE WEIGHT OF THE COVER SHALL BE 130LBS., ± 5 LBS.
- F. THE STORM DRAIN MANHOLE SHALL NOT BE USED ON STORM DRAIN CONDUIT GREATER THAN 36 INCHES IN DIAMETER.

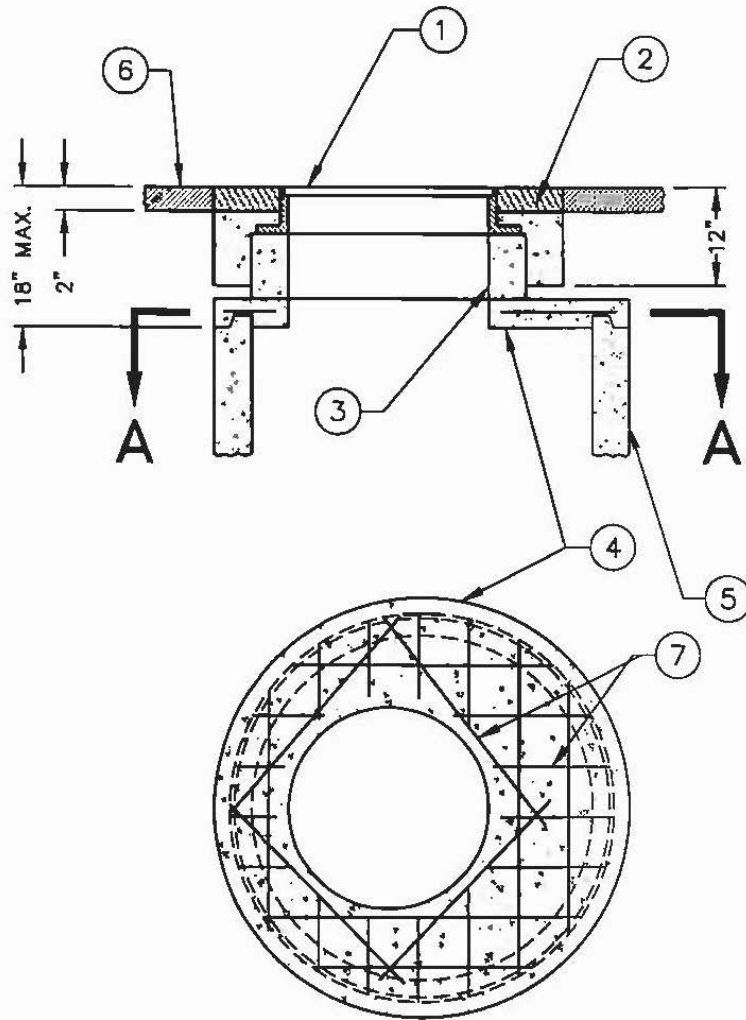
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| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

STORM DRAIN MANHOLE

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |

STANDARD PLAN NO. 302



SECTION A-A

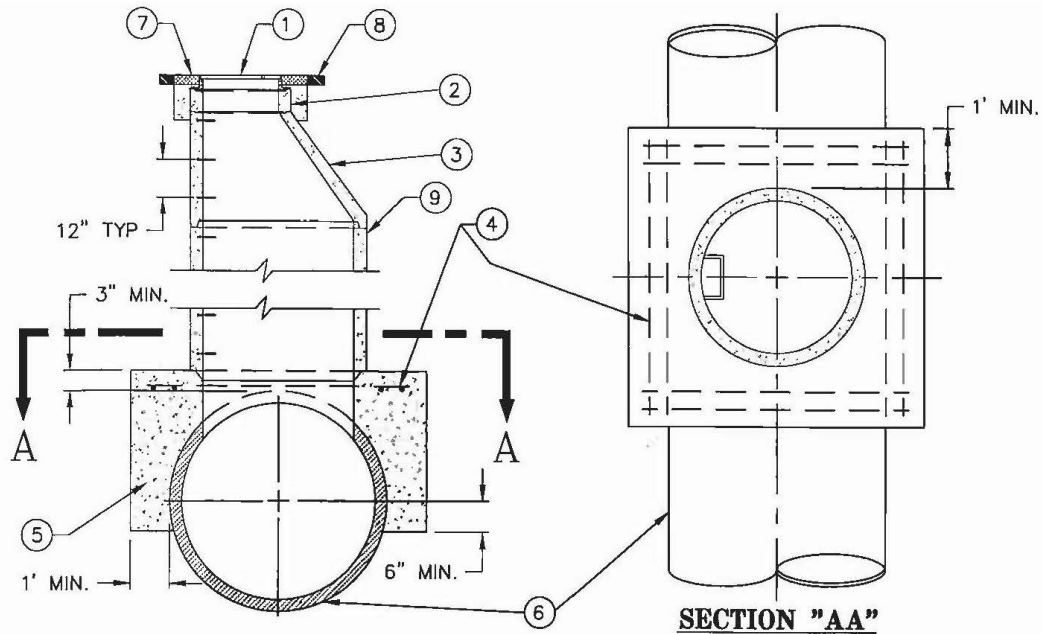
1. FRAME AND COVER, SEE STANDARD DETAIL #302.
2. CLASS "A" CONCRETE COLLAR WITH 2" A.C. COLLAR, SEE STANDARD DETAIL #302.
3. GRADE RING(S), 2-FOOT INSIDE DIAMETER; 18" MAXIMUM HEIGHT.
4. USE FLAT SLAB TOP IF DEPTH DOES NOT PERMIT USE OF TAPERED CONE. DESIGN SHALL MEET H-20 LOADING REQUIREMENTS AND BE TESTED IN ACCORDANCE WITH ASTM C-497.
5. STANDARD BARREL.
6. STREET STRUCTURAL SECTION.
7. REINFORCING BARS, TYPICAL. DESIGN BY PROJECT ENGINEER.

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| DATE: 03/2015 | | | |

FLAT SLAB MANHOLE TOP

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD | 303 |
| PLAN NO. | |



1. FRAME AND COVER, SEE DETAIL # 302
2. GRADE RINGS, 24 INCH INSIDE DIAMETER; 3 INCH MIN., 18 INCH MAX. FROM CONE TO FINISH GRADE.
3. STANDARD 48 INCH ECCENTRIC MANHOLE REDUCER CONE SHOWN WITH COPOLYMER POLYPROPYLENE STEPS.
4. TWO #5 REBAR EACH WAY.
5. CLASS "A" CONCRETE.
6. EXISTING STORM DRAIN PIPE.
7. CLASS "A" CONCRETE COLLAR WITH 2" AC.
8. STREET STRUCTURAL SECTION.
9. STANDARD FORTY EIGHT (48) INCH DIAMETER MANHOLE SECTION, CONFORMING TO ASTM C478 LATEST REVISION WITH FOUR (4) INCH MINIMUM WALL THICKNESS. COPOLYMER POLYPROPYLENE STEPS REQUIRED @ 12" O.C. FOR MANHOLES MORE THAN FIVE (5) FEET DEEP.

NOTE: SADDLE MANHOLES SHALL ONLY BE ALLOWED ON STORM DRAIN PIPE GREATER THAN 36 INCHES IN DIAMETER, PROVIDED THAT NO JUNCTION EXISTS WITH ANY OTHER STORM DRAIN CONDUIT AT THE MANHOLE.

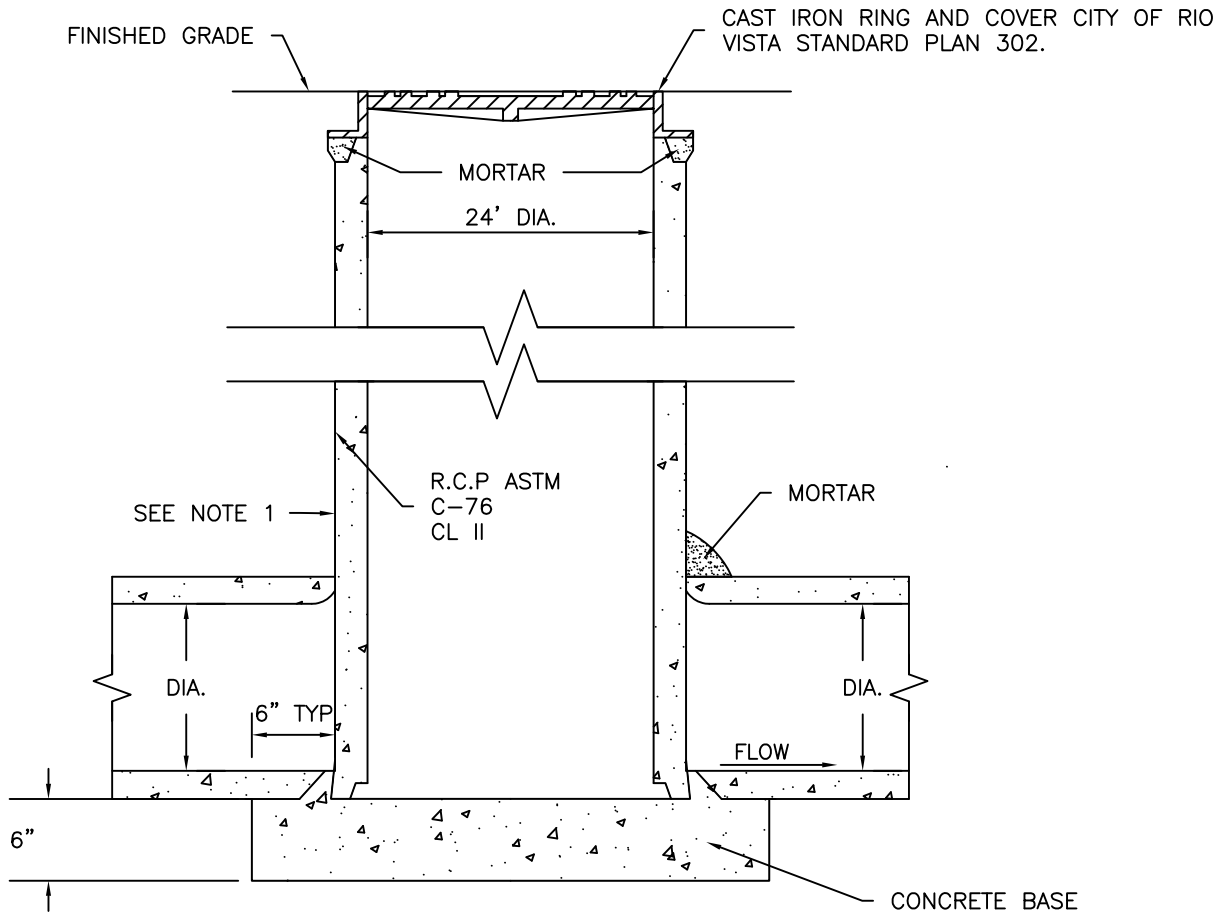
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| DATE: 03/2015 | | | |

SADDLE MANHOLE

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER DATE
RCF 25835

STANDARD PLAN NO. 304



NOTES:

1. BACKFILL AROUND RISER SHALL BE A MINIMUM OF 95% R.C. (90% IN LANDSCAPE AREAS).
2. CONCRETE:
 - A. 2500 PSI @28 DAYS
 4. 4' SLUMP MAXIMUM
 5. CLASS "B" CONCRETE PER SECTION 90 OF STANDARD SPECIFICATIONS. 1-1/2" MAX. AGG.
3. FOR DEPTH OVER 60", USE 48" MANHOLE, STANDARD PLAN 302.
4. FOR TRENCH BACKFILL REQUIREMENTS, SEE STANDARD PLAN 101.

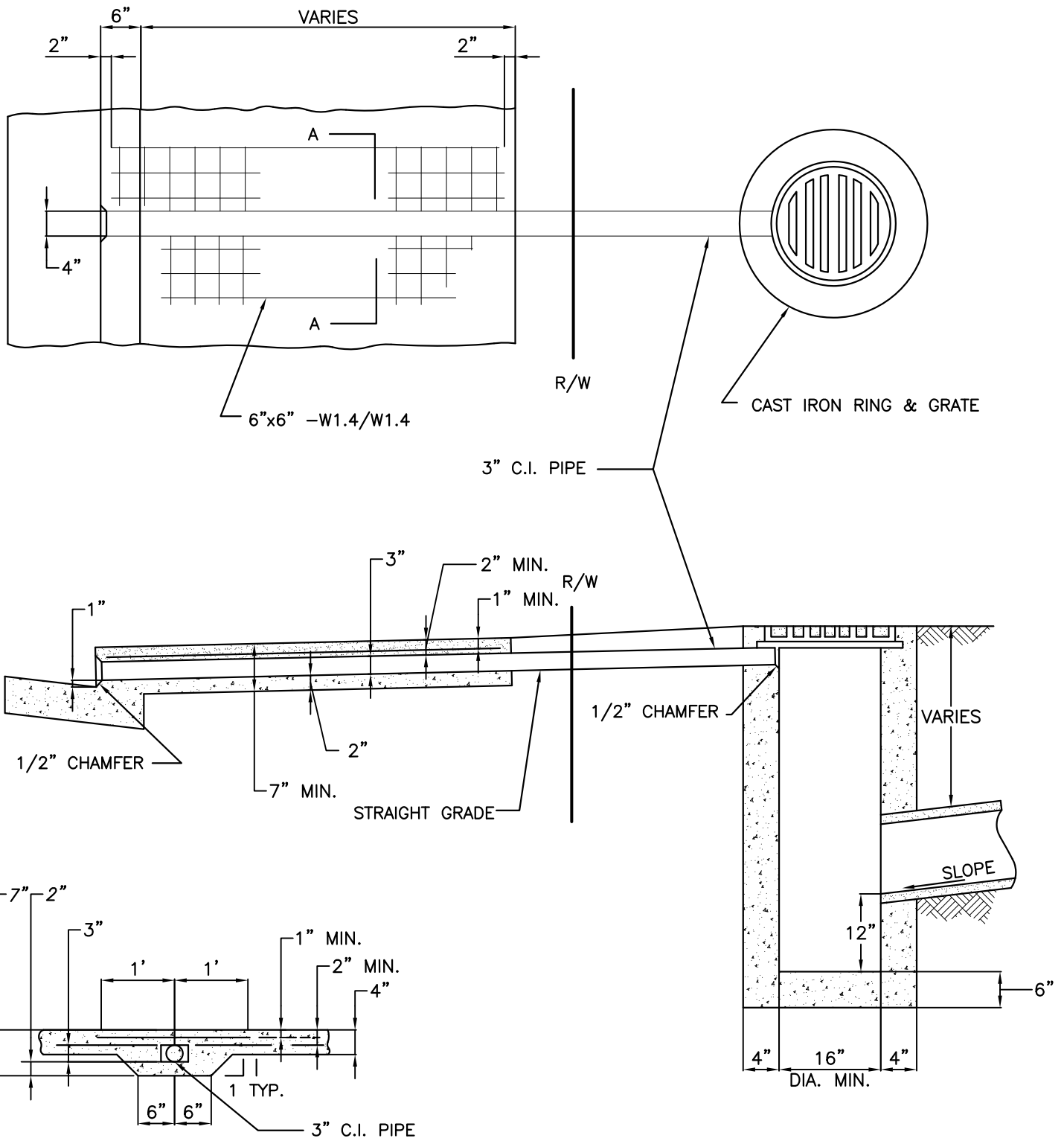
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| DATE: 03/2015 | | | |

24" MONITORING STRUCTURE

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |

STANDARD
PLAN NO. **305**



SECTION "A"

NOTES:

- 1. SEE STD. PLAN 207 & 209 FOR CURB GUTTER AND SIDEWALK DETAILS

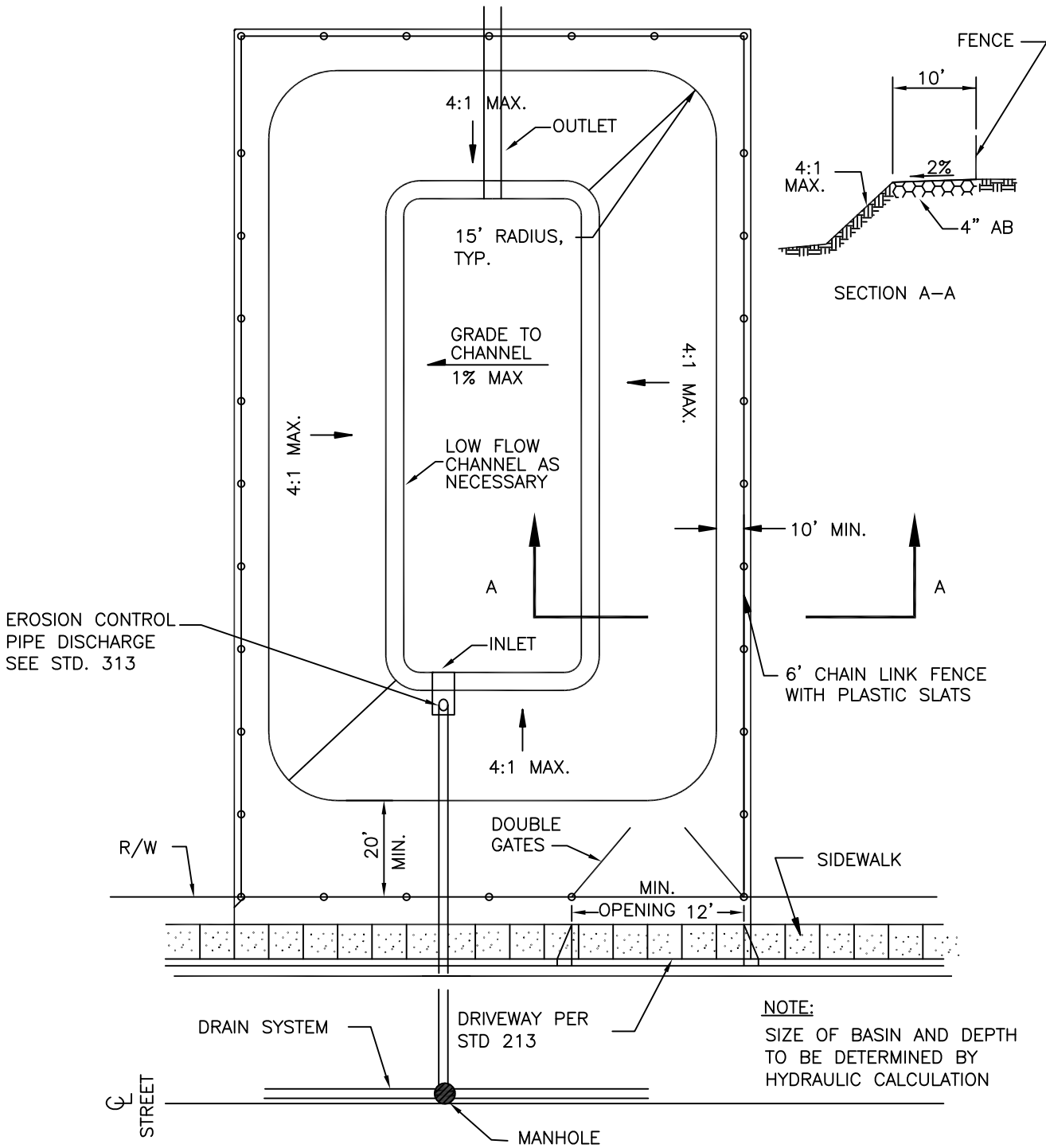
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| SCALE: NONE | | | |
| DATE: 03/2015 | | | |

**YARD DRAIN
THROUGH CURB**

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER RCF 25835 DATE

STANDARD PLAN NO. 306



- NOTES:
1. 8:1 SIDE SLOPES ARE REQUIRED FOR DETENTION BASINS THAT DOUBLE AS PARK FACILITIES
 2. GRAVITY DISCHARGE IS DESIRABLE AND THE DESIGN MUST BE SUBMITTED FOR APPROVAL
 3. PUMP STATIONS ARE ALLOWABLE ONLY WITH APPROVAL OF THE CITY ENGINEER

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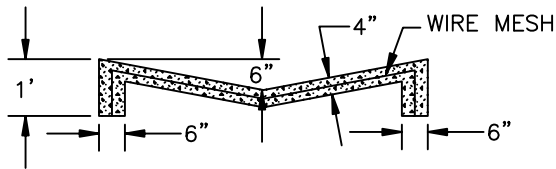
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**STANDARD COMMUNITY
 DETENTION BASIN**

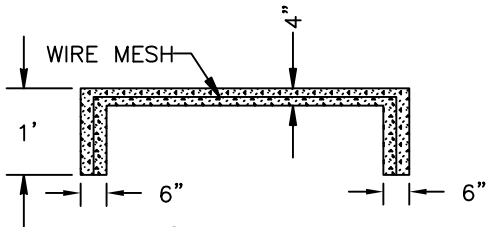
CITY OF RIO VISTA
 DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
 CITY ENGINEER DATE
 RCF 25835

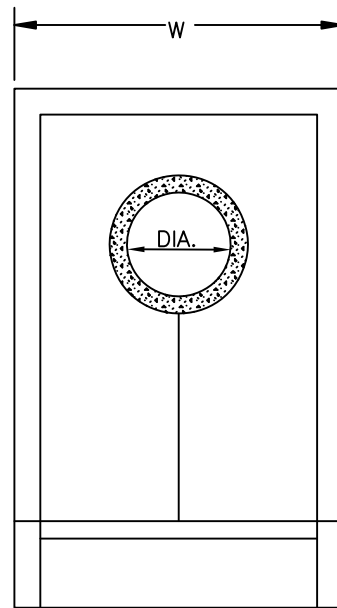
STANDARD PLAN NO. 307



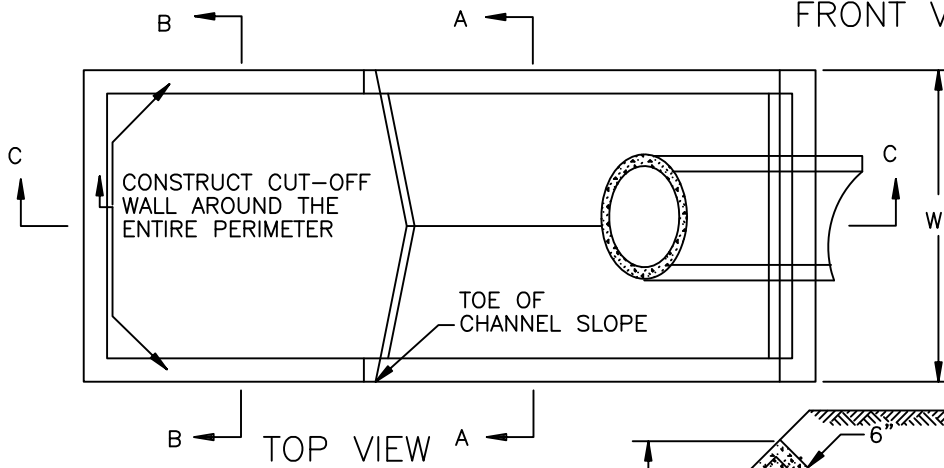
SECTION A-A



SECTION B-B

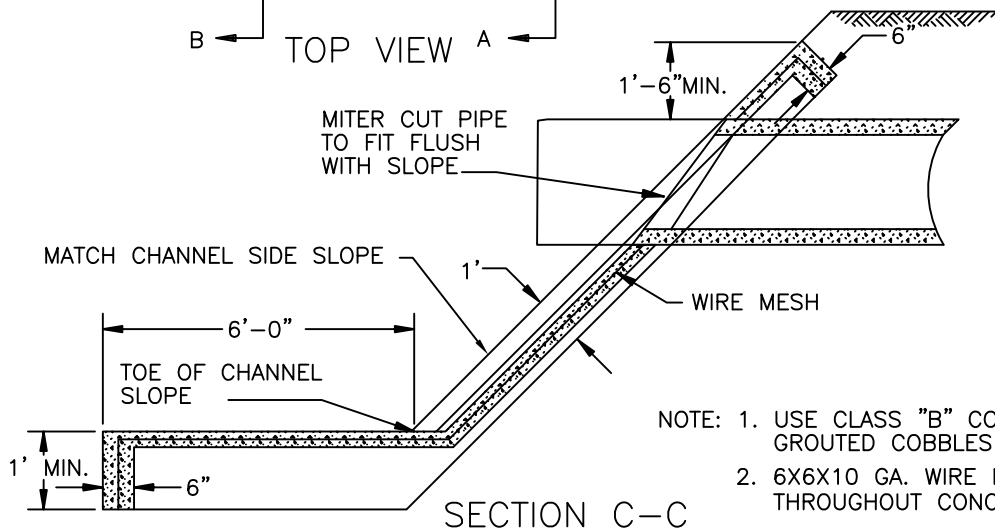


FRONT VIEW



TOP VIEW

W = 6'-0" MINIMUM
W = 2 X PIPE DIA. (3' TO 6')



SECTION C-C

- NOTE: 1. USE CLASS "B" CONCRETE OR GROUTED COBBLES AS SPECIFIED.
2. 6X6X10 GA. WIRE MESH THROUGHOUT CONCRETE

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| DATE: 03/2015 | | | |

**EROSION CONTROL
PIPE DISCHARGE**

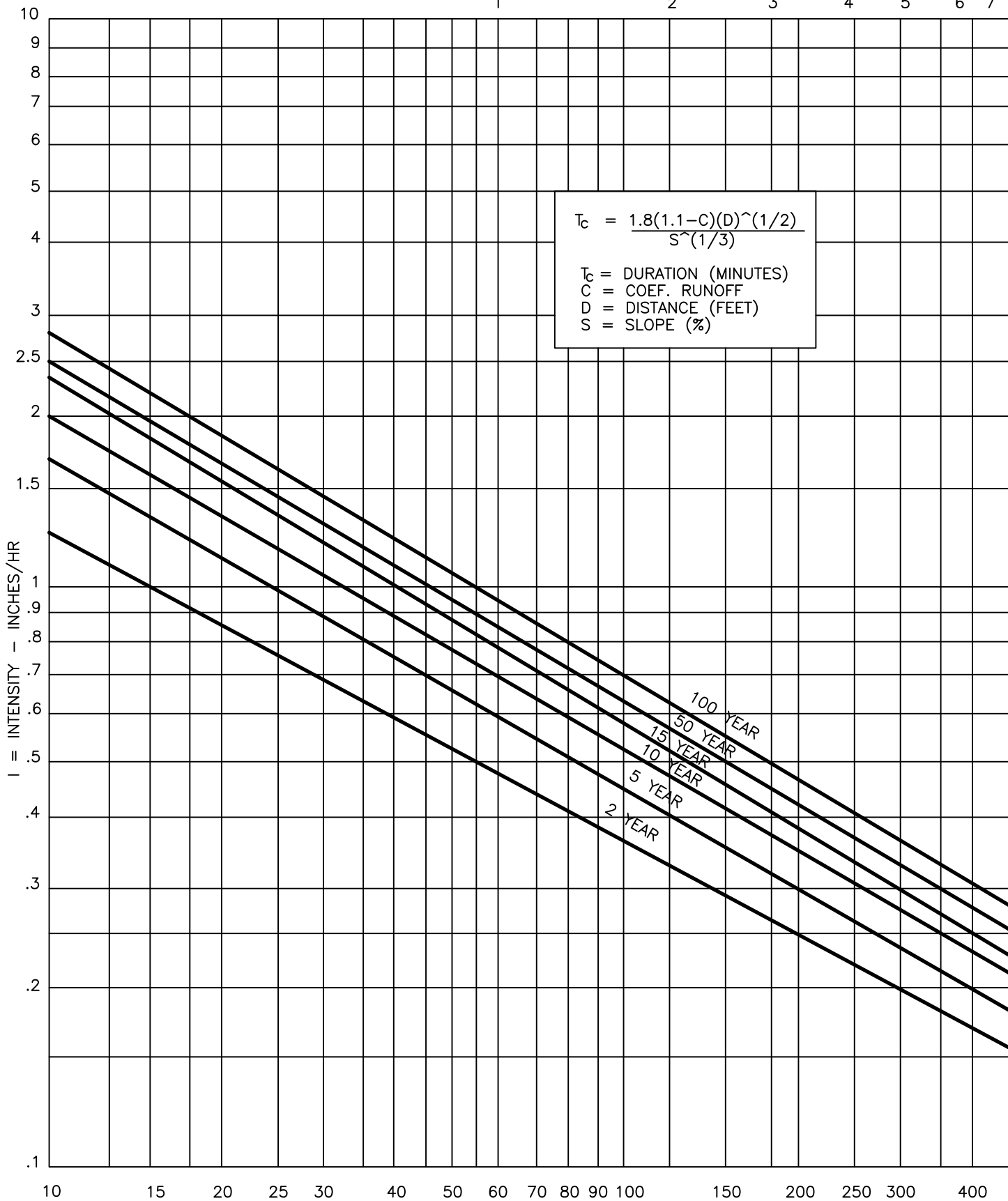
CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835 DATE

STANDARD PLAN NO. 308

DURATION - HOURS

1 2 3 4 5 6 7

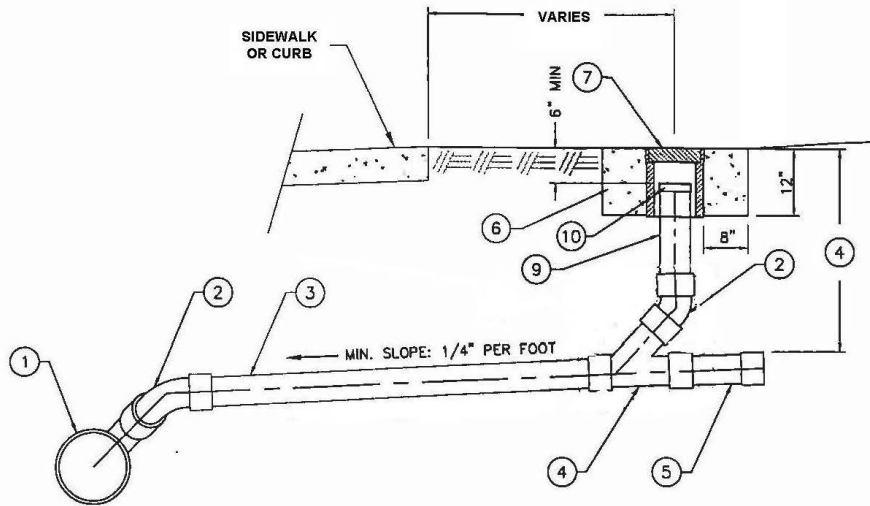


$$T_c = \frac{1.8(1.1-C)(D)^{(1/2)}}{S^{(1/3)}}$$

T_c = DURATION (MINUTES)
 C = COEF. RUNOFF
 D = DISTANCE (FEET)
 S = SLOPE (%)

MEAN ANNUAL PRECIPITATION 17 INCHES T_c = DURATION - MINUTES

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| NO. | REVISION DATE | BY | RAINFALL - INTENSITY DURATION - FREQUENCY | APPROVED BY: | DECEMBER |
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1. SEWER MAIN WITH SEWER SERVICE WYE AT 30-45 DEGREES.
2. WYE BRANCH WITH 1/8 BENDS OR 4" ABS LONGSWEEP COMBO.
3. SEWER SERVICE SHALL BE CONSTRUCTED WITH A STRAIGHT GRADE AND ALIGNMENT FROM THE MAIN TO THE RIGHT-OF-WAY UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. SEWER SERVICES SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE (CLASS 52) OR POLYVINYL CHLORIDE PIPE (SDR 26).
4. SEWER SERVICE SHALL HAVE A MINIMUM OF 36" OF COVER FROM FINISHED GRADE AT RIGHT-OF-WAY. SEWER SERVICES THAT HAVE LESS THAN 36" OF COVER, SHALL REQUIRE SPECIAL APPROVAL BY THE CITY ENGINEER.
5. SERVICE TO BUILDING. IF NO BUILDING, STUB LATERAL 12" BEYOND RIGHT-OF-WAY WITH WATER TIGHT CAP.
6. CLASS "A" CONCRETE EXCEPT IN RESIDENTIAL PLANTER OR LAWN AREAS.
7. CLEANOUT BOX SHALL BE A CHRISTY G5 BOX WITH CAST IRON LID WHEN SUBJECT TO TRAFFIC LOADS. USE CRISTY F08 BOX IN RESIDENTIAL LAWN AND PLANTER AREAS. ALL LIDS SHALL READ "SEWER C.O."
8. CURB, GUTTER, AND SIDEWALK WITH A 2" X 2" LETTER "S" STAMPED, CHISELED, ETC. ON TOP OF CURB LOCATED DIRECTLY ABOVE WHERE SEWER SERVICE CROSSES THE GUTTER FLOWLINE. METHOD TO BE APPROVED BY THE CITY ENGINEER.
9. RISER SAME MATERIAL AS SEWER SERVICE.
10. RUBBER END CAP W/STAINLESS STEEL SHEAR BAND.

NOTES:

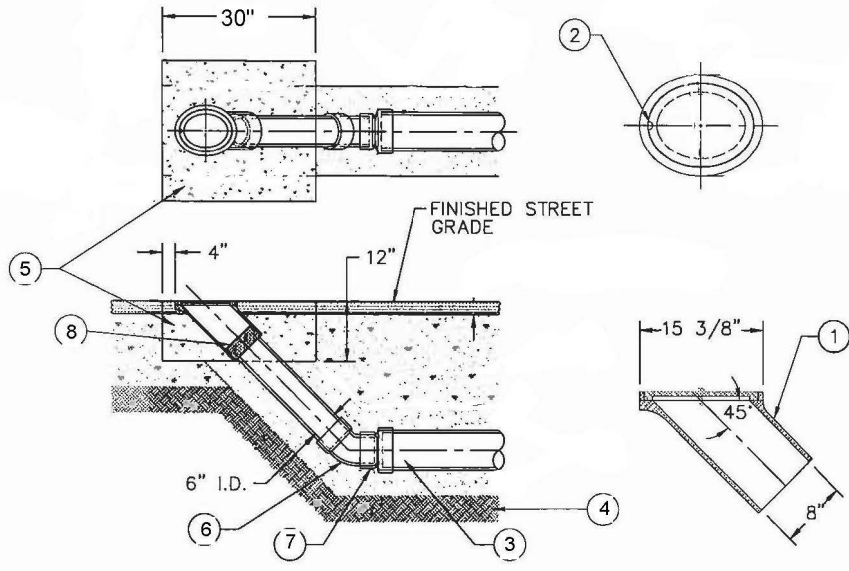
- A. SEWER SERVICES SHALL BE RUN TO MANHOLES WHENEVER POSSIBLE.
- B. SEWER CLEANOUTS SHALL LIE WITHIN CITY R/W OR A DEDICATED PUBLIC EASEMENT IN ALL CASES.

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RESIDENTIAL SEWER SERVICE WITH CLEANOUT

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
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| STANDARD | 401 |
| PLAN NO. | |



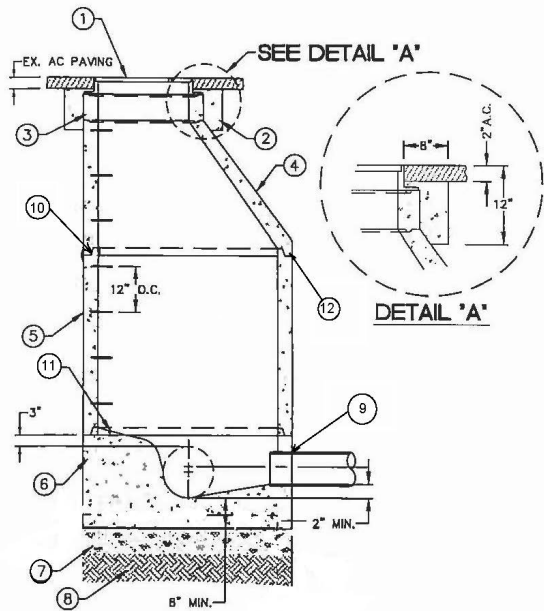
1. CAST IRON FLUSHING INLET, FRAME AND COVER, SOUTHBAY FOUNDRY 1247 OR APPROVED EQUAL W/C.O.
2. 1/2" BY 1" PICK HOLE.
3. PROPOSED SEWER MAIN.
4. UNDISTURBED SOIL.
5. CLASS "A" CONCRETE WITH 2" A.C.
6. 1/8 BEND.
7. REDUCE (IF REQUIRED)
8. RUBBER END CAP WITH STAINLESS STEEL SHEAR BAND.

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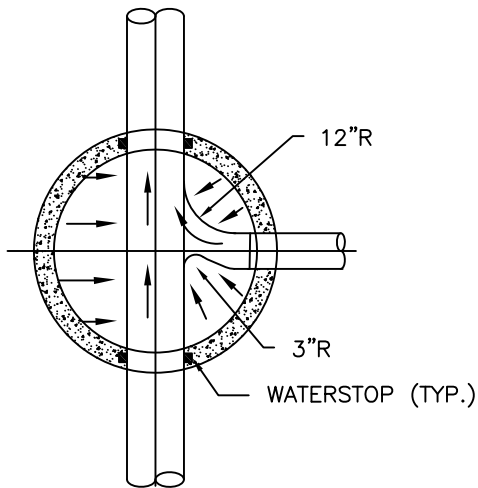
SEWER FLUSHING INLET

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |
| STANDARD | 402 |
| PLAN NO. | |



1. FRAME AND COVER, D&L SUPPLY 1024 MARKED "SANITARY SEWER" WITH PICK HOLE.
2. CLASS "A" CONCRETE COLLAR WITH 2" AC.
3. STANDARD TWENTY FOUR (24) INCH DIAMETER MANHOLE GRADE RINGS THREE (3) INCH MINIMUM, EIGHTEEN (18) INCH MAXIMUM NECK HEIGHT FROM CONE TO FINISH GRADE.
4. STANDARD FORTY EIGHT (48) INCH ECCENTRIC MANHOLE REDUCER CONE. COPOLYMER POLYPROPYLENE STEPS REQUIRED FOR MANHOLES DEEPER THAN FIVE (5) FEET.
5. STANDARD FORTY EIGHT (48) INCH DIAMETER MANHOLE BARREL SECTION, CONFORMING TO ASTM C478—LATEST REVISION WITH FOUR (4) INCH MINIMUM WALL THICKNESS. COPOLYMER POLYPROPYLENE STEPS REQUIRED FOR MANHOLES MORE THAN FIVE (5) FEET DEEP.
6. CLASS "A" CAST-IN-PLACE OR PRECAST CONCRETE BASE.
7. SIX (6) INCHES MINIMUM, 3/4 INCH CRUSHED ROCK PER ASTM D448 #67.
8. UNDISTURBED SOIL.
9. CONNECTIONS TO MANHOLE SHALL BE MADE BY UTILIZING MANHOLE ADAPTERS OR ELASTOMERIC SEAL RINGS EMBEDDED IN THE CONCRETE.
10. BARREL SECTION JOINTS SHALL BE SEALED BY PRE-FORMED PLASTIC SEALING GASKETS THAT CONFORM TO FEDERAL SPECIFICATION SS-S-00210.
11. FOUR (4) INCHES PER FOOT MINIMUM SLOPE.
12. ALL JOINTS SHALL BE MORTARED OUTSIDE OF MANHOLE



NOTES:

- A. COUNTRY OF ORGIN SHALL BE CLEARLY AND PERMANENTLY SHOWN ON TOP SURFACE OF THE FRAME AND COVER IN ACCORDANCE WITH THE TRADE AND TARIFF ACT OF 1984
- B. DATE OF MANUFACTURE SHALL BE CLEARLY AND PERMANENTLY INDICATED ON THE COVER AND THE TOP OF THE FRAME.
- C. SEATING SURFACE SHALL BE CLOSELY MACHINED TO NOMINAL DIMENSIONS WITH TOLERANCES NOT TO EXCEED +/- 1/64 INCH.
- D. THE WIEGHT OF THE FRAME SHALL BE 140LBS., +/- 10LBS.
- E. THE WIEGHT OF THE COVER SHALL BE 130LBS., +/- 5LBS.
- F. VACUUM TEST REQUIRED.
- G. SANITARY "SEWER" SHALL BE STAMPED CLEARLY AND PERMANENTLY ON THE COVER.

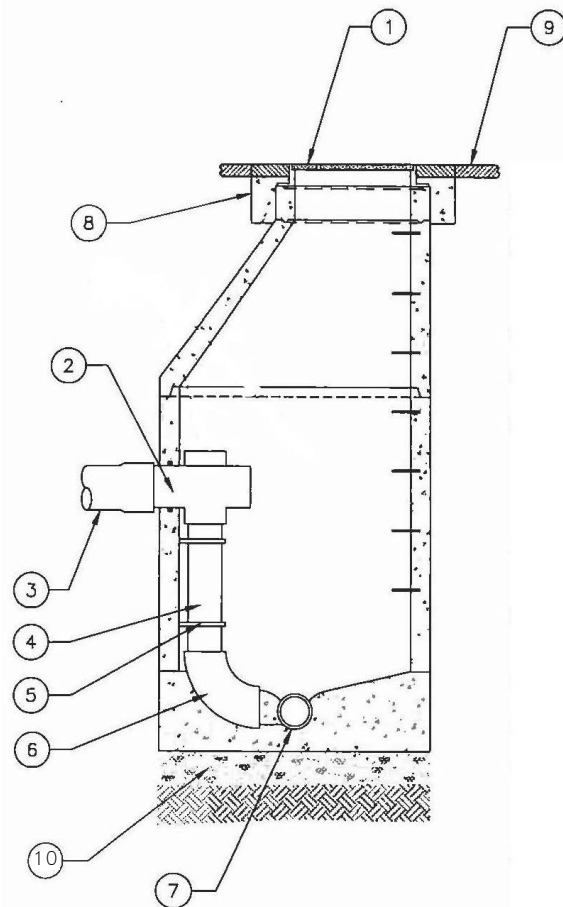
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| DATE: 03/2015 | | | |

SEWER MANHOLE

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: CECIL DILLON
CITY ENGINEER
RCE 25835
DECEMBER 2015
DATE

STANDARD PLAN NO. 403



1. FRAME AND COVER SEE DETAIL 403
2. SCHEDULE 40, PVC CROSS SOLVENT WELD (TYPICAL ALL DROP FITTINGS). CUT OFF INBOARD LET OF TEE IF NECESSARY.
3. ADAPT TO MAIN.
4. DROP PIPE.
5. 3/32" BY 2" TYPE 316 STAINLESS STEEL STRAP ANCHORED TO MANHOLE WALL WITH 5/8", STAINLESS STEEL ANCHOR BOLTS. 3' MAXIMUM SPACING 2 STRAPS MIN. PER DROP.
6. PVC ELBOW. CHIP OUT CHANNEL AS SHOWN. FILL VOIDS WITH EPOXY. XYPEX OR APPROVED EQUAL.
7. SEWER MAIN (EXISTING OR TO BE CONSTRUCTED)
8. CLASS "A" CONCRETE COLLAR WITH 2" A.C.
9. STREET STRUCTURAL SECTION.
10. MINIMUM 6" OF 3/4" CRUSHED ROCK PER ASTM D448 #67 COMPACTED TO 95% RELATIVE COMPACTION.

NOTE:

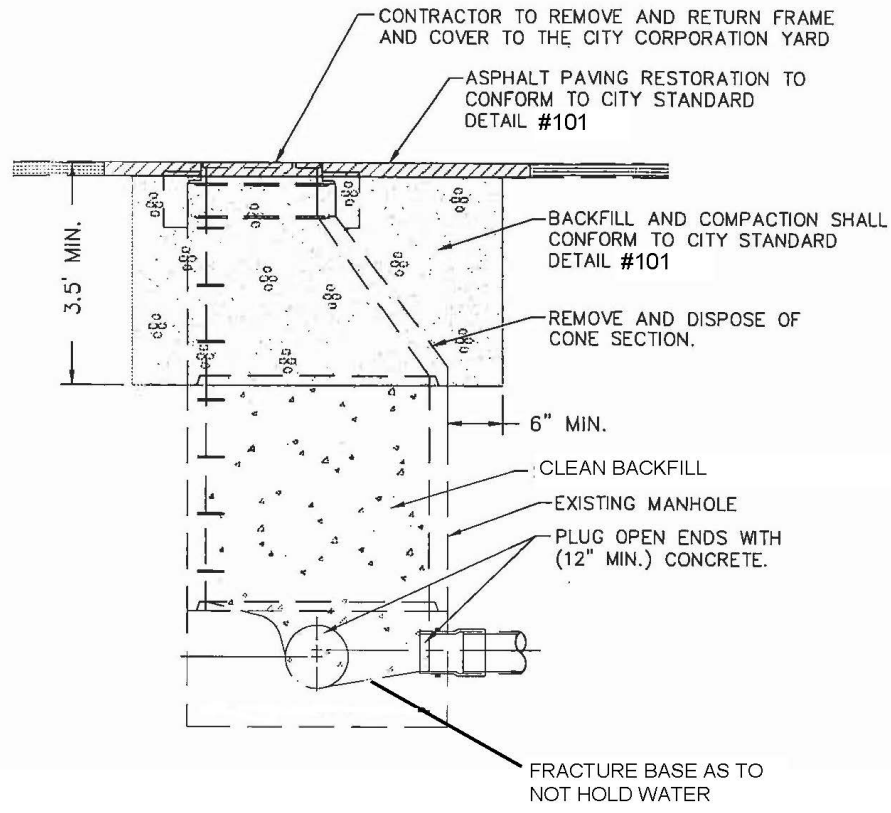
A. INSIDE DROP CONNECTIONS SHALL BE ALLOWED ONLY UPON PRIOR APPROVAL OF THE CITY ENGINEER.

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SEWER MANHOLE WITH INSIDE DROP CONNECTION

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| CECIL DILLON | 2015 |
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| RCE 25835 | |
| STANDARD | 404 |
| PLAN NO. | |



NOTE:

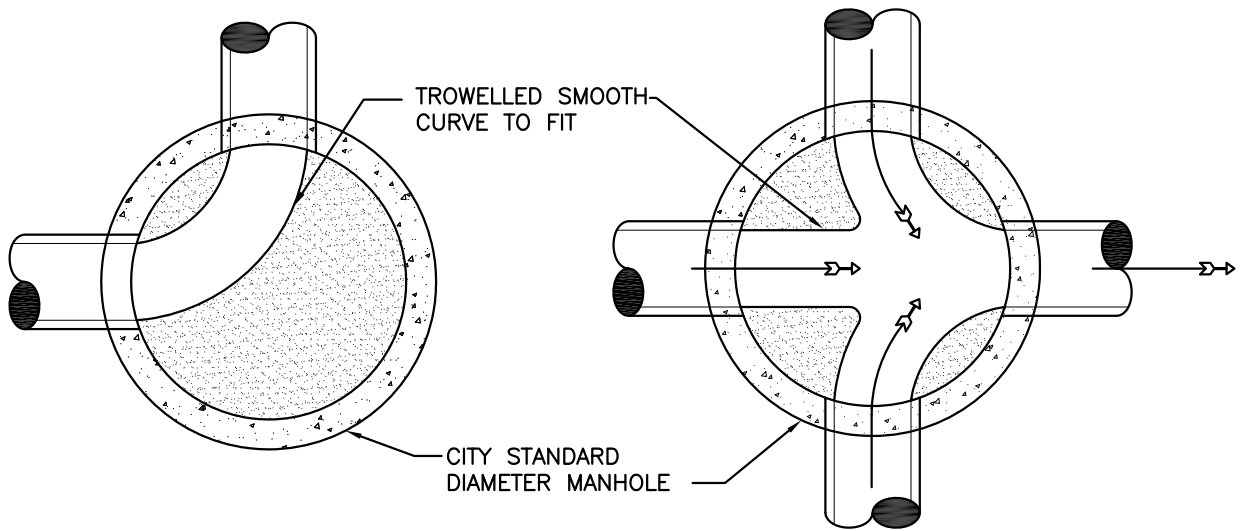
A. REMOVE CONE AND BARREL SECTION ON MANHOLES SHALLOWER THAN 5'.

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**SEWER MANHOLE
ABANDONMENT**

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| STANDARD | 405 |
| PLAN NO. | |



**TYPICAL M.H. AT
PIPELINE ANGLE**

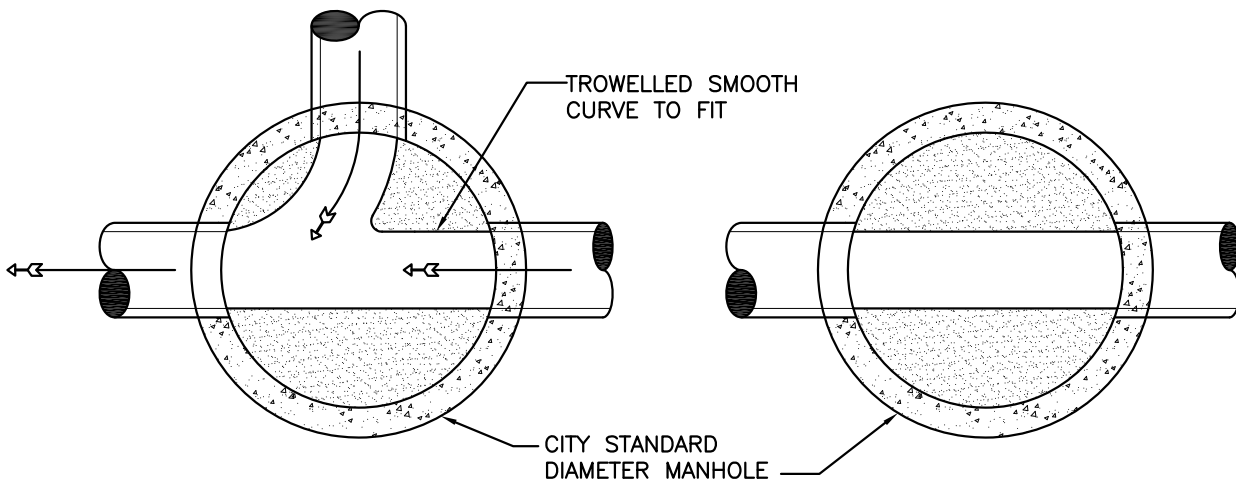
**TYPICAL M.H. WITH
2 BRANCHES**

NOTE:

PRECAST BASES ARE
ACCEPTABLE.

LEGEND

 INDICATES SHELF



**TYPICAL M.H.
1 BRANCH**

**TYPICAL STRAIGHT
THROUGH M.H.**

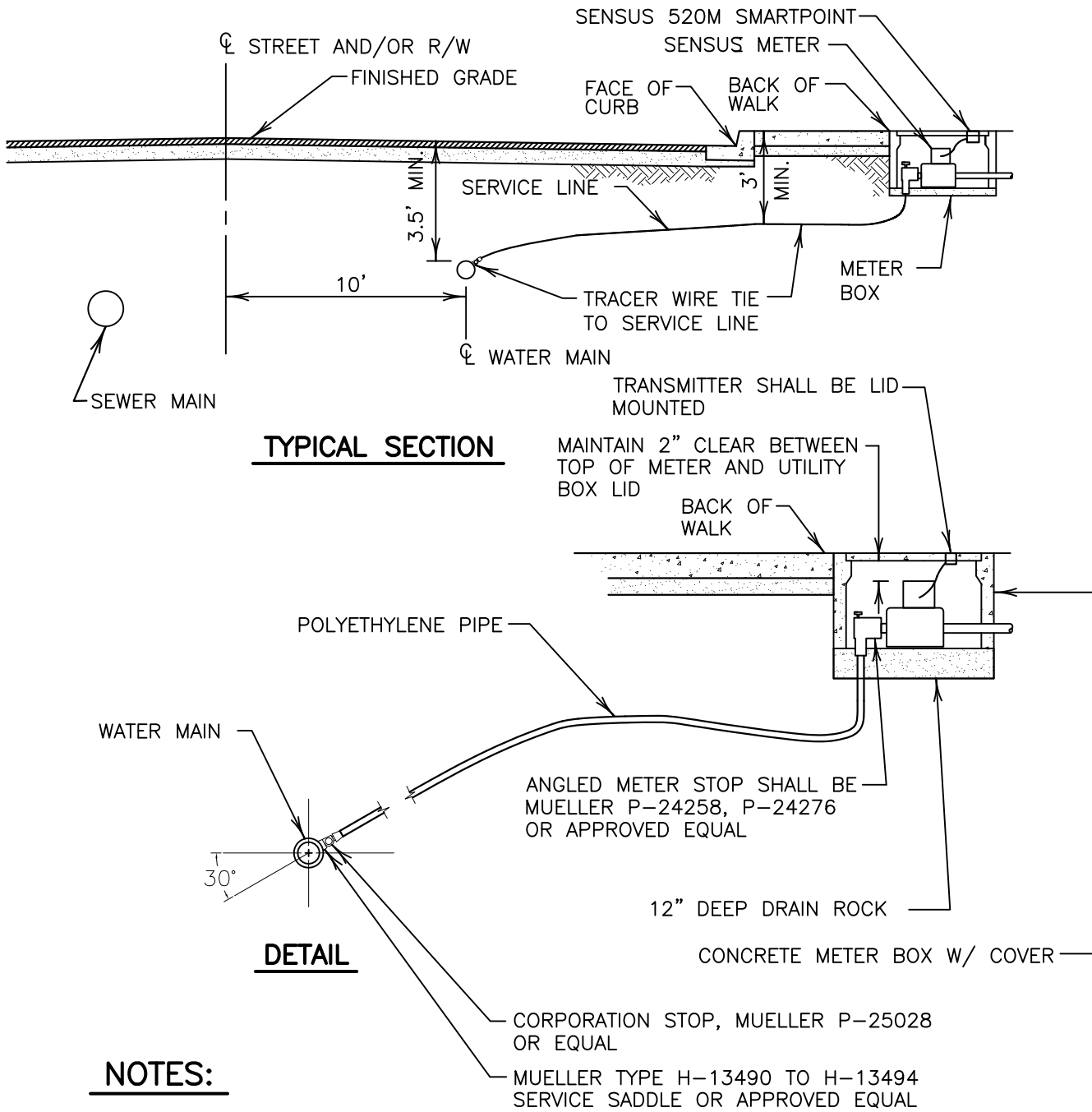
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**STANDARD MANHOLE
CHANNELIZATION**

**CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS**

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER DATE
RCF 25835

**STANDARD
PLAN NO. 406**



TYPICAL SECTION

DETAIL

NOTES:

1. SERVICE TAP SHALL BE A MINIMUM OF 18" FROM ANY OTHER TAP, FLANGE OR JOINT ON THE WATER MAIN.
2. CLEARANCE BETWEEN WATER AND SEWER SERVICE LINES SHALL BE 12" MIN. VERTICAL AND 18" HORIZONTAL.
3. STAMP "W" IN 2-1/2" LETTERS ON TOP OF CURB AT SERVICE LOCATION.
4. LARGER THAN 2" SERVICE SHALL BE APPROVED BY THE CITY ENGINEER.
5. WATER METERS:
 SENSUS iPERL - 3/4" AND 1"
 SENSUS OMNI C2 - 1 1/2" AND LARGER
 METER BOXES:
 CHRISTY B16 WITH N16RP LID - 3/4" AND 1"
 CHRISTY N36 WITH N36RP LID - 1 1/2", 2", AND 3"
 CHRISTY B48 WITH TWO PIECE LID - 4"
6. COMMERCIAL SERVICES REQUIRE BACKFLOW PROTECTION

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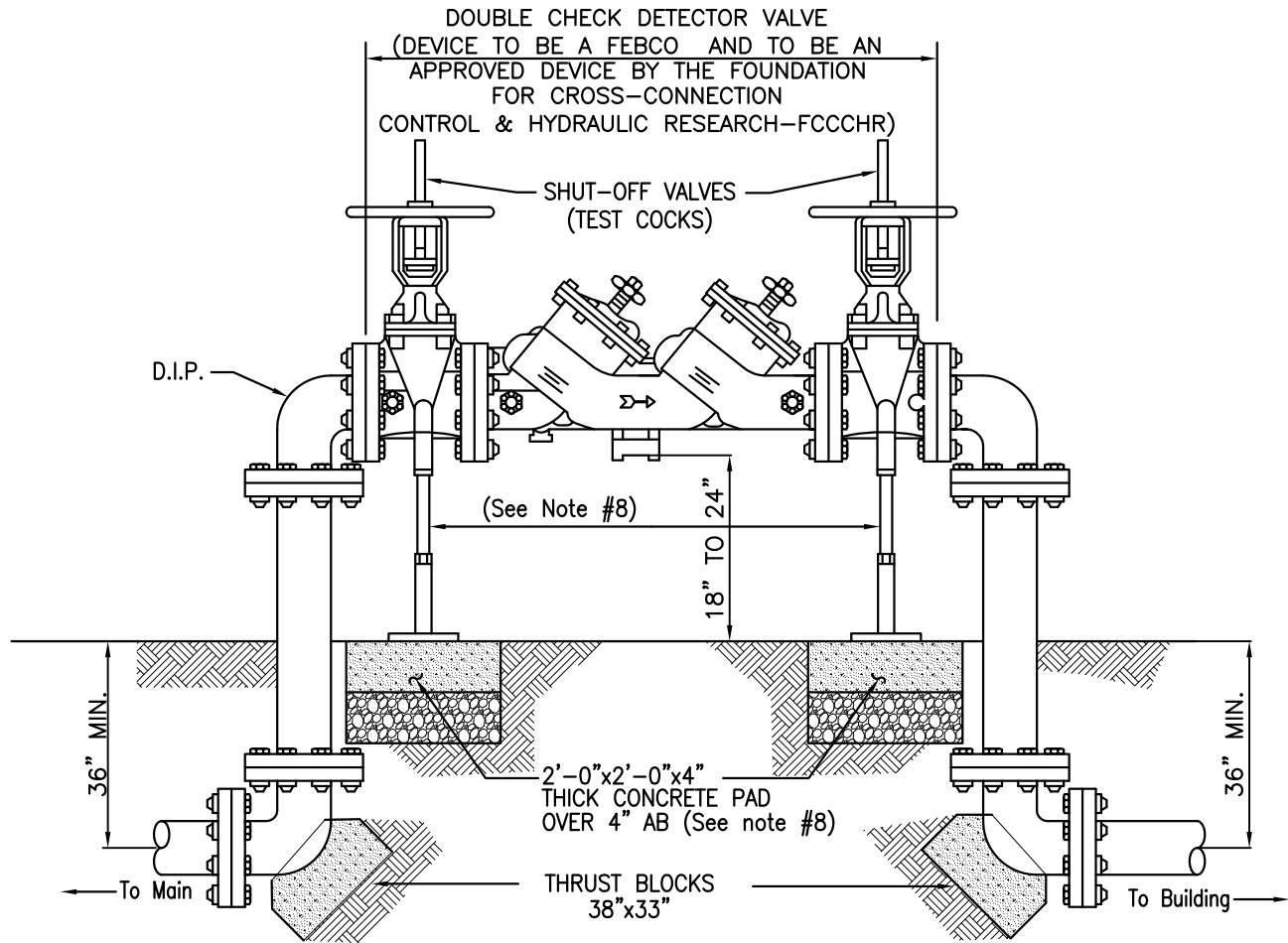
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WATER SERVICE 1" TO 2"

CITY OF RIO VISTA
 DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
 CITY ENGINEER
 RCE 25835 DATE

STANDARD PLAN NO. 501



NOTES:

1. LOCATION OF DEVICE SHALL BE APPROVED PRIOR TO INSTALLATION.
2. RESILIENT SEAT GATE VALVES AND TEST COCKS ARE REQUIRED.
3. WATER SUPPLY-NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN METER AND DEVICE.
4. PROTECTION FROM FREEZE DAMAGE IS RECOMMENDED IN EXPOSED AREAS.
5. DEVICE MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE.
6. BYPASS METER TO READ IN GALLONS.
7. PROVIDE COPIES OF BACKFLOW TESTS BY APPROVED TESTER TO THE CITY OF RIO VISTA PUBLIC WORKS DEPARTMENT.
8. D.C.D.A. BRACES ARE OPTIONAL FOR 6" AND SMALLER DEVICES UPON THE REQUIREMENT OF THE CITY ENGINEER.

