RESOLUTION NO. 90-17

A RESOLUTION OF THE COUNCIL OF THE CITY OF RICHMOND, CALIFORNIA ADOPTING THE UPDATED SEWER SYSTEM MANAGEMENT PLAN (SSMP) FOR THE CITY OF RICHMOND PREPARED BY VEOLIA WATER NORTH AMERICA AND THE CITY OF RICHMOND

WHEREAS, on May 2, 2006, the State Water Resource Control Board adopted Order No. 2006-0003-DWQ requiring all federal, and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California comply with the terms of this order to eliminate Sanitary Sewer Overflows; and

WHEREAS, such order requires each Municipality to prepare and implement a Sewer System Management Plan (SSMP) that will include provisions to provide proper and efficient management, operation and maintenance of sanitary sewer systems, while taking into consideration risk management and health benefits; and

WHEREAS, an SSMP must contain the eleven (11) elements as required in the adopted order which include the following: (1) Goals; (2) Organization; (3) Legal Authority; (4) Operations and Maintenance Program; (5) Design and Performance Provisions; (6) Overflow Emergency Response Plan ("OERP"); (7) Fats, Oils and Grease (FOG) Control Program; (8) System Evaluation and Capacity Assurance Plan ("SECAP"); (9) Monitoring Measurements and Program Modifications; (10) SSMP Audits; and (11) Communications Program; and

WHEREAS, some of these elements are designed to minimize water quality impacts and potential nuisance conditions; and

WHEREAS, the SSMP must be reviewed and updated consistent with the requirements as described in the Order; and

WHEREAS, the City of Richmond in conjunction with its Waste Water System operator, Veolia Water North America, has reviewed and updated the SSMP.

NOW, THEREFORE, BE IT RESOLVED that the Council of the City of Richmond hereby adopts the updated Sewer System Management Plan attached hereto, pursuant to California Water Code 13263, contained in Division 7 of such code and regulations.

****

I certify that the foregoing resolution was passed and adopted by the Council of the City of Richmond at a regular meeting thereof held July 18, 2017, by the following vote:

AYES:	Councilmembers Choi, Martinez, McLaughlin, Willis, Vice Mayor Beckles, and Mayor Butt.
NOES:	None.
ABSTENTIONS:	None.
ABSENT:	Councilmember Myrick.

PAMELA CHRISTIAN
CLERK OF THE CITY OF RICHMOND
(SEAL)

Approved:

TOM BUTT
Mayor

Approved as to form:

BRUCE GOODMILLER
City Attorney

State of California }
County of Contra Costa : ss.
City of Richmond }

I certify that the foregoing is a true copy of **Resolution No. 90-17**, finally passed and adopted by the City Council of the City of Richmond at a regular meeting held on July 18, 2017.

Pamela Christian, Clerk of the City of Richmond

SEWER SYSTEM MANAGEMENT PLAN

Richmond Municipal Sewer District
Updated May 2017

Veolia Water operates, maintains and manages the RMSD Sewer Collection, Storm Water and Wastewater Treatment systems by contract to the City of Richmond.

This document, amended in April 2017, has been assembled to present the City of Richmond's Sewer System Management Plan (SSMP), which has been prepared pursuant to the (updated) San Francisco Bay Regional Water Quality Control Board's (RWQCB) SSMP Development Guide (September 2015). All components of the management plan are currently in place in well-established programs.

The SSMP describes the City's and Veolia's goals, organizational structure, emergency overflow response plan (OERP), Fats, Oils, and Grease (FOG) control program, legal authority, measures and activities, design and construction standards, capacity management, sanitary sewer overflows (SSO) monitoring, measurement and program modifications, and audits.

Certified by: _____

Ryan Smith
Water Resource Recovery Director
City of Richmond

Certified by: _____

Aaron Winer
Project Manager
Veolia Water North America

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Appendix J. Element 11 (Communication Plan) Placeholder for Future Supporting Documents

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LIST OF ACRONYMS

BACWA	Bay Area Clean Water Agencies
BMP	Best Management Practice
CCCFCD	Contra Costa County Flood Control District
CCTV	Closed-Circuit Television
CFR	Code of Federal Regulations
CIP	Capital Improvement Project
CIWQS	California Integrated Water Quality System
CMMS	Computerized Maintenance Management System
CDFW	California Department of Fish and Wildlife
EHS	Environmental Health Services
FHF	Food Handling Facility
FOG	Fats, Oils and Grease
FSE	Food Service Establishment
GIS	Geographical Information System
GPM	Gallons per Minute
I/I or I&I	Inflow & Infiltration
LRGP	Lateral Replacement Grant Program
LRO	Legally Responsible Official
MGD	Million Gallons per Day
MRP	Monitoring and Reporting Program
NASSCO	National Association of Sewer System Companies
NPDES	National Pollution Discharge Elimination System
OERP	Overflow Emergency Response Plan
OES	Office of Emergency Services (formerly California Emergency Management Agency)
PACP	Pipeline Assessment and Certification Program
POTW	Publicly-Owned Treatment Works
RMSD	Richmond Municipal Sewer District (also referenced as “City”)
RWQCB	Regional Water Quality Control Board
SSMP	Sewer System Management Plan

SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
WDR	General Waste Discharge Requirements
WPCP	Water Pollution Control Plant (also known as the Wastewater Treatment Plant)
WWTP	Wastewater Treatment Plant

LIST OF TERMS

Bay Area Clean Water Association (BACWA) – Association comprised of Bay Area wastewater treatment and collection system agencies. BACWA represents the interests of public wastewater agencies in regulatory matters and to support the exchange of information.
Website: http://www.bacwa.org

Blockage – An object that partially or fully hinders flow 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. Also known as a stoppage.

California Association of Sanitation Agencies (CASA) - A non-profit, statewide association representing public agencies that provide wastewater collection, treatment, disposal, and/or water reclamation services to California agencies. Website: http://www.casaweb.org

California Integrated Water Quality System (CIWQS) – A computer system used by the State and Regional Water Quality Control Boards to track information about SSOs, among other information. CIWQS is the tool used for online submittal of SSO details, which are then made available to the public. Website: http://www.waterboards.ca.gov/ciwqs/

California Water Environment Association (CWEA) – The statewide association of wastewater professionals that trains and certifies wastewater professionals, disseminates technical information and promotes policies to protect and enhance the environment.
Website: http://www.cwea.org

Enrollee – The legal public entity that owns a sanitary sewer system, as defined by the Statewide WDR. Also known as a sewer system agency or wastewater collection system agency.

FOG Control Program –Program implemented at the discretion of the agency, based on the identified causes of sewer overflows, to reduce the discharge of fats, oils and grease into the sewer system.

Geographical Information System (GIS) – A database linked with mapping that records sewer system information. The GIS database could include sewer features such as pipe location, diameter, material, condition, or last date cleaned or repaired. GIS maps also typically contain base information such as streets and parcels.

Governing Board – Richmond City Council.

Groundwater Induced Infiltration (GWI) – Infiltration attributed to groundwater entering the sewer system.

Infiltration – The seepage of groundwater into a sewer system, including service connections. Seepage frequently occurs through defective or cracked pipes, pipe joints, connections or manhole walls and joints.

Inflow – Water discharged into a sewer system from such sources as roof leaders, cellars, yard and area drains, foundation drains, through holes in manhole covers, cross connections from the storm system or street wash waters. Inflow differs from infiltration in that it is a direct discharge into the sewer rather than a leak through defects in the sewer.

Lateral or Private Lateral – The privately-owned sewer pipeline that conveys wastewater from the premises of a user to the City's sewer system. The upper lateral extends from the building to property line (or easement line). The lower lateral extends from the property or easement line to the connection to the pipe.

Monitoring and Reporting Program - The program used by the City to monitor, maintain records, report issues and complete needed public notifications.

Overflow Emergency Response Plan (OERP) – This document identifies measures that are needed to respond to sanitary sewer overflows in a way that maximizes the protection of public health and the environment.

Preventive maintenance (PM) – Regularly scheduled servicing of machinery, infrastructure or other equipment using appropriate tools, tests, and lubricants.

R-Value – The amount of rainfall that reaches the collection system via infiltration and inflow. This value is typically expressed as a percentage of total rainfall volume that reaches the collection system.

Rainfall Dependent Infiltration and Inflow – Infiltration and Inflow that is attributed directly to rainfall R-Value.

Rehabilitation and Replacement Plan (also referred to as a Capital Improvement Plan) – Identifies and prioritizes system deficiencies and implements short-term and long-term rehabilitation actions to address each deficiency.

San Francisco Bay Regional Water Quality Control Board – Also known as Region 2 or RWQCB. This regulatory agency preserves, enhances and restores the quality of California's water resources, and ensures their proper allocation and efficient use for the benefit of present and future generations. Website: http://www.waterboards.ca.gov/sanfranciscobay

Sanitary Sewer Overflow (SSO) – Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system, including overflows or releases that reach

waters of the United States, overflows or releases that *do not* reach water of the United States, and backups into buildings and/or private property caused by conditions within the publicly owned portion of the sewer system.

Sanitary Sewer System – Any system of pipes, pump stations, sewer lines, or other conveyances, upstream of a wastewater treatment plant head works used to collect and convey wastewater to the wastewater treatment plant.

Satellite Collection System – The portion, if any, of a sanitary sewer system that is owned or operated by a different public agency or user.

Sewer System Management Plan (SSMP) – A series of written programs that address how a collection system owner/operator conducts daily business. Each SSMP is unique for an individual discharger. The plan includes provisions to provide proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management and cost benefit.

State Water Resources Control Board – Also called the State Board. This agency developed and passed the Statewide Waste Discharge Requirements for collection systems and maintains the SSO reporting web site.

System Evaluation and Capacity Assurance Plan – A required component of an agency's SSMP that provides 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.

Statewide Waste Discharge Requirements – The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems was adopted by the SWCRB in 2006 (Order No. 2006-0003-DWQ) to provide a structure and guidance for SSMP development. It was amended in 2013 (Order No 2013-0058-EXEC).

Veolia Water – Contract operator for the RMSD sanitary sewer and stormwater collection systems and wastewater treatment plant.

Wastewater Collection System – See Sanitary Sewer System.

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ELEMENT 1 - GOALS

The purpose of this section is to identify the goals that the RMSD has established for sewer collection system maintenance and the SSMP. These goals are intended to define a program that promotes continuous improvement in RMSD and its contract operator Veolia Water's existing wastewater collection system management and maintenance processes.

1.1 RWQCB and SWRCB SSMP Requirements

Requirements for the Goals element of the SSMP are described in the RWQCB SSMP Guidelines and SWRCB Statewide WDR as follows:

1.1.1 RWQCB Requirement

The RMSD must develop goals to manage, operate, and maintain all parts of its collection system. The goals should address the provision of adequate capacity to convey peak wastewater flows, as well as a reduction in the frequency of SSOs and the mitigation of their impacts.

1.1.2 SWRCB Requirement

The RMSD must provide a plan and schedule to properly manage, operate, and maintain all parts of its wastewater collection system in order to reduce and prevent SSOs, as well as to mitigate any SSOs that occur.

1.2 Richmond Municipal Sewer District Goals

The goals of the RMSD and its contract operator, Veolia Water, are to accomplish the following:

- To properly manage, operate, and maintain all parts of the wastewater collection system, so as to preserve and protect the public's investment in that system
- To provide adequate capacity to convey peak flows to the WWTP
- To minimize the frequency and duration of SSOs, including implementing regular, proactive maintenance of the system to remove issues that may cause sewer backups or SSOs
- To mitigate the impact of SSOs on public health and the environment
- To respond quickly and respectfully to public notifications of SSOs or other collection system issues
- To collect complete and accurate information regarding SSOs for reporting to the appropriate regulatory agencies

- To uphold the City's standards and specifications on newly constructed public and private sewers
- To provide a safe working environment for City and Veolia employees
- To provide City and Veolia employees with the tools and training needed to perform their work effectively and achieve the RMSD goals

ELEMENT 2 - ORGANIZATION

The purpose of this section is to identify City and Veolia staff responsible for implementing this SSMP, responding to SSO events and meeting the SSO reporting requirements. This section also includes the designation of the Legally Responsible Official (LRO) or Authorized Representative to meet RWQCB and Statewide WDR requirements for completing and certifying spill reports.

2.1 RWQCB and SWRCB SSMP Requirements

The requirements for the Organization element of the SSMP are described in the RWQCB SSMP Guidelines and SWRCB Statewide WDR as follows:

2.1.1 RWQCB Requirement

The RMSD SSMP must identify staff, including names and phone numbers, who are responsible for implementing measures outlined in the SSMP, including management, administration, and maintenance positions. The SSMP must identify the chain of communication for reporting and responding to SSOs.

2.1.2 SWRCB Requirement

The RMSD SSMP must identify:

- The name of the legally responsible or authorized representative.
- The names and telephone numbers for management, administrative, 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.
- 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, RWQCB, and/or California Office of Emergency Services (Cal OES)).

2.2 Organization Chart and SSMP Responsibilities

The RMSD sewer collection system is operated and maintained by contractor Veolia Water. Veolia is responsible for all sanitary sewer, storm water, and treatment plant operations, maintenance and management, and responds to sewer emergencies including SSOs. Veolia reports each SSO to the Regional Board through CIWQS, and makes all reports to the City, SWRCB, RWQCB, County, Department of Environmental Health Services (EHS), Contra Costa

County Flood Control District (CCCFCD), California Department of Fish and Wildlife (CDFW), and OES as appropriate. The City Water Resource Recovery Director is the Legally Responsible Official (LRO) for certifying SSOs. The City Senior Administrative Analyst is the "back-up" Legally Responsible Official (LRO).

Roles and responsibilities of key personnel involved in managing the wastewater collection system are as follows:

City Council. The Richmond City Council consists of six (6) Council Members who are elected at large, and a separately elected Mayor. The City Council appoints the City Manager. The current City Council Members, as of January 2017, include:

- Mr. Tom Butt – Mayor
- Ms. Jovanka Beckles – Vice Mayor
- Mr. Melvin Willis – Member
- Ms. Gayle McLaughlin – Member
- Mr. Eduardo Martinez – Member
- Mr. Jael Myrick – Member
- Mr. Ben Choi – Member

The City Council Chambers are located at: 440 Civic Center Plaza, Richmond, California. The main telephone number is: (510) 620-6581.

City Clerk. The City Clerk, Ms. Pamela Christian, supports the City Council and manages specific business functions for the City. Related to this SSMP, the City Clerk receives claims from private property owners for damage to private property that is allegedly the result of City sewer operations.

The City Clerk's office is located at: 450 Civic Center Plaza, Richmond, California. The contact number is (510) 620-6513.

City Manager. The City Manager is responsible for implementing City Council policy, directing departments and the City's administrative functions, and for providing day-to-day leadership in policy development and implementation.

Mr. Bill Lindsay, Richmond City Manager, has signatory and certification authority for all applications, reports, or information related to the sewer system..

The City Manager's office is located at: 450 Civic Center Plaza, Richmond, California. The main telephone number is: (510) 620-6512.

Water Resource Recovery Director. The City's Water Resource Recovery Director, Mr. Ryan Smith, ensures compliance with applicable federal, state and local laws and regulations, oversees source control, provides reports on SSO events, and manages the City's contract operator, Veolia Water.

Mr. Smith is also the General Manager of the Richmond Municipal Sewer district and a Legally Responsible Official. The Director's office is located at: 450 Civic Center Plaza, Richmond, California. The main telephone number is: (510) 620-5486.

City Source Control Superintendent. The City Source Control Superintendent, Ms. Joanne Le, works directly with the Water Resource Recovery Director. This position is responsible for enforcement of the City's FOG Control Program and the environmental compliance component of the SSO WDR. Ms. Le is also a data submitter for reporting SSOs into the California Integrated Water Quality System (CIWQS).

The Source Control Superintendent's office is located at: 450 Civic Center Plaza, Richmond, California. The main telephone number is: (510) 620-6540.

Senior Administrative Analyst. The City Senior Administrative Analyst, Ms. Mary Phelps, is responsible for ensuring all data entered into CIWQS is accurate. Ms. Phelps is the primary LRO for certifying all SSOs entered into the California Integrated Water Quality System.

The Senior Administrative Analyst's office is located at: 450 Civic Center Plaza, Richmond, CA. The main telephone number is (510) 621-1269.

Project Coordinator. The City's Project Coordinator, Ms. Gina DeLaTorre, is responsible for the Lateral Inspection Program. Ms. DeLaTorre is also responsible for the public outreach to Plumbers and Contractors to ensure compliance with the Sewer System Management Plan. The Project Coordinator's office is located at 450 Civic Center Plaza, Richmond, CA. The main number is (510) 620-6594.

City Risk Manager. The City's Risk Manager, Ms. Kimberly Greer, is responsible for managing all aspects of risk for the City, including addressing claims related to SSOs.

The City Risk Manager's office is located at: 450 Civic Center Plaza, Richmond, California. The Risk Management Division's telephone number is: (510) 620-6810.

Veolia Project Manager. Veolia Water's Project Manager, Mr. Aaron Winer, is responsible for managing operations and maintenance of the WWTP and sanitary sewer and stormwater collection systems. Mr. Winer is registered as a data submitter for reporting SSO into CIWQS if necessary. He also serves as the primary contact between Veolia Water and the City's Water Resource Recovery Director.

The Project Manager is located at the WWTP at 601 Canal Blvd., Richmond, CA. The WWTP main telephone number is (510) 412-2001.

Veolia Underground Asset Management Group. Veolia Water's Underground Asset Management Group provides overall management of the collection system.

The Underground Asset Management Group is located at Veolia Headquarters at 2300 Contra Costa Blvd, Suite 350, Pleasant Hill, CA. The main office telephone number is (925) 681-2304.

Veolia Capital Program Manager. Veolia Water's Capital Program Manager, Mr. Fadi Alabbas, manages the implementation of all phases of capital improvement plans for the collection system and wastewater treatment plant.

The Capital Program Manager is located at Veolia Headquarters at 2300 Contra Costa Blvd, Suite 350, Pleasant Hill, CA. The main office telephone number is (925) 681-2304.

Veolia Collection System Manager. Veolia Water's Collection System Manager, Mr. Tim O'Connor, oversees field operations and maintenance activities, provides relevant information to Veolia Water's management team, prepares and implements contingency plans, leads emergency responses, investigates , and trains field crews. The Collection System Manager makes all reports to the City, SWRCB, RWQCB, County Department of Environmental Health Services (EHS), Contra Costa County Flood Control District (CCCFCD), California Department of Fish and Wildlife (CDFW) and OES as appropriate. Mr. O'Connor is a data submitter and is the secondary person responsible for entering SSOs into CIWQS.

The Collection System Manager is located at the WWTP at 601 Canal Blvd., Richmond, CA. The WWTP main telephone number is (510) 412-2001.

Veolia Collection System Supervisor. Veolia Water's Collection System Supervisor, Mr. Wayne Madison, supervises field operations and maintenance activities, provides relevant information to Veolia Water's management team, prepares and implements contingency plans, leads emergency responses, investigates and reports SSOs to the City, and trains field crews. Mr. Madison is registered as a data submitter and is capable of reporting SSOs in CIWQS.

The Collection System Supervisor is located at the WWTP at 601 Canal Blvd., Richmond, CA. The WWTP main telephone number is (510) 412-2001.

Veolia Collection System Planner/Scheduler. Veolia Water's Collection System Planner/Scheduler, Ms. Marie Hernandez, works directly with the Underground Asset

Management Group and Field Supervisor to plan, estimate, and prioritize operation and maintenance tasks and project work based on the established performance measurements and benchmarks. She also coordinates emergency response work with the Field Supervisor. Ms. Hernandez is registered as a data submitter and is the main person responsible for reporting SSOs in CIWQS.

The Collection System Planner/Scheduler is located at the WWTP at 601 Canal Blvd., Richmond, CA. The WWTP main telephone number is (510) 412-2001.

Veolia Collection System Field Crew. Veolia Water's Field Crew performs preventive maintenance activities, and mobilizes and responds to blockages and SSOs. The Field Crew operates the inspection and sewer cleaning equipment, bypass pumping equipment, portable generators, and other equipment used to maintain the collection system.

The structure of the City and Veolia Water team for RMSD is shown in Figure 2-1. This organization chart also identifies the reporting lines between Veolia and the City of Richmond, and between Veolia, the City, and regulatory agencies.

Figure 2-1. RMSD Sewer Collection System Organization Chart

Table 2-1 on the following page presents individual responsibilities for each section of the SSMP.

Figure 2-1 RMSD Sewer Collection System Organization Chart

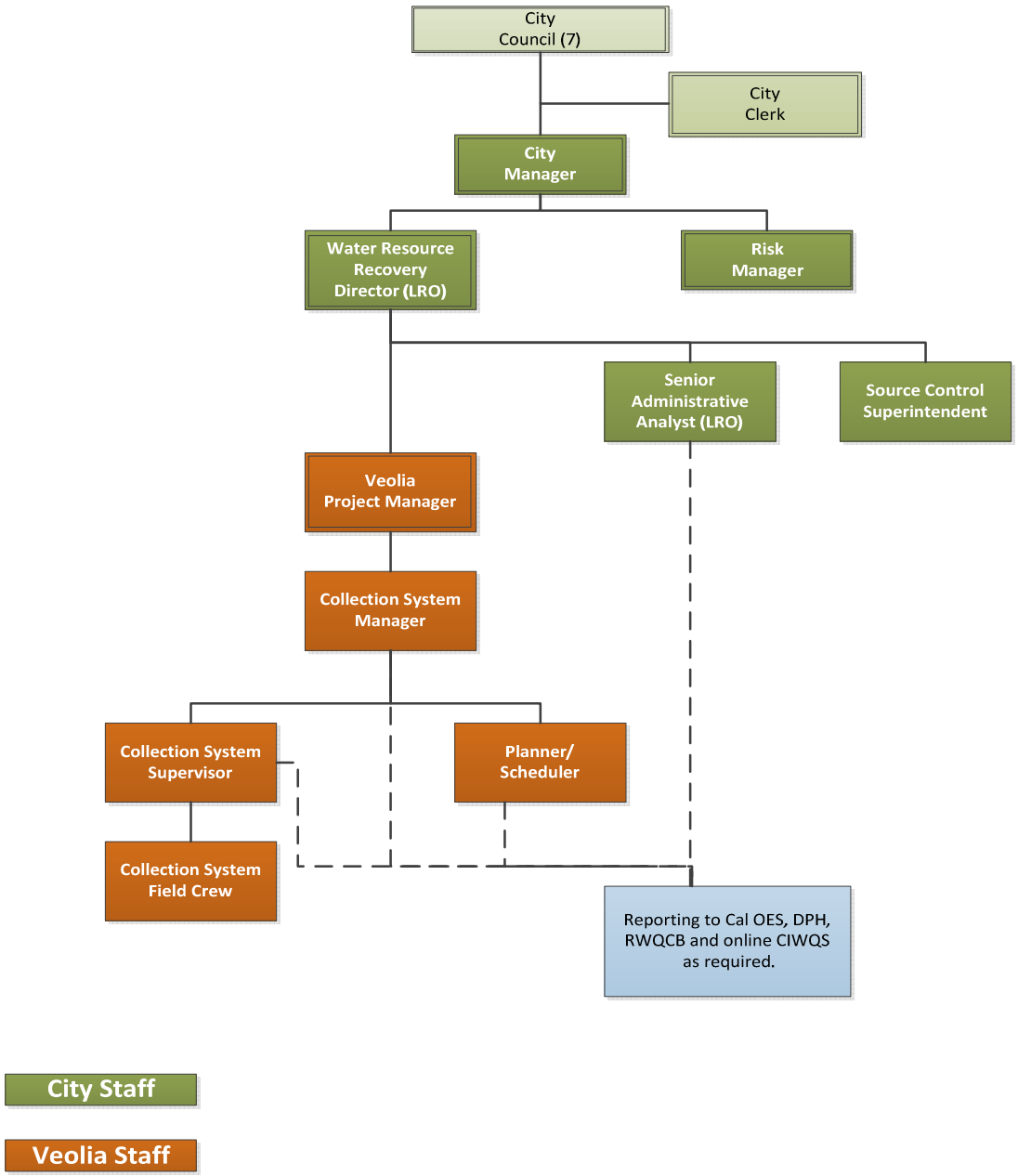


Table 2-1. SSMP Responsibilities

SSMP Element	Responsible Position
1. Goals	• The City Manager leads staff in the implementation of the City's goals.
2. Organization	• The Water Resource Recovery Director updates the organizational structure, manages SSMP implementation assignments, and amends SSO response and reporting chains of communication, as needed.
3. Legal Authority	• The City Manager upholds the City Ordinance and drafts new ordinances as needed.
4. Operations & Maintenance	• The Water Resource Recovery Director manages the City's resources and budget. • The Project Coordinator manages outreach to plumbers and building contractors. • The Veolia Project Manager manages Veolia's resources and budget, preventive maintenance, contingency equipment and replacement inventories, training, collection system map, project inspections, and condition assessments.
5. Design and Performance Provisions	• The Water Resource Recovery Directors reviews design and construction documents to ensure that all construction projects meet the City's standards. The Director also updates standards for installation, rehabilitation and repair, as needed.
6. Overflow Emergency Response Plan	• The Veolia Collection System Manager implements the Overflow Emergency Response Plan, makes revisions to the plan, and conducts regular training for maintenance crew members.
7. FOG Control Program	• The Veolia Collection System Supervisor and the Collection System Planner/Scheduler identify grease hot spots and maintain an effective cleaning program for grease problem sewers. The City Source Control Superintendent inspects grease interceptors/traps that have been installed at non-residential locations and enforces discharge regulations, as needed.
8. System Evaluation and Capacity Assurance	• The Water Resource Recovery Director establishes and assesses capacity requirements for the RMSD collection system and manages implementation of the System Evaluation and Capacity Assurance Plan that was completed by Veolia. The Water Resource Recovery Director also endorses the City's long-term Capital Improvement Plan as developed by Veolia, including updating City CIP budgets and schedules.
9. Monitoring, Measurement and Program Modifications	• The Water Resource Recovery Directory and Veolia Project Manager monitor implementation and assess success of the SSMP program elements, including identifying trends in SSOs, and reporting progress to the City Manager.
10. SSMP Audits	• The Water Resource Recovery Director oversees annual SSMP audits.
11. Communication Plan	• The Water Resource Recovery Director, City Manager and Veolia Project Manager communicate with the public and nearby agencies regarding the RMSD SSMP.

2.3 Chain of Communication for Reporting

The following chain of communication is also shown in the diagram on Figure 2-2.

2.3.1 During Normal Business Hours

- During normal business hours, telephone calls reporting SSOs are received at Veolia Water's office, either directly or via the City or 9-1-1. Calls are dispatched by the Collection System Planner/Scheduler to the Field Crew.
- The Field Crew responds to the SSO site within a target range of 30 minutes to one hour and evaluates the severity of the SSO.
- The Field Crew relays the information to the Collection System Manager and/or the Collection System Supervisor, who in turn immediately determines if OES should be notified.
- The Collection System Manager or Collection System Supervisor communicates SSO details to the Collection Planner/ Scheduler as soon as possible after arrival on site and regularly during the SSO response. Information is recorded electronically on the Veolia handheld field devices, and conveyed to the City via a combination of telephone and email communication.