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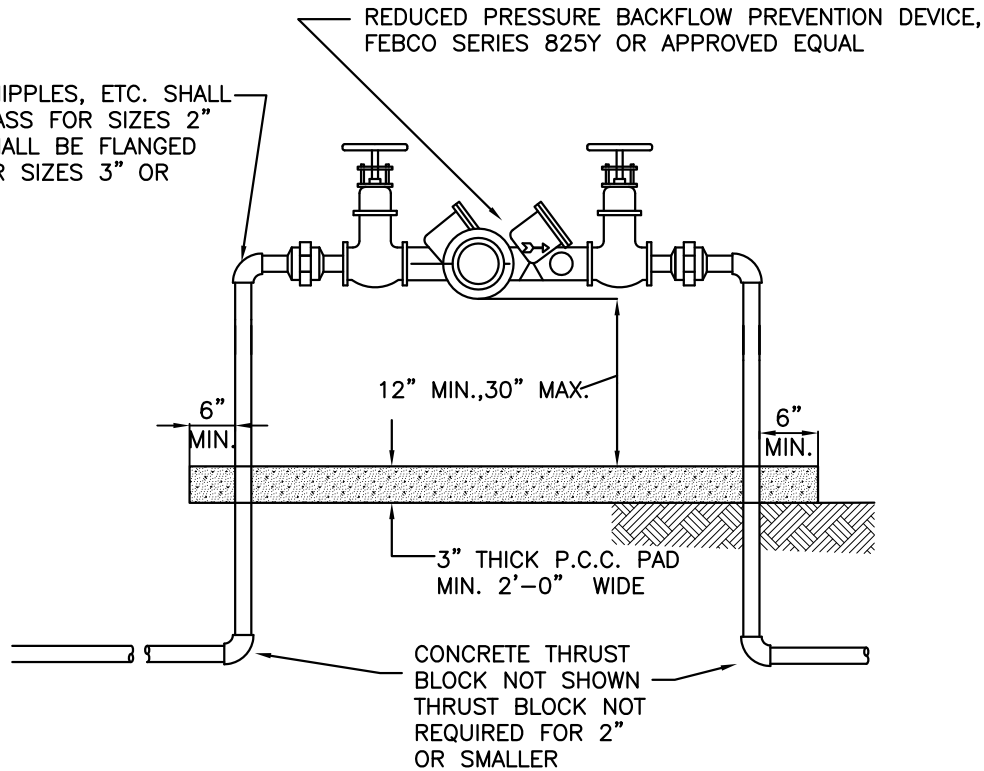
DOUBLE CHECK DETECTOR ASSEMBLY

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: CECIL DILLON
CITY ENGINEER
RCF 25835
DECEMBER 2015
DATE

STANDARD PLAN NO. 502

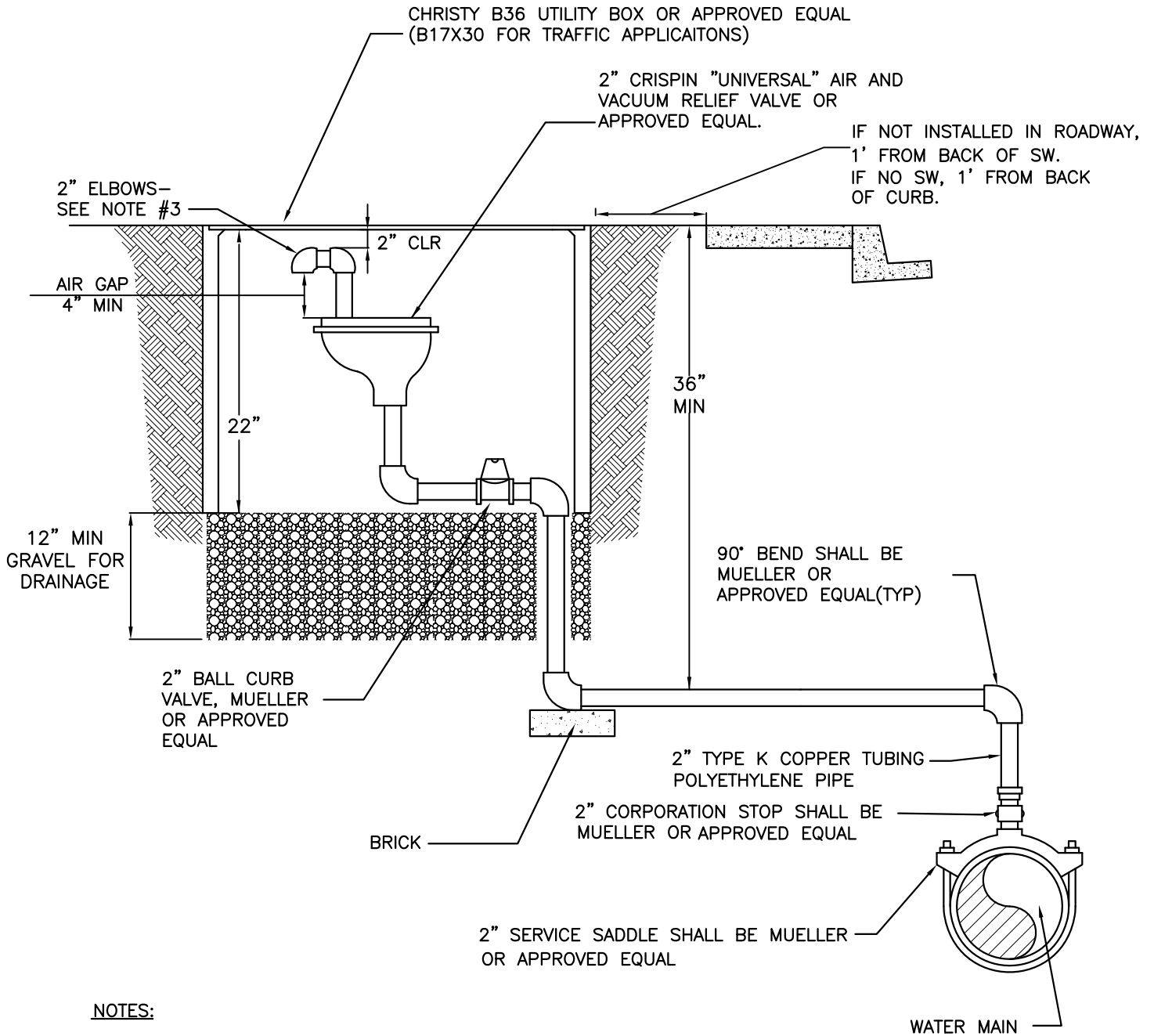
PIPING, VALVES, NIPPLES, ETC. SHALL BE THREADED BRASS FOR SIZES 2" OR LESS, AND SHALL BE FLANGED DUCTILE IRON FOR SIZES 3" OR GREATER.



NOTES:

1. REDUCED-PRESSURE TYPE BACKFLOW PREVENTION DEVICES SHALL BE REQUIRED FOR ANY USE WHERE TOXIC MATERIALS ARE USED OR WHERE POSITIVE PROTECTION FOR THE PUBLIC WATER SUPPLY IS REQUIRED. TYPICAL APPLICATIONS INCLUDE; IRRIGATION SERVICES, COMMERCIAL SERVICES, INDUSTRIAL SERVICES, HOSPITALS, LABORATORIES, MORTUARIES, OR AS DETERMINED BY THE CITY. (TITLE 17 CALIF. ADMINISTRATION CODE)
2. CONNECTIONS BETWEEN THE CITY MAIN AND THE RP DEVICE SHALL BE AT THE DISCRETION OF THE CITY ENGINEER.
3. BACKFLOW PREVENTION DEVICES SHALL BE INSTALLED ADJACENT TO AND ON THE PROPERTY SIDE OF SIDEWALK WHERE APPLICABLE. THE ASSEMBLY SHALL BE INSTALLED AS CLOSE TO THE WATER METER LOCATION AS PRACTICAL.
4. DEVICE TO BE SAME SIZE OR LARGER THAN SERVICE METER.
5. LANDSCAPING OR OTHER SCREENING AROUND THE BACKFLOW DEVICE SHALL BE AS SHOWN ON APPROVED PLANS.
6. PROTECTION FROM FREEZE DAMAGE IS RECOMMENDED IN EXPOSED AREAS.

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| NO. | REVISION DATE | BY | REDUCED PRESSURE BACKFLOW PREVENTER | APPROVED BY: | DECEMBER |
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| DATE: 03/2015 | | | | | |



NOTES:

1. THE EXACT LOCATIONS OF THE AIR VALVE ASSEMBLIES WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. BEFORE INSTALLING COMPRESSION FITTINGS, REMOVE BURR FROM INSIDE AND RE-ROUND PIPE.
3. ATTACH SMALL MESH SCREEN WITH A STAINLESS STEEL HOSE CLAMP OVER OPENING.
4. SERVICE PIPE SHALL MAINTAIN CONTINUOUS UPWARD SLOPE FROM MAIN TO THE VALVE. POLYETHYLENE PIPE REQUIRES STIFFENERS AT VALVES.

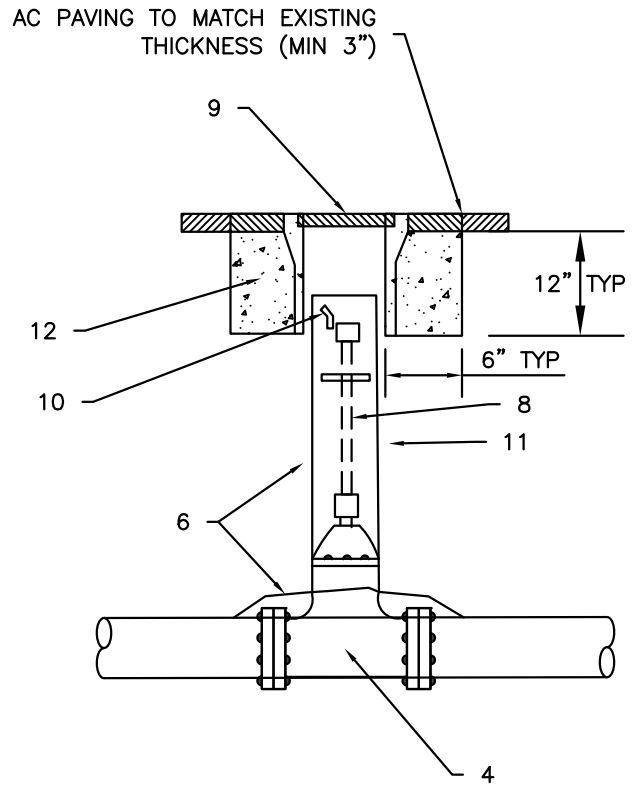
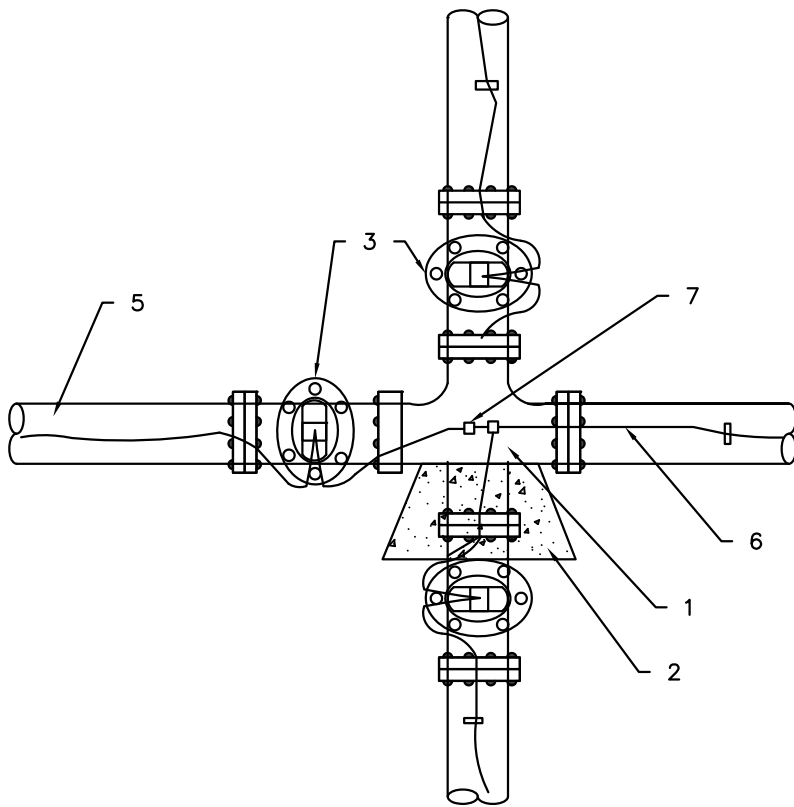
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| DATE: 03/2015 | | | |

AIR VALVE ASSEMBLY

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835 DATE

STANDARD PLAN NO. 504

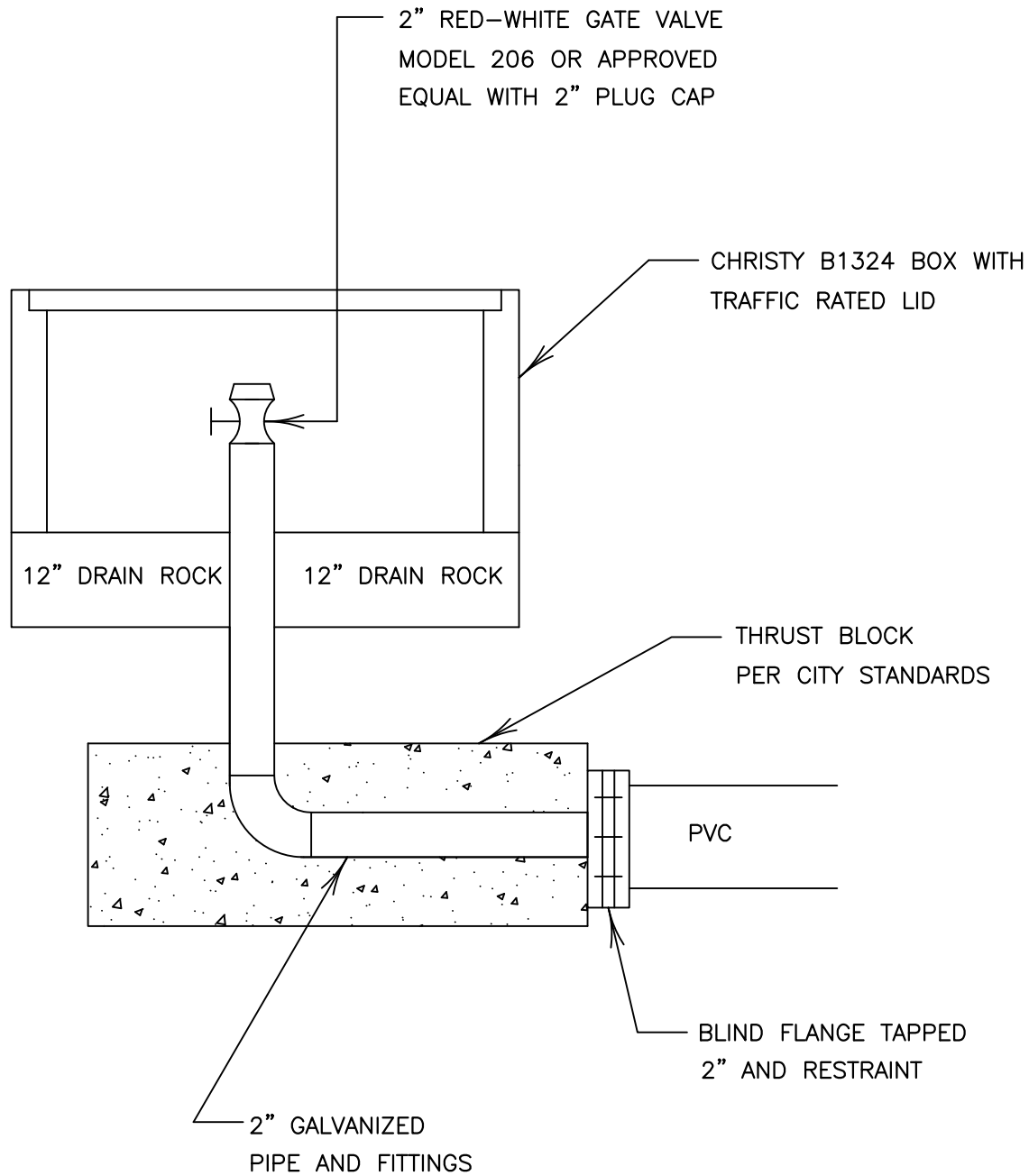


1. FLANGED TEE (OR CROSS). POLYWRAP.
2. THRUST BLOCK IF APPLICABLE.
3. FLANGED X MECHANICAL JOINT RESILIENT WEDGE GATE VALVES POLYWRAP.
4. VALVE – MUELLER A2360 OR APPROVED EQUAL.
5. PROPOSED WATER MAIN.
6. TRACER WIRE SHALL BE REQUIRED ON ALL NONFERROUS MAINS. TRACER WIRE SHALL BE SOLID COPPER WIRE WITH U.S.E. RATED INSULATION, COLOR YELLOW AND MINIMUM SIZE OF AWG #10 SECURE WIRE TO TOP OF PIPE WITH 10 MIL WRAPPING TAPE AT LEAST EVERY 10' PER DIVISION IV SECTION
7. TRACER WIRES SHALL BE INTERCONNECTED AT PIPE TEES AND CROSSES. SPLICES SHALL BE "KURNEY" (SPLIT BOLT) OR "KUPLETAP". INSTALLATION TAPE SHALL BE VINYL. ELECTRICAL WITH TWO COATS OF "SCOTCH KOTE."
8. PROVIDE EXTENSION IF OPERATING NUT EXCEEDS MAXIMUM OF 4' FROM FINISH GRADE. EXTENSION SHALL INCLUDE A STEADYING PLATE.
9. CHRISTY TYPE G-5 TRAFFIC BOX. LID SHALL READ "WATER".
10. PROVIDE NOTCH IN RISER FOR TRACER WIRE.
11. 8" PVC RISER TO BE PLUMB WITHIN 1".
12. CONCRETE COLLAR WITH 2" AC.

NOTES:

- A. ALL NUTS, BOLTS, AND WAHSERS ON FITTINGS SHALL BE STAINLESS STEEL TYPE 304.
- B. CONCRETE SHALL BE CLASS "A".

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| NO. | REVISION | DATE | BY | TYPICAL VALVE AND WATER MAIN INSTALLATION 6" THRU 12" | APPROVED BY: | DECEMBER |
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| DRAWN BY: BH, NR | | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | DATE |
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| DATE: 03/2015 | | | | PLAN NO. | | |

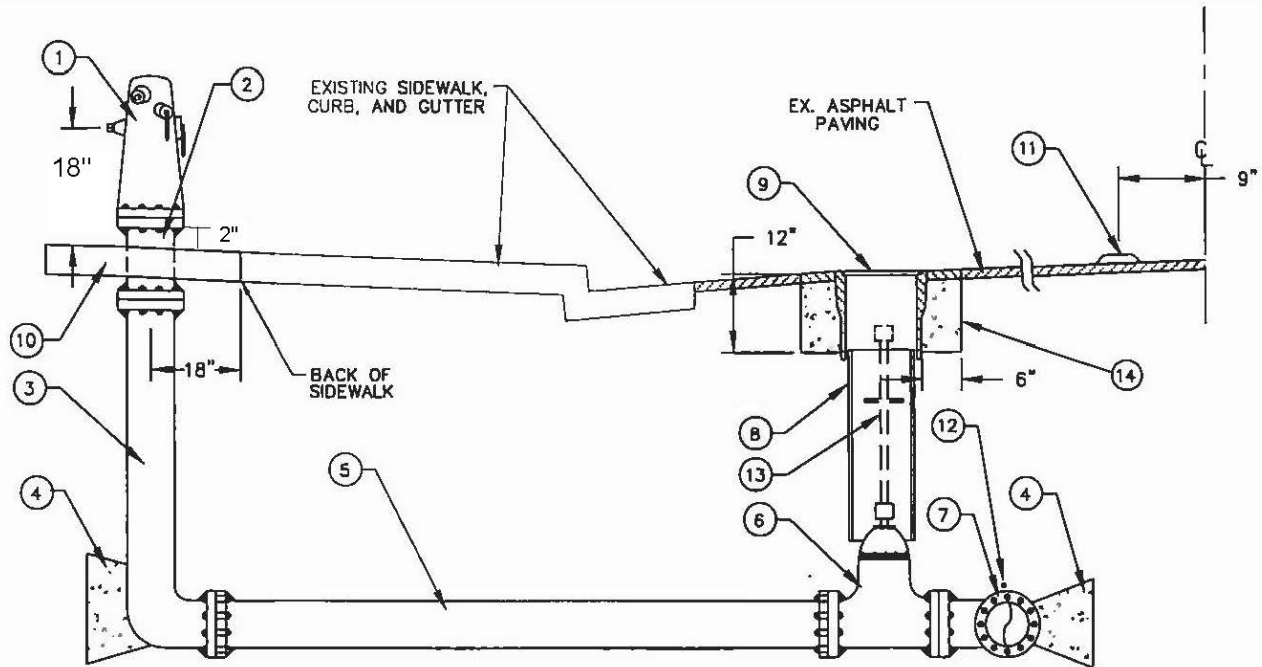


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2" BLOWOFF

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

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| APPROVED BY: | DECEMBER |
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| STANDARD | 506 |
| PLAN NO. | |



1. FIRE HYDRANT 4 1/2 INCH OUTLET SHALL FACE THE STREET. BOLTS ATTACHING FIRE HYDRANT TO BREAK-OFF TYPE, HEX HEAD, WITH THE HEAD ON TOP OF THE SPOOL FLANGE. HYDRANT SHALL BE LOCATED AT PROPERTY LINES, OUTSIDE OF CURB RETURN AREAS, AND AT LEAST 3 FEET FROM DRIVEWAYS WHERE POSSIBLE.
2. 12" BREAK-OFF SPOOL. BREAK-OFF GROOVE TO BE ABOVE CONCRETE. POLYWRAP SPOOL BELOW CONCRETE PAD.
3. BURY SECTION. FLANGED x MECHANICAL JOINT. (USE RESTRAINING GLAND) POLYWRAP.
4. CLASS "A" CONCRETE THRUST BLOCK. (SEE DETAIL #509)
5. 6 INCH PVC C900 OR DUCTILE IRON C151. POLYWRAP DUCTILE IRON PIPE.
6. 6 INCH RESILIENT WEDGE GATE VALVE. FLANGED x MECHANICAL JOINT(USE RESTRAINING GLAND IF REQUIRED.) POLYWRAP.
7. TEE WITH FLANGED CONNECTION FOR VALVE. POLYWRAP.
8. 8" PVC RISER. MUST BE PLUMB WITHIN 1 INCH.
9. CHRISTY TYPE G-5 TRAFFIC BOX. LID SHALL READ WATER.
10. 4 INCH MIN. THICKNESS CONCRETE PAD, 36 INCH x 36 INCH SQUARE CENTER FIRE HYDRANT IN PAD. SLOPE PAD TO MATCH SIDEWALK, CURB, OR FINISHED GRADE. (TYP. 2%)
11. REFLECTIVE BLUE MARKER (TYPE DB). AT INTERSECTIONS: TWO MARKERS SHALL BE INSTALLED PERPENDICULAR TO FIRE HYDRANT ON EACH STREET AND 9 INCHES OF CENTERLINE. (SEE DETAIL #508).

12. TRACER WIRE (SEE DETAIL #505).
13. PROVIDE EXTENSION IF OPERATING NUT EXCEEDS MAXIMUM OF FOUR (4) FEET FROM FINISHED GRADE. EXTENSION SHALL INCLUDE A STEADYING PLATE.
14. CONCRETE COLLAR WITH 2" AC.

NOTES:

- A. ALL NUTS, BOLTS, AND WASHERS ON FLANGED FITTINGS SHALL BE STAINLESS STEEL TYPE 304 EXCEPT FOR BREAK-OFF BOLTS. FITTINGS SHALL BE WRAPPED AND BEDDED IN SAND.
- B. WHERE NO R/W OR EASEMENT EXIST BEHIND NEW OR EXISTING SIDEWALK, AND FOR AREAS WITH SEPARATED SIDEWALK, INSTALL CENTER OF FIRE HYDRANT 18 INCHES BEHIND FACE OF CURB.
- C. CONCRETE SHALL BE CLASS "A"
- D. LOWEST STEM OF FIRE HYDRANT SHALL HAVE A MIN. CLEARANCE OF 18 INCHES.
- E. HYDRANT SHALL BE CLOW 960 PAINTED WITH ENAMEL, SAFETY YELLOW.

| NO. | REVISION | DATE | BY |
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| DATE: 03/2015 | | | |

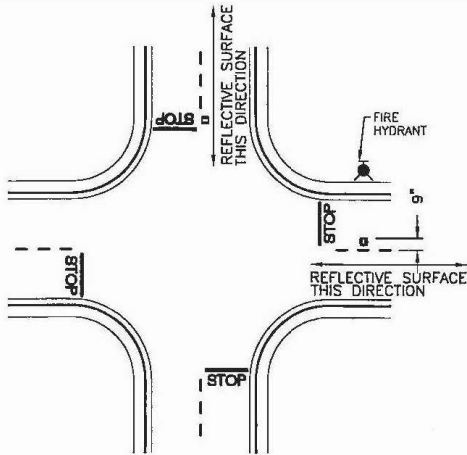
FIRE HYDRANT LATERAL AND VALVE ASSEMBLY

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: DECEMBER 2015
CECIL DILLON
CITY ENGINEER DATE
RCF 25835

STANDARD PLAN NO. 507

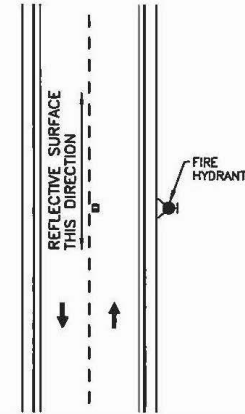
HYDRANT MARKER PLACEMENT AT INTERSECTIONS



NOTE:

MARKERS ARE TYPICALLY PLACED OFF CENTER TO THE CORNER WHERE THE HYDRANT IS LOCATED. EACH MARKER SHOULD BE "TWO-WAY" MARKER SO IT'S REFLECTIVE SURFACE CAN BE VIEWED FROM BOTH DIRECTIONS BY ON COMING VEHICLES. TWO MARKERS ARE NORMALLY USED WITH THE REFLECTIVE SURFACES BEING ORIENTED 90 DEGREES FROM EACH OTHER SO THAT VEHICLES COMING FROM ANY DIRECTION CAN SEE THE MARKERS CLEARLY. MARKERS SHOULD BE OFFSET FROM EACH OTHER SO AS NOT TO BLOCK THE HEADLIGHT FROM HITTING THE REFLECTIVE SURFACE.

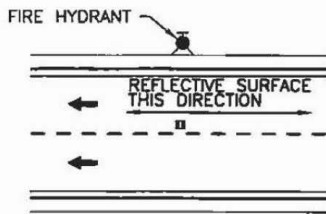
HYDRANT MARKER PLACEMENT AT MID BLOCK LOACTIONS



NOTE:

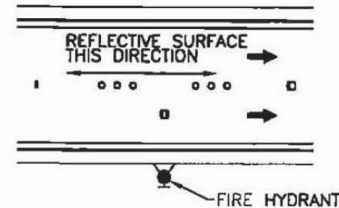
MARKERS FOR MID BLOCK LOCATIONS ARE TYPICALLY PLACED OFF CENTERLINE TO THE SIDE OF THE STREET WHERE THE HYDRANT IS LOCATED. EACH MARKER SHOULD BE A "TWO-WAY" MARKER SO IT'S REFLECTIVE SURFACE CAN BE VIEWED FROM BOTH DIRECTIONS BY ON COMING VEHICLES. THE MARKER SHOULD BE PLACED CLOSE ENOUGH TO THE CENTERLINE THAT IT CAN BE VIEWED EASILY FROM EITHER DIRECTION.

HYDRANT MARKER PLACEMENT MULTI LANE ROADS



NOTE:

ON MULTI-LANE STREET WITH NO RAISED ROAD DOTS OR REFLECTORS, PLACE REFLECTOR 9" OFF CENTERLINE.



NOTE:

ON MULTI-LANE STEET WITH ROAD DOTS OR REFLECTORS, PLACE REFLECTOR IN THE MIDDLE OF THE LANE CLOSEST TO THE HYDRANT.



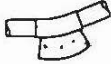
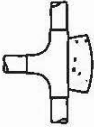

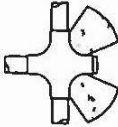
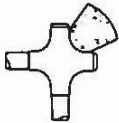
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| DATE: 03/2015 | | | |

HYDRANT MARKER (BLUE DOT) LOCATIONS

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

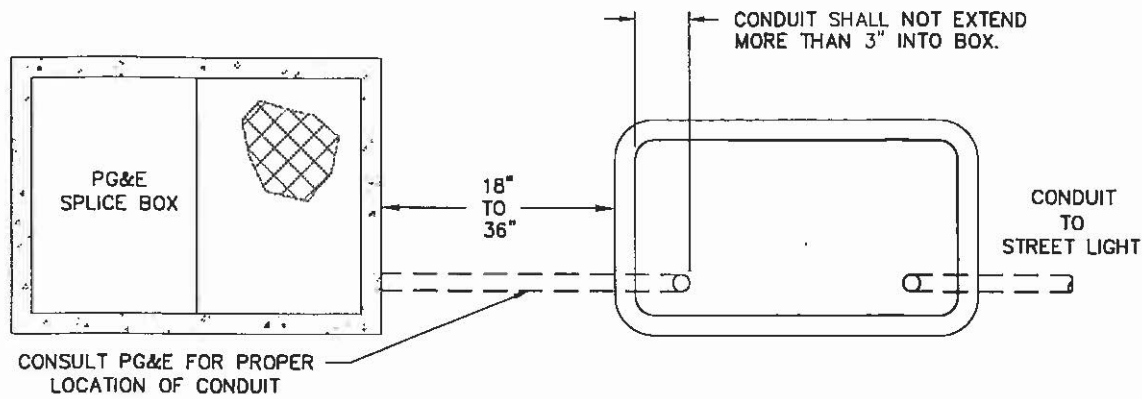
APPROVED BY: DECEMBER 2015
CECIL DILLON
CITY ENGINEER DATE
RCF 25835

STANDARD
PLAN NO. **508**

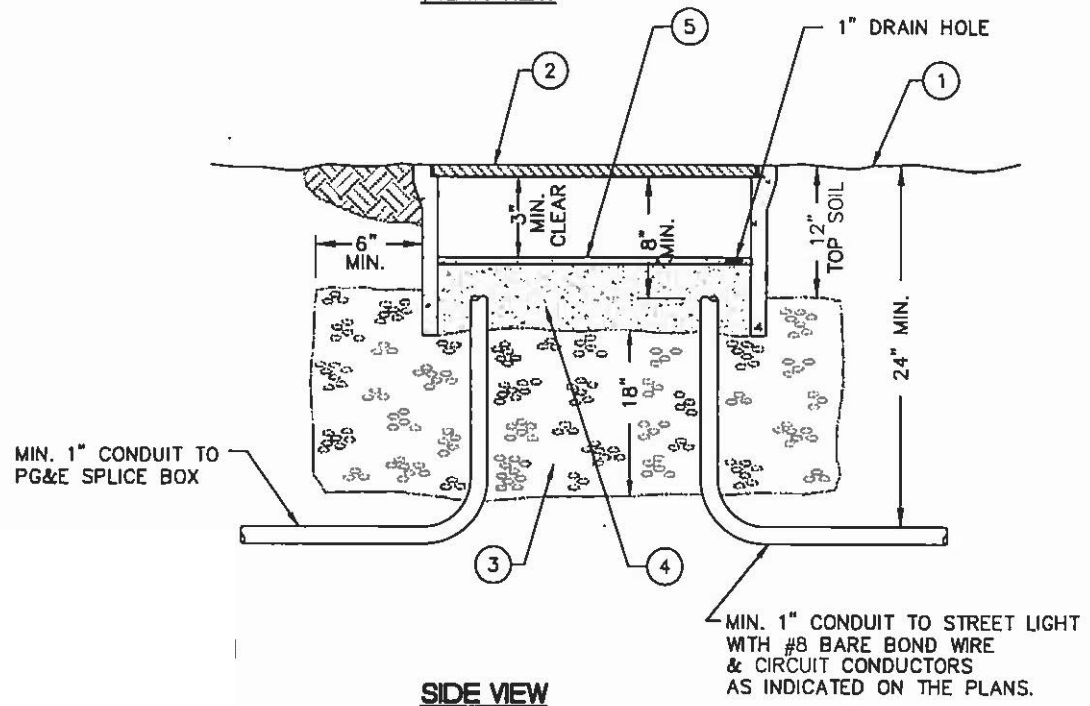
| FITTING TYPE | | 90° BEND | 45° BEND | 11 1/4° OR 22 1/2° BEND | TEE OR DEAD END | TEE W/ PLUG | CROSS W/ PLUG | CROSS W/ PLUGS |
|----------------------|-----|---|---|---|---|--|---|---|
| TYPICAL INSTALLATION | |  |  |  |  |  |  |  |
| PIPE SIZE | 4" | 2 | 1 | 1 | 2 | 2 | 2 EA. | 2 |
| | 6" | 4 | 2 | 1 | 3 | 4 | 4 EA. | 4 |
| | 8" | 7 | 4 | 2 | 5 | 7 | 7 EA. | 7 |
| | 10" | 12 | 6 | 3 | 8 | 12 | 12 EA. | 12 |
| | 12" | 16 | 10 | 5 | 12 | 16 | 16 EA. | 16 |
| | 14" | 23 | 13 | 7 | 16 | 23 | 23 EA. | 23 |
| | 16" | 29 | 16 | 8 | 20 | 29 | 29 EA. | 29 |

1. NUMBERS IN TABLE ABOVE ARE REQUIRED MINIMUM BEARING AREAS IN SQUARE FEET.
2. THRUST BLOCKS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE.
3. AREAS GIVEN ARE FOR CLASS 150 PIPE AT 150 PSI TEST PRESSURE IN SOILS WITH 2,000 PSF BEARING CAPACITY.
4. THRUST BLOCKS SHALL BE PLACED AGAINST UNDISTURBED SOIL.
5. STRAPS USED FOR ANCHORING PIPE TO THRUST SHALL BE STAINLESS STEEL ONLY.
6. PIPE FITTINGS SHALL BE PROTECTED WITH MINIMUM 8 MIL VISCUINE IN ORDER THAT NO CONCRETE WILL TOUCH THE FITTING OR JOINT UPON THRUST BLOCK PLACEMENT.
7. A SOILS REPORT SHALL BE PROVIDED UPON REQUEST BY THE CITY ENGINEER.
8. THIS TABLE IS NOT APPLICABLE TO THE DESIGN OF ON-SITE FIRE SUPPRESSION WATER MAINS.

| | | | | | |
|------------------|---------------|----|---|---------------|------------|
| NO. | REVISION DATE | BY | THRUST BLOCK BEARING AREA DETAIL | APPROVED BY: | DECEMBER |
| | | | | CECIL DILLON | 2015 |
| | | | | CITY ENGINEER | DATE |
| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | RCE 25835 | |
| CHECKED BY: CD | | | | | |
| SCALE: NONE | | | | STANDARD | 509 |
| DATE: 03/2015 | | | | PLAN NO. | |



PLAN VIEW



SIDE VIEW

1. FINISH GRADE
2. MIN. #3 1/2 STATE BOX (STD. ES-8) WITH COVER MARKER "STREET LIGHTS" (CHRISTY N9 OR EQUAL).
3. DRAIN ROCK BACKFILL.
4. PLACE SAND BACKFILL TO COMPLETERLY COVER CONDUITS AND CONDUCTORS.
5. 2" OF 2-SACK SLURRY.

NOTES:

- A. INSTALL CONDUIT AND CONDUCTORS TO PG&E SECONDARY SPLICE BOX. PG&E WILL PROVIDE CONNECTION WITHIN SPLICE BOX.
- B. INSTALL DUCT SEAL IN CONDUIT ENDS.
- C. THE STEET LIGHT CABLE MUST COME UP INTO THE SAME END OF THE BOX AS ALL OF THE OTHER CABLES.

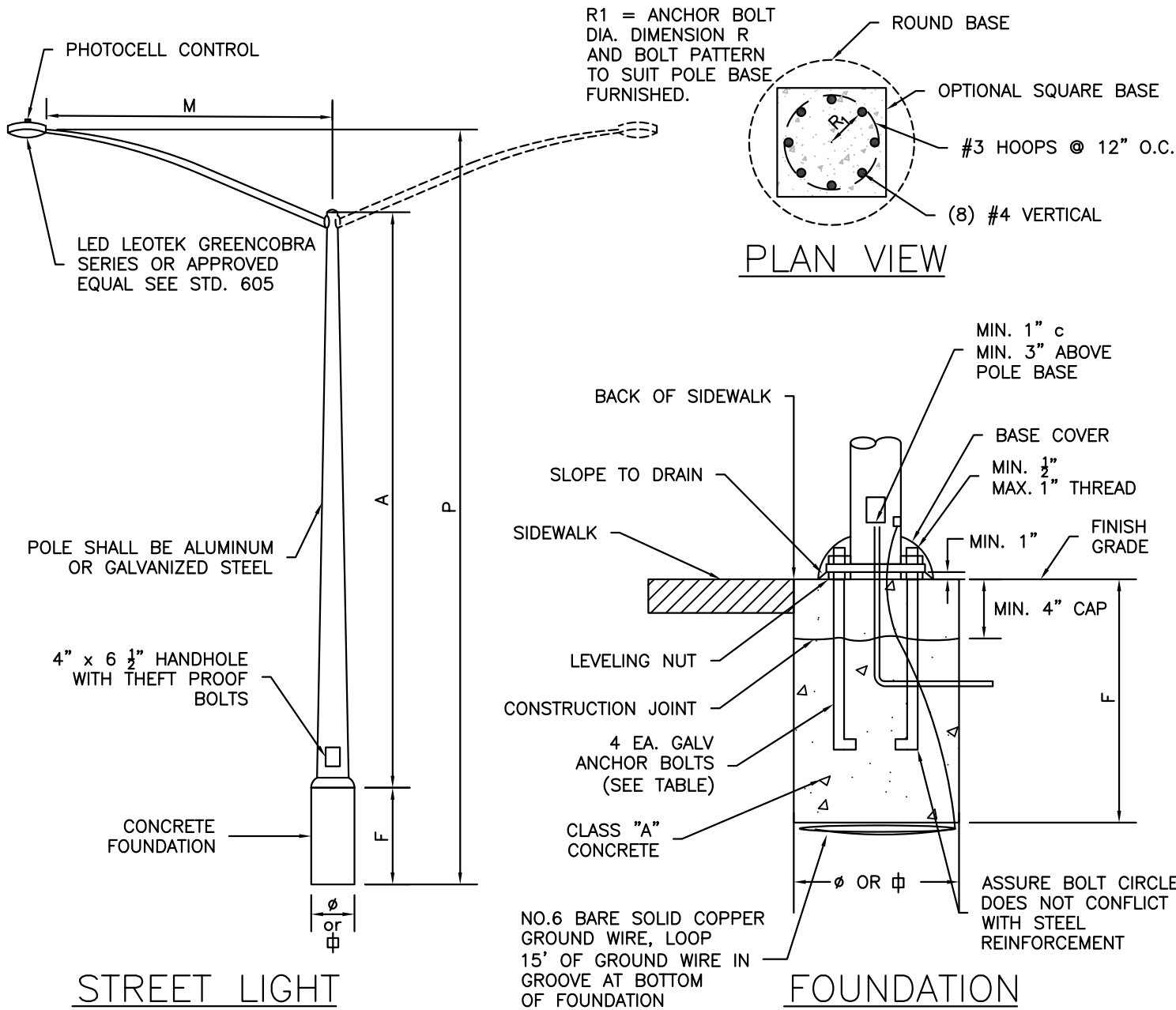
| NO. | REVISION | DATE | BY |
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| DATE: 01/2015 | | | |

STREET LIGHT SERVICE POLE

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCF 25835 DATE

STANDARD PLAN NO. 601



| | POLE DATA | | | ARM | FOUNDATION | | ANCHOR BOLTS | |
|-------------------|-----------|------------|--|----------------------|------------|-------|--------------|---------------|
| | A HEIGHT | P MTG. HGT | ACCEPTABLE PRODUCTS | M LENGTH | F DEPTH | Ø DIA | ϕ SQ | SIZE |
| MINOR & COLLECTOR | 25'-0" | 27'-6" | HAPCO 21 SERIES, UNION METAL 203, AMERON SERIES PL OR APPROVED EQUAL | 4' MINOR 6' COLL. | 5'-0" | 2'-0" | 1'-8" | 1" x 36" x 4" |
| MAJOR & ARTERIAL | 30'-0" | 32'-6" | | 8'-0" | 5'-0" | 2'-6" | 2'-3" | 1" x 36" x 4" |

NOTES:

- A. PULL BOX SHALL BE INSTALLED ADJACENT TO POLE WITHIN 36". PULL BOX SHALL NOT BE LOCATED IN SIDEWALK WITHOUT PRIOR APPROVAL OF THE CITY ENGINEER.
- B. WHEN A SECONDARY PULL BOX IS LOCATED WITHIN 8' OF POLE, PULL BOX IS NOT REQUIRED.
- C. POLE LOCATION SHALL BE AT BACK OF SIDEWALK. IN THE CASE OF NO SIDEWALK OR SEPARATED SIDEWALK, POLE SHALL BE 2' BEHIND FACE OF CURB. ALTERNATE LOCATIONS SHALL BE AT THE DISCRETION OF THE CITY ENGINEER.

| NO. | REVISION | DATE | BY |
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| DATE: 01/2015 | | | |

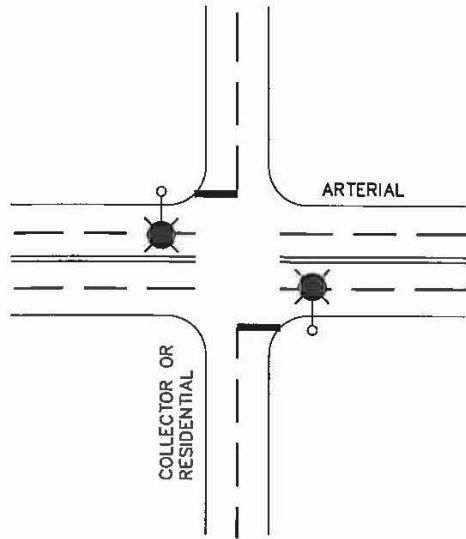
STANDARD STREET LIGHT

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

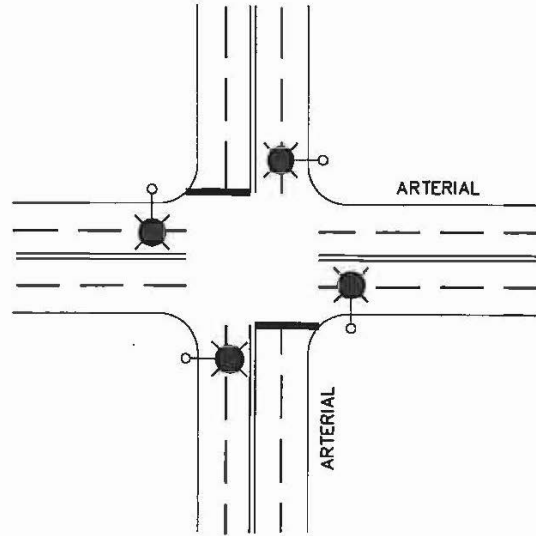
APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER
RCE 25835 DATE

STANDARD PLAN NO. 602

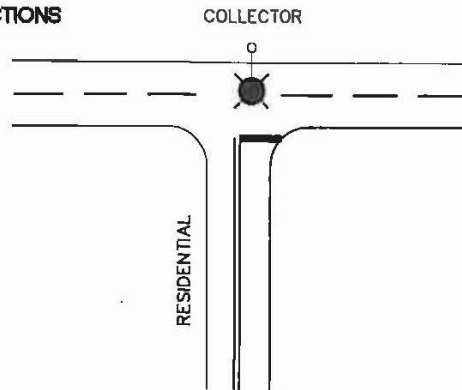
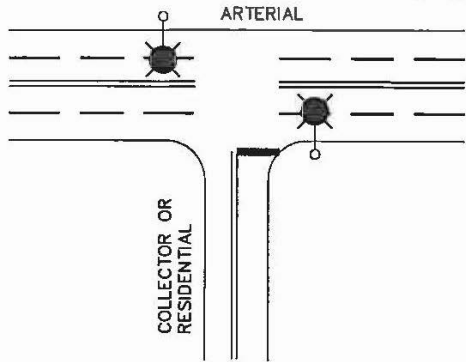
INTERSECTION WITH 2-LANE STREET



INTERSECTION WITH 4-LANE STREET



TEE INTERSECTIONS



NOTE:

LOCATE STREET LIGHTS ON TRAFFIC SIGNAL POLES WHENEVER POSSIBLE AT SIGNALIZED INTERSECTIONS.

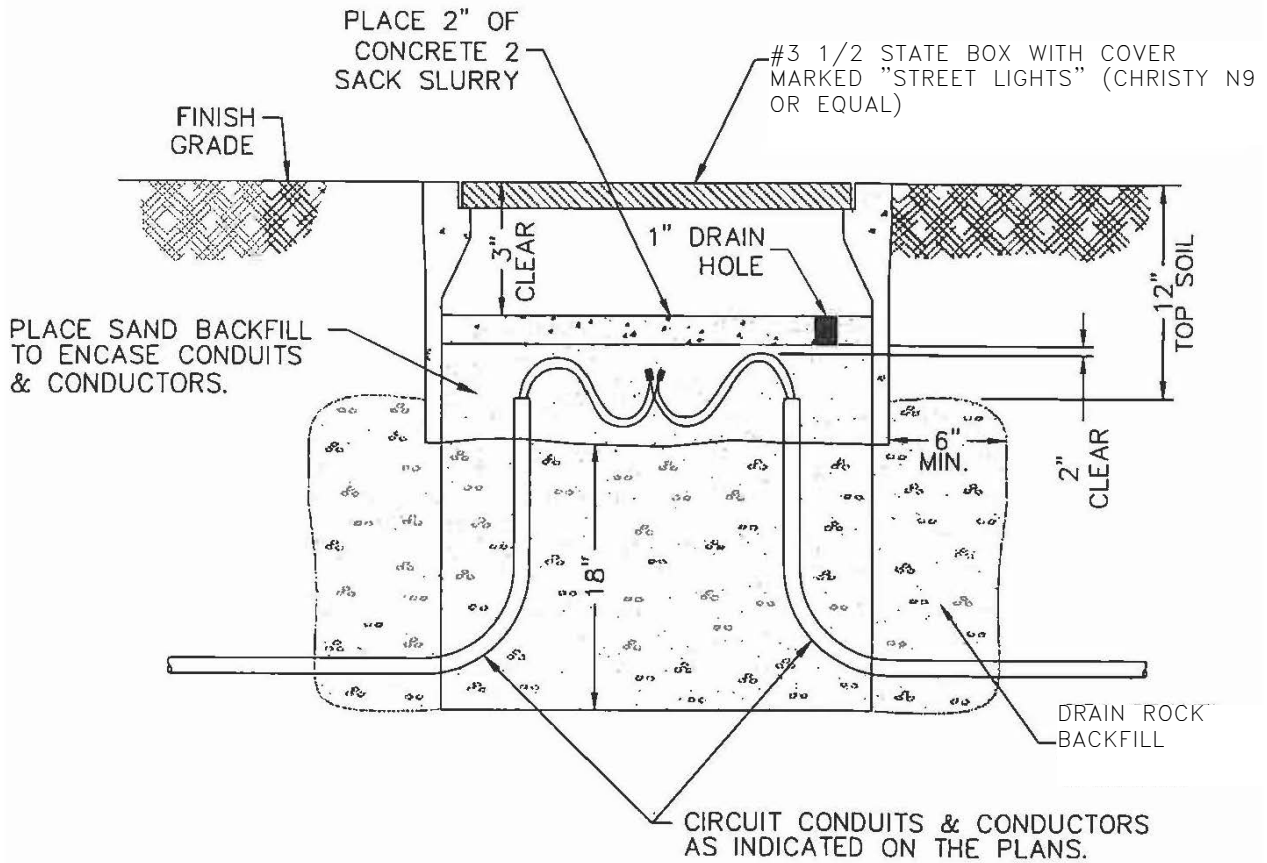
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| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 01/2015 | | | |

INTERSECTION LIGHTING

CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS

| | |
|---------------|----------|
| APPROVED BY: | DECEMBER |
| CECIL DILLON | 2015 |
| CITY ENGINEER | DATE |
| RCE 25835 | |

STANDARD PLAN NO. 603



CROSS SECTION

NOTE:

CONDUCTORS & CONDUITS SHALL BE WRAPPED WITH 8 MIL POLYETHELENE ENCASEMENT PRIOR TO PLACING SAND BACKFILL.

| NO. | REVISION | DATE | BY |
|------------------|----------|------|----|
| | | | |
| | | | |
| DRAWN BY: BH, NR | | | |
| CHECKED BY: CD | | | |
| SCALE: NONE | | | |
| DATE: 01/2015 | | | |

**STREET LIGHT CONDUITS &
CONDUCTORS ENCASEMENT**

**CITY OF RIO VISTA
DEPARTMENT OF PUBLIC WORKS**

APPROVED BY: **CECIL DILLON** DECEMBER 2015
CITY ENGINEER DATE
RCF 25835

STANDARD PLAN NO. 604

| ROADWAY CLASS | LIGHT SPACING (FT) | LUMINAIRE WATT | MIN. AVG. MAINTAINED FC | UNIFORMITY RATIO AVG. FC/MIN. FC |
|------------------|--------------------|----------------|-------------------------|----------------------------------|
| MINOR | 200 | 38w LED | 0.20 | 5:1 |
| COLLECTOR | 200 | 48w LED | 0.30 | 4:1 |
| MAJOR & ARTERIAL | 100 | 58w LED | 0.70 | 3:1 |

NOTES:

1. FC = FOOT-CANDLE
2. LUMINAIRES SHALL BE LEOTEK GREENCOBRA SERIES WITH PHOTOCELL CONTROL OR APPROVED EQUAL. FINISH SHALL BE GREY

| | | | | | |
|------------------|---------------|----|--|---------------|------------|
| NO. | REVISION DATE | BY | ROADWAY ILLUMINATION | APPROVED BY: | DECEMBER |
| | | | | CECIL DILLON | 2015 |
| DRAWN BY: BH, NR | | | CITY OF RIO VISTA DEPARTMENT OF PUBLIC WORKS | CITY ENGINEER | DATE |
| CHECKED BY: CD | | | | RCE 25835 | |
| SCALE: NONE | | | | STANDARD | 605 |
| DATE: 01/2015 | | | | PLAN NO. | |

APPENDIX VI-A
City of Rio Vista
Sewer System Management Plan
Rio Vista Overflow Emergency Response Plan
& Sewer Spill Reporting Packet

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CITY OF RIO VISTA

Sewer Spill Reporting Packet

Department of Public Works



California Regional Water Quality Control Board Central Valley Region

Karl E. Longley, ScD, P.E., Chair



Arnold Schwarzenegger
Governor

Linda S. Adams
Secretary for
Environmental
Protection

Sacramento Office
11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Phone (916) 464-3291 • FAX (916) 464-4645
<http://www.waterboards.ca.gov/centralvalley>

SPILL REPORTING FACT SHEET

To be posted at facility.

WHEN A SPILL OCCURS YOU MUST FOLLOW THE MANDATORY PROCEDURES IN THE TABLE BELOW:

What is a spill? A spill is any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into surface waters or drainage channels that is not permitted or authorized by a regulatory agency. (A spill includes an unauthorized discharge to land that poses a public health threat.) Be on the safe side, **REPORT IT!**

| Required Communication | Agency to Contact (all are required) | Time Requirements | Contact Method |
|------------------------|---|---|---|
| 1. Notification | Office of Emergency Services (OES) | As soon as possible, but not later than 2 hours after becoming aware of the unauthorized discharge. | Telephone – (800) 852-7550 (obtain a control number from OES) |
| | Local Health Department (LHD) | As soon as possible, but not later than 2 hours after becoming aware of the unauthorized discharge. | Telephone - (fill in LHD number) 707-784-6765 |
| | Appropriate Regional Water Board Office Sacramento-(RB5S) Redding (RB5R) Fresno (RB5F) | As soon as possible, but not later than 2 hours after becoming aware of the unauthorized discharge. | Telephone – RB5S: (916) 464-3291 RB5R: (530) 224-4845 or RB5F: (559) 445-5116 |
| 2. Certification | Regional Water Board | As soon as possible, but not later than 24 hours after becoming aware of the unauthorized discharge. | Telephone – (916) 464-3291 (be prepared to provide detailed information) ¹ |
| 3. Reporting | Regional Water Board | Within 5 business days ; submit written report. | Mail or Hand Delivery |

¹ See Spill Reporting Procedures document (Enclosure 1).

Enclosure 2

City of Rio Vista

Sewage Spill Notification and Clean-up Procedures

1. Sewage Spill Containment:

- The discharge must be stopped or contain within a restricted area as soon as possible. Depending on the specific conditions, set up portable pump or call for a pumper truck or vacuum truck to prevent or reduce the overflow until the overflow repairs can be made or the sewer line is unplugged. The number for ASTA Pumping service is 707-249-3550 or Warren Gomes at 707-374-2881 or home phone 707-374-6162.
- The Public must be protected by restricting access or contact with the discharge.

2. Sewage Spill Notification:

- Notify the Project Manager or Assistant Project Manager immediately. If you are unable to reach them leave a message on their cell phone and explain the situation, what happened and what you are doing to correct it.
- After the immediate containment has been addressed and you have gathered information about the spill, notify the City of Rio Vista Public Works Director and the City of Rio Vista Fire Department (374.2233). Notifying a city staff member is **NOT** sufficient. It must be the Public Works Director *Robin Barre, / Greg Malcolm*
707-249-7506 *707-249-4153*
- OES, RWQCB, and Department of Health must be notified ASAP and no later than 2 hours after becoming aware of the discharge. A written certification (report) of the notification must also be provided to the RWQCB within 24 hours.
- All sewage spills and overflows of any volume require an immediate verbal notification and a written follow-up report within five (5) working days to the RWQCB. Calls should be made to Patricia Leary or Berry Hilto *t* (916) 464-4660. If after normal business hours leave a complete message on the voice mail.
- The fire department will notify OES but verify this and if they do not, then notify the Office of Emergency Services (OES) @ 800-852-7550. O.E.S. will contact the Department of Fish & Game. When leaving a message please provide your name, agency, return number (cell), City, location of spill or overflow, and include cross street and nearest address, volume, surface water bodies impacted (Sacramento River), agencies that have responded, if known - cause of spill or cleanup activities undertaken.
- The City of Rio Vista must provide documentation of the event via electronic reporting. The written report to the City for completion of the electronic reporting shall be prepared by the Project Manager or their designate.
- The written report should include all the above information as well as the duration of the incident, size of the affected area, and the agency contacts made during the notification, detailed descriptions of the repair and cleanup actions taken, and a statement on what steps will be taken to minimize or prevent a spill or overflow again. A specific form has been created and must be used).
- Fill out the daily log book with information as well.

- Complete a Sewage Bypass Notification form, have the Project Manager or Assistant Manager review and then it fax to RWQCB, Solano County and the Fire Department.

3. Posting and Cleanup:

1. If needed, post signs warning the public of the release (See prepared posting in Spill Response Notebook in the office) – City will determine if this is to be accomplished..
2. Health warning signs should remain posted until County Health or Regional Board authorizes their removal or sample results show acceptable background levels.
3. Contain and divert the flow to the nearest sanitary sewer or into a vacuum truck.
4. Once the overflow is contained, and repairs made, collect any debris, and vacuum up sewage solids and liquid for disposal at the WWTP.
5. Flush the affected area with clean water and if possible collect the flush water using the vacuum truck for disposal at the WWTP. The use of disinfectants, such as bleach is not recommended due to toxicity to fish and wildlife.
6. Sampling should be conducted upstream and downstream in the receiving water if the spill volume exceeds 1,000 gallons. Samples should be analyzed for fecal coliform and ammonia. Dissolved oxygen testing may also be required to determine impact. Samples should be collected and analyzed on the overflow water as well.

IMPORTANT NUMBERS:

1. City of Rio Vista Main WWTP permit number = CA007801
2. Northwest WWTP permit number = CA0083771
3. City of Rio Vista *Public Works 707-249-7510*
4. City of Rio Vista Fire Department *Dispatch 707-374-2300*
Dispatch @ 707.421.7090, local @ 374.2233, fax @ 374.6324
5. Solano County Department of Environmental Management (Christina Saffholm or Ed Padilla @ 707.784.3305, fax @ 784.4805, dispatch @ 421.7090)
6. O.E.S. (800.852.7550)
7. Department of Fish and Game (916.358.1300) **no need to contact if O.E.S. is contacted.**
8. Regional Water Quality Control Board (Patricia Leary or Berry Hilton – Environmental Health Specialist - @ 916.464.4623, fax @ 464.4645)
9. NRC – (800.424.8802) **no need to contact if RWQCB has been contacted**

*QUINN
Gomes 707 580-4838*

2.1.1 Collection System Owner

City of Rio Vista, California
One Main Street
Rio Vista, CA 94571

2.1.2 Contract Collection System Operator

Veolia Water North America Operating Services, LLC

Project Manager: ~~Chris McAuliffe~~ **Fermin Garcia**

Address: 3000 Airport Road
Rio Vista, CA 94571

Office: 707-374-2633

FAX: 707-374-2824

Cell 209-265-6339; Veolia On Call, 707-374-2652

2.1.3 Local Contact List

City of Rio Vista:

| | | | |
|--|-----|----------|-----------------------|
| Police Department | 911 | Dispatch | 707-374-2300 |
| Fire Department | 911 | Dispatch | 707-421-7090 |
| Emergency Medical | 911 | | |
| Emergency Services Coordinator | | | 707-249-7510 on-call |
| ██████████ | | | 707-249-7506 |
| Public Works Supervisor (Greg Malcolm) | | | ██████████ |
| City Manager | | | 707-374-6451 |

Veolia Water-Rio Vista:

Wastewater Treatment Plant 707-374-2633

Contractors for Response/Cleanup Assistance

The contractors listed below may be called upon for additional resources including vacuum and jetting trucks, pumper trucks, pumps, portable tanks, and earth moving and transportation equipment.

| | |
|--------------------|---------------------|
| Gomes Contractor | 707-374-2881 |
| ASTA Contractor | 707-249-3550 |
| Rain-For-Rent | 925-250-3722 |
| Roto Rooter | 707-642-9200 |

QUINN 707 580 - 4838

Norcal Pipeline Services
Emergency Response Plan

916-442-5400

INTRODUCTION

The City of **R.V.** Public Works Department's is Responsible for the operation and maintenance of the city's Wastewater collection system, Storm drain Collection system, Wastewater and storm drain Manholes, .

The purpose of this system is to collect and convey the city's wastewater. These facilities are well maintained and normally should not result in any sewage spills or overflows. However, the possibility exists that unforeseen accidents, unusual equipment failure or other events not controllable by the city could result in a sewage spill/overflow. This procedure provides a plan that when enacted in response to a sewer spill/overflow would reduce or eliminate public health hazards, spillage of raw sewage onto public or private property, unnecessary property damage, contamination of the environment, and the inconvenience of service interruptions.

This Sanitary Sewer Overflow Response Plan (SSORP) is designed to assist and train employees to comply with the responsibilities of the plan and to ensure that all citizens and employees health and safety are protected. It is also designed to ensure that all the appropriate entities are informed of all sewage spills.

DEFINITIONS

Blockage – Something that partially or fully blocks the wastewater from flowing through a sewer pipeline. The blockage can be caused by debris in the sewer, grease buildup, root intrusion, or a partial or full collapse of the pipeline. If not caught in time, the blockage may cause an overflow. This is also called a stoppage.

Category 1 SSO – All discharges of sewage of ANY VOLUME resulting from a failure in the Enrollee's sanitary sewer system or flow condition that reach surface water and/or a drainage channel tributary to a surface water; or reach a storm drainpipe that was not fully captured and returned to the sanitary sewer system.

Category 2 SSO – All discharges of sewage resulting from a failure in the Enrollee's sanitary sewer system or flow condition that equals or exceeds 1000 gallons that does not reach surface water and/or a drainage channel and/or a storm drainpipe that is fully captured and returned to the sanitary sewer system.

Category 3 SSO – All other discharges of sewage, not included in Category 1 or 2, resulting from a failure in the Enrollee's sanitary sewer system or flow condition.

GPM – Gallons per Minute

OES – Office of Emergency Services

Private Lateral Sewage Discharges – Sewage discharges that are caused by blockages or other problems within a privately owned lateral or from other private sewer assets.

RWQCB –Regional Water Quality Control Board

REPORTING REQUIREMENTS

Category 1 SSO – All SSOs that meet the above criteria for Category 1 SSOs must be reported as soon as:

- the Enrollee has knowledge of the discharge,
- reporting is possible, and
- reporting can be provided without substantially impeding cleanup or other emergency measures.

Initial reporting of Category 1 SSOs must be reported to the Online SSO System as soon as possible but no later than 3 business days after the Enrollee is made aware of the SSO. A final certified report must be completed through the Online SSO System within 15 calendar days of the conclusion of SSO response and remediation.

Also, Category 1 SSOs greater than or equal to 1,000 gallons must also be reported to the State Office of Emergency Services (OES) within 2 hours of becoming aware of the SSO. All Category 1 spills shall be reported verbally to State of California Office of Emergency Services at: 800-852-7550.

Also, Category 1 SSOs great than or equal to 50,000 gallons that reach surface waters must have a technical report submitted within 45 calendar days after then end date of the SSO.

Category 2 SSO – All SSOs that meet the above criteria for Category 2 SSOs must be reported to the Online SSO Database within 15 calendar days of the conclusion of SSO response and remediation.

Category 3 SSO – All SSOs that meet the above criteria for Category 3 SSOs must be reported to the Online SSO Database within 30 days after the end of the calendar month in which the SSO occurs

All hazardous materials - contact the Lodi Fire Department **Immediately** at: 209-369-3531

Private Lateral SSO – All sewage discharges that meet the above criteria for Private Lateral sewage discharges may be reported to the Online SSO Database based upon the Enrollee's discretion.

RESPONDING STAFF RESPONSIBILITIES

The first crew responding to a sewer backup has the immediate responsibility to protect people, property, and the environment from effects of a sewage spill/overflow. To meet these objectives in a rapid, effective and organized manner, staff will respond and fulfill the duties in the following categories as directed by this plan:

#1 CONTAIN spilling sewage from entering waterways

- Capture the sewage where it can be recovered and returned to the sewer system.
- Contain sewage in advantageous locations (i.e. flood control facilities, construction excavations locations, vacant lots etc.)
- Containment materials include sand, sand bags, poly sheeting, socks, etc.

#2 CONTROL the spill overflow and bypass area of failure

- Bypass the obstructed line by pumping the spillage into another non-restricted line or vacuum with VacCon truck
- Set up barricades to prevent public contact with spill

#3 CLEANUP the affected areas to ensure public health and safety

- Remove all visible debris
- Wash down and contain run-off being careful not to wash sewage into storm drain system
- Determine whether to disinfect or not to disinfect?
 - Consider requirements of other agencies
 - Consider beneficial use of receiving waters
 - Consider the uses and ownership of affected properties
- Clean all hard/soft surfaces

SPILL DEFINITIONS

Minor spill

A minor spill is a sewage spill that is contained and can be effectively and satisfactorily cleaned up by city personnel, and does not require regulatory notification.

A minor *inside* spill is one that:

1. Is confined to the affected drain area and does not enter other rooms.
2. Does not contaminate carpet, furniture or other homeowner belongings that require specialized cleaning and disinfection.
3. Does not pose a threat to public health.

A minor *outside* spill is one that:

1. Is less than 50 gallons: or
2. Is between 50 and 1000 gallons and does not occur within 50 feet of human habitation, does not contaminate public waters, does not pose a threat to public health and/or the environment, and can be cleaned up by city personnel.

Major Spill

A major spill is a sewage spill that contaminates the homeowner's property inside the home, can not be effectively and satisfactorily cleaned up by city personnel, and requires regulatory notification.

A major *inside* spill is one that:

1. Spreads beyond the immediate drain area and into other living areas.
2. Contaminates wall-to-wall carpets, furniture or other homeowner's belongings that require specialized cleaning or disinfection.
3. Poses a threat to public health.

A major *outside* spill is one that:

1. Is greater than 1000 gallons.
2. Is more than 50 gallons but occurs within 50 feet of human habitation, contaminates public water and/or poses a threat to public health and/or the environment.

SAFETY

Whenever City personnel respond to a report of an overflow/spill, they may encounter an emergency situation that requires immediate action. The most critical aspect of resolving an incident of this nature is to **safely and competently** perform the actions necessary to return the damaged equipment or facility to operation as soon as possible.

The most important item to remember during this type of incident is that safe operations, both to the employee and the public, always take precedence over expediency or short cuts.

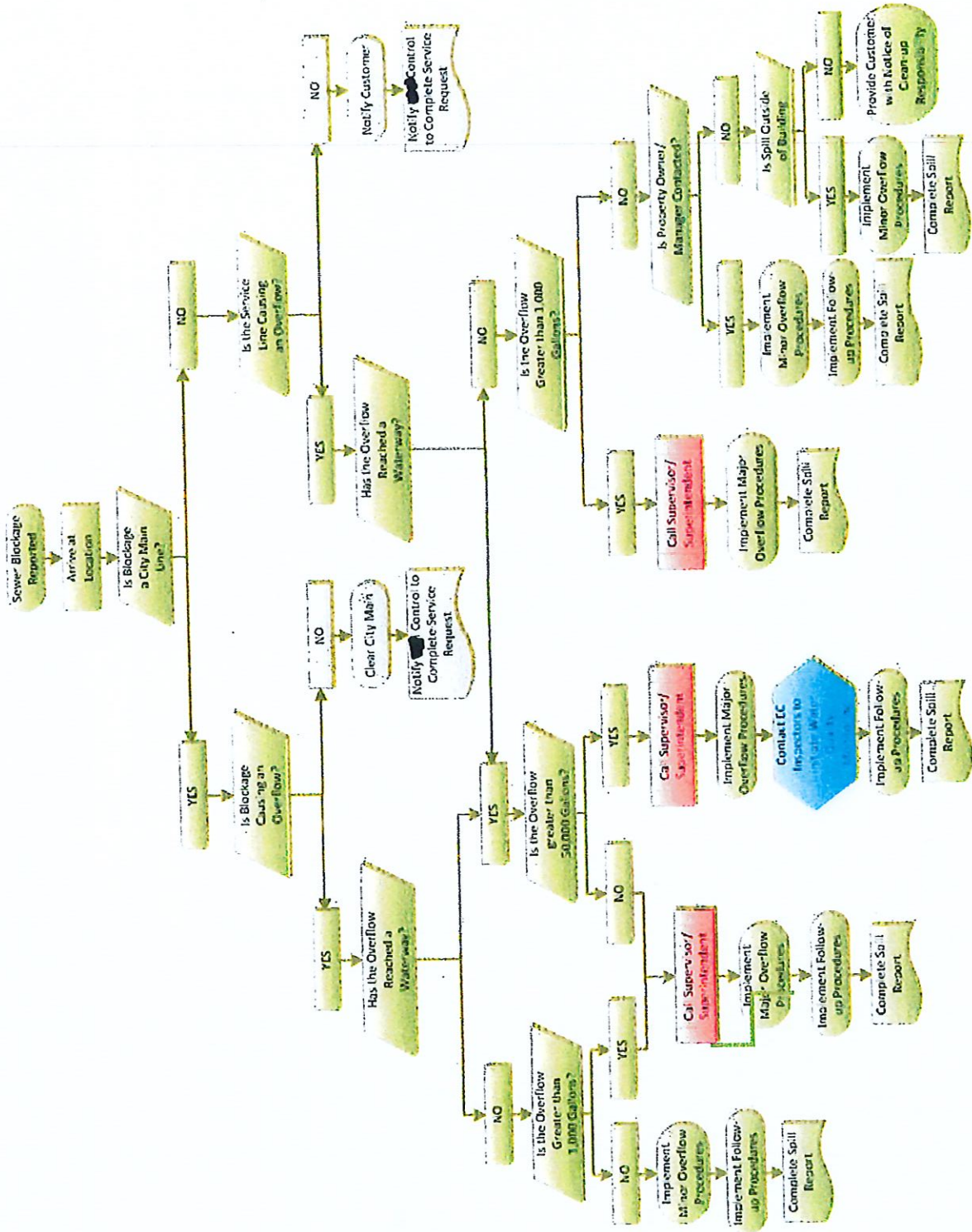
Depending on the nature or cause of the overflow/spill, personnel may be performing mechanical or electrical repairs at a pump station, removing a mainline blockage with the vactor truck or repairing a damaged section of pipeline. At this point, it is essential that all applicable safety procedures are followed so that the response does not cause the situation to escalate.

Typical responses may require personnel to implement the following types of safety procedures:


- Lockout/tagout of equipment for repairs
- Confined space entry procedures
- Traffic control procedures at site
- Equipment and/or vehicle operation
- Use of personnel protective equipment

Another important aspect of responding to an overflow/spill is the ability to maintain adequate communication via two-way radio and/or cellular telephone. Responders may need to call for additional resources as the situation may warrant as well as to notify other personnel and supervisors of the situation.

SSO DECISION FLOW CHART



SPILL RESPONSE PLAN***(Public Right of Way)***

1. Upon Arrival assess the severity of the spill and determine the manpower and equipment needed. Contain spillage immediately if possible.
2. Locate and clear stoppage and restore unobstructed flow.
3. Prevent contact between public and spill, utilize barricades, cones, and for dangerous traffic areas contact police for assistance in traffic control.
4. Once the blockage has been relieved or problem corrected and the overflow has ceased, every effort shall be made to contain the sewage that has spilled
5. If there is flooding or property damage, notify supervisor immediately.
6. Take photographs or video of the affected area, before and after clean-up, for city records.
- 7.
8. Do not volunteer or disown City liability. Instead, neutral comments should be used by City personnel indicating that the liability issue cannot be addressed until all of the relevant information has been evaluated.
9. After clean up is complete remove barricades to restore public access after area is safe.

11. The responding employee shall complete the Sanitary Sewer Overflow Field Data Sheet and turn it in to the Water/Wastewater Supervisor.

(Private Property)

1. Upon Arrival assess the severity of the spill and determine the manpower and equipment needed. Contain spillage immediately if possible. If it is determined that it is a customer problem and not a city main line blockage, notify the customer to clear their service line and clean up the spill. Try to contain the spill to the property, if you can not contain the spill call for assistance.
2. If it is a city problem, Locate and clear stoppage and restore unobstructed flow.
3. Prevent contact between public and spill, utilize barricades, cones, and for dangerous traffic areas contact police for assistance in traffic control.
4. Once the blockage has been relieved or problem corrected and the overflow has ceased, every effort shall be made to contain the sewage that has spilled to public property.
5. Obtain customer/property owner information, including Name, Address Phone Number, and the date and time they were notified and record on Agency Notification sheet. Provide customer with a "Customer Information Sheet".
6. If there is flooding or property damage, notify supervisor immediately.
7. Take photographs or video of the affected area, before and after clean-up, for city records.

8

areas.

9. Do not volunteer or disown City liability. Instead, neutral comments should be used by City personnel indicating that the liability issue cannot be addressed until all of the relevant information has been evaluated.
10. After clean up is complete remove barricades to restore public access after area is safe.
11. Supply the customer with the customer information sheet.
12. For major spills caused by the city, additional assistance may be required, including hotel/motel accommodations. Details and arrangements for Major spills shall be the responsibility of the Water/Wastewater Supervisor.
13. [REDACTED]
14. The responding employee shall complete the Sanitary Sewer Overflow Field Data Sheet and turn it in to the Water/Wastewater Supervisor.

SPILL PROCEDURES***Major Spill – Public***

1. Call Supervisor/ Superintendent
2. Assess spill location and prioritize and implement containment strategy
3. Clear stoppage & restore flow
4. Contain spill with earth berms, plugs for downstream storm drain pipe, and plastic sheets for drop inlets
5. Prevent contact between public and spill utilizing barricades, cones and traffic control (contact Police for dangerous traffic areas)
6. Investigate overflow inside structures and take photographs before and after clean-up for City records
7. Return spill to collection system with Vac-Con truck, pumps & hoses, or water truck
8. Remove all signs of gross pollution
9. Flush with water and disinfect area if needed
10. Notify Lodi Control to complete service request
11. Implement Follow-up procedures

Minor Spill – Public

1. Assess spill location and prioritize and implement containment strategy
2. Clear stoppage & restore flow
3. Contain spill and return to system
4. Prevent contact between public and spill
5. Investigate overflow inside structures and take photographs before and after clean-up for City records
6. Remove all signs of gross pollution
7. Flush with water and disinfect area if needed
8. Notify Lodi Control to complete service request.
9. Implement Follow-up Procedures

Major Spill – Private

1. Request Assistance *if needed, notify private property owner*
2. Call Supervisor/ Superintendent *to clean spill & blockage*
3. [REDACTED]
4. Take photographs or video of the affected area, before and after clean-up, for city records.
5. Fill-out report for billing the customer
6. [REDACTED]
7. [REDACTED]

Minor Spill - Private

1. Notify Customer of customer's responsibility to clear blockage and clean-up
2. Stay at location to verify customer takes care of blockage and clean-up
3. [REDACTED]
4. Check back at location during working hours to verify spill has stopped

Follow-up Procedures

1. Investigate cause of spill
2. Do CCTV Inspection
3. Add to Cleaning Schedule (if needed)
4. Repair or replace any broken line segments

INCIDENT STAFF RESPONSIBILITIES

The Utility Superintendent and the Water/Wastewater Supervisor are responsible to ensure that all Operations and Maintenance personnel are trained in and follow these procedures.

The responding Employee is responsible for filling out the Sanitary Sewer Overflow Field Data sheet. The Wastewater Supervisor is responsible for filling out the Overflow report and signs off that it is complete and accurate.

The Utility Superintendent or the Water/Wastewater Supervisor is responsible for notifying regulatory agencies within the required time frames outlined on Page 2.

SSO Report Form

Date of Spill: _____
What time was FM Notified: _____ AM/PM
What time did FM Arrive on the Scene: _____ AM/PM
What time was the SSO Cleared: _____ AM/PM

Who Initially Reported the Spill (name): _____
Telephone Number: _____ (NA if information is not available)

Who is filling out this SSO Report Form (name and phone): _____

Exact Location of Spill: _____
Exact Latitude: _____ Exact Longitude: _____

Estimated spill start date/time: _____ (MM/DD/YY) _____ (AM/PM)

Estimated spill end date/time: _____ (MM/DD/YY) _____ (AM/PM)

Estimated spill volume: _____ gal Spill rate: _____ gal/min

Estimated volume of spill recovered: _____ gal

How was recovered volume determined? _____

Was a picture taken? YES NO

Spill Dimensions: _____

What method was used to estimate spill volume? (circle all that apply)

- | | | |
|-------------------------------|------------------------------------|---------------------------------|
| Eyeball Method | Calculations from Spill Dimensions | Duration and Flow Rate |
| Open Channel Spill Estimation | Drop Bucket Method | Calculations Based on Pipe Size |
| Flow from Vent or Pick Holes | Flow around Manhole Cover | Flow from Manhole w/o a Cover |

Refer to Volume Estimation forms to document spill dimensions, shapes and other information.

Cause of spill (options on back): _____

Where are the spill appear points? (options on back): _____

Where did the failure occur? (options on back): _____

Did spill discharge to surface waters? YES NO

If yes, what volume? _____ Gal
Estimated spill volume recovered from surface water _____ Gal

Did the spill reach a storm drain system? YES NO

If yes, was the volume fully recovered? YES NO

If the volume was not fully recovered, what volume was recovered? _____ Gal

Did the spill discharge to land? YES NO

Estimated spill volume recovered from discharge to land (do not include water for clean-up): _____ Gal

Final spill destination (circle all that apply):

- | | | | |
|-------------|--------------------|---------------|-----------------|
| Beach | Building/Structure | Paved Surface | Unpaved Surface |
| Storm Drain | Street Curb/Gutter | Surface Water | |

Other: _____

Spill response and corrective actions taken (circle all that apply/ more on back side):

- | | | |
|---------------|---|----------------------------|
| Cleaned up | Contained all or portion of spill | Inspected sewer using CCTV |
| Restored Flow | Returned all or portion of spill to sanitary sewer system | Mitigated Effects of Spill |

Other: _____



SANITARY SEWER OVERFLOW DATA WORKSHEET

If possible take photos of spill and any damage to personal property.



| | | |
|----|--|--------|
| | Date and Time of Spill: | |
| | CalEMA Event ID # (From CIWQS Online Report): | |
| | Certification Confirmation # (Available After Certifying CIWQS Online Report): | |
| | SSO Event ID # (from CIWQS Online Report): | |
| 1 | Estimated spill volume: | |
| 2 | Did the spill discharge to a drainage channel and/or surface water?: | YES NO |
| 3 | Did the spill reach a separate (not combined) storm drainpipe?: | YES NO |
| 4 | If yes, was all of the wastewater fully captured and returned to the sanitary sewer system?: | YES NO |
| 5 | Private lateral spill?: | YES NO |
| 6 | Name of responsible party (for private lateral spill only, if known): | |
| 7 | Spill Location Name: | |
| 8 | Latitude of Spill Location: | |
| 9 | Longitude of Spill Location: | |
| 10 | Address: | |
| 11 | Cross Street: | |
| 12 | Spill Location Description: | |
| 13 | Spill Appearance Point: | |
| 14 | Spill Appearance Point Explanation: | |



SANITARY SEWER OVERFLOW DATA WORKSHEET
If possible take photos of spill and any damage to personal property.



| | | |
|----|---|--|
| 15 | Final spill destination: | |
| 16 | Explanation of final spill destination: | |
| 17 | Estimated volume of spill recovered: | |
| 18 | Est'd volume of spill that reached surface water, drainage channel, or not recovered from SD: | |
| 19 | Estimated current spill rate (if applicable): | |
| 20 | Estimated spill start date/time: | |
| 21 | Date and time of sanitary system agency was notified of or discovered spill?: | |
| 22 | Estimated Operator arrival date/time: | |
| 23 | Estimated spill end time: | |
| 24 | Spill cause: | |
| 25 | Spill cause explanation: | |
| 26 | Where did failure occur?: | |
| 27 | Explanation of where failure occurred: | |
| 28 | Diameter of sewer pipe at point of blockage or spill cause (if applicable): | |
| 29 | Material of sewer pipe at the point of blockage or spill cause (if applicable); | |
| 30 | Estimated age of sewer pipe at the point of blockage or spill cause (if applicable): | |
| 31 | Description of terrain surrounding the point of blockage or spill cause (if applicable): | |
| 32 | Spill response activities: | |



SANITARY SEWER OVERFLOW DATA WORKSHEET

If possible take photos of spill and any damage to personal property.



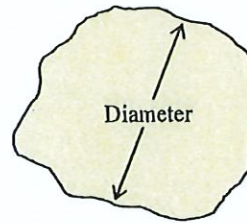
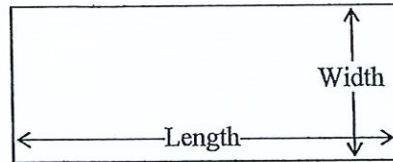
| | | |
|----|---|----------------|
| 33 | Explanation of spill response activities: | |
| 34 | Visual inspection results from impacted receiving water: | |
| 35 | Health warnings posted?: | YES NO |
| 36 | Name of impacted beaches (enter NA if not applicable): | |
| 37 | Name of impacted surface waters (enter NA if not applicable): | |
| 38 | OES Control Number: | |
| 39 | OES Called Date/Time: | |
| 40 | County Health Agency Notified: | YES NO |
| 41 | Method notification: | |
| 42 | Name of staff contacted: | |
| 43 | Phone Number of Staff Contacted: | |
| 44 | Date and Time Notified: | |
| 45 | RWQB notified date/time: | |
| 46 | Method notification: | |
| 47 | Name of staff contacted: | |
| 48 | Phone Number of Staff Contacted: | |
| 49 | Other Agency Notified: | YES NO Agency: |
| 50 | Was any of this spill report info submitted via fax (or electronically) to the RWQCB: | YES NO |

FLOW CALCULATIONS

Contained Area

Estimate the volume of an overflow based on area calculations. Use the following steps to calculate volume:

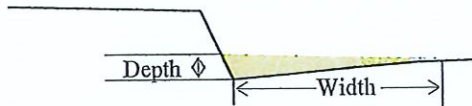
1. Sketch the shape of the spill
2. Measure the dimension of the spill
3. Measure the average depth of the spill
4. Convert all measurements to feet
5. Calculate the volume using the following formulas:
6. Rectangular (gallons) = length x width x depth x 7.48
7. Circular (gallons) = $0.785 * (\text{diameter})^2 * \text{depth}$



Contained in Street Gutter

Estimate the volume of an overflow contained along a street gutter. Use the following steps to calculate volume:

1. Measure the length and width of the spill
2. Measure the average depth of the spill
3. Convert all measurements to feet
4. Calculate the volume using the following formula:
5. Volume (gallons) = length x width x depth x 3.74



Un-contained Flow

The overflow volume can be estimated with the following formula:

$$\text{Volume (gallons)} = \text{Flow Rate (gpm)} \times \text{duration (minutes)}$$

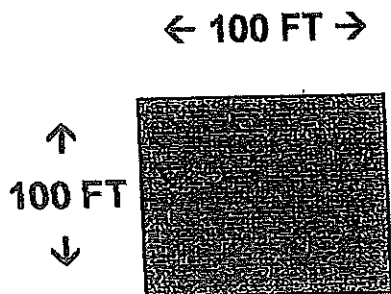
SANITARY SEWER OVERFLOWS

Determining Flow Volume - Measurement

The volume of some small spills can be estimated using this method if it is not raining. In addition, the shape, dimensions, and depth of the spilled wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume.

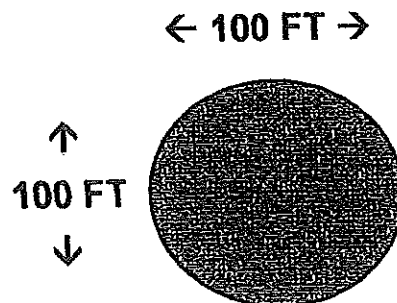
- Step 1 Sketch the shape of the contained sewage
- Step 2 Measure or pace off the dimensions.
- Step 3 Measure the depth in several locations
- Step 4 Convert the dimensions, including depth to feet.
- Step 5 Calculate the area using the following formulas:
Rectangle Area = length x width
Circle Area = diameter x diameter x 0.785
Triangle Area = base x height x 0.5
- Step 6 Multiply the area times the depth
- Step 7 Multiply the volume by 7.85 to convert it to gallons

EXAMPLE:



$$V = 100' \times 100' \times .5' \times 7.85$$
$$= 37,400 \text{ gallons}$$

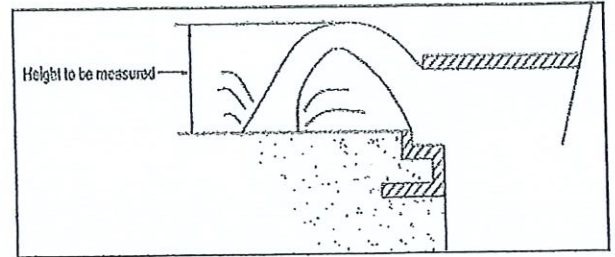
EXAMPLE:



$$V = 100' \times 100' \times .5' \times .785 \times 7.85$$
$$= 29,359 \text{ gallons}$$

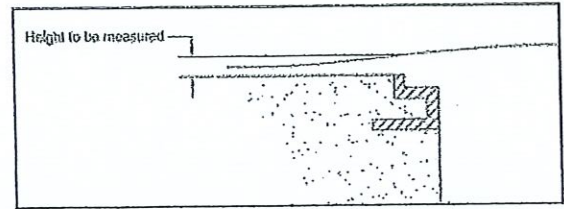
Manhole with Cover in Place

| Height of spout above M/H Rim "H" in height | 24" MH Cover in Place | | 36" MH Cover in Place | |
|---|-----------------------|---|-----------------------|---|
| | SSO flow "Q" in gpm | Min. Sewer size in which these flows are possible | SSO flow "Q" in gpm | Min. Sewer size in which these flows are possible |
| 1/4 | 1 | | 1 | |
| 1/2 | 3 | | 4 | |
| 3/4 | 6 | | 8 | |
| 1 | 9 | | 13 | |
| 1 1/4 | 12 | | 18 | |
| 1 1/2 | 16 | | 24 | |
| 1 3/4 | 21 | | 31 | |
| 2 | 25 | | 37 | |
| 2 1/4 | 31 | | 45 | |
| 2 1/2 | 38 | | 55 | |
| 2 3/4 | 45 | | 66 | |
| 3 | 54 | | 78 | |
| 3 1/4 | 64 | | 93 | |
| 3 1/2 | 75 | | 109 | |
| 3 3/4 | 87 | | 127 | |
| 4 | 100 | | 147 | |
| 4 1/4 | 115 | | 169 | |
| 4 1/2 | 131 | | 192 | |
| 4 3/4 | 148 | | 217 | 6" |
| 5 | 166 | | 243 | |
| 5 1/4 | 185 | | 270 | |
| 5 1/2 | 204 | | 299 | |
| 5 3/4 | 224 | 6" | 327 | |
| 6 | 244 | | 357 | |
| 6 1/4 | 265 | | 387 | 8" |
| 6 1/2 | 286 | | 419 | |
| 6 3/4 | 308 | | 451 | |
| 7 | 331 | | 483 | |
| 7 1/4 | 354 | | 547 | |
| 7 1/2 | 377 | | 551 | |
| 7 3/4 | 401 | 8" | 587 | 10" |
| 8 | 426 | | 622 | |
| 8 1/4 | 451 | | 659 | |
| 8 1/2 | 476 | | 697 | |
| 8 3/4 | 502 | | 734 | |
| 9 | 529 | | 773 | |



Manhole with Cover Removed

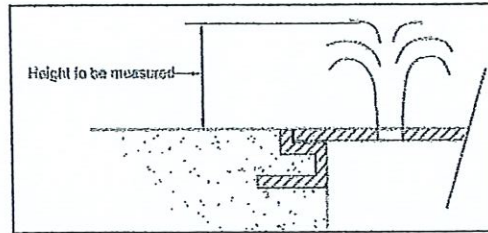
| Height of spout above M/H Frame "H" in height | 24" MH Cover Removed | | 36" MH Cover Removed | |
|---|----------------------|---|----------------------|---|
| | SSO flow "Q" in gpm | Min. Sewer size in which these flows are possible | SSO flow "Q" in gpm | Min. Sewer size in which these flows are possible |
| 1/8 | 28 | | 49 | |
| 1/4 | 62 | | 111 | |
| 3/8 | 111 | | 187 | 6" |
| 1/2 | 160 | | 271 | |
| 5/8 | 215 | 6" | 361 | 8" |
| 3/4 | 354 | 8" | 458 | |
| 7/8 | 569 | 10" | 556 | 10" |
| 1 | 799 | 12" | 660 | 12" |
| 1 1/8 | 1,035 | | 1,035 | |
| 1 1/4 | 1,340 | 15" | 1,486 | 15" |
| 1 3/8 | 1,660 | | 1,951 | |
| 1 1/2 | 1,986 | | 2,424 | 18" |
| 1 5/8 | 2,396 | | 2,903 | |
| 1 3/4 | 5,799 | | 3,382 | |
| 1 7/8 | 3,132 | | 3,917 | 24" |
| 2 | 3,444 | 21" | 4,458 | |
| 2 1/8 | 3,750 | | 5,000 | |
| 2 1/4 | 3,986 | | 5,556 | |
| 2 3/8 | 4,215 | | 6,118 | |
| 2 1/2 | 4,437 | | 6,764 | |
| 2 5/8 | 4,569 | 24" | 7,403 | |
| 2 3/4 | 4,687 | | 7,972 | 30" |
| 2 7/8 | 4,799 | | 8,521 | |
| 3 | 4,910 | | 9,062 | |
| 3 1/8 | | | 9,604 | |
| 3 1/4 | | | 10,139 | |
| 3 3/8 | | | 10,625 | 36" |
| 3 1/2 | | | 11,097 | |
| 3 5/8 | | | 11,569 | |
| 3 3/4 | | | 12,035 | |
| 3 7/8 | | | 12,486 | |
| 4 | | | 12,861 | |
| 4 1/8 | | | 13,076 | |
| 4 1/4 | | | 13,285 | |
| 4 3/8 | | | 13,486 | |



Manhole pick-hole with Cover in Place

| Height of spout above M/H Cover "H" | SSO flow "Q" in gpm |
|-------------------------------------|---------------------|
| 1/8 | 1.0 |
| 1/4 | 1.4 |
| 3/8 | 1.7 |
| 1/2 | 1.9 |
| 5/8 | 2.2 |
| 3/4 | 2.4 |
| 7/8 | 2.6 |
| 1 | 2.7 |
| 1 1/8 | 2.9 |
| 1 1/4 | 3.1 |
| 1 3/8 | 3.2 |
| 1 1/2 | 3.4 |
| 1 5/8 | 3.5 |
| 1 3/4 | 3.6 |
| 1 7/8 | 3.7 |
| 2 | 3.9 |
| 2 1/8 | 4.0 |
| 2 1/4 | 4.1 |
| 2 3/8 | 4.2 |
| 2 1/2 | 4.3 |
| 2 5/8 | 4.4 |
| 2 3/4 | 4.5 |
| 2 7/8 | 4.6 |
| 3 | 4.7 |
| 3 1/8 | 4.8 |
| 3 1/4 | 4.9 |
| 3 3/8 | 5.0 |
| 3 1/2 | 5.1 |
| 3 5/8 | 5.2 |
| 3 3/4 | 5.3 |
| 3 7/8 | 5.4 |
| 4 | 5.5 |
| 4 1/8 | 5.6 |
| 4 1/4 | 5.6 |
| 4 3/8 | 5.7 |
| 4 1/2 | 5.8 |
| 4 5/8 | 5.9 |
| 4 3/4 | 6.0 |
| 4 7/8 | 6.0 |
| 5 | 6.1 |

| Height of spout above M/H Cover "H" | SSO flow "Q" in gpm |
|-------------------------------------|---------------------|
| 5 1/8 | 6.2 |
| 5 1/4 | 6.3 |
| 5 3/8 | 6.3 |
| 5 1/2 | 6.4 |
| 5 5/8 | 6.5 |
| 5 3/4 | 6.6 |
| 5 7/8 | 6.6 |
| 6 | 6.7 |
| 6 1/8 | 6.8 |
| 6 1/4 | 6.8 |
| 6 3/8 | 6.9 |
| 6 1/2 | 7.0 |
| 6 5/8 | 7.0 |
| 6 3/4 | 7.1 |
| 6 7/8 | 7.2 |
| 7 | 7.2 |
| 7 1/8 | 7.3 |
| 7 1/4 | 7.4 |
| 7 3/8 | 7.4 |
| 7 1/2 | 7.5 |
| 7 5/8 | 7.6 |
| 7 3/4 | 7.6 |
| 7 7/8 | 7.7 |
| 8 | 7.7 |
| 8 1/8 | 7.8 |
| 8 1/4 | 7.9 |
| 8 3/8 | 7.9 |
| 8 1/2 | 8.0 |
| 8 5/8 | 8.0 |
| 8 3/4 | 8.1 |
| 8 7/8 | 8.1 |
| 9 | 8.2 |
| 9 1/8 | 8.3 |
| 9 1/4 | 8.3 |
| 9 3/8 | 8.4 |
| 9 1/2 | 8.4 |
| 9 5/8 | 8.5 |
| 9 3/4 | 8.5 |
| 9 7/8 | 8.6 |
| 10 | 8.7 |



Unrestricted M/H cover will start to lift

Note: this chart is based on a 7.8 inch diameter pick hole.

Flow Estimation Pictures

Wastewater Collection Division
(619) 654-4160



50 gpm



200 gpm



275 gpm

rev. 4/99

Reference Sheet for Estimating Sewer Spills
from Overflowing Sewer Manholes
All estimates are calculated in gallons per minute (gpm)

City of San Diego
Metropolitan Wastewater Department



5 gpm



100 gpm



225 gpm

All photos were taken during a demonstration using tinted water from a hydrant in cooperation with the City of San Diego's Water Department.

Gibbs Pump Station

Atlantic Pump Station

Riverwood Pump Station

Northwest Influent Pump Station

Airport Road Pump Station

Private Pump Stations

River Road Pump Station

City Hall Pump Station

Marina Pump Station

Vineyard Bluffs Pump Station

Second Street Pump Station

LEGEND

☐ Lift Stations

• Sewer Manholes

Sewer Pipe Diameter

Unknown

3-inches

4-inches

5-inches

6-inches

8-inches

10-inches

12-inches

14-inches

15-inches

18-inches

21-inches

24-inches

27-inches

Force Mains

◻ Rio Vista City Limits

Note:
Arrows on the sewer pipe indicate the direction of flow.

M:\Rio Vista - RIOVISTA\Map - MXD\IOERR Appendix A Sewer System Map for Veeha.mxd

APPENDIX VI-B
City of Rio Vista
Sewer System Management Plan
CSWRCB Order No. WQ 2013-0058-EXEC

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STATE OF CALIFORNIA
WATER RESOURCES CONTROL BOARD
ORDER NO. WQ 2013-0058-EXEC

AMENDING MONITORING AND REPORTING PROGRAM
FOR
STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR
SANITARY SEWER SYSTEMS

The State of California, Water Resources Control Board (hereafter State Water Board) finds:

1. The State Water Board is authorized to prescribe statewide general Waste Discharge Requirements (WDRs) for categories of discharges that involve the same or similar operations and the same or similar types of waste pursuant to Water Code section 13263(i).
2. Water Code section 13193 *et seq.* requires the Regional Water Quality Control Boards (Regional Water Boards) and the State Water Board (collectively, the Water Boards) to gather Sanitary Sewer Overflow (SSO) information and make this information available to the public, including but not limited to, SSO cause, estimated volume, location, date, time, duration, whether or not the SSO reached or may have reached waters of the state, response and corrective action taken, and an enrollee's contact information for each SSO event. An enrollee is defined as the public entity having legal authority over the operation and maintenance of, or capital improvements to, a sanitary sewer system greater than one mile in length.
3. Water Code section 13271, *et seq.* requires notification to the California Office of Emergency Services (Cal OES), formerly the California Emergency Management Agency, for certain unauthorized discharges, including SSOs.
4. On May 2, 2006, the State Water Board adopted Order 2006-0003-DWQ, "Statewide Waste Discharge Requirements for Sanitary Sewer Systems"¹ (hereafter SSS WDRs) to comply with Water Code section 13193 and to establish the framework for the statewide SSO Reduction Program.
5. Subsection G.2 of the SSS WDRs and the Monitoring and Reporting Program (MRP) provide that the Executive Director may modify the terms of the MRP at any time.
6. On February 20, 2008, the State Water Board Executive Director adopted a revised MRP for the SSS WDRs to rectify early notification deficiencies and ensure that first responders are notified in a timely manner of SSOs discharged into waters of the state.
7. When notified of an SSO that reaches a drainage channel or surface water of the state, Cal OES, pursuant to Water Code section 13271(a)(3), forwards the SSO notification information² to local government agencies and first responders including local public health officials and the applicable Regional Water Board. Receipt of notifications for a single SSO event from both the SSO reporter and Cal OES is duplicative. To address this, the SSO notification requirements added by the February 20, 2008 MRP revision are being removed in this MRP revision.

¹ Available for download at:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2006/wgo/wgo20060003.pdf

² Cal OES Hazardous Materials Spill Reports available Online at:

[http://w3.calema.ca.gov/operational/malhaz.nsf/\\$defaultview](http://w3.calema.ca.gov/operational/malhaz.nsf/$defaultview) and
<http://w3.calema.ca.gov/operational/malhaz.nsf>

8. In the February 28, 2008 Memorandum of Agreement between the State Water Board and the California Water and Environment Association (CWEA), the State Water Board committed to re- designing the CIWQS3 Online SSO Database to allow "event" based SSO reporting versus the original "location" based reporting. Revisions to this MRP and accompanying changes to the CIWQS Online SSO Database will implement this change by allowing for multiple SSO appearance points to be associated with each SSO event caused by a single asset failure.
9. Based on stakeholder input and Water Board staff experience implementing the SSO Reduction Program, SSO categories have been revised in this MRP. In the prior version of the MRP, SSOs have been categorized as Category 1 or Category 2. This MRP implements changes to SSO categories by adding a Category 3 SSO type. This change will improve data management to further assist Water Board staff with evaluation of high threat and low threat SSOs by placing them in unique categories (i.e., Category 1 and Category 3, respectively). This change will also assist enrollees in identifying SSOs that require Cal OES notification.
10. Based on over six years of implementation of the SSS WDRs, the State Water Board concludes that the February 20, 2008 MRP must be updated to better advance the SSO Reduction Program⁴ objectives, assess compliance, and enforce the requirements of the SSS WDRs.

IT IS HEREBY ORDERED THAT:

Pursuant to the authority delegated by Water Code section 13267(f), Resolution 2002-0104, and Order 2006-0003-DWQ, the MRP for the SSS WDRs (Order 2006-0003-DWQ) is hereby amended as shown in Attachment A and shall be effective on September 9, 2013.

8/6/13

Date


Thomas Howard
Executive Director

³ California Integrated Water Quality System (CIWQS) publicly available at <http://www.waterboards.ca.gov/ciwqs/publicreports.shtml>

⁴ Statewide Sanitary Sewer Overflow Reduction Program information is available at: http://www.waterboards.ca.gov/water_issues/programs/ssr/

ATTACHMENT A

STATE WATER RESOURCES CONTROL BOARD ORDER NO. WQ 2013-0058-EXEC

AMENDING MONITORING AND REPORTING PROGRAM FOR STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER SYSTEMS

This Monitoring and Reporting Program (MRP) establishes monitoring, record keeping, reporting and public notification requirements for Order 2006-0003-DWQ, "Statewide General Waste Discharge Requirements for Sanitary Sewer Systems" (SSS WDRs). This MRP shall be effective from September 9, 2013 until it is rescinded. The Executive Director may make revisions to this MRP at any time. These revisions may include a reduction or increase in the monitoring and reporting requirements. All site specific records and data developed pursuant to the SSS WDRs and this MRP shall be complete, accurate, and justified by evidence maintained by the enrollee. Failure to comply with this MRP may subject an enrollee to civil liabilities of up to \$5,000 a day per violation pursuant to Water Code section 13350; up to \$1,000 a day per violation pursuant to Water Code section 13268; or referral to the Attorney General for judicial civil enforcement. The State Water Resources Control Board (State Water Board) reserves the right to take any further enforcement action authorized by law.

A. SUMMARY OF MRP REQUIREMENTS

Table 1 – Spill Categories and Definitions

| CATEGORIES | DEFINITIONS [see Section A on page 5 of Order 2006-0003-DWQ, for Sewer Overflow (SSO) definition] |
|-------------------|--|
| CATEGORY 1 | Discharges of untreated or partially treated wastewater of <u>any volume</u> resulting from an enrollee's sanitary sewer system failure or flow condition that: <ul style="list-style-type: none">• Reach surface water and/or reach a drainage channel tributary to a surface water; or• Reach a Municipal Separate Storm Sewer System (MS4) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond). |
| CATEGORY 2 | Discharges of untreated or partially treated wastewater of <u>1,000 gallons or greater</u> resulting from an enrollee's sanitary sewer system failure or flow condition that <u>do not</u> reach surface water, a drainage channel, or a MS4 unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly. |
| CATEGORY 3 | All other discharges of untreated or partially treated wastewater resulting from an enrollee's sanitary sewer system failure or flow condition. |

| | |
|--|--|
| CATEGORIES | DEFINITIONS [see Section A on page 5 of Order 2006-0003-DWQ, for Sewer Overflow (SSO) definition] |
| PRIVATE LATERAL SEWAGE DISCHARGE (PLSD) | Discharges of untreated or partially treated wastewater resulting from blockages or other problems <u>within a privately owned sewer lateral</u> connected to the enrollee's sanitary sewer system or from other private sewer assets. PLSDs that the enrollee becomes aware of may be <u>voluntarily</u> reported to the California Integrated Water Quality System (CIWQS) Online SSO Database. |

Table 2 – Notification, Reporting, Monitoring, and Record Keeping Requirements

| ELEMENT | REQUIREMENT | METHOD |
|---|---|---|
| NOTIFICATION (see section B of MRP) | <ul style="list-style-type: none"> • Within two hours of becoming aware of any Category 1 SSO <u>greater than or equal to 1,000 gallons discharged to surface water or spilled in a location where it probably will be discharged to surface water</u>, notify the California Office of Emergency Services (Cal OES) and obtain a notification control number. | Call Cal OES at: (800) 852-7550 |
| REPORTING (see section C of MRP) | <ul style="list-style-type: none"> • Category 1 SSO: Submit draft report within three business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • Category 2 SSO: Submit draft report within 3 business days of becoming aware of the SSO and certify within 15 calendar days of the SSO end date. • Category 3 SSO: Submit certified report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: Submit within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater are spilled to surface waters. • “No Spill” Certification: Certify that no SSOs occurred within 30 calendar days of the end of the month or, if reporting quarterly, the quarter in which no SSOs occurred. • Collection System Questionnaire: Update and certify every 12 months. | Enter data into the CIWQS Online SSO Database (http://ciwqs.waterboards.ca.gov/), certified by enrollee's Legally Responsible Official(s). |
| WATER QUALITY MONITORING (see section D of MRP) | <ul style="list-style-type: none"> • Conduct water quality sampling <u>within 48 hours</u> after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters. | Water quality results are required to be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters. |

| | | |
|--|---|--|
| RECORD KEEPING (see section E of MRP) | <ul style="list-style-type: none">• SSO event records.• Records documenting Sanitary Sewer Management Plan (SSMP) implementation and changes/updates to the SSMP.• Records to document Water Quality Monitoring for SSOs of 50,000 gallons or greater spilled to surface waters.• Collection system telemetry records if relied upon to document and/or estimate SSO Volume. | Self-maintained records shall be available during inspections or upon request. |
|--|---|--|

B. NOTIFICATION REQUIREMENTS

Although Regional Water Quality Control Boards (Regional Water Boards) and the State Water Board (collectively, the Water Boards) staff do not have duties as first responders, this MRP is an appropriate mechanism to ensure that the agencies that have first responder duties are notified in a timely manner in order to protect public health and beneficial uses.

1. For any Category 1 SSO greater than or equal to 1,000 gallons that results in a discharge to a surface water or spilled in a location where it probably will be discharged to surface water, either directly or by way of a drainage channel or MS4, the enrollee shall, as soon as possible, but not later than two (2) hours after (A) the enrollee has knowledge of the discharge, (B) notification is possible, and (C) notification can be provided without substantially impeding cleanup or other emergency measures, notify the Cal OES and obtain a notification control number.
2. To satisfy notification requirements for each applicable SSO, the enrollee shall provide the information requested by Cal OES before receiving a control number. Spill information requested by Cal OES may include:
 - i. Name of person notifying Cal OES and direct return phone number.
 - ii. Estimated SSO volume discharged (gallons).
 - iii. If ongoing, estimated SSO discharge rate (gallons per minute).
 - iv. SSO Incident Description:
 - a. Brief narrative.
 - b. On-scene point of contact for additional information (name and cell phone number).
 - c. Date and time enrollee became aware of the SSO.
 - d. Name of sanitary sewer system agency causing the SSO.
 - e. SSO cause (if known).
 - v. Indication of whether the SSO has been contained.
 - vi. Indication of whether surface water is impacted.
 - vii. Name of surface water impacted by the SSO, if applicable.
 - viii. Indication of whether a drinking water supply is or may be impacted by the SSO.
 - ix. Any other known SSO impacts.
 - x. SSO incident location (address, city, state, and zip code).
3. Following the initial notification to Cal OES and until such time that an enrollee certifies the SSO report in the CIWQS Online SSO Database, the enrollee shall provide updates to Cal OES regarding substantial changes to the estimated volume of untreated or partially treated sewage discharged and any substantial change(s) to known impact(s).

4. PLSDs: The enrollee is strongly encouraged to notify Cal OES of discharges greater than or equal to 1,000 gallons of untreated or partially treated wastewater that result or may result in a discharge to surface water resulting from failures or flow conditions within a privately owned sewer lateral or from other private sewer asset(s) if the enrollee becomes aware of the PLSD.

C. **REPORTING REQUIREMENTS**

1. **CIWQS Online SSO Database Account:** All enrollees shall obtain a CIWQS Online SSO Database account and receive a “Username” and “Password” by registering through CIWQS. These accounts allow controlled and secure entry into the CIWQS Online SSO Database.
2. **SSO Mandatory Reporting Information:** For reporting purposes, if one SSO event results in multiple appearance points in a sewer system asset, the enrollee shall complete one SSO report in the CIWQS Online SSO Database which includes the GPS coordinates for the location of the SSO appearance point closest to the failure point, blockage or location of the flow condition that caused the SSO, and provide descriptions of the locations of all other discharge points associated with the SSO event.
3. **SSO Categories**
 - i. **Category 1** – Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee’s sanitary sewer system failure or flow condition that:
 - a. Reach surface water and/or reach a drainage channel tributary to a surface water; or
 - b. Reach a MS4 and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond).
 - ii. **Category 2** – Discharges of untreated or partially treated wastewater greater than or equal to 1,000 gallons resulting from an enrollee’s sanitary sewer system failure or flow condition that does not reach a surface water, a drainage channel, or the MS4 unless the entire SSO volume discharged to the storm drain system is fully recovered and disposed of properly.
 - iii. **Category 3** – All other discharges of untreated or partially treated wastewater resulting from an enrollee’s sanitary sewer system failure or flow condition.
4. **Sanitary Sewer Overflow Reporting to CIWQS - Timeframes**
 - i. **Category 1 and Category 2 SSOs** – All SSOs that meet the above criteria for Category 1 or Category 2 SSOs shall be reported to the CIWQS Online SSO Database:
 - a. Draft reports for Category 1 and Category 2 SSOs shall be submitted to the CIWQS Online SSO Database within three (3) business days of the enrollee becoming aware of the SSO. Minimum information that shall be reported in a draft Category 1 SSO report shall include all information identified in section 8.i.a. below. Minimum information that shall be reported in a Category 2 SSO draft report shall include all information identified in section 8.i.c below.

- b. A final Category 1 or Category 2 SSO report shall be certified through the CIWQS Online SSO Database within 15 calendar days of the end date of the SSO. Minimum information that shall be certified in the final Category 1 SSO report shall include all information identified in section 8.i.b below. Minimum information that shall be certified in a final Category 2 SSO report shall include all information identified in section 8.i.d below.
- ii. **Category 3 SSOs** – All SSOs that meet the above criteria for Category 3 SSOs shall be reported to the CIWQS Online SSO Database and certified within 30 calendar days after the end of the calendar month in which the SSO occurs (e.g., all Category 3 SSOs occurring in the month of February shall be entered into the database and certified by March 30). Minimum information that shall be certified in a final Category 3 SSO report shall include all information identified in section 8.i.e below.
- iii. **“No Spill” Certification** – If there are no SSOs during the calendar month, the enrollee shall either 1) certify, within 30 calendar days after the end of each calendar month, a “No Spill” certification statement in the CIWQS Online SSO Database certifying that there were no SSOs for the designated month, or 2) certify, quarterly within 30 calendar days after the end of each quarter, “No Spill” certification statements in the CIWQS Online SSO Database certifying that there were no SSOs for each month in the quarter being reported on. For quarterly reporting, the quarters are Q1 - January/ February/ March, Q2 - April/May/June, Q3 - July/August/September, and Q4 - October/November/December.

If there are no SSOs during a calendar month but the enrollee reported a PLSD, the enrollee shall still certify a “No Spill” certification statement for that month.

- iv. **Amended SSO Reports** – The enrollee may update or add additional information to a certified SSO report within 120 calendar days after the SSO end date by amending the report or by adding an attachment to the SSO report in the CIWQS Online SSO Database. SSO reports certified in the CIWQS Online SSO Database prior to the adoption date of this MRP may only be amended up to 120 days after the effective date of this MRP. After 120 days, the enrollee may contact the SSO Program Manager to request to amend an SSO report if the enrollee also submits justification for why the additional information was not available prior to the end of the 120 days.

5. **SSO Technical Report**

The enrollee shall submit an SSO Technical Report in the CIWQS Online SSO Database within 45 calendar days of the SSO end date for any SSO in which 50,000 gallons or greater are spilled to surface waters. This report, which does not preclude the Water Boards from requiring more detailed analyses if requested, shall include at a minimum, the following:

- i. **Causes and Circumstances of the SSO:**
 - a. Complete and detailed explanation of how and when the SSO was discovered.
 - b. Diagram showing the SSO failure point, appearance point(s), and final destination(s).
 - c. Detailed description of the methodology employed and available data used to calculate the volume of the SSO and, if applicable, the SSO volume recovered.
 - d. Detailed description of the cause(s) of the SSO.

- e. Copies of original field crew records used to document the SSO.
- f. Historical maintenance records for the failure location.

ii. **Enrollee's Response to SSO:**

- a. Chronological narrative description of all actions taken by enrollee to terminate the spill.
- b. Explanation of how the SSMP Overflow Emergency Response plan was implemented to respond to and mitigate the SSO.
- c. Final corrective action(s) completed and/or planned to be completed, including a schedule for actions not yet completed.

iii. **Water Quality Monitoring:**

- a. Description of all water quality sampling activities conducted including analytical results and evaluation of the results.
- b. Detailed location map illustrating all water quality sampling points.

6. **PLSDs**

Discharges of untreated or partially treated wastewater resulting from blockages or other problems within a privately owned sewer lateral connected to the enrollee's sanitary sewer system or from other private sanitary sewer system assets may be voluntarily reported to the CIWQS Online SSO Database.

- i. The enrollee is also encouraged to provide notification to Cal OES per section B above when a PLSD greater than or equal to 1,000 gallons has or may result in a discharge to surface water. For any PLSD greater than or equal to 1,000 gallons regardless of the spill destination, the enrollee is also encouraged to file a spill report as required by Health and Safety Code section 5410 et. seq. and Water Code section 13271, or notify the responsible party that notification and reporting should be completed as specified above and required by State law.
- ii. If a PLSD is recorded in the CIWQS Online SSO Database, the enrollee must identify the sewage discharge as occurring and caused by a private sanitary sewer system asset and should identify a responsible party (other than the enrollee), if known. Certification of PLSD reports by enrollees is not required.

7. **CIWQS Online SSO Database Unavailability**

In the event that the CIWQS Online SSO Database is not available, the enrollee must fax or e-mail all required information to the appropriate Regional Water Board office in accordance with the time schedules identified herein. In such event, the enrollee must also enter all required information into the CIWQS Online SSO Database when the database becomes available.

8. **Mandatory Information to be Included in CIWQS Online SSO Reporting**

All enrollees shall obtain a CIWQS Online SSO Database account and receive a "Username" and "Password" by registering through CIWQS which can be reached at CIWQS@waterboards.ca.gov or by calling (866) 792-4977, M-F, 8 A.M. to 5 P.M. These accounts will allow controlled and secure entry into the CIWQS Online SSO Database. Additionally, within thirty (30) days of initial enrollment and prior to recording SSOs into the CIWQS Online SSO Database, all enrollees must complete a Collection System Questionnaire (Questionnaire). The Questionnaire shall be updated at least once every 12 months.

i. **SSO Reports**

At a minimum, the following mandatory information shall be reported prior to finalizing and certifying an SSO report for each category of SSO:

- a. **Draft Category 1 SSOs**: At a minimum, the following mandatory information shall be reported for a draft Category 1 SSO report:
 1. SSO Contact Information: Name and telephone number of enrollee contact person who can answer specific questions about the SSO being reported.
 2. SSO Location Name.
 3. Location of the overflow event (SSO) by entering GPS coordinates. If a single overflow event results in multiple appearance points, provide GPS coordinates for the appearance point closest to the failure point and describe each additional appearance point in the SSO appearance point explanation field.
 4. Whether or not the SSO reached surface water, a drainage channel, or entered and was discharged from a drainage structure.
 5. Whether or not the SSO reached a municipal separate storm drain system.
 6. Whether or not the total SSO volume that reached a municipal separate storm drain system was fully recovered.
 7. Estimate of the SSO volume, inclusive of all discharge point(s).
 8. Estimate of the SSO volume that reached surface water, a drainage channel, or was not recovered from a storm drain.
 9. Estimate of the SSO volume recovered (if applicable).
 10. Number of SSO appearance point(s).
 11. Description and location of SSO appearance point(s). If a single sanitary sewer system failure results in multiple SSO appearance points, each appearance point must be described.
 12. SSO start date and time.
 13. Date and time the enrollee was notified of, or self-discovered, the SSO.
 14. Estimated operator arrival time.
 15. For spills greater than or equal to 1,000 gallons, the date and time Cal OES was called.