2.3.2 During Non-Business Hours

- After normal business hours, the Field Crew receives SSO calls from the Veolia Water office answering service and responds to the SSO site within one hour.
- The Field Crew designee relays the information to the Collection System Manager or the Collection System Supervisor, who immediately determines if OES should be notified.
- The Collection System Manager or the Collection System Supervisor communicates SSO details to the Collection System Planner/Scheduler as described in 2.3.1, above.

2.3.3 Regulatory Reporting

The Collection System Planner/Scheduler is the primary data submitter responsible for SSO reporting.

- Within two hours of becoming aware of any Category 1 SSO 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, the Veolia Collection System Manager, Collection System Supervisor or the Collections System Planner/Scheduler will notify the California Office of Emergency Services (Cal OES) and obtain a

notification control number.

- Category 1 SSO: Veolia Collection System Planner/Scheduler submits draft report in CIWQS within three days of becoming aware of the SSO and Richmond's LRO will certify within 15 calendar days of SSO end date.

- Category 2 SSO: Veolia Collection System Planner/Scheduler submits draft report within 3 business days of becoming aware of the SSO and Richmond's LRO will certify within 15 calendar days of the SSO end date.

- Category 3 SSO: Veolia Collection System Planner/Scheduler submits report within 15 calendar days of the end of month in which SSO the occurred. Richmond LRO will certify within 30 calendar days of the end of the month in which the SSO occurred.

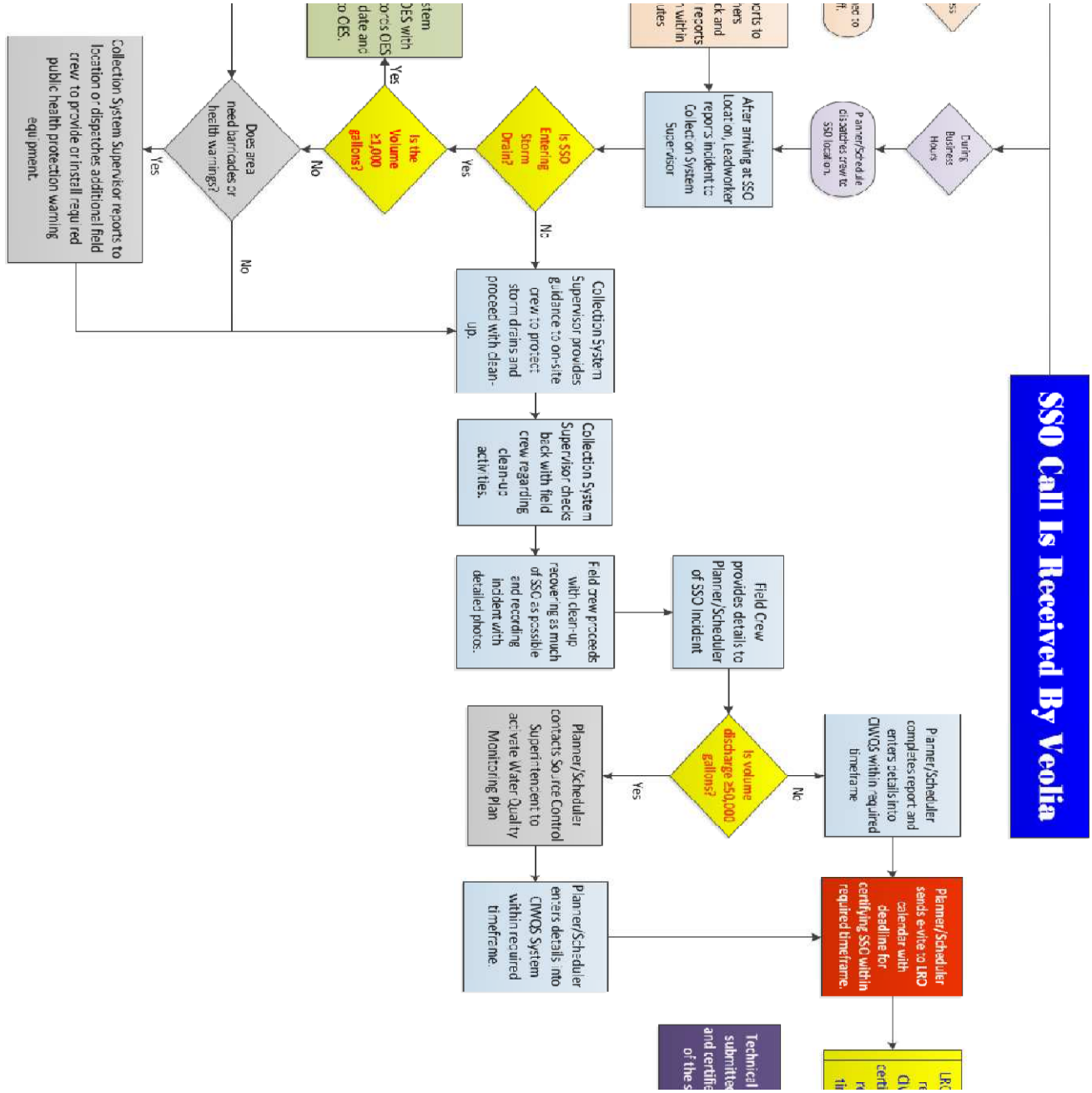
- SSO Technical Report: Richmond's LRO submits certified report within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater are spilled to surface waters.

- "No Spill" Certification: Richmond's LRO will 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: Richmond's LRO will update and certify every 12 months.

Figure 2-2 shows the Veolia and RMSD Chain of Communication for responding to and reporting overflows.

Figure 2-2. Chain of Communication



Appendix A – Element 2 Documents

Appendix A includes the following documents related to this section. The information in these documents will change from time to time, and the documents in Appendix A may have been superseded. Please contact the City Water Resource Recovery Director for the most recent updates to the Appendix A documents.

- City Staff First Responder and Contract Responder Names and Contact Numbers
- Emergency Contact List

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ELEMENT 3 - LEGAL AUTHORITY

This element of the SSMP discusses the City's Legal Authority provided through the Richmond Municipal Code (RMC). This section fulfills the Legal Authority requirement for the RWQCB (Element 5) and the SWRCB (Element 3).

3.1 RWQCB and SWRCB SSMP Requirements

3.1.1 RWQCB Requirement:

The RMSD must demonstrate that it has the legal authority (through ordinances, service agreements, and other binding procedures) to control infiltration and inflow (I&I) from satellite collection systems and private service laterals; require proper design, construction, installation, testing, and inspection of new and rehabilitated sewers and laterals; and enforce violation of ordinances.

The SSMP should describe specific applicable legal mechanisms, with citations of names and code numbers of ordinances. If legal authority does not currently exist for a required element, the SSMP should indicate a schedule of activities to obtain the proper legal authority.

3.1.2 SWRCB Requirement:

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

- 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.)
- Require that sewers and connections be properly designed and constructed
- Limit the discharge of fats, oils, grease, and other debris that may cause blockages
- Enforce any violation of its sewer ordinances

3.2 Legal Authority to Enforce SSMP Requirements

The RMSD is regulated by several agencies of the United States Government and the State of California, pursuant to the provisions of Federal and State Law. Federal and State Laws including, but not limited to the following, grant to the City the authority to regulate and/or prohibit, by the adoption of an ordinance and by issuance of control mechanisms, the discharge of any waste, directly or indirectly, to the Richmond Municipal Sewer District sewerage facilities.

1) Federal Water Pollution Control Act, commonly known as the Clean Water Act (33 U.S.C. Section 1251 et seq.);

2) California Porter Cologne Water Quality Act (California Water Code Section 13000 et seq.);

3) California Health & Safety Code Sections 25100 to 25250;

4) Resource Conservation and Recovery Act of 1976 (42 U.S.C. Section 6901 et seq.); and

5) California Government Code, Sections 54739-54740.

Through the RMC, the City possesses the necessary legal authority. The relevant RMC Chapters are included in Appendix B. The City's legal authority is further described below.

3.2.1 Prevention of Illicit Discharges

The City's Sewer Use Ordinance comprises RMC Article XII, Chapter 12.18, "Discharges to the Wastewater Treatment System" and RMC Article XII, Chapter 12.17, "Sanitary Sewer Connections." RMC Chapter 12.18 establishes the City's authority related to the prevention of illicit discharges to the sewer system. Also, Article XII, Chapter 12.22, "Stormwater Management and Discharge Control" addresses stormwater discharges to the sewer system as noted below.

RMC Section 12.18.020.1 "Prohibited Discharge Standards"

A. General Prohibitions. No user shall introduce or cause to be introduced into the WPCP any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the WPCP whether or not they are subject to Categorical Pretreatment Standards or any other Federal, State, or local Pretreatment Standards or Requirements.

B. Specific Prohibitions. No user shall introduce or cause to be introduced into the WPCP the following pollutants, substances, or wastewater:

(1) Pollutants which create a fire or explosive hazard in the WPCP, 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;

(2) Wastewater having a pH less than 6.0 or more than 10.0, or otherwise causing corrosive structural damage to the POTW or equipment;

(3) Solid or viscous substances, such as, but not limited to, grease, garbage with particles greater than one-half (0.5) inch in any dimension, animal guts or tissues, paunch manure, bones, hair, hides or fleshing, entrails, whole blood, feathers, ashes, cinders, sands, spent lime, stone or marble dust, metal, glass, straw, shavings, grass clippings, rags spent grains, spent hops, waste paper, wood, plastics, gas, tar, asphalt residues, residues from refining or processing of fuel or lubricating oil, mud, glass grindings, or polishing wastes, in amounts which will cause obstruction of the flow in the WPCP resulting in interference;

(4) 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 WPCP;

(5) Wastewater having a temperature greater than 140 degrees F (60 degrees C), or 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);

(6) Petroleum oil, non-biodegradable cutting oil, or products of mineral origin, in amounts that will cause interference or pass through;

(7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the WPCP in a quantity that may cause acute worker health and safety problems;

(8) Trucked or hauled pollutants, except at discharge points designated by the City Manager in accordance with Section 12.18.030.5 of this ordinance;

(9) Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;

(10) Pollutants that impart color, which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions.

(11) Wastewater containing any radioactive wastes or isotopes except in compliance with applicable State or Federal regulations;

(12) Storm water, surface water, groundwater, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, non-contact cooling

water, and unpolluted wastewater, unless specifically authorized by the City Manager;

(13) Sludges, screenings, or other residue from the pretreatment of industrial wastes;

(14) Medical wastes, except as specifically authorized by the City Manager in a wastewater discharge permit;

(15) Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to fail toxicity test;

(16) Detergents, surface-active agents, or other substances that might cause excessive foaming in the WPCP;

(17) Wastewater causing two readings on an explosion hazard meter at the point of discharge into the sanitary sewer system, or at any point in the WPCP, of more than five percent (5%) as hexane or any single reading over ten percent (10%) of the Lower Explosive Limit (LEL) of the meter. LEL values may be found in the NIOSH Pocket Guide to Chemical Hazards. Prohibited materials include, but are not limited to, gasoline, kerosene, naphtha, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, carbides, hydrides, and sulfides.

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 WPCP.

RMC 12.22.060 "Prohibited Discharges".

A. The release of non-stormwater discharges to the City stormwater system is prohibited.

B. The discharge of stormwater from premises or an activity that causes or contributes to a violation of receiving water limitations in the City's NPDES permit is prohibited.

C. The following discharges are exempt from the prohibition set forth in subsection (a) above:

(1) Any discharge in compliance with a NPDES permit issued to the discharger;

(2) Flows from riparian habitats and wetlands, diverted stream flows, springs, rising groundwater and uncontaminated groundwater infiltration.

D. The following discharges are exempt from the prohibitions set forth in subsection (a) above if the Regional Water Quality Control Board approves the exempted category under Section C. 11. of the City's NPDES permit: uncontaminated pumped groundwater, foundation drains, water from crawl space pumps, footing drains, air

conditioning condensate, irrigation water, landscape irrigation, lawn or garden watering, planned and unplanned discharges from potable water sources, water line and hydrant flushing, individual residential car washing, discharges or flows from emergency fire-fighting activities, and dechlorinated swimming pool discharges.

3.2.2 Proper Design and Construction of Sewers and Connections

The following Sections of the RMC establish the requirement that sewers and connections must be properly designed and constructed.

RMC 12.16.010 "Sewer and Water Pipe Connections Required"

All property owners owning or controlling property facing upon any of the streets or avenues of the City of Richmond shall lay or cause to be laid all necessary sewer and water pipe connections with the mains before said streets or avenues are bituminized, macadamized, or otherwise permanently improved.

RMC 12.16.020 "Connections Required Every Separate Lot"

Every separate lot of twenty-five feet or more or any two lots adjoining shall be connected with the mains as provided in Section 12.16.010.

RMC 12.17.020 "Sewer Connections Required"

Property owners shall provide connections to the sanitary sewer system in accordance with Richmond Municipal Code Sections 12.16.010 and 12.16.020, as those Sections may be amended from time to time.

In addition, the City has developed standard design standards and specifications for sewer pipelines, appurtenances, connections, trenches, and other details. These standards are available on the City's website and are discussed further in Element 5 of this SSMP.

3.2.3 Responsibility for Private Laterals

RMC Chapter 12.17 establishes the property owner's responsibility for the sewer lateral, which is privately-owned up to and including the connection to the City's sewer system.

RMC 12.17.040 "Standards for Sewer Laterals and Appurtenant Facilities"

A. Every property owner shall perform all required maintenance and keep the lateral(s) and private sewer main(s), if any, connecting the premises on his or her property to the City's sanitary sewer system in good condition.

B. Every lateral shall meet the following minimum requirements:

(1) It shall be kept free from roots, grease deposits, and other solids which may impede the flow or obstruct the transmission of waste.

(2) All joints shall be tight and all pipes shall be sound and free from structural defects, cracks, breaks, openings, and missing portions to prevent ex-filtration by waste or infiltration by groundwater or stormwater.

(3) The grade of every lateral shall be uniform without sags or offsets.

(4) It shall have a two-way cleanout located at or near the property line or at or near the sewer main easement. All cleanouts shall be securely capped at all times.

(5) It shall be equipped with a backflow valve or overflow device.

(6) In conjunction with a lateral serving a structure in which there are plumbing fixtures at an elevation too low to permit drainage by gravity from the fixtures to the sewer main, the property owner shall install and maintain a pump or other appropriate device or devices to lift the contents of the sewer lateral to the City's sanitary sewer system. Such devices shall be installed and maintained in accordance with the Uniform Building and Plumbing Codes and all applicable provisions of the Richmond Municipal Code, and shall be subject to testing, repair and replacement under the provisions of this Section governing sewer laterals.

3.2.4 Access for Maintenance, Inspection & Repairs

The Sewer Use Ordinance establishes the City's authority to enter buildings and property for the purpose of protecting the public sewer system and enforcing provisions of the Municipal Code:

RMC 12.17.120 "Right of entry"

The City Manager, or his or her designee, may enter, inspect, collect wastewater samples, and test any buildings, structures, or premises to secure compliance or prevent a violation of any portion of this Section. Unless there is an emergency threatening the public health, safety or welfare, the City Manager shall provide at least ten (10) business days notice to the property

owner of intent to enter upon property. The City Manager may also request that a property owner provide all written records of lateral inspection, maintenance, repair and replacement at the time of inspection or within ten (10) or more business days after receipt of the request.

3.2.5 Limit Discharge of Fats, Oils & Grease and Debris

The City's authority to limit Fats, Oils and Grease (FOG) disposal to the sewer collection system is established in the Sections described above, and more specifically addressed in RMC Section 12.18.030.2, "Fats, Oils, and Grease." This Section establishes the City's FOG Program, which comprises the following:

- Requirements for fats, oils, and grease interceptors
- FOG Management Program permit which enables City staff right of entry to inspect the facility
- Parameters warranting inspection
- Responsibility for overflow

The City's FOG management program is discussed further in Section 7.

3.2.6 Enforcement Measures

The Sewer Use Ordinance describes the various enforcement measures available to the City to enforce the terms of the RMC.

RMC 12.18.100 "Administrative Enforcement Remedies" et. seq

RMC Section 12.18.100 describes the administrative enforcement remedies for non-compliance with the RMC, beginning with Section 12.18.100.1Notification of Violation, which states:

When the City Manager finds that a user has violated, or continues to violate, any provision of this Section, a wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, the City Manager may serve upon that user a written Notice of Violation. Within fourteen (14) 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 Manager. 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 Manager to take any action, including emergency actions or any other enforcement actions, without first issuing a Notice of Violation.

RMC Section 12.18.110 describes judicial enforcement remedies and RMC Section 12.18.120 describes supplemental enforcement actions such as fines and penalties.

RMC Section 12.18.030.2 "Fats, Oils & Grease, " establishes the City's authority to enforce the FOG program.

RMC 12.18.030.2 "Fats, Oils & Grease ", Section H

Pursuant of this Section and/or lawful direction from the City, any user who fails to maintain a grease interceptor or grease trap shall be subject to enforcement procedures set forth in Sections 12.18.100, 12.18.110, and/or 12.18.120 of this Section. Enforcement actions may be initiated if the user fails to maintain, pump, and/or institute a proper grease or flammable substance reduction program and/or providing appropriate employee training.

This Section also provides the City with the power to disconnect the individual user from the RMSD system, and to require the user to deposit the cost of disconnection and reconnection with the City before the service is reconnected.

3.3 Interagency Agreements and Satellite Systems

The RMSD does not collect wastewater from satellite systems, and therefore does not have any agreements with satellite sewer collection agencies.

Appendix B – Element 3 Documents

Appendix B includes the following documents related to this section. The information in these documents will change from time to time, and the documents in Appendix B may have been superseded. Please contact the Water Resource Recovery Director for the most recent updates to the Appendix B documents.

- Richmond Municipal Code Applicable Sections from Article VI, Building Regulations and Article XII, Public Works

ELEMENT 4 - OPERATION AND MAINTENANCE PROGRAM

This section of the SSMP discusses the RMSD mapping, operations, preventive maintenance, inspection, training and outreach activities. This section fulfills the Operation and Maintenance Program SSMP requirement for the SWRCB (Element 4) and the Measures and Activities SSMP requirement for the RWQCB (Element 6).

The requirements and RMSD's plan for the Operations and Maintenance element of the SSMP are summarized in each category below. Since requirements for this SSMP element contain multiple categories, this summary is organized by category, with SWRCB and RWQCB requirements described for each category as applicable.

The categories that are addressed in Element 4 include:

- Collection System Mapping
- Resources and Budget
- Prioritized Preventive Maintenance
- Scheduled Inspections, Condition Assessments and Replacement Planning
- Critical Equipment and Spare Parts
- Training

4.1 SSMP Requirement for Collection System Maps

4.1.1 RWQCB Requirement

The RMSD must maintain current maps of its collection system facilities.

4.1.2 SWRCB Requirement

The RMSD must maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments, manholes, pumping facilities, pressure pipes, valves and applicable stormwater conveyance facilities.

4.1.3 RMSD Collection System Mapping Description

Veolia and the RMSD currently use Geographic Information System (GIS) software to create and maintain maps of the sewer collection system facilities. The GIS geodatabase includes pipe,

manhole, and pump station asset information, and records pipe length, direction of flow, manhole numbers, most pipe diameters, rim and invert elevations, and some materials.

The RMSD sewer map grid system, which accompanies the RMSD sewer map book, is included in Appendix C. The map books contain individual map sheets printed at 1"=300' scale. Maps are updated regularly within GIS by Veolia, and updates are transferred approximately monthly to the City's GIS department.

The City and Veolia are completing a project to document stormwater facilities in GIS. The known facilities are included as a separate layer in the RMSD maps described above.

4.2 SSMP Requirement for Resources and Budget

4.2.1 RWQCB Requirement

The RMSD must demonstrate that adequate resources are allocated for the operation, maintenance and repair of the RMSD collection system.

4.2.2 SWRCB Requirement

The Statewide WDR includes no requirement for resources and budget.

4.2.3 RMSD Resources and Budget for Sewer System Management

The City prepares an annual budget and CIP. The current fiscal year adopted budget for the Wastewater Enterprise is included in Appendix C. Veolia Water is required by contract to fulfill all contractual requirements for operations and maintenance, including but not limited to SSO compliance related to sewer system maintenance, using this budget.

The capital improvement budget is earmarked for sewer collection system improvements to reduce inflow and infiltration and address capacity needs. Capital improvement needs for the sewer collection system were identified and prioritized through an updated sewer collection system master plan that is discussed in Element 8.

4.3 SSMP Requirement for Prioritized Preventative Maintenance

4.3.1 RWQCB Requirement

The SSMP must demonstrate that prioritized maintenance activities are performed by the RMSD.

4.3.2 SWRCB Requirement

The SSMP must 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 Preventive Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders.

4.3.3 Prioritized Preventive Maintenance Activities

The City's contract with Veolia requires cleaning all parts of the sewer collection system on a four-year cycle. Veolia must also develop and maintain a Hot Spots list for areas requiring more frequent maintenance. Pipeline maintenance is planned according this schedule, and prioritized through field experience. The City's contract with Veolia requires the development of a System Cleaning Plan. This plan must be updated every three years in order to incorporate new information. Veolia maintains internal documentation on maintenance activities and prioritization plans, and is developing a formal summary document for presentation to the City in 2014.

Veolia uses hydro-cleaning and other methods to clean the sanitary sewer system, and herbicide chemical treatment application (via contract) and cutting to manage root intrusions. Pipes with known SSOs are placed on a one-year hot spot list. If recurring SSOs occur, this segment is elevated to a more frequent cleaning schedule (1-, 3-, 6- or 9-month schedule). Appendix C includes a map showing Veolia's cleaning schedule and a second map showing the segments on the current Hot Spot list.

Veolia conducts emergency repairs to the sewer system when failure appears imminent, in situations that may involve public and employee health and/or safety issues, and in situations that may involve property or liability damages. These repairs are discussed with the City in advance of completing the work. All other repairs must be prioritized by Veolia and pre-authorized by the City. Veolia is also required to inspect manholes and include the inspection results as an integral part of the system documentation.

Veolia currently inspects manholes as part of the CCTV inspection process. Photo and video documentation are taken from the street level into the manhole, and from the pipeline up and out of the manhole. Structural defects are noted during the visual inspection. Veolia documents manhole inspections using an electronic form on their field tablet. This form is included in Appendix C.

To supplement pipeline assessment, repair and replacement, Veolia's maintenance program includes hydrogen sulfide monitoring and control, easement maintenance at lift stations, and

electronic monitoring of lift stations through the use of the plant SCADA. Weekly lift station checks are conducted to determine the physical condition of equipment. If authorized, Veolia also provides temporary repairs to landscaping, driveways, and final roads including grading, seeding, and sod replacement after pipe repairs.

Gravity pipeline maintenance assets and activities are included in Veolia's computerized maintenance management system (CMMS), which uses Innovyze® InfoNet™ CMMS software. Pump station data is maintained in a separate CMMS system named Oracle Work and Asset Management (OWAM). InfoNet™ and OWAM generate work orders for sewer system and pump station preventive maintenance, respectively, and store the resulting findings and recommendations.

4.4 SSMP Requirements for Inspections, Condition Assessment and Rehabilitation

4.4.1 RWQCB Requirement

The RMSD must identify and prioritize structural deficiencies and implement a program of prioritized short-term and long-term actions to address them.

4.4.2 SWRCB Requirement

The RMSD must 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 (CIP) 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.

4.4.3 CCTV Inspection Program

Veolia conducts all CCTV inspections for the RMSD system. CCTV data is collected in digital format with fully equipped CCTV vehicles, using pan-and-tilt cameras. Veolia's inspection program uses the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP)) defect rating systems. In addition to evaluating each defect, the program assigns a PACP "Quick Rating" for each pipe segment. The quick rating indicates the number of occurrences for the two highest severity grades for each pipe segment for either maintenance or structural defects.

The contract with Veolia requires the completion of CCTV inspection every ten years, and the development of a plan to identify areas requiring CCTV inspection on a more frequent basis. The inspection results must be fully documented so that they support the development of a prioritized CIP. Veolia must then work with the City to prepare annual budgets for repairing the Collection System.

CCTV inspection activities are prioritized through field experience and recorded in InfoNet. Veolia is currently developing a formal summary document for presentation to the City in 2014.

Appendix C includes a map showing Veolia's 10-year CCTV inspection schedule. This map also delineates segments to have been inspected in 2013.

4.5 SSMP Requirement for Training

4.5.1 RWQCB Requirement

The RMSD must provide training on a regular basis for its collection system operations, maintenance, and monitoring staff.

4.5.2 SWRCB Requirement

The RMSD must provide training on a regular basis for staff in sanitary sewer system operations, maintenance, and require contractors to be appropriately trained.

4.5.3 Training of City Personnel and Contractors

Veolia provides sewer maintenance and customer service training to its employees, through either classroom or on-the-job exercises. Veolia also provides monthly safety training based on an established schedule.

The City and Veolia has recently (2017) expanded this training to include the contents of the SSMP and the Overflow Emergency Response Plan. Recipients also include City employees that are responsible for implementing the various elements of this SSMP.

Records are kept of all training that is provided by Veolia in support of the SSMP. The records include the date, time, place, content, name of trainer(s) and names of attendees.

4.6 SSMP Requirement for Contingency Equipment

4.6.1 RWQCB Requirement

The RMSD must demonstrate that contingency equipment is provided to handle emergencies, and that spare parts are available to minimize equipment/facility downtime during emergencies.

4.6.2 SWRCB Requirement

The RMSD must provide equipment and replacement part inventories, including identification of critical replacement parts.

4.7 Contingency Equipment and Replacement Inventories

The current collection systems equipment inventory, as maintained by Veolia, is listed below.

- Three (3) Vacuum and Jetter Trucks; two of these trucks are provided by the City as part of the contract between the City and Veolia.
- One (1) Rodder Truck
- Three (3) Video Trucks
- Two (2) Traffic Utility Trucks
- One (1) Small Gas Generator
- One (1) 6" Portable Bypass Pump
- One (1) 3" Honda Portable Pump

4.8 Critical Replacement Parts

The inventory of critical replacement parts is stored in a CMMS named Oracle Work and Asset Management (OWAM) and is published as a component of Appendix C.

Appendix C – Element 4 Documents

Appendix C includes the following documents related to this section. The information in these documents will change from time to time, and the documents in Appendix C may have been superseded. Please contact the Water Resource Recovery Director for the most recent updates to the Appendix C documents.

- Richmond Municipal Sewer District Sewer Map Grid
- Current Fiscal Year Sewer Related Budget
- Maps Showing Cleaning Schedule, Hot Spot Preventive Maintenance Program, and CCTV Inspection Plan
- Manhole Inspection Form

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ELEMENT 5 - DESIGN AND PERFORMANCE PROVISIONS

This section of the SSMP discusses the City's design and construction standards.

5.1 RWQCB and SWRCB SSMP Requirements

5.1.1 RWQCB Requirement

RMSD shall demonstrate that minimum design and construction standards and specifications are in place for the installation of new sewer systems and for the rehabilitation and repair of existing sewer systems.

5.1.2 SWRCB Requirement

RMSD must have design and construction standards and specifications for the installation of new sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sewer systems.

RMSD must have procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

5.2 Design and Construction Standards for Installation, Rehabilitation and Repair

The City of Richmond standards for the design and construction for the installation of sewer system components and for rehabilitation and repair of existing are specified in part in the Richmond Municipal Code, Article VI Building Regulations Chapters 6.02, 6.04, 6.20 and 6.28 reference the appropriate electrical, mechanical, building and other adopted codes and standards that apply to City construction. RMC Chapters 12.24, 12.28, 12.30, 12.32, 12.36, 12.44 and 12.48 describe standards for public works construction including roads, sidewalks, utilities, pipes, earthwork and other related construction. Legal authority for enforcing the design and construction standards is provided by City Chapter 1.04 Adoption of Code – Construction of Provisions – Enforcement.