16. For spills greater than or equal to 1,000 gallons, the Cal OES control number.
- b. **Certified Category 1 SSOs:** At a minimum, the following mandatory information shall be reported for a certified Category 1 SSO report, in addition to all fields in section 8.i.a:
1. Description of SSO destination(s).
 2. SSO end date and time.
 3. SSO causes (mainline blockage, roots, etc.).
 4. SSO failure point (main, lateral, etc.).
 5. Whether or not the spill was associated with a storm event.
 6. Description of spill corrective action, including steps planned or taken to reduce, eliminate, and prevent reoccurrence of the overflow; and a schedule of major milestones for those steps.
 7. Description of spill response activities.
 8. Spill response completion date.
 9. Whether or not there is an ongoing investigation, the reasons for the investigation and the expected date of completion.
 10. Whether or not a beach closure occurred or may have occurred as a result of the SSO.
 11. Whether or not health warnings were posted as a result of the SSO.
 12. Name of beach(es) closed and/or impacted. If no beach was impacted, NA shall be selected.
 13. Name of surface water(s) impacted.
 14. If water quality samples were collected, identify parameters the water quality samples were analyzed for. If no samples were taken, NA shall be selected.
 15. If water quality samples were taken, identify which regulatory agencies received sample results (if applicable). If no samples were taken, NA shall be selected.
 16. Description of methodology(ies) and type of data relied upon for estimations of the SSO volume discharged and recovered.
 17. SSO Certification: Upon SSO Certification, the CIWQS Online SSO Database will issue a final SSO identification (ID) number.
- c. **Draft Category 2 SSOs:** At a minimum, the following mandatory information shall be reported for a draft Category 2 SSO report:
1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO.

- d. **Certified Category 2 SSOs:** At a minimum, the following mandatory information shall be reported for a certified Category 2 SSO report:
 1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO and Items 1-9, and 17 in section 8.i.b above for Certified Category 1 SSO.
- e. **Certified Category 3 SSOs:** At a minimum, the following mandatory information shall be reported for a certified Category 3 SSO report:
 1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO and Items 1-5, and 17 in section 8.i.b above for Certified Category 1 SSO.

ii. **Reporting SSOs to Other Regulatory Agencies**

These reporting requirements do not preclude an enrollee from reporting SSOs to other regulatory agencies pursuant to state law. In addition, these reporting requirements do not replace other Regional Water Board notification and reporting requirements for SSOs.

iii. **Collection System Questionnaire**

The required Questionnaire (see subsection G of the SSS WDRs) provides the Water Boards with site-specific information related to the enrollee's sanitary sewer system. The enrollee shall complete and certify the Questionnaire at least every 12 months to facilitate program implementation, compliance assessment, and enforcement response.

iv. **SSMP Availability**

The enrollee shall provide the publicly available internet web site address to the CIWQS Online SSO Database where a downloadable copy of the enrollee's approved SSMP, critical supporting documents referenced in the SSMP, and proof of local governing board approval of the SSMP is posted. If all of the SSMP documentation listed in this subsection is not publicly available on the Internet, the enrollee shall comply with the following procedure:

- a. Submit an **electronic** copy of the enrollee's approved SSMP, critical supporting documents referenced in the SSMP, and proof of local governing board approval of the SSMP to the State Water Board, within 30 days of that approval and within 30 days of any subsequent SSMP re-certifications, to the following mailing address:

State Water Resources Control Board
Division of Water Quality
Attn: SSO Program Manager
1001 I Street, 15th Floor, Sacramento, CA 95814

D. WATER QUALITY MONITORING REQUIREMENTS:

To comply with subsection D.7(v) of the SSS WDRs, the enrollee shall develop and implement an SSO Water Quality Monitoring Program to assess impacts from SSOs to surface waters in which 50,000 gallons or greater are spilled to surface waters. The SSO Water Quality Monitoring Program, shall, at a minimum:

1. Contain protocols for water quality monitoring.
2. Account for spill travel time in the surface water and scenarios where monitoring may not be possible (e.g. safety, access restrictions, etc.).
3. Require water quality analyses for ammonia and bacterial indicators to be performed by an accredited or certified laboratory.
4. Require monitoring instruments and devices used to implement the SSO Water Quality Monitoring Program to be properly maintained and calibrated, including any records to document maintenance and calibration, as necessary, to ensure their continued accuracy.
5. Within 48 hours of the enrollee becoming aware of the SSO, require water quality sampling for, at a minimum, the following constituents:
 - i. Ammonia
 - ii. Appropriate Bacterial indicator(s) per the applicable Basin Plan water quality objective or Regional Board direction which may include total and fecal coliform, enterococcus, and e-coli.

E. RECORD KEEPING REQUIREMENTS:

The following records shall be maintained by the enrollee for a minimum of five (5) years and shall be made available for review by the Water Boards during an onsite inspection or through an information request:

1. General Records: The enrollee shall maintain records to document compliance with all provisions of the SSS WDRs and this MRP for each sanitary sewer system owned including any required records generated by an enrollee's sanitary sewer system contractor(s).
2. SSO Records: The enrollee shall maintain records for each SSO event, including but not limited to:
 - i. Complaint records documenting how the enrollee responded to all notifications of possible or actual SSOs, both during and after business hours, including complaints that do not result in SSOs. Each complaint record shall, at a minimum, include the following information:
 - a. Date, time, and method of notification.
 - b. Date and time the complainant or informant first noticed the SSO.
 - c. Narrative description of the complaint, including any information the caller can provide regarding whether or not the complainant or informant reporting the potential SSO knows if the SSO has reached surface waters, drainage channels or storm drains.
 - d. Follow-up return contact information for complainant or informant for each complaint received, if not reported anonymously.
 - e. Final resolution of the complaint.

- ii. Records documenting steps and/or remedial actions undertaken by enrollee, using all available information, to comply with section D.7 of the SSS WDRs.
 - iii. Records documenting how all estimate(s) of volume(s) discharged and, if applicable, volume(s) recovered were calculated.
3. Records documenting all changes made to the SSMP since its last certification indicating when a subsection(s) of the SSMP was changed and/or updated and who authorized the change or update. These records shall be attached to the SSMP.
 4. Electronic monitoring records relied upon for documenting SSO events and/or estimating the SSO volume discharged, including, but not limited to records from:
 - i. Supervisory Control and Data Acquisition (SCADA) systems
 - ii. Alarm system(s)
 - iii. Flow monitoring device(s) or other instrument(s) used to estimate wastewater levels, flow rates and/or volumes.


F. CERTIFICATION

1. All information required to be reported into the CIWQS Online SSO Database shall be certified by a person designated as described in subsection J of the SSS WDRs. This designated person is also known as a Legally Responsible Official (LRO). An enrollee may have more than one LRO.
2. Any designated person (i.e. an LRO) shall be registered with the State Water Board to certify reports in accordance with the CIWQS protocols for reporting.
3. Data Submitter (DS): Any enrollee employee or contractor may enter draft data into the CIWQS Online SSO Database on behalf of the enrollee if authorized by the LRO and registered with the State Water Board. However, only LROs may certify reports in CIWQS.
4. The enrollee shall maintain continuous coverage by an LRO. Any change of a registered LRO or DS (e.g., retired staff), including deactivation or a change to the LRO's or DS's contact information, shall be submitted by the enrollee to the State Water Board within 30 days of the change by calling (866) 792-4977 or e-mailing help@ciwqs.waterboards.ca.gov.
5. A registered designated person (i.e., an LRO) shall certify all required reports under penalty of perjury laws of the state as stated in the CIWQS Online SSO Database at the time of certification.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of an order amended by the Executive Director of the State Water Resources Control Board.

7/30/13
Date


Jeanine Townsend
Clerk to the Board

APPENDIX VIII-A
City of Rio Vista
Sewer System Management Plan
Flow and Loads Evaluation

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To: Rob Hickey
Robin Borre
Cecil Dillon

From: Jason Crowley, PE
Greg Felter, PE

Reviewed By: Curtis Lam, PE

Subject: TM #1 – Flows and Loads Evaluation

Date: April 12, 2022

This Technical Memorandum (TM) is the first in a series of TMs that will be completed in support of the City of Rio Vista Wastewater Plant Consolidation Project.

INTRODUCTION AND PURPOSE

The City of Rio Vista (City) owns and operates two wastewater treatment plants that provide wastewater service to the City, the Beach and Northwest Wastewater Treatment Plants (WWTPs). **Figure 1** displays the location of both WWTPs.

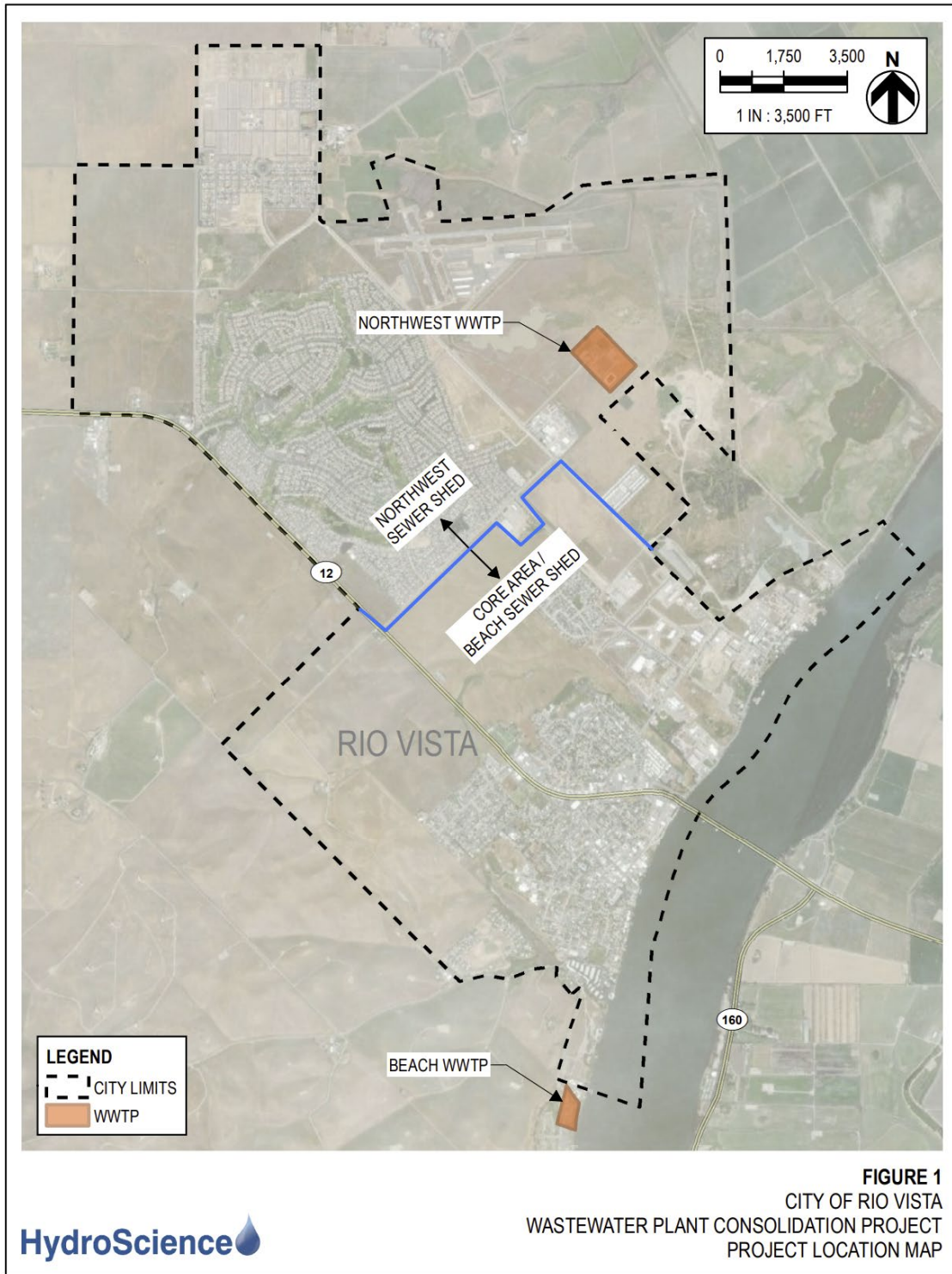
The Beach WWTP is located at 1000 Beach Drive and provides wastewater service to the “Core Area”, which is the shed of the City closest to the Sacramento River and shown in **Figure 1**. The Beach WWTP has a permitted average dry weather flow (ADWF) capacity of 0.65 MGD and a peak wet weather flow (PWWF) capacity of 2.3 MGD. Secondary effluent from the Beach WWTP is discharged through an outfall diffuser to the Sacramento River.

The Northwest WWTP is located at 3000 Airport Road and has a permitted ADWF of 1.0 MGD and a peak hydraulic capacity of 3.0 MGD. Current flows to the Northwest WWTP are significantly less than the ADWF, which results in the plant operating at approximately 30% of its rated capacity on a typical day. The Northwest WWTP treats flow from the north and west sides of the City, which is generally newer construction and comprised primarily of single family residential land uses. Tertiary effluent produced at the Northwest WWTP is discharged to the Sacramento River approximately two miles to the east.

Solids from both the Beach and Northwest WWTPs are dewatered at the Northwest WWTP. To convey sludge from one plant to the other, sludge is trucked from the Beach to the Northwest WWTP.

Since the Northwest WWTP has excess treatment capacity that is not being utilized, the City is looking at options to treat all of the City’s wastewater at the Northwest WWTP. This would result in the abandonment of the Beach WWTP and conveying all of the wastewater from the Core Area to the Northwest WWTP. To assess the feasibility of this option, the flows, wastewater characteristics, and influent loads of both the Beach and Northwest WWTP is being evaluated to determine if the Northwest WWTP has adequate treatment capacity to handle the combined flows and loads from both plants. Additionally, this memorandum will identify triggers for when capacity or load improvements at the Northwest WWTP may be required.

Figure 1: Project Location Map



Data Summary

This TM was developed through research of existing information and discussions with Veolia and City staff. The following information sources were used in the flow and loading analysis:

- The California Integrated Water Quality System (CIWQS) database
- Data obtained from the City's Supervisory Control and Data Acquisition (SCADA) system
- City of Rio Vista 2004 Northwest WWTP record drawings and design criteria
- City of Rio Vista 2015 Design Standards and Standard Plans
- City of Rio Vista 2001 General Plan
- Contract Drawings for City of Rio Vista Northwest Wastewater Treatment Plant
- City of Rio Vista 2020 Urban Water Management Plan
- City of Rio Vista Sewer Shed and Land Use GIS Geodatabases
- Conversations and meetings with City staff and Veolia staff

DESIGN CRITERIA

Following consolidation of the Beach and Northwest WWTPs, future City wastewater flows will be treated entirely at the Northwest WWTP. Therefore, it is necessary to understand the original design criteria of the Northwest WWTP and compare that data to the expected future wastewater flows and loading.

Definitions of pertinent terms used throughout this section are as follows:

- Average Dry Weather Flow (ADWF): The average daily flow for the dry months of the year: June, July, and August.
- Peak Monthly Average Flow (PMAF): The average daily flow for the month that experiences the highest flow.
- Peak Day Flow (PDF): The highest daily flow in the data series.
- Peak Hour Flow (PHF): The highest hourly measurement of the dataset.

The design basis for the Northwest WWTP is presented in **Table 1**.

Table 1: Northwest WWTP Design Parameters

| Parameter | Limit ¹ |
|---|--------------------|
| Average Dry Weather Flow (ADWF) | 1.0 MGD |
| Peak Monthly Average Flow (PMAF) | 1.3 MGD |
| Peak Day Flow (PDF) | 1.8 MGD |
| Peak Hour Flow (PHF) | 3.0 MGD |
| Average Monthly Biochemical Oxygen Demand (BOD) Loading | 2,369 lbs/day |
| Peak Month BOD Loading | 3,080 lbs/day |
| Average Monthly Total Suspended Solids (TSS) Loading | 2,369 lbs/day |
| Peak Month TSS Loading | 3,080 lbs/day |
| Average Monthly Total Kjeldahl Nitrogen (TKN) data ² | 474 lbs/day |
| Peak Month TKN data ² | 616 lbs/day |

Notes:

1. Data sourced from 2004 Northwest Wastewater Treatment Facility Record Drawings, Volume 2A.
2. While Total Kjeldahl Nitrogen (TKN) data were used during the design of the WWTP, these data are not currently tracked in the City's SCADA system. Therefore, these parameters were excluded from the analysis.

The current Northwest WWTP permit effluent limitations must also be met once the combined flows are treated at the Northwest WWTP. The permit requirements are summarized in **Table 2**.

Table 2: Northwest WWTP Permit Effluent Limitations

| Parameter | Limit ¹ |
|---|--------------------|
| Average Monthly BOD | 10 mg/L |
| Average Weekly BOD | 15 mg/L |
| Average Monthly TSS | 10 mg/L |
| Average Weekly TSS | 15 mg/L |
| Average Monthly Total Recoverable Copper | 18 µg/L |
| Maximum Daily Total Recoverable Copper | 25 µg/L |
| Average Monthly Ammonia Nitrogen Total (as N) | 1.3 mg/L |
| Average Weekly Ammonia Nitrogen Total (as N) | 2.3 mg/L |
| pH | 6.5 – 8.5 |
| ADWF | 1.0 MGD |

Notes:

1. 2021 RWQCB CVR NPDES Waste Discharge Requirements for the City of Rio Vista Northwest Wastewater Treatment Facility.

These parameters will be compared to the historical flow and loading data to determine if the Northwest WWTP has adequate capacity to accommodate the additional flow from the Beach WWTP.

WASTEWATER FLOWS

Influent WWTP data obtained from CIWQS and the City's SCADA database were used to determine the flows from the two WWTPs that would be treated at the Northwest WWTP.

Historic daily WWTP influent flow data was reviewed from January 2018 through September 2021 for the Northwest WWTP and January 2018 through August 2021 for the Beach WWTP. These data sets are generally complete except for a data gap during July 2021 for the Northwest WWTP. Influent daily flow rates for the Northwest and Beach WWTPs are presented in **Figure 2** and **Figure 3**, respectively.

Figure 2: Northwest WWTP Daily Flows

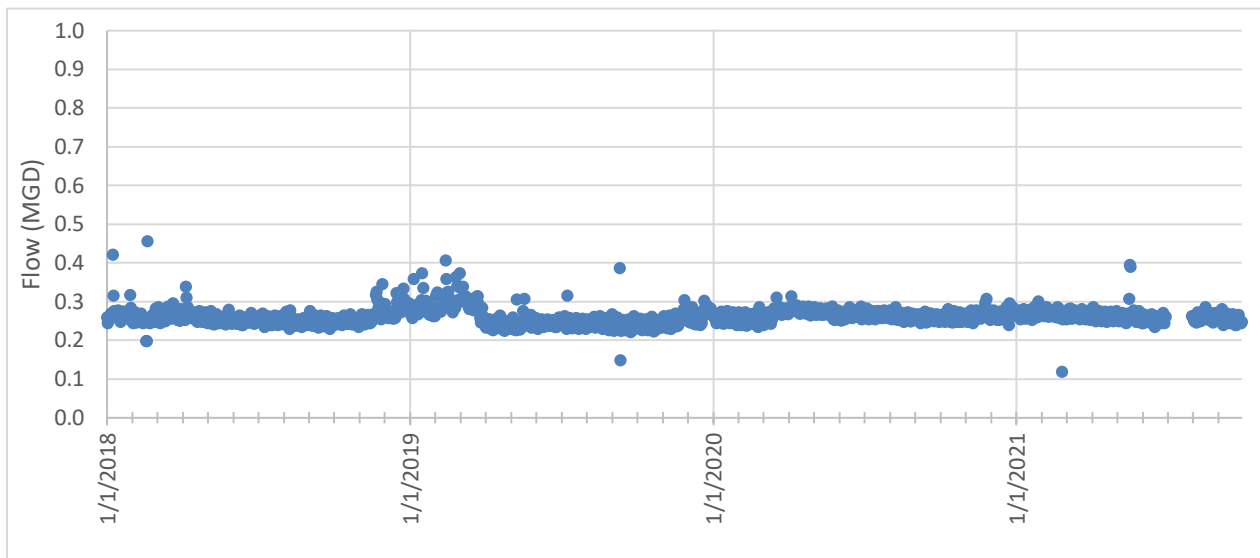
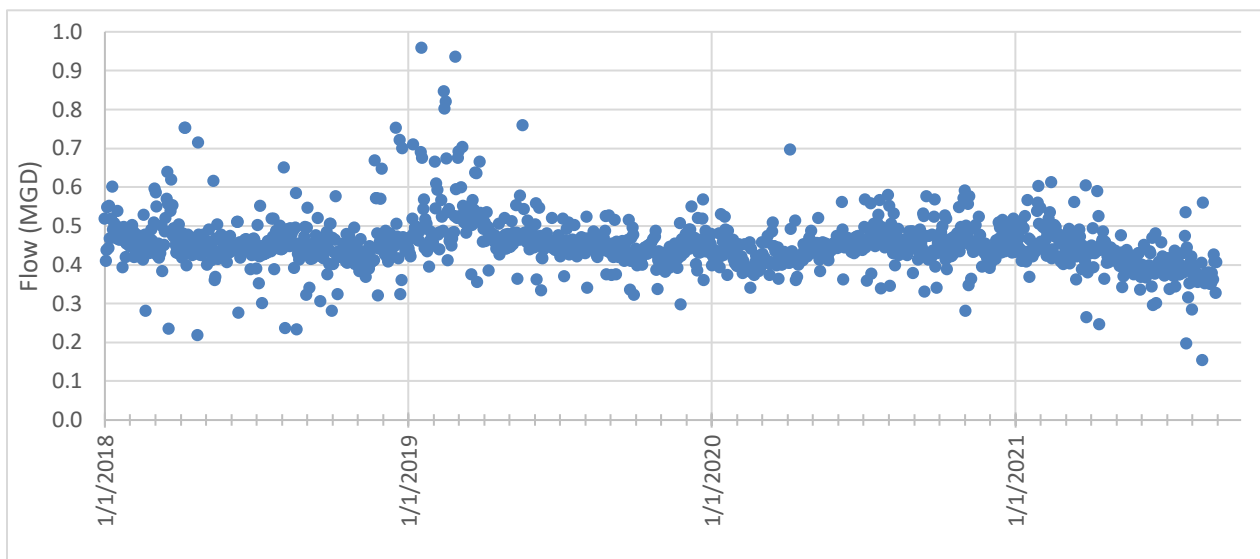


Figure 3: Beach WWTP Daily Flows



Since 2019, influent flow rates to both plants were not observed to have significant variations during wet weather. Additionally, daily flow rates have generally been very consistent year over year as well as during both dry and wet weather periods. An overview of the ADWF is shown in **Table 3**.

Table 3: Yearly ADWF (MGD)

| Year | Northwest WWTP | Beach WWTP |
|---------|----------------|------------|
| 2018 | 0.25 | 0.45 |
| 2019 | 0.24 | 0.45 |
| 2020 | 0.26 | 0.46 |
| 2021 | 0.26 | 0.39 |
| Average | 0.25 | 0.44 |

HydroScience analyzed daily and hourly flow data for each WWTP to estimate future flows to the Northwest WWTP after the Beach WWTP is taken out of service. For peak flows in the combined plant scenario, the maximum values from each plant are combined regardless of whether they occurred at different times to provide a more conservative estimate.

Table 4 presents the results of the analyzed separate WWTP flows and combined plant flows.

Table 4: Wastewater Flows (MGD)

| Parameter | Northwest WWTP | Beach WWTP | Combined WWTPs | Northwest WWTP Design Criteria |
|-----------|----------------|------------|----------------|--------------------------------|
| ADWF | 0.25 | 0.44 | 0.69 | 1.0 |
| PMAF | 0.31 | 0.57 | 0.87 | 1.3 |
| PDF | 0.46 | 1.22 | 1.67 | 1.8 |
| PHF | 0.90 | 2.14 | 3.03 | 3.0 |

Based on the flow combinations in **Table 4**, it appears that the Northwest WWTP has adequate capacity to treat the combined flows from the Beach and Northwest WWTPs. Therefore, it is not anticipated that a significant capacity expansion will be necessary at the Northwest WWTP to adequately treat the combined flows. However, when the combined flows reach 80% of the design capacity, it is advisable to further increase plant capacity.

Using or adding emergency storage at the lift stations or at the Northwest WWTP would allow the City to attenuate the PHF. HydroScience will look into the feasibility of adding peak hour storage at the new lift stations and strategies to utilize emergency storage at the Northwest WWTP in subsequent memoranda. Strategies to increase peak day flow capacity at the Northwest WWTP will also be investigated.

WASTEWATER CHARACTERISTICS AND LOADING

The wastewater characteristics and loading were evaluated based on CIWQS data for both the Beach WWTP and Northwest WWTP individually, as well as the combined flow from the two WWTPs that will ultimately be treated at the Northwest WWTP. Definitions of pertinent terms used throughout this section are as follows:

- Biochemical Oxygen Demand (BOD): The amount of dissolved oxygen that biological organisms require to break down organic material in water.
- Total Suspended Solids (TSS): The dry-weight of suspended particles that are not dissolved in a sample of water.
- Average Monthly Loading: The average load experienced at the WWTP.
- Peak Month Loading: The maximum load experienced at the WWTP.

Analyses were performed for BOD and TSS since those are the two parameters indicated in the original design for which data is currently tracked. TKN was not analyzed since current data is not tracked in neither the City's CIWQS data nor SCADA. The analysis also considered the Average Monthly Loading and the Peak Month Loading for both WWTPs.

The BOD and TSS concentrations were obtained from the CIWQS data and are presented in mg/L for both parameters at each plant. The loadings (lbs/day) were calculated by multiplying the concentrations, presented in mg/L, by the corresponding flow for the given day.

Biochemical Oxygen Demand (BOD)

The BOD design criteria for the Northwest WWTP are 2,369 lb/day Average Monthly Loading and 3,080 lb/day Peak Month BOD Loading. The ADWF is used to calculate the Average Monthly Loading from the recorded concentrations. Conversely, the Peak Month Loading was selected based on the month within the dataset that has the highest average value. With approximately weekly readings, the dataset contains four to five points for each month.

The combined loading scenario for BOD was based on a weighted average of the flows and concentrations coming from both the Beach and Northwest WWTP. This weighted average was then compared to the BOD loading design criteria for each WWTP.

For both loading scenarios, the ADWF for each plant is multiplied by the loading value, added together, and divided by the total flow. This allows the combined loading to capture the impacts from the two plants. ADWF is used for both Average Monthly Loading and Peak Month Loading because higher flow does not necessarily result in higher loading.

Figure 4: Northwest WWTP BOD Concentration

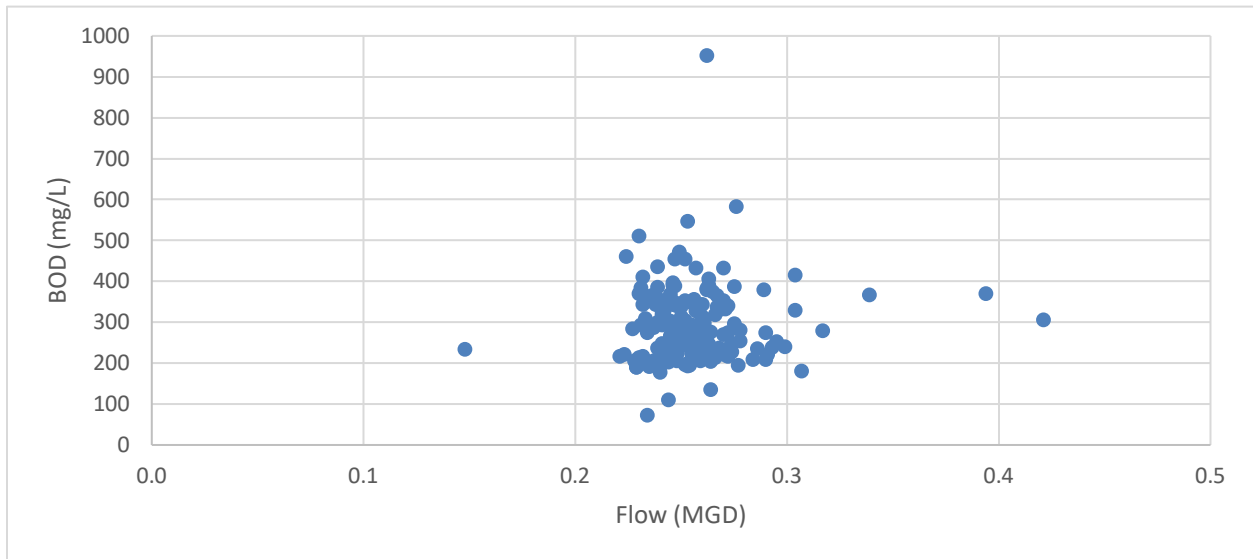


Figure 4 presents the daily BOD concentrations at the Northwest WWTP for the data set. The BOD concentrations do not appear to correlate well to influent flow volume.

Figure 5: Northwest WWTP BOD Loading (Jan 2018 – Sept 2021)

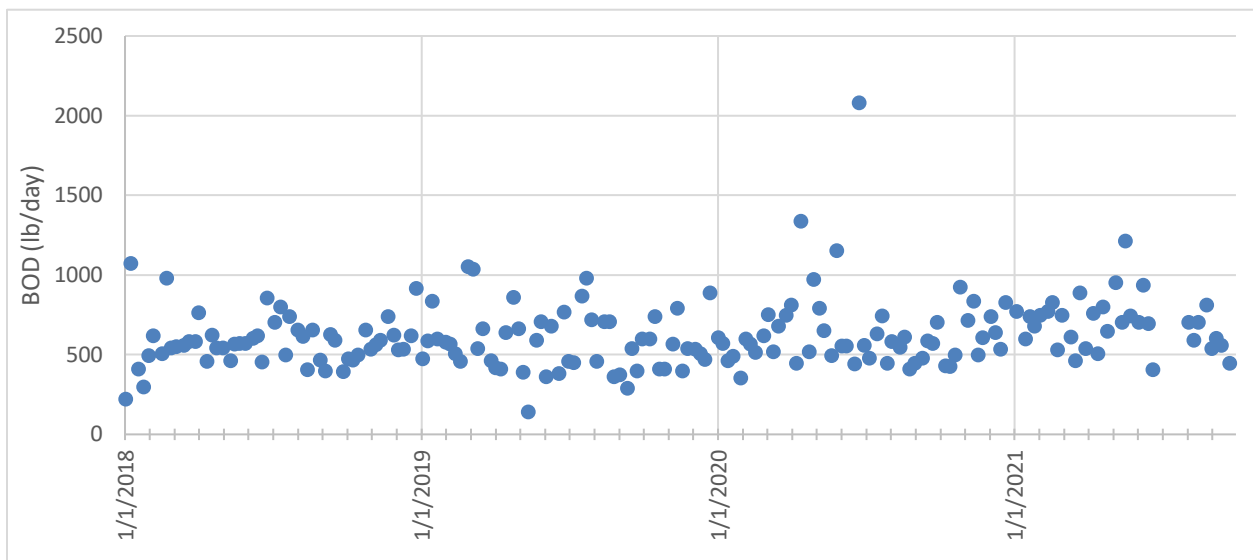


Figure 5 presents daily BOD loading at the Northwest WWTP. Daily BOD loadings appear to be fairly constant over time. The maximum recorded loading is 2,080 lb/day and occurs on June 24, 2020. The calculated loading for this data is significantly higher than any other day, as no other daily loadings exceeded 1,500 lbs/day. There is no discernable loading trend over time.

Figure 6: Beach WWTP BOD Concentration (Jan 2018 – Aug 2021)

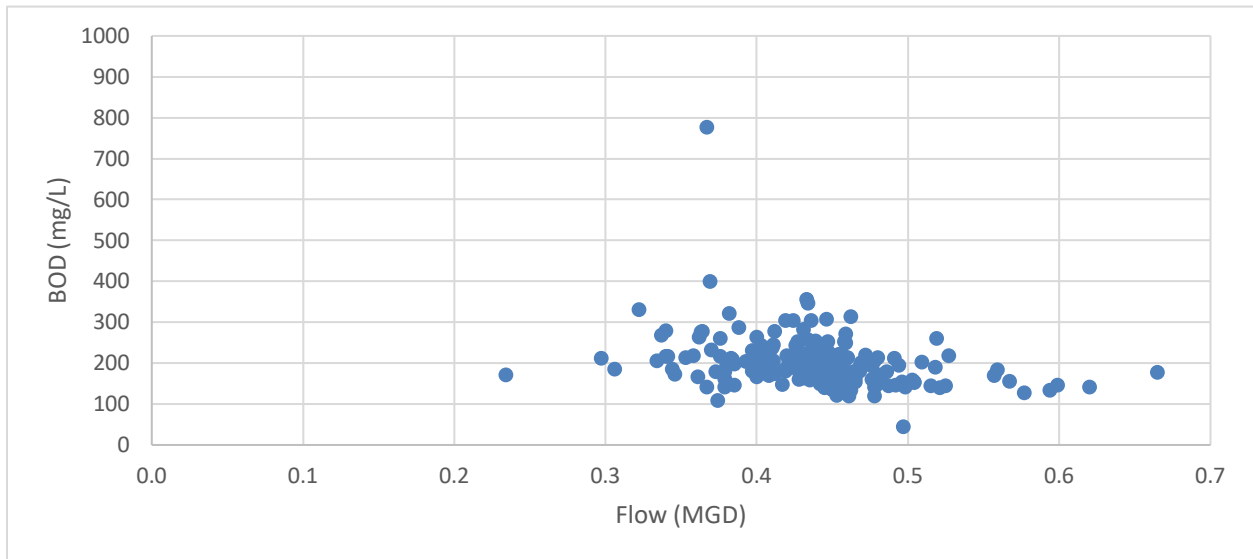


Figure 6 presents the daily BOD concentrations at the Beach WWTP for the data set. The BOD concentrations appear to be fairly constant regardless of flow volume. It was also noted that Beach WWTP BOD concentrations are generally lower than Northwest WWTP BOD concentrations.

Figure 7: Beach WWTP BOD Loading (Jan 2018 – Aug 2021)

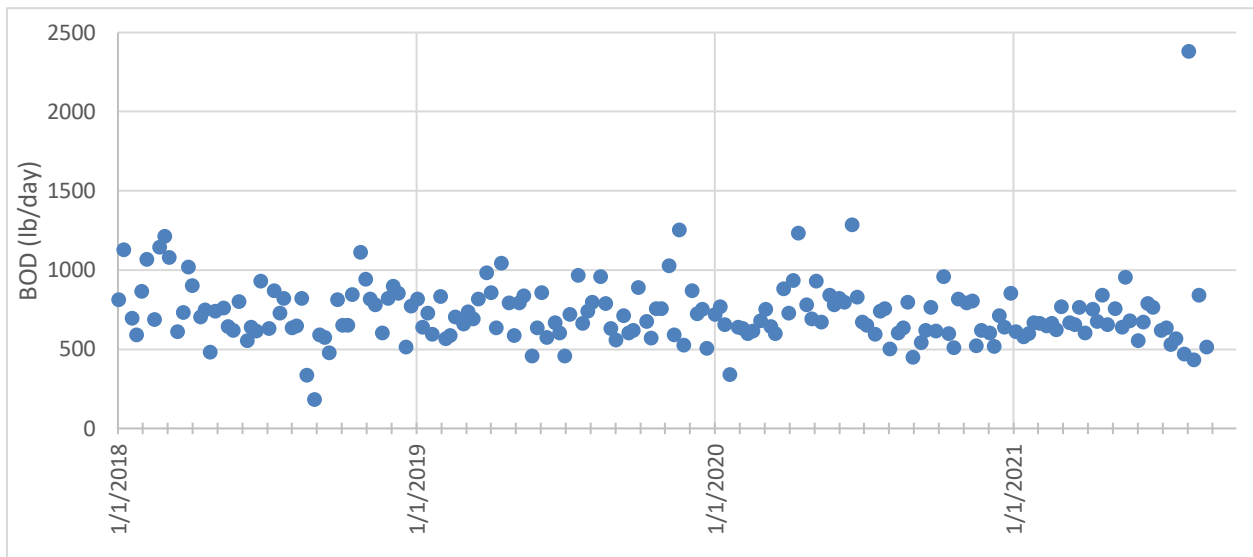


Figure 7 shows the daily BOD loading at the Beach WWTP for the data set. The BOD loadings appear to be fairly constant over time. The maximum recorded loading is 2,378 lb/day and occurs on August 4, 2021. The calculated loading for this data is significantly higher than any other day, as no other loadings exceeded 1,500 lbs/day. There is no discernable loading trend over time.

Total Suspended Solids (TSS)

The TSS design criteria for the Northwest WWTP are 2,369 lbs/day Average Monthly Loading and 3,080 lb/day Peak Month BOD loading. The Average Monthly Loading is calculated based on the TSS concentrations associated with the ADWF. The Peak Month Loading was selected based on the month within the dataset that has the highest average value. With approximately weekly readings, the dataset contains four to five points for each month.

Figure 8: Northwest WWTP TSS Concentration (Jan 2018 – Sept 2021)

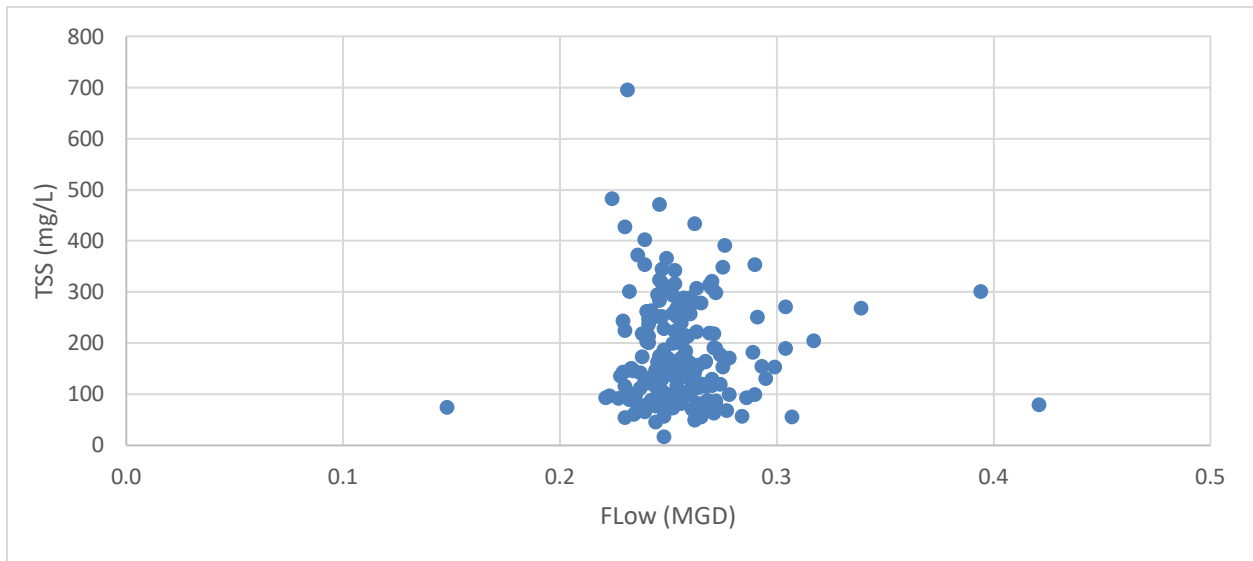
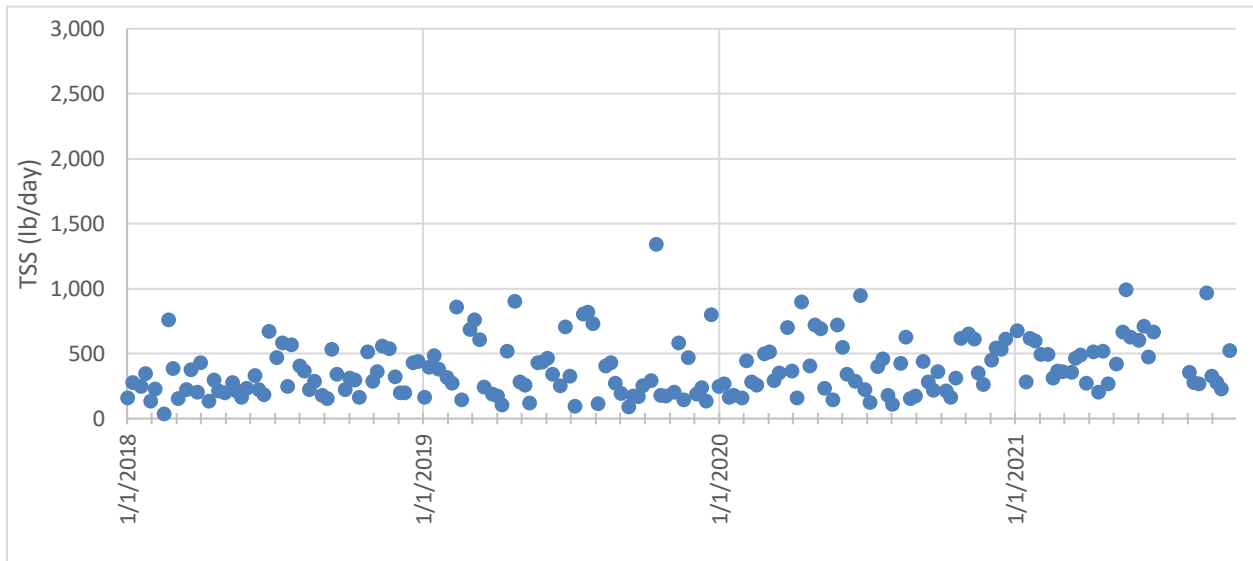


Figure 8 presents the TSS concentrations at the Northwest WWTP for the data set. The TSS concentrations appear to be fairly constant regardless of flow volume.

Figure 9: Northwest WWTP TSS Loading (Jan 2018 – Sept 2021)



As shown in **Figure 9** the TSS loadings appear have moderate variance. The maximum recorded influent TSS loading of 1,339 lbs/day occurs on October 16, 2019. There is no discernable loading trend over time.

Figure 10: Beach WWTP TSS Concentration (Jan 2018 – Aug 2021)

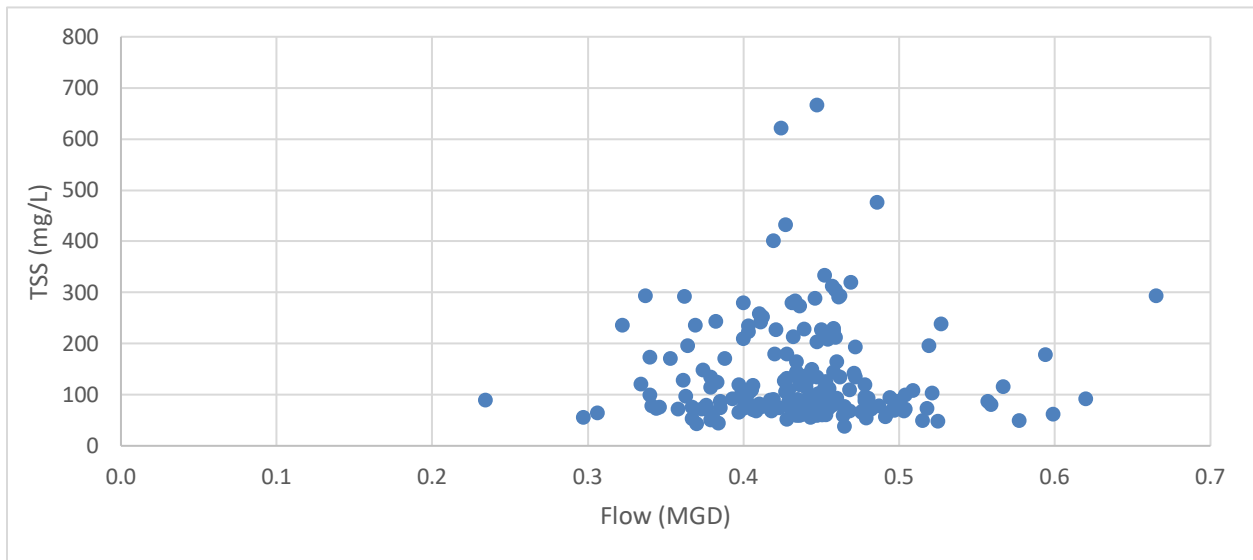
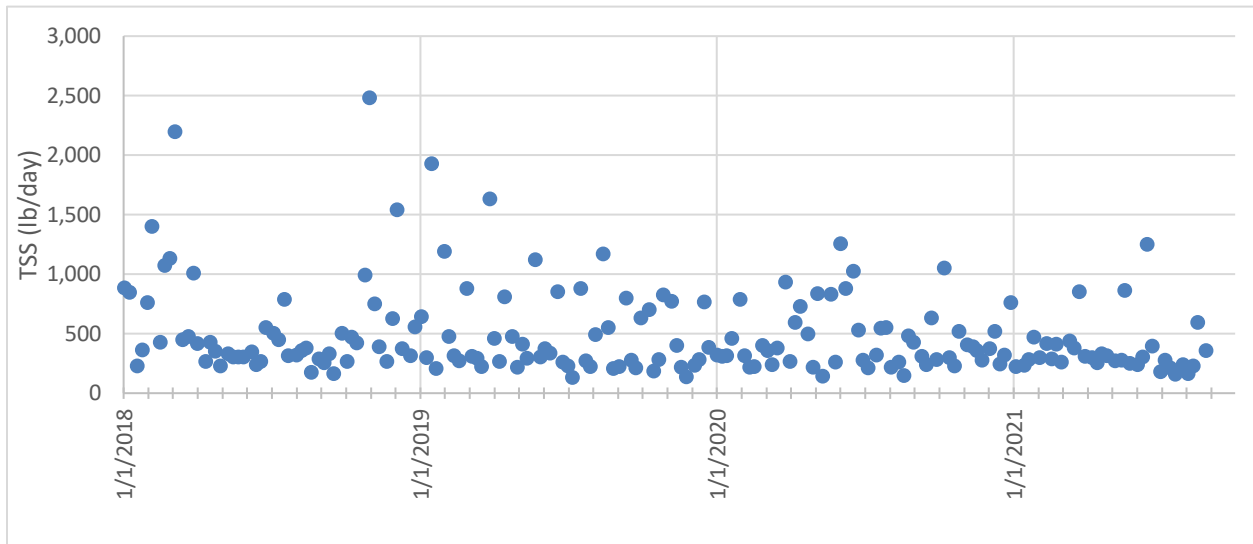


Figure 10 presents the TSS concentrations at the Beach WWTP for the data set. The TSS concentrations to be fairly constant over time regardless of flow volume. It was noted that Beach WWTP TSS concentrations are generally lower than the Northwest WWTP influent TSS.

Figure 11: Beach WWTP TSS Loading (Jan 2018 – Aug 2021)



As shown in **Figure 11**, the TSS loadings at the Beach WWTP appear have moderate variance. The maximum recorded loading is 2,483 lb/day and occurs on October 31, 2018. Based on the data, this appears to be one of several outliers. The majority of the data are relatively constant. There is no discernable loading trend over time.

Combined Loading

The BOD concentrations for the combined flow were determined by a weighted average that was calculated based on the flows from each WWTP. The combined flow loading was calculated based on the weighted average concentration and total combined flow from both WWTPs. The peak flow loading was calculated using the same weighted average methodology. This results in the expected loading (lbs/day) at the Northwest WWTP once the flows are combined, which was then compared to the design criteria.

These combined loading values were then compared to the design criteria for the Northwest WWTP identified in **Section 1**. The calculated BOD and TSS loading conditions are presented for both WWTPs and the combined flows in **Table 5**.

Table 5: Wastewater Concentration and Loading

| Parameter | Northwest WWTP | | Beach WWTP | | Combined WWTPs | | Original Design Criteria | |
|--------------------------|----------------|------------------|------------|--------------------|----------------|-------|--------------------------|-------|
| | Avg. | Peak | Avg. | Peak | Avg. | Peak | Avg. | Peak |
| BOD Concentration (mg/L) | 311 | - | 205 | - | 244 | - | - | - |
| BOD Loading (lb/day) | 657 | 905 ¹ | 746 | 1,041 ² | 1,403 | 1,946 | 2,369 | 3,080 |
| TSS Concentration (mg/L) | 207 | - | 121 | - | 152 | - | - | - |
| TSS Loading (lb/day) | 437 | 675 ¹ | 440 | 1,032 ³ | 877 | 1,707 | 2,369 | 3,080 |

Notes:

1. Peak occurred on May 2021.
2. Peak occurred on August 2021.
3. Peak occurred on March 2018.

Both the expected BOD loading and the expected TSS loading that the Northwest WWTP will experience from the combined scenario fall well below the Northwest WWTP design criteria for both Average Monthly Loading and Peak Month Loading. Even though the peak loading conditions occur in different months, the combined loading associated with influent from both treatment plants being treated at the Northwest WWTP still does not exceed the original Northwest WWTP loading design criteria.

FLOW PROJECTIONS

Flow projections were developed using historical wastewater flow data coupled with population projections and unit generation rates. All future treatment will take place at the Northwest WWTP. Therefore, as the City grows, capacity expansion of the Northwest WWTP may be required.

Unit Flow Factors and Land Use

The City's Design Standards indicate that average residential flows should be based on 100 gallons per day (gpd) per person, with 3.0 persons per Single Family Dwelling Unit (DU) and 2.5 persons per Multi Family DU.

The City's Design Standard flows were used to size the Northwest WWTP and are believed to be overly conservative. HydroScience estimated a residential unit factor to compare with the City's Design Standards. The City's GIS land use parcel data indicate that current flow to the Northwest WWTP is 99% residential, with approximately 3,419 contributing single family EDUs. Using the measured ADWF flow data for the Northwest WWTP (0.25 MGD) and assuming all flow is residential, the calculated residential flow factor is approximately 73 gpd/DU. This is 76% smaller than the City's current single family unit flow factor. Therefore, the current residential wastewater unit flows are significantly overestimated in the City's design standards and should be adjusted downward to more accurately represent future flows.

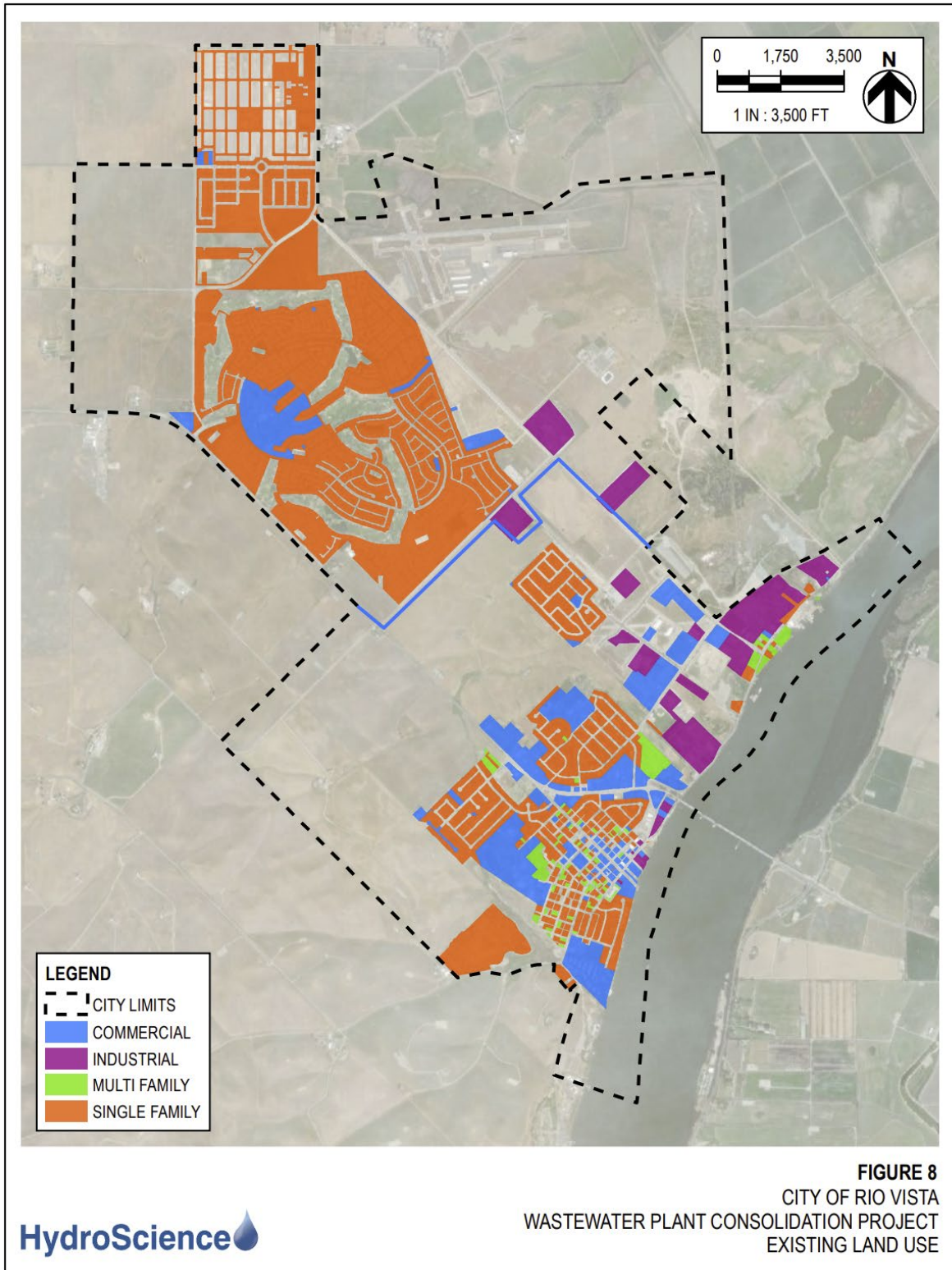
To determine the approximate flow from non-residential sources, the unit factor calculated above (73 gpd/DU) was multiplied by the number of residential DUs (1,484) that are served by the Beach WWTP. Therefore, the total residential flows to the Beach WWTP is calculated to be 108,332 gpd. This was then subtracted from the total ADWF for Beach (440,000 gpd) to get the total flow from non-residential sources, which is 331,668 gpd. There are approximately 267 acres of occupied non-residential land. Assuming that both commercial and industrial users produce roughly equivalent flows, the calculated non-residential flow is 1,242 gpd/acre, which also falls below the current city design standards. These data are presented in **Table 6**. Based on the calculations, it is believed that the current city design standards are overly conservative.

Table 6: Unit Flow Factors

| Land Use | City Design Standards | Calculated Unit Flow Factors | Unit |
|---------------|-----------------------|------------------------------|----------|
| Single Family | 300 | 73 | gpd/DU |
| Multi Family | 250 | 73 | gpd/DU |
| Commercial | 1,500 | 1,242 | gpd/acre |
| Industrial | 2,000 | 1,242 | gpd/acre |

The current land use of the Core Area that flows to the Beach WWTP is primarily commercial and residential. The Core Area of the City is largely built out, therefore the primary considerations for future land use will be the development horizon for the Northwest WWTP shed area. The current land uses from the City's GIS geodatabase are presented in **Figure 12**.

Figure 12: Rio Vista Land Use Map



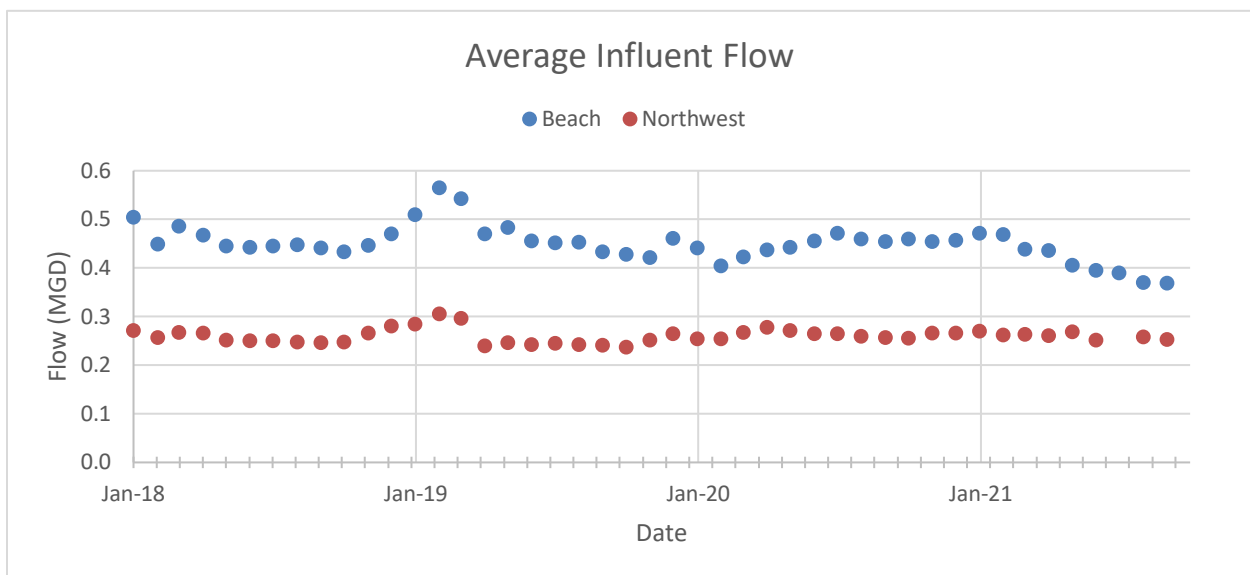
Population Projections

The planning period for this evaluation is 20 years, which is consistent with the City’s General Plan planning period. Based on the Department of Finance Projected Populations presented in the City’s 2020 Urban Water Management Plan, the City’s 2020 population is expected to grow by 11.1% by 2040.

Combined Northwest and Beach WWTP Projected Flows

The average flows from the CIWQS data are plotted in **Figure 13**.

Figure 13: Average Influent Flow



The flow data show that both WWTPs have been relatively consistent over time. During February 2019, flows increased somewhat due to wet weather at both plants. Flows are expected to be relatively constant until growth occurs, with the increase in flow proportional to the increase in the number of units and their associated land use type.

Table 7: Combined WWTP Flows (MGD)

| Parameter | Current Flow (2020) | Design Criteria |
|-----------|---------------------|-----------------|
| ADWF | 0.690 | 1.0 |
| PMAF | 0.871 | 1.3 |
| PDF | 1.671 | 1.8 |
| PHF | 3.034 | 3.0 |

Notes:

1. Projected flow = Current flow * 11.1%

The current combined flow is approximately 69% of the Northwest WWTP flow design criteria. The City has the ability to treat average daily flows up to 80% of the rated capacity of the Northwest WWTP prior to triggering a project that would increase the plant capacity. Assuming that all of the additional land use was single family residential that generates wastewater at the 73 gpd/DU rate of the existing users, it would be expected that up to 1,507 homes could connect to the system prior to the ADWF of the combined Beach/Northwest WWTPs exceeding 80% of the design capacity of the Northwest WWTP.

PHF estimates exceed the design criteria for the Northwest WWTP by 0.034 MGD. In the near term, it should be possible to accommodate the increased PHF by increasing the retention times in the instances in which design PHF is exceeded.

Based on the trends from the Beach and Northwest plants, it is expected that flows will remain relatively constant when combined. Furthermore, as the City expands and the sanitary sewer collection system is expanded, a significant increase in Inflow and Infiltration (I & I) is not expected in the short term due to relatively low I & I from newly constructed collections systems.

CONCLUSION

The initial data analyses suggest that there is adequate capacity at the Northwest WWTP to treat the wastewater flows for the entire City of Rio Vista. The calculated flows fall below the design flow thresholds for all scenarios considered, ADWF, PHAF, and PDF. It is estimated that the Northwest WWTP can serve an additional 1,507 DUs before it reaches 80% of Northwest WWTP rated design capacity, at which point the capacity of the WWTP should be expanded. The flow data indicate that flows are fairly consistent throughout the year, suggesting that Inflow and Infiltration (I & I) does not significantly impact flows.

Assuming that the City's population will grow as projected by the Department of Finance, the expected population in 2040 is expected to be 11.1% higher than at present. If wastewater flows grow proportionally to population, the ADWF in 2040 will be 0.767 MGD and the PDF in 2040 will be 1.856 MGD. Therefore, the ADWF will still be below the design criteria of 1.0 MGD, but the PDF may exceed the original design criteria. However, as noted previously, the PDF combined scenario combined the worst case from both the Beach and Northwest WWTPs. Since these conditions occurred on different days, it is unlikely that they would occur simultaneously.

The analysis of BOD and TSS loading from both plants indicates that there is ample capacity to treat the combined loads from the Beach and Northwest WWTP. Both the Average Monthly Loading and Peak Month Loading from weighted average design flows fall well below the design criteria.

Given the conditions of the combined flows to the Northwest WWTP, a significant expansion of the WWTP is not expected. However, it is likely that some operational modifications will be required to accommodate the increased flows to the Northwest WWTP. Consideration of how to increase the hydraulic capacity of the WWTP when the flow trigger is hit will also be evaluated.

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APPENDIX VIII-B
City of Rio Vista
Sewer System Management Plan
Collection System Evaluation

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To: Rob Hickey, Cecil Dillon, Robin Borre (City of Rio Vista)
From: Robert Le, PE; Navina Venugopal, EIT
Reviewed By: Curtis Lam, PE
Subject: TM #2 – Collection System Evaluation
Date: April 27, 2022

This Technical Memorandum (TM) is the second in a series of TMs that will be completed in support of the City of Rio Vista Wastewater Plant Consolidation Project.

INTRODUCTION

The City of Rio Vista (City) has retained HydroScience Engineers (HydroScience) to develop a feasibility study and long-term plan for the Wastewater Consolidation Project (Project). The City currently operates two wastewater treatment plants, the Beach and Northwest Wastewater Treatment Plants (WWTP).

HydroScience worked with the City to develop and evaluate potential options for the transfer of flows from the Beach WWTP collection system to the Northwest WWTP. This TM summarizes the collection system evaluation, the key findings, and the recommendations.

EXISTING COLLECTION SYSTEM

Figure 1 shows the existing Rio Vista sewer collection system, including the two treatment plants and the existing lift stations. The 'Core Area' of the City is mostly built-out in terms of development and growth. Sewage flow in the Core Area generally flows from west to east towards the Sacramento River, and from north to south with treatment occurring at the Beach WWTP. The collection system currently has multiple pump stations that pump into the shed of other pump stations. Pump stations upstream of the Marina Lift Station that pump into its shed include the Second Street, Airport Road, River Road, and City Hall pump stations. The Marina Lift Station is the largest lift station in the Core Area and is therefore a critical part of the collection system. Several of the lift stations, including River Road Lift Station, Second Street Lift Station, and Marina Lift Station are located within the 100-year floodplain¹.

To facilitate the collection system evaluation, the current average and peak flows were estimated for each existing sewer-shed in the Core Area. Total flow from the Core Area is equivalent to total inflow to the Beach WWTP, which was analyzed using the California Integrated Water Quality System (CIWQS) database in *TM #1 – Flows and Loads Evaluation*.

¹ As defined by FEMA based on the latest FIRM or FIRMette maps available on the FEMA website.

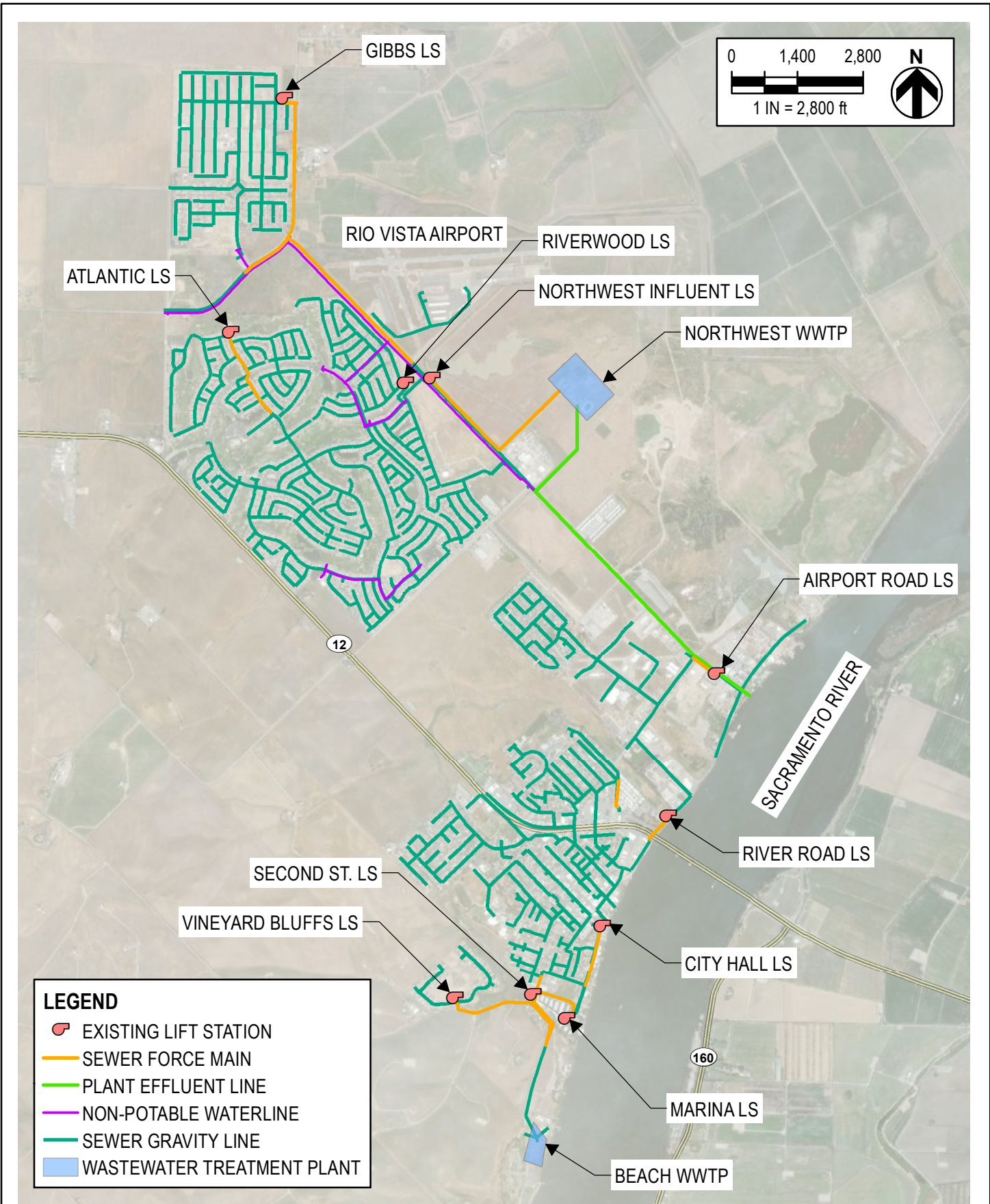


FIGURE 1
CITY OF RIO VISTA
EXISTING SEWER SYSTEM

Flows were distributed to each shed based on the shed’s proportional peak inflow contribution to the total flow, calculated using City-provided data. The sewer-shed flow estimates and lift station capacities are outlined in **Table 1**.

Table 1: Sewer-Shed and Lift Station Flow Summary

| Sewer Shed | Estimated Flow from Individual Shed | | Estimated Total Flow to Lift Station | | Current Lift Station Capacity ¹ (gpm) |
|-----------------|-------------------------------------|-----------------|--------------------------------------|-----------------|--|
| | Average Flow (gpm) | Peak Flow (gpm) | Average Flow (gpm) | Peak Flow (gpm) | |
| Vineyard Bluffs | 7 | 32 | 7 | 32 | 140 |
| Beach | 7 | 30 | N/A, currently drains to Beach WWTP | | N/A |
| Second Street | 0.5 | 2 | 0.5 | 2 | unknown |
| Airport Road | 19 | 84 | 19 | 84 | 230 |
| River Road | 82 | 354 | 101 | 438 | 320 |
| City Hall | 122 | 526 | 223 | 964 | 497 |
| Marina | 74 | 321 | 298 | 1,285 | 1,800 |

Notes:

1. From System Evaluation Capacity Assurance Plan, Table 2-1, City of Rio Vista Lift Station Information, (Stantec, 2011)

ALTERNATIVES EVALUATION

Due to the topography and the general flow direction of the existing collection system, transferring flow from the Core Area to the Northwest shed by gravity is not feasible. Therefore, one or multiple lift stations are required to convey flow to the Northwest shed.

This new or retrofitted lift station needs to be located at either at the Beach WWTP or near the Marina Lift Station. **Figure 2** shows the potential lift station sites that were identified. Alternatively, the Marina Lift Station could be retrofit to have the downstream lift stations (south of Marina) pump into a tributary of the Marina Lift Station. Both options are further discussed below.

Option 1A (Delta Marina Second Street Storage Yard): The Delta Marina Second Street Storage Yard on Second Street was identified as a potential site for a new lift station. One advantage of locating the new station along this stretch of Second Street is the ability to abandon the existing Second Street LS, which is located within the 100-yr floodplain. The flows to Second Street LS could be diverted to the new lift station, which would be located nearby.

During the City’s initial outreach to the property owner, the owner stated that the Storage Yard is planned for future residential development. Although the owner expressed a willingness to work with the City in terms of an easement, identifying a workable site at this location is a challenge. The southernmost third of the site is within the FEMA 100-yr floodplain. Siting the station just north of the floodplain extents, in the middle third of the site, would obstruct site access for the planned development, according to the owner.



FIGURE 2
CITY OF RIO VISTA
POTENTIAL LIFT STATION SITES

A moderately sloping ground elevates the northern third of the parcel, from an elevation of 14 ft at the toe of slope, up to a maximum elevation of approximately 32 ft. The elevations in this portion of the site would make it challenging and costly to tie-in the surrounding sewer infrastructure. The site layout of the proposed development is a critical factor in identifying a suitable lift station location.

Option 1B (Delta Marina Property): Across Second Street from the Delta Marina Second Street Storage Yard is the Delta Marina and RV Park, which is also owned by the same person who owns the boat storage yard. Two potential sites were identified on the Marina property.

One site is immediately across the street from the existing Second Street LS. Subsequently, the City stated that a future Marine research facility may be located here. The site is relatively constrained with an existing 6-inch gas line to the west, the Marina waterway to the east, and an existing 15-inch storm drain crossing the northeast corner. In addition, a portion of the site appears to be within the 100-yr floodplain. The site's footprint is approximately 2,000 square feet. Construction at this site would require replacing the Delta Marina entrance sign, and the lift station's new emergency generator would likely need to be shielded from public view with a fence or wall.

The other location is on the southwestern corner of the Marina parcel, near the intersection of Second Street and Beach Drive. The second site is also relatively constrained with the waterway to the northeast and an existing gas line along the southwest edge. The site's footprint is approximately 2,300 square feet, and slopes towards the water to the northeast. This location may result in adverse traffic impacts during construction. A majority of the site appears to be within the 100-yr floodplain. For this reason, this site is not considered feasible.

Option 1C (Riverview Middle School): Within the footprint of the school, a new lift station could be located either in the sports field or adjacent to the school maintenance building. The sports field was noted to have an existing grade several feet higher than Marina Drive, which would result in a deeper wet well and buried infrastructure. Either location would also require odor control and noise attenuation to minimize impacts to students and neighboring residents. An easement would be needed at these two sites.

Option 1D (Near Beach WWTP): Locating the new lift station at the Beach WWTP would not require modifications to the existing collection system lift stations. These stations would continue to pump as they were, and the City would be required to pump sewage multiple times to convey sewage to the Northwest WWTP. As the existing lift stations continue to pump as there are designed, a new lift station would be located near the Beach WWTP in currently undeveloped land near the plant. It is expected that wastewater would be pumped from the terminal manhole where sewage last enters the collection system, which is the manhole immediately north of the influent screen.

The City and Veolia have noted that the Beach WWTP and the surrounding parcels are located on federal government land. It is anticipated that right-of-way would be required for the new lift station.

Compared to the other options evaluated, the overall force main length would be longer by approximately 4,000 feet. Trenchless construction may be needed to cross underneath the existing 36-inch storm drain connecting the Delta Marina to the wetlands to the west.

Option 2 (Retrofit Marina Lift Station): If a new lift station were to be constructed, there would be two relatively large lift stations pumping the majority of the flow originating from the City's Core Area: the existing Marina Lift Station and the new lift station. The two lift stations would be located relatively close to each other, which would result in increased O&M responsibilities and costs. An option was explored to retrofit and repurpose the existing Marina Lift Station to pump sewage from the Core Area to the Northwest shed. The Marina Lift Station was originally built in 1954 and is nearing 70 years of operation. The main disadvantages of this option include the age of the station, and its location in the 100-year floodplain. Although a structure of this age would typically be replaced in the near to medium term, visual observation and anecdotal comments from the City suggest that the structure is in good condition.

Upgrading the Marina Lift Station to allow it to convey swage to the Northwest shed would consist of replacing and upgrading the mechanical and electrical components, including the pumps, valves, piping, electrical and control equipment, and power supply. The emergency generator would need to be replaced with a higher capacity unit. The replacement of these components would help modernize the station. **Figure 3** illustrates several of the recommendations within the existing motor and pump rooms.

Veolia staff noted that during their tenure, the worst flooding occurred during king tide and reached the top of the existing flood barrier but did not overtop it. Subsequent design should include an assessment of the impacts of future sea level rise on the 100-yr flood elevation at this site. Replacing the existing flood barrier system with a taller system could be warranted. It is also recommended that code compliance be checked for the final proposed upgrades and modifications to the station. There could be building code provisions that trigger additional improvements thereby increasing construction cost.

The existing wet well is relatively small. To prevent excessive pump starts, Variable-Frequency Drives (VFDs) could be installed to ramp down the pump flowrates. The consequence of this is that self-cleaning velocity of 3 ft/s would not be achieved on a daily basis. To compensate for low velocities, pigging stations should be considered along the force main alignment to facilitate force main cleaning if and when needed.

In terms of flow rerouting, the Beach and Vineyard Bluffs sewer-sheds would need to be redirected to the Marina sewer shed.

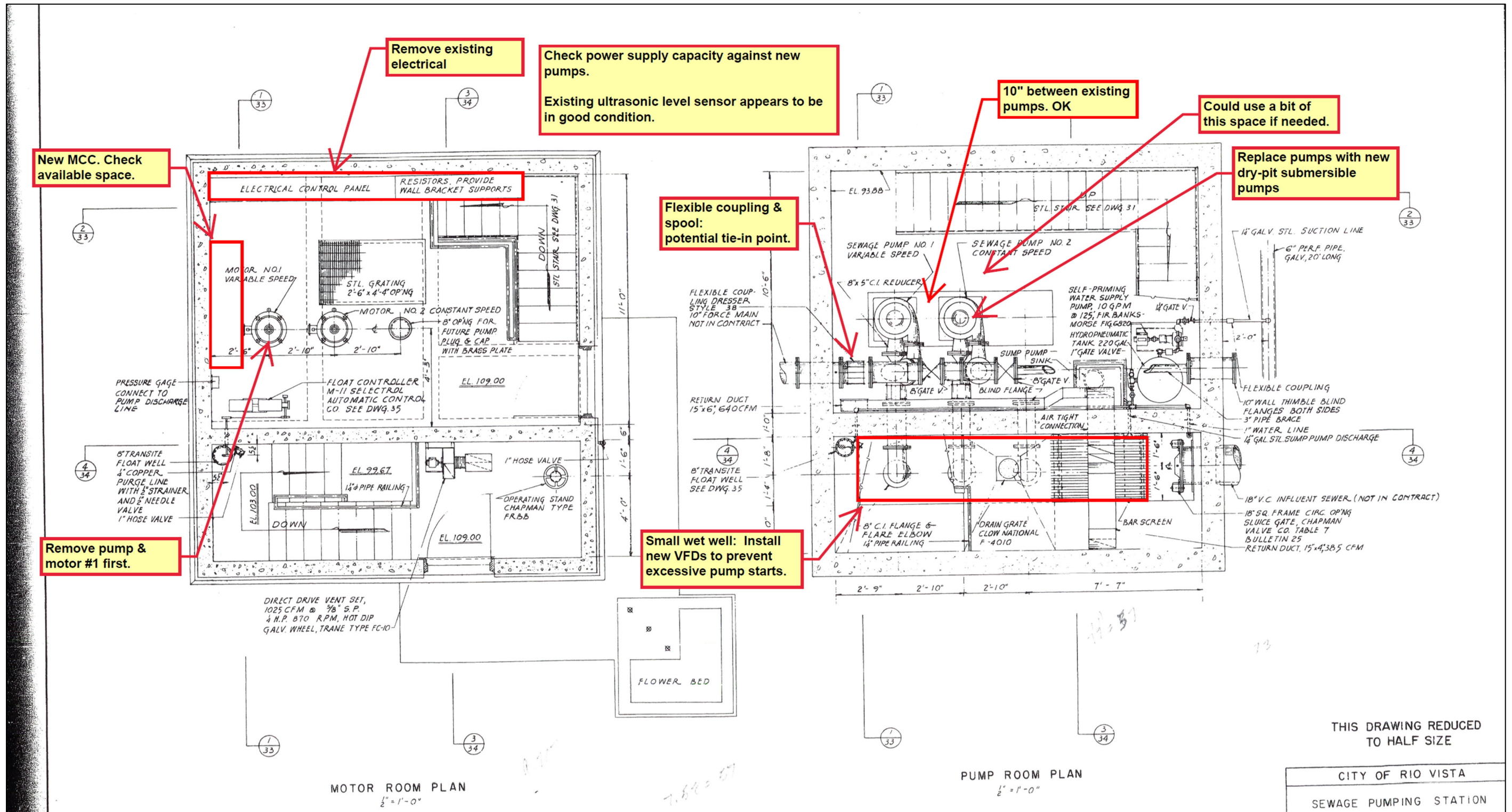


Figure 3: Marina Lift Station – Excerpt of Retrofit Recommendations

The main advantages of this option are:

- Significant construction cost savings – constructing a new lift station would be more costly than upgrading the existing Marina Lift Station.
- Reduction of O&M costs - There would be one less station to operate and maintain. Modern mechanical and electrical equipment would also facilitate station efficiency.
- Favorable schedule – the transfer of flows from the Core Area to the northwest area could be implemented on a shorter timeframe in comparison to the other options.
- Safety improvements – Veolia noted concerns relating to maintenance of the existing dry pit pumps, with the shafts extending up to the motor room. Replacing the pumps with new dry pit submersible-type pumps would alleviate the safety concerns because the motor is an integral part of the pump. It is anticipated that the new pumps would also require less maintenance, thereby reducing the need for personnel to enter the station and pump room.

Force Main – Core Area to Northwest

A new force main is required to convey sewage from the new lift station location to the Northwest shed. For this analysis, we have assumed that the lift station conveying sewage would be the upgraded Marina Lift Station. The force main would discharge to an existing manhole located at the intersection of Church Road and Airport Road. This existing manhole was installed with a 15-inch PVC pipe stub for future connection.

South of Highway 12, it is expected that the force main would be located on Second Street and Front Street, as it is the most direct route to proceed north. North of Highway 12, the force main would be located on St. Francis Way and Airport Road, which are the only public roads outside of the Caltrans right-of-way connecting to Airport Road and Church Road. Between those areas, a key consideration for locating the force main is how to cross Highway 12. Four alignment alternatives have been identified to cross Highway 12 and these are shown on **Figure 4**. The alternatives are only different in the way they traverse across the downtown area, the Highway 12 crossing location, and the immediate route north of Highway 12.

The alternatives all converge onto St. Francis Way and the downstream route is identical between them. For the purposes of comparing alignment alternatives, it was assumed that the force main diameter would be in the range of 12 to 14 inches, which was determined to be hydraulically compatible with the anticipated design flows.

Alternative 1 (Hillside Terrace): From the Second Street/Marina Dr intersection, the alignment continues on Second Street then turns northwest onto Montezuma St. The alignment continues onto 7th St., then northwest onto Main Street until it reaches Bruna Vista Park. This park is a City-owned parcel and could be utilized as a construction staging area as well as a location for the trenchless jacking pit. From the Park, the alignment turns northeast onto Hillside Terrace, where it crosses Highway 12 to Hillside Terrace, and then traverses Flores Way and Gardiner Way before reaching St Francis Way. This alignment has a total length of 15,200 linear feet, which is the longest length out of the four alternatives evaluated.



FIGURE 4
CITY OF RIO VISTA
HIGHWAY 12 CROSSING ALTERNATIVES

Alternative 2 (Gardiner Way): From the Second Street/Marina Dr intersection, the alignment continues on Second Street until Logan St. It runs northwesterly on Logan St until it reaches 90 N. 6th Street. The alignment runs along the north side of this residential lot to reach the Lira's Supermarket property, where it then crosses Highway 12 onto Gardiner Way. The alignment continues on Gardiner Way until reaching St Francis Way. This alignment has a total length of 14,700 linear feet.

This alternative requires acquiring two easements: one on the private residential lot, and the other on the supermarket property. The trenchless crossing of Highway 12 would take several weeks to complete, and the work area would obstruct the supermarket loading docks during that period. Therefore, the impacts to the supermarket would be significant.

Alternative 3 (Virginia Drive): To reach the Highway 12 / Virginia Dr crossing location from the east side, the alignment would navigate St Gertrudes Ave in order to reach Front St. It would then run along Front St until it turns west onto the Highway 12 offramp, which is Caltrans right-of-way, and then run for several hundred feet until reaching the crossing location. This type of Caltrans encroachment requires a longitudinal encroachment permit, which typically has a processing time of over 12 months. Considering the time-critical nature of the consolidation project, a Caltrans longitudinal encroachment permit is not preferable.

After crossing Highway 12 onto Virginia Dr, the alignment continues on Virginia Dr until it intersects with St Francis Way. This alignment has a total length of 14,200 linear feet, which represents the shortest length of the four alternatives.

Alternative 4 (Front Street): The alignment runs along Second Street until it turns east down St Gertrudes Ave to reach Front St. It then continues on Front St, crosses underneath the bridge deck of Highway 12, and then intersects with Highway 84. Subsequently, the alignment runs along the outer edge of two undeveloped private parcels along a "U" shaped path, and then continues northwest on a straight alignment along the edge of a third parcel to reach St Francis Way. The City would need to acquire three easements in total. The City has reached out to the landowner, who owns all three parcels, to coordinate easement needs. The owner expressed a willingness to work with the City and stated their plan to develop the parcel fronting Highway 84.

Both Caltrans crossings are transverse encroachments which are preferable over longitudinal encroachments. The Caltrans right-of-way spans across both highways with no gap in between. It is anticipated that Caltrans would require a single trenchless crossing across Highway 84 and likely allow an open trench crossing under the Highway 12 bridge. The traffic volumes are relatively low along this section of Front St. Therefore, the traffic and community impacts would likely be less disruptive in comparison to the other alignment alternatives. This alignment has a total length of 14,700 linear feet.

This alternative could be combined with a potential new location for the River Road LS, which the City expressed an interest in relocating. If the City decides to locate the new River Road LS adjacent to the new force main, there is an opportunity for the River Road LS to pump into the force main. The pipeline would become a common force main between Marina Lift Station and River Road LS. A dedicated River Road LS force main would be avoided, resulting in considerable cost savings. This concept was evaluated and is discussed later in this TM.

Downstream Connection Point: A potential option to shorten the length of the transfer force main was identified. The new force main would terminate at a high-point located halfway along Airport Road near 1604 Airport Road (self-storage facility). From this point a new gravity sewer pipe would be installed to transport flows downhill and would connect to the existing pipe stub at the Church Road/Airport Road intersection. This option would reduce the total force main length by approximately 1,700 ft. This would reduce the required pumping head, minimize the size and horsepower of the pumps, as well as the annual operating power costs.

An additional benefit of this option is that the existing gravity collection system would be extended along Airport Road, thereby facilitating the provision of sewer service to future development within the area. The nearby self-storage facility, which is reported to be served by an onsite septic system, could connect to this new sewer pipe, and then abandon its existing septic system.

River Road Lift Station

The City would like to relocate the River Road LS as part of the wastewater consolidation project. The River Road LS is reported to be unreliable and is located in a poor location within Caltrans right-of-way and the 100-yr floodplain. The relocation of River Road LS presents an opportunity to break up the multiple-pumping chain in the collection system. Instead of the River Road LS pumping to City Hall LS, and then to Marina Lift Station, implementation of this alternative would result in the River Road LS diverting flow into the proposed force main flowing north to the Northwest WWTP. This would reduce pumping requirements for both the City Hall and Marina Lift Stations, reducing O&M costs.

Three options for the River Road sewer-shed were developed in collaboration with the City, and these are discussed in the following paragraphs.

Re-Sewer the Sewer-shed: An option was evaluated to ‘re-sewer’ the River Road LS sewer-shed to direct the flows towards the northwest, which would match the objective of the consolidation project to redirect Core Area flows in the same direction. This option involves abandoning the existing River Road LS, constructing a new gravity sewer flowing northwesterly through the Dutra Materials property to a new lift station on Oak Tree Alley. This station would then pump to St Francis Way, where the new force main would either discharge to another new lift station, or it would connect into the new force main.

If the flows are redirected, then the existing sewer running along Highway 84, which is Caltrans right-of-way, could be abandoned. The new gravity sewer through the Dutra Materials property would flow against the slope of the existing ground profile, resulting in a deeper sewer further to the northwest.

Additionally, redirecting the sewer in this manner would make it difficult for the City to provide sewer service to two parcels: the Calpine Pipeline Facility (60 River Road), and the undeveloped parcel abutting the Calpine facility to the south. The City would need to find an alternative means of providing sewer service and it is unclear at this time if a pumped or gravity system would be more cost-effective.

Relocate to Poppy House Road: Poppy House Road is another potential area to relocate the River Road LS and force main. The parcels abutting Poppy House Road appear to be undeveloped and could provide a clear corridor for new sewer infrastructure. A new gravity sewer would be installed and it would connect to an existing sewer manhole at the eastern end of the Dutra Materials property, and then traverse north towards Poppy House Rd. The new sewer pipe would discharge into the new River Road LS, located on Poppy House Road, and the new force main would continue on to St Francis Way.

Easement acquisition would be needed through three parcels in total. If an easement can be acquired, then the existing sewer along Highway 84 could be relocated out of Caltrans right-of-way and into this easement. After this alternative was conceptualized, the City noted that construction had commenced on a new boat storage yard on Poppy House Rd and that acquiring the easement through the property would be a challenge.

Co-locate with the Proposed Force Main: As discussed earlier, there is an opportunity to relocate the River Road LS to a site adjacent to the new force main alignment. The River Road LS would pump into the new force main, and there would be cost savings involved with not constructing a separate force main. An easement would be required for the lift station and associated pipelines. Initial outreach to the landowner noted that they expressed a willingness to provide the City with an easement. In addition to most of the parcel being located within the FEMA 100-yr floodplain, a regulatory floodway runs through the property as well. The preferred site is located outside of the floodplain and adjacent to the Calpine Facility at 60 River Road. The existing paved access drive for the Calpine facility could also serve as site access to the new station.

This option facilitates the City's need to provide sewer service to the Calpine Facility and the adjacent lot. Because the adjacent lot has the same owner as the lot in which the new River Road LS would be located, demonstrating the City's commitment to providing local sewer service would facilitate easement negotiations. As part of the new River Road LS installation, a sewer connection stub could be provided to serve the future development.

Based on discussions with the City, the City preferred a common force main concept over the construction of two separate force mains. As part of this study, the proposed common force main system was analyzed to check its feasibility. It was determined that the proposed system is feasible but is highly dependent on the flow characterization at each sewer-shed, the design pumping rates, and available storage (operational and/or emergency) at each station during peak flow conditions. Based on this analysis, emergency storage is recommended at the new River Road LS to accommodate a worst-case scenario where all pumps at the Marina Lift Station pump continuously and River Road LS would be unable to pump into the common force main. Veolia staff noted at least one instance in the past in which all three pumps at Marina Lift Station were pumping simultaneously to handle peak inflows. Therefore, this worst-case scenario is based on an actual historical event. VFDs would be needed at each station to alter the flowrates according to operational conditions. Pending further engineering analysis, a SCADA system may be warranted to prevent River Road LS from pumping when both of the Marina Lift Station pumps are pumping (peak flow conditions). Without this control, the pumping head required for each station could become excessive. If the required head is too high, then the pumps would be considerably oversized for normal conditions. The cost savings associated with a common force

main would likely offset the costs of emergency storage at River Road LS and the additional electrical and control equipment required to operate the system.

Figure 5 is a draft conceptual site plan that has been prepared for the new River Road LS location adjacent to the Calpine Facility.

Vineyard Bluffs and Beach Sewer-sheds

The improvements needed at these two sewer-sheds are dependent on the selected modifications to Second Street LS (described in a subsequent section) as well as the location of the new lift station. The Vineyard Bluffs sewer-shed is located at the edge of the City limits and is relatively isolated. The existing Vineyard Bluffs LS pumps to the Beach WWTP. The flow would need to be diverted towards the location of the new lift station. Whether this flow is routed through Second Street LS depends on how Second Street LS is modified (or not) and if Second Street LS will be relocated. Based on initial flow estimates, the peak inflow into Vineyard Bluffs LS is 32 gpm. However, based on City records the current pumps are rated for 140 gpm. If the Vineyard Bluffs development is fully built out, then replacing the pumps with smaller capacity pumps could be warranted, and this would benefit the downstream infrastructure by reducing flows.

The Beach sewer-shed currently drains to the Beach WWTP. For the consolidation project, the inflows would need to be pumped to a different sewer-shed. The exception is if the new lift station is located within the Beach sewer-shed, in which case the new 'Beach LS' would be the new lift station. Based on initial flow estimates, the peak flow into Beach LS would be approximately 30 gpm, representing a relatively small amount of flow. To achieve self-cleaning velocities through a new 3-inch force main, it is recommended that the design pump rate be increased to 60 gpm.

Second Street Lift Station

The options for Second Street LS are: upgrade in place, relocate, or relocate and upgrade. These options are described in the following paragraphs.

Upgrade in Place: Both the Vineyard Bluffs LS and the new Beach LS could be pumped to the existing Second Street LS. The station would be upgraded to approximately 205 gpm to accommodate the additional flow. According to City records, the existing station has one pump. This pump would need to be replaced with two new, larger capacity pumps (1 duty + 1 standby). The existing wet well needs to be checked to ensure there is sufficient space to fit the new pumps, as well as to check that the pump-starts per hour are not excessive. If the wet well is undersized, then it would need to be replaced with a larger wet well. As discussed earlier, there is a potential opportunity to replace the existing pumps at Vineyard Bluffs LS with smaller capacity pumps that more closely match the estimated peak inflow. Doing so would allow a reduction in capacity, and reduce the required upgrades for the Second Street LS.

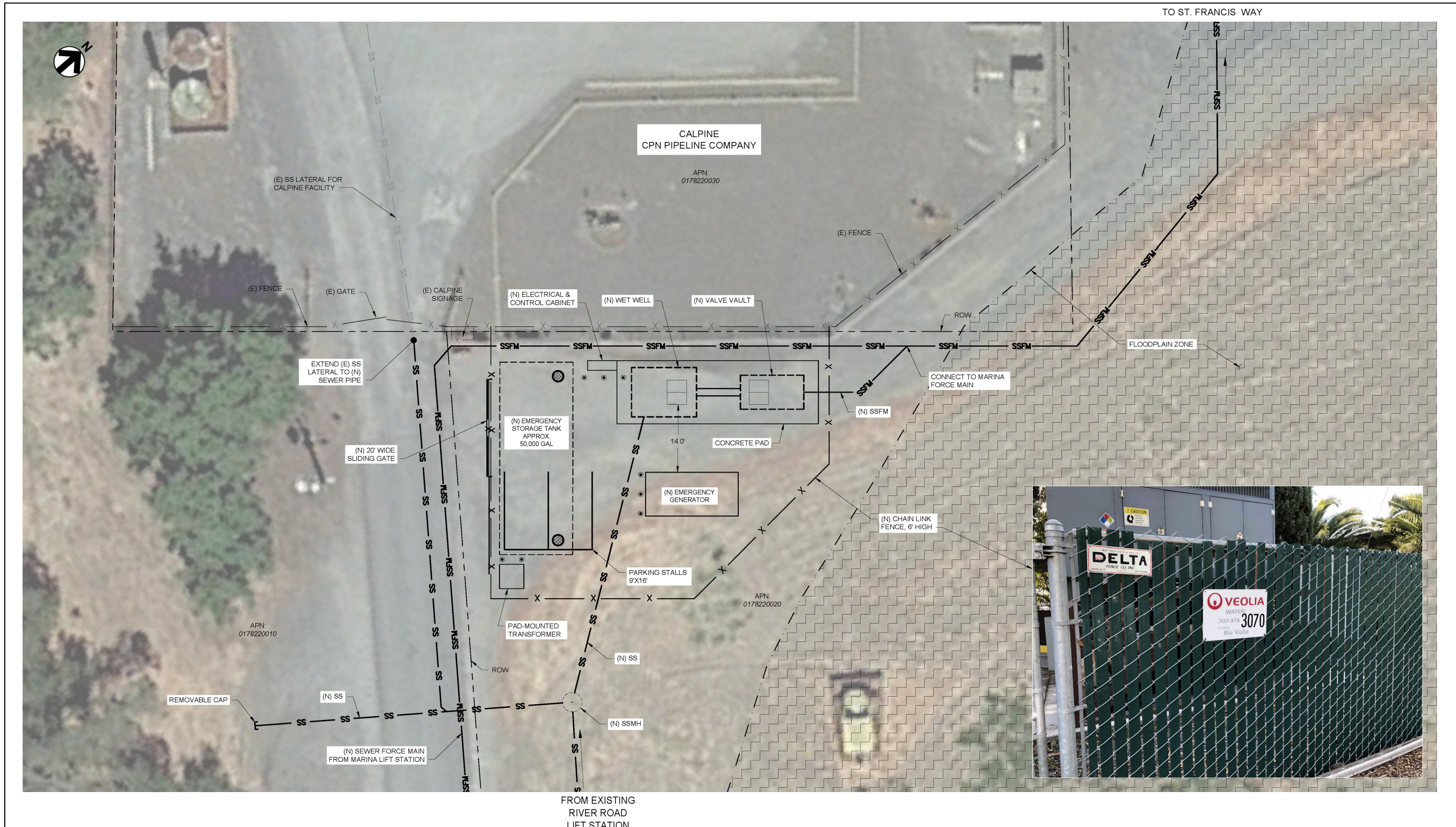


Figure 5: River Road Lift Station Relocation – Draft Conceptual Site Plan

Relocate: The potential sites discussed earlier for the new lift station could also serve as potential sites for a relocated Second Street LS. In addition to those four locations, a fifth site has been identified at the existing sewer manhole located at the intersection of Beach Dr and Montezuma Hills Road that is serving the Second Street LS sewer-shed.

Based on FEMA flood maps, this manhole is located just outside of the 100-yr floodplain. The existing manhole could be removed and the new Second Street LS wet well could be installed in its place. Due to the small inflows (less than 5 gpm), a prepackaged “grinder pump station” could be installed. A new 2-inch force main would be routed to the Marina Lift Station sewer-shed.

If the relocated station is not upgraded in capacity, then Vineyard Bluffs LS and the new Beach LS would not pump into it. The force mains for those two stations would need to bypass the Second Street LS to reach the new lift station. Alternatively, they could pump into the Marina Lift Station sewer-shed, which is only a few hundred feet away from the Beach Dr/Montezuma Hills Rd intersection. Depending on the selected collection system improvements, there could be up to two existing pipes along Second Street that would be abandoned and hence available for sliplining.

Relocate and Upgrade: This option is similar to the “upgrade” option except the City would relocate the station out of the 100-yr floodplain. The station would be upgraded to approximately 205 gpm to accommodate the additional flow from Vineyard Bluffs and Beach sewer-sheds. If the Second Street LS is not combined with the New Lift Station, then two sites would need to be identified in the area: one for each new station. This would be very challenging and the construction costs as well as ongoing O&M costs would be significantly higher than the other options. Relocating and upgrading the Second Street LS in addition to constructing a New Lift Station is not considered cost-effective.

RECOMMENDATIONS

The recommended collection system improvements for the consolidation project have been developed based on the evaluation described in this TM and the initial feedback provided by the City. These recommendations are described in the following paragraphs and are shown on **Figure 6** and **Figure 7**.

New Lift Station – To implement the consolidation project in an expeditious manner, it is recommended that the existing Marina Lift Station be upgraded and re-purposed into the Core Area Lift Station. Modernizing the Marina Lift Station would extend its remaining useful life and make it safer to operate and maintain. The basic scope of work for the Marina Lift Station upgrade would consist of the following:

- Replace the three existing pumps with new dry pit submersible pumps. Stage the work and replace one pump at a time.
- Install a new Motor Control Center (MCC) and VFDs in the existing motor room. As part of design, determine if the available space is adequate.
- Upgrade the power supply system including a new transformer and emergency generator.

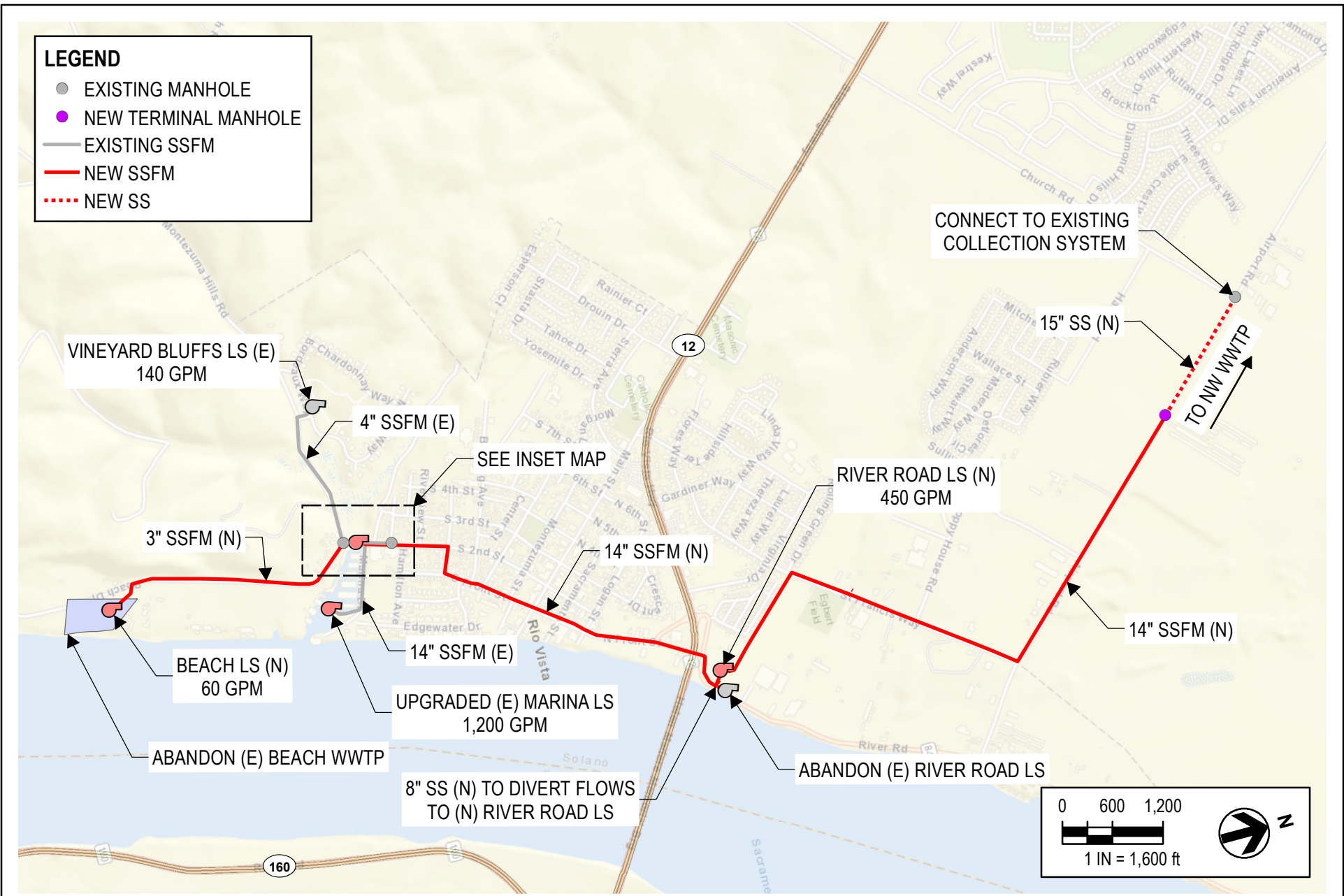


FIGURE 6
CITY OF RIO VISTA
RECOMMENDED COLLECTION SYSTEM IMPROVEMENTS

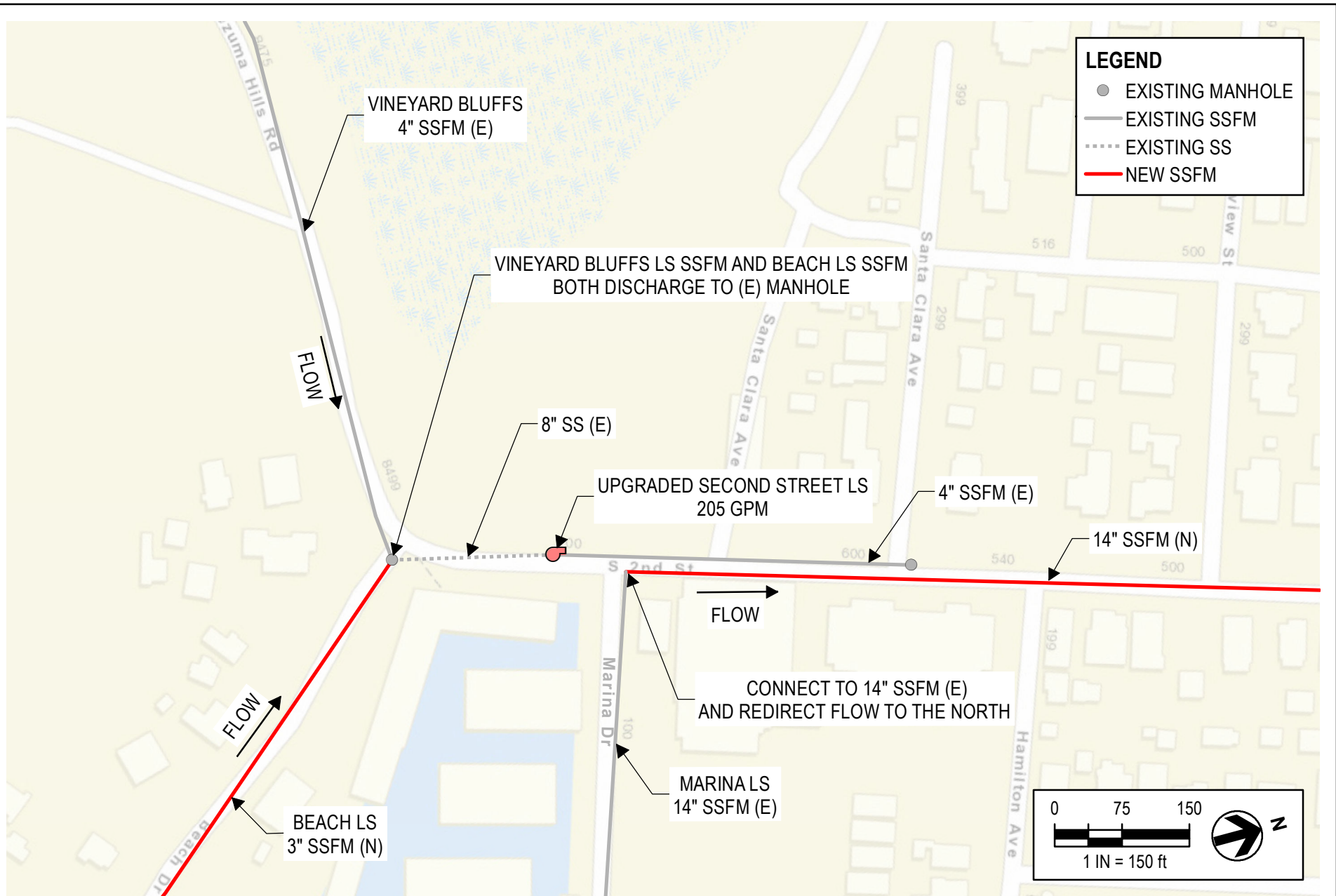


FIGURE 7
CITY OF RIO VISTA
RECOMMENDED COLLECTION SYSTEM IMPROVEMENTS - INSET MAP

- Replace the existing 8-inch discharge pipework with 10-inch and 12-inch pipework to reduce the required pumping head.
- Replace the existing swing check valves with ball-type check valves, and replace the gate valves with eccentric plug valves. Install an air release valve.
- Optimize the level setpoints according to the proposed operating conditions.
- Disconnect and remove the existing mechanical and electrical equipment being replaced.

In addition to the primary upgrades outlined above, it is recommended that the following evaluations be undertaken:

- Evaluate the need for a bypass connection fitting to facilitate future maintenance, and pig-launching station(s) for periodic force main cleaning.
- Conduct a desktop flood risk review, including the approximation of future 100-yr flood elevations and any additional flood protection measures that may be needed.
- Conduct transient surge analysis for the lift station and force main system. A surge tank may be needed on the station site.

New Force Main – The recommended new force main alignment is shown on **Figure 8**. Approximately 1,200 linear ft of existing 14-inch force main would be reused, from the existing Marina Lift Station to the intersection of Marina Drive and Second Street. From this intersection, a new 12 to 14-inch force main would be constructed utilizing open-trench construction methods within the City's public road right-of-way. This reach of pipeline would traverse along Second Street, St Gertrudes Ave, and then Front St until it intersects with Caltrans right-of-way before crossing underneath the Highway 12 bridge.

The Caltrans right-of-way extends approximately 300 ft from the south side of Highway 12 to the north side of Highway 84. The Highway 12 encroachment would be crossed utilizing open-trench construction under the highway bridge. Highway 84 would be crossed utilizing trenchless construction methods. Depending on the soil conditions and other factors, auger bore-and-jack could be feasible. If the soils are unsuitable for auger boring, then microtunneling should be considered.

The trenchless crossing ends within private property. The force main would be constructed using open-trench methods along the outer edge of the property and set back from the Caltrans Highway 84 right-of-way as well as an existing gas main. The force main would then turn down the existing driveway for 60 River Road (Calpine facility), which is also within the same property. Once the force main reaches the Calpine facility, the alignment turns and wraps around the Calpine facility property line through additional private properties. As mentioned earlier, the same entity owns all three private properties that the pipeline would traverse through, and the City has already commenced owner outreach. From the Calpine facility, the pipeline turns and runs northwest until it reaches St Francis Way, which is City right-of-way. It would continue through City right-of-way and be constructed using open-trench methods for the remainder of the alignment, along St Francis Way and then on Airport Road.

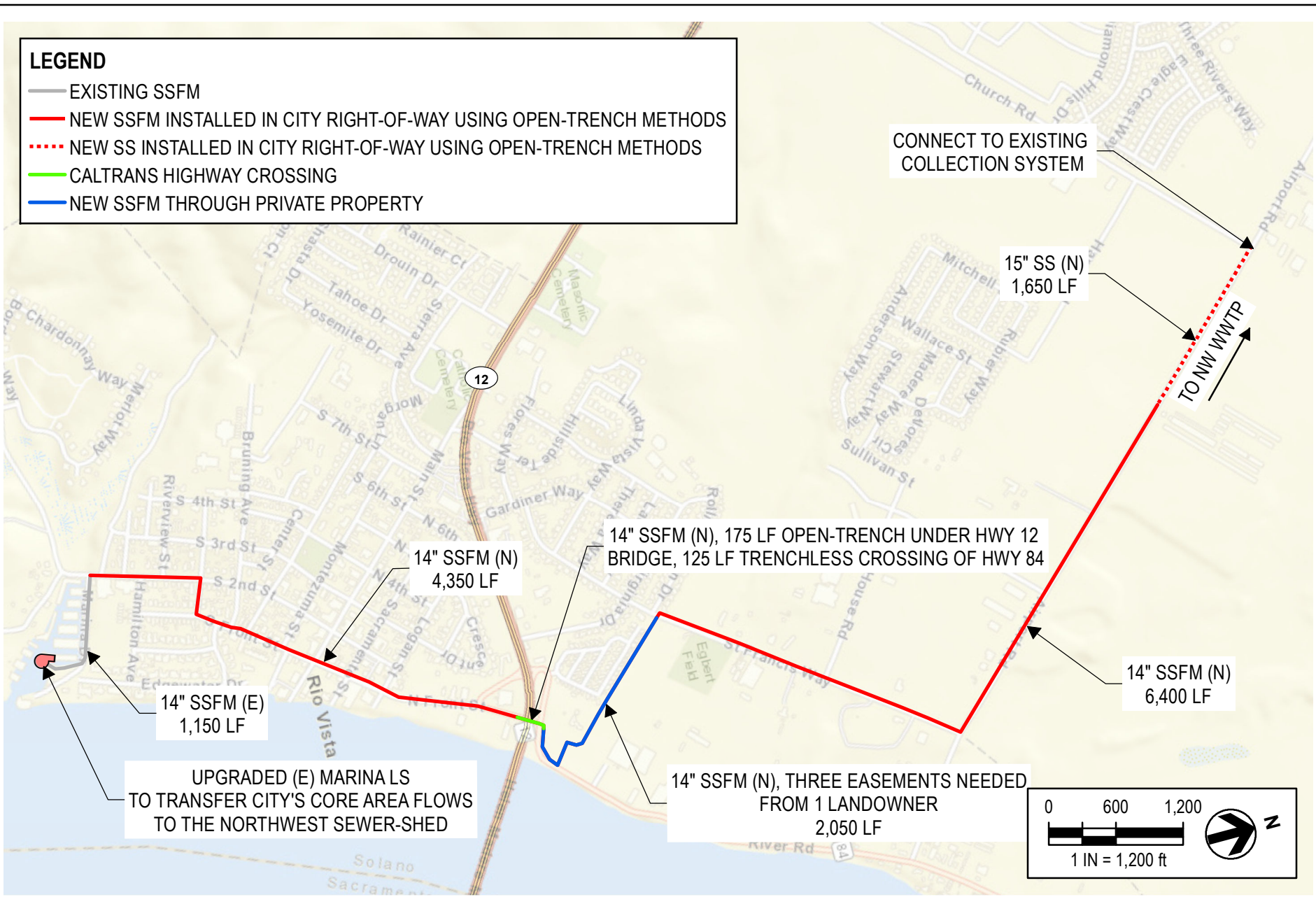


FIGURE 8
CITY OF RIO VISTA
NEW FORCE MAIN - RECOMMENDED ALIGNMENT

The force main would terminate at a new discharge manhole located near 1604 Airport Road (self-storage facility). This manhole would flow into a new 15-inch gravity sewer running approximately 1,700 ft and discharge to an existing manhole located at the Church Road /Airport Road intersection. From this point the flow would continue on to the Northwest WWTP through the existing collection system. The total alignment length consists of approximately 12,950 ft of new 12 or 14-inch sewer force main and approximately 1,700 ft of new 15-inch gravity sewer pipe.

Other Lift Station Improvements – The River Road LS would be relocated to a site adjacent to 60 River Road (Calpine facility), where it would pump into the new force main. Therefore, the new force main downstream of this location would be a common force main. The existing River Road LS would be decommissioned and abandoned. The new River Road LS would have a capacity of approximately 450 gpm, and an underground emergency storage tank of approximately 55,000 gallons would be constructed near the station. The new station would operate with 2 pumps (1 duty + 1 standby), and controlled with VFDs to cater for the range of different operating conditions associated with the common force main system.

The sewer-shed surrounding the Beach WWTP would be directed to a new Beach LS with a capacity of approximately 60 gpm and a new 3-inch force main. At the intersection of Beach Dr and Montezuma Hills Rd, an existing sewer manhole would be utilized to receive flows from the new Beach LS force main and the existing Vineyard Bluffs force main. The existing Vineyard Bluffs 4-inch force main would be rerouted to this existing manhole. Wastewater would flow from this manhole, through an existing 8-inch sewer, to reach the upgraded Second Street LS, with a new capacity of 205 gpm. The Second Street LS would convey flow north through its existing 4-inch force main to its existing connection point on Second Street and Santa Clara Avenue, where it would then continue by gravity flow through the Marina sewer-shed. The potential to downsize the capacity of Vineyard Bluffs LS and the upgraded Second Street LS should be investigated.

Engineer's Opinion of Probable Construction Cost – Based on the recommendations outlined in this section, a conceptual-level opinion of probable construction cost has been developed and is presented in **Table 2**. With contingencies included, the estimated construction cost is \$14.4M. With soft costs included, the overall project total is approximately \$17.8M. This estimate was developed based on recent construction bid pricing in the region. The decommissioning of Beach WWTP is not included in this estimate.

Table 2 – Opinion of Probable Construction Cost

| Item | Quantity | Unit | Unit Cost | Total |
|---------------------------------------|----------|------|-------------|---------------------|
| General | | | | |
| Mobilization | 1 | LS | \$500,000 | \$500,000 |
| SWPPP Compliance | 1 | LS | \$80,000 | \$80,000 |
| Startup and Commissioning | 1 | LS | \$50,000 | \$50,000 |
| Traffic Control | 1 | LS | \$100,000 | \$100,000 |
| Pump Stations | | | | |
| Beach LS Construction | 1 | LS | \$700,000 | \$700,000 |
| Marina Lift Station Upgrade | 1 | LS | \$1,000,000 | \$1,000,000 |
| Second Street LS Upgrade | 1 | LS | \$600,000 | \$600,000 |
| River Road LS Relocation | 1 | LS | \$1,300,000 | \$1,300,000 |
| Collection System | | | | |
| Beach 3-inch SSFM | 3,200 | LF | \$150 | \$480,000 |
| Vineyard Bluffs SSFM Modification | 1 | LS | \$30,000 | \$30,000 |
| Marina 14-inch SSFM | 13,000 | LF | \$400 | \$5,200,000 |
| Special Trench Section (Highway 12) | 1 | LS | \$80,000 | \$80,000 |
| Bore and Jack under Highway 84 | 1 | LS | \$180,000 | \$180,000 |
| Airport Road 15-inch SS | 1,700 | LF | \$450 | \$770,000 |
| Overall Subtotal | | | | \$11,070,000 |
| Contingency | | 30% | | \$3,320,000 |
| Estimated Construction Cost | | | | \$14,390,000 |
| Soft Costs | | | | |
| Permitting/CEQA | | 2% | | \$290,000 |
| Right-of-way and Administration Costs | | 1% | | \$140,000 |
| Design | | 8% | | \$1,150,000 |
| Construction Management/Inspection | | 10% | | \$1,440,000 |
| ESDC | | 3% | | \$430,000 |
| Overall Project Total | | | | \$17,840,000 |

Note: Pipeline costs include excavation, backfill, sheeting, shoring, pavement resurfacing, and grading.

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APPENDIX VIII-C
City of Rio Vista
Sewer System Management Plan
2011 Sewer Evaluation and Capacity Assurance Plan

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Stantec

City of Rio Vista

System Evaluation and Capacity Assurance Plan

October 2011

Prepared for
City of Rio Vista

Prepared by
Stantec Consulting Services Inc.
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City of Rio Vista

System Evaluation and Capacity Assurance Plan

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Introduction

1.1 PURPOSE

The purpose of this study is to analyze capacity of existing wastewater collection system components for the City of Rio Vista. In May of 2006, the State Water Resources Control Board Order No. 2006-0003DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Statewide General Order). One of the requirements of the Statewide General Order was the completion of a System Evaluation and Capacity Assurance Plan (SECAP).