In addition to the RMC requirements, the City Engineering Services Division is developing standalone design and construction standards for pipeline projects. The design criteria includes pipe materials, minimum sizes, minimum cover, strength, minimum slope, trench and backfill requirements, structure standards and other factors

The Municipal Code Sections are included as part of Element 3, in Appendix B. The City's design and construction standards are included in Appendix D.

5.3 Procedures and Standards for Inspection, Testing, Rehabilitation and Repair

City of Richmond design standards will establish the standards that the City follows when inspecting and testing new or rehabilitated sewers, pump stations, and other appurtenances. For small maintenance projects, inspections are provided by Veolia staff. For larger projects, inspection services may be provided through a joint effort from the City's engineering consultant and Veolia or by other persons(s) appointed by the City. Testing is normally conducted by the contractor, with the inspector observing to verify that all requirements are met.

Appendix D – Element 5 Documents

Appendix D includes the City of Richmond Design and Construction Standards. The information in this document will change from time to time, and the document in Appendix D may have been superseded. If the information in this section has been updated, it will be noted in the beginning pages of the SSMP under "Changes to SSMP".

ELEMENT 6 - OVERFLOW EMERGENCY RESPONSE PLAN

This section of the SSMP provides a summary of the Overflow Emergency Response Plan that was developed and is maintained by Veolia, and fulfills the Overflow Emergency Response Plan requirements for both the RWQCB and the SWRCB. The OERP that is included in Appendix E is also maintained by Veolia as a stand-alone document as required by the RWQCB. This document will be updated as necessary.

6.1 RWQCB and SWRCB SSMP Requirement

The summarized requirements for the Overflow Emergency Response Plan element of the SSMP are as follows:

6.1.1 RWQCB Requirement:

The RMSD must develop an overflow emergency response plan that provides procedures for SSO notification, response, reporting, and impact mitigation. The response plan should be developed as a stand-alone document and summarized in the SSMP.

6.1.2 SWRCB Requirement:

The RMSD 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:

- Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner
- A program to ensure appropriate response to all overflows
- 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 Statewide 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 WDR or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification
- Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the emergency response plan and are appropriately trained
- Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities

- A program to ensure that all reasonable steps are taken to contain and prevent discharge of untreated and partially treated 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.

6.2 OERP Goals

The purpose of the Overflow Emergency Response Plan (OERP) is to support an orderly and effective response to Sanitary Sewer Overflows (SSOs). The OERP provides guidelines for City staff to follow in responding to, cleaning up, and reporting SSOs that may occur within the City's service area.

The City's goals with respect to responding to SSOs are:

- Respond quickly to minimize the volume of the SSO
- Eliminate the cause of the SSO
- Contain the spilled wastewater to the extent feasible
- Minimize public contact with the spilled wastewater
- Mitigate the impact of the SSO
- Meet regulatory reporting requirements

6.3 SSO Categories

The responsibilities of the SSO Response Team depend on the volume and location of an incident. Three categories of SSOs are defined by the SWRCB:

- Category 1 SSO: Discharges of untreated or partially treated wastewater of any volume resulting from the RMSD's sanitary sewer system failure or flow condition that:
  - Reach surface water and/or reach a drainage channel tributary to a surface water; or
  - Reach a municipal separate storm sewer system 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 municipal separate storm sewer system is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or ground water infiltration basin (e.g., infiltration pit, percolation pond).
- Category 2 SSO: Discharges of untreated or partially treated wastewater of 1,000 gallons or greater resulting from the RMSD's sanitary sewer system failure or flow condition that do not reach surface water, a drainage channel, or a municipal separate storm sewer system unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.
- Category 3 SSO: All other discharges of untreated or partially treated wastewater resulting from the RMSD's sanitary sewer system failure or flow condition.

6.4 SSO Notification Procedures

The City is most often notified of an SSO by Veolia staff. However, on occasion, SSOs are called into a particular City department in which case Veolia staff is contacted to execute a response. Veolia learns of the SSO through its crews, contractors, or a member of the public. When a member of the public notices an overflow or blockage, they report this occurrence to the Veolia SSO hotline. The hotline is answered by Veolia staff at the WWTP (601 Canal Boulevard, Richmond, CA). The Veolia number for reporting SSOs is (510) 412-2001.

The Veolia hotline is included in the telephone book and on the City's website, which can be accessed through the url: http://www.ci.richmond.ca.us under the "Wastewater" tab.

Figure 6-1 on the following page provides a notification and response flow chart procedure for an SSO occurrence. This is the same chart that is provided in Section 2, Organization.

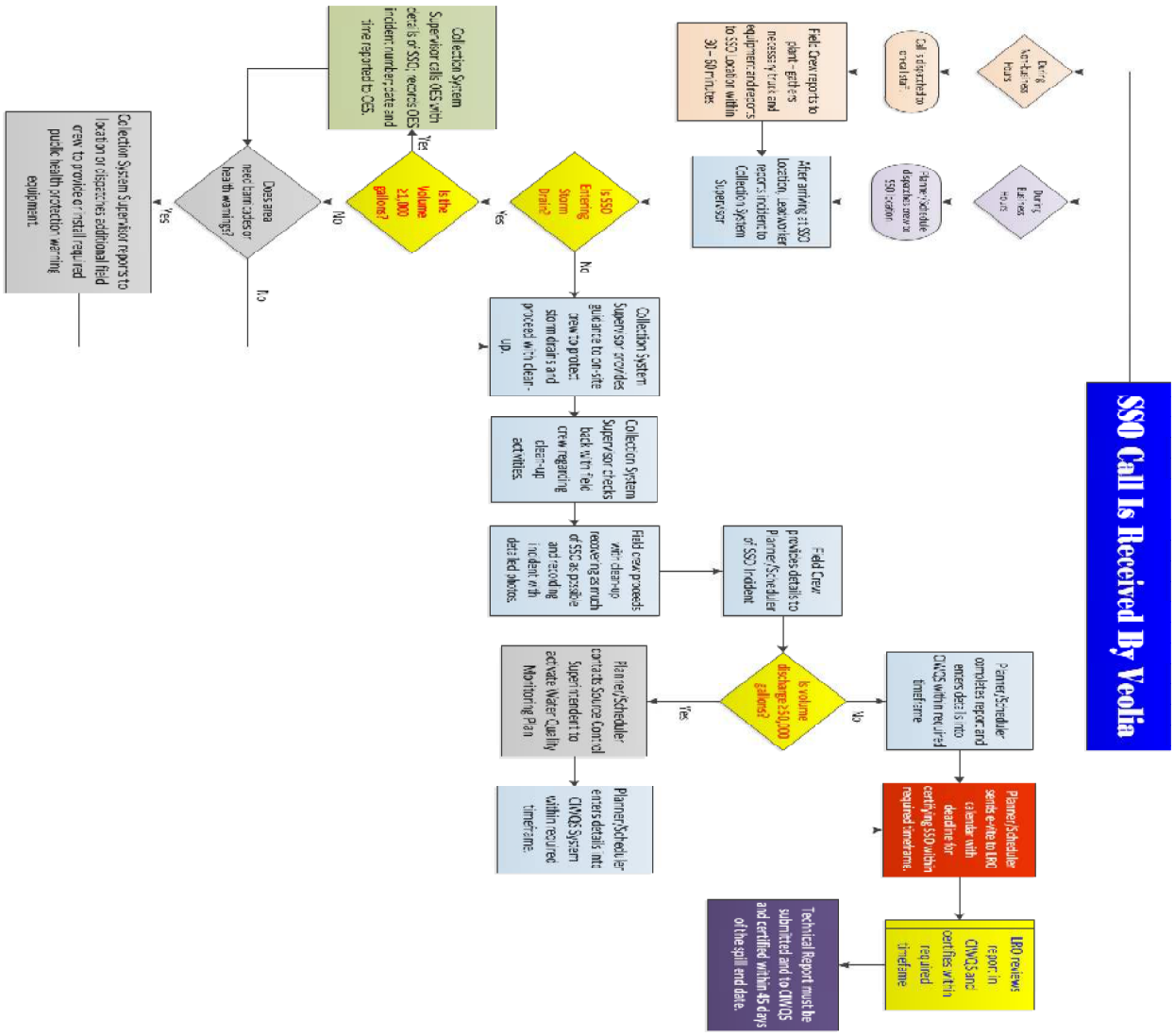
The Veolia Field Crew, which includes the First Responder, arrives at the spill site within 30 minutes to one hour to perform an initial evaluation of the impact of the overflow. The First Responder selects an approach that will result in the least environmental damage – deciding between clearing the blockage first or initiating spill containment measures. The First Responder reports the severity of the overflow to both the Veolia Collection System Manager, Field Supervisor and Veolia Underground Asset Management Group.

The Field Crew takes and sends pictures to the Manager, Field Supervisor and Underground Asset Management Group. The Field Crew is responsible for calling for back-up support if a large volume of spill has the potential to reach the storm drain system and/or the San Francisco Bay.

The Veolia Manager or Field Supervisor records the overflow start time, and provides update as soon as flow is restored and the clean-up procedure begins. Immediate notification is a priority if the spill appears to be over 1,000 gallons, in a sensitive area, may imminently and substantially endanger human health, results in fish kills, if there is doubt regarding the extent, impact, or how to proceed, or if additional help is needed for line cleaning or repair, containment, recovery, lab analysis, and/or site cleanup.

Veolia staff makes all reports to the regulatory agencies.

Figure 6-1. SSO Notification Process



6.4.1 Normal Working Hours

Normal business hours are Monday through Friday from 7:00 AM to 4:00 PM. Service calls received during normal business hours are taken immediately by the Veolia Collection System Planner/Scheduler who fills out the service call report form and then dispatches the call to the Veolia Field Crew who will respond within 30 minutes to one hour of an SSO event.

Upon arrival, the crew makes assessment, mitigates exposure and notifies the field supervisor of all facts related to the SSO. The Field Crew remains in close communication with the Veolia Collection System Manager and/or Field Supervisor

6.4.2 After Normal Working Hours

After normal business hours, service calls are taken by the Veolia Water Answering Service Center which relays the information to the Veolia Field Crew on-call representative, who responds within a one hour time frame. The Veolia operator completes a standardized form available through the Infonet® mobile tablet that records start time of the incident and other information related to the SSO.

All other communications procedures are similar to that of an SSO during normal working hours.

6.4.3 Notification from Pump Station SCADA Alarms

Any overflows associated with a lift station are detected and reported through the SCADA remove monitoring and Mission alarm system to the Veolia Field on call staff. Pump or equipment failure and high wet well levels produce alarms which may require a response depending on the circumstances. The on-call person would initiate a support response by the field crew as necessary. A lift station overflow may also be relayed by the public to Veolia and addressed as described above.

In a non-emergency response situation, a Work Order to address the issue is provided through the plant CMMS program.

6.5 Staff and Contractor Training

All Veolia personnel and contractor employees who may have a role in responding to, reporting and/or mitigating a sewer system overflow receive training on the contents of the OERP. All new employees receive training before they are placed in a position where they may have to respond. Current employees receive annual refresher training on this plan and the procedures to be followed.

Records are kept of all training that is provided in support of this plan. The records for all scheduled training courses and for each overflow emergency response training event include date, time, place, content, name of trainer(s) and names of attendees.

6.6 Response Program

Names and contact information for the Veolia SSO responders are as listed below, or as otherwise updated in the OERP:

- Veolia Hotline: (510) 412-2001
- Veolia Project Manager - Aaron Winer Cell: (510) 385-6482
- Veolia Underground Asset Management Group - (925) 681-2304
- Veolia Collection System Manager – Tim O'Connor Cell: (510) 426-0008
- Veolia Sewer Crew Supervisor - Wayne Madison Cell: (510) 542-3247
- Veolia Field Crew Cell Numbers:
    - Armstrong, Ronnie (510) 812-2776
    - Roos, Jason (510) 812-1173
    - Wallis, David (510) 447-0220
    - Lewis, Kenny (510) 932-1242
    - Madison, Wayne (510)542-3247
    - Hill, Arlee (510) 829-2108
    - Hendricks, Mitchell (510) 660-7942
    - Mendoza, Rafael (510) 334-4924
- In Case of Emergency: 911
- City Police Dispatch: (510) 233-1214
- Office of Emergency Services: (800) 852-7550
- City Manager: (510) 620-6512
- City Water Resource Recovery Director Cell: (510) 932-5014
- City Source Control Superintendent Cell: (510) 290-9149
- City Senior Administrative Analyst Cell: (510) 685-0820
- Contractors:

o BayHawk, Inc.: (510) 776-5886

o Ghilloti Brothers: (415) 454-7011

- W.R. Forde : (510) 215-9338
- TMB, LLC: (707) 252-5480
- Sierra Pacific Loss Management (Bruce Burnett – Interior Cleaning): (707) 479-1375
- Rain for Rent (bypass pumping): (925) 679-2803
- DW Pumps: (510) 633-2040
    - Regulatory Agencies:
- California Regional Water Quality Control Board: (510) 622-2369
- California Department of Fish and Games - Bay Delta Region : (707) 944-5500
- East Bay Regional Park District: (510) 633-0460
- Contra Costa County Health Services: (925) 692-2500
- California Office of Emergency Services : (916) 845-8506 / (800) 852-7550
    - U.S. Coast Guard : (510) 437-3073

6.6.1 First Responder Priorities

The First Responder's priorities are as follows:

- To follow safe work practices, including those related to traffic control, confined space, and employee and public safety.
- To respond promptly with the appropriate equipment.
- To evaluate the cause of spill and determine responsibility.
- To restore the flow as soon as possible.
- To contain the spill whenever feasible.
- To minimize public access to and/or contact with the spilled sewage.

6.6.2 Initial Response

The First Responder must report to the SSO location within 30 minutes to one hour of the initial SSO report during business hours, and within one hour during non-business hours. The objective of the response is to minimize and/or eliminate the overflow. The appropriate response measure

will vary based on the circumstances and nature of the SSO and the information provided by the caller. Actions related to external and internal SSOs are summarized below.

Veolia uses a computerized form to document the contact and response for each SSO that occurs. Separate forms are used for SSO response and customer issues. These forms are included in Appendix E.

Veolia has a variety of equipment available for clearing blockages and impact mitigation and cleanup activities, including the following:

- Three (3) Combination Sewer Cleaning Trucks (vacuum and jetter/hydroflush); two of these trucks are provided by the City as part of the contract between the City and Veolia.
- One (1) Rodder Truck
- Two (2) CCTV Trucks
- Two (2) Traffic Utility Trucks
- One (1) 3" Honda Portable Pump
- One (1) 6" Portable by-pass pump, trailer mounted

6.6.3 External SSO Response

Upon arrival at the site, the First Responder should complete the following:

- Note notification time, crew arrival time, SSO start time and SSO end time and cleaning completion time; Crew completes the report through the use of Infonet® mobile tablet.
- Verify the existence of the SSO
- Field verify the address and nearest cross street, and confirm that the SSO is part of the RMSD sewer/conveyance system
- Conduct visual monitoring to determine immediate actions, starting with documentation of SSO volume using the methods included in the OERP
- Identify and clearly assess the affected area and extent of spill, including possible impacts on surface water. Where it is safe and practical, visually inspect surface water in the vicinity of the SSO and record observations on the Infonet mobile tablet. Signs of receiving water impacts include clear signs of sewage (solids, grease, and paper), abnormal color, fish kills, etc.

- Estimate spill volume using SSO reporting guidelines in Appendix E.
- Contain, mitigate, and minimize impacts from the SSO. If the SSO is the result of a blockage, and the blockage cannot be cleared expeditiously via hydro-cleaning from the downstream manhole, then clearing and vacuuming the blockage from the pipe, containment and/or bypass pumping must be initiated.
- If several efforts to clear blockage have failed, the Manager or Field Supervisor must be immediately informed, who will in turn call up other employees and local contractors to initiate emergency repair to restore flow and also provide assistance to initiate spill containment or bypass pumping.
- In the event the SSO should exceed 50,000, text and e-mail the City Source Control Superintendent, so the City can activate their Water Quality Monitoring Plan.Comply with all safety precautions (traffic, confined space, etc.).
- Contact caller. Identify SSO cause, including conducting CCTV inspection as appropriate.
- Document all activities through photos and written documentation.

6.6.4 Internal SSO Response (Residential Sewage Backup)

Upon arrival at the location of a spill into a house or a building, the First Responder should evaluate and determine if the spill was caused by a blockage in the lateral or in the RMSD-owned sewer main. If a blockage is found in a property owner's lateral, it should be clearly communicated to the homeowner that response and repair of private laterals is not the City's responsibility. Additionally, Veolia's Collection System Manager, Collection System Supervisor and the Veolia Richmond Project Manager are notified immediately if a sewage back up impacts a home or business owner within the dwelling. The homeowner is responsible for clearing any blockage or addressing a failure in the home's plumbing system or private lateral and for any resulting flood damage to the structure.

As a courtesy, Veolia crews will assist the homeowner in coordinating for the repair. However, Veolia and/or the City are not authorized to repair the private lateral at the City's cost.

If a backup in the main line is found to have caused the SSO in a house or building, the First Responder should take steps to address the issue as described above. An independent contractor hired by the City follows the steps below:

- Keep all family members and pets away from the affected area.

- Place towels, rags, blankets, etc. between areas that have been affected and areas that have not been affected, and move any uncontaminated property away from the overflow area.
- Move any uncontaminated property away from the overflow area. Do not remove any contaminated items.
- Turn off the HVAC system.

The First Responder should follow the following steps to assist the homeowner:

- Gather information and fill out the electronic form on the Infonet® mobile tablets. A hard copy is included in the OERP
- Call a restoration company as described below (contact numbers are included in the emergency response list), and wait for the restoration firm to arrive
- Forward incident reports and related documents to Collection System Supervisor

6.6.5 Pump Station SSO Response

The First Responder to a potential pump station or force main failure should determine whether flow can be restored within a reasonable time. If it appears that flow cannot be restored within a reasonable time or if the conveyance system facility requires construction and/or repairs, then the First Responder should employ a plan covering containment, bypass pumping and contractor assistance. Veolia uses DW Pumps for bypass pumping services. The pump stations in the service area will be evaluated in 2017. A formalized emergency contingency plan for each pump station will be developed. The individual plans will become an integral part of the OERP and incorporated into a master pump station emergency contingency plan by July 2018.

In addition, response activities discussed above should be implemented where applicable.

6.6.6 Recovery and Cleanup

The recovery and clean up phase must begin when the flow has been restored and the spilled sewage has been contained to the extent possible. Spilled sewage shall be vacuumed or pumped and discharged to the extent possible back into the sanitary sewer system.

Estimate and Recover the Volume of Spilled Sewage

Use the methods outlined in the OERP in Appendix E to estimate the volume of the spilled sewage. Wherever possible, document the estimate using photos of the SSO site before and during the recovery operation.

Spilled sewage shall be vacuumed or pumped and discharged to the extent possible back into the sanitary sewer system.

Clean Up and Disinfection

Clean up and disinfection procedures must be implemented to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and should be modified as required for wet weather conditions. Clean up should proceed quickly in order to minimize negative impact. Any water that is used in the cleanup process should be de-chlorinated prior to use.

Where cleanup is beyond the capabilities of Veolia staff, Veolia contacts a cleanup contractor to complete the work. Phone numbers are provided in the emergency response list.

Spills inside houses or buildings should be cleaned by a professional cleaning company as discussed above. Contact information for professional cleaning companies can be found in the "Water Damage Restoration" section of the Yellow Pages and is also provided in the OERP. Claims by homeowners should be forwarded to the City Risk Manager.

In the event of an SSO occurrence during night time hours, the incident must be re-inspected as soon as possible the following day. The site shall be inspected for any signs of sewer related debris/material that may warrant additional cleanup activities.

Guidelines for Cleanup

On **hard surface areas**, collect all signs of sewage solids and sewage-related material either by hand or with the use of rakes and brooms. Take reasonable steps to contain and vacuum up the wastewater.. Repeat the process if additional cleaning is required.

On **landscaped or unpaved areas**, collect all signs of sewage solids and sewage-related material either by hand or with the use of rakes and brooms. Allow the area to dry. Repeat the process if additional cleaning is required.

If the SSO has reached the **storm drain system**, the combination sewer cleaning truck should be used to vacuum/pump out the catch basin and any other portion of the storm drain that may contain sewage. In the event that an overflow occurs at night, the location should be re-inspected

as soon as possible the following day. The operator should look for any signs of sewage solids and sewage-related material that may warrant additional cleanup activities.

6.7 Impact to Waters of the United States

If an SSO is confirmed to have entered waters of the United States[1], the Sewer System Coordinator is immediately notified. The response team then proceeds with the following additional activities:

- Determine the extent of the SSO by investigating downstream until there is no evidence of sewage or debris along the creek or water body
- If the SSO is 50,000 gallons or greater, e-mail and text the Source Control Superintendent so the City may activate their Water Quality Monitoring Plan (see Appendix D).
- Immediately post contaminated water sign(s) and protect the waterbody from public access on all sides.
- Photograph sign placement and evidence of the overflow in and around the waterbody to the farthest point reached by the sewage
- If feasible, block the waterbody downstream of the affected area in a location that is safe to enter and is accessible to set up a pump or utilize other sewer cleaning equipment
- To the extent feasible, recover and return contaminated water to the collection system

6.7.1 Water Quality Sampling

Water quality sampling and testing is required only when the spilled sewage enters a water body is greater than or equal to 50,000 gallons. The purpose of testing is to determine the extent and impact of the SSO. The City Source Control Superintendent will activate their Water Quality Monitoring Plan for any spills that are greater than or equal to 50,000 gallons (see Appendix D).

6.7.2 Water Quality Monitoring Plan

A Water Quality Monitoring Plan must be implemented immediately upon discovery of any Category 1 SSO of 50,000 gallons or more in order to assess impacts from SSOs to surface waters. Water quality testing must be completed within 48 hours of the City becoming aware of the SSO.

The City's SSO Water Quality Monitoring Program is included in Appendix D, and includes the following:

[1] **40 CFR 230.3(s)** defines the term "waters of the United States." This term includes all lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, or natural ponds, or waters that could be used for recreational or other purposes.

- Protocols for water quality monitoring
- Account for spill travel time in the surface water and scenarios where monitoring may not be possible (e.g. safety, access restrictions, etc.)
- Requirement for water quality analyses for ammonia and bacterial indicators to be performed by an accredited or certified laboratory
- Requirement for 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

6.7.3 SSO Technical Report

If 50,000 gallons or greater from an SSO reaches surface waters, an SSO Technical Report must be prepared and submitted to the CIWQS online SSO database and certified within 45 calendar days of the SSO end date. The SSO Technical Report must include, at a minimum, the following:

1. Causes and Circumstances of the SSOs
2. Complete and detailed explanation of how and when the SSO was discovered
3. Diagram showing the SSO failure point, appearance point(s), and final destination(s)
4. Detailed description of the causes(s) of the SSO
5. Copies of the original field crew records used to document the SSO
6. Historical maintenance records for the failure location
7. Response to SSO:
8. Chronological narrative description of all actions taken to terminate the SSO
9. Explanation of how the OERP was implemented to respond to and mitigate the SSO
10. Final corrective action(s) completed and/or planned to be completed, including a schedule or actions not yet completed
11. Water Quality Monitoring:
12. Description of all water quality sampling activities conducted including analytical results and evaluation of the results
13. Detailed location map illustrating all water quality sampling points

The Water Resource Recovery Director, in conjunction with Veolia, are responsible for the development and certification of the SSO Technical Report.

6.8 Containment or Bypass

The first responder should attempt to contain as much of the spilled sewage as possible using the following steps:

- Determine the immediate destination of the overflowing sewage.

- Plug storm drain manholes, catch basins, inlets and culverts using available equipment and materials, including sandbags, air plugs and plastic mats to contain the spill, where

feasible. If spilled sewage has made contact with the storm drainage system, attempt to contain the spilled sewage by plugging downstream storm drainage facilities.

- Contain/direct the spilled sewage using dike/dam or sandbags.
- Pump around the blockage or pipe failure, or vacuum up flow from upstream of the blockage and dispose of downstream of the blockage to prevent further overflow.
- If an SSO reaches a water body, follow the requirements below for posting and SSO notification signage. Also conduct water quality sampling if the spill is greater than or equal to 50,000 gallons.

6.9 SSO Notification Signage

Veolia supplies notification signage, which is posted by Veolia staff and the Source Control Superintendent and/or other City staff. Barriers are installed where required to prevent the public from having contact with the sewage. Signs are posted along with barricades with yellow flashing lights to keep vehicles and pedestrians away from contact with spilled sewage. "Closed" signs should be posted at the outfall of streams and a minimum of 100 feet upstream and 100 feet downstream of the discharge. If there is a large volume of sewage, more signs must be posted downstream.

Signs must remain in place until the risk of contamination has subsided to acceptable levels. Warning signs should be checked every day in order to ensure that they are still in place.

A sample warning sign is included in the OERP.

6.10 Traffic and Crowd Control

Traffic and crowd control measures vary based on the size and potential impact of the overflow event. When appropriate, local police, fire department, and City contacts must be notified to aide in addressing traffic and crowd control issues.

General steps in implementing traffic and crowd control include the following:

- Contact impacted agencies, local law enforcement and fire/sheriff as needed
- Set up barriers and delineation directing human and vehicular traffic around spill area, including closing any entrances or exits from adjacent facilities
- Establish signage including signs protecting public health and safety
- Use staff personnel to control traffic and pedestrians

6.11 SSO Failure Analysis

For each SSO event greater than 250 gallons, all participants involved in the response – from the person who received the call to the last person to leave the site – should meet, as soon as feasible, after the event to review and evaluate the incident and the City response procedures. The objective of the Post-SSO Debrief is to determine actions necessary, if any, to reduce the recurrence and better mitigate the effects of SSOs.

It is the responsibility of the Veolia Collection System Manager to investigate an SSO and to ensure that the procedures in the OERP are followed or modified as a result of the incident failure analysis. The failure analysis is intended to determine if additional maintenance, repair/replacement or other follow-up actions or response procedures changes are needed to reduce or eliminate the likelihood of future SSOs. The procedures for investigating an SSO are as follows:

- Reviewing and completing the Sewer Overflow Report
- Reviewing the incident timeline and other documentation regarding the incident
- Review actions by all persons involved in the response, including the initial recipient of the complaint
- Reviewing communications with the all reporting parties, and witnesses
- Review volume estimate, volume recovered estimate, volume estimation assumptions and
- associated drawings
- Reviewing available photographs
- Interviewing staff that responded to the spill
- Reviewing past maintenance records of all affected manholes and pipe segments
- Reviewing past CCTV records
- Conducting a CCTV inspection to determine the condition of the line segment immediately following the SSO and reviewing the video and logs
- Reviewing any FOG related information or results
- Identify any changes or additions needed to the OERP and SSMP following the event

The product of the failure analysis investigation should be the determination of the root cause and identification of the corrective actions. The Collection System Failure Analysis Form in Appendix E should be used to document the investigation.