The purpose of the SECAP is to prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather flow event. At a minimum, the plan must include:

- **Evaluation:** Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;
- **Design Criteria:** Where design criteria do not exist or are deficient, undertake the evaluation identified above to establish appropriate design criteria;
- **Capacity Enhancement Measures:** The steps needed to establish a short and long term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding; and,
- **Schedule:** The City shall develop a schedule of completion dates for all portions of the capital program developed above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D.14 of the Statewide General Order.

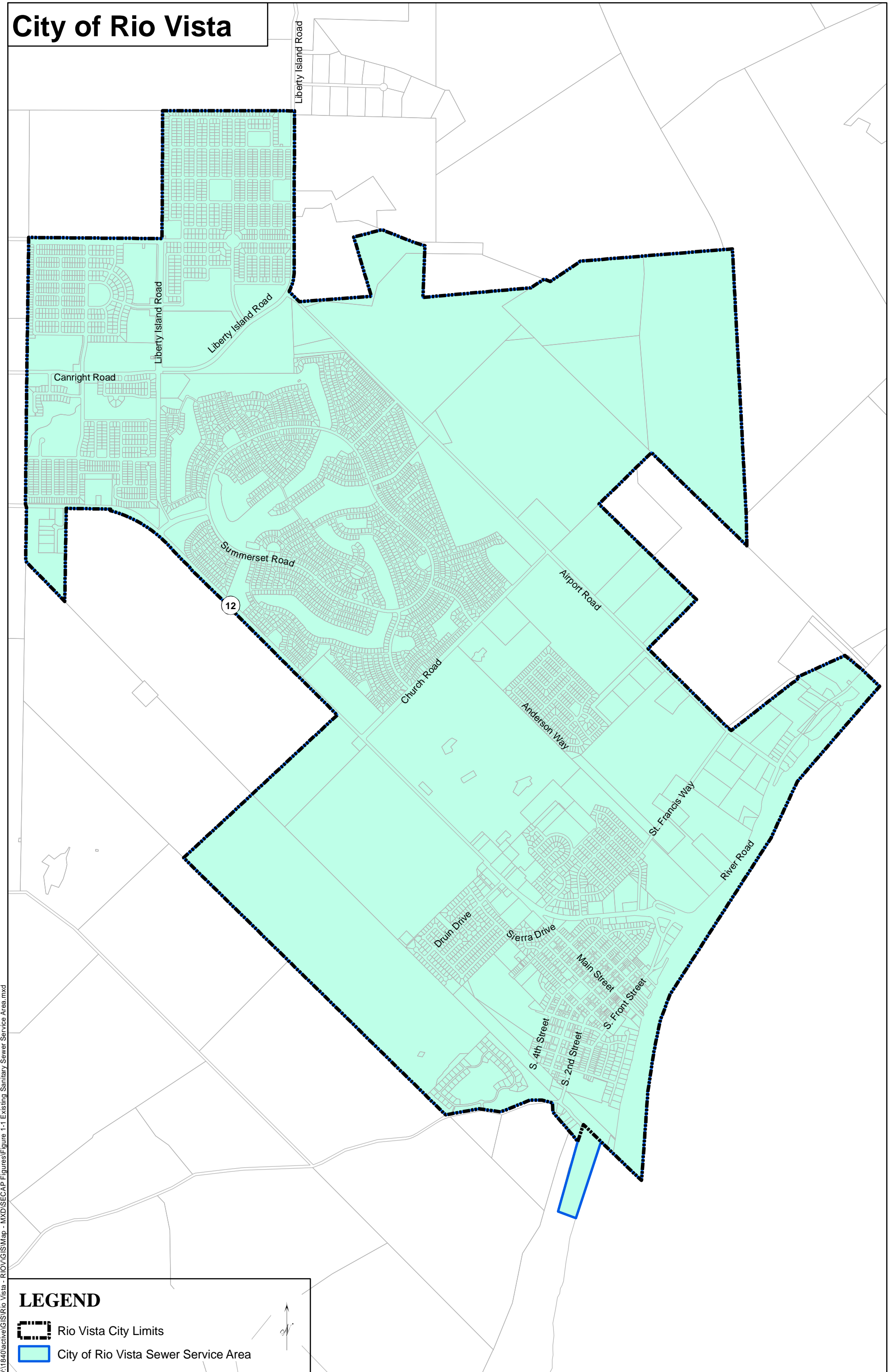
1.1.1 COLLECTION SYSTEM

Facilities analyzed in this report consist of existing wastewater collection and conveyance systems providing service for the current level of development. Analysis of the existing collection system is based on the existing system conveying current wastewater flows under design precipitation conditions.

1.2 STUDY AREA



The study area considered in the analysis is limited to the City of Rio Vista sewer service area. The sewer service area is generally shown in Figure 1-1. Since this analysis is not intended to consider future growth, areas of expansion for the sewer service area or future additional wastewater flows within General Plan growth boundaries have not been included.

City of Rio Vista



V:\1840\active\GIS\Rio Vista - RIOV\GIS\Map - MXD\SECAP Figures\Figure 1-1 Existing Sanitary Sewer Service Area.mxd

LEGEND

-  Rio Vista City Limits
-  City of Rio Vista Sewer Service Area

Existing Wastewater Collection System

2.1 PURPOSE

The purpose of this chapter is to describe the City's existing wastewater collection system, which currently provides service to users within the city limits as well as a limited number of users outside of the city limits.

This chapter is divided into the following sections:

- Description of Existing Wastewater Collection System
- GIS Database
- Existing Wastewater Flows

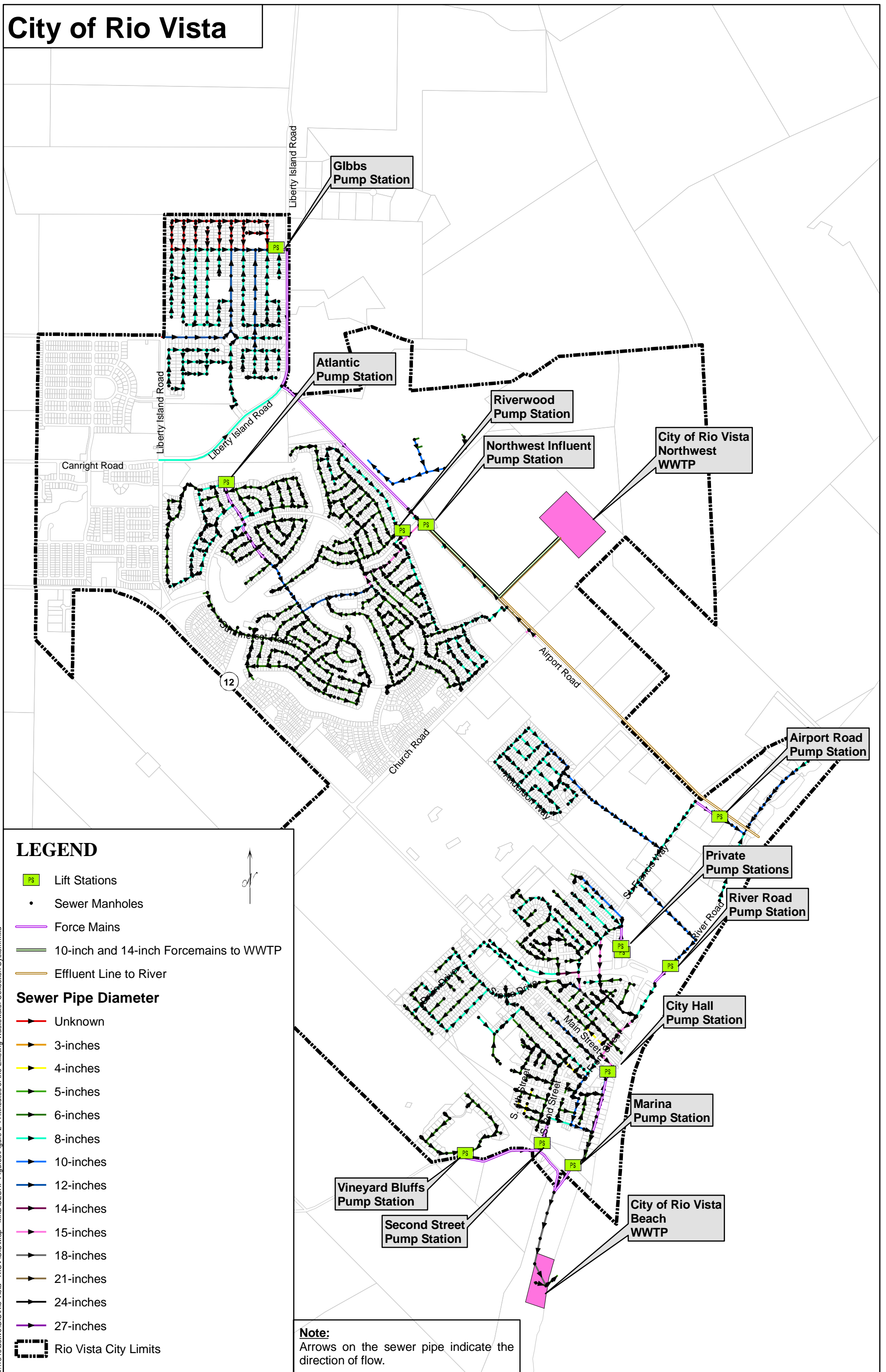
2.2 DESCRIPTION OF EXISTING WASTEWATER COLLECTION SYSTEM

The City's existing wastewater collection system covers an area of approximately 4,268 acres and provides service to over 4,655 residential, commercial, and industrial users (as reported in the 2009 *City of Rio Vista Wastewater Rate Analysis* by Wildan Financial Services). The wastewater generated by these users is collected and conveyed either to the City's Beach wastewater treatment plant (WWTP) to the south or to the City's Northwest WWTP by a network of sewer pipelines, force mains, and pump stations. The City owns, operates, and maintains this network of over 41 miles of pipelines (ranging in size from 6 to 27 inches in diameter) and 10 lift stations.

The City is located in Solano County in the Sacramento River Delta area. The terrain is relatively flat, sloping gently to the Sacramento River bordering the eastern edge of the City. The City's existing collection system generally follows this natural slope, flowing from east to west. The northern portion of the City's collection system, consisting primarily of the Trilogy retirement community, flows to the City's Northwest WWTP influent pump station via a network of sewers tributary to the 15 and 21 inch sewers in Airport Road. The sewers in the older downtown area and along the river flows to the Beach WWTP via the Marina lift station and an 18 inch sewer in Beach Street. The City's existing wastewater collection system and significant facilities are shown in Figure 2-1.

For the purposes of this study, it was assumed that both wastewater treatment plants would remain in service. Should the City decide to retire the Beach WWTP due to age or perceived economic benefit, it is recommended that a predesign report be completed to determine the implications of abandoning that WWTP and diverting all sewers to the Northwest WWTP. After completing a predesign report, it is recommended that this study be updated to determine the impact on the capacity issues and related capital improvement projects described in this study.

City of Rio Vista



LEGEND

- PS Lift Stations
 - Sewer Manholes
 - Force Mains
 - 10-inch and 14-inch Forcemains to WWTP
 - Effluent Line to River
- Sewer Pipe Diameter**
- Unknown
 - 3-inches
 - 4-inches
 - 5-inches
 - 6-inches
 - 8-inches
 - 10-inches
 - 12-inches
 - 14-inches
 - 15-inches
 - 18-inches
 - 21-inches
 - 24-inches
 - 27-inches
- ⬜ Rio Vista City Limits

Note:
Arrows on the sewer pipe indicate the direction of flow.

2.2.1 LIFT STATIONS

The City operates 10 lift stations in its sewer system. These pumps range in total pumping capacity from 140 to 2,760 gallons per minute (gpm). The City's largest lift station the Northwest Influent Pump Station serves the entire area tributary to the NW WWTP. The second largest pump station (Marina Lift Station), is located in the Delta Marina, has a pumping capacity of 1,800 gpm and serves The entire downtown area and along the river. More detailed information regarding the lift stations are shown in Table 2-1 below. In addition, lift station locations are shown above on Figure 2-1.

Table 2-1
City of Rio Vista
Lift Station Information

| Lift Station | Number of Pumps | Pump Capacity (gpm) ^(a) | Total Dynamic Head (feet) | Horsepower |
|---------------------------------|-------------------|------------------------------------|---------------------------|-------------------|
| Tributary to the Beach WWTP | | | | |
| Airport Rd. | 2 | 230 | 40 | 5 |
| River Road | 2 | 320 | 28 | 5 |
| City Hall | 2 | 497 | 29 | 7.5 |
| Vineyard Bluffs | 2 | 140 | 85 | 10 |
| Second Street | 1 | -- ^(b) | -- ^(b) | 1.5 |
| Marina | 3 | 1,800 | 48 | 15 |
| Tributary to the Northwest WWTP | | | | |
| Riverwood | 2 | 313 | 14.2 | 3 |
| Atlantic | 2 | 650 | 65 | 15 |
| Northwest Influent Pump Station | 3 | 2,760 | 95 | 60 |
| Gibbs | -- ^(c) | -- ^(c) | -- ^(c) | -- ^(c) |

(a) Pump capacity indicates the maximum reliable capacity (largest pump out of service).

(b) Information unavailable.

(c) Gibbs Lift Station is not currently operational.

2.3 GIS DATABASE DEVELOPMENT

Pipe and manhole data for the majority of the wastewater collection system was provided by the City in AutoCAD format and in the form of hard copy as-built drawings. Both sources of data were consolidated into Geographic Information System (GIS) format for use in the hydraulic model.

Pipe information included:

- Location
- Pipe size (diameter)

Manhole information included:

- Location

Invert and rim elevations for the manholes and pipes were not provided for the majority of the sewer system. Surveying was completed at manholes deemed strategic for developing a hydraulic model of the system. Invert and rim elevations for the manholes and pipes selected for the hydraulic model were interpolated from the surveyed data.

2.4 EXISTING WASTEWATER FLOWS

The following sections describe typical wastewater flow characteristics and include a description of the flow monitoring program used to determine existing wastewater flow in the system.

2.4.1 WASTEWATER FLOW CHARACTERIZATION

Wastewater collection systems are designed to convey peak wet weather flows. Peak wet weather flows are generally comprised of three elements: base sanitary flow, groundwater infiltration (GWI), and rainfall-dependent infiltration and inflow (RDI/I). Each component is described in more detail below.

Base Sanitary Flow

Base sanitary flow is the component of wastewater generated directly by residential, commercial, and industrial users throughout a community. It is also referred to as base flow.

The majority of base flow is generated by residential and commercial users (i.e. restaurants, grocery stores, shops, etc.). Some base flow is also generated by light industrial users (i.e. warehouses) and public facilities (such as City Hall and schools).

Groundwater Infiltration

Groundwater infiltration is groundwater that enters the collection system through cracks in sewer pipes, leaky joints, damaged sewer lateral connections, and poorly sealed manhole walls. Groundwater infiltration tends to vary seasonally depending on groundwater depth in relation to the depth of the sewer pipes. Typically, groundwater infiltration is more significant during the wet season when groundwater elevations can rise due to rainfall.

Rainfall Dependent Infiltration and Inflow

Rainfall-dependent infiltration and inflow (RDI/I) is rainfall that enters the collection system. Infiltration is an indirect introduction of rainfall into the collection system through cracked sewer pipes, leaky joints, and manhole walls. Inflow directly enters the sewer system through leaky manholes covers, roof leaders, and clean-outs.

Diurnal Patterns

A diurnal flow pattern is the variation in flow occurring over the course of a full day. In a 24-hour period, wastewater flow varies significantly with maximum flows typically occurring in the morning and early evening, and minimum flow occurring in the late evening/early morning. During the flow monitoring study (described below), flow was measured every 15 minutes, providing detailed data to evaluate these daily patterns. Each area of the City has its own unique pattern, which varies between weekdays and weekends. Typical diurnal flow patterns for Site 3 are shown in Figure 2-2.

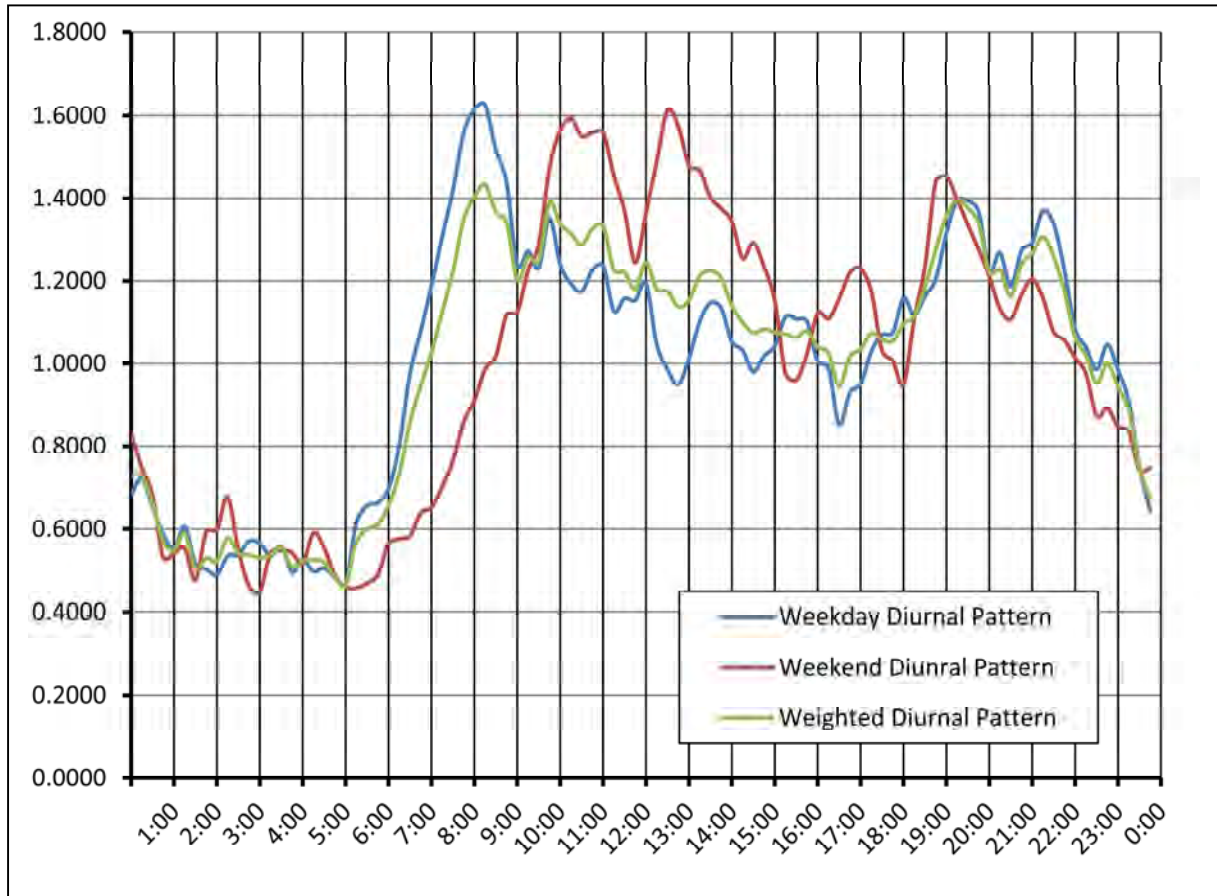


Figure 2-2
City of Rio Vista
Flow Monitoring Site 3 Diurnal Flow Patterns

2.4.2 FLOW MONITORING

Existing wastewater flow within the City's system during dry and wet weather conditions was determined by monitoring flow for a six week period from February 15, 2011 to March 27, 2011.

Three monitoring sites were chosen to divide the City's collection system into the sewer basins shown in Figure 2-3. A flow schematic of the sites and basins is included as Figure 2-4. As seen in this figure, the ten temporary flow monitors divided the collection system into ten basins.

Average and peak flows observed at each flow monitoring site during the flow monitoring period are shown in Table 2-2.

Table 2-2
City of Rio Vista
Summary of Existing Average and Peak Flows
February 15 to March 27, 2011

| Flow Monitoring Site | Average Flow (Mgal/d) ^(a) | Peak Flow (Mgal/d) ^{(a) (b)} |
|---|---|--|
| 1 ^(c) | 0.20 | 0.69 |
| 2 | 0.33 | 1.7 |
| 3 | 0.42 | 1.9 |
| TOTAL SYSTEM FLOW ^(d) | 0.62 | 2.6 |

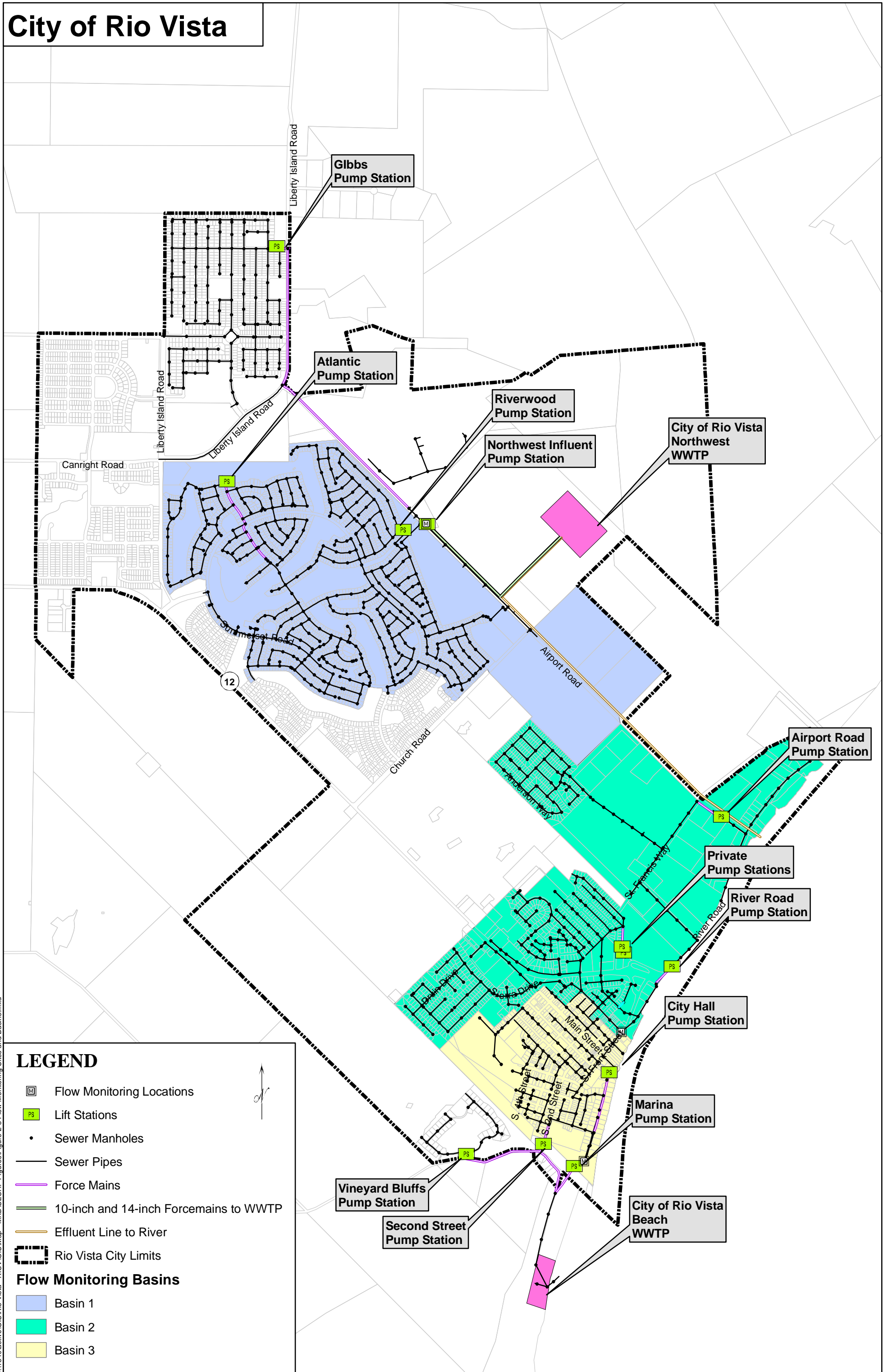
(a) Mgal/d = million gallons per day.

(b) Peak flows from monitoring sites taken from wet weather events.

(c) Total flow to Northwest WWTP.

(d) Total system flow was determined by adding flow from flow monitoring sites 1 and 3 (Site 2 is upstream of site 3, so its flow is included in the flow recorded at site 3).

City of Rio Vista



LEGEND

- Flow Monitoring Locations
 - Lift Stations
 - Sewer Manholes
 - Sewer Pipes
 - Force Mains
 - 10-inch and 14-inch Forcemains to WWTP
 - Effluent Line to River
 - Rio Vista City Limits
- ### Flow Monitoring Basins
- Basin 1
 - Basin 2
 - Basin 3



V:\1840\active\GIS\Rio Vista - RIOV\GISMap - MXD\SECAP Figures\Figure 2-3 Flow Monitoring Sites and Basins.mxd

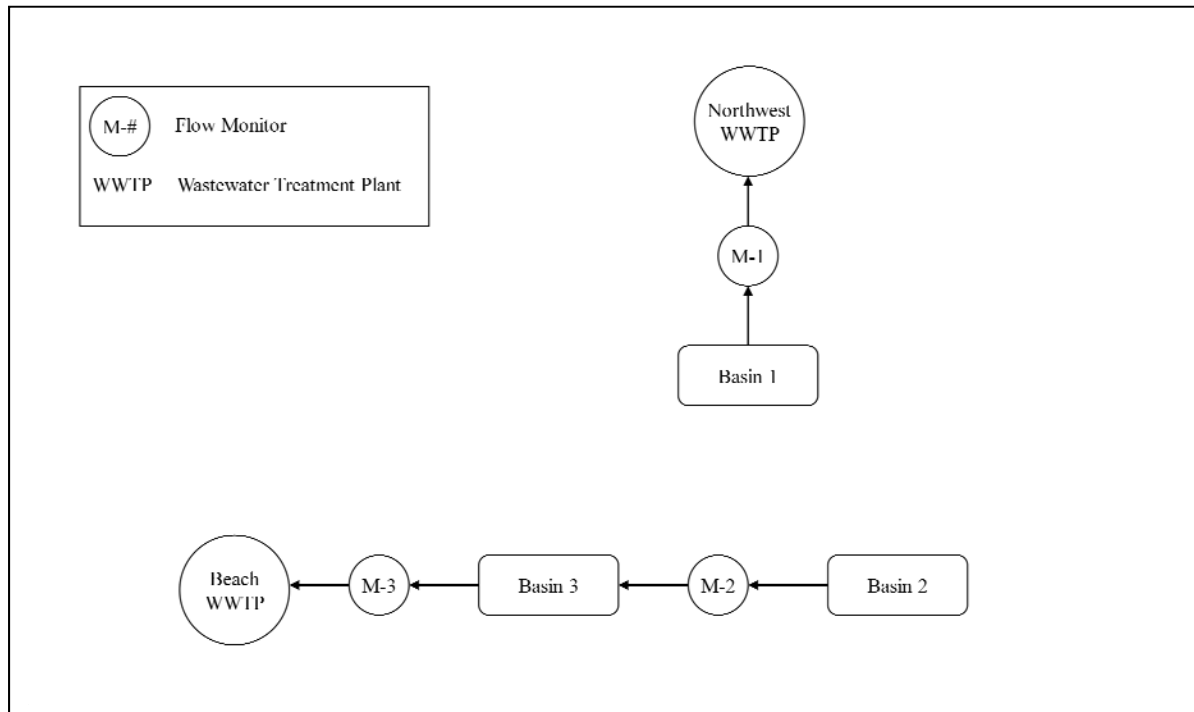


Figure 2-4
City of Rio Vista
Wastewater Collection System Flow Schematic

2.4.3 RAINFALL DATA

Rainfall data was collected from one rain gauge during the same six week period as the flow monitoring (February 15, 2011 to March 27, 2011).

The largest rainfall event during the analysis period occurred from March 21 – 27, 2011. Total rainfall during this event was approximately 2.3 inches. The rainfall event was a 1-year storm.

For comparison, in the City of Rio Vista a 10-year storm event over a six day period is predicted to generate 5.11 inches. A 10-year storm event is the level of protection against sanitary sewer overflows used for the capacity analysis described in Chapter 5 as required by the Regional Board.

2.4.4 INFLOW AND INFILTRATION ANALYSIS

The results of a cursory inflow / infiltration (I/I) analysis of the flow monitoring data is summarized below in Table 2-3.

Table 2-3
City of Rio Vista
Flow Monitoring and I/I Results Summary
February 15 to March 27, 2011

| Flow Monitoring Site | Average Flow (Mgal/d) ^(a) | Estimated Total I/I (gallons) | Peak I/I Rate (Mgal/d) | Peak I/I to ADWF Ratio | Peak Factor |
|----------------------|--------------------------------------|-------------------------------|------------------------|------------------------|-------------|
| 1 | 0.20 | 302,000 | 0.34 | 1.69 | 3.4 |
| 2 | 0.33 | 761,000 | 1.06 | 3.22 | 5.3 |
| 3 ^(b) | 0.42 | 1,354,000 | 1.46 | 3.46 | 4.6 |

(a) Mgal/d = million gallons per day.

(b) Site 3 flow includes flow from site 2.

The following observations regarding I/I in the City's sewer system were drawn from the analysis:

Rainfall Dependent Inflow and Infiltration: Sites 2 and 3 had significantly higher rainfall dependent inflow and infiltration rates compared to Site 1. This is due to the age and condition of the downtown sewer system where these flow monitors were located. Other possible sources of inflow and infiltration may be cross connections with the storm water system or leaky manhole lids in low spots. Further investigation of these issues may be warranted if the City suspects these to be problems.

Groundwater Infiltration: The ratio of low dry weather flows to average dry weather flow is a good indicator of groundwater infiltration in a flow monitoring basin. This ratio for Sites 2 and 3 indicates that there may be slightly higher-than-normal groundwater infiltration occurring in the basins upstream from these sites. These flow monitors were located downtown where the sewer system is very old and where high groundwater is probable because of the proximity of the Sacramento River.

Capacity (Peaking Factor): Sites 2 and 3 had peaking factors above the typical design threshold limits for peak flow to average dry weather flow ratio during this study.

d/D Ratio: Site 2 had d/D Ratios greater than 1, during the recorded storm events indicating a surcharged condition. Site 3 had d/D Ratios either equal to or greater than the typical design threshold of 0.75. Site 1 had d/D Ratios well below the design threshold of 0.75. High d/D ratios for Site 2 may be caused by backflow from the downstream capacity issues identified in Chapter 5.

Land Use Data

3.1 PURPOSE

This purpose of this chapter is to provide an overview of existing land use generating wastewater flow (as described further in Chapter 4). Existing land uses were determined from information provided by the City's Engineer, Dillon & Murphy.

3.2 EXISTING LAND USE DATA

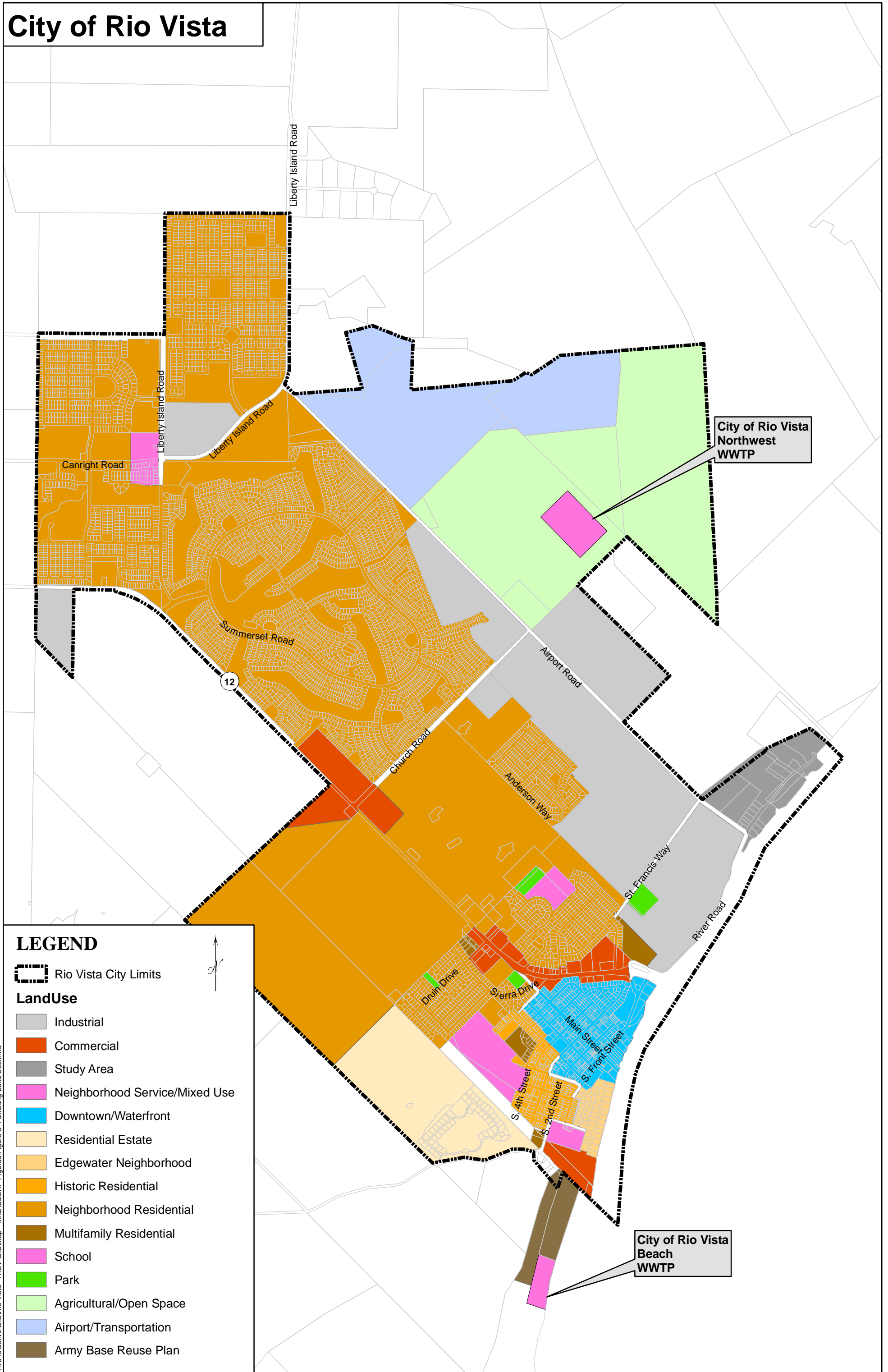
Parcel data was provided by the City in GIS format. Land use data was provided in hard copy of the City's General Plan Land Uses from the City's 2001 General Plan and a hard copy of the City's 1992 Zoning Map. Because the General Plan Land Use drawing was more recent and reflected development of the Trilogy Retirement Community, that drawing was chosen to be the basis for the land use in this study.

For the purposes of this study the following assumptions regarding land use were made:

- The Trilogy retirement community was assumed to be the only General Plan development to have occurred.
- Developed parcels in the Trilogy development were assumed to be occupied. Developed parcels were identified from a development scheduling map for the subdivision provided by Dillon & Murphy.
- The downtown area and the surrounding older residential areas were assumed to be completely developed and occupied.
- Areas zoned as Industrial/Employment (General), Industrial/Employment (Warehouse), and Industrial/Employment (Limited) were combined into one category and identified as "industrial".
- Areas zoned as Neighborhood Core District Commercial, Marina and Highway Commercial were combined into one category and identified as "commercial".
- All residential land use designations were assumed to have one dwelling unit per parcel.
- Commercial and industrial land uses were assumed to generate 2,000 gallons of wastewater per acre per day, as described in the City's design standards.
- The neighborhood service/mixed use and downtown/waterfront land use designations were assumed to have half as many dwelling units as parcels and to generate 1,000 gallons of wastewater per acre per day, or half of the industrial and commercial wastewater generation.

Land uses for existing developments are shown in Figure 3-1.

City of Rio Vista



V:\1840\active\GIS\Rio Vista - RIOV\GIS\Map - MXD\SECAP Figures\Figure 3-1 Existing Land Use.mxd

Hydraulic Model

4.1 PURPOSE

The purpose of this chapter is to present an overview of the construction (including inputs) and calibration of the hydraulic model of the City of Rio Vista's wastewater collection system.

This chapter is divided into the following sections:

- Modeling Software
- Model Inputs and Construction
- Model Calibration

4.2 MODELING SOFTWARE

Wastewater collection system capacity was evaluated using a dynamic flow routing model, Wallingford Software's *InfoWorks*. Dynamic flow routing models are considered one of the most sophisticated means to assess sewer system capacity. The model simulates sewer system hydraulic response during peak flow events resulting from a combination of peak diurnal sanitary flows, groundwater infiltration, and rainfall dependent infiltration and inflow (RDI/I).

4.3 MODEL CONSTRUCTION

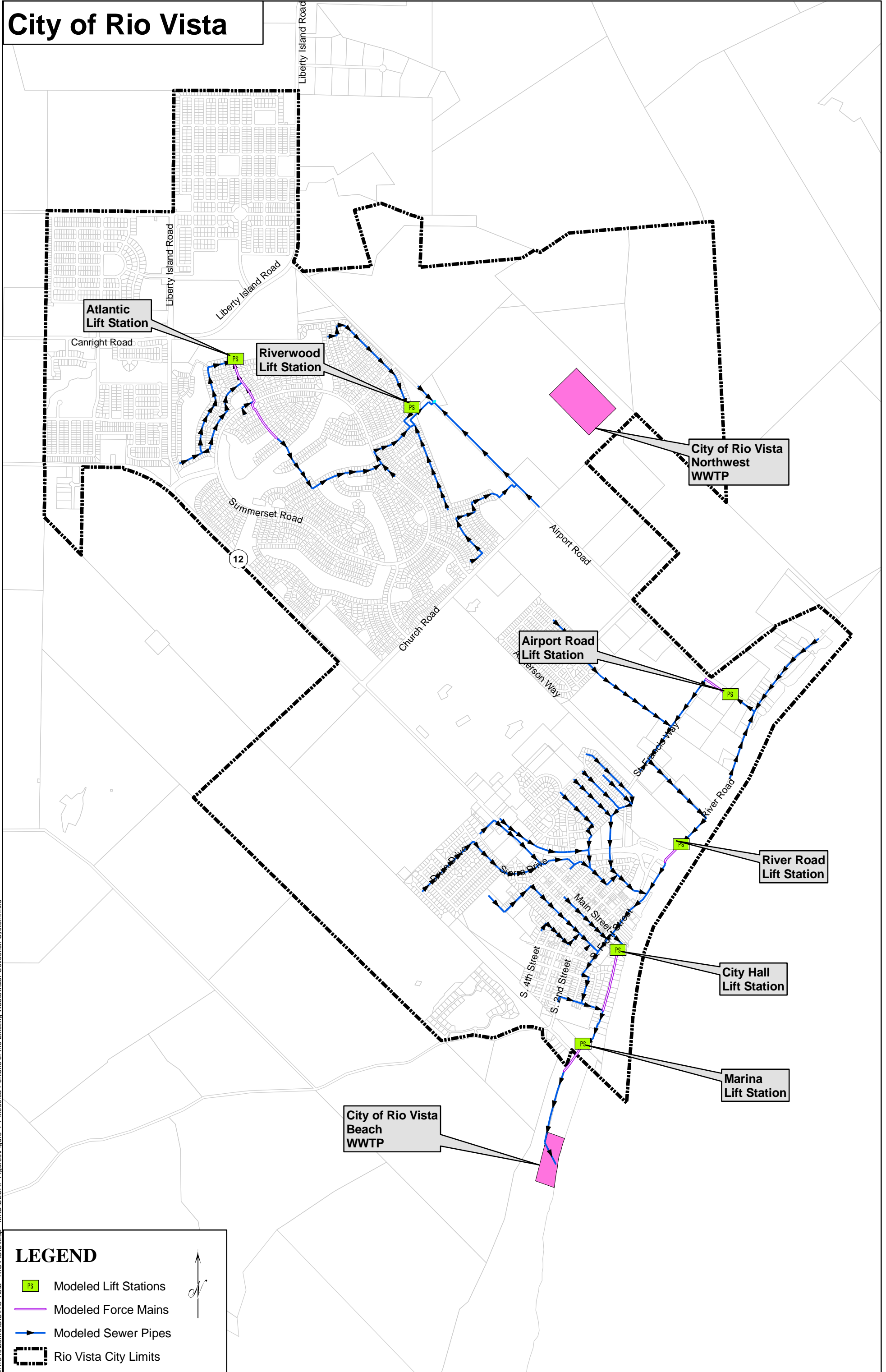
The following inputs were used in construction of the hydraulic model and are described in more detail below:

- Pipes and Manholes
- Pump Stations
- Subcatchments
- Design Storm

4.3.1 PIPES AND MANHOLES

All sewer lines with a diameter of 10 inches and greater were modeled. In addition, arterial 8 inch lines were modeled, as well as critical 6 inch lines when necessary. The modeled portions of the sewer are shown in Figure 4-1. An inventory of all modeled pipes is included in Appendix A.

City of Rio Vista



V:\1840\active\GIS\Rio Vista - RIO\GIS\Map - MXD\SECAP Figures\Figure 4-1 Modeled Portions of the Existing Wastewater Collection System.mxd

LEGEND

- Modeled Lift Stations
- Modeled Force Mains
- Modeled Sewer Pipes
- Rio Vista City Limits



4.3.2 LIFT STATIONS

Lift stations that were considered to have a significant impact on the system were modeled. The 7 modeled pump stations include:

- Atlantic Lift Station
- Riverwood Lift Station
- Airport Road Lift Station
- City Hall Lift Station
- River Road Lift Station
- Marina Lift Station

4.3.3 SUBCATCHMENTS

Subcatchments are geographic areas within a wastewater service area that represent a composite of land uses (such as residential, commercial, and industrial) and discharge to a common manhole.

To determine total average daily dry weather flow from each subcatchment, the flow from each land use type was determined separately. Commercial, and industrial flows were accounted for as additional base flow calculated based on the acreage of the subcatchment and the per acreage flow described in Chapter 3. Dwelling units were assigned to each subcatchment to account for residential flow. Each parcel in a subcatchment was assumed to contain one dwelling unit. The number of dwelling units was then multiplied by a per dwelling unit wastewater generation rate (determined during dry weather calibration) to determine total daily dry weather flow from the subcatchment. Neighborhood service/mixed use and downtown/waterfront flows were accounted for as a combination of commercial and residential, assuming half as many dwelling units as parcels in the subcatchment, as well as an additional base flow.

Separate subcatchments were developed for elementary/middle schools and high schools. Current enrollment numbers were compiled using the California Board of Education's website (<http://data1.cde.ca.gov/dataquest/>). As with residential, commercial, and industrial flows, a unit flow factor was assigned per student and modified in the calibration process.

4.3.4 STORM EVENT

Design storms are usually simulated in the hydraulic model to assess the level of protection provided by the capacity of sewer system against sanitary sewer overflows. A 10-year, 6-hour design storm is a generally accepted design storm to be used for this purpose.

Normally a design storm would be developed from statistical analysis of hourly local precipitation records. An example hyetograph for of a 10-year, 6-hour storm is shown on Figure 4-2.

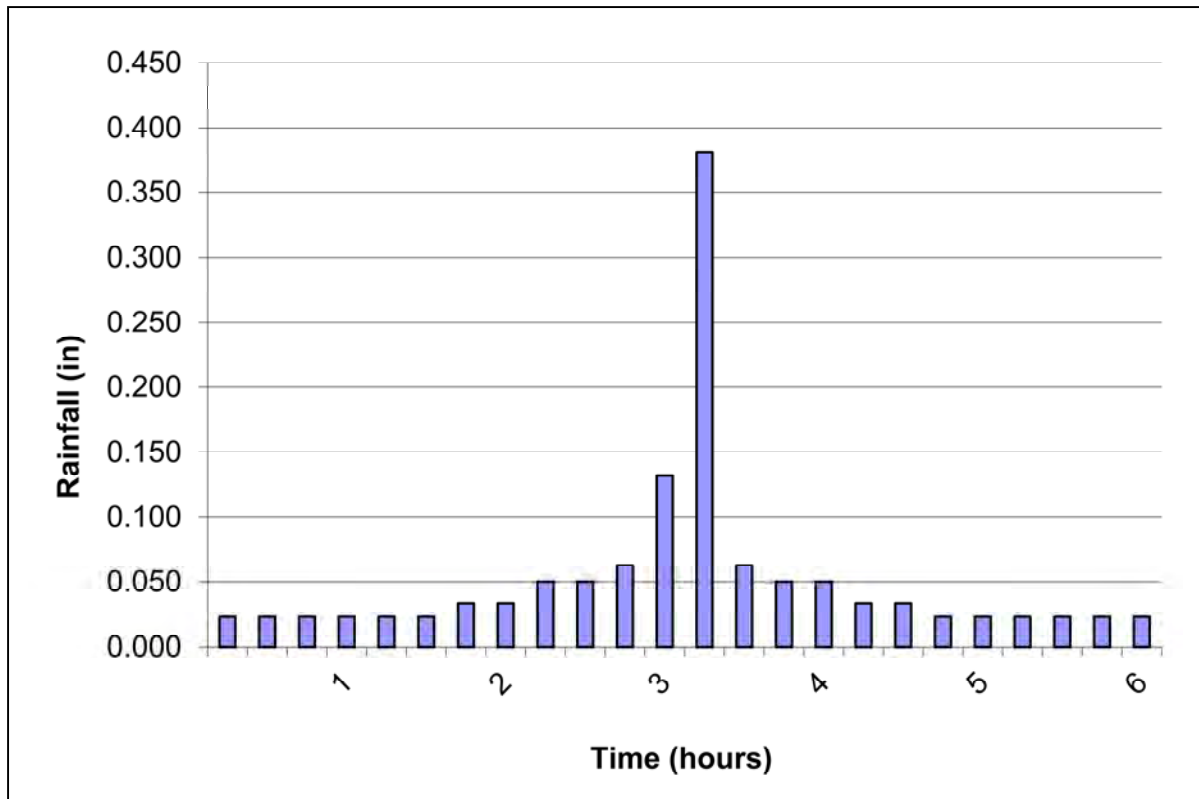


Figure 4-2
City of Rio Vista
Example 10-Year, 6-Hour Design Storm Hyetograph

For the area around Rio Vista, only daily rainfall totals were available. A design storm could not be developed. Instead, the March 21-27 was scaled up to the rainfall depth for a 10-year, 6-day storm event. The hyetograph for this rainfall is shown on Figure 4-3.

The storm event has similar characteristics to the design storm, namely antecedent rainfall and significant peaks. Based on these similar characteristics, it is anticipated that scaling the historic rainfall event to the 10 year storm level will provide the City's collection system with a comparable level of protection as a 10-year design storm.

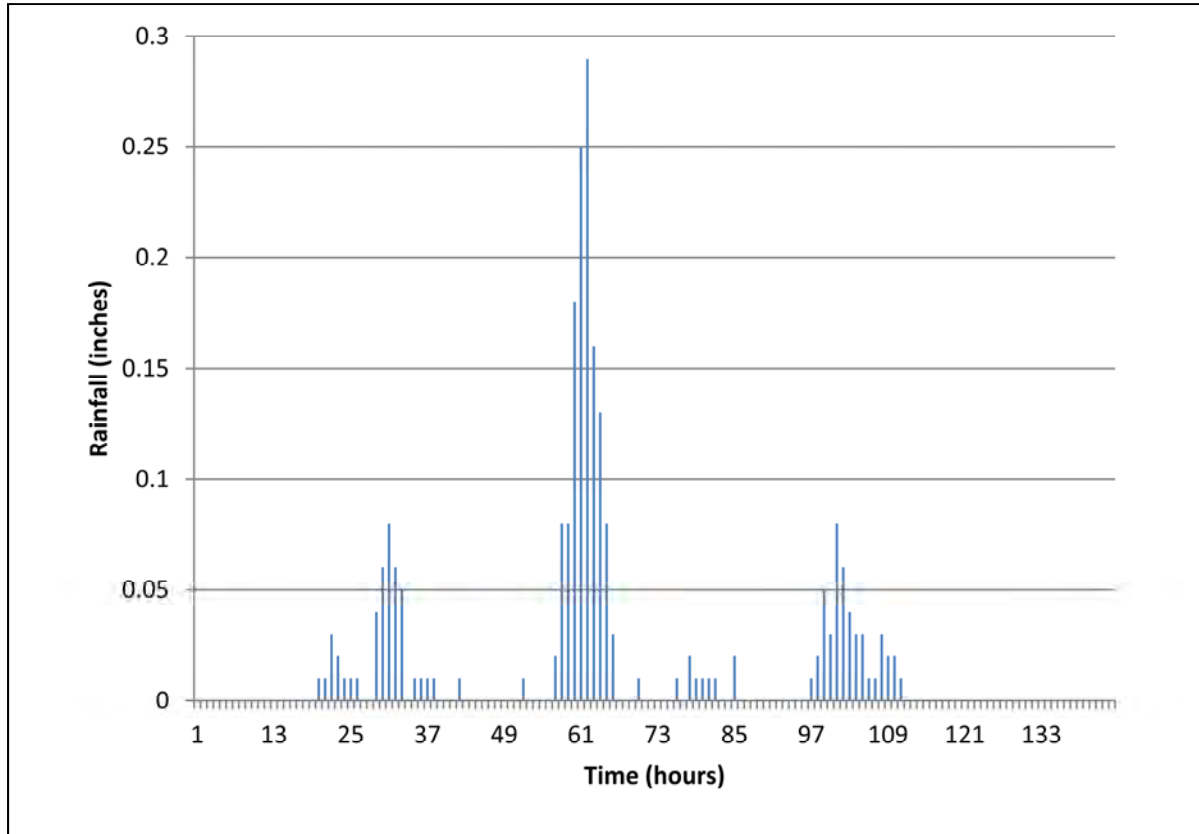


Figure 4-3
City of Rio Vista
March 21-27, 2011 Storm Hyetograph

4.4 MODEL CALIBRATION

Calibration is the process of matching hydraulically modeled results with observed flow monitoring results to assure a model accurately reflects actual conditions. Hydraulic models are calibrated for both dry weather and wet weather conditions.

4.4.1 DRY WEATHER CALIBRATION

The estimated wastewater flow generated from each sewer basin was calculated by multiplying the area or population of each land use type by an initial unit flow factor. To calibrate the model, simulated flows were graphically compared to observed flows in *InfoWorks* at each flow monitoring location and unit flow factors adjusted until simulated flows sufficiently matched observed flows. An example of well calibrated dry weather flow for Site 1 is shown in Figure 4-4.

4.4.2 WET WEATHER CALIBRATION

Once the dry weather flow calibration is completed for each flow monitoring site, the wet weather calibration is performed using an observed storm event. Ideally, a storm event occurs during the flow monitoring study so that a response is measured in the system. The flow monitoring for Rio Vista was conducted during the wet season and a few storm events occurred

during this time period (February 15, 2011 through March 27, 2011). Even though none of these storms was a 10-year return period type event, the impact on the system during the March 21-27, 2011 storm was significant, and that storm was chosen for wet weather.

The storm was simulated in the hydraulic model and the peak flow produced by the system at each of the flow monitoring sites was determined. This simulated flow was compared to the maximum flow observed at each of the flow monitoring sites during the storm event. The simulated peak flow was modified to match the measured peak flow at each flow monitoring site by adjusting the leakage rate of each flow monitoring basin. An example of wet weather calibration at Site 1 is shown in Figure 4-5.

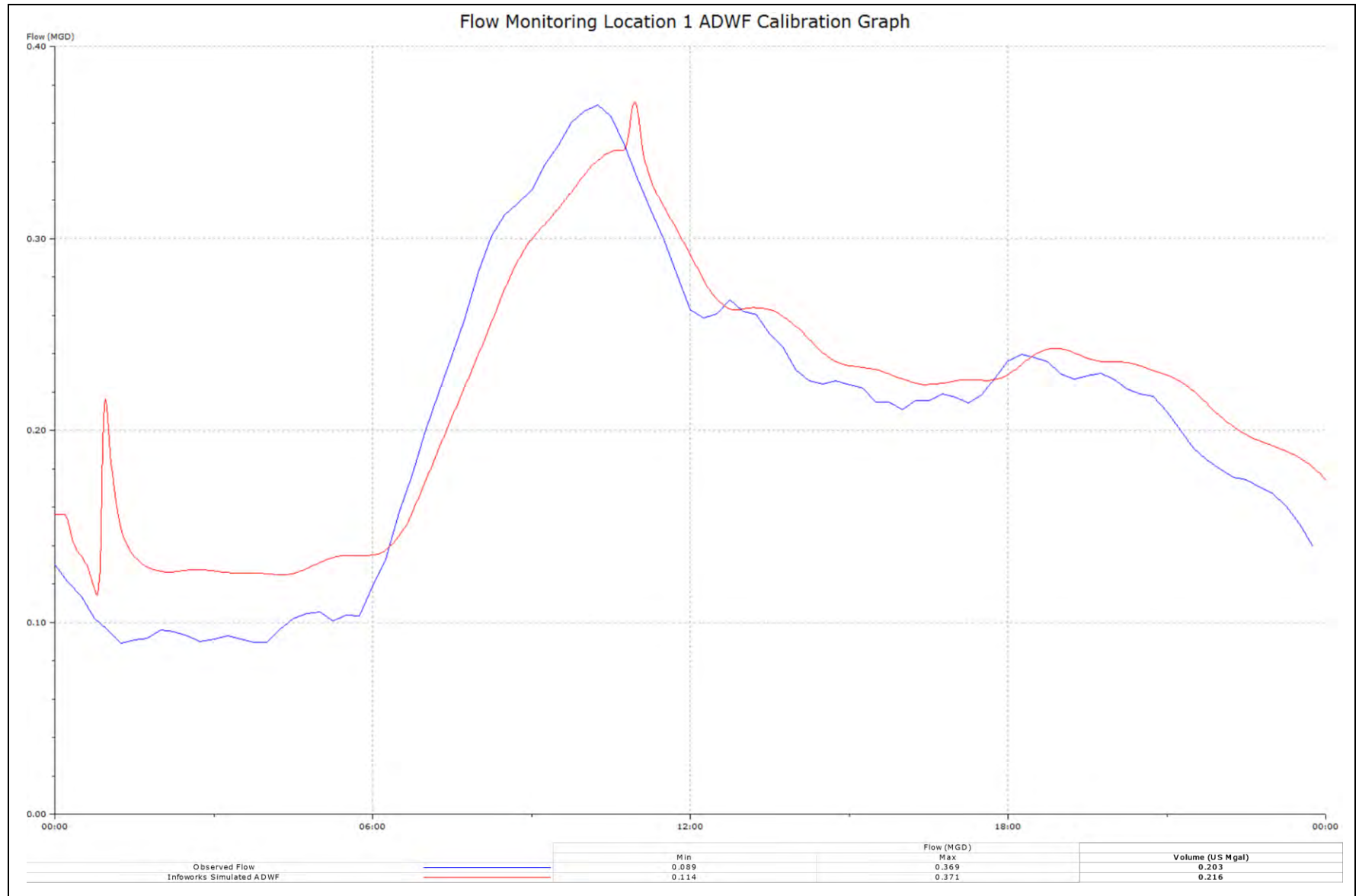


Figure 4-4
City of Rio Vista
Dry Weather Calibration for Site 1

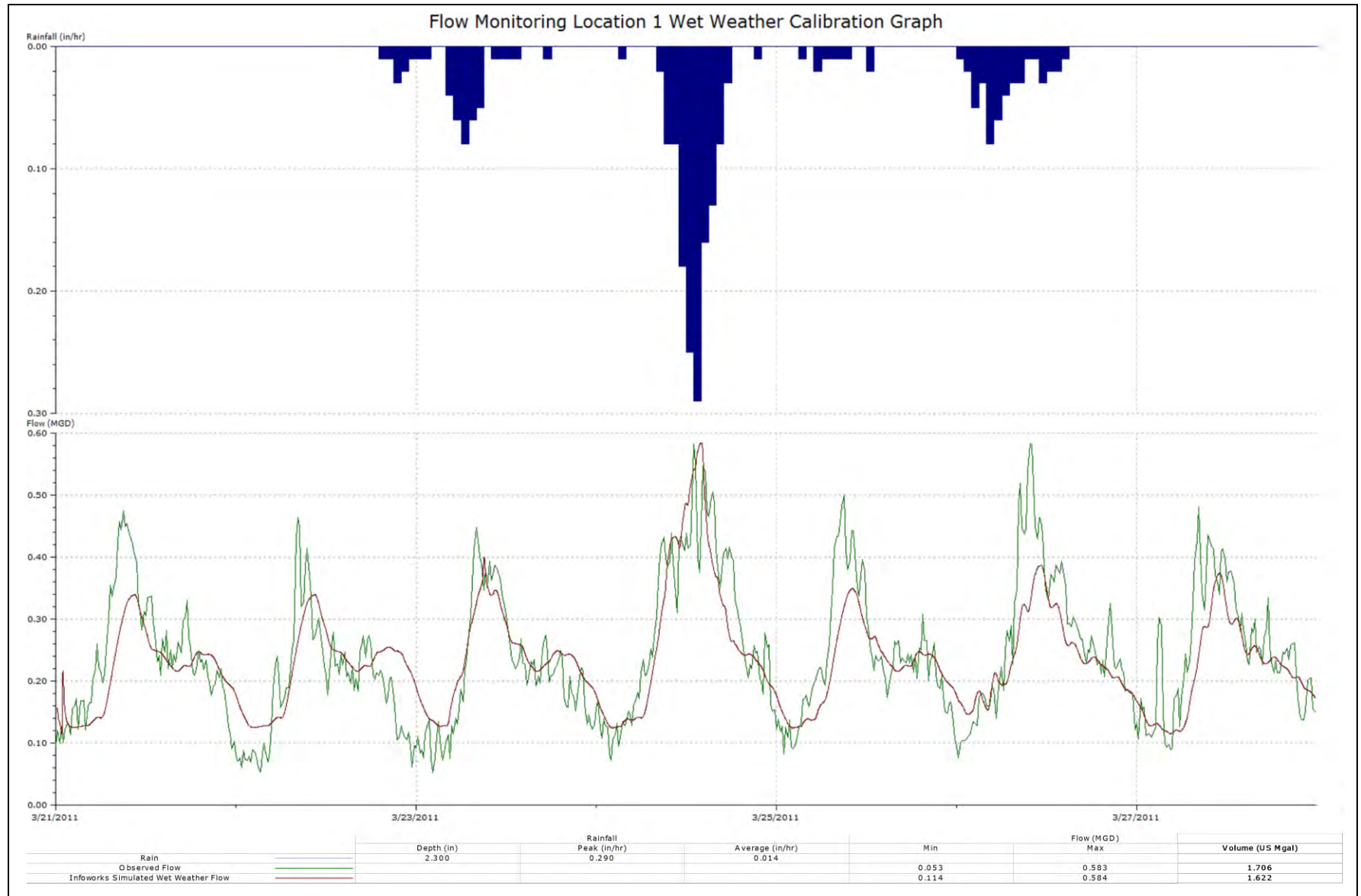


Figure 4-5
City of Rio Vista
Wet Weather Flow Calibration for Site 1

Wastewater Collection System Capacity Evaluation

5.1 PURPOSE

The purpose of this chapter is to provide a summary of the results of the model simulations outlined in Chapter 4. Modeling was conducted for dry weather flow (dry weather calibration), observed storm event peak flows (wet weather calibration), and during a 10-year storm event for the existing level of development.