6.12 SSO Documentation and Reporting

In accordance with the WDR, the City maintains records for each sanitary sewer overflow. Records include:

- Documentation of response steps and/or remedial actions
- Photographic evidence to document the extent of the SSO, field crew response operations
- Site conditions after field crew SSO response operations have been completed
- The date, time, location, and direction of photographs taken will be documented

- Documentation of how any estimations of the volume of discharged and/or recovered overflow were calculated

The records are maintained at the Wastewater Treatment Plant office and are also entered into Veolia's CMMS system.

Veolia also maintains records of complaints received, even if the complaint does not relate to a City SSO.

6.12.1 Regulatory Reporting

Table 6-1 summarizes the regulatory reporting requirements that are also described in the paragraphs following the table.

Multiple Appearance Points – Single SSO

For reporting purposes, if one SSO event of whatever category results in multiple appearance points in a sewer system, a single SSO report is required in CIWQS 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 descriptions of the locations of all other discharge points associated with the single SSO event.

2-Hour Notification to Regulatory Agencies of SSOs

Cal OES is only to be notified of a Category 1 SSO 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. The First Responder is responsible for reviewing field data for reporting to regulatory agencies. If it is determined that the criteria for OES notification was met, than the First Responder must notify OES of the event no later than two (2) hours after:

1. Veolia has knowledge of the SSO;
2. Notification is possible; and
3. Notification can be provided without substantially impeding cleanup or other emergency measures.

The OES phone number is (800) 852-7550. The First Responder is responsible for obtaining an OES Control number, call time, and the name of the OES operator taking the call. Following the initial notification to OES and until the SSO report is certified in the SWRCB online SSO Database, the LRO will provide updates (or provide direction for updates to be provided) to OES regarding substantial changes to estimated volume of untreated or partially treated sewage discharged and any substantial changes to known impact(s).

Detailed Reporting Requirements

Table 6-1 provides detail on the City's regulatory reporting process, which is also described below.

SSO Reporting for Category 1 SSOs

Cal OES shall receive notification of Category 1 SSOs greater than or equal to 1,000 gallons, as stated earlier in this Section.

The Data Submitter must then submit the initial draft report to the SWRCB's CIWQS Online SSO database @ http://ciwqs.waterboards.ca.gov/ciwqs within 3 business days of becoming aware of the SSO.

An e-vite is sent to the City's LRO's calendar inviting them to certify the Category 1 SSO thirteen (13) days after the date of the SSO. This is to prevent any Category 1 SSO from being delayed in certifying within the fifteen (15) day requirement.

Within 15 calendar days of the SSO end date, the LRO must review and certify the report in the CWIQS Online SSO database @ http://ciwqs.waterboards.ca.gov/ciwqs

SSO Reporting for Category 2 SSOs

Within 3 business days of becoming aware if the SSO, the Collection System Planner/Scheduler shall submit the initial report to the SWRCB's CWIQS Online SSO database @ http://ciwqs.waterboards.ca.gov/ciwqs.

An e-vite is sent to the City's LRO's calendar inviting them to certify the Category 2 SSO thirteen (13) days after the date of the SSO. This is to prevent any Category 2 SSO from being delayed in certifying within the fifteen (15) day requirement.

Within 15 calendar days of the SSO end date, the LRO must review and certify the report in the CWIQS Online SSO database @ http://ciwqs.waterboards.ca.gov/ciwqs.

SSO Reporting for Category 3 SSOs

Within 30 calendar days of the end of the calendar month in which the SSO occurred, the LRO must submit and certify a report to the SWRCB's CWIQS Online SSO database @ http://ciwqs.waterboards.ca.gov/ciwqs.

Every LRO has an "event" on their calendar on the 28th and 30th day of each month to check the CIWQS system for any Category 3 SSO events that need to be certified. This will help prevent any Category 3 SSO from being certified past the due date.

No Spill Certification (Monthly)

Within 30 calendar days of the end of a calendar month that there are no SSO's, the LRO must submit and certify a "No Spill" certification to the CIWQS online SSO database.

Every LRO has an "event" on their calendar on the 1st and 3rd day of each month to check the CIWQS system for any SSOs that occurred the previous month. If there are no SSOs, they are to submit a "No Spill" certification to the CIWQS online SSO database at that time.

CIWQS Not Available

In the event that the CIWQS online SSO database is not available, the LRO will fax or all required information to the RWQCB office at (510) 622-2460 in accordance with the time schedules identified above. In such an event, the City will submit the appropriate reports using the CIWQS online SSO database when the database becomes available. A copy of all documents that certify the submittal in fulfillment of this section shall be retained in the SSO document file.

Amending SSO Reports

The LRO is responsible for amending SSO reports. Certified SSO reports may be updated by amending the report or adding an attachment to the SSO report within 120 calendar days after the SSO end date. After 120 days, the City must contact the State SSO Program Manager to request to amend an SSO report along with a justification for why the additional information was not available prior to the end of the 120 days. The SWRCB SSO Program Manager contact information is as follows:

Russell Norman, P.E.
State Water Resources Control Board
Division of Water Quality
1001 I Street 15th Floor
Sacramento, CA 95814
E-mail: Russell.norman@waterboards.ca.gov
Phone: (916) 323-5598

6.12.2 Technical Report

If 50,000 gallons or greater from an SSO reaches surface waters, an SSO Technical Report must be prepared and submitted to the CIWQS online SSO database within 45 calendar days of the SSO end date. The LRO is response for submitting the Technical Report, which is described in further detail earlier in this Section.

Table 6.1. Regulatory Reporting Requirements

Element	Requirement	Method
NOTIFICATION	Within two hours of becoming aware of any Category 1 SSO 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, the City will notify the California Office of Emergency Services (CalOES) and obtain a notification control number.	Call Cal OES at: **(800) 852-7550**
REPORTING	• Category 1 SSO: Veolia will submit draft report within three business days of becoming aware of the SSO and the City certify within 15 calendar days of SSO end date. • Category 2 SSO: Veolia will submit draft report within 3 business days of becoming aware of the SSO and the City certify within 15 calendar days of the SSO end date. • Category 3 SSO: Veolia will submit the report and the City will certify the report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: The City will 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: The City will 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: The City will update and certify every 12 months	• Enter data into the CIWQS Online SSO Database (http://ciwqs.waterboards.ca.gov/), certified by the Legally Responsible Official(s). • All information required by CIWQS will be captured in the Sanitary Sewer Overflow Report. • Certified SSO reports may be updated by amending the report or adding an attachment to the SSO report within 120 calendar days after the SSO end date. After 120 days, the State SSO Program Manager must be contacted to request to amend an SSO report along with a justification for why the additional information was not available prior to the end of the 120 days.
WATER QUALITY MONITORING	• The City will conduct water quality sampling within 48 hours after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.	Water quality results will be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.
RECORD KEEPING	Veolia will maintain the following records on behalf of the City: • 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.

6.13 Equipment

This section provides a list of specialized equipment that is required to support this Overflow Emergency Response Plan.

Closed Circuit Television (CCTV) Inspection Unit – A CCTV Inspection Unit is required to determine the root cause for all SSOs from gravity sewers.

Camera – A digital or disposable camera is required to record the conditions upon arrival, during clean up, and upon departure.

Emergency Response Trucks -- A utility body pickup truck, or open bed is required to store and transport the equipment needed to effectively respond to sewer emergencies. The equipment and tools should include containment and clean up materials.

Portable Generators, Portable Pumps, Piping, and Hoses – Equipment used to bypass pump, divert, or power equipment to mitigate an SSO.

Combination Sewer Cleaning Trucks -- Combination high velocity sewer cleaning trucks with vacuum tanks are required to clear blockages in gravity sewers, vacuum spilled sewage, and wash down the impacted area following the SSO event.

6.14 Contractors Working On City Sewer Facilities

All contractors working on City sewer facilities will be trained in the City's OERP and will be required to follow the OERP in the event that they cause or observe an SSO.

6.15 Training

This section provides information on the training that is required to support this Overflow Emergency Response Plan.

6.15.1 Initial and Annual Refresher Training

All City personnel who may have a role in responding to, reporting, and/or mitigating a sewer system overflow should receive training on the contents of this OERP. All new employees should receive training before they are placed in a position where they may have to respond. Current employees should receive annual refresher training on this plan and the procedures to be followed. Affected employees will receive annual training on the following topics, at a minimum, by knowledgeable trainers:

- The City's Overflow Emergency Response Plan
- SSO Volume Estimation Techniques

- Impacted Surface Waters: Response Procedures

The City will verify that annual safety training requirements are current for each employee, and that employees are competent in the performance of all core competencies. The City will address, through additional training/instruction, any identified gaps in required core competencies.

6.15.2 SSO Response Drills

Periodic training drills should be held to ensure that employees are up to date on these procedures, equipment is in working order, and the required materials are readily available. The training drills will cover scenarios typically observed during sewer related emergencies (e.g. mainline blockage, mainline failure, force main failure, pump station failure, and lateral blockage). The results and the observations during the drills will be recorded and action items should be tracked to ensure completion.

6.15.3 SSO Training Record Keeping

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

Appendix E – Overflow Emergency Response Plan Documents

Appendix E includes a full copy of the Veolia Emergency Overflow Response Plan. The information in this document will change from time to time, and the OERP may have been superseded. Please contact the Water Resource Recovery Director for the most recent updates to the OERP.

- Veolia Emergency Overflow Response Plan
- Hard Copies of Veolia Field Forms

ELEMENT 7 - FOG CONTROL PROGRAM

The purpose of this section is to evaluate the extent and nature of SSOs related to Fats, Oils and Grease (FOG), to determine the need for a FOG Control Program, and to outline the elements of the RMSD FOG Control Program.

The City of Richmond's FOG Control Plan was initiated in 2003. A field survey identified all food service facilities with and without grease control devices. Periodic inspection of food service facilities began in 2004.

In 2006, the City of Richmond Municipal Code was revised to require that new Food Handling Facilities (FHFs) install grease pretreatment devices that conform to the current version of the Uniform Plumbing Code (UPC). Additionally, one component of the 2006 settlement agreement between the City and San Francisco Baykeeper required the City to increase the inspection frequency of FHFs, and improve the public education and outreach program.

The RMC provides legal authority to prevent the introduction of FOG into the Sanitary Sewer System. In addition, the City's FOG Control Plan has developed tools for tracking, inspecting, and grading FOG dischargers, as well as developed documents for education and outreach on FOG disposal.

7.1 RWQCB and SWRCB SSMP Requirements

7.1.1 RWQCB Requirement:

The RMSD must evaluate its service area to determine whether a FOG control program is needed. If needed, a FOG control program shall be developed as part of the SSMP. If the RMSD determines that a FOG program is unnecessary, proper justification must be provided.

7.1.2 SWRCB Requirement:

The RMSD shall evaluate its service area to determine whether a FOG control program is needed. If the RMSD determines that a FOG program is not needed, justification must be provided for why it is not needed. If FOG is found to be a problem, the RMSD 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:

- An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG.
- 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.

- The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG.
- Requirements to install grease removal devices (such as traps or interceptors), design standards for the grease removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements
- Authority to inspect grease producing facilities, enforce requirements, and determine whether the RMSD has sufficient staff to inspect and enforce the FOG ordinance.
- An identification of sewer system sections subject to FOG blockages and the establishment of a cleaning maintenance schedule for each section.
- Development and implementation of source control measures, for all sources of FOG discharged to the sewer system, for each sewer system section identified as subject to blockages.

7.2 Public Education Outreach Plan

The City has developed a public outreach program to inform residents about the impacts of FOG waste on the sewer system. The program begins with information provided on the City website, which discusses the sources of FOG and the impact of FOG on the sewer system, and provides links to fact sheets for grease traps, grease interceptors, and mechanical grease removal devices. These fact sheets are also included in Appendix F.

When a residential FOG-related SSO occurs, the City's source control staff distribute brochures, door hangers, and educational pot scrapers to the residents upstream of the SSO location to inform these residents of proper FOG control. This program may be updated/modified annually by the Source Control Superintendent based on departmental staffing. A copy of this program and example handout materials are included in Appendix F.

The City has approximately 115 food service establishments (FSE). The outreach program includes a component designed to educate the City's FSE owners and employees about minimizing FOG disposal into the sewer system, including information about best management practices for minimizing FOG. The City's program was based on materials developed by the Tri-TAC CalFOG workgroup. Program information is included in Appendix F.

7.3 FOG Disposal Plan

The requirement for proper FOG disposal is provided in RMC Section 12.18.030.2.

RMC 12.18.030.2 "Fats, Oils & Grease"

D. Best Management Practices.

(1) Drain Screen. After March 1, 2006, drain screens shall be installed on all drainage pipes for all new food services establishments deemed by the City Manager to generate FOG.

(2) Waste FOG:

(a) All waste FOG shall be collected and stored properly in recycling barrels, drums, or bins.

(b) Such recycling barrels, drums, or bins shall be maintained appropriately to ensure they do not leak or enter the City's stormwater collection system by direct discharge or by commingling with stormwater.

(c) A licensed collection service must be used to dispose of waste FOG.

Currently, grease haulers dispose of grease pumped from interceptors at a grease collection facility outside of the RMSD service area. At this time, there does not appear to be a need for additional grease disposal facilities to collect grease from the City's service area. However, the City may choose to evaluate this need further, should the need for additional grease disposal facilities become an issue in the future.

7.4 Legal Authority to Prohibit SSOs and Blockages Caused by FOG Discharge

Section 3, Legal Authority, discusses the City's authority to enforce sewer-related issues. Specifically, Richmond Municipal Code Section 12.18.020.1. B prohibits the discharge of fats, oils and grease. Only the specific subsections relevant to this requirement are listed.

RMC Section 12.18.020.1 "Prohibited Discharge Standards"

B. Specific Prohibitions. No User shall introduce or cause to be introduced into the WPCP the following pollutants, substances, or wastewater:

(3) Solid or viscous substances, such as, but not limited to, grease, garbage with particles greater than one-half (0.5) inch in any dimension, animal guts or tissues, paunch manure, bones, hair, hides or fleshing, entrails, whole blood, feathers, ashes, cinders, sands, spent lime, stone or marble dust, metal, glass, straw, shavings, grass clippings, rags spent grains, spent hops, waste paper, wood, plastics, gas, tar, asphalt residues, residues from refining or processing of fuel or lubricating oil, mud, glass grindings, or

polishing wastes, in amounts which will cause obstruction of the flow in the WPCP resulting in interference.

(6) Petroleum oil, non-biodegradable cutting oil, or products of mineral origin, in amounts that will cause interference or pass through.

7.5 Requirements and Design Standards for Installation of Grease Removal Devices

RMC Section 12.18.030.02 includes requirements for the installation of grease removal devices, including design standards and approvals. Specific subsections are called out below.

RMC 12.18.030.2 "Fats, Oils & Grease"

A. Fats, Oils, and Grease Program.

(1) Fats, oils, and grease interceptors:

(a) FOG separators and grease interceptors shall be provided, at the user's expense, where, in the opinion of the City Manager, they are necessary for proper handling of wastes containing these substances in excessive amounts, or any flammable wastes or harmful ingredients. All grease interceptors shall be of a type and capacity approved by the City Manager, and shall be located so it is readily and easily accessible for inspection and cleaning.

(5) A grease collection service shall be required for all facilities that generate FOG.

B. Administration of FOG Program. The City shall administer a FOG program, which is intended to prevent fats, oils, and grease, and other substances that are likely to block or create a hazard within the sewer system from entering the system through use of grease interceptors or grease traps. The City may require any non-domestic user to install a grease interceptor or grease trap according to the guidelines set for in the City's Standard Specifications or other program prior to or at any time after connection to the WPCP if the City discovers or determines subsequent to the connection of the facility, the user produces a waste with characteristics that would require installation of a grease interceptor or grease trap pursuant of this chapter.

The installation of a proper grease interceptor or grease trap device shall be the responsibility of the user that applies for the connection or wastewater discharge permit. The City shall determine whether a grease interceptor, grease trap, or other interceptor is required on a case-by-case basis based on an evaluation of the following criteria including, but not limited to:

(1) The type of facility (restaurant, bakery, cheese factory, yogurt shop, gas station, lube facility, etc.);

(2) The volume of the user's business or operation (number of meals served, number of seats, hours of operation, etc.);

(3) Size and nature of facilities (including kitchen facilities) based on size, type, number of fixtures, and types of processing and/or cooking equipment used;

(4) The type of service provided or operation undertaken (such as dine-in meal service versus carry-out meal service);

(5) The type of foods and other materials used in the cooking, processing, or manufacturing operations carried on within the user's facility;

(6) The overall potential for grease-laden, flammable, or sand-laden discharges; and

(7) The existence of devices, procedures, or processes which are designed to minimize the amount of grease, sand, oil, or other flammable liquids from entering the sewer system.

The design, location, and procedures for operation of a required grease interceptor or grease trap shall be approved by the City. Such approval shall be obtained prior to the user's connection of the facility to the WPCP, in the event of new construction or remodeling. In instances where a user has already connected and the City determines that a grease interceptor or grease trap must be installed, the user shall promptly provide for the installation of the device, including providing such design and operational plans as may be required. The installation of a grease interceptor or grease trap as required by this chapter on an existing user facility shall occur within a reasonable time not to exceed one hundred (100) days after the user has been provided notice that a grease interceptor or grease trap must be installed. This time limit may only be extended by the City in a written agreement.

E. Grease Separators (Traps) for Treating FOG Wastes.

(1) Facilities that have FOG, but are not required to have a grease interceptor, must have an adequate-sized grease trap as determined by the City Manager.

(2) Required connections to grease traps: all three compartment sinks, scullery (preparation) sinks, and pre-wash sinks at dishwashing stations.

(3) Prohibited connections or additives to grease traps:

(a) Final rinse discharge from automatic dishwashers/sanitizers shall not be connected to the grease trap.

(b) Chemical additives, such as chlorinated solvents, or any other additives that causes the emulsification of grease, are strictly prohibited from use in any grease trap.

F. Grease Interceptors for Treating FOG Wastes.

(1) Grease interceptors shall be required for new food handling facilities constructed after March 1, 2006.

(2) Grease interceptors are required for food handling facilities that generate FOG when there is remodeling, additions, alterations, or repairs valued at or greater than what is specified in the City's fee schedule.

(3) Effective March 1, 2006, those food handling facilities operating without a grease interceptor shall, within six (6) months of written notification by the City Manager, be required to install a grease interceptor if the City Manager determines that the food service establishment is not adhering to the BMPS set forth in Section 12.18.030.2(D) of this chapter, or that the food service establishment has caused or contributed to a sewer system blockage resulting in maintenance requirements and/or sewage spills.

(4) All new grease interceptors shall be designed, constructed, and installed in accordance with the current City of Richmond Building and Plumbing Codes, and shall be subject to approval by the Building Regulations Department.

(5) All submitted drawings shall be prepared by a licensed and registered professional engineer. Any false information or misleading calculations submitted shall be the responsibility of the user.

(6) All grease interceptors shall be located such that they are readily and easily accessible for cleaning, inspection, and removal of intercepted waste.

(7) A common grease interceptor shared by multiple businesses can be utilized if specifically authorized by the City Manager upon evidence of legal operating and maintenance agreements between the involved users.

(8) All grease interceptors shall include an effluent sample box and a sanitary tee located on the discharge side of the sample box of a type and size approved by the City.

(9) Inspection by the City of installed grease interceptors and piping prior to backfilling is required. Piping shall meet the requirements of the City of Richmond Building and Plumbing Code.

(10) Grease interceptors shall have a clean-out installed after the sample box on the private lateral as required by the City of Richmond Building and Plumbing Code.

(11) Required connections to grease interceptors: all three compartment sinks, scullery (preparation) sinks, floor drains and mop sinks along the cook line, pre-wash sinks at dishwashing stations, and all other fixtures that contribute grease into the sewer system.

(12) No food service establishment or other identified user shall construct, remodel, or convert a grease interceptor without approval by the City.

(13) Prohibited connections or additives to grease interceptors:

(a) Final rinse discharge from automatic dishwashers/sanitizers shall not be connected to the grease interceptor.

(b) The use of any additive such as surfactants or chemicals shall not be connected to any type of grease interceptor. Chemical additives, such as chlorinated solvents, or another other additives that cause the emulsification of grease, are strictly prohibited from use in any type of grease interceptor.

G. Waivers for Treating FOG Wastes.

(3) A grease interceptor or grease trap may not be required for business types listed below:

(a) Facilities only serving beverages;

(b) Facilities serving beverages and/or ready-to-eat, packaged, or unpackaged items;

(c) Ice cream parlors without any baking or other food preparation;

(d) Snack bars with no food preparation other than food warming;

(e) Bakeries with no food preparation other than food warming; or

(f) Other facilities serving only ready-to-eat foods with or without food warming.

7.6 Device Maintenance Requirements

RMC Section 12.18.030.02 includes requirements for the maintenance of grease removal devices. Only the specific subsections relevant to this requirement are listed.

RMC 12.18.030.2 "Fats, Oils & Grease"

A. Fats, Oils, and Grease Program.

(1) Fats, oils, and grease interceptors:

(c) Where installed, all FOG separators or grease interceptors shall be maintained and in continuous efficient operation at all times.

(6) If significant grease accumulation (e.g., a partial blockage) is found downstream or if significant grease wicking is found upstream of the process of concern, an Authorized Inspector and/or the City Manager may inspect the facility. The inspection will include a review of the grease management program, treatment system, waste storage area, and drains not flowing to the treatment system. BMPs not in place, hauler receipts for the prior three (3) years not available, and/or training documents not current may result in future inspections with an assessed fee as published in the City's fee schedule (see Section 12.18.140).

(7) If a business is shown to be the cause of a grease-related sewer overflow, the user will be responsible for the cost of clean-up as set forth in Section 12.18.140

C. Grease Interceptor Maintenance Procedures and Program. Any user, required by the City and/or this chapter to install and/or operate a grease interceptor or grease trap, shall adequately maintain the device so that the device is in proper working order at all times. Grease and oil interceptors shall be cleaned by a licensed and permitted waste hauler on a periodic basis to assure that the grease interceptor will operated as designed at all times. Any user, required to install or have in operation a grease interceptor or grease trap pursuant of this chapter, shall have a plan of operation or program for their facility that is intended to ensure that the grease interceptor or grease trap operates as designed to prevent grease, oil, sand, or other harmful constituents from entering the sewer system. These procedures may be include adoption of kitchen practices to minimize grease-laden garbage, which may ultimately enter the facility's drains and floor traps and/or other such procedures as may be required for proper operation of the grease interceptors.

(1) Grease interceptors shall be cleaned out completely by a FOG collection service as necessary to assure that the grease interceptor will operate as designed at all times or as otherwise specified by the City.

(2) Decanting or discharging of removed waste back into the grease interceptor, for the purpose of reducing the volume to be hauled, is prohibited.

(3) The use of additives, directly or indirectly to the plumbing or sewer system, to emulsify grease and/or oil, is specifically prohibited.

(4) The use of biological additives as a supplement to grease interceptor maintenance, including the addition of microorganisms, may be authorized by the City Manager. Approval shall be obtained (in writing) prior to use of such additives.

(5) Maintenance records indicating date of service, volume pumped, name of waste hauler, and waste disposal location for each pumping of the grease interceptor must be kept for a minimum of three (3) years. The records must be provided to the City Manager when requested during normal business hours.

(6) All waste removed from a grease interceptor must be disposed of at a facility permitted by Contra Costa County or other applicable regulatory agencies to receive such waste. Pumped out FOG shall not be returned to the sewer system, nor any private wastewater system, nor storm drains.

(7) Any fixture connected to a grease interceptor shall have a non-removable, secured food strainer of such integrity so as to withstand daily operational usage.

E. Grease Separators (Traps) for Treating FOG Wastes.

(6) A maintenance log for the grease trap must be kept for a minimum of three (3) years and must be provided at the request of the City.

F. Grease Interceptors for Treating FOG Wastes.

(6) All grease interceptors shall be located such that they are readily and easily accessible for cleaning, inspection, and removal of intercepted waste.

7.7 BMP Requirements, Recordkeeping and Reporting

BMP requirements are included in the following section of the RMC:

RMC 12.18.030.2 D "Best Management Practices"

(1) Drain Screen. After March 1, 2006, drain screens shall be installed on all drainage pipes for all new food services establishments deemed by the City Manager to generate FOG.

(2) Waste FOG:

(a) All waste FOG shall be collected and stored properly in recycling barrels, drums, or bins.

(b) Such recycling barrels, drums, or bins shall be maintained appropriately to ensure they do not leak or enter the City's stormwater collection system by direct discharge or by commingling with stormwater.

(c) A licensed collection service must be used to dispose of waste FOG.

(3) Food Waste. All food waste shall be disposed of directly into the trash or garbage and not in sinks.

(4) Employee Training:

(a) Employees of food service establishments shall be trained within three (3) months after the effective date of this chapter, and two (2) times each calendar year thereafter, on the following subjects:

(i) How to "dry wipe" pots, pans, dishware, and work areas before washing to remove FOG.

(ii) 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.

(iii) The location and use of absorption products to clean under fryers and other locations where grease may be spilled or dripped.

(b) Training shall be documented and employee signatures retained, indicating each employee's attendance and understanding of the practices.

(c) Training records shall be available for review at any reasonable time by an Authorized Inspector and/or the City Manager.

(5) Kitchen exhaust filters shall be cleaned as frequently as necessary in order to maintain good operating condition.

(6) All BMPs shall be posted conspicuously in the food preparation and dishwashing areas and process areas at all times.

7.8 Authority to Inspect Grease Producing Facilities and Enforce Requirements

The following sections of the RMC provide authority to inspect facilities and enforce requirements. Only the specific subsections relevant to this requirement are listed.

RMC 12.18.030.2 "Fats, Oils & Grease"

A. Fats, Oils, and Grease Program.

(2) These facilities must have a FOG Management Program Permit. An Authorized Inspector and/or the City Manager shall have right of entry as described in Section 12.18.070.1 of this chapter.

(3) Fees, charges, and penalties are pursuant of Section 12.18.140 of this chapter.

(6) If significant grease accumulation (e.g., a partial blockage) is found downstream, or if significant grease wicking is found upstream of the process of concern, an Authorized Inspector and/or the City Manager may inspect the facility. The inspection will include a review of the grease management program, treatment system, waste storage area, and drains not flowing to the treatment system. BMPs not in place, hauler receipts for the prior three (3) years not available, and/or training documents not current may result in future inspections with an assessed fee as published in the City's fee schedule (see Section 12.18.140).

E. Grease Separators (Traps) for Treating FOG Wastes.

(6) A maintenance log for the grease trap must be kept for a minimum of three (3) years and must be provided at the request of the City.

F. Grease Interceptors for Treating FOG Wastes.

(4) All new grease interceptors shall be designed, constructed, and installed in accordance with the current City of Richmond Building and Plumbing Codes, and shall be subject to approval by the Building Regulations Department.

(9) Inspection by the City of installed grease interceptors and piping prior to backfilling is required. Piping shall meet the requirements of the City of Richmond Building and Plumbing Code.

(12) No food service establishment or other identified user shall construct, remodel, or convert a grease interceptor without approval by the City.

7.9 Sewer Sections Subject to FOG Blockages

SSOs due to FOG are reported in CIWQS. Appendix F contains a table with locations of FOG-related SSOs from 2014 to present.

The City's Source Control Superintendent manages response, outreach activities, and maintains records of the response activities for FOG-related SSOs. This information is updated annually.

Appendix F – Element 7 Documents

Appendix F includes the following documents related to this section. The information in these documents will change from time to time, and the documents in Appendix F may have been superseded. Please contact the Water Resource Recovery Director for the most recent updates to the Appendix F documents.

- Fats, Oils and Grease Policy (RMC §12.18.020.2)
- FOG Control Program Including City Handouts and Public Outreach Materials
- FOG Related SSOs reported in CIWQS and Source Control Activities tables 2014 – Present.

ELEMENT 8 - SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

This section of the SSMP discusses the RMSD's activities related to capacity management. This section fulfills the Capacity Management requirements for the RWQCB and the SWRCB elements.

8.1 RWQCB and SWRCB SSMP Requirements

8.1.1 RWQCB Requirement

The RMSD must prepare a CIP to provide hydraulic capacity of key collection system elements under peak flow conditions.

8.1.2 SWRCB Requirement

The RMSD must prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements from dry weather peak flow conditions, as well as the appropriate design storm or wet weather 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 my 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 associates with overflow events;

- **Design Criteria:** Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and
- **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.

- **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 Sewer System Management Plan (SSMP) review and update requirements as described in Section D. 14.

8.2 System Evaluation and Capacity Assurance Plan

8.2.1 Pipeline Capacity Assessment and Capital Improvement Plan

The contract between the City and Veolia required Veolia to complete a capacity assurance plan and establish a prioritized CIP to address capacity needs in the sewer collection system. In 2010, Veolia Water completed an updated Sewer Collection System Master Plan (Master Plan) that addressed pipeline capacity issues. The Master Plan was adopted by City Council in 2011, and used a calibrated fully dynamic hydraulic model developed in Innovyze® Infoworks ™ CS. The hydraulic model can be used to evaluate future pipeline capacity issues, and to further evaluate collection system pump station performance.

The hydraulic model was used to predict sewer system pipelines that would have capacity constraints leading to SSOs during a 10-year, 24-hour design storm. The model also predicts peak hourly system flow that would be conveyed by the system during the design storm, provided the predicted SSOs are addressed.

The predicted SSO locations are in areas of the system that have known SSOs. However, because recorded SSO data is related to storm events that are not identical to the theoretical design storm event in magnitude, intensity, and rainfall distribution, there is some difference between predicted and actual system behavior.

The Master Plan includes a description of the RMSD 2009/10 flow monitoring program and two subsequent flow monitoring projects that were conducted by Veolia for the City. The results from these projects were collectively used to estimate the proportion of inflow and infiltration (I&I) that enters the sewer system during a wet weather event. The flow monitoring program identified various sources of I&I, including groundwater, tidal influence, and permitted dry weather industrial stormwater discharges (this program is being discontinued by the City). The Master Plan also establishes design criteria for use in evaluating system capacity, and for sizing new pipelines.

The Master Plan includes a short- (one to five year) and long-term (10 year) capital improvement plan (CIP) to address predicted pipeline hydraulic deficiencies under the design storm event. The CIP evaluates, assigns costs, and prioritizes recommended projects. The CIP implementation schedule is focused on maximizing the success in achieving the capacity-related SSO reduction requirements of the settlement agreement between the City and San Francisco Baykeeper.

The CIP includes recommended capacity increases, pipeline rehabilitation and replacement to reduce system-wide I&I, and wet weather relief and storage. The CIP is used to help provide justification for, and subsequently receive funding from the City's bond funds and sewer service charges.

Figure 8-1 is found at the end of this section. This figure reproduces the CIP presented in Table 9-1 of the Master Plan. The CIP is in the process of being updated as part of the City's annual budgeting process.

8.2.2 Pump Station Capacity Assessment and Capital Improvement Plan

Flows generated by the system hydraulic model were compared to firm pump station capacity (i.e., with the largest pump out of service) as listed in the City's 2006 master plan report and confirmed by Veolia. Based on this information, all of the modeled pump stations have sufficient capacity to convey flows from the 10-year, 24-hour design storm, as shown in Table 8-1.

Table 8-1. RMSD Pump Station Capacities

Pump Station	Firm Capacity from 2006 Master Plan (gpm)	Design Storm Flow (gpm)
Keller Beach	780	174
Ferry Point	450	331
ICI	440	245
Marina Bay Cove	440	46
Marina Bay Parkway	4200	2646

8.3 Design Criteria

The City uses a 10-year, 24-hour design storm, using National Oceanographic and Atmospheric Administration (NOAA) precipitation data and a SCS-1A rainfall distribution curve. Pipes were considered under-capacity if the hydraulic model predicted an SSO under this design storm. Pump stations were considered under-capacity if they were unable to convey peak flows from this storm with the largest pump out of service.

8.4 Capacity Enhancement Measures

The recommended capacity improvement projects are included in the previously described CIP. These improvements include specific projects to upsize pipelines and the addition of wet weather storage.

8.5 Capital Improvement Program Budget and Schedule

The City's fiscal year 2017/18 budget and schedule are included in the City's annual budget, the relevant pages of which are provided in Appendix G.

Appendix G – Element 8 Documents

Appendix G includes the following documents related to this section. The information in these documents will change from time to time, and the documents in Appendix G may have been superseded. Please contact the Water Resource Recovery Director for the most recent updates to the Appendix G documents.

- Master Plan Executive Summary

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Figure 8-1. Capital Improvement Program

(From Sewer Collection System Master Plan Table 9-1)

Table 9-1. City of Richmond Sewer Collection System Capital Improvement Program

	Project Name	Estimated Cost	Fiscal Year									
			2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
R&R Priority												
1	Stormwater Inflow Abatement	$10,600,000	1,060,000	1,060,000	1,060,000	1,060,000	1,060,000	1,060,000	1,060,000	1,060,000	1,060,000	1,060,000
2	Cypress Point Sewer Replacement	$ 300,000	300,000									
3	Keller Beach Interceptor Replacement	$ 5,670,000	567,000	1,000,000	1,367,667	1,367,667	1,367,667					
4	Ongoing R&R Projects	$ 7,000,000				1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
5	Inaccessible R&R Projects	$ 4,750,000	2,375,000	1,187,500	1,187,500							
	Subtotal R&R	$ 28,320,000	$ 4,302,000	$ 3,247,500	$ 3,615,167	$ 3,427,667	$ 3,427,667	$ 2,060,000	$ 2,060,000	$ 2,060,000	$ 2,060,000	$ 2,060,000
Capacity Project												
1	Hensley Street Pipelines	$16,117,000	1,611,700	7,252,650	7,252,650							
2	Hensley Street Storage	$24,544,000	2,454,400	11,044,800	11,044,800							
3	Cutting and Hoffman Boulevard Capacity Improvements	$7,639,000	763,900	3,437,550	3,437,550							
4	First Street, MacDonald and Virginia Avenue Capacity Improvements	$7,691,000			769,100	6,921,900						
5	San Pablo and Carlson Capacity Improvements	$4,236,000				423,600	3,812,400					
n/a	Emergency Projects[(a)]	$10,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
	Subtotal Capacity	$70,227,000	5,830,000	22,735,000	23,504,100	8,345,500	4,812,400	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
	Total CIP	**$ 98,547,000**	**10,132,000**	**25,982,500**	**27,119,267**	**11,773,167**	**8,240,067**	**3,060,000**	**3,060,000**	**3,060,000**	**3,060,000**	**3,060,000**

[(a)] Includes South Harbour Overflow Mitigation Project

ELEMENT 9 - MONITORING, MEASUREMENT AND PROGRAM MODIFICATIONS

This section of the SSMP discusses the RMSD Monitoring, Measurement, and Program Modifications. This section fulfills the Monitoring, Measurement, and Program Modifications requirements for the RWQCB and the SWRCB elements.

9.1 RWQCB and SWRCB SSMP Requirements

The requirements for the Monitoring, Measurement, and Program Modifications element of the SSMP are summarized below.

9.1.1 RWQCB Requirement

The RMSD must monitor the effectiveness of each SSMP element and update and modify SSMP elements to keep them current, accurate, and available for audit as appropriate.

9.1.2 SWRCB Requirement

The RMSD shall:

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

9.2 Maintenance of Relevant Data

The RMSD maintains complaint and blockage records in electronic format, maintains electronic logs of cleaning, repairs, other preventive maintenance activities, and records problems (e.g., excessive debris, observed manhole defects) identified through regular sewer maintenance activities on special report forms within the CMMS. This information is used to establish and prioritize appropriate SSMP activities.

9.3 Monitoring and Assessment

The RMSD tracks the following parameters with which to measure the effectiveness of the SSMP and its effectiveness in reducing SSOs:

- Number of SSOs per year
- Volume of SSOs per year
- Number of SSOs per year by cause
- Number of dry weather SSOs per year
- Response time to SSOs and other service calls (time from call received to time First Responder arrived on site)
- Length of gravity sewers cleaned annually (at least one time and in total)
- Length of gravity sewers CCTV inspected annually (at least one time and in total)
- Record of pump station maintenance work orders completed annually
- Footage of sewer mainlines rehabilitation

The SSMP will be audited as described in Element 10 SSMP Audits, based on this performance data.

9.4 Utility Metrics to Measure Progress and Prioritize Activities

The RMSD has established the preventive maintenance sewer metrics that are shown in Table 9-1 for the City and Veolia's use in monitoring, measuring and adjusting sewer maintenance activities. The City's responsibilities pertain to source control and claims, and Veolia is responsible for monitoring and measuring progress in sewer system performance.

Table 9-1. Success Factors and Metrics

Sewer Maintenance Success Factor	Metric
• System Pipes	• Miles
• Sewer Maintenance Field Staff	• Full Time Equivalents (FTE)
• Pipes Initially Cleaned	• Miles/Year
• Pipes Re-cleaned	• Miles/Year
• Pipe Inspected (CCTV)	• Miles/Year
• Manholes Inspected	• Miles/Year
• Hot Spots Cleaned	• Number by Underlying Cause (Roots, Debris, FOG, Structural)
• SSOs	• Number by Underlying Cause per 100 Miles
• Repeat SSOs	• Number by Address
• Response Time	• Minutes per SSO after Notification
• Pump Station Overflows	• Number by Cause
• Odor Complaints	• Number
• FSE Inspections	• #/Year
• Laterals Replaced (LRGP)	• #/Year
• Pipe Replaced	• Miles/Year
• Claims	• #/Year and $/Year/Incident

9.5 Performance Monitoring and Program and Modifications

The City will evaluate the performance of its SSMP on a biennial basis using the performance indicators noted in Section 9.3. Any operational changes that are made to improve specific performance indicators will be documented in the SSMP Audit and reflected in the revised language of the SSMP. Element 10 discusses the SSMP Audit process in detail.

9.6 SSO Trends – Frequency, Location and Volume

Table 9-2 summarizes the nature of reported SSOs from 2011 – 2016. Between 2011 and 2012, SSOs decreased in number and volume. Most of the volume reported was discharged through the City's two engineered overflow structures. The City completed construction of a five (5) million gallon wet weather storage facility in October 2015. This was to in order to cease the use of the overflow structures (weirs) during wet weather events with a magnitude less than the design

storm. The wet weather facility went on line early 2016. The overflow weirs were not used in 2016.

Table 9-2. Summary of SSOs from 2011 through 2017

Year	Roots	FOG	Debris	Structural & Other	Capacity	Total (#)	Recovered Vol (gal)	Lost Volume (gal)	Total Volume (gal)
2011	3	7	7	5	27	49	1911	14,644,544	14,657,455
2012	8	6	7	5	20	46	4,844	7,425,826	7,430,670
2013	4	7	9	9	0	29	28,975	68,755	97,730
2014	5	10	9	2	8	34	16,095	2,827,137	2,843,359
2015	6	8	3	4	0	21	5,684	3,405	9,142
2016	6	6	5	3	26	46	2,382	644,632	647,654

Appendix H – Element 9 Documents

There are no Appendix documents to accompany Section IX. However, this Appendix H is included as a placeholder for future documents.

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ELEMENT 10 - SSMP PROGRAM AUDITS

This section of the SSMP discusses plans for required self-audits of the SSMP. This section fulfills the SSMP Audit requirement for the RWQCB and the SWRCB elements.

10.1 RWQCB and SWRCB SSMP Requirements

The requirements for the SSMP Audits element of the SSMP are summarized below:

10.1.1 RWQCB Requirement

The RMSD must conduct a biannual audit of the SSMP that includes any deficiencies and steps to correct them that are appropriate to the size of the RMSD system and the number of overflows. The RMSD must submit a report of its biannual audit, as described in the updated SSMP audit requirements issued in October 2012.

10.1.2 SWRCB Requirement

The RMSD 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 RMSD's compliance with the SSMP requirements, including identification of any deficiencies in the SSMP and steps to correct them.

10.2 Audit Procedures, Roles and Responsibilities

The RMSD will prepare a biannual SSMP audit to keep on file. The proposed audit format is included in Appendix I.

10.3 SSMP Program Modification/Update Process

If the biannual audit identifies significant changes to be made to the SSMP, then the SSMP will be updated by September 30th . However, it is anticipated that the main SSMP document will remain generally unchanged, and that any changes will be recorded in the SSMP Change Log, which is included in Appendix I.

Appendix I – SSMP Program Audit Documents

Appendix I include the following documents related to this section. The information in these documents will change from time to time, and the documents in Appendix I may have been superseded. Please contact the Water Resource Recovery Director for the most recent updates to the Appendix I documents.

- Audit Form

- SSMP Change Log
- Completed audits

ELEMENT 11 - COMMUNICATION PLAN

This section of the SSMP discusses the City's Communication plan. This section fulfills the Communication Plan requirements for the SWRCB element. There is no requirement in the RWQCB guidelines.

11.1 RWQCB and SWRCB SSMP Requirements

The requirements for the Communication Plan element of the SSMP are summarized below:

11.1.1 RWQCB Requirement

No requirement.

11.1.2 SWRCB Requirement

The City 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 City as the program is developed and implemented. The City shall also create a plan of communication with systems that are tributary and/or satellite to the sanitary sewer system.

11.2 Communication Plan

The City does not currently have a formal communication plan in place for the communication of SSMP elements, performance, or updates. However, the City has a comprehensive library of documents that are available to the public through the "Wastewater" page of the City website. The SSMP will be added to this library for access by the public, and a clear link to the document will be provided on the website to facilitate access to the document. The public has the opportunity to comment on the SSMP at Council meetings, which are open to the public and held at least twice per month.

Appendix J – Communication Plan Documents

There are no Appendix documents to accompany Section IX. However, this Appendix J is included as a placeholder for future documents.

Appendix A
Element 2 (Organization) Supporting Documents

Names and contact information for the Veolia SSO responders (First Responder) and responsible City employees are as listed below:

- Veolia Hotline: 510-412-2001
- Veolia Project Manager - Aaron Winer Cell: 510-385-6482
- Veolia Sewer Collection Manager - Tim O' Connor Cell: 510-426-0008
- Veolia Sewer Field Supervisor - Wayne Madison Cell: 510-542-3247
- Veolia Field Crew Cell Numbers:
    - Armstrong, Kenny 510-812-2776
    - Roos, Jason 510-812-1173
    - Wallis, David 510-447-0220
    - Lewis, Kenny 510-932-1242
    - **Madison, Wayne** 510-542-3247
    - Hill, Arlee 510-829-2108
    - Hendricks, Mitchell 510-660-7942
    - Mendoza, Rafael 510-334-4924
- In Case of Emergency: 911
- City Police Dispatch: 510-233-1214
- OES: 800-852-7550
- City Manager: 510-620-6512
- City Interim Engineering Services Director Cell: 510-435-4340
- City Source Control Superintendent Cell: 510-290-9149
- Contractors
    - BayHawk, Inc.: 510-776-5886
    - Roto-Rooter: 804-794-7474 TMB, LLC: 707-252-5480

  - Sierra Pacific Loss Management (Bruce Burnett – Interior Cleaning): 707-479-1375
  - DW Pumps- 916-559-2054

- California Regional Water Quality Control Board: 510-622-2369
- California Department of Fish and Games - Bay Delta Region : 707-944-5500
- East Bay Regional Park District: 510-633-0460
- Contra Costa County Health Services: 925-692-2500
- California Office of Emergency Services : 800-852-7550
- U.S. Coast Guard : 510-437-3073

Appendix B
Element 3 (Legal Authority) Supporting Documents

Chapter 6.02 - BUILDING REGULATIONS ADMINISTRATIVE CODE

Sections:

6.02.010 - Title.
6.02.020 - Definitions.
6.02.030 - Purpose.
6.02.040 - Scope.
6.02.050 - Existing buildings, structures and equipment.
6.02.060 - Conflicting provisions.
6.02.070 - Alternate materials and methods of construction.
6.02.080 - Modifications.
6.02.090 - Tests.
6.02.100 - Authority.
6.02.110 - Powers and duties of Building Official.
6.02.120 - Unsafe buildings, structures or equipment.
6.02.130 - Board of Appeals.
6.02.140 - Violations—Penalties.
6.02.150 - Permits.
6.02.160 - Application for permit.
6.02.170 - Permits issuance.
6.02.180 - Fees.
6.02.190 - Inspections.
6.02.210 - Special inspections.
6.02.220 - Engineering or architect requirements.
6.02.230 - Connection to utilities.
6.02.240 - Certificate of Occupancy.
6.02.250 - Adoption of technical codes.

6.02.010 - Title.

These regulations shall be known as the "Building Regulations Administrative Code," may be cited as such and will be referred to herein as "this chapter."

6.02.020 - Definitions.

General. For the purpose of this chapter, certain terms, phrases, words and their derivatives shall be construed as specified in this section. Where terms are not defined, they shall have their ordinarily accepted meanings within the context with which they are used. Webster's Third New International Dictionary of the English Language, Unabridged, Copyright 1961, shall be considered as providing ordinarily accepted meanings. Words used in the singular include the plural and the plural the singular. Words used in the masculine gender include the feminine and the feminine the masculine.

"Accepted for construction," means as to materials, types of construction, equipment and systems, refers to the acceptance by the Building Official as the result of investigation and/or tests conducted by him, or by reason of accepted principles or tests by recognized authorities, technical or scientific organizations.

"Addition" means an extension or increase in floor area or height of a building or structure.

"Alter" or "alteration" means any change or modification in construction or building service equipment.

"Approved agency" means an established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved by the Building Official.

"Building" means any structure used or intended for supporting or sheltering and use or occupancy.

"Building Code" or "Building Standards Code" means the California Building Standards Code as published by the California Building Standards Commission and promulgated in Title 24 of the California Code of Regulations (including any interim amendments thereto), and adopted in this Code herein by reference.

"Building Official" means the person charged with the administration and enforcement of this chapter and the Building Code, or the duly authorized representative of the Building Official. All references to Building Official in Article VI of this Code shall include the Building Official's designee, if any.

"Building service equipment" means it refers to the plumbing, mechanical, electrical and elevator equipment including piping, wiring, fixtures and other accessories which provide sanitation, lighting, heating, ventilation, cooling, refrigeration, firefighting and transportation facilities essential for the habitable occupancy of the building or structure for its designated use and occupancy.

Building, Existing. "Existing building" means a building erected prior to the adoption of this chapter, or one for which a legal building permit has been issued.

CABO One and Two-Family Dwelling Code. This jointly sponsored code is intended to eliminate conflicts and duplications among the model codes to achieve national uniformity.

CABO Model Energy Code. This Code sets forth minimum requirements for the effective use of energy in the design of new buildings and structures and additions to existing buildings and is adopted by reference in the Uniform Building Code.

"Chief Building, Electrical, Mechanical, Plumbing Inspector, Plans Examiner" means the person providing expertise for the Building Official in the designated technical code.

"Concrete Inspection Manual" means a publication on concrete to be used for reference or as a text on concrete inspection.

"Dangerous Building Code" means the Uniform Building Code for the Abatement of Dangerous Buildings promulgated by the International Conference of Building Officials, as adopted by the City of Richmond in Chapter 6.10. "Electrical Code" means the National Electrical Code promulgated by the National Fire Protection Association, as adopted by the City of Richmond in Chapter 6.16. "Engineer of Record" means an engineer licensed by the State of California to practice as such and who is responsible for the preparation of plans, specifications, engineering calculations and other data submitted to the City of Richmond for the purpose of obtaining a permit under the provisions of this chapter.

"Fire Code" means the California Fire Code and Fire Code Standards as published in the Building Standards Code and Title 24 of the California Code of Regulations, and adopted in this Code herein by reference.

"Jurisdiction," as used in this chapter and technical codes, means the City of Richmond, California.

"Listed" and "Listing" mean terms referring to equipment and materials which are shown in a list published by an approved testing agency, qualified and equipped for experimental testing and maintaining an adequate periodic inspection of current productions and whose listing states that the equipment complies with recognized safety standards.

"Mechanical Code" means the California Mechanical Code as published in the Building Standards Code and Title 24 of the California Code of Regulations, and adopted in this Code herein by reference.

"Occupancy" means the purpose for which a building, or part thereof, is used or intended to be used. The term "occupancy" as used in this chapter shall include the building or part thereof housing such use.

"Occupant" means the person, agent, firm or corporation occupying a building or part thereof.

"Owner" means any person, agent, firm or corporation having a legal or equitable interest in the property interest.

"Permit" means an official document or certificate issued by the Building Official authorizing performance of a specific activity.

"Person" means a natural person, his heirs, executors, administrators or assigns, and also includes a firm, partnership or corporation, its or their successors or assigns, or the agent of any of the aforesaid.

"Plumbing Code" means the California Plumbing Code as published in the Building Standards Code and Title 24 of the California Code of Regulations, and adopted in this Code herein by reference.

"Process equipment" means equipment used in the production or development of manufactured products. Process equipment includes the following production or research equipment: pressure vessels, heat exchangers, pumps, compressors, boilers and furnaces. Process equipment shall be designed and fabricated in conformance with nationally established and recognized industry codes and standards and is to be certified as such. Process equipment also includes its installation but does not include foundations or structures around this equipment or the connection to utility sources.

"Repair" means the reconstruction or renewal of any part of an existing building, structure or building service equipment for the purpose of its maintenance.

"Shall," as used in this chapter, means mandatory.

"Stamped plans" and/or "specifications" mean the plans and/or specifications which have been "accepted for construction" as the official plans and/or specifications to be followed on the job site. Such plans and/or specifications are to be stamped by the Building Official with the official stamp of the City of Richmond's Building Regulations Division and signed by the Building Official authorizing the issuance of a permit(s) for work to proceed.

"Structure" means that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

"Technical Codes" means it refer to those codes adopted by the City of Richmond containing the provisions for design, construction, alteration, addition, repair, removal, demolition, use, location, occupancy and maintenance of all buildings and structures and building service equipment as herein defined.

"Uniform Building Code" means it covers the fire, life and structural safety aspects of all building and related structures.

"Uniform Building Code Standards" means it presents in a compact and concise manner national test, material and special design standards referred to as the Uniform Building Code. U.B.C. STANDARDS is the Uniform Building Code Standards promulgated by the International Conference of Building Officials, as adopted by the City of Richmond in Chapter 6.04 "Uniform Building Security Code" means it establishes minimum standards to make dwelling units resistance to unlawful entry. It regulates swinging doors, sliding doors, windows and hardware in connection with dwelling units of apartment houses or one- and two-family dwellings. The code gives consideration to the concerns of police, fire and Building Officials in establishing requirements for resistance to burglary which are compatible with fire and life safety.

"Uniform Code for the Abatement of Dangerous Buildings" means it sets forth orderly procedures for remedying dangerous buildings. This Code covers all structures and may be used to supplement the Building Code and State Housing Code.

"Uniform Fire Code and Uniform Fire Code Standards" means it sets out provisions necessary for fire prevention while achieving uniformity in terms and requirements with other codes published by the conference. The Code is sponsored jointly by the Western Fire Chiefs Association and the International Conference of Building Officials, as adopted by the City of Richmond in Chapter 8.16 of this Code.

"Uniform Housing Code" means it provides for the conservation and rehabilitation of housing compatible with the Uniform Building Code; meets Federal Workable Program requirements and is sponsored by the International Conference of Building Officials, as adopted by the City of Richmond in Chapter 6.24. "Uniform Mechanical Code" means it contains requirements for the installation and maintenance of heating, ventilating, cooling and refrigeration systems. This publication is sponsored jointly by the International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials.

"Uniform Plumbing Code," means published by the International Association of Plumbing and Mechanical Officials, the Uniform Plumbing Code covers all aspects of plumbing, including requirements for plumbing materials, and IAPMO installation standards. It is endorsed by the ICBO.

"Uniform Sign Code" means dedicated to the development of better sign regulation. Its requirements pertain to all signs and sign construction attached to buildings and is sponsored by the International Conference of Building Officials, as adopted by the City of Richmond in Chapter 4.04 of this Code.

"Valuation" or "value of buildings," means as applied to a building and its building service equipment, shall be the established cost to replace the building and its building service equipment in kind, based on current replacement costs.

"Valuation" or "value of structures," means as applied to a structure and its process and/or service equipment, shall be the estimated cost to replace the structure and its process and service equipment in kind, based on current replacement costs.

(Amended by Ordinance Nos. 11-94 N.S., 4-06 N.S. and 18-06 N.S.)

6.02.030 - Purpose.

The purpose of this chapter is to provide for the administration and enforcement of the technical codes adopted by the City of Richmond and to provide for and promote the health, safety and welfare of the general public, and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefitted by the terms of this chapter of the technical codes.

6.02.040 - Scope.

The provisions of this chapter shall serve as the administrative, organizational and enforcement rules and regulations for the technical codes which regulate the site preparation, construction, alteration, moving, demolition, repair, use and occupancy of buildings, structures and building service equipment within the City of Richmond.

6.02.050 - Existing buildings, structures and equipment.

(A) General. Buildings, structures and their building service equipment to which additions, alterations or repairs are made shall comply with all the requirements of the technical codes for new facilities, except as specifically provided in this section.

(B) Additions, Alterations or Repairs.

1. Additions, alterations or repairs may be made to any building or structure without requiring the existing building or structure to comply with all the requirements of this chapter, provided the addition, alteration or repair conforms to that required for a new building or structure, and the capability of the existing building or structure to resist all lateral forces to which it may be subjected has been demonstrated.
2. Additions or alterations shall not be made to an existing building or structure which will cause the existing building or structure to be in violation of any of the provisions of this chapter nor shall such additions or alterations cause the existing building or structure to become unsafe. An unsafe condition shall be deemed to have been created if an addition or alteration will cause the existing building or structure to become structurally unsafe or overloaded; will not provide adequate egress in compliance with the provisions of this chapter or will obstruct existing exits; will create a fire hazard; will reduce required fire resistance or will otherwise create conditions dangerous to human life.
3. Any altered building which involves a change in use or occupancy, shall not exceed the height, number of stories and the area permitted for new buildings.
4. Any new building plus additions shall not exceed the height, number of stories and area specified for new buildings.
5. Additions or alterations shall not be made to an existing building or structure when such existing building or structure is not in full compliance with the provisions of this chapter except when such addition or alteration will result in the existing building or structure being no more hazardous based on safety and sanitation, than before such additions or alterations are undertaken.
6. Alterations or repairs to an existing building or structure which are nonstructural and do not adversely affect any structural member or any part of the building or structure having required fire resistance may be made with the same materials of which the building or structure is constructed. The installation or replacement of glass shall be as required for new installations.
7. Minor additions, alterations and repairs to existing building service equipment installations may be made in accordance with the technical code in effect at the time the original installation was made, subject to the approval of the Building Official, and provided such additions, alterations and repairs will not cause the existing building service equipment to become unsafe, unsanitary or overloaded.
8. Structural alterations intended to improve the resistance to lateral forces due to earthquakes in existing building may be made without full compliance with the provisions for earthquake-resistant design as specified in the technical codes.