This chapter is divided into the following sections:

- Recommended Capacity Evaluation Criteria
- Modeled Scenarios
- Model Results – Existing Level of Development
 - Existing System – Average Dry Weather Flow
 - Existing System – March 21-27, 2011 Storm Event
 - Existing System – 10-Year Storm Event

5.2 RECOMMENDED CAPACITY EVALUATION CRITERIA

Wastewater collection systems can generally accommodate some degree of surcharging during peak flow conditions. However, once a manhole surcharges, it takes very little additional flow for an overflow to occur. Sewer systems are typically designed to accommodate peak flows somewhere between 50 to 80 percent full. For modeling of a system’s response to a design storm, some surcharging may be acceptable. Criteria for acceptable levels of maximum surcharging in model simulations were developed based on criteria used by other similar communities in California. These criteria are presented in Table 5-1. These recommended criteria were used to evaluate capacity in flow limited segments of sewer pipelines in all modeled scenarios.

Table 5-1
City of Rio Vista
Recommended Acceptable Manhole Surcharging

| Manhole Depth ^(a) | Acceptable Level of Manhole Surcharging |
|------------------------------|---|
| 4 feet or less | None |
| Greater than 4 feet | Not to exceed 4 feet below ground surface |

(a) Manhole depth as measured from the crown of the pipe to the rim of the manhole.

5.3 MODELED SCENARIOS

All modeled scenarios were conducted at the existing level of development. Two of the scenarios described below were used to calibrate the model for wet and dry weather flows. The remaining scenario, the existing system during a 10-year storm event is generally accepted as a conservative level of protection a collection system against sanitary sewer overflows. All three scenarios are listed below and described in more detail in the remainder of this chapter:

- Existing system during winter dry weather flow (includes more groundwater infiltration than summer dry weather flow)
- Existing system during the March 21-27, 2008 storm event (calibration event)
- Existing system during design storm (10-year, 6-hour) event

The modeled results for the simulations shown above are listed by pipe in Appendix B.

5.4 MODEL RESULTS

The average and peak flow model results are summarized in Table 5-2 and described in more detail in the sections below.

Table 5-2
City of Rio Vista
Average and Peak Flow Model Results

| Simulation | Average Flow (Mgal/d) | | Peak Hourly Flow (Mgal/d) | |
|------------------------------------|-----------------------|------------|---------------------------|------------|
| | To Beach WWTP | To NW WWTP | To Beach WWTP | To NW WWTP |
| Winter Dry Weather Flow | 0.51 | 0.21 | 1.68 | 0.78 |
| March 21-27, 2011 Storm Event Flow | 0.62 | 0.23 | 2.6 | 0.95 |
| 10-Year Storm Flow | 0.76 | 0.25 | 3.8 | 1.3 |

5.4.1 EXISTING SYSTEM – WINTER DRY WEATHER FLOW

At the existing level of development, model simulations indicated that the average dry weather flow for the existing system is approximately 0.51 million gallons per day (Mgal/d) at the City's Beach WWTP headworks. An additional 0.21 Mgal/d of flow from the northwestern part of the city is directed to the City's northwest WWTP.

At the diurnal peak during dry weather flow, the majority of pipes in the system were shown to be less than 80 percent full. Model simulation results for the existing system during peak diurnal dry weather flow conditions are shown in Figure 5-1. The northwest part of the City is not shown on the figure because there are no capacity issues in that area.

On Figure 5-1, blue pipes show areas with no capacity issues. Pipes shown in green indicate pipes that normally would be experiencing surcharging conditions, but because of downstream hydraulics are flowing at conditions less than full capacity (hydraulic drawdown). Pipes shown in yellow have between 80 percent and 100 percent of capacity being utilized. Pipes shown in orange are at capacity or are being impacted by problems downstream (i.e. at full capacity because of a bottleneck downstream). Pipes shown in red are experiencing surcharged conditions. It is important to note that the pipeline stretches shown in red and orange are causing surcharging of wastewater in the upstream manholes.

There is one area in the City with capacity issues during dry weather flow. This is along Front Street, downstream of the River Road Lift Station and upstream of City Hall Lift Station. The model indicates that during dry weather flow, the surcharging in this area does not exceed the criteria outlined in Table 5-1.

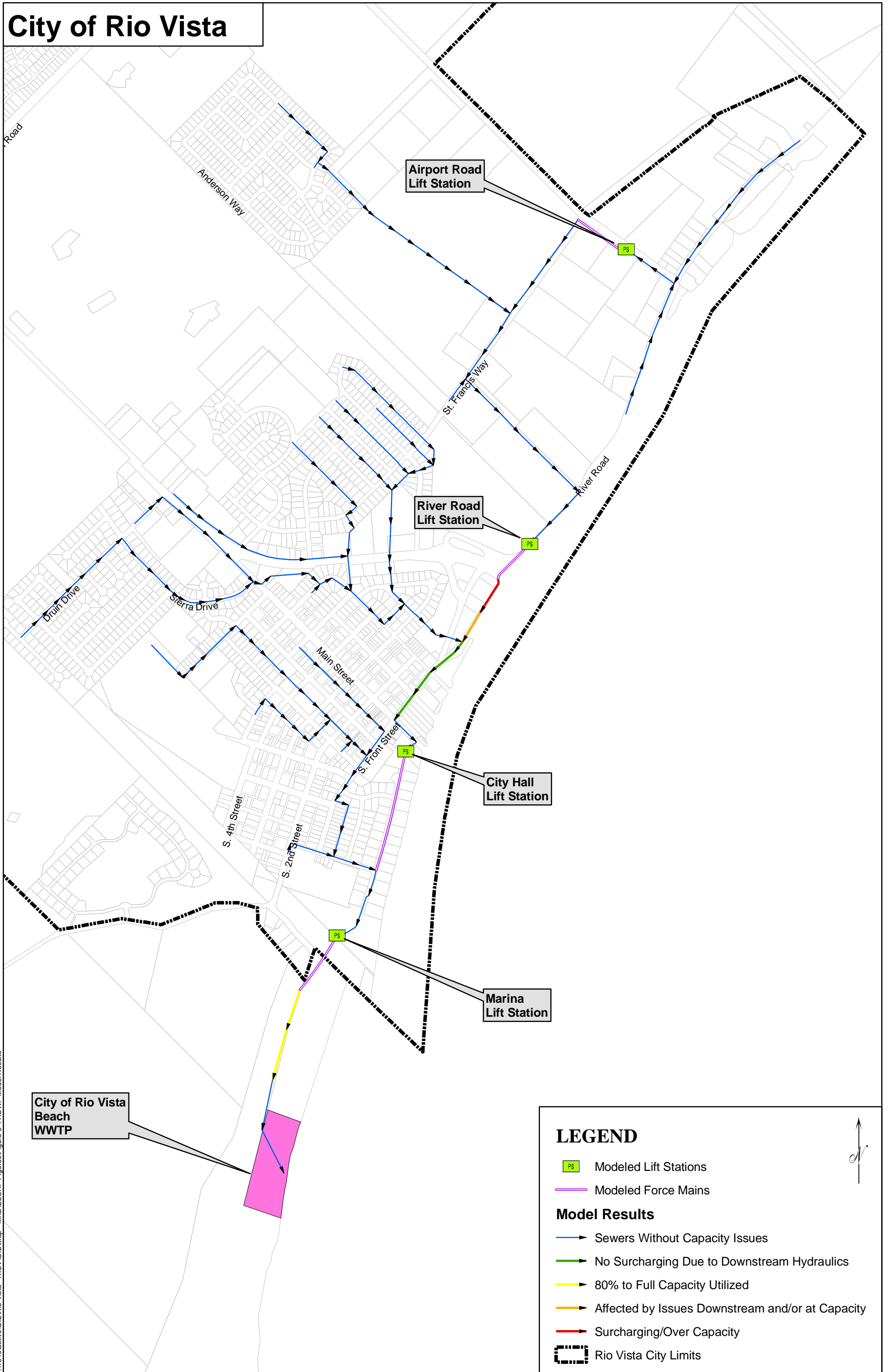
5.4.2 EXISTING SYSTEM – MARCH 21 – 27, 2011 CALIBRATION STORM EVENT

The capacity of the existing system was evaluated during the March 21 – 27, 2011 storm event. This storm was classified as less than a 2-year storm, according to statistical data from the California Department of Water Resources as described in Chapters 2 and 4. During this storm event, model simulations indicated that the peak flow at the Beach WWTP was 2.6 Mgal/d while an additional 0.95 Mgal/d of flow from the northwestern part of the City went to the Northwest WWTP.

Model simulation results are shown on Figure 5-2. The model indicates that during the storm event, the majority of pipes in the system were still at less than 80 percent capacity. The capacity issues in the sewer along First Street are more pronounced, causing backup in the tributary sewer which enters from the northwest along Delta Way. Surcharging in excess of the criteria in Table 5-1 is now predicted along the First Street sewer and the tributary sewer from the northwest.

The sewer downstream of the Marina Lift Station on Beach Street, upstream of the Beach WWTP, is also shown to have had capacity issues during the storm event. The outfall manhole for the Marina Lift Station force main is shown to have had surcharging exceeding the criteria outlined in Table 5-1.

City of Rio Vista



LEGEND

PS Modeled Lift Stations

Modeled Force Mains

Model Results

→ Sewers Without Capacity Issues

→ No Surcharging Due to Downstream Hydraulics

→ 80% to Full Capacity Utilized

→ Affected by Issues Downstream and/or at Capacity

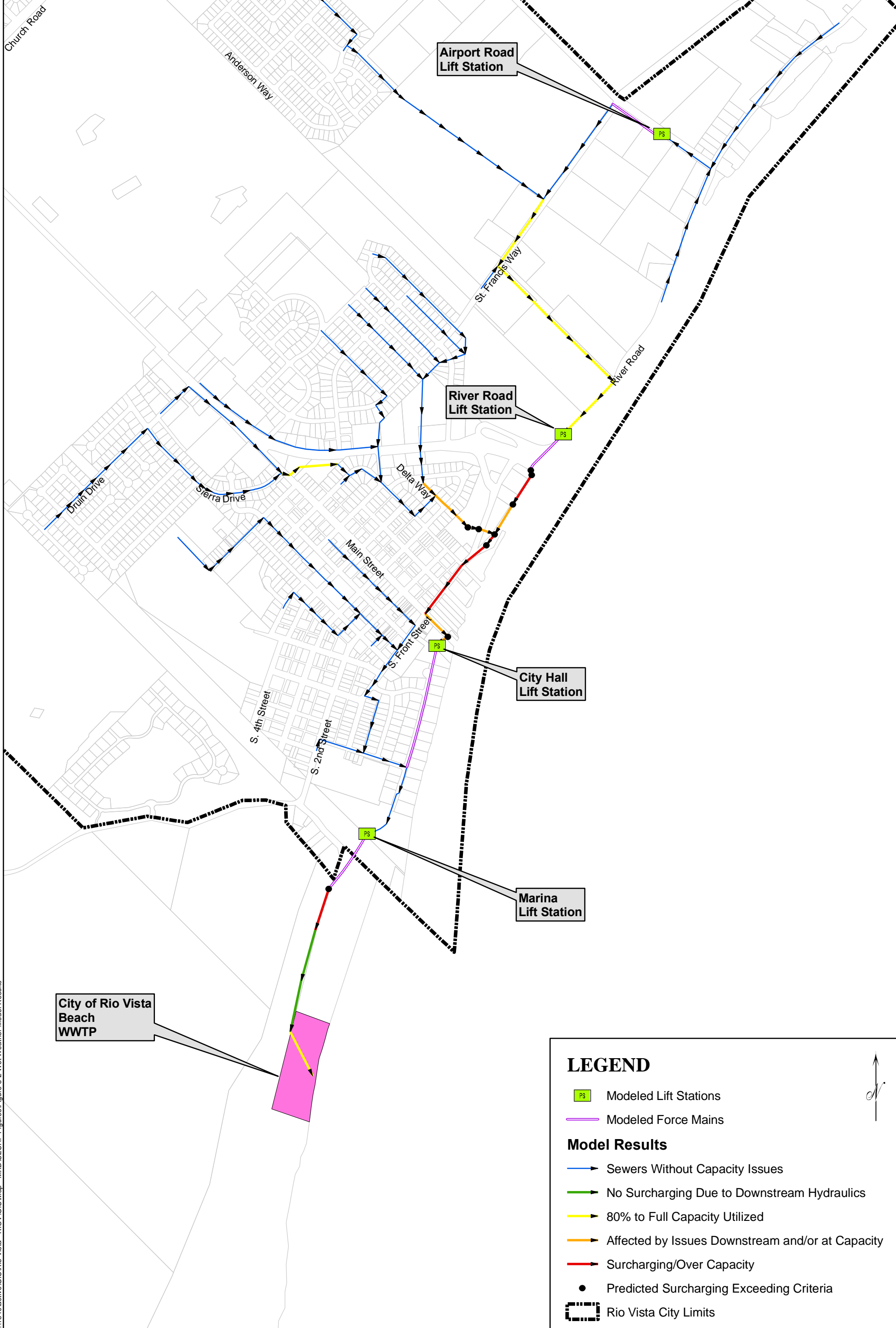
→ Surcharging/Over Capacity

Rio Vista City Limits



V:\1840\active\GIS\Rio Vista - RIOV\GIS\Map - MXD\SECAP Figures\Figure 5-1 ADWF Model Results

City of Rio Vista



V:\1840\active\GIS\Rio Vista - RIOV\GIS\Map - MXD\SECAP Figures\Figure 5-2 Wet Weather Model Results

Figure 5-2

5.4.3 EXISTING SYSTEM – 10-YEAR STORM EVENT

Under existing conditions, a 10-year storm event is predicted to generate a peak flow of 6.0 Mgal/d at the Beach WWTP with an additional peak flow of 1.3 Mgal/d flowing from the northwestern part of the City to the Northwest WWTP. This storm event is predicted to cause 17 sanitary sewer overflows and 22 incidences of surcharging above the criteria recommended in Table 5-1. The locations of these surcharges are shown on Figure 5-3 and are described in more detail below.

1. North Front Street and Main Street between River Road Lift Station and City Hall Lift Station

The model has already indicated capacity issues for this section of sewer for the winter dry weather and wet weather flow events. During the storm event, the model predicts more impactful capacity issues, causing back up further up the tributary sewer entering from the northwest. The existing sewer infrastructure appears to be too small to handle the peak flows generated by the storm. The City Hall Lift Station is also undersized to accommodate the peak flows generated by the storm. The bottleneck caused by this section of sewer is predicted to cause sanitary sewer overflows and surcharging above the Table 5-1 criteria.

2. Northwest of Front Street on Delta Way and Logan Street

The capacity issues in this area of the sewer system are caused by the capacity bottleneck in the Front Street Sewer. These sewers have the necessary capacity for the flows, but the backflow from the Front Street sewer is causing the predicted sanitary sewer overflows and excessive surcharging.

3. West of 6th Street on Sierra Drive and Main Street

The capacity issues in this area are caused by three 6 inch sewers undersized for the peak flows generated by the storm. Upstream of these pipes, excessive surcharging and overflows are predicted by the model because of the backflow from this bottleneck.

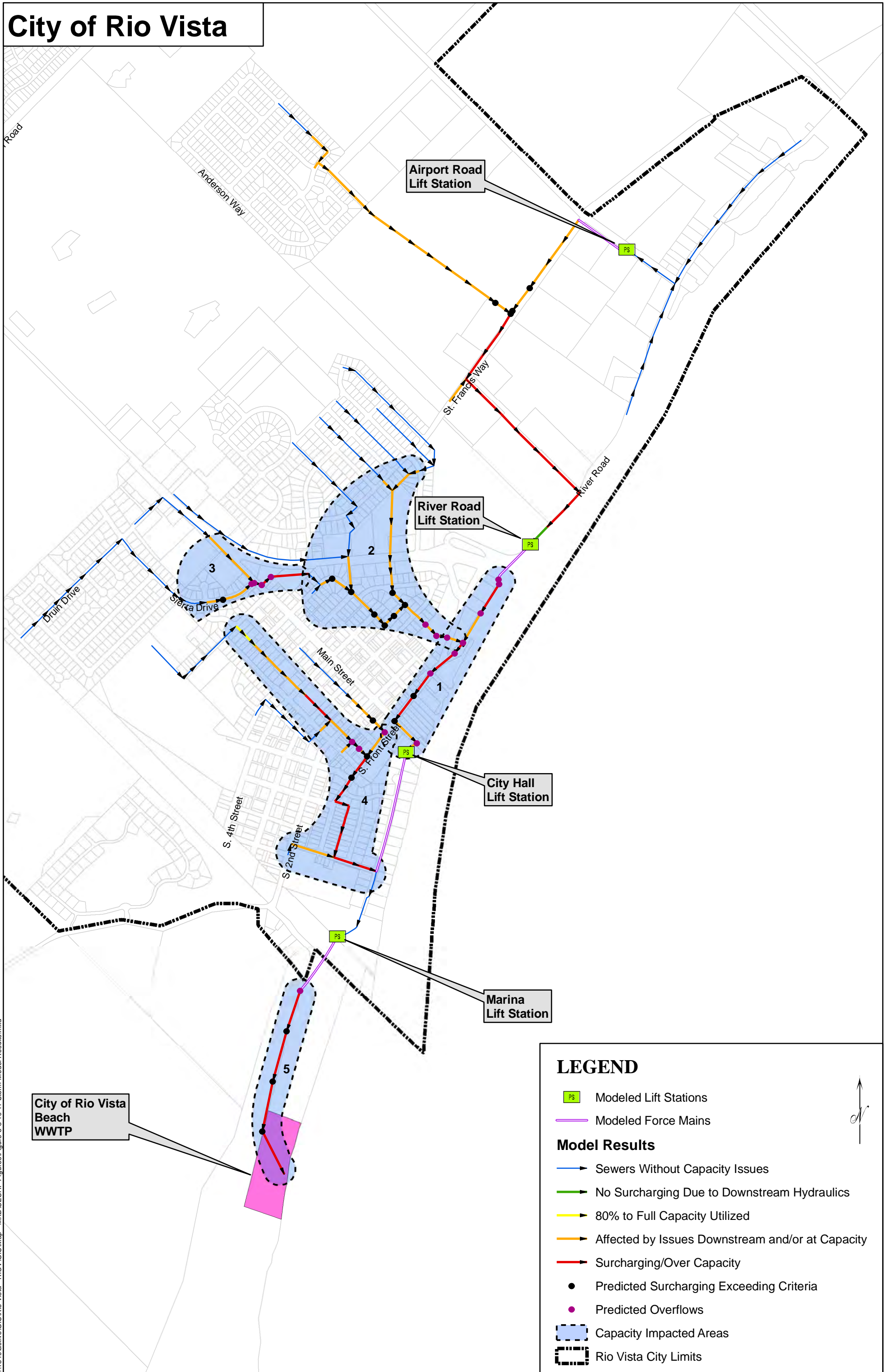
4. West of Main Street

The capacity issues in the sewers west of Main Street are primarily caused by undersized sewer infrastructure on South Front Street and Hamilton Avenue. The South Front Street sewer is also being impacted by backflow from the North Front Street Sewer describe above. The backflow from this bottleneck is causing backflow into its tributary sewer between Montezuma and California Street and along Hamilton. The backflow is predicted to cause sanitary sewer overflows and surcharging above the Table 5-1 criteria.

5. Beach Street South of the Marina Lift Station

The sewer flowing into the Beach WWTP is under capacity during peak flows generated by the 10-year storm event. The model predicts that the capacity shortage will cause excessive surcharging and sanitary sewer overflows.

City of Rio Vista



LEGEND

- PS Modeled Lift Stations
- Modeled Force Mains
- Model Results**
- Sewers Without Capacity Issues
- No Surcharging Due to Downstream Hydraulics
- 80% to Full Capacity Utilized
- Affected by Issues Downstream and/or at Capacity
- Surcharging/Over Capacity
- Predicted Surcharging Exceeding Criteria
- Predicted Overflows
- Capacity Impacted Areas
- Rio Vista City Limits



V:\1840\active\GIS\Rio Vista - RIOV\GISMap - MXD\SECAP Figures\Figure 5-3 10 Yr Storm Model Results.mxd

Capital Improvement Project Recommendations

6.1 PURPOSE

The purpose of this chapter is to provide recommendations for capital improvements for providing sufficient capacity in the City's sewer system so that no sanitary sewer overflows are predicted to occur during a 10-year storm event. It is anticipated that the City will review and adopt the recommended capital improvements into a short term Capital Improvement Plan (CIP). The model results for the existing system during a 10-year storm event, detailed in Chapter 5, have been used as the basis for these capital improvement recommendations.

This chapter is divided into the following sections:

- Project Targeting Strategy
- Project Development Method
- Capital Improvement Projects
- Opinion of Probable Costs
- CIP Prioritization

6.2 CIP DEVELOPMENT

This section describes how areas of the sewer system were targeted for capital improvement projects and how the improvements were developed after the selected areas were chosen.

6.2.1 PROJECT TARGETING STRATEGY

Capacity limited areas were targeted for improvement projects according to their level of surcharging. Areas of the sewer predicted by the model to experience sanitary sewer overflows during the 10-year storm event were targeted for capacity improvements. Areas of the sewer only predicted to experience surcharging in excess of the criteria listed in Table 5-1 were not selected for capacity improvements.

Because the purpose of the capital improvement projects recommended here is to bring the system capacity to a level at which no sanitary sewer overflows would occur during a 10-year storm event. Capital improvement projects to mitigate manhole surcharging in excess of the criteria listed in Table 5-1 can be developed by the City as part of a long-term, ongoing CIP.

6.2.2 PROJECT DEVELOPMENT METHOD

The first capacity area of the sewer which was targeted for capital improvement projects was the Front Street sewer between River Road Lift Station and City Hall Lift Station. This area was chosen for the following reasons:

- The area was shown to be capacity impacted even during winter dry weather flow.
- The area was causing backflow into multiple tributary sewer areas, indicating that mitigating the capacity issues in this sewer could potentially eliminate the need for improvement projects in other areas.
- The City already has plans to complete a capital improvement project in the area.

Once the North Front Street sewer was upsized in the model, overflows were eliminated and increased flow was reaching City Hall Lift Station, causing overflows at that location and indicating the need for a larger pumping capacity.

The size increase in the North Front Street Sewer and the increased pumping capacity in the City Hall Lift Station eliminated the need for any improvements in the following areas described above in Section 5.4.3.

- Northwest of Front Street on Delta Way and Logan Street
- West of Main Street

The improvements to the North Front Street Sewer and the City Hall Lift Station caused increase flow at Marina Lift Station, triggering the need for upsizing pumping capacity at the lift station.

The sewer downstream of the Marina Lift Station had been predicted to experience excessive surcharging and sanitary sewer overflows. The improvements to this section of sewer were sized for the increased flow from the Marina Lift Station.

The section of sewer west of 6th Street on Sierra Drive and Main Street was not affected by any of the sewer improvements discussed above. The three undersized pipes were upsized to accommodate the upstream flows and eliminate the bottleneck they were causing.

In all cases, the improvements were assumed to follow the slopes assumed for the existing sewers. The improvements were sized so that the improved sewers would be at 70% depth when conveying the peak flow predicted by the model for the 10-year storm. This sizing criteria is in accordance with the City's design standards.

6.3 CAPITAL IMPROVEMENT PROJECTS

Based on the model results described in Chapter 5, to address the capacity impacted areas of the City's sewer system, and to provide enough capacity to eliminate predicted sanitary sewer overflows during a 10-year storm event, the following sections of the City's sewer system need to be addressed with capital improvement projects:

- **Manhole K6-048 to Manhole L6-038** (on Front and Main Street between River Road and City Hall Lift Stations)
- **City Hall Lift Station**
- **Marina Lift Station**
- **Manhole M6-018 to Manhole O6-001** (on Beach Street between Marina Lift Station and the Beach WWTP)
- **Manhole K6-074 to Manhole M6-030** (west of 6th Street)

These recommended improvement areas are shown in Figure 6-1.

Recommended Improvement #1 (Manhole K6-048 to Manhole L6-038)

According to model results discussed in Chapter 5, this section of sewer is severely over capacity during a 10-year storm event. It is predicted to cause sanitary sewer overflows, excessive surcharging and backflows into other sections of the sewer system.

To relieve the capacity limitations in this area, it is recommended that the pipelines from Manhole K6-048 to Manhole L6-038 be upsized from 15 inches in diameter to 24 inches in diameter. It is also recommended that a 10inch capacity relief line be installed from Manhole L6-043 to L6-042. This will provide capacity relief for the impacted sewers west of Main Street and eliminate the predicted overflows in this area.

Recommended Improvement #2 – Increase Pumping Capacity at City Hall Lift Station

By eliminating overflows with Improvement #1, flow to the City Hall Lift Station increases, driving the need for more pumping capacity at the City Hall Lift Station. Maximum pumping capacity needs to be increased from 994 gallons per minute (gpm) to 3,000 gpm.

Recommended Improvement #3 – Increase Pumping Capacity at Marina Lift Station

The increase in flow resulting from Improvement #1 also triggers the need for more capacity at Marina Lift Station to accommodate peak flows. Pumping capacity should be increased to 4,200 gpm from 2,700 gpm. A parallel 14 inch force main should be installed to accommodate the higher pumping capacity.

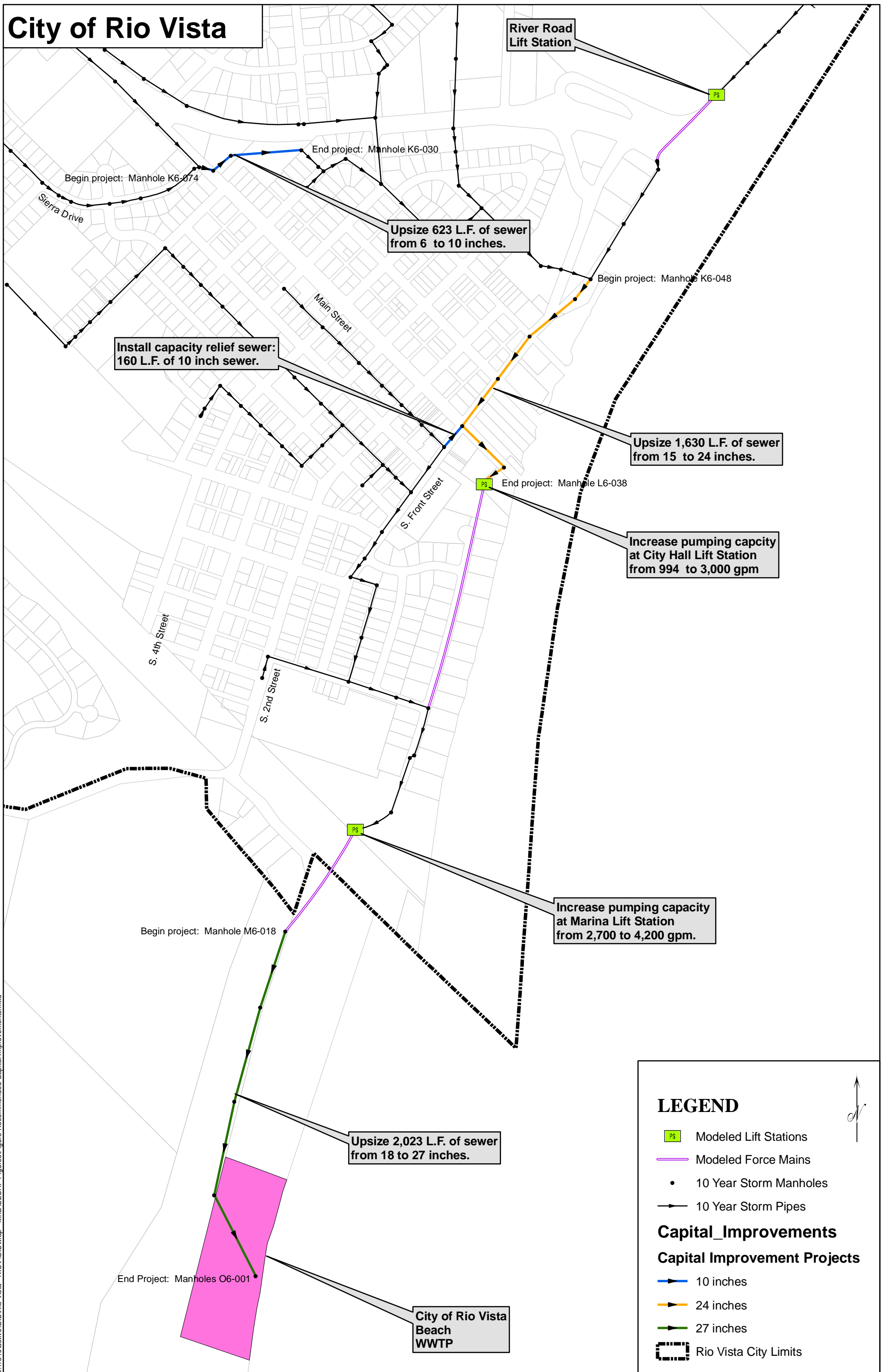
Recommended Improvement #4 – (Manhole M6-018 to Manhole O6-001)

The 18 inch sewer from Marina Lift Station to the Beach WWTP headworks needs to be upsized to eliminate the sanitary sewer overflows predicted by the model during a 10-year storm event and to accommodate the larger flows from Marina Lift Station. It is recommended that the pipes from Manhole M6-018 to O6-001 be upsized from 18 inches in diameter to 27 inches in diameter.

Recommended Improvement #5 – (Manhole K6-074 to Manhole M6-030)

Three 6 inch sewers in this section of sewer connect 8 inch sewers upstream to 12 inch sewers downstream. The 6 inch sewers are undersized for the predicted 10-year storm peak flows, causing backflow and sanitary sewer overflows in the upstream 8 inch sewers. It is recommended that the pipes from Manhole K6-074 to M6-030 be upsized from 6 inches in diameter to 10 inches in diameter.

City of Rio Vista



LEGEND

- PS Modeled Lift Stations
 - Modeled Force Mains
 - 10 Year Storm Manholes
 - 10 Year Storm Pipes
- Capital Improvements**
- Capital Improvement Projects**
- 10 inches
 - 24 inches
 - 27 inches
 - Rio Vista City Limits



6.4 OPINION OF PROBABLE COSTS

Planning level opinions of probable cost for recommended capital improvement projects for the existing system (as described in Section 6.2) are provided in Table 6-1. Planning level opinions of probable cost assume open cut and replacement for sewer upsizing projects because the size difference between the diameter of the existing sewers and the diameter of the recommended improvements are too large for pipe bursting.

The pipe costs include traffic control, pipe material, excavation, dewatering, laying and joining, backfill, manholes, testing, paving, cleanup, and contractor's overhead and profit.

Pump station upgrades include the costs of new pumps, new valves, new piping to the force main, new motor controls, new generators, and electrical upgrades. Pump station upgrades do not include the cost for any structural modifications to the wet well, as it was assumed that new pumps could be placed in the existing wet well.

A 16% allowance for design and administration has been included. The opinions of cost also include a 30% contingency. The actual cost for the project may vary by this amount above or below the estimated cost due to unknown conditions. For the purpose of planning, the contingency has been added to the opinion of cost. All costs have been estimated at a current Engineering News-Record Construction Cost Index (ENRCCI) of 9,104. (June 2011).

Table 6-1
City of Rio Vista

Preliminary Opinion of Probable Cost for Recommended Capital Improvement Projects

| Improvement Description | Cost, \$ ^(a) |
|---|-------------------------|
| Improvement #1 - Upsize Pipe (MH K6-048 to MH L6-038) to 24" | \$743,000 |
| Improvement #2 - Upsize Maximum Pump Capacity at City Hall Lift Station | \$119,000 |
| Improvement #3 - Upsize Maximum Pump Capacity at Marina Lift Station | \$342,000 |
| Improvement #4 - Upsize Pipe (MH M6-018 to MH O6-001) to 27" | \$1,038,000 |
| Improvement #5 - Upsize Pipe (MH K6-074 to MH K6-030) to 10" | \$118,000 |
| SUBTOTAL | \$2,360,000 |
| Estimating Contingency (30%) | \$708,000 |
| SUBTOTAL – CONSTRUCTION COSTS (rounded) | \$3,067,000 |
| Design/Administration (16%) | \$491,000 |
| TOTAL (rounded) | \$3,558,000 |

(a) June 2011 Costs; ENRCCI = 9,104.

Specific details regarding each project and a detailed cost breakdown for each CIP are provided in Appendix C.

6.5 CIP PRIORITIZATION

Completing the capital improvements recommended above should be scheduled and funded in a short-term Capital Improvement Plan. A recommended priority for completion is listed below in Table 6-2.

Table 6-2
City of Rio Vista
Recommended Priority for Project Completion

| Priority | Improvement |
|----------|---|
| 1 | Improvement #1 - Upsize Pipe (MH K6-048 to MH L6-038) to 24" |
| 2 | Improvement #2 - Upsize Maximum Pump Capacity at City Hall Lift Station |
| 3 | Improvement #3 - Upsize Maximum Pump Capacity at Marina Lift Station |
| 4 | Improvement #4 - Upsize Pipe (MH M6-018 to MH O6-001) to 27" |
| 5 | Improvement #5 - Upsize Pipe (MH K6-074 to MH K6-030) to 10" |

It is recommended that Improvement #1 be completed in the near future because that section of sewer has capacity issues during dry weather flow and annual wet weather storm events. The City already has plans in place to improve this section of sewer. It is recommended that these plans be updated with the recommendations presented above.

After Improvement #1 is completed, the capacity issues move downstream, forcing completion of Improvement #2, followed by #3 and #4. Consequently, the City should be prepared to complete the first four improvements in Table 6-2 in rapid succession, as each improvement mitigates the capacity issue in the target sewer, but increases the downstream capacity issues.

Prior to any project, additional surveying, specifically of manholes along stretches of sewer targeted for CIPs, should be completed to confirm manhole and sewer elevations.

The City should consider conducting additional dry and wet weather flow monitoring prior to initiating the capital improvement projects. Additional data could refine the leakage rates and improve the accuracy of modeling simulations, possibly reducing the sizes of the recommended capital improvements.

Should the City decide to abandon the Beach WWTP and divert all sewer flows to the Northwest WWTP, the projects recommended above will be affected. In that case, it is recommended that this study be updated to reflect the updated flow routing.

Appendix A

Modeled Pipe Inventory

Model Pipe Attributes

| US Node ID | DS Node ID | US Invert Level (feet) | DS Invert Level (feet) | Diameter (inches) | Length (feet) | Slope (%) | Full Pipe Capacity (Mgal/d) |
|------------|------------|------------------------|------------------------|-------------------|---------------|-----------|-----------------------------|
| E3-012 | E3-016 | 14.02 | 13.51 | 8 | 54.7 | 0.932 | 0.75 |
| E3-013 | E3-012 | 14.91 | 14.02 | 8 | 95.5 | 0.932 | 0.75 |
| E3-014 | E3-013 | 18.41 | 14.91 | 8 | 377 | 0.928 | 0.75 |
| E3-016 | E3-017 | 13.51 | 8.93 | 8 | 492.6 | 0.93 | 0.75 |
| E3-017 | E4-015 | 8.93 | 6.93 | 8 | 214.3 | 0.933 | 0.75 |
| E3-021 | E4-024 | 20 | 15.08 | 8 | 428.2 | 1.149 | 0.84 |
| E4-006 | E4-007 | 17.89 | 16.9 | 8 | 210.9 | 0.469 | 0.54 |
| E4-007 | E4-008 | 16.9 | 15.92 | 8 | 210.4 | 0.466 | 0.53 |
| E4-008 | E4-009 | 15.92 | 15 | 8 | 195.3 | 0.471 | 0.54 |
| E4-009 | E4-010 | 15 | 14.22 | 8 | 166.9 | 0.467 | 0.53 |
| E4-010 | E4-036 | 14.22 | 12.51 | 8 | 365.4 | 0.468 | 0.53 |
| E4-014 | AtlanticPS | 6.35 | 5.48 | 6 | 53.1 | 1.638 | 0.46 |
| E4-015 | E4-014 | 6.93 | 6.35 | 10 | 35.6 | 1.629 | 1.81 |
| E4-016 | E4-015 | 9.88 | 6.93 | 8 | 178.5 | 1.653 | 1 |
| E4-024 | E4-016 | 15.08 | 9.88 | 6 | 315.2 | 1.65 | 0.47 |
| E4-036 | E5-001 | 12.51 | 10.81 | 8 | 364 | 0.467 | 0.53 |
| E5-001 | E5-002 | 10.81 | 9.18 | 8 | 348.1 | 0.468 | 0.53 |
| E5-002 | E5-003 | 9.18 | 7.8 | 8 | 294 | 0.469 | 0.54 |
| E5-003 | E5-004 | 7.8 | 5.97 | 8 | 390.7 | 0.468 | 0.53 |
| E5-004 | F5-010 | 5.97 | 4.58 | 8 | 297.9 | 0.467 | 0.53 |
| E5-009 | E5-010 | 7.25 | 4.16 | 15 | 219.5 | 1.408 | 4.95 |
| E5-010 | F5-019 | 4.16 | 1.53 | 15 | 186 | 1.414 | 4.97 |
| F3-009 | F3-010 | 42.71 | 37 | 8 | 248.3 | 2.3 | 1.18 |
| F3-010 | F3-011 | 37 | 33.47 | 8 | 283.4 | 1.246 | 0.87 |
| F3-011 | F3-013 | 33.47 | 30.72 | 8 | 135.4 | 2.031 | 1.11 |
| F3-012 | F3-011 | 34.78 | 33.47 | 8 | 160.8 | 0.815 | 0.71 |
| F3-013 | F3-014 | 30.72 | 28.76 | 8 | 210.1 | 0.933 | 0.75 |
| F3-014 | F3-015 | 28.76 | 26.32 | 8 | 262.2 | 0.931 | 0.75 |
| F3-015 | F3-017 | 26.32 | 23.55 | 8 | 297.4 | 0.931 | 0.75 |
| F3-017 | F3-018 | 23.55 | 22.08 | 8 | 158.6 | 0.927 | 0.75 |
| F3-018 | F3-019 | 22.08 | 20.36 | 8 | 184.8 | 0.931 | 0.75 |
| F3-019 | E3-014 | 20.36 | 18.41 | 8 | 208.4 | 0.936 | 0.76 |
| F3-020 | E3-021 | 21.84 | 20 | 8 | 160.3 | 1.148 | 0.84 |
| F3-022 | F3-020 | 23.88 | 21.84 | 8 | 177.3 | 1.151 | 0.84 |
| F3-024 | F3-022 | 27.17 | 23.88 | 8 | 286 | 1.15 | 0.84 |
| F3-026 | F3-024 | 30.17 | 27.17 | 8 | 261.2 | 1.149 | 0.84 |
| F3-027 | F3-026 | 34.52 | 30.17 | 8 | 379.2 | 1.147 | 0.84 |
| F4-001 | E4-024 | 17.62 | 15.08 | 8 | 354.3 | 0.717 | 0.66 |
| F4-002 | F4-001 | 18.5 | 17.62 | 8 | 122.1 | 0.721 | 0.66 |
| F4-003 | F4-002 | 20.61 | 18.5 | 8 | 295.7 | 0.714 | 0.66 |
| F4-005 | F4-003 | 21.78 | 20.61 | 8 | 162.7 | 0.719 | 0.66 |
| F4-038 | F4-042 | 35.2 | 33.34 | 10 | 294.1 | 0.632 | 1.13 |
| F4-039 | F4-038 | 35.8 | 35.2 | 6 | 94.8 | 0.633 | 0.29 |
| F4-042 | F4-043 | 33.34 | 31.55 | 10 | 283.4 | 0.632 | 1.13 |
| F4-043 | F4-046 | 31.55 | 30.12 | 10 | 226 | 0.633 | 1.13 |
| F4-046 | F4-047 | 30.12 | 28.63 | 10 | 236.8 | 0.629 | 1.12 |
| F4-047 | G4-005 | 28.63 | 27.28 | 10 | 214 | 0.631 | 1.12 |
| F4-070 | F5-046 | 18.48 | 17.24 | 12 | 196.2 | 0.632 | 1.83 |
| F4-071 | F4-070 | 20.37 | 18.48 | 12 | 299.6 | 0.631 | 1.83 |
| F4-072 | F4-071 | 22.3 | 20.37 | 12 | 305.1 | 0.633 | 1.83 |
| F4-073 | F4-072 | 23.62 | 22.3 | 12 | 208.9 | 0.632 | 1.83 |
| F5-010 | F5-011 | 4.58 | 4.12 | 8 | 98.9 | 0.465 | 0.53 |

Model Pipe Attributes

| | | | | | | | |
|--------|---------|-------|-------|----|--------|-------|-------|
| E3-012 | E3-016 | 14.02 | 13.51 | 8 | 54.7 | 0.932 | 0.75 |
| F5-012 | F5-013 | 9.75 | 9.53 | 8 | 70.5 | 0.312 | 0.44 |
| F5-013 | F5-014 | 9.53 | 8.56 | 8 | 309.8 | 0.313 | 0.44 |
| F5-014 | F5-015 | 8.56 | 8.36 | 8 | 61.2 | 0.327 | 0.45 |
| F5-015 | F5-052 | 8.36 | 7.96 | 8 | 129.5 | 0.309 | 0.43 |
| F5-016 | F5-017 | 6.14 | 2.56 | 15 | 548.9 | 0.652 | 3.37 |
| F5-017 | F5-018 | 2.56 | 2.03 | 15 | 80.5 | 0.658 | 3.39 |
| F5-018 | F5-019 | 2.03 | 1.53 | 15 | 76 | 0.658 | 3.39 |
| F5-019 | NWINFPS | 1.53 | 1.34 | 27 | 29 | 0.655 | 16.2 |
| F5-020 | F5-019 | 3.83 | 1.53 | 21 | 1200.2 | 0.192 | 4.48 |
| F5-021 | F5-020 | 6.13 | 3.83 | 21 | 1200.2 | 0.192 | 4.48 |
| F5-022 | F5-021 | 7.28 | 6.13 | 21 | 600.1 | 0.192 | 4.48 |
| F5-023 | F5-024 | 12.47 | 11.7 | 15 | 149.5 | 0.515 | 3 |
| F5-024 | F5-025 | 11.7 | 10.61 | 15 | 212.1 | 0.514 | 2.99 |
| F5-025 | F5-026 | 10.61 | 10.5 | 15 | 21.4 | 0.514 | 2.99 |
| F5-026 | F5-027 | 10.5 | 9.4 | 15 | 214.3 | 0.513 | 2.99 |
| F5-027 | F5-052 | 9.4 | 7.96 | 15 | 453.4 | 0.318 | 2.35 |
| F5-028 | F5-016 | 7.06 | 6.14 | 15 | 141.3 | 0.651 | 3.37 |
| F5-029 | F5-028 | 9.38 | 7.06 | 8 | 216.6 | 1.071 | 0.81 |
| F5-033 | F5-029 | 13.5 | 9.38 | 8 | 384.6 | 1.071 | 0.81 |
| F5-043 | F5-033 | 17.3 | 13.5 | 8 | 354.5 | 1.072 | 0.81 |
| F5-044 | F5-043 | 19.33 | 17.3 | 8 | 189.9 | 1.069 | 0.81 |
| F5-045 | F5-044 | 20.38 | 19.33 | 8 | 98.2 | 1.069 | 0.81 |
| F5-046 | F5-023 | 17.24 | 12.47 | 15 | 301.6 | 1.582 | 5.25 |
| F5-047 | F5-046 | 18.89 | 17.24 | 8 | 204.4 | 0.807 | 0.7 |
| F5-049 | F5-047 | 20.53 | 18.89 | 8 | 201.9 | 0.812 | 0.7 |
| F5-052 | F5-028 | 7.96 | 7.06 | 15 | 453.4 | 0.199 | 1.86 |
| G4-005 | F4-073 | 27.28 | 23.62 | 12 | 577.4 | 0.634 | 1.83 |
| G5-046 | G5-050 | 28.3 | 27.02 | 8 | 200.9 | 0.637 | 0.62 |
| G5-050 | G5-051 | 27.02 | 26.24 | 8 | 122.3 | 0.638 | 0.62 |
| G5-051 | G5-052 | 26.24 | 24.07 | 8 | 341.5 | 0.635 | 0.62 |
| G5-052 | G5-053 | 24.07 | 22.7 | 8 | 214.3 | 0.639 | 0.62 |
| G5-053 | G5-054 | 22.7 | 21.8 | 8 | 141.7 | 0.635 | 0.62 |
| G5-054 | G5-056 | 21.8 | 20.29 | 8 | 238.7 | 0.633 | 0.62 |
| G5-056 | G5-057 | 20.29 | 18.94 | 8 | 211.5 | 0.638 | 0.62 |
| G5-057 | G5-065 | 18.94 | 17.6 | 8 | 210.6 | 0.636 | 0.62 |
| G5-065 | G5-066 | 17.6 | 16.26 | 8 | 210 | 0.638 | 0.62 |
| G5-066 | G5-067 | 16.26 | 14.59 | 8 | 261.3 | 0.639 | 0.62 |
| G5-067 | G5-068 | 14.59 | 13.21 | 8 | 217.7 | 0.634 | 0.62 |
| G5-068 | G5-069 | 13.21 | 12.83 | 8 | 60 | 0.633 | 0.62 |
| G5-069 | G5-070 | 12.83 | 12.52 | 8 | 48.4 | 0.64 | 0.63 |
| G5-070 | G5-071 | 12.52 | 12.03 | 8 | 75.9 | 0.646 | 0.63 |
| G5-071 | G5-072 | 12.03 | 9.65 | 8 | 374.3 | 0.636 | 0.62 |
| G5-072 | G5-073 | 9.65 | 9.21 | 8 | 69.2 | 0.636 | 0.62 |
| G5-073 | G6-001 | 9.21 | 8.57 | 8 | 73 | 0.877 | 0.73 |
| G5-090 | F5-045 | 22.82 | 20.38 | 8 | 226.2 | 1.079 | 0.81 |
| G5-091 | G5-090 | 25.21 | 22.82 | 8 | 223.2 | 1.071 | 0.81 |
| G5-093 | G5-091 | 27.81 | 25.21 | 8 | 243.1 | 1.07 | 0.81 |
| G6-001 | F5-022 | 8.57 | 7.28 | 21 | 674.1 | 0.191 | 4.48 |
| G6-002 | G6-001 | 10.74 | 8.57 | 21 | 670.7 | 0.324 | 5.83 |
| G6-003 | G6-002 | 10.87 | 10.74 | 21 | 11.8 | 1.102 | 10.75 |
| H6-004 | H6-007 | 24.66 | 23.94 | 10 | 254.1 | 0.283 | 0.75 |
| H6-007 | H6-011 | 23.94 | 23.23 | 10 | 252.7 | 0.281 | 0.75 |
| H6-011 | H6-012 | 23.23 | 22.55 | 10 | 240 | 0.283 | 0.75 |
| H6-012 | H6-013 | 22.55 | 22.1 | 10 | 157.8 | 0.285 | 0.76 |

Model Pipe Attributes

| | | | | | | | |
|--------|--------|-------|-------|----|-------|-------|------|
| E3-012 | E3-016 | 14.02 | 13.51 | 8 | 54.7 | 0.932 | 0.75 |
| H6-013 | I6-015 | 22.1 | 21.7 | 10 | 145.4 | 0.275 | 0.74 |
| H8-001 | I7-016 | 0.84 | -0.2 | 10 | 280 | 0.371 | 0.86 |
| H8-002 | H8-001 | 1.98 | 0.84 | 8 | 310 | 0.368 | 0.47 |
| I6-014 | H6-013 | 26.42 | 22.1 | 10 | 71.4 | 6.05 | 3.48 |
| I6-015 | I6-024 | 21.7 | 20.6 | 10 | 398.4 | 0.276 | 0.74 |
| I6-016 | I6-025 | 20 | 19.78 | 10 | 80.1 | 0.275 | 0.74 |
| I6-018 | I6-019 | 19.02 | 18.32 | 10 | 255 | 0.275 | 0.74 |
| I6-019 | I6-020 | 18.32 | 17.65 | 10 | 243 | 0.276 | 0.74 |
| I6-020 | I6-021 | 17.65 | 16.98 | 10 | 245 | 0.273 | 0.74 |
| I6-021 | I6-022 | 16.98 | 16.26 | 10 | 260 | 0.277 | 0.75 |
| I6-022 | I7-018 | 16.26 | 15.39 | 10 | 319 | 0.273 | 0.74 |
| I6-024 | I6-016 | 20.6 | 20 | 10 | 221 | 0.271 | 0.74 |
| I6-025 | I6-018 | 19.78 | 19.02 | 10 | 275 | 0.276 | 0.74 |
| I7-001 | I7-017 | 16.4 | 14.83 | 8 | 284.4 | 0.552 | 0.58 |
| I7-002 | I7-001 | 18.08 | 16.4 | 8 | 306.2 | 0.549 | 0.58 |
| I7-003 | I7-002 | 19.73 | 18.08 | 8 | 300 | 0.55 | 0.58 |
| I7-004 | I7-003 | 21.38 | 19.73 | 8 | 300 | 0.55 | 0.58 |
| I7-005 | I7-004 | 23.03 | 21.38 | 8 | 300 | 0.55 | 0.58 |
| I7-006 | I7-007 | -1.28 | -2.09 | 10 | 220 | 0.368 | 0.86 |
| I7-007 | I7-008 | -2.09 | -2.9 | 10 | 220 | 0.368 | 0.86 |
| I7-008 | I7-009 | -2.9 | -4.01 | 10 | 299.5 | 0.371 | 0.86 |
| I7-009 | I7-010 | -4.01 | -4.82 | 10 | 220 | 0.368 | 0.86 |
| I7-010 | I7-011 | -4.82 | -5.67 | 10 | 230 | 0.37 | 0.86 |
| I7-011 | I7-013 | -5.67 | -6.63 | 10 | 314.5 | 0.305 | 0.78 |
| I7-012 | I7-011 | -4.41 | -5.67 | 8 | 323 | 0.39 | 0.49 |
| I7-013 | I7-014 | -6.63 | -7.19 | 10 | 185 | 0.303 | 0.78 |
| I7-014 | I7-015 | -7.19 | -7.6 | 10 | 135 | 0.304 | 0.78 |
| I7-016 | I7-006 | -0.2 | -1.28 | 10 | 295 | 0.366 | 0.86 |
| I7-017 | J7-006 | 14.83 | 12.24 | 8 | 284.4 | 0.911 | 0.75 |
| I7-018 | I7-017 | 15.39 | 14.83 | 10 | 202.6 | 0.276 | 0.74 |
| J5-001 | K5-029 | 45.72 | 40.92 | 8 | 302.7 | 1.586 | 0.98 |
| J6-002 | J6-067 | 46.77 | 42.01 | 8 | 284 | 1.676 | 1.01 |
| J6-007 | J6-008 | 18.28 | 16.66 | 8 | 297.2 | 0.545 | 0.58 |
| J6-008 | K6-007 | 16.66 | 15 | 8 | 302.5 | 0.549 | 0.58 |
| J6-013 | K6-008 | 10.07 | 8.41 | 15 | 370 | 0.449 | 2.8 |
| J6-014 | J6-013 | 11.2 | 10.07 | 8 | 147.8 | 0.765 | 0.68 |
| J6-015 | J6-014 | 13.27 | 11.2 | 8 | 269.8 | 0.767 | 0.68 |
| J6-016 | J6-015 | 15.81 | 13.27 | 8 | 333 | 0.763 | 0.68 |
| J6-017 | J6-016 | 16.94 | 15.81 | 8 | 147 | 0.769 | 0.68 |
| J6-018 | J6-017 | 18.62 | 16.94 | 8 | 220.3 | 0.763 | 0.68 |
| J6-019 | J6-020 | 16.34 | 15.08 | 8 | 215.4 | 0.585 | 0.6 |
| J6-020 | J6-021 | 15.08 | 14.23 | 8 | 147 | 0.578 | 0.59 |
| J6-021 | J6-022 | 14.23 | 10.84 | 8 | 580 | 0.584 | 0.6 |
| J6-022 | J6-013 | 10.84 | 10.07 | 8 | 250 | 0.308 | 0.43 |
| J6-023 | J6-022 | 11.44 | 10.84 | 6 | 119.3 | 0.503 | 0.26 |
| J6-024 | J6-023 | 12.27 | 11.44 | 8 | 165.4 | 0.502 | 0.55 |
| J6-025 | J6-024 | 13.21 | 12.27 | 8 | 269.3 | 0.349 | 0.46 |
| J6-026 | J6-025 | 15.33 | 13.21 | 8 | 607.8 | 0.349 | 0.46 |
| J6-027 | J6-028 | 8.35 | 6.68 | 8 | 300 | 0.557 | 0.58 |
| J6-028 | J6-029 | 6.68 | 5.87 | 10 | 230 | 0.352 | 0.84 |
| J6-029 | J7-001 | 5.87 | 4.83 | 10 | 295 | 0.353 | 0.84 |
| J6-030 | J6-028 | 9.51 | 6.68 | 8 | 310 | 0.913 | 0.75 |
| J6-031 | J6-032 | 15.21 | 14.93 | 10 | 141.9 | 0.197 | 0.63 |
| J6-032 | J6-033 | 14.93 | 14.27 | 10 | 343.3 | 0.192 | 0.62 |