(C) Existing Installations. Building service equipment lawfully in existence at the time of the adoption of the technical codes may have their use, maintenance or repair continued if the use, maintenance or repair is in accordance with the original design and no hazard to life, health or property has been created by such building service equipment.

(D)

Existing Occupancy. Buildings in existence at the time of the adoption of the Building Code may have their existing use or occupancy continued if such use or occupancy was legal at the time of the adoption of the Building Code, provided such continued use is not dangerous to life, health and safety. Any change of use, occupant or occupancy of any existing building or structure shall comply with the provisions of Section 6.02.240 of this chapter and the Building Code.

(E) Maintenance. All buildings, structures and building service equipment, existing and new, and all parts thereof shall be maintained in a safe and sanitary condition. All devices or safeguards which are required by the technical codes shall be maintained in conformance with the technical code under which installed. The owner or his designated agent shall be responsible for the maintenance of buildings, structures and their building service equipment. To determine compliance with this subsection, the Building Official may cause any structure to be reinspected.

(F) Moved Buildings and Temporary Buildings. Buildings, structures and their building service equipment moved into or within the City of Richmond shall comply with the provisions of the technical codes for buildings or structures and their building service equipment.

Temporary structures such as reviewing stands and other miscellaneous structures, sheds, canopies or fences used for the protection of the public around and in conjunction with construction work may be erected by special permit from the Building Official for a limited period of time. Such buildings or structures need not comply with the type of construction or fire-resistive time periods required by the Building Code. Temporary buildings or structures shall be completely removed upon the expiration of the time limit stated in the permit.

(G) Historic Buildings. Repairs, alterations and additions necessary for the preservation, restoration, rehabilitation or continued use of a building structure, or its building service equipment may be made without conformance to all the requirements of the technical codes when authorized by the Building Official, provided:

1. The building or structure has been designated by official action of the City Council as having special historical or architectural significance.
2. Any unsafe conditions as described in this chapter are corrected.
3. The restored building or structure and its building service equipment will be no more hazardous based on safety and sanitation than the existing building.

6.02.060 - Conflicting provisions.

Wherever conflicting provisions or requirements occur between this chapter and the technical codes; or between the technical codes; or between any other municipal code section, the following shall apply:

(1) This Administrative Code shall prevail in the administration of all codes relating to construction within the City of Richmond.

(2) The various technical codes shall prevail in their technical field (i.e., the California Building Code shall prevail over other codes in the area of occupancies, types of construction, quality and design of the materials and methods of construction of buildings and structures, and permit requirements. The National Electric Code shall prevail over other codes as relating to electrical work, etc.).

(3) Where conflicts occur within a technical code, those provisions providing the greater safety shall govern. In other conflicts where safety or sanitation are not involved, the most restrictive provisions shall govern.

(4) Where in any specific case, different sections within any of the technical codes specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

(5) Changes, additions and deletions to any technical code can only occur within that particular code which governs the technical field which is being changed, added to or deleted from.

(Amended by Ordinance No. 18-06 N.S.)

6.02.070 - Alternate materials and methods of construction.

(A) The provisions of the technical codes are not intended to prevent the use of any material or method of construction not specifically prescribed by the technical codes, provided any alternate has been approved and its use authorized by the Building Official.

(B) The Building Official may approve any alternate, provided he finds that the proposed design is satisfactory and complies with the provisions of the technical codes and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in the technical codes in suitability, strength, effectiveness, fire resistance, durability, safety and sanitation.

(C) The Building Official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding its use. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.

6.02.080 - Modifications.

Whenever there are practical difficulties involved in carrying out the provisions of the technical codes, the Building Official may grant modifications for individual cases, provided he shall first find that a special individual reason makes the strict letter of the technical code impractical and the modification is in conformity with the intent and purpose of the technical code, and that such modification does not lessen safety or health requirements or any degree of structural integrity. The details of actions granting modifications shall be recorded and entered in the files of the code enforcement agency.

6.02.090 - Tests.

(A) Whenever there is insufficient evidence of compliance with any of the provisions of the technical codes or evidence that materials or construction do not conform to the requirements of the technical codes, the Building Official may require tests as evidence of compliance to be made at no expense to the City of Richmond.

1. Test methods shall be as specified by the technical codes or by other recognized test standards. In the absence of recognized and accepted test methods for the proposed alternate, the Building Official shall determine test procedures.
2. All tests shall be made by an approved agency. Reports of such tests shall be retained by the Building Official for the period required for the retention of public records.

6.02.100 - Authority.

(A) Creation of Enforcement Agency. There is established in the City of Richmond a code enforcement agency which shall be under the administration and operational control of the Building Official.

(B) General. Whenever the term or title "administrative authority," "responsible official," "Building Official," "Chief Inspector," "Code Enforcement Officer," "Superintendent of Inspection Services," or other similar designation is used herein or in any of the technical codes or in any other law, ordinance or regulation, it shall be construed to mean the Building Official as designated by the Director of Public Works of the City of Richmond.

6.02.110 - Powers and duties of Building Official.

(a) General. The Building Official is authorized and directed to enforce all the provisions of this chapter and the referenced technical codes.

The Building Official shall have the power to render interpretations of this chapter and the referenced technical codes, and to adopt and enforce rules and regulations supplemental to this chapter as he may deem necessary in order to clarify the application of the provisions of this chapter and the technical codes. Such interpretations, rules and regulations shall be in conformity with the intent and purpose of this chapter and the technical codes.

(b) Deputies. In accordance with prescribed procedures and with the approval of the appointing authority, the Building Official may appoint such number of technical officers and inspectors and other employees as shall be authorized from time to time. He may deputize such inspectors or employees as may be necessary to carry out the functions of the code enforcement agency.

(c) Right-of-Entry. Whenever necessary to make an inspection to enforce any of the provisions of this chapter and the technical codes, or whenever the Building Official or his authorized representative has reasonable cause to believe that there exists in any building or upon any premises any condition or code violation which makes such building or premises unsafe, dangerous or hazardous, the Building Official or his authorized representative may enter such building or premises at all reasonable times to inspect the same or to perform any duty imposed upon the Building Official by such codes, provided that if such building or premises be occupied, he shall first present proper credentials and request entry; and if such building or premises be unoccupied, he shall first make a reasonable effort to locate the owner or other persons having charge or control of the building or premises and request entry. Should entry be refused, the Building Official or his authorized representative shall have recourse to every remedy provided by law to secure entry.

(d) Stop Orders. Whenever any work is being done contrary to the provisions of this chapter and the technical codes, the Building Official may order the work stopped by notice in writing served on any persons engaged in the doing or causing such work to be done, and any such persons shall forthwith stop such work until authorized by the Building Official to proceed with the work.

(e) Occupancy Violations. Whenever any building or structure or building service equipment therein regulated by this chapter and the technical codes are being used contrary to the provisions of such codes, the Building Official may order such use discontinued and utility service disconnected by written notice served on any person causing such use to be continued. Such person shall discontinue the use within the time prescribed by the Building Official after receipt of such notice to make the structure, or portion thereof, comply with the requirements of such codes. Utility disconnection authorized by this section shall be pursuant to the provisions of subsection (f) of this section.

(f) Authority to Disconnect Utilities. The Building Official or his authorized representative shall have the authority to order the disconnection and/or to disconnect any utility service or energy supplied to the building, structure or building service equipment therein regulated by this chapter or the technical codes in case of emergency where necessary to eliminate an immediate hazard to life or property. The Building Official shall notify the City Attorney and the utility company prior to disconnection and whenever possible notify the owner or occupant of the building, structure or building service equipment, in writing, of such disconnection prior to disconnect.

(g) Authority to Condemn Building Service Equipment. Whenever the Building Official ascertains that any building service equipment regulated in the technical codes has become hazardous to life, health, property or becomes unsanitary, he shall order in writing that such equipment either be removed or restored to a safe or sanitary condition, whichever is appropriate.

The written notice itself shall fix a time limit for compliance with such order. No person shall use or maintain defective building service equipment after receiving such notice.

When such equipment or installation is to be disconnected, a written notice of such disconnection and causes therefore shall be given within 24 hours to the serving utility, the owner and occupant of such building, structure or premises. Utility disconnection authorized by this section shall be pursuant to the provisions of subsection (f) of this section.

When any building service equipment is maintained in violation of the technical codes and in violation of any notice issued pursuant to the provisions of this section, the Building Official shall institute any appropriate action to prevent, restrain, correct or abate such violation.

(h) Connection After Order to Disconnect. No person shall make connections from any energy, fuel or power supply nor supply energy or fuel to any building service equipment which has been disconnected or ordered to be disconnected by the Building Official or the use of which has been ordered to be discontinued by the Building Official until the Building Official authorizes the reconnection and use of such equipment.

(i) Liability. The Building Official, or his authorized representative charged with the enforcement of this chapter and the technical codes, acting in good faith and without malice in the discharge of his duties, shall not thereby render himself personally liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of his duties. Any suit brought against the Building Official or employee because of such act or omission performed by him in the enforcement of any provision of such codes shall be defended by the City of Richmond until final termination of such proceedings, and any judgment resulting therefrom shall be assumed by the City of Richmond.

This chapter, the technical codes and other laws shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building, structure or building service equipment therein for any damages to persons or property caused by defects, nor shall the Public Works Department or its parent jurisdiction, the City of Richmond be held as assuming any such liability by reason of the inspections authorized by such laws or approvals issued under such laws.

(j) Cooperation of Other Officials and Officers. The Building Official may request, and shall receive so far as is required in the discharge of his duties, the assistance and cooperation of other officials of the City of Richmond.

(Amended by Ordinance No. 18-06 N.S.)

6.02.120 - Unsafe buildings, structures or equipment.

(a) All buildings or structures regulated by this chapter and the technical codes which are structurally inadequate or have inadequate egress, or which constitute a fire hazard, or are otherwise dangerous to human life are, for the purpose of this section, unsafe.

(b) Building service equipment regulated by such codes, which constitutes a fire, electrical or health hazard, or insanitary condition, or is otherwise dangerous to human life is, for the purpose of this section, unsafe. Any use of buildings, structures or building service equipment constituting a hazard to safety, health or public welfare by reason of inadequate maintenance, dilapidation, obsolescence, fire hazard, disaster, damage or abandonment is, for the purpose of this section, an unsafe use.

(c) Parapet walls, cornices, spires, towers, tanks, statuary and other appendages or structural members which are supported by, attached to, or a part of a building and which are in deteriorated condition or otherwise unable to sustain the design loads which are specified in the Building Code are hereby designated as unsafe building appendages.

(d) All unsafe buildings, structures or appendages and building service equipment are hereby declared to be public nuisances and shall be abated by repair, rehabilitation, demolition or removal in accordance with the procedures set forth in the Dangerous Buildings Code or such alternative procedure as may be adopted by the City of Richmond. As an alternative, the Building Official or other employee or official of the City of Richmond as designated by the City Council, may institute any other appropriate action to prevent, restrain, correct or abate the violation.

6.02.130 - Board of Appeals.

(a) General. There is created a Board of Appeals to hear appeals of decisions, orders or determinations of the Building Official, or his or her designee, regarding the application and interpretations of the technical codes, as well as the soundness or habitability of all new or existing buildings, dwellings and structures, including all alterations, additions, repair, demolition, and moving thereof. The Board shall also hear appeals of all notices and orders issued by the Building Official, or his or her designee.

(b) Board Members. The Board shall consist of five members who are qualified by experience and training to pass upon matters pertaining to building construction in conformance with the California Building Standards Code and applicable local ordinances, including the Uniform Code for Abatement of Dangerous Buildings. Board members shall not be City employees and shall be appointed by and serve at the pleasure of the City Manager. A quorum for the conduct of business shall be three.

(c) Appeals. Except as otherwise provided by law, any person, firm, or corporation adversely affected by a decision, order, or determination by the Building Official, or his or her designee, relating to the application of building standards published in the California Building Standards Code, the Uniform Code for Abatement of Dangerous Buildings, or any lawfully enacted City ordinance, may appeal the issue for resolution to the Board of Appeals.

(d) Form of Appeal. Appeals of notice, orders and determinations of the Building Official, or his or her designee, shall follow the requirements set forth in Chapter 5 (Appeal) of the Uniform Code for Abatement of Dangerous Buildings. All appeals shall be filed within thirty (30) days from the date of the service of such order or action of the Building Official; provided, however, that if the building or structure is in such condition as to make it immediately dangerous to the life, limb, property or safety of the public or adjacent property and is ordered vacated, such appeal shall be filed within ten (10) days from the date of service of the notice, order or determination of the Building Official, or his or her designee. Decisions of the Board may be challenged only through the courts. Failure to comply with the appeal deadline acts as a waiver of all appeal rights and constitutes a failure to exhaust administrative remedies.

(e) Hearing on Appeal. The Board of Appeals shall conduct a hearing within sixty (60) days from the date the appeal is filed. The Board shall render a written decision within fifteen (15) business days from the date the hearing is closed.

(Amended by Ordinance No. 9-06 N.S.; Ord. No. 14-10 N.S., § 1, 4-6-2010)

6.02.140 - Violations—Penalties.

(a) It is unlawful and a misdemeanor for any person, firm or corporation to erect, construct, enlarge, alter, repair, move, improve, remove, convert, demolish, equip, use, occupy or maintain any building, structure or building service equipment, or to cause, suffer or permit the same to be done, in violation of any provision of state or local law, including the California Building Standards Code, the Uniform Code for Abatement of Dangerous Buildings or the Richmond Municipal Code.

(b) Cumulative Remedies. The rights and remedies provided herein are cumulative and in addition to any other rights and remedies provided by law.

(Amended by Ordinance No. 11-94 N.S.; Ord. No. 14-10 N.S., § 1, 4-6-2010)

6.02.150 - Permits.

(a) Permits Required. Except as specified in subsection (b) of this section, no building, structure or service equipment regulated by this chapter and the technical codes shall be erected, constructed, enlarged, altered, repaired, moved, improved, removed, converted or demolished unless a separate, appropriate permit for each building, structure or service equipment has first been obtained from the Building Official.

(b) Exempted Work:

(1) Building Permits. A building permit shall not be required for the following:

(A) One-story detached accessory buildings used as tool and storage sheds, playhouses and similar uses, provided the projected roof area does not exceed 120 square feet;

(B) Fences not over 6 feet high;

(C) Oil derricks;

(D) Movable cases, counters and partitions not over 5 feet high;

(E) Retaining walls which are not over 4 feet in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding flammable liquids;

(F) Water tanks supported directly upon grade if the capacity does not exceed 5,000 gallons and the ratio of height to diameter or width does not exceed two to one;

(G) Platforms, walks and driveways not more than 30 inches above grade and not over any basement or story below;

(H) Painting, papering and similar finish work;
(I) Temporary motion picture, television and theater stage sets and scenery;
(J) Window awnings supported by an exterior wall of Group R, Division 3, and Group M occupancies when projecting not more than 54 inches;
(K) Prefabricated swimming pools accessory to a Group R, Division 3 occupancy in which the pool walls are entirely above the adjacent grade and if the capacity does not exceed 5,000 gallons;
(L) The replacement of any window with another window of the same shape and size.

(2) Plumbing Permits. A plumbing permit shall not be required for the following:
(A) The stopping of leaks in drains, soil, waste or vent pipe, provided, however, that should any concealed trap, drainpipe, soil, waste or vent pipe become defective and it becomes necessary to remove and replace the same with new material, the same shall be considered as new work and a permit shall be procured and inspection made as provided in this chapter;
(B) The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, nor for the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures;
(C) Equipment and/or appliances not connected directly or indirectly to utility service.

(3) Electrical Permits. An electrical permit shall not be required for the following:
(A) Portable motors or other portable appliances energized by means of a cord or cable having an attachment plug end to be connected to an approved receptacle when that cord or cable is permitted by the Electrical Code;
(B) Repair or replacement of fixed motors, transformers or fixed approved appliances of the same type and rating in the same location;
(C) Temporary decorative lighting;
(D) Repair or replacement of current-carrying parts of any switch, contractor or control device;
(E) Reinstallation of attachment plug receptacles, but not the outlets therefor;
(F) Repair or replacement of any overcurrent device of the required capacity in the same location;
(G) Repair or replacement of electrodes or transformers of the same size and capacity for signs or gas tube systems;
(H) Taping joints;
(I) Removal of electrical wiring;
(J) Temporary wiring for experimental purposes is suitable experimental laboratories;
(K) The wiring for temporary theater, motion picture of television stage sets;
(L) Electrical wiring, devices, appliances, apparatus or equipment operating at less than 25 volts and not capable of supplying more than 50 watts of energy;
(M) Low-energy power, control and signal circuits of Classes II and III as defined in the Electrical Code;
(N) The installation, alteration or repair of electrical wiring, apparatus or equipment or the generation, transmission, distribution or metering of electrical energy or in the operation of signals or the transmission of intelligence by a public or private utility in the exercise of its function as a serving utility;
(O) Equipment and/or appliances not connected directly or indirectly to utility service.

(4) Mechanical Permits. A mechanical permit shall not be required for the following:
(A) Any portable heating appliance;
(B) Any portable ventilating equipment;
(C) Any portable cooling unit;
(D) Any portable evaporative cooler;
(E) Any closed system of steam, hot or cold water piping within any heating or cooling equipment regulated by the Mechanical Code;
(F) Replacement of any component part of assembly of an appliance which does not alter its original approval and complies with other applicable requirements of the technical codes;
(G) Any refrigerating equipment which is part of the equipment for which a permit has been issued pursuant to the requirements of the technical codes;
(H) Any unit refrigerating system as defined in the Mechanical Code;
(I) Equipment and/or appliances not connected directly or indirectly to utility service.

(Amended by Ordinance Nos. 11-94 N.S. and 4-06 N.S.)

6.02.160 - Application for permit.

(A) Application. To obtain a permit, the applicant shall first file an application therefor in writing on a form furnished by the Public Works Department for that purpose. Every such application shall:
1. Identify and describe the work to be covered by the permit for which application is made.
2. Describe the land on which the proposed work is to be done by legal description, street ad-dress or similar description that will readily identify and definitely locate the proposed building or work.
3. Indicate the use or occupancy for which the proposed work is intended.
4. Be accompanied by plans and diagrams, computations and specifications and other data as required in subsection (B) of this section.
5. State the valuation of any new building or structure or any addition, remodeling or alteration to an existing building.
6. Be signed by permittee, or his authorized agent.
7. Give such other data and information as may be required by the Building Official.
8. Be accompanied by a plat of the survey of the land as required in subsection (D) of this section.

(B) Plans and Specifications. Plans, engineering calculations, diagrams and other data shall be submitted in three or more sets with each application for a permit. The Building Official may require plans, computations and specifications to be prepared and designed by an engineer or architect licensed by the state to practice as such.

Exception: The Building Official may waive the submission of plans, calculations, etc., if he finds that the nature of the work applied for is such that reviewing of plans is not necessary to obtain compliance with this chapter or the work is being done under Section 6.02.200 "Certified Inspection Program" and Section 6.02.220 "Engineer or Architect Requirements."

(C) Information on Plans and Specifications. Plans and specifications shall be drawn to scape upon substantial paper and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of the technical codes and all relevant laws, ordinances, rules and regulations.

Plans for buildings more than two stories in height of other than Groups R, Division 3 and M Occupancies shall indicate how required structural and fire-resistive integrity will be maintained where a penetration will be made for electrical, mechanical, plumbing and communication conduits, pipes and similar systems.

(D) Plat of a Property Survey. With each application for a building permit, three copies of a plat of a survey of the property shall be submitted. The survey upon which the plat is based shall have been made by a licensed land surveyor or registered civil engineer of the State of California and shall be signed by him and endorsed with his license or certificate number. Elevations shown thereon shall be to the Mean Sea Level Datum of 1929 established by the U.S. Coast and Geodetic Survey unless the nearest City of Richmond bench mark is more than five hundred feet (500′) from the property or to such other datum as is approved by the City Engineer.

The plat shall show the following information:

1. The exterior lines of said property to be improved defined by appropriate stakes or marks.
2. The elevations of such stakes or marks.
3. The location of said exterior lines by map or deed distance to the nearest intersecting street.
4. Ties to existing permanent monuments.
5. Contours of not more than two-foot (2′) intervals except that five-foot (5′) intervals may be used when the slope of lot exceeds one foot (1′) in five (5) in any direction. Such contours shall extend to the center of the street when said street is unimproved.
6. The location of every existing building or structure on the property.
7. The location of reserves and the location and elevation of existing curbs, sidewalks, center line of pavement, main sewers, waterways, drains and culverts, affecting the property.

Exceptions: When authorized by the Building Official, plats of surveys need not be submitted for the following:

1. Minor additions and alterations to existing structures or minor detached accessory buildings.
2. Areas located more than sixty feet (60′) beyond the proposed work for land zones M-2 or M-3 and under one ownership.

(E) Expiration of Plan Review. Applications for which no permit is issued within 180 days following the date of application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the Building Official. The Building Official may extend the time for action by the applicant for a period not exceeding 180 days upon request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken. No application shall be extended more than twice. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee.

6.02.170 - Permits issuance.

(a) Issuance. The application, plans and specifications, and other data, filed by an applicant for permit shall be reviewed by the Building Official. Such plans may be reviewed by other departments of this jurisdiction to verify compliance with any applicable laws under their jurisdiction. If the Building Official finds that the work described in an application for a permit and the plans, specifications and other data filed therewith conform to the requirements of this chapter and the technical codes and other pertinent laws and ordinances, and that the fees specified in the City's adopted fee schedule have been paid, he shall issue a permit therefor to the applicant.

When the Building Official issues the permit where plans are required, he shall endorse in writing and stamp the plans and specifications "ACCEPTED, City of Richmond, by _____." Such stamped plans and specifications shall not be changed, modified or altered without authorization from the Building Official, and all work shall be done in accordance with the stamped plans.

The Building Official may issue a permit for the construction of part of a building, structure or building service equipment before the entire plans and specifications for the whole building, structure or building service equipment have been submitted or approved, provided, adequate information and detailed statements have been filed complying with all pertinent requirements of the technical codes. The holder of such permit shall proceed at his own risk without assurance that the permit for the entire building, structure or building service will be granted.

(b) Retention of Plans. One set of stamped plans and specifications shall be returned to the applicant and shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress. One set of stamped plans, specifications and computations shall be retained by the Building Official for at least ninety (90) days after final approval and inspection of the work. After the retention period the Building Official shall cause to be delivered to the address of the permitted work or to the owner of such plans, specifications and records which are not required by law to be kept as official records.

(c) Validity of Permit. The issuance of a permit or approval of plans and specifications shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this chapter or the technical codes, or of any other ordinance of the jurisdiction.

No permit presuming to give authority to violate or cancel the provisions of these laws shall be valid.

The issuance of a permit based upon plans, specifications and other data shall not prevent the Building Official from thereafter requiring the correction of errors in said plans, specifications and other data, or from preventing building operations being carried on thereunder when in violation of these Codes or of any other ordinances of this jurisdiction.

(d) Expiration. Every permit issued by the Building Official under the provisions of the technical codes shall expire by limitation and become null and void; if the work is not completed within 365 days; or if the building or work authorized by such permit is not commenced within 180 days from the date of such permit; or if the building or work authorized by such permit has not had a satisfactory inspection after the work has commenced for a period of 180 days. Before such work can be recommenced, a new permit shall be first obtained and the fee for such new

permit shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original plans and specifications for such work; and provided further that such suspension or abandonment has not exceeded one year.

Any permittee holding an unexpired permit may apply for an extension of the time within which he may commence or complete work under that permit when he is unable to commence or complete work within the time required by this section for good and satisfactory reasons. The Building Official may extend the time for action by the permittee for a period not exceeding 180 days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than twice once. In order to renew action on a permit after expiration, the permittee shall pay a new full permit fee.

(e) Utility Service. Until all work and inspections are completed and during the course of construction all utility service to the property shall be temporary construction utility service and/or temporary occupancy utility service. Temporary utility service is at the discretion of the Building Official.

(f) Suspension or Revocation. The Building Official may, in writing, suspend or revoke a permit issued under the provisions of this chapter and the technical codes whenever the permit is issued in error or on the basis of incorrect information supplied, or in violation of any ordinance, regulation or any of the provisions of law.

(Amended by Ordinance No. 9-06 N.S.)

6.02.180 - Fees.

(A) General. Fees shall be assessed in accordance with the provisions set forth in the fee schedule adopted by resolution by the City of Richmond.

(B) Permit Fees. The fee for each permit shall be as set forth in City's adopted fee schedule.

For fee based on valuation the determination of value or valuation under any of the provisions of these Codes shall be made by the Building Official. The value to be used in computing the building permit and building plan review fees shall be the total value of all construction work for which the permit is issued as well as all finish work, painting, roofing, electrical, plumbing, heating, air-conditioning, elevators, fire-extinguishing systems and any other permanent equipment.

(C) Plan Review Fees. When a plan or other data are required to be submitted by subsection (B) of Section 6.02.160 a plan review fee shall be paid at the time of submitting plans and specifications for review. Said plan review fee for buildings or structures shall be as adopted in the City's fee schedule.

Where plans are incomplete or changed so as to require additional plan review, an additional plan review fee shall be charged at the rate adopted in the City's fee schedule.

The plan review fees specified in this subsection are separate from any permit fees specified in subsection (B) and are in addition to the permit fees.

(D) Work Without a Permit:

1. Investigation. Whenever any work for which a permit is required by this chapter has been commenced without first obtaining said permit, a special investigation shall be made before a permit may be issued for such work.
2. Fee. An investigation fee, in addition to the permit fee, shall be collected whether or not a permit is then or subsequently issued. The investigation fee shall be equal to the amount of the permit fee required by this chapter. The minimum investigation fee shall be the same as the minimum fee set forth in the City's adopted fee schedule. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of either this chapter or the technical codes nor from any penalty prescribed by law.

(E) Fee Refunds. The Building Official shall not authorize the refunding of any fee paid except upon written application filed by the original permittee not later than 180 days after the date of fee payment.

1. The Building Official may authorize the refunding of any fee paid hereunder which was erroneously paid or collected.
2. The Building Official may authorize the refunding of not more than 80 percent of the permit fee paid when no work has been done under a permit issued in accordance with this chapter.
3. The Building Official may authorize the refunding of not more than 80 percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan checking is done.

(F) Transfer of Permit. The Building Official may authorize the transferring of a permit upon written request of the owner and the permit applicant. Permit transfers shall be charged a filing fee plus a fee of ten percent (10%) of the original permit fee including plan check fees.

6.02.190 - Inspections.

(A) General. All construction or work for which a permit is required shall be subject to inspection by the Building Official and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the Building Official. In addition, certain types of construction shall have special inspection by special inspectors as specified in Section 6.02.210

It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the Building Official nor his jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

A survey of the lot may be required by the Building Official to verify that the structure is located in accordance with stamped plans.

(B) Inspection Record Card. Work requiring a building permit shall not be commenced until the permit holder or his agent shall have posted or otherwise made available the inspection record card such as to allow the Building Official to conveniently make the required entries thereon regarding inspection of the work. This card shall be maintained available by the permit holder until final approval has been issued by the Building Official.

(C) Inspection Requests. It shall be the duty of the person doing the work authorized by a permit to notify the Building Official that such work is ready for inspection. The Building Official may require that every request for inspection be filed at least one working day before such inspection is desired. Such request may be in writing or by telephone at the option of the Building Official.

It shall be the duty of the person requesting any inspections required either by this chapter or the technical codes to provide access to and means for inspection of such work.

(D) Approval Required. No work shall be done beyond the point indicated in each successive inspection without first obtaining the approval of the Building Official. The Building Official, upon notification, shall make the requested inspections and shall either indicate that portion of the construction is satisfactory as completed or shall notify the permit holder or his agent wherein the same fails to comply with this chapter or the technical codes. Any portions which do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the Building Official.

There shall be a final inspection and approval of all buildings and building service equipment when completed and ready for occupancy or use.

(E) Required Building Inspections. Reinforcing steel or structural framework of any part of any building or structure shall not be covered or concealed without first obtaining the approval of the Building Official.

The Building Official, upon notification, shall make the following inspections:

1. Foundation Inspection: To be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. All materials for the foundation shall be on the job, except where concrete is ready mixed in accordance with U.B.C. Standard No. 26-13, the concrete need not be on the job. Where the foundation is to be constructed of approved treated wood, additional inspections may be required by the Building Official.
2. Concrete Slab or Under-Floor Inspection: To be made after all in-slab or under-floor building service equipment, conduit, piping accessories, insulation and other ancillary equipment items are in place but before any concrete is placed or floor sheathing installed, including the subfloor.
3. Frame Inspection: To be made after the roof, all framing, fire blocking and bracing are in place and all pipes, chimneys and vents are complete and the rough electrical, plumbing, and heating wires, pipes, and ducts are approved.
4. Lath and/or Wallboard Inspection: To be made after all lathing and wallboard, interior and exterior, is in place but before any plastering is applied or before wallboard joints and fasteners are taped and finished.
5. Final Inspection: To be made after finish grading and the building is completed and ready for occupancy.

(F) Required Building Service Equipment Inspections:

1. General. All building service equipment for which a permit is required by this chapter shall be inspected by the Building Official. No portion of any building service equipment intended to be concealed by any permanent portion of the building shall be concealed until inspected and approved. When the installation of any building service equipment is complete, an additional and final inspection shall be made. Building service equipment regulated by the technical codes shall not be connected to the water, fuel or power supply or sewer system until authorized by the Building Official.
2. Operation of Building Service Equipment. The requirements of this section shall not be considered to prohibit the operation of any building service equipment installed to replace existing building service equipment serving an occupied portion of the building in the event a request for inspection of such building service equipment has been filed with the Building Official not more than 48 hours after such replacement work is completed, and before any portion of such building service equipment is concealed by any permanent portion of the building.

(G) Other Inspections. In addition to the required inspections specified above, the Building Official may make or require other inspections of any construction work to ascertain compliance with the provisions of this chapter or technical codes and other laws which are enforced by the code enforcement agency.

(H) Reinspections:

1. A reinspection fee may be assessed for each inspection or reinspection when such portion of work for which inspection is called is not complete or when corrections called for are not made.
2. This subsection is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply with the requirements of the technical codes, but as controlling the practice of calling for inspections before the job is ready for such inspection or reinspection.
3. Reinspection fees may be assessed when the permit card is not properly posted on the work site; when the stamped plans are not readily available to the inspector for failure to provide access on the date for which inspection is requested; or for deviating from plans requiring the approval of the Building Official.
4. To obtain a reinspection, the applicant shall file an application therefor in writing upon a form furnished for that purpose, and pay the reinspection fee in accordance with the fee schedule adopted by the City of Richmond.
5. In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

6.02.210 - Special inspections.

(A) General. In addition to the inspections required by Section 6.02.190 the owner shall employ one or more special inspectors who shall provide continuous inspection during construction on the following types of work:

1. Concrete: During the taking of test specimens and placing of all reinforced concrete and pneumatically placed concrete.

Exceptions:

1. Concrete for foundations conforming to the minimum requirements of Table No. 29-A of the Building Code or for Group R, Division 3 or Group M, Division 1 Occupancies, provided the Building Official finds that a special hazard does not exist.
2. For foundation concrete when the structural design is based on f'c no greater than 2500 psi.
3. Nonstructural slabs on grade, including prestressed slabs on grade when effective prestress in concrete is less than 150 pounds per square inch.
4. Site work concrete fully supported on earth and concrete where no special hazard exists.

2. Bolts Installed in Concrete: During installation of bolts and placing of concrete around such bolts when stress increases permitted by Table No. 26-G are utilized.
3. Ductile Moment-Resisting Concrete Frame: As required by Section 2626(h) of the Building Code.
4. Reinforcing Steel and Prestressing Steel:

(a) During all stressing and grouting of prestressed concrete.
(b) During placing of reinforcing steel, placing of tendons and prestressing steel for all concrete required to have special inspection by Item No. 1.

Exception: The special inspector need not be present during entire reinforcing steel and prestressing steel placing operations, provided he has inspected for conformance with the stamped plans, prior to the closing of forms or the delivery of concrete to the jobsite.

5. Welding:
(a) Ductile moment-resisting steel frames. As required by Section 2272(f) of the Building Code.
(b) All structural welding, including welding of reinforcing steel.

Exceptions:

1. When welding is done in an approved fabricator's shop.
2. When approved by the Building Official, single pass fillet welds when stressed to less than 50 percent of the allowable stresses and floor and roof deck welding and welded studs when used for structural diaphragm or composite systems may have periodic inspections in accordance with Section 6.02.210(E) of this chapter. For periodic inspection, the inspector shall check qualifications of welders at the start of work and then make final inspection of all welds for compliance prior to completion of welding.
6. High-Strength Bolting: During all bolt installations and tightening operations.

Exceptions:

1. The special inspector need not be present during the entire installation and tightening operation, provided he has:
(i) Inspected the surfaces and bolt type for conformance to plans and specifications prior to start of bolting:
(ii) And will, upon completion of all bolting, verify the minimum specified bolt tension for 10 percent of the bolts for each connection with a minimum of two bolts per connection.
2. In bearing-type connections when threads are not required by design to be excluded from the shear plane, inspection prior to or during installation will not be required.
7. Structural Masonry: During preparation of masonry wall prisms, sampling and placing of all masonry units, placement of reinforcement, inspection of grout space, immediately prior to closing of cleanouts, and during all grouting operations. Where the f'm is less than 2600 psi and special inspection stresses are used, test specimens may consist of either one prism test for each 5000 square feet of wall area or a series of tests based on both grout and mortar for the first three consecutive days and each third day thereafter.

Exceptions:

(1) Special inspection will not be required for structures designed in accordance with the values in appropriate tables for noncontinuous inspection.
(2) The special inspector need not provide continuous inspection during the placement of masonry units or reinforcement, provided the special inspector has inspected for conformance with the stamped plans prior to any grouting.
8. Reinforced Gypsum Concrete: When cast-in-place Class B gypsum concrete is mixed and placed.
9. Insulating Concrete Fill: During the application of insulating concrete fill when used as part of a structural system.

Exception: The special inspections may be limited to an initial inspection to check the deck surface and placement of reinforcing. The special inspector shall supervise the preparation of compression test specimens during this initial inspection.

10. Sprayed-On Fireproofing: As required by U.B.C. Standard No. 43-9.
11. Piling, Drilled Piers and Caissons: During driving and resting of piles and construction of cast-in-place drilled piles or caissons. See Items Nos. 1 and 3 for concrete and reinforcing steel inspection.
12. Special Grading, Excavation and Filling: During earthwork excavations, grading and filling operations inspection to satisfy requirements of Chapter 29 and Chapter 70 (Appendix) of the Building Code.
13. Special Cases: Work which, in the opinion of the Building Official, involves unusual hazards or conditions.

(B) Number of Special Inspectors. There shall be a sufficient number of special inspectors present for each particular type of construction or operation to adequately perform the inspection.
(C) Special Inspectors:
1. Special inspectors shall be individuals who are qualified for inspection of the particular type of construction or operation requiring special inspection.
2. Special inspectors shall be approved by and shall be responsible to the engineer or architect of record.
(D) Duties and Responsibilities of the Special Inspector:
1. Special inspectors shall observe the work assigned for conformance with the stamped plans and specifications.
2. The special inspector shall furnish inspection reports to the Building Official, the engineer or architect of record, and other designated persons. All discrepancies shall be brought to the immediate attention of the builder for correction, then, if uncorrected, to the proper design authority and to the Building Official.
3. Special inspectors shall submit a final signed report stating that whether the work required special inspection was, to the best of their knowledge, in substantial conformance with the stamped plans and specifications.
(E) PERIODIC SPECIAL INSPECTION. Some inspections may be made on a periodic basis and satisfy the requirements of continuous inspection, provided this periodic scheduled inspection is performed as outlined in the project plans and specifications and approved by the Building Official.
(F) APPROVED FABRICATORS. Special inspections required by this section and elsewhere in this Code or in the technical codes shall not be required where the work is done on the premises of a fabricator registered and approved by the Building Official to perform such work without special inspection. The certificate of registration shall be subject to revocation by the Building Official if it is found that any work done pursuant to the approval is in violation of the technical codes. The approved fabricator shall submit a Certificate of Compliance that the work was

performed in accordance with the stamped plans and specifications to the Building Official and to the engineer or architect of record. The approved fabricator's qualifications shall be contingent on compliance with the following:

1. The fabricator has developed and submitted a detailed fabrication procedural manual reflecting key quality control procedures which will provide a basis for inspection control of workmanship at the fabricator plant.
2. Verification of the fabricator's quality control capabilities, plant and personnel as outlined in the fabrication procedural manual shall be by an approved agency.
3. Periodic plant inspections shall be conducted by an approved inspection or quality control agency to monitor the effectiveness of the quality control program.
4. It shall be the responsibility of the inspection or quality control agency to notify the approving authority in writing of any change to the procedural manual. Any fabricator approval may be revoked for just cause. Reapproval of the fabricator shall be contingent on compliance with quality control procedures during the past year.

(G) WAIVER of SPECIAL INSPECTION. The Building Official may waive the requirement that special inspectors be employed if he finds that the construction is of a minor nature.

6.02.220 - Engineering or architect requirements.

(A) GENERAL. In addition to the inspections required in Section 6.02.190 on work designed by a professional engineer or architect the following shall also apply:

1. Worksite Visits. During the construction or installation of work designed by a professional engineer or architect, the Building Official may require the engineer or architect of record responsible for the design, or such approved authorized representative of the engineer or architect, to make visits at the worksite to observe general compliance with the stamped plans, specifications and approved change orders. The engineer or architect of record shall submit a statement in writing to the Building Official stating that such engineer or architect knows from personal knowledge that the site visits have been made and that any discrepancies have been reported to the Building Official and the builder.
2. Required Worksite Visits. Worksite visits by the engineer or architect of record or such approved authorized representative shall be required for projects in which a special inspector and/or registered deputy inspector is required during construction as stated in this Code or the technical codes.
3. Such observation and statement shall not be relied upon by others as acceptance of the work, nor shall it be construed to relieve the builder in any way of its obligations and responsibilities.

(B) SUPERVISION of SPECIAL INSPECTORS. When any work requires special inspection, the engineer or architect of record shall be responsible for supervising the work of the special inspectors.

(C) CERTIFICATION BY ENGINEER OR ARCHITECT. Prior to the issuance of a Certificate of Occupancy, the engineer or architect of record shall state in writing to the Building Official that to the best of his knowledge, information and belief while exercising reasonable professional judgment, those portions of the work which required special inspection were construed in substantial conformity with the stamped plans and specifications.

6.02.230 - Connection to utilities.

(A) ENERGY CONNECTIONS. No person shall make connections from a source of energy, fuel or power to any building service equipment which is regulated by the technical codes and for which a permit is required by this Code, until approved by the Building Official.

(B) TEMPORARY CONNECTIONS. If the Building Official finds no substantial hazard will result he may authorize the temporary connection of the building service equipment to the source of energy, fuel or power for the purpose of testing building service equipment, or for use under a temporary Certificate of Occupancy.

(C) TEMPORARY CONSTRUCTION UTILITY SERVICE. The Building Official may authorize the temporary connection of temporary construction service equipment to the source of energy, fuel or power for various approved construction activities.

(D) COMPLIANCE WITH ENERGY STANDARDS. The servicing utility company providing energy, fuel or power shall determine that the buildings and structures meet local, state or federal energy resource allocation standards prior to the installation of new permanent utility service. The servicing utility company shall develop a pan to be approved by the City Council of the City of Richmond for dealing with buildings and structures which do not comply with the standards. This Section 6.02.230(D) shall not take effect until December 1, 1986.

(E) REVOCATION. The Building Official may, in writing, suspend or revoke utility connection clearance issued under the provisions of this Code whenever an unsafe condition exists as a result of the clearance, the clearance is being used illegally to occupy the premises or when the energized system is being used for purposes other than those stated on the Certificate of Occupancy. Any utility disconnection or any revocation or suspension of utility connection clearance authorized by this section shall be performed pursuant to the provisions of Section 6.02.110(F).

6.02.240 - Certificate of Occupancy.

(A) USE and OCCUPANCY:

1. No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the Building Official has issued a Certificate of Occupancy therefor as provided herein.
2. A Certificate of Occupancy shall not be issued until the Building Official has accepted all required inspection certifications.

(B) CHANGE IN USE. Changes in the character or use of a building shall not be made except as specified in the Building Code.

(C) CERTIFICATE ISSUED. After final inspection when it is found that the building or structure complies with the provisions of this Code and the technical codes, the Building Official shall issue a Certificate of Occupancy which shall contain the following:

1. The building permit number.
2. The address of the building.
3. The name and address of the owner.
4. A description of that portion of the building for which the certificate was issued.
5.

A statement that the described portion of the building complies with the requirements of this Code and the technical codes for the group and division of occupancy and the use for which the proposed occupancy is classified.

6. The name of the Building Official.

(D) TEMPORARY CERTIFICATE. If the Building Official finds that no substantial hazard will result from occupancy of any building or portion thereof before the same is completed, he may issue a temporary Certificate of Occupancy for the use on a portion or portions of a building or structure prior to the completion of the entire building or structure.

(E) POSTING. The Certificate of Occupancy shall be posted in a conspicuous place on the premises and shall not be removed except by the Building Official.

EXCEPTION: Group R, Division 3, and M Occupancies Certificate need not be posted in a conspicuous place, however, it must be posted in an accessible location.

(F) REVOCATION:

1. The Building Official may, in writing, revoke or suspend a Certificate of Occupancy issued under the provisions of this chapter, whenever the certificate is issued in error or on the basis of incorrect information supplied, or when the Building Official has determined that the building or structure or portion thereof is in violation of any ordinance or regulation or any of the provisions of this chapter.
2. The Building Official shall issue the written notice suspending or revoking the certificate and direct a copy to the record owner of the property by certified mail, return receipt requested at the address shown on the last equalized assessment roll of the county and direct a copy to the occupant(s) of the building or structure by certified mail, return receipt requested at the address of the building or structure. The notice shall contain the street address and sufficient legal description of the property on which the structure is located, a statement of whether the certificate is being suspended or revoked, the basis for the revocation or suspension, and the time within which the use and occupancy of the building or structure be discontinued and the building or structure vacated.
3. Any party aggrieved by the determination of the Building Official to suspend or revoke the certificate may appeal said determination to the Board of appeals by filing a written request for appeal with the Building Official within the time period in which the Building Official has ordered the use to be discontinued. Failure of any person to file an appeal shall constitute a waiver of the right to an administrative hearing and adjudication of the notice suspending or revoking the certificate or any portion thereof.

(Amended by Ordinance No. 11-94 N.S.)

6.02.250 - Adoption of technical codes.

Where any of the technical codes of the City of Richmond are adopted by reference, the effective dates of such codes shall be as follows:

(a) Any new edition of the Uniform Housing Code, the Uniform Building Code, the Uniform Plumbing Code, the Uniform Mechanical Code, and the National Electric Code shall become effective 90 days after publication of said codes in the State Building Standards Code.

(b) Any new edition of any other technical code shall become effective 90 days after the publication date of the new edition.

(Amended by Ordinance No. 11-94 N.S. Source: Ordinance No. 20-86 N.S.)

Chapter 6.04 - BUILDING CODE*

Sections:

6.04.010 - Administration.
6.04.020 - Adoption by reference.
6.04.030 - Copies on file.
6.04.040 - Amendments, additions and deletions.

6.04.010 - Administration.

These regulations shall be known as the "Building Code," and may be cited as such, and will be referred to herein as "this chapter."

This Code is one of the technical codes of Building Regulations and is administered under Chapter 6.02 of the Municipal Code of the City of Richmond as such.

6.04.020 - Adoption by reference.

The most recent edition of the Uniform Building Code, published by the International Conference of Building Officials, including all appendix chapters thereto, except as specifically deleted by Section 6.04.040 of this chapter, is adopted by this reference and incorporated herein the same as though fully set forth in this chapter, subject to the amendments, additions and deletions specified in Section 6.04.040 of this chapter. Any new edition of the Uniform Building Code shall be adopted and shall become effective 90 days after publication of said code in the State Building Standards Code.

(Amended by Ordinance No. 12-94 N.S.)

6.04.030 - Copies on file.

Three copies of the Uniform Building Code and Appendix as adopted by Section 6.04.020, and all amendments thereto, shall be kept on file in the office of the city clerk for inspection by the public.

6.04.040 - Amendments, additions and deletions.

The following amendments, additions and deletions are made to the Uniform Building Code as adopted by Section 6.04.020 of this chapter:

(A) Addition — Chapter 1, Sec. 103 — Revise the Scope to add the following as an additional paragraph to Sec. 103:

"Sec. 103. . . .The Administrative part of this chapter is in addition to the City of Richmond's Building Regulations Administrative Code, Chapter 6.02 of the Municipal Code. Where conflicts occur between this chapter and Chapter 6.02 of the Municipal Code the provisions of Chapter 6.02 of the Municipal Code shall govern."

(B) Amendment — Section 204 — Revise Section 204(a) of the Uniform Building Code to read as follows:

"Sec. 204.(a) General. Appeals of orders, decisions or determinations made by the Building Official relative to the application and interpretation of this code shall be heard and decided by the Board of Appeals, the body created by Richmond Municipal Code Section 6.02.130."

(C) Amendment — Section 409 — HABITABLE SPACE (ROOM). Revise the definition of HABITABLE SPACE (ROOM) to read as follows:

"Sec. 409. HABITABLE SPACE (ROOM) is space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space, greenhouses, and similar areas are not considered habitable space."

(D) Addition — Section 420 — Swimming pool. The following definition is added to the Uniform Building Code Section 420, to read as follows:

"Swimming Pool: Any outside body of water created by artificial means, which is designed or used for swimming or immersion purposes, any portion of which exceeds eighteen inches (18″) in depth except portable swimming pools."

(E) Amendment — Section 1101 — Fences. Division 2 of the Uniform Building Code Section 1101 is amended to read as follows:

"Division 2: Fences over six feet (6′) high, tanks, towers, and swimming pools."

(F) Addition — Section 1107 — Swimming pools. Section 1107 is added to the Uniform Building Code to read as follows:

"(1) To be enclosed. Every swimming pool shall be completely enclosed by a wall, fence or other substantial structure not less than four feet (4′) in height measured on the outside of the enclosure. No openings other than doors and gates with any dimension greater than four inches (4″) shall be permitted therein except that a picket fence may be erected or maintained having horizontal spacing between pickets not more than four inches (4″). All gates or door openings through such enclosures shall be equipped with self-closing and self-latching devices designed to keep and are capable of keeping such door or gate securely closed at all times when not in actual use; provided, however, that the door of any dwelling occupied by human beings and forming any part of the enclosure hereinabove required need not be so equipped. Any self-latching device accessible from the outside of the pool enclosure shall be located at least four feet (4′) above the ground or otherwise equally inaccessible to small children."

"(2) Existing Pools. Existing swimming pools as well as those hereafter constructed shall be enclosed in accordance with the requirements of this section."

(G) Deletion — Appendix Chapter 12. Delete Appendix Chapter 12, "REQUIREMENTS FOR GROUP R, DIVISION 3 OCCUPANCIES."

(H) Amendment — Appendix Chapter 51, Sec. 5110 (b) — Revise the EXCEPTION: to read as follows:

"EXCEPTION: Certificates of inspection shall not be required of conveyances if inspected and certified by the State of California."

(I) Deletion — Appendix Chapter 53. Delete Appendix Chapter 53 "ENERGY CONSERVATION IN NEW BUILDING CONSTRUCTION."

(J) Addition — Appendix Chapter 70, Sec. 7002 — Revise the scope to add the following as a second paragraph to Sec. 7002:

"Sec. 7002. . . .This chapter is in addition to the City of Richmond's Excavation and Grading Ordinance. Where conflicts occur between this chapter and the city's ordinance the most restrictive shall govern."

(Amended by Ordinance No. 12-94 N.S.; Source: Ordinance No. 20-86 N.S.)

Chapter 6.20 - MECHANICAL CODE*

Sections:

6.20.010 - Administration.
6.20.020 - Adoption by reference.
6.20.030 - Copies on file.
6.20.040 - Amendments, additions and deletions.

6.20.010 - Administration.

These regulations shall be known as the "Mechanical Code," may be cited as such, and will be referred to herein as "this chapter."

This code is one of the technical codes of Building Regulations and is administered under Chapter 6.02 of the Municipal Code of the City of Richmond as such.

6.20.020 - Adoption by reference.

The most recent edition of the Uniform Mechanical Code, jointly sponsored by the International Association of Plumbing and Mechanical Officials and the International Conference of Building Officials, including all appendix chapters thereto, except as specifically deleted by Section 6.20.040 of this chapter, is adopted by this reference and incorporated herein the same as though fully set forth in this chapter, subject to the amendments, additions and deletions specified in Section 6.04.040 of this chapter. Any new edition of the Uniform Mechanical Code shall be adopted and shall become effective 90 days after publication of said code in the State Building Standards Code.

(Amended by Ordinance No. 15-94 N.S.)

6.20.030 - Copies on file.

Three copies of the Uniform Mechanical Code and Appendix as adopted by Section 6.20.020, and all amendments thereto, shall be kept on file in the office of the city clerk for inspection by the public.

6.20.040 - Amendments, additions and deletions.

The following amendments, additions and deletions are made to the Uniform Mechanical Code as adopted by Section 6.20.020 of this chapter:

(A) Addition — Chapter 1, Sec. 103 — Revise the Scope to add the following as an additional paragraph to Sec. 103:

"Sec. 103. . . The Administrative part of this chapter is in addition to the City of Richmond's Building Regulations Administrative Code, Chapter 6.02 of the Municipal Code. Where conflicts occur between this chapter and Chapter 6.02 of the Municipal Code, the provisions of Chapter 6.02 of the Municipal Code shall govern."

(B) Amendment — Section 203 — Revise Section 203(a) of the Uniform Mechanical Code to read as follows:

"Sec. 203.(a) General. Appeals of orders, decisions, or determinations made by the Building Official relative to the application and interpretation of this code shall be heard and decided by the Board of Appeals, the body created by Richmond Municipal Code Section 6.02.130."

(Amended by Ordinance No. 15-94 N.S. Source: Ordinance No. 20-86 N.S.)

Chapter 6.28 - PLUMBING CODE*

Sections:

6.28.010 - Administration.
6.28.020 - Adoption by reference.
6.28.030 - Copies on file.
6.28.040 - Amendments, additions and deletions.

6.28.010 - Administration.

These regulations shall be known as the "Plumbing Code," may be cited as such, and will be referred to herein as "this chapter."

This code is one of the technical codes of Building Regulations and is administered under Chapter 6.02 of the Municipal Code of the City of Richmond as such.

6.28.020 - Adoption by reference.

The most recent edition of the Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials, including all appendix chapters thereto and the "IAPMO Installation Standards" appended thereto, except as specifically deleted by Section 6.20.040 of this chapter, is adopted by this reference and incorporated herein the same as though fully set forth in this chapter, subject to the amendments, additions and deletions specified in Section 6.28.040 of this chapter. Any new edition of the Uniform Plumbing Code shall be adopted and shall become effective 90 days after publication of said code in the State Building Standards Code.

(Amended by Ordinance No. 17-94 N.S.)

6.28.030 - Copies on file.

Three copies of the Uniform Plumbing Code and Standards as adopted by Section 6.28.020, and all amendments thereto, shall be kept on file in the office of the City Clerk for inspection by the public.

6.28.040 - Amendments, additions and deletions.

(A) Addition — Chapter 1, Paragraph 10.3 — Revise the Scope to add the following as an additional paragraph to Paragraph 10.3:

"10.3 . . . The Administrative part of this chapter is in addition to the City of Richmond's Building Regulations Administrative Code Chapter 6.02 of the Municipal Code. Where conflicts occur between this chapter and Chapter 6.02 of the Municipal Code the provisions of Chapter 6.02 of the Municipal Code shall govern."

(Source: Ordinance No. 20-86 N.S.)

Chapter 12.17 - SANITARY SEWER CONNECTIONS*

Sections:

12.17.010 - Definitions.
12.17.020 - Sewer connections required.
12.17.030 - Connections to be made without damage to streets.
12.17.040 - Standards for sewer laterals and appurtenant facilities.
12.17.050 - Lateral testing requirements.
12.17.060 - Failure of test.
12.17.070 - Lateral certification.
12.17.080 - Notices to correct violations.
12.17.090 - Persons authorized to perform work.
12.17.100 - Other regulatory considerations.
12.17.110 - Nuisance conditions.
12.17.120 - Right of entry.
12.17.130 - Citation penalties.

12.17.010 - Definitions.

The following definitions apply to this chapter. Terms not defined in this section shall have their ordinary and common meaning or, if applicable, the meaning set forth in the Uniform Plumbing Code:

"Backflow valve" means a valve that is opened by the flow of sewage exiting a structure but closes when the flow reverses, preventing sewage from backing into the structure. All backflow valves shall conform to the specifications set forth in the Uniform Plumbing Code and all guidelines and policies established by the City Engineer to implement this chapter.

"Building sewer" shall have the same meaning as "lateral," defined below.

"Certificate of lateral compliance" means the certificate issued by the City Engineer certifying that a lateral complies with the standards set forth in this chapter. A fee for a certificate of compliance shall be charged in accordance with the City's rate and fee schedule. A certificate of compliance is valid only for the lateral at the address specified in the certificate and for a period of fifteen (15) years.

"City authorized representative" means the City Engineer or his or her designee.

"City of Richmond" or "City" means the City of Richmond and shall include Richmond Municipal Sewer District Number 1.

"City's fee and rate schedule" means a list of all City of Richmond service, penalty, interest, and permit fees, and hourly personnel and equipment rates, as amended from time to time.

"Cleanout" means a segment of pipe connected to a sewer lateral and rising to the surface, providing access to the lateral for purposes of inspection and removal of obstructions. (See also "two-way cleanout," defined below.)

"Commercial building" means any building designed for use as or used for commercial purposes.

"Lateral," "building sewer," or "service lateral" means the sewer pipeline conveying wastewater from the premises of a user to the City's sewer system.

"Main" or "sewer main" means any sewer pipe within a public or private street or right-of-way receiving or intended to receive the discharges of one or more sewer lateral(s). No sewer main constructed after the effective date of this chapter shall be less than eight inches (8") in diameter nor be laid or constructed in any City street, easement or right-of-way under the control of the City, except to the lines, grades, and specifications approved by the City Engineer.

"Maintenance" means routine flushing or rodding of a sewer to maintain a free flowing condition.

"Overflow device" means a device designed to relieve the pressure created when a gravity sewer is flowing full. All overflow devices require the approval of the City Engineer for proper application before their installation.

"Person" means any individual, partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity or any other legal entity, or their legal representative, agents or assigns. The masculine gender shall include the feminine, the singular shall include the plural where indicated by context.

"Plumbing fixtures" means sinks, baths, showers, toilets, bidets, and all fixtures and appliances, such as dishwashers and washing machines, from which water or wastewater are discharged.

"Private sewer main" means a main on private property that connects to the City's sanitary sewer system. A private sewer main shall meet the same standards as a lateral and is subject to all lateral testing, certification and enforcement provisions of this chapter.

"Repair" means physical exposure of a section of pipe and/or appurtenances for the purpose of resuming proper operating condition.

"Replacement" means removal and replacement of existing pipe and/or appurtenances.

"Sanitary sewer system" shall have the same meaning as "publicly owned treatment works" as that term is defined at Richmond Municipal Code Section 12.18.020.

"Service lateral" shall have the same meaning as "lateral," defined above.

"Sewage" means water carrying wastes from residences, business buildings, institutions and industrial establishments, together with such other waters as may be present, or any combination of such wastes and water.

"Sewer facilities" means and includes the sanitary and storm sewage collection systems owned and operated by the City, all appurtenances thereto, and all portions thereof.

"Storm sewer" or "storm drain" means a pipe or conduit which carries storm and surface waters and drainage, but excludes sewage and polluted industrial wastes.

"Subdivider" means to cause land to be divided into separate developed or developable lots that are or may be owned by different persons.

"Two-way cleanout" means a "Y"- or "V"-shaped segment of pipe connected to a sewer lateral and rising to the surface, providing access to the lateral in both directions for purposes of inspection and removal of obstructions.

"User" means and includes any person who causes or permits a discharge of sewage into the City's sanitary sewer system.

"Wastewater" shall have the meaning set forth at Richmond Municipal Code Section 12.18.020.

12.17.020 - Sewer connections required.

Property owners shall provide connections to the sanitary sewer system in accordance with Richmond Municipal Code Sections 12.16.010 and 12.16.020, as those sections may be amended from time to time.

12.17.030 - Connections to be made without damage to streets.

All connections to the City's sanitary sewer system shall be laid without damaging the surface of any improved street unless the City Engineer grants a permit to remove and replace street paving. To obtain such a permit, the applicant shall furnish the City Engineer with a bond with two sufficient sureties in an amount set forth in the City's fee and rate schedule. The bond shall guarantee that the permit holder will restore the street surface to a serviceable condition as good or better than the condition of the street prior to resurfacing.

12.17.040 - Standards for sewer laterals and appurtenant facilities.

(a) Every property owner shall perform all required maintenance and keep the lateral(s) and private sewer main(s), if any, connecting the premises on his or her property to the City's sanitary sewer system in good condition.

(b) Every lateral shall meet the following minimum requirements:

(1) It shall be kept free from roots, grease deposits, and other solids which may impede the flow or obstruct the transmission of waste.

(2) All joints shall be tight and all pipes shall be sound and free from structural defects, cracks, breaks, openings, and missing portions to prevent ex-filtration by waste or infiltration by ground water or storm water.

(3) The grade of every lateral shall be uniform without sags or offsets.

(4) It shall have a two-way cleanout located at or near the property line or at or near the sewer main easement. All cleanouts shall be securely capped at all times.

(5) It shall be equipped with a backflow valve or overflow device.

(6) In conjunction with a lateral serving a structure in which there are plumbing fixtures at an elevation too low to permit drainage by gravity from the fixtures to the sewer main, the property owner shall install and maintain a pump or other appropriate device or devices to lift the contents of the sewer lateral to the City's sanitary sewer system. Such devices shall be installed and maintained in accordance with the Uniform Building and Plumbing Codes and all applicable provisions of the Richmond Municipal Code, and shall be subject to testing, repair and replacement under the provisions of this chapter governing sewer laterals.

12.17.050 - Lateral testing requirements.

(a) All testing procedures must be approved by the City Engineer, or his or her designee, and performed in accordance with approved procedures. Results of all lateral tests shall be filed with the City Engineer. If, after testing, a property owner agrees to undertake specific repairs or replacements to bring a lateral into compliance with the provisions of this chapter, the statement of test results shall specify the repairs or replacements to be completed before retesting; shall state, "The property owner agrees to complete the above repairs and/or replacements and retest the subject lateral(s) in accordance with Richmond Municipal Code Chapter 12.17"; and shall be signed by the property owner.

(b) Laterals for all multi-unit residential buildings, all commercial buildings and all industrial facilities in the City of Richmond and all private sewer mains that connect to the City's sanitary sewer system shall be tested within one (1) year of the effective date of this chapter and shall be repaired or replaced as necessary to ensure compliance with the standards set forth in this chapter.

(c) Whenever title to property located in the City of Richmond is transferred, and the property includes buildings or structures that discharge into a sanitary sewer system, the sewer lateral(s) to the property shall be tested for compliance with the standards set forth in this chapter. Before title is transferred, all repairs or replacements necessary to bring a lateral into compliance shall be performed. A seller shall disclose to prospective purchasers the requirements of this chapter and the compliance status of the subject property. This subsection shall not apply to transfer of title to:

(1) An individual unit in a multi-unit building served by a single lateral;

(2) A property for which there is a valid certificate of lateral compliance;

(3) A property located in the City of Richmond but served by a sanitary sewer service provider that has a lateral maintenance, inspection and repair program in place.

(d) Whenever property located in the City of Richmond and containing one or more structures is subdivided, the sewer lateral(s) serving the property shall be tested. Before the subdivision is approved, all repairs or replacements necessary to bring a lateral into compliance shall be

performed. If the subdivision of land causes structures served by a single lateral to be separated onto different lots, laterals for each lot on which there is a structure shall be constructed in accordance with the Uniform Building and Plumbing Codes and all applicable provisions of the Richmond Municipal Code.

(e) Whenever property located in the City of Richmond is remodeled to include the addition of two or more plumbing fixtures that discharge into a sanitary sewer system, the sewer lateral(s) to the property shall be tested. Before final building inspection, all repairs or replacements necessary to bring a lateral into compliance shall be performed.

(f) The City Engineer reserves the right to notify any owner of property for which there is not a valid certificate of lateral compliance on file that the City shall conduct a random test of the property's sewer lateral in accordance with Richmond Municipal Code Section 12.17.120 and shall notify the property owner of and require the property owner to correct any conditions that do not comply with this chapter.

12.17.060 - Failure of test.

Should a lateral fail the test, the lateral shall be repaired or replaced, as necessary and in accordance with the Uniform Building and Plumbing Codes and all applicable provisions of the Richmond Municipal Code, then retested. This process shall continue until the lateral passes the required test.

12.17.070 - Lateral certification.

Once the lateral has passed the testing procedure and upon payment of the appropriate fee as published in the City's fee and rate schedule, the City Engineer, or his or her designee, shall issue a signed certificate of lateral compliance to the property owner specifying the address of the property served by the subject lateral. A certificate of lateral compliance shall be valid for fifteen (15) years and shall be valid only for the lateral at the address specified in the certificate. The City Engineer shall maintain records of all certificates of lateral compliance issued.

12.17.080 - Notices to correct violations.

If the City Engineer receives notice that a lateral does not meet the standards set forth in this chapter and the property owner has not agreed in writing to perform the repairs or replacements necessary to bring the lateral into compliance, then the City Engineer shall give written notice to the property owner of any conditions that violate this chapter. Such notice shall specify the repair or replacement necessary to correct the condition and the time in which to make the correction, and shall advise the property owner of the enforcement provisions of this chapter.

12.17.090 - Persons authorized to perform work.

Only contractors licensed by the state shall be authorized to construct or repair laterals and mains.

12.17.100 - Other regulatory considerations.

(a) The Uniform Building and Plumbing Codes and other applicable regulations adopted by the City of Richmond shall govern the construction and repair of laterals and mains.

(b) The City Engineer shall establish guidelines and policies for implementing and enforcing this chapter.

(c) If property located in the City of Richmond is served by a sanitary sewer service provider other than the City of Richmond and that service provider has a lateral maintenance, inspection and repair program in place, the property shall be subject to the regulations and standards of the service provider. If property located in the City of Richmond is served by a sanitary sewer service provider that does not have a lateral maintenance, inspection and repair program in place, the property is subject to the requirements of this chapter.

12.17.110 - Nuisance conditions.

All sewer laterals or sewer clean-outs which contain leaks or breaks; uncapped or improperly capped sewer clean-outs; sump pumps; down spouts or yard drains which discharge into the City's sanitary sewer system; and all other sources of accidental, negligent or intended introduction of storm water run off or similar waters into the sanitary sewer system are hereby declared to be a public nuisance, subject to abatement in accordance with Richmond Municipal Code Chapter 9.22 if, after being notified of the nuisance condition, the property owner fails to correct the condition. If the City of Richmond abates a sewer-related public nuisance, the costs of such abatement shall be assessed against the subject property owner and may result in a lien against the subject property in accordance with Richmond Municipal Code Sections 12.16.050 and 12.16.060.

12.17.120 - Right of entry.

The City Engineer, or his or her designee, may enter, inspect, collect wastewater samples, and test any buildings, structures, or premises to secure compliance or prevent a violation of any portion of this chapter. Unless there is an emergency threatening the public health, safety or welfare, the City Engineer shall provide at least ten (10) business days notice to the property owner of intent to enter upon property. The City Engineer may also request that a property owner provide all written records of lateral inspection, maintenance, repair and replacement at the time of inspection or within ten (10) or more business days after receipt of the request.

12.17.130 - Citation penalties.

In addition to, or in lieu of, the remedies set forth in this chapter, any violation of this chapter may result in the issuance of an administrative citation pursuant to Richmond Municipal Code Chapter 2.62.

(Source: Ordinance No. 61-06 N.S.)

Chapter 12.18 - DISCHARGES TO THE WASTEWATER TREATMENT SYSTEM [15]

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12.18.010 - General provisions.

12.18.010.1 - Purpose and policy.

This ordinance sets forth the requirements of users of the Richmond Municipal Sewer District Water Pollution Control Plant and its collection system (collectively, called the WPCP in this ordinance) for the City of Richmond (City), and enables the City to comply with all applicable State and Federal laws, including the Clean Water Act (Title 33 of the United States Code [USC] 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:

A. To prevent the introduction of pollutants into the WPCP that will interfere with its operations;
B. To prevent the introduction of pollutants into the WPCP that will pass through the WPCP, inadequately treated, into receiving waters or atmosphere, or otherwise be incompatible with the WPCP;
C. To protect both WPCP personnel who may be affected by wastewater and sludge in the course of their employment and the general public;
D. To promote reuse and recycling of wastewater, sludge, gases, and other byproducts from the WPCP;
E. To provide for fees for the equitable distribution of the cost of operation, maintenance, and improvement of the WPCP;
F. To prevent sanitary sewage overflows as a result of grease obstructions that subject the City and the public to adverse health risks, State Water Resources Control Board penalties, and civil lawsuits, impact service continuance, and diminish stormwater quality;
G. To comply with San Francisco Bay Regional Water Quality Control Board regulations for establishing a Sanitary Sewer Overflow Plan that also includes a Fats, Oils, and Grease Control Plan;
H. 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 WPCP is subject.

This chapter shall apply to all users of the WPCP. The chapter authorizes the issuance of individual and general wastewater discharge permits; provides for monitoring, compliance, and enforcement activities; establishes administrative review procedures; requires user reporting; and provides for the setting of fees for equitable distribution of costs resulting from the program established herein.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.010.2 - Administration.

Except as otherwise provided herein, the City Engineer shall administer, implement, and enforce the provisions of this chapter. Any powers granted to or duties imposed upon the City Engineer may be delegated by the City Engineer to a duly authorized City employee.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.010.3 - Definitions.

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

A. "Act" or "the Act." The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 USC Section 1251 et seq.
B. "Administrator." The EPA Administrator or their designee.
C. "Applicant." Any person who applies for an individual or coverage under a wastewater discharge permit.
D. "Approval Authority." The San Francisco Bay Regional Water Quality Control Board.
E. "Authorized" or "Duly Authorized Representative of the user."
   (1) If the user is a corporation:
      (a) 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
      (b) 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.

(2) If the user is a partnership or sole proprietorship: a general partner or proprietor, respectively.

(3) If the user is a Federal, State, or local government facility: a director or highest official appointed or designated to oversee the operations and performance of the activities of the government facility, or their designee.

(4) The individuals described in subdivisions (1) through (3) 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 facility. This authorization must be made in writing by the principal executive officer or ranking elected official, and submitted to the City prior to or together with any document being submitted.

F. "Authorized Inspector." An inspector designated by the City Engineer.

G. "Beneficial uses." Any and all use of the waters of the State that are protected against quality degradation, including but not limited to domestic, municipal, and agricultural use, use for industrial supply, power generation, recreation, aesthetic enjoyment, or navigation, use for the preservation and enhancement of fish, wildlife and other aquatic resources or reserves, and other beneficial uses, tangible and intangible, as specified by Federal or State law or other applicable regulations.

H. "Best management practices (BMPs)." The schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions listed in 40 CFR Part 403.5(a)(1) and (b). 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.

I. "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 in milligrams per liter (mg/L).

J. "Bypass." The intentional diversion of wastestreams from any portion of a user's treatment facility.

K. "California Code of Regulations (CCR)." The publication of the State of California government containing finalized State regulations.

L. "Categorical industrial user." Any user subject to a Categorical Pretreatment Standard or Categorical Standard.

M. "Categorical Pretreatment Standard" or "Categorical Standards." Any regulation containing pollutant discharge limits promulgated by EPA in accordance with Sections 307(b) and (c) of the Act (33 USC Section 1317) that apply to a specific category of users and that appear in 40 CFR, Chapter I, Subchapter N, Parts 405-471.

N. "Chemical oxygen demand." A measure of the oxygen required to oxidize all compounds, both organic and inorganic, in water.

O. "City." City of Richmond.

P. "City Engineer." The person, designated by the City, who is in charge with certain duties and responsibilities by this chapter. The term also means a Duly Authorized Representative of the City Engineer.

Q. "Code of Federal Regulations (CFR)." The publication of the United States government that contains finalized Federal regulations.

R. "Commercial garbage/food grinder." A mechanical unit for pulverizing wastes before discharging into the public sewer system by a commercial user.

S. "Commercial user." Any source of wastewater discharge originating from a commercial business.

T. "Cooling water." Water discharges from any use such as air conditioning, cooling, or refrigeration, or to which the only pollutant added is heat.

U. "Daily maximum." The arithmetic average of all effluent samples for a pollutant collected during a calendar day.

V. "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 concentration, the daily discharge is the arithmetic average measurement of the pollutant concentration derived from all measurements taken that day.

W. "Environmental Protection Agency (EPA)." The Regional Water Management Division Director, the Regional Administrator, or other Duly Authorized Official of said agency.

X. "Existing source." Any source of discharge that is not a "new source."

Y. "Fats, oils, and grease (FOG)." Any organic polar compound derived from animal and/or plant sources that contain multiple carbon chain triglyceride molecules.

Z. "Food handling facility (FHF)." Any facility that prepares and/or serves food for commercial use or sale. This includes, but is not limited to, restaurants, cafes, lunch counters, cafeterias, hotels, hospitals, convalescent homes, factory or school kitchens, catering kitchens, bakeries, grocery stores with food preparation and packaging, meat cutting and preparation (excluding grocery stores with only food warming operations), meat packing facilities, and other food handling facilities not listed above where FOG may be introduced to the sewer system and cause line blockages and sewer overflows. This is a process of concern for the City.

AA. "Grab sample." A sample that is taken from a wastestream without regard to the flow in the wastestream and over a period of time not to exceed fifteen (15) minutes.

AB. "Grease collection service." A qualified company that specializes in cleaning grease interceptors and/or hauling grease to an approved waste site.

AC. "Grease separators," or sometimes called "separators." A multi-compartment device designed to retain grease from one or more fixtures. It shall be designed outside of the food establishment and shall be of a size and design in compliance with all current Building and Plumbing Codes adopted by the City.

AD. "Grease trap." A device designed to retain grease from one to a maximum of four fixtures.

AE. "Industrial user." Any source of industrial wastewater discharge.

AF. "Industrial wastewater." All water-carried wastes, excluding domestic and commercial wastewater, resulting from the processing or manufacture of goods or products.

AG. "Instantaneous limit." The maximum concentration of a pollutant allowed to be discharged at any time, determined from the analysis of any discrete or composited sample collected, independent of the industrial flow rate and the duration of the sampling event.

AH. "Interference." A discharge, that alone or in conjunction with a discharge or discharges from other sources, inhibits or disrupts the WPCP, 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 the prevention of sewage sludge use or disposal in compliance with any of the following statutory/regulatory provisions or permits issued thereunder, 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.

AI. "Lateral." A sewer pipeline conveying wastewater from the premises of a user to the City's sewer system. The term "lateral" includes "building sewer" and "service lateral."

AJ. "Lift station." A sump used to allow sewage to accumulate to a level where it is pumped to the sewer system at a higher elevation.

AK. "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).

AL. "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.

AM. "Monthly average." The sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharge" measured during that month.

AN. "Monthly average limit." The highest allowable average of the "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.

AO. "National Pollutant Discharge Elimination System (NPDES) Permit." A permit issued pursuant of Section 402 of the Act, as amended (33 USC Section 1251 et seq.), which regulates discharges from the WPCP to a Water of the United States.

AP. "National Pretreatment Standard." The term "National Pretreatment Standard," "Pretreatment Standard," or "Standard" means any regulation containing pollutant discharge limits promulgated by EPA in accordance with Sections 307(b) and (c) of the Act, which applies to industrial users. This term includes prohibitive discharge limits.

AQ. "New source."

(1) 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 the 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:

(a) The building, structure, facility, or installation is constructed at a site at which no other source is located; or

(b) The building, structure, facility, or installation is totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or

(c) The production or wastewater generating processes of the building, structure, facility, or installation are structurally independent from 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.

(2) 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.

(3) Construction of a new source as defined under this paragraph has commenced if the owner or operator has:

(a) Begun, or caused to begin, as part of a continuous on-site 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

(b) 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.

AR. "Nuisance." Anything which is injurious to health or is indecent or offensive to the senses or an obstruction to the free use of property so as to interfere with the comfort or enjoyment of life or property or which affects at the same time an entire community or neighborhood or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

AS. "Pass through." A discharge which exits the WPCP 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.

AT. "Permittee." A user that is permitted by the City with a wastewater discharge permit.

AU. "Person." Any individual, partnership, copartnership, 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.

AV. "pH." A measure of acidity or alkalinity of a solution, expressed in standard units.

AW. "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, TSS, turbidity, color, BOD, COD, toxicity, or odor).

AX. "Premises." Any land, including any improvements or structures thereon, which is owned, used, occupied, leased or operated by a user and from or on which discharges occur or wastewater is created.

AY. "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 WPCP. 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.

AZ. "Pretreatment Requirements." Any substantive or procedural requirement related to pretreatment imposed on a user, other than a Pretreatment Standard.

BA. "Pretreatment Standards" or "Standards." Pretreatment Standards shall mean prohibited discharge standards, Categorical Pretreatment Standards, and local limits.

BB. "Process of concern." For the purpose of the City's FOG Control Program, this means any business that has FOG on-site or generally any business process that introduces material or matter into wastewater.

BC. "Process wastewater." Any water, which during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product from any industrial, commercial, institutional, or agricultural source.

BD. "Prohibited discharge standards" or "prohibited discharges." Absolute prohibitions against the discharge of certain substances; these prohibitions appear in Section 12.18.020.1 of this chapter.

BE. "Publicly owned treatment works (POTW)." A treatment works, as defined by Section 212 of the Act (33 USC Section 1292), which is owned by the City. This definition includes any devices or systems used in the collection, storage, treatment, recycling, and reclamation of sewage or industrial wastes of a liquid nature and any conveyances, which convey wastewater to a treatment plant. In this chapter, the POTW is the Richmond Municipal Sewer District Water Pollution Control Plant and its collection system.

BF. "Septic tank waste." Any sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.

BG. "Sewage." Human excrement and gray water (household showers, dishwashing operations, etc.).

BH. "Significant industrial user (SIU)." Except as provided in paragraphs (3) and (4) below, an SIU is:

(1) An industrial user subject to Categorical Pretreatment Standards; or

(2) An industrial user that:

(a) Discharges an average of twenty-five thousand (25,000) gallons per day (gpd) or more of process wastewater to the POTW (excluding sanitary, non-contact cooling, and boiler blowdown wastewater);

(b) Contributes a process wastestream which makes up five percent (5%) or more of the average dry weather hydraulic or organic capacity of the WPCP; or

(c) Is designated as such by the City on the basis that it has reasonable potential for adversely affecting WPCP operation or for violating any Pretreatment Standard or Requirement.

(3) The City may determine that an industrial user subject to Categorical Pretreatment Standards is a non-significant categorical industrial user rather than an SIU on a finding that the industrial user never discharges more than one hundred (100) 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:

(a) The industrial user, prior to the City's finding, has consistently complied with all applicable Categorical Pretreatment Standards and Requirements;

(b) The industrial user annually submits the certification statement required in Section 12.18.060.14(B) (see 40 CFR Part 403.12(q)) of this chapter, together with any additional information necessary to support the certification statement; and

(c) The industrial user never discharges any untreated concentrated wastewater.

(4) Upon a finding that a user meeting the criterion in Section 12.18.010.3(BH)(2) of this chapter has no reasonable potential for adversely affecting WPCP 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 403.8(f)(6), determine that such user should not be considered an SIU.

BI. "Significant noncompliance (SNC)." Any action of conduct by a user which constitutes a violation of any applicable regulation and which consists of one or more of the following:

(1) Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all of the measurements taken for the same pollutant parameter during a 6-month period exceed (by any magnitude) a numeric Pretreatment Standard or Requirement, including instantaneous limits, as defined by 40 CFR Part 403.3(l);

(2) Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of all of the measurements taken for the same pollutant parameter during a six- (6-) month period equal or exceed the product of the numeric Pretreatment Standard or Requirement including instantaneous limits, as defined by 40 CFR Part 403.3(l) multiplied by the applicable TRC (TRC=1.4 for BOD, TSS, fats, oil, and grease, and 1.2 for all other pollutants except pH);

(3) Any other violation of a Pretreatment Standard or Requirement as defined by 40 CFR Part 403.3(l) (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 City personnel or the general public);

(4) Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the City's exercise of its emergency authority to halt or prevent such a discharge;

(5) Failure to meet, within ninety (90) days after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance;

(6) Failure to provide, within forty-five (45) days after the due date, required reports such as baseline monitoring reports, ninety- (90-) day compliance reports, periodic self monitoring reports, and reports on compliance with compliance schedules;

(7) Failure to accurately report noncompliance; or

(8) Any other violation or group of violations, which may include a violation of BMPs, which the City determines will adversely affect the operation or implementation of its Pretreatment Program.

BJ. "Slug load" or "slug discharge." Any discharge at a flow rate or concentration, which could cause a violation of the prohibited discharge standards in Section 12.18.020.1 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 City's regulations or local limits or the user's wastewater discharge permit conditions.

BK. "Standard industrial classification (SIC)." The system of classifying industries as identified in the *Standard Industrial Classification Manual* (1972), Office of Management and Budget and as may be amended.

BL. "Standard Specifications." The document entitled, *Standard Specifications for Sewer Construction*, which includes the specifications and drawings to be used in design and construction of laterals and sewers.

BM. "State." The State of California, including any department or agency thereof.

BN. "Stormwater." Any flow occurring during or following any form of natural precipitation, and resulting from such precipitation, including snowmelt.

BO. "Total suspended solids" or "suspended solids." 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.

BP. "United States Code (USC)." The codification by subject matter of the general and permanent laws of the United States.

BQ. "User." A source of wastewater discharge to the WPCP.

BR. "Waste." Sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation of whatever nature, including such waste placed within containers of whatever nature prior to, and for the purposes of, disposal.

BS. "Wastewater." Liquid and water-carried industrial wastes and sewage from residential dwelling, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or untreated, which are contributed to the WPCP.

BT. "Wastewater discharge permit." A permit issued to a user that allows it to discharge wastewater to the WPCP.

BU. "Water softener." A unit using an ion-exchange process requiring sodium chloride ion to regenerate the exchange bed.

BV. "Waters of the State." Any water, surface or underground, including saline waters within the boundaries of the State as defined in 40 CFR Part 230.3(s).

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.020 - General sewer use requirements.

12.18.020.1 - Prohibited discharge standards.

A. General Prohibitions. No user shall introduce or cause to be introduced into the WPCP any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the WPCP whether or not they are subject to Categorical Pretreatment Standards or any other Federal, State, or local Pretreatment Standards or Requirements.

B. Specific Prohibitions. No user shall introduce or cause to be introduced into the WPCP the following pollutants, substances, or wastewater:

(1) Pollutants which create a fire or explosive hazard in the WPCP, including, but not limited to, wastestreams 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*;

(2) Wastewater having a pH less than 6.0 or more than 10.0, or otherwise causing corrosive structural damage to the POTW or equipment;

(3) Solid or viscous substances, such as, but not limited to, grease, garbage with particles greater than one-half (0.5) inch in any dimension, animal guts or tissues, paunch manure, bones, hair, hides or fleshing, entrails, whole blood, feathers, ashes, cinders, sands, spent lime, stone or marble dust, metal, glass, straw, shavings, grass clippings, rags spent grains, spent hops, waste paper, wood, plastics, gas, tar, asphalt residues, residues from refining or processing of fuel or lubricating oil, mud, glass grindings, or polishing wastes, in amounts which will cause obstruction of the flow in the WPCP resulting in interference;

(4) 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 WPCP;

(5) Wastewater having a temperature greater than 140 degrees F (60 degrees C), or 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);

(6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral origin, in amounts that will cause interference or pass through;

(7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the WPCP in a quantity that may cause acute worker health and safety problems;

(8) Trucked or hauled pollutants, except at discharge points designated by the City Engineer in accordance with Section 12.18.030.5 of this chapter;

(9) Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;

(10) Pollutants that impart color, which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions;

(11) Wastewater containing any radioactive wastes or isotopes except in compliance with applicable State or Federal regulations;

(12) Stormwater, surface water, groundwater, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, non-contact cooling water, and unpolluted wastewater, unless specifically authorized by the City Engineer;

(13) Sludges, screenings, or other residue from the pretreatment of industrial wastes;

(14) Medical wastes, except as specifically authorized by the City Engineer in a wastewater discharge permit;

(15) Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to fail toxicity test;

(16) Detergents, surface-active agents, or other substances that might cause excessive foaming in the WPCP;

(17) Wastewater causing two readings on an explosion hazard meter at the point of discharge into the sanitary sewer system, or at any point in the WPCP, of more than five percent (5%) as hexane or any single reading over ten percent (10%) of the lower explosive limit (LEL) of the meter. LEL values may be found in the NIOSH *Pocket Guide to Chemical Hazards*. Prohibited materials include, but are not limited to, gasoline, kerosene, naphtha, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, carbides, hydrides, and sulfides.

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 WPCP.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.020.2 - National Categorical Pretreatment Standards.

Users must comply with the Categorical Pretreatment Standard found in 40 CFR Chapter I, Subpart N, Parts 405-471.

A. Where