Model Pipe Attributes

| | | | | | | | |
|-----------|--------|-------|-------|----|-------|-------|------|
| E3-012 | E3-016 | 14.02 | 13.51 | 8 | 54.7 | 0.932 | 0.75 |
| J6-033 | J6-034 | 14.27 | 13.77 | 10 | 260 | 0.192 | 0.62 |
| J6-034 | J6-035 | 13.77 | 12.6 | 10 | 600 | 0.195 | 0.63 |
| J6-035 | J6-024 | 12.6 | 12.27 | 10 | 170.8 | 0.193 | 0.62 |
| J6-043 | J6-007 | 20.39 | 18.28 | 8 | 386.8 | 0.546 | 0.58 |
| J6-050 | J6-051 | 34.82 | 29.94 | 8 | 291.3 | 1.675 | 1.01 |
| J6-051 | J6-052 | 29.94 | 18.93 | 8 | 656.7 | 1.677 | 1.01 |
| J6-052 | J6-053 | 18.93 | 18.41 | 8 | 31.7 | 1.64 | 1 |
| J6-053 | J6-054 | 18.41 | 11.51 | 14 | 411.6 | 1.676 | 4.5 |
| J6-054 | K6-035 | 11.51 | 7.47 | 15 | 381 | 1.06 | 4.3 |
| J6-055 | J6-054 | 12.9 | 11.51 | 8 | 254.3 | 0.547 | 0.58 |
| J6-056 | J6-055 | 13.27 | 12.9 | 8 | 68.9 | 0.537 | 0.57 |
| J6-067 | J6-068 | 42.01 | 39.53 | 8 | 148.5 | 1.67 | 1.01 |
| J6-068 | J6-050 | 39.53 | 34.82 | 8 | 280.4 | 1.68 | 1.01 |
| J7-001 | J7-002 | 4.83 | 3.77 | 10 | 300 | 0.353 | 0.84 |
| J7-002 | J7-003 | 3.77 | 2.71 | 10 | 300 | 0.353 | 0.84 |
| J7-003 | J7-004 | 2.71 | 1.71 | 10 | 285 | 0.351 | 0.84 |
| J7-004 | J7-005 | 1.71 | 0.57 | 10 | 321.9 | 0.354 | 0.84 |
| J7-005 | K7-074 | 0.57 | -0.34 | 10 | 257.7 | 0.353 | 0.84 |
| J7-006 | J6-030 | 12.24 | 9.51 | 8 | 300 | 0.91 | 0.75 |
| J7-007 | J7-009 | 0.93 | -0.89 | 8 | 305 | 0.597 | 0.6 |
| J7-008 | I7-012 | -2.68 | -4.41 | 8 | 291.3 | 0.594 | 0.6 |
| J7-009 | J7-008 | -0.89 | -2.68 | 8 | 300 | 0.597 | 0.6 |
| J7-010 | J7-007 | 2.66 | 0.93 | 8 | 290 | 0.597 | 0.6 |
| K5-001 | K5-003 | 69.11 | 68.03 | 8 | 265 | 0.408 | 0.5 |
| K5-003 | K5-004 | 68.03 | 67.39 | 8 | 156.8 | 0.408 | 0.5 |
| K5-004 | K5-005 | 67.39 | 66.68 | 8 | 174.2 | 0.408 | 0.5 |
| K5-005 | K5-009 | 66.68 | 65.88 | 8 | 185.5 | 0.431 | 0.51 |
| K5-009 | K5-010 | 65.88 | 65 | 8 | 203.9 | 0.432 | 0.51 |
| K5-010 | K5-012 | 65 | 63.92 | 8 | 250 | 0.432 | 0.51 |
| K5-012 | K5-014 | 63.92 | 62.65 | 8 | 294.8 | 0.431 | 0.51 |
| K5-014 | K5-019 | 62.65 | 58.78 | 8 | 252.1 | 1.535 | 0.97 |
| K5-019 | K5-020 | 58.78 | 54.79 | 8 | 259.4 | 1.538 | 0.97 |
| K5-020 | K5-021 | 54.79 | 50.78 | 8 | 260 | 1.542 | 0.97 |
| K5-021 | K5-022 | 50.78 | 46.36 | 8 | 119.1 | 3.711 | 1.5 |
| K5-022 | K5-023 | 46.36 | 43.35 | 8 | 80.5 | 3.739 | 1.51 |
| K5-023 | K6-014 | 43.35 | 34.95 | 8 | 226.4 | 3.71 | 1.5 |
| K5-026 | L5-004 | 67.19 | 57.81 | 8 | 490 | 1.914 | 1.08 |
| K5-028 | J5-001 | 47.55 | 45.72 | 8 | 115 | 1.591 | 0.99 |
| K5-029 | K6-009 | 40.92 | 35.23 | 8 | 358.8 | 1.586 | 0.98 |
| K5-CO-028 | K5-028 | 52.38 | 47.55 | 8 | 305 | 1.584 | 0.98 |
| K6-006 | J6-056 | 14.17 | 13.27 | 8 | 164.7 | 0.546 | 0.58 |
| K6-007 | K6-006 | 15 | 14.17 | 8 | 152.9 | 0.543 | 0.58 |
| K6-008 | K7-072 | 8.41 | 6.61 | 15 | 401.9 | 0.448 | 2.79 |
| K6-009 | K6-010 | 35.23 | 29.76 | 8 | 345 | 1.586 | 0.98 |
| K6-010 | K6-011 | 29.76 | 24.29 | 8 | 345 | 1.586 | 0.98 |
| K6-011 | K6-074 | 24.29 | 22.97 | 6 | 83.4 | 1.583 | 0.46 |
| K6-012 | K6-011 | 24.83 | 24.29 | 8 | 29.2 | 1.849 | 1.06 |
| K6-013 | K6-012 | 31.58 | 24.83 | 8 | 360.7 | 1.871 | 1.07 |
| K6-014 | K6-013 | 34.95 | 31.58 | 8 | 180.2 | 1.87 | 1.07 |
| K6-017 | K6-018 | 50.87 | 42.45 | 8 | 440.1 | 1.913 | 1.08 |
| K6-018 | K6-019 | 42.45 | 39.58 | 6 | 150 | 1.913 | 0.5 |
| K6-019 | K6-020 | 39.58 | 36.8 | 6 | 145 | 1.917 | 0.5 |
| K6-020 | K6-021 | 36.8 | 33.45 | 6 | 175 | 1.914 | 0.5 |
| K6-021 | L6-025 | 33.45 | 27.71 | 6 | 300 | 1.913 | 0.5 |

Model Pipe Attributes

| | | | | | | | |
|--------|--------|-------|-------|----|-------|-------|------|
| E3-012 | E3-016 | 14.02 | 13.51 | 8 | 54.7 | 0.932 | 0.75 |
| K6-022 | L6-049 | 22.12 | 18.22 | 12 | 313 | 1.246 | 2.57 |
| K6-030 | K6-031 | 14.41 | 12.24 | 12 | 137.4 | 1.579 | 2.89 |
| K6-031 | K6-032 | 12.24 | 11.64 | 12 | 37.7 | 1.592 | 2.91 |
| K6-032 | K6-034 | 11.64 | 10.11 | 12 | 144.9 | 1.056 | 2.37 |
| K6-033 | K6-032 | 19.33 | 11.64 | 12 | 134.8 | 5.705 | 5.5 |
| K6-034 | K6-035 | 10.11 | 7.47 | 12 | 250 | 1.056 | 2.37 |
| K6-035 | K6-036 | 7.47 | 6.27 | 18 | 348.3 | 0.345 | 3.99 |
| K6-036 | K6-037 | 6.27 | 5.72 | 18 | 160.5 | 0.343 | 3.97 |
| K6-037 | K6-040 | 5.72 | 5.23 | 24 | 142.5 | 0.344 | 8.57 |
| K6-040 | K6-044 | 5.23 | 4.66 | 24 | 166.5 | 0.342 | 8.56 |
| K6-042 | K6-043 | 6.01 | 5.32 | 15 | 194.7 | 0.354 | 2.49 |
| K6-043 | K6-044 | 5.32 | 4.66 | 15 | 184.9 | 0.357 | 2.49 |
| K6-044 | K6-045 | 4.66 | 3.57 | 24 | 306.3 | 0.356 | 8.72 |
| K6-045 | K6-046 | 3.57 | 2.97 | 24 | 170 | 0.353 | 8.69 |
| K6-046 | K6-047 | 2.97 | 2.56 | 24 | 117 | 0.35 | 8.66 |
| K6-047 | K6-048 | 2.56 | 1.92 | 24 | 178.7 | 0.358 | 8.75 |
| K6-048 | K6-049 | 1.92 | 1.85 | 15 | 145.6 | 0.048 | 0.92 |
| K6-049 | L6-055 | 1.85 | 1.7 | 15 | 338 | 0.044 | 0.88 |
| K6-071 | K6-048 | 6.95 | 1.92 | 8 | 370.2 | 1.359 | 0.91 |
| K6-073 | K6-030 | 20.87 | 14.41 | 6 | 406.7 | 1.588 | 0.46 |
| K6-074 | K6-073 | 22.97 | 20.87 | 6 | 133 | 1.579 | 0.46 |
| K7-001 | K6-071 | 11.99 | 6.95 | 8 | 370.6 | 1.36 | 0.91 |
| K7-002 | K7-001 | 12.67 | 11.99 | 8 | 50 | 1.36 | 0.91 |
| K7-072 | K6-042 | 6.61 | 6.01 | 15 | 134.2 | 0.447 | 2.79 |
| K7-074 | K7-075 | -0.34 | -1.24 | 10 | 255 | 0.353 | 0.84 |
| K7-075 | K7-073 | -1.24 | -2.14 | 10 | 255 | 0.353 | 0.84 |
| L5-002 | K6-017 | 54.02 | 50.87 | 8 | 165 | 1.909 | 1.08 |
| L5-003 | L5-002 | 56.32 | 54.02 | 8 | 120 | 1.917 | 1.08 |
| L5-004 | L5-003 | 57.81 | 56.32 | 8 | 78.2 | 1.905 | 1.08 |
| L6-004 | L6-010 | 35.85 | 32.95 | 8 | 159.1 | 1.823 | 1.05 |
| L6-005 | L6-004 | 36.75 | 35.85 | 8 | 48.5 | 1.856 | 1.06 |
| L6-010 | L6-011 | 32.95 | 29.93 | 8 | 165.4 | 1.826 | 1.06 |
| L6-011 | L6-013 | 29.93 | 26.97 | 8 | 162 | 1.827 | 1.06 |
| L6-013 | L6-014 | 26.97 | 23.86 | 8 | 169.7 | 1.833 | 1.06 |
| L6-014 | L6-015 | 23.86 | 20.94 | 8 | 160 | 1.825 | 1.06 |
| L6-015 | L6-021 | 20.94 | 17.91 | 8 | 166.6 | 1.819 | 1.05 |
| L6-021 | L6-022 | 17.91 | 14.89 | 8 | 165 | 1.83 | 1.06 |
| L6-022 | L6-026 | 14.89 | 9.07 | 8 | 325.1 | 1.79 | 1.05 |
| L6-023 | L6-022 | 18.24 | 14.89 | 6 | 174.8 | 1.916 | 0.5 |
| L6-024 | L6-023 | 22.35 | 18.24 | 6 | 215 | 1.912 | 0.5 |
| L6-025 | L6-024 | 27.71 | 22.35 | 6 | 280.1 | 1.914 | 0.5 |
| L6-026 | L6-027 | 9.07 | 7.18 | 8 | 105 | 1.8 | 1.05 |
| L6-027 | L6-028 | 7.18 | 5 | 8 | 121 | 1.802 | 1.05 |
| L6-028 | L6-029 | 5 | 4.17 | 10 | 284.8 | 0.291 | 0.76 |
| L6-029 | L6-030 | 4.17 | 3.64 | 10 | 181.1 | 0.293 | 0.77 |
| L6-030 | L6-032 | 3.64 | 3.25 | 10 | 134.2 | 0.291 | 0.76 |
| L6-032 | L6-033 | 3.25 | 2.79 | 10 | 158.7 | 0.29 | 0.76 |
| L6-033 | M6-009 | 2.79 | 1.88 | 10 | 313.5 | 0.29 | 0.76 |
| L6-040 | L6-038 | -2.66 | -2.8 | 15 | 16.6 | 0.843 | 3.83 |
| L6-041 | L6-040 | -1.42 | -2.66 | 15 | 148.2 | 0.837 | 3.82 |
| L6-042 | L6-041 | 1.4 | -1.42 | 15 | 338.1 | 0.834 | 3.81 |
| L6-043 | L6-028 | 6.02 | 5 | 8 | 320.6 | 0.318 | 0.44 |
| L6-044 | L6-043 | 8.27 | 6.02 | 12 | 181 | 1.243 | 2.57 |
| L6-046 | L6-044 | 10.29 | 8.27 | 12 | 162.1 | 1.246 | 2.57 |

Model Pipe Attributes

| | | | | | | | |
|------------------------------|--------|-------|-------|----|-------|-------|------|
| E3-012 | E3-016 | 14.02 | 13.51 | 8 | 54.7 | 0.932 | 0.75 |
| L6-047 | L6-046 | 12.26 | 10.29 | 12 | 157.9 | 1.248 | 2.57 |
| L6-048 | L6-047 | 14.57 | 12.26 | 12 | 186.3 | 1.24 | 2.56 |
| L6-049 | L6-048 | 18.22 | 14.57 | 12 | 292.9 | 1.246 | 2.57 |
| L6-050 | L6-042 | 1.56 | 1.4 | 15 | 339.8 | 0.047 | 0.91 |
| L6-055 | L6-050 | 1.7 | 1.56 | 15 | 304 | 0.046 | 0.9 |
| L6-063 | L6-026 | 10.71 | 9.07 | 8 | 165.6 | 0.99 | 0.78 |
| M6-005 | M6-007 | 17.9 | 14.42 | 8 | 127.5 | 2.729 | 1.29 |
| M6-007 | M6-008 | 14.42 | 1.11 | 8 | 485.1 | 2.744 | 1.29 |
| M6-008 | M6-010 | 1.11 | -1.24 | 10 | 290 | 0.81 | 1.28 |
| M6-009 | M6-008 | 1.88 | 1.11 | 10 | 265 | 0.291 | 0.76 |
| M6-010 | M6-011 | -1.24 | -2.81 | 10 | 192.6 | 0.815 | 1.28 |
| M6-011 | M6-013 | -2.81 | -5.11 | 14 | 283.5 | 0.811 | 4.52 |
| M6-013 | M6-014 | -5.11 | -5.35 | 14 | 30 | 0.8 | 4.49 |
| M6-014 | M6-016 | -5.35 | -8.04 | 14 | 330.7 | 0.813 | 4.53 |
| M6-016 | M6-017 | -8.04 | -9.93 | 14 | 233.1 | 0.811 | 4.52 |
| M6-018 | N6-001 | 26.73 | 26.02 | 18 | 460 | 0.154 | 2.67 |
| N6-001 | N6-002 | 26.02 | 25.16 | 18 | 560 | 0.154 | 2.66 |
| N6-002 | N6-003 | 25.16 | 24.31 | 18 | 550 | 0.155 | 2.67 |
| N6-003 | O6-001 | 24.31 | 23.5 | 18 | 522.6 | 0.155 | 2.67 |
| Indicates a surveyed manhole | | | | | | | |

Appendix B

Wastewater Collection System Model Results

Model Results for Existing Level of Development: ADWF, March 2011 Storm Event, and 10-Year Storm

| US Node ID | DS Node ID | Full Pipe Capacity (Mgal/d) | Peak ADWF (Mgal/d) | March Storm Peak Flow (Mgal/d) | 10-yr Storm Peak Flow (Mgal/d) |
|------------|------------|-----------------------------|--------------------|--------------------------------|--------------------------------|
| E3-012 | E3-016 | 0.75 | 0.0207 | 0.037 | 0.0654 |
| E3-013 | E3-012 | 0.75 | 0.0102 | 0.0182 | 0.0323 |
| E3-014 | E3-013 | 0.75 | 0.0089 | 0.0161 | 0.0285 |
| E3-016 | E3-017 | 0.75 | 0.0207 | 0.037 | 0.0654 |
| E3-017 | E4-015 | 0.75 | 0.0253 | 0.044 | 0.0775 |
| E3-021 | E4-024 | 0.84 | 0.0055 | 0.0101 | 0.0179 |
| E4-006 | E4-007 | 0.54 | 0.0061 | 0.011 | 0.0196 |
| E4-007 | E4-008 | 0.53 | 0.0085 | 0.0152 | 0.0269 |
| E4-008 | E4-009 | 0.54 | 0.0091 | 0.0163 | 0.029 |
| E4-009 | E4-010 | 0.53 | 0.0102 | 0.0186 | 0.0331 |
| E4-010 | E4-036 | 0.53 | 0.0146 | 0.0267 | 0.0476 |
| E4-014 | AtlanticPS | 0.46 | 0.0939 | 0.1574 | 0.2744 |
| E4-015 | E4-014 | 1.81 | 0.0939 | 0.1574 | 0.2744 |
| E4-016 | E4-015 | 1 | 0.0601 | 0.1058 | 0.1865 |
| E4-024 | E4-016 | 0.47 | 0.0191 | 0.0339 | 0.0603 |
| E4-036 | E5-001 | 0.53 | 0.0161 | 0.0292 | 0.0519 |
| E5-001 | E5-002 | 0.53 | 0.0181 | 0.0322 | 0.0569 |
| E5-002 | E5-003 | 0.54 | 0.021 | 0.0366 | 0.0645 |
| E5-003 | E5-004 | 0.53 | 0.021 | 0.0366 | 0.0645 |
| E5-004 | F5-010 | 0.53 | 0.0229 | 0.041 | 0.0739 |
| E5-009 | E5-010 | 4.95 | 0 | 0 | 0 |
| E5-010 | F5-019 | 4.97 | -0.0067 | -0.0078 | -0.009 |
| F3-009 | F3-010 | 1.18 | 0 | 0 | 0.0001 |
| F3-010 | F3-011 | 0.87 | 0.0007 | 0.0013 | 0.0024 |
| F3-011 | F3-013 | 1.11 | 0.0019 | 0.0035 | 0.0063 |
| F3-012 | F3-011 | 0.71 | 0 | 0 | 0.0001 |
| F3-013 | F3-014 | 0.75 | 0.0025 | 0.0045 | 0.008 |
| F3-014 | F3-015 | 0.75 | 0.0036 | 0.0062 | 0.0108 |
| F3-015 | F3-017 | 0.75 | 0.0056 | 0.0098 | 0.0173 |
| F3-017 | F3-018 | 0.75 | 0.0063 | 0.011 | 0.0193 |
| F3-018 | F3-019 | 0.75 | 0.007 | 0.0123 | 0.0216 |
| F3-019 | E3-014 | 0.76 | 0.0073 | 0.0129 | 0.0228 |
| F3-020 | E3-021 | 0.84 | 0.0055 | 0.0101 | 0.0179 |
| F3-022 | F3-020 | 0.84 | 0.004 | 0.0072 | 0.0129 |
| F3-024 | F3-022 | 0.84 | 0.0028 | 0.0049 | 0.0086 |
| F3-026 | F3-024 | 0.84 | 0.0017 | 0.003 | 0.0054 |
| F3-027 | F3-026 | 0.84 | 0 | 0.0001 | 0.0001 |
| F4-001 | E4-024 | 0.66 | 0.0111 | 0.0197 | 0.0349 |
| F4-002 | F4-001 | 0.66 | 0.0092 | 0.0163 | 0.0288 |
| F4-003 | F4-002 | 0.66 | 0.0092 | 0.0163 | 0.0288 |
| F4-005 | F4-003 | 0.66 | 0.0092 | 0.0163 | 0.0288 |
| F4-038 | F4-042 | 1.13 | 0.7359 | 0.8268 | 0.8567 |
| F4-039 | F4-038 | 0.29 | 0.8353 | 0.8793 | 0.8805 |
| F4-042 | F4-043 | 1.13 | 0.6587 | 0.7642 | 0.8158 |
| F4-043 | F4-046 | 1.13 | 0.6051 | 0.7419 | 0.7896 |
| F4-046 | F4-047 | 1.12 | 0.5682 | 0.7175 | 0.7579 |
| F4-047 | G4-005 | 1.12 | 0.5308 | 0.6923 | 0.7513 |
| F4-070 | F5-046 | 1.83 | 0.4671 | 0.637 | 0.8505 |

Model Results for Existing Level of Development: ADWF, March 2011 Storm Event, and 10-Year Storm

| US Node ID | DS Node ID | Full Pipe Capacity (Mgal/d) | Peak ADWF (Mgal/d) | March Storm Peak Flow (Mgal/d) | 10-yr Storm Peak Flow (Mgal/d) |
|------------|------------|-----------------------------|--------------------|--------------------------------|--------------------------------|
| F4-071 | F4-070 | 1.83 | 0.4827 | 0.6521 | 0.8645 |
| F4-072 | F4-071 | 1.83 | 0.5015 | 0.6939 | 0.8865 |
| F4-073 | F4-072 | 1.83 | 0.5298 | 0.7285 | 0.9276 |
| F5-010 | F5-011 | 0.53 | 0.0568 | 0.0974 | 0.1708 |
| F5-012 | F5-013 | 0.44 | 0.4456 | 0.4463 | 0.4464 |
| F5-013 | F5-014 | 0.44 | 0.4258 | 0.428 | 0.4288 |
| F5-014 | F5-015 | 0.45 | 0.4229 | 0.424 | 0.4234 |
| F5-015 | F5-052 | 0.43 | 0.4195 | 0.4216 | 0.4205 |
| F5-016 | F5-017 | 3.37 | 0.7364 | 0.9139 | 1.2746 |
| F5-017 | F5-018 | 3.39 | 0.7334 | 0.9057 | 1.2734 |
| F5-018 | F5-019 | 3.39 | 0.7322 | 0.9048 | 1.2724 |
| F5-019 | NWINFPS | 16.2 | 0.7758 | 0.9502 | 1.3671 |
| F5-020 | F5-019 | 4.48 | 0.0675 | 0.0895 | 0.1495 |
| F5-021 | F5-020 | 4.48 | 0.0519 | 0.0813 | 0.1172 |
| F5-022 | F5-021 | 4.48 | 0.0519 | 0.0813 | 0.1172 |
| F5-023 | F5-024 | 3 | 0.4621 | 0.6465 | 0.8926 |
| F5-024 | F5-025 | 2.99 | 0.4571 | 0.6426 | 0.9006 |
| F5-025 | F5-026 | 2.99 | 0.4705 | 0.6704 | 0.9506 |
| F5-026 | F5-027 | 2.99 | 0.4551 | 0.6584 | 0.9351 |
| F5-027 | F5-052 | 2.35 | 0.4447 | 0.6358 | 0.8929 |
| F5-028 | F5-016 | 3.37 | 0.7547 | 0.9181 | 1.2789 |
| F5-029 | F5-028 | 0.81 | 0.0093 | 0.0152 | 0.0281 |
| F5-033 | F5-029 | 0.81 | 0.0029 | 0.0051 | 0.009 |
| F5-043 | F5-033 | 0.81 | 0.0004 | 0.0007 | 0.0013 |
| F5-044 | F5-043 | 0.81 | 0 | 0 | 0 |
| F5-045 | F5-044 | 0.81 | 0 | 0 | 0 |
| F5-046 | F5-023 | 5.25 | 0.4743 | 0.6626 | 0.8999 |
| F5-047 | F5-046 | 0.7 | 0.0196 | 0.0344 | 0.0588 |
| F5-049 | F5-047 | 0.7 | 0.0153 | 0.0272 | 0.0481 |
| F5-052 | F5-028 | 1.86 | 0.754 | 0.9146 | 1.2577 |
| G4-005 | F4-073 | 1.83 | 0.539 | 0.7295 | 0.9017 |
| G5-046 | G5-050 | 0.62 | 0 | 0 | 0 |
| G5-050 | G5-051 | 0.62 | 0 | 0 | 0 |
| G5-051 | G5-052 | 0.62 | 0 | 0 | 0 |
| G5-052 | G5-053 | 0.62 | 0 | 0 | 0 |
| G5-053 | G5-054 | 0.62 | 0 | 0 | 0 |
| G5-054 | G5-056 | 0.62 | 0 | 0 | 0 |
| G5-056 | G5-057 | 0.62 | 0 | 0 | 0 |
| G5-057 | G5-065 | 0.62 | 0 | 0 | 0 |
| G5-065 | G5-066 | 0.62 | 0 | 0 | 0 |
| G5-066 | G5-067 | 0.62 | 0 | 0 | 0 |
| G5-067 | G5-068 | 0.62 | 0 | 0 | 0 |
| G5-068 | G5-069 | 0.62 | 0 | 0 | 0 |
| G5-069 | G5-070 | 0.63 | 0 | 0 | 0 |
| G5-070 | G5-071 | 0.63 | 0 | 0 | 0 |
| G5-071 | G5-072 | 0.62 | 0 | 0 | 0 |
| G5-072 | G5-073 | 0.62 | 0 | 0 | 0 |
| G5-073 | G6-001 | 0.73 | 0 | 0.0002 | 0.0004 |

Model Results for Existing Level of Development: ADWF, March 2011 Storm Event, and 10-Year Storm

| US Node ID | DS Node ID | Full Pipe Capacity (Mgal/d) | Peak ADWF (Mgal/d) | March Storm Peak Flow (Mgal/d) | 10-yr Storm Peak Flow (Mgal/d) |
|------------|------------|-----------------------------|--------------------|--------------------------------|--------------------------------|
| G5-090 | F5-045 | 0.81 | 0 | 0 | 0 |
| G5-091 | G5-090 | 0.81 | 0 | 0 | 0 |
| G5-093 | G5-091 | 0.81 | 0 | 0 | 0 |
| G6-001 | F5-022 | 4.48 | 0.0519 | 0.0813 | 0.1172 |
| G6-002 | G6-001 | 5.83 | 0.0519 | 0.0813 | 0.1172 |
| G6-003 | G6-002 | 10.75 | 0 | 0 | 0.0016 |
| H6-004 | H6-007 | 0.75 | 0.0277 | 0.0788 | 0.15 |
| H6-007 | H6-011 | 0.75 | 0.0276 | 0.0788 | 0.1499 |
| H6-011 | H6-012 | 0.75 | 0.0276 | 0.0788 | 0.1948 |
| H6-012 | H6-013 | 0.76 | 0.0276 | 0.0788 | 0.2011 |
| H6-013 | I6-015 | 0.74 | 0.0276 | 0.0788 | 0.2047 |
| H8-001 | I7-016 | 0.86 | 0 | 0 | 0 |
| H8-002 | H8-001 | 0.47 | 0 | 0 | 0 |
| I6-014 | H6-013 | 3.48 | 0 | 0.0003 | 0.005 |
| I6-015 | I6-024 | 0.74 | 0.0276 | 0.0911 | 0.2092 |
| I6-016 | I6-025 | 0.74 | 0.1112 | 0.3392 | 0.5639 |
| I6-018 | I6-019 | 0.74 | 0.1111 | 0.3391 | 0.5618 |
| I6-019 | I6-020 | 0.74 | 0.111 | 0.3391 | 0.5663 |
| I6-020 | I6-021 | 0.74 | 0.111 | 0.3391 | 0.5788 |
| I6-021 | I6-022 | 0.75 | 0.111 | 0.339 | 0.5927 |
| I6-022 | I7-018 | 0.74 | 0.1109 | 0.339 | 0.6085 |
| I6-024 | I6-016 | 0.74 | 0.0912 | 0.2697 | 0.4483 |
| I6-025 | I6-018 | 0.74 | 0.1111 | 0.3391 | 0.5623 |
| I7-001 | I7-017 | 0.58 | 0.3297 | 0.3303 | 0.3462 |
| I7-002 | I7-001 | 0.58 | 0.3299 | 0.33 | 0.342 |
| I7-003 | I7-002 | 0.58 | 0.33 | 0.33 | 0.3385 |
| I7-004 | I7-003 | 0.58 | 0.33 | 0.33 | 0.336 |
| I7-005 | I7-004 | 0.58 | 0.33 | 0.3301 | 0.3343 |
| I7-006 | I7-007 | 0.86 | 0 | 0 | 0 |
| I7-007 | I7-008 | 0.86 | 0 | 0.0016 | 0.0039 |
| I7-008 | I7-009 | 0.86 | 0.0117 | 0.0408 | 0.0763 |
| I7-009 | I7-010 | 0.86 | 0.0117 | 0.0408 | 0.0763 |
| I7-010 | I7-011 | 0.86 | 0.0117 | 0.0417 | 0.0784 |
| I7-011 | I7-013 | 0.78 | 0.0208 | 0.0727 | 0.1359 |
| I7-012 | I7-011 | 0.49 | 0 | 0.0011 | 0.003 |
| I7-013 | I7-014 | 0.78 | 0.0269 | 0.0934 | 0.1746 |
| I7-014 | I7-015 | 0.78 | 0.0269 | 0.0934 | 0.1746 |
| I7-016 | I7-006 | 0.86 | 0 | 0 | 0 |
| I7-017 | J7-006 | 0.75 | 0.451 | 0.7053 | 0.8911 |
| I7-018 | I7-017 | 0.74 | 0.1206 | 0.3534 | 0.6305 |
| J5-001 | K5-029 | 0.98 | 0.0056 | 0.0235 | 0.0462 |
| J6-002 | J6-067 | 1.01 | 0 | 0.0003 | 0.0008 |
| J6-007 | J6-008 | 0.58 | 0.0206 | 0.0708 | 0.1385 |
| J6-008 | K6-007 | 0.58 | 0.0219 | 0.0755 | 0.1478 |
| J6-013 | K6-008 | 2.8 | 0.068 | 0.2495 | 0.4678 |
| J6-014 | J6-013 | 0.68 | 0.0183 | 0.0929 | 0.1917 |
| J6-015 | J6-014 | 0.68 | 0.0158 | 0.0854 | 0.1724 |
| J6-016 | J6-015 | 0.68 | 0.0126 | 0.0761 | 0.1546 |

Model Results for Existing Level of Development: ADWF, March 2011 Storm Event, and 10-Year Storm

| US Node ID | DS Node ID | Full Pipe Capacity (Mgal/d) | Peak ADWF (Mgal/d) | March Storm Peak Flow (Mgal/d) | 10-yr Storm Peak Flow (Mgal/d) |
|------------|------------|-----------------------------|--------------------|--------------------------------|--------------------------------|
| J6-017 | J6-016 | 0.68 | 0.0094 | 0.0665 | 0.1362 |
| J6-018 | J6-017 | 0.68 | 0.0094 | 0.0665 | 0.1362 |
| J6-019 | J6-020 | 0.6 | 0 | 0 | 0 |
| J6-020 | J6-021 | 0.59 | 0 | 0.0002 | 0.0005 |
| J6-021 | J6-022 | 0.6 | 0.0035 | 0.0107 | 0.0282 |
| J6-022 | J6-013 | 0.43 | 0.0369 | 0.1127 | 0.2112 |
| J6-023 | J6-022 | 0.26 | 0.0256 | 0.0789 | 0.1504 |
| J6-024 | J6-023 | 0.55 | 0.0256 | 0.0789 | 0.1507 |
| J6-025 | J6-024 | 0.46 | 0.0098 | 0.0282 | 0.0542 |
| J6-026 | J6-025 | 0.46 | 0.0038 | 0.0115 | 0.0223 |
| J6-027 | J6-028 | 0.58 | -0.0154 | -0.0221 | 0.0223 |
| J6-028 | J6-029 | 0.84 | 0.4465 | 0.7032 | 0.8739 |
| J6-029 | J7-001 | 0.84 | 0.444 | 0.7031 | 0.873 |
| J6-030 | J6-028 | 0.75 | 0.4502 | 0.7033 | 0.8839 |
| J6-031 | J6-032 | 0.63 | 0.0022 | 0.007 | 0.0135 |
| J6-032 | J6-033 | 0.62 | 0.0032 | 0.0099 | 0.0192 |
| J6-033 | J6-034 | 0.62 | 0.0032 | 0.0099 | 0.0192 |
| J6-034 | J6-035 | 0.63 | 0.0032 | 0.0106 | 0.0211 |
| J6-035 | J6-024 | 0.62 | 0.008 | 0.0255 | 0.049 |
| J6-043 | J6-007 | 0.58 | 0.02 | 0.0685 | 0.1339 |
| J6-050 | J6-051 | 1.01 | 0.0068 | 0.0239 | 0.0447 |
| J6-051 | J6-052 | 1.01 | 0.0132 | 0.046 | 0.0857 |
| J6-052 | J6-053 | 1 | 0.0169 | 0.0586 | 0.1096 |
| J6-053 | J6-054 | 4.5 | 0.0274 | 0.0991 | 0.19 |
| J6-054 | K6-035 | 4.3 | 0.0609 | 0.2267 | 0.449 |
| J6-055 | J6-054 | 0.58 | 0.033 | 0.1253 | 0.2481 |
| J6-056 | J6-055 | 0.57 | 0.0315 | 0.1183 | 0.2341 |
| J6-067 | J6-068 | 1.01 | 0.0068 | 0.0237 | 0.0442 |
| J6-068 | J6-050 | 1.01 | 0.0068 | 0.0236 | 0.0442 |
| J7-001 | J7-002 | 0.84 | 0.4418 | 0.703 | 0.8724 |
| J7-002 | J7-003 | 0.84 | 0.4391 | 0.703 | 0.8721 |
| J7-003 | J7-004 | 0.84 | 0.4371 | 0.7029 | 0.8719 |
| J7-004 | J7-005 | 0.84 | 0.4333 | 0.7028 | 0.8718 |
| J7-005 | K7-074 | 0.84 | 0.4305 | 0.7027 | 0.8717 |
| J7-006 | J6-030 | 0.75 | 0.4507 | 0.704 | 0.8871 |
| J7-007 | J7-009 | 0.6 | 0 | 0 | 0 |
| J7-008 | I7-012 | 0.6 | 0 | 0 | 0 |
| J7-009 | J7-008 | 0.6 | 0 | 0 | 0 |
| J7-010 | J7-007 | 0.6 | 0 | 0 | 0 |
| K5-001 | K5-003 | 0.5 | 0.008 | 0.0363 | 0.0735 |
| K5-003 | K5-004 | 0.5 | 0.0111 | 0.0496 | 0.1001 |
| K5-004 | K5-005 | 0.5 | 0.0111 | 0.0496 | 0.1003 |
| K5-005 | K5-009 | 0.51 | 0.0161 | 0.0659 | 0.1317 |
| K5-009 | K5-010 | 0.51 | 0.019 | 0.0744 | 0.148 |
| K5-010 | K5-012 | 0.51 | 0.0221 | 0.0851 | 0.1689 |
| K5-012 | K5-014 | 0.51 | 0.028 | 0.1042 | 0.2059 |
| K5-014 | K5-019 | 0.97 | 0.0361 | 0.1372 | 0.2717 |
| K5-019 | K5-020 | 0.97 | 0.0386 | 0.1466 | 0.2903 |

Model Results for Existing Level of Development: ADWF, March 2011 Storm Event, and 10-Year Storm

| US Node ID | DS Node ID | Full Pipe Capacity (Mgal/d) | Peak ADWF (Mgal/d) | March Storm Peak Flow (Mgal/d) | 10-yr Storm Peak Flow (Mgal/d) |
|------------|------------|-----------------------------|--------------------|--------------------------------|--------------------------------|
| K5-020 | K5-021 | 0.97 | 0.0477 | 0.1736 | 0.3419 |
| K5-021 | K5-022 | 1.5 | 0.076 | 0.2614 | 0.5111 |
| K5-022 | K5-023 | 1.51 | 0.0775 | 0.266 | 0.5197 |
| K5-023 | K6-014 | 1.5 | 0.0775 | 0.266 | 0.5195 |
| K5-026 | L5-004 | 1.08 | 0 | 0.0025 | 0.0052 |
| K5-028 | J5-001 | 0.99 | 0.0029 | 0.014 | 0.0285 |
| K5-029 | K6-009 | 0.98 | 0.0151 | 0.0566 | 0.1081 |
| K5-CO-028 | K5-028 | 0.98 | 0 | 0.0003 | 0.0005 |
| K6-006 | J6-056 | 0.58 | 0.0315 | 0.1183 | 0.2341 |
| K6-007 | K6-006 | 0.58 | 0.0231 | 0.08 | 0.1574 |
| K6-008 | K7-072 | 2.79 | 0.0679 | 0.2495 | 0.4751 |
| K6-009 | K6-010 | 0.98 | 0.0154 | 0.0805 | 0.1593 |
| K6-010 | K6-011 | 0.98 | 0.0154 | 0.0808 | 0.158 |
| K6-011 | K6-074 | 0.46 | 0.1062 | 0.4103 | 0.573 |
| K6-012 | K6-011 | 1.06 | 0.0907 | 0.3299 | 0.4973 |
| K6-013 | K6-012 | 1.07 | 0.0845 | 0.3112 | 0.6102 |
| K6-014 | K6-013 | 1.07 | 0.0845 | 0.3112 | 0.612 |
| K6-017 | K6-018 | 1.08 | 0.008 | 0.1813 | 0.3947 |
| K6-018 | K6-019 | 0.5 | 0.0101 | 0.1932 | 0.4205 |
| K6-019 | K6-020 | 0.5 | 0.0101 | 0.1932 | 0.4195 |
| K6-020 | K6-021 | 0.5 | 0.0115 | 0.1998 | 0.4309 |
| K6-021 | L6-025 | 0.5 | 0.0115 | 0.1998 | 0.4286 |
| K6-022 | L6-049 | 2.57 | 0.0051 | 0.0231 | 0.0457 |
| K6-030 | K6-031 | 2.89 | 0.1119 | 0.4303 | 0.606 |
| K6-031 | K6-032 | 2.91 | 0.1119 | 0.4303 | 0.606 |
| K6-032 | K6-034 | 2.37 | 0.1136 | 0.4357 | 0.6165 |
| K6-033 | K6-032 | 5.5 | 0.0017 | 0.0055 | 0.0103 |
| K6-034 | K6-035 | 2.37 | 0.1136 | 0.4357 | 0.6175 |
| K6-035 | K6-036 | 3.99 | 0.1917 | 0.7148 | 1.1331 |
| K6-036 | K6-037 | 3.97 | 0.1917 | 0.7148 | 1.1317 |
| K6-037 | K6-040 | 8.57 | 0.1986 | 0.735 | 1.167 |
| K6-040 | K6-044 | 8.56 | 0.2037 | 0.7525 | 1.1985 |
| K6-042 | K6-043 | 2.49 | 0.0915 | 0.3311 | 0.6129 |
| K6-043 | K6-044 | 2.49 | 0.0915 | 0.3476 | 0.6112 |
| K6-044 | K6-045 | 8.72 | 0.2982 | 1.1805 | 1.8269 |
| K6-045 | K6-046 | 8.69 | 0.2991 | 1.3452 | 1.8312 |
| K6-046 | K6-047 | 8.66 | 0.3073 | 1.5115 | 1.6627 |
| K6-047 | K6-048 | 8.75 | 0.5484 | 1.5909 | 1.6744 |
| K6-048 | K6-049 | 0.92 | 1.0446 | 1.7097 | 1.8258 |
| K6-049 | L6-055 | 0.88 | 0.9828 | 1.7081 | 1.8248 |
| K6-071 | K6-048 | 0.91 | 0.8822 | 0.9043 | 0.8968 |
| K6-073 | K6-030 | 0.46 | 0.1087 | 0.4192 | 0.5854 |
| K6-074 | K6-073 | 0.46 | 0.1061 | 0.4103 | 0.5732 |
| K7-001 | K6-071 | 0.91 | 0.8959 | 0.901 | 0.9187 |
| K7-002 | K7-001 | 0.91 | 0.9589 | 0.9658 | 0.9725 |
| K7-072 | K6-042 | 2.79 | 0.0811 | 0.2953 | 0.5473 |
| K7-074 | K7-075 | 0.84 | 0.4279 | 0.7027 | 0.8716 |
| K7-075 | K7-073 | 0.84 | 0.4236 | 0.7026 | 0.8716 |

Model Results for Existing Level of Development: ADWF, March 2011 Storm Event, and 10-Year Storm

| US Node ID | DS Node ID | Full Pipe Capacity (Mgal/d) | Peak ADWF (Mgal/d) | March Storm Peak Flow (Mgal/d) | 10-yr Storm Peak Flow (Mgal/d) |
|------------|------------|-----------------------------|--------------------|--------------------------------|--------------------------------|
| L5-002 | K6-017 | 1.08 | 0.008 | 0.1815 | 0.395 |
| L5-003 | L5-002 | 1.08 | 0.008 | 0.1817 | 0.3939 |
| L5-004 | L5-003 | 1.08 | 0.008 | 0.1822 | 0.3966 |
| L6-004 | L6-010 | 1.05 | 0 | 0.0011 | 0.0021 |
| L6-005 | L6-004 | 1.06 | 0 | 0 | 0 |
| L6-010 | L6-011 | 1.06 | 0.0065 | 0.0626 | 0.1328 |
| L6-011 | L6-013 | 1.06 | 0.0078 | 0.0689 | 0.1454 |
| L6-013 | L6-014 | 1.06 | 0.0089 | 0.0738 | 0.1553 |
| L6-014 | L6-015 | 1.06 | 0.0101 | 0.0813 | 0.1707 |
| L6-015 | L6-021 | 1.05 | 0.0149 | 0.1127 | 0.2355 |
| L6-021 | L6-022 | 1.06 | 0.0165 | 0.1184 | 0.2461 |
| L6-022 | L6-026 | 1.05 | 0.0379 | 0.3758 | 0.7581 |
| L6-023 | L6-022 | 0.5 | 0.019 | 0.2465 | 0.517 |
| L6-024 | L6-023 | 0.5 | 0.019 | 0.2465 | 0.5088 |
| L6-025 | L6-024 | 0.5 | 0.0161 | 0.2283 | 0.4771 |
| L6-026 | L6-027 | 1.05 | 0.04 | 0.385 | 0.7696 |
| L6-027 | L6-028 | 1.05 | 0.0425 | 0.3953 | 0.7889 |
| L6-028 | L6-029 | 0.76 | 0.0477 | 0.4175 | 0.9539 |
| L6-029 | L6-030 | 0.77 | 0.0499 | 0.432 | 0.9842 |
| L6-030 | L6-032 | 0.76 | 0.0523 | 0.4461 | 1.0136 |
| L6-032 | L6-033 | 0.76 | 0.0523 | 0.4461 | 1.0273 |
| L6-033 | M6-009 | 0.76 | 0.0523 | 0.4465 | 1.0449 |
| L6-040 | L6-038 | 3.83 | 0.9528 | 1.8358 | 1.8858 |
| L6-041 | L6-040 | 3.82 | 0.9448 | 1.755 | 1.998 |
| L6-042 | L6-041 | 3.81 | 0.9499 | 1.8055 | 1.9991 |
| L6-043 | L6-028 | 0.44 | 0.0041 | 0.0219 | 0.2307 |
| L6-044 | L6-043 | 2.57 | 0.0126 | 0.0569 | 0.1893 |
| L6-046 | L6-044 | 2.57 | 0.0126 | 0.0569 | 0.1642 |
| L6-047 | L6-046 | 2.57 | 0.0102 | 0.0456 | 0.0899 |
| L6-048 | L6-047 | 2.56 | 0.0102 | 0.0456 | 0.0901 |
| L6-049 | L6-048 | 2.57 | 0.0078 | 0.0347 | 0.0684 |
| L6-050 | L6-042 | 0.91 | 0.9416 | 1.8141 | 1.9726 |
| L6-055 | L6-050 | 0.9 | 0.945 | 1.7239 | 1.8384 |
| L6-063 | L6-026 | 0.78 | 0.0021 | 0.0092 | 0.0761 |
| M6-005 | M6-007 | 1.29 | 0.019 | 0.2921 | 0.635 |
| M6-007 | M6-008 | 1.29 | 0.0276 | 0.3396 | 0.7235 |
| M6-008 | M6-010 | 1.28 | 0.085 | 0.8169 | 1.7135 |
| M6-009 | M6-008 | 0.76 | 0.0578 | 0.4775 | 1.1115 |
| M6-010 | M6-011 | 1.28 | 0.178 | 0.8169 | 1.7128 |
| M6-011 | M6-013 | 4.52 | 1.5255 | 2.2569 | 3.1523 |
| M6-013 | M6-014 | 4.49 | 1.5244 | 2.2569 | 3.1553 |
| M6-014 | M6-016 | 4.53 | 1.5294 | 2.3026 | 3.2489 |
| M6-016 | M6-017 | 4.52 | 1.5275 | 2.3026 | 3.3632 |
| M6-018 | N6-001 | 2.67 | 2.4863 | 3.6319 | 3.8926 |
| N6-001 | N6-002 | 2.66 | 2.1754 | 2.8005 | 3.8852 |
| N6-002 | N6-003 | 2.67 | 1.8688 | 2.5759 | 3.8796 |
| N6-003 | O6-001 | 2.67 | 1.6826 | 2.5713 | 3.8651 |

Appendix C

**Planning Level Opinions of Probable Cost for
Recommended Capital Improvement Projects**

City of Rio Vista
System Evaluation and Capacity Assurance Plan
Planning Level Opinions of Probable Cost for Recommended Capital Improvement Projects

Stantec Consulting Services Inc.

| | |
|--|--------------------------------|
| PROJECT: CITY OF RIO VISTA SEWER SYSTEM MANAGEMENT PLAN PRELIMINARY OPINION OF PROBABLE COST | DATE CREATED: 6/13/2011 |
| | UPDATED: 6/13/2011 |
| JOB NUMBER: 184030138 | PREPARED BY: NJW |
| | CHECKED BY: JBD |
| DESCRIPTION: RECOMMENDED CAPITAL IMPROVEMENT PROJECTS | CURRENT ENR CCI: 9,104 |

| PROJECT | DESCRIPTION | QTY. | UNIT | UNIT PRICE | TOTAL |
|-----------------|--|-------|------|-------------|-----------|
| <u>1</u> | <u>UPSIZE SEWER IN FRONT AND MAIN STREET</u> | | | | |
| | Install 24" sewer | 1,630 | LF | \$456.00 | \$743,280 |
| <u>2</u> | <u>UPSIZE MAX PUMP CAPACITY AT CITY HALL LIFT STATION</u> | | | | |
| | Install new pumps | 2 | EA | \$30,000.00 | \$60,000 |
| | Install new piping to force main | 1 | LS | \$8,000.00 | \$8,000 |
| | Install new valves | 1 | LS | \$4,500.00 | \$4,500 |
| | Upgrade electrical service | 1 | LS | \$25,000.00 | \$25,000 |
| | Install new motor controls | 1 | LS | \$15,000.00 | \$15,000 |
| | New generator | 1 | LS | \$6,000.00 | \$6,000 |
| <u>3</u> | <u>UPSIZE MAX PUMP CAPACITY AT MARINA LIFT STATION</u> | | | | |
| | Install new pumps | 2 | EA | \$45,000.00 | \$90,000 |
| | Install new piping to force main | 1 | LS | \$8,000.00 | \$8,000 |
| | Install new valves | 1 | LS | \$4,500.00 | \$4,500 |
| | Upgrade electrical service | 1 | LS | \$15,000.00 | \$15,000 |
| | Install new motor controls | 1 | LS | \$25,000.00 | \$25,000 |
| | New 125 kW diesel generator | 1 | LS | \$10,000.00 | \$10,000 |
| | Install parallel 14" force main | 711 | LF | \$266.00 | \$189,126 |

**City of Rio Vista
System Evaluation and Capacity Assurance Plan
Planning Level Opinions of Probable Cost for Recommended Capital Improvement Projects**

Stantec Consulting Services Inc.

| | |
|--|--------------------------------|
| PROJECT: CITY OF RIO VISTA SEWER SYSTEM MANAGEMENT PLAN PRELIMINARY OPINION OF PROBABLE COST | DATE CREATED: 6/13/2011 |
| | UPDATED: 6/13/2011 |
| JOB NUMBER: 184030138 | PREPARED BY: NJW |
| | CHECKED BY: JBD |
| DESCRIPTION: RECOMMENDED CAPITAL IMPROVEMENT PROJECTS | CURRENT ENR CCI: 9,104 |

| PROJECT | DESCRIPTION | QTY. | UNIT | UNIT PRICE | TOTAL |
|-----------------|--|-------|------|------------|--------------------|
| <u>4</u> | <u>UPSIZE SEWER IN BEACH STREET</u> | | | | |
| | Install 27" sewer | 2,023 | LF | \$513.00 | \$1,037,799 |
| <u>5</u> | <u>UPSIZE SEWER IN WEST OF 6TH STREET</u> | | | | |
| | Install 10" sewer | 623 | LF | \$190.00 | \$118,370 |
| | SUBTOTAL | | | | \$2,359,575 |
| | Estimating Contingency | 30 | % | | \$707,873 |
| | SUBTOTAL CONSTRUCTION COSTS | | | | \$3,067,448 |
| | Design/Administration | 16 | % | | \$490,792 |
| | TOTAL CONSTRUCTION COSTS | | | | \$3,558,239 |

Notes:

- (a) Does not specifically include pump station costs or costs for easement acquisitions.
- (b) Unit price calculated at a rate of \$19/inch diameter-linear foot
- (c) Unit price includes excavation, materials and construction as well as installation of manholes.

APPENDIX IX-A
City of Rio Vista
Sewer System Management Plan
SSO Monitoring and Performance Evaluation Forms

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City of Rio Vista SSMF Monitoring Parameters

Year: 2022

| Parameters | Jan - Mar | Apr - Jun | Jul - Sep | Oct - Dec | Annual Total |
|---|-----------|-----------|-----------|-----------|--------------|
| Number of SSOs (per 100 mile of mainline) | 0 | 0 | 0 | NA | 0 |
| Cause of SSOs | 0 | 0 | 0 | 1 | 0 |
| Average SSO response time (minutes) | 30 | 0 | 0 | 1 | 0 |
| Average SSO volume (gallons) | 0 | 0 | 0 | 1 | 0 |
| Percentage of spill contained | 0 | 0 | 0 | 1 | 0 |
| Percentage of spill discharged to surface water | 0 | 0 | 0 | 1 | 0 |
| Number of Category 1 spills | 0 | 0 | 0 | 1 | 0 |
| Staff sewer O&M training (hours) | 8 | 8 | 16 | 0 | 32 |
| SSMP requirements review (hours) | 0 | 0 | 0 | 0 | 0 |

City of Rio Vista SSMP Performance Measures

| Year: <u>2022</u> | | |
|--|--|---------------|
| SSMP Element | Performance Measure | Annual Total |
| Element 4 - Operation and Maintenance Program | Number of SSOs (per 100 mile of mainline) | 0 |
| | Average SSO volume (gallons) | 0 |
| | Cause of SSOs | 0 |
| | Number or repeat SSOs (by location) | 0 |
| | Number of SSOs due to lift station failure | 0 |
| | Staff sewer O&M training (hours) | <u>32</u> |
| Element 6 - Overflow Emergency Response Plan | Average SSO response time (minutes) | <u>30 min</u> |
| | Percentage of spill contained | 0 |
| Element 8 - SECAP | Number of SSOs due to capacity limitations | 0 |
| Element 10 - SSMP Program Audits | Date of most recent SSMP audit | <u>10/22</u> |
| | SSMP Requirements Review (hours) | <u>8</u> |

City of Rio Vista SSMP Monitoring Parameters

| Year: _____ | | | | | |
|---|----------|-----------|-----------|-----------|--------------|
| Parameters | Jan -Mar | Apr - Jun | Jul - Sep | Oct - Dec | Annual Total |
| Number of SSOs (per 100 mile of mainline) | | | | | |
| Cause of SSOs | | | | | |
| Average SSO response time (minutes) | | | | | |
| Average SSO volume (gallons) | | | | | |
| Percentage of spill contained | | | | | |
| Percentage of spill discharged to surface water | | | | | |
| Number of Category 1 spills | | | | | |
| Staff sewer O&M training (hours) | | | | | |
| SSMP requirements review (hours) | | | | | |

City of Rio Vista SSMP Performance Measures

| Year: _____ | | |
|--|--|--------------|
| SSMP Element | Performance Measure | Annual Total |
| Element 4 - Operation and Maintenance Program | Number of SSOs (per 100 mile of mainline) | |
| | Average SSO volume (gallons) | |
| | Cause of SSOs | |
| | Number or repeat SSOs (by location) | |
| | Number of SSOs due to lift station failure | |
| | Staff sewer O&M training (hours) | |
| Element 6 - Overflow Emergency Response Plan | Average SSO response time (minutes) | |
| | Percentage of spill contained | |
| Element 8 - SECAP | Number of SSOs due to capacity limitations | |
| Element 10 - SSMP Program Audits | Date of most recent SSMP audit | |
| | SSMP Requirements Review (hours) | |

APPENDIX X-A
City of Rio Vista
Sewer System Management Plan
Quarterly Evaluation and Bi-Annual Audit Forms

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**City of Rio Vista
Quarterly SSMP Evaluation Form**

1) Have any positions, names or contact numbers for personnel listed in Attachment 2-1 of the City's SSMP changed?

Yes _____ No

If yes, list the changes below and update the City's SSMP contact information:

2) Has the Chain of Communication for reporting SSOs changed?

Yes _____ No

If yes, list the changes below and update the City's SSMP:

3) Are staff members on schedule for meeting their annual training goals?

Yes No _____

If no, list the training classes scheduled for the remainder of the year:

**City of Rio Vista
Bi-annual SSMP Audit Form**

1) Describe the progress made since implementation of the SSMP, or the most recent audit update:

City has implemented ordinance no. 006-2022. Staff is in the process of issuing wastewater discharge permit & audit of all commercial & industrial dischargers

2) Do the performance measures outlined in Element 9 meet the City's needs?

Yes No

If no, outline modifications to these performance measures:

3) Describe the success of implementation and overall effectiveness of each SSMP element:

| Element | Not Effective | Effective | Extremely Effective |
|--|---------------|-----------|---------------------|
| Goal | 1 | 2 | 3 |
| Organization | 1 | 2 | 3 |
| Legal Authority | 1 | 2 | 3 |
| Operation and Maintenance | 1 | 2 | 3 |
| Overflow Emergency Response Plan | 1 | 2 | 3 |
| Fats, Oils and Grease (FOG) Control Program | 1 | 2 | 3 |
| Design and Performance Provisions | 1 | 2 | 3 |
| System Evaluation & Capacity Assurance Plan | 1 | 2 | 3 |
| Monitoring, Measurement, and Program Modifications | 1 | 2 | 3 |
| SSMP Program Audits | 1 | 2 | 3 |
| Communication Program | 1 | 2 | 3 |

Comments:

**City of Rio Vista
Bi-annual SSMP Audit Form**

4) Describe any changes or updates to the SSMP:

NA

5) Describe any needed improvements to the SSMP:

NA

6) Outline steps to correct any deficiencies with the SSMP:

NA

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**City of Rio Vista
Quarterly SSMP Evaluation Form**

1) Have any positions, names or contact numbers for personnel listed in Attachment 2-1 of the City's SSMP changed?

Yes _____ No _____

If yes, list the changes below and update the City's SSMP contact information:

2) Has the Chain of Communication for reporting SSOs changed?

Yes _____ No _____

If yes, list the changes below and update the City's SSMP:

3) Are staff members on schedule for meeting their annual training goals?

Yes _____ No _____

If no, list the training classes scheduled for the remainder of the year:

**City of Rio Vista
Bi-annual SSMP Audit Form**

1) Describe the progress made since implementation of the SSMP, or the most recent audit update:

2) Do the performance measures outlined in Element 9 meet the City's needs?

Yes _____ No _____

If no, outline modifications to these performance measures:

3) Describe the success of implementation and overall effectiveness of each SSMP element:

| Element | Not Effective | Effective | Extremely Effective |
|--|---------------|-----------|---------------------|
| Goal | 1 | 2 | 3 |
| Organization | 1 | 2 | 3 |
| Legal Authority | 1 | 2 | 3 |
| Operation and Maintenance | 1 | 2 | 3 |
| Overflow Emergency Response Plan | 1 | 2 | 3 |
| Fats, Oils and Grease (FOG) Control Program | 1 | 2 | 3 |
| Design and Performance Provisions | 1 | 2 | 3 |
| System Evaluation & Capacity Assurance Plan | 1 | 2 | 3 |
| Monitoring, Measurement, and Program Modifications | 1 | 2 | 3 |
| SSMP Program Audits | 1 | 2 | 3 |
| Communication Program | 1 | 2 | 3 |

Comments:

**City of Rio Vista
Bi-annual SSMP Audit Form**

4) Describe any changes or updates to the SSMP:

5) Describe any needed improvements to the SSMP:

6) Outline steps to correct any deficiencies with the SSMP:

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APPENDIX X-B
City of Rio Vista
Sewer System Management Plan
SSMP Change Log

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| SSMP Section # | Description of Change/Revision Made |
|--------------------------------------|---|
| Title Page | Updated to standard HydroScience format. |
| All sections | General formatting update. |
| All sections | Minor clarifying text updates throughout. |
| All sections | Re-organized to a standard Introduction, Regulatory Requirements, City Information format |
| Introduction Subsection B | Added Introduction Section |
| Element I Subsection C | Reworded: "Minimize costs associated with (future) consolidation of treatment facilities by considering the impacts to the collections system that would result from consolidation when evaluating SSMP capacity improvement and repair or replacement project" to "Analyze the future treatment facility consolidation together with the collection system capacity to provide cost effective and efficient projects." |
| Element II Figure II-1 | Added Organization chart for Public Works Department |
| Element II Subsection C | Separated Engineer from Public Works now that the City Engineer is contracted with Dillon & Murphy Engineering. |
| Element II Subsection C | Added back-up LRO (Public Works Director) |
| Element II Subsection C | Added City Staff Responsibility for SSMP Element Table. |
| Element II Subsection C | Added reference to Element VI figure/diagram for Chain of Communication information. |
| Element III Subsection C | Municipal Code Reference sections updated to reflect the most current and accurate information. |
| Element III Subsection C Table III-1 | Added a table to present information in an easier-to-read format. |
| Element IV Subsection C | Added that the City now has a storm drain GIS. |
| Element IV Subsection C | Updated the Section to describe the City's O&M program activities. |
| Element IV Subsection C Table IV-1 | Added table to summarize Staff Maintenance resources. |
| Element IV Subsection C | Added updated list of equipment resources and replacement parts. |
| Element V Subsection C | Updated reference to Design Standards (now Section 5).. |
| Element V Subsection C | Attached updated City Design Standards. |
| Element V Subsection C | Updated inspection and testing Specification reference to Specification 5.05. |
| Element V Subsection C | Updated inspection and testing Specification reference to Specification 2.10 (no longer 2.1300).. |

| SSMP Section # | Description of Change/Revision Made |
|------------------------------------|---|
| Element VI Subsection C | Added information regarding systems currently in place in support of the Sanitary Sewer Overflow Response, including the Sewer Spill Reporting packet and updated OERP.. |
| Element VI Subsection C | Added figure to show the internal communications process. |
| Element VI Subsection C | Added discussion of Duties and procedures |
| Element VI Subsection D | Added description of SSO Notification and Reporting procedures |
| Element VI Subsection D Table VI-1 | Added a table to summarize SSO definitions |
| Element VI Subsection D Table VI-2 | Added table for Notification, Reporting, Monitoring, and Record Keeping requirements |
| Element VI Subsection E&F | Added reference to SSO Emergency Response Equipment and Training |
| Element VII Subsection C | Changed section from FOG Control Program to FOG Evaluation. |
| Element VII Subsection C | Updated the number of grease producing facilities to 16. |
| Element VII Subsection D | Added Section called Municipal Code FOG Restrictions to detail City's code. |
| Element VII Subsection E | Added Summary Section, including Education and Outreach information |
| Element VIII Subsection C | Added system mapping description. |
| Element VIII Subsection C | Added Evaluation – Wastewater Consolidation Project summary and summarized the previous Hydraulic Model Evaluation and subsequent projects. |
| Element VIII Subsection C | Added reference to the City's updated Design Criteria |
| Element VIII Subsection C | Added information regarding analysis that will take place after the General Plan Update is complete to include future development and attached the City's current CIP projects. |
| Element IX Subsection C&D | Reorganized to summarize City regulatory activity into two categories: Performance Measures and Performance Monitoring and Program Changes. |
| Element IX Subsection C | Additional information added detailing most recent SSO statistics. |
| Element X Subsection C&D | Reorganized section to Audits and SSMP Updates. Included this log of changes. |
| Element XI Subsection C | Added subsection: Ongoing Communication of SSMP Development and Updates. Added printed public copies and information regarding the Water and Wastewater Monitoring Committee reports. |

| SSMP Section # | Description of Change/Revision Made |
|----------------------------|--|
| Element XI Subsection C | Added link for individual SSO information from the State Board in the <u>Ongoing Communication</u> section. |

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APPENDIX X-C
City of Rio Vista
Sewer System Management Plan
SSMP Formal Adoption Documents

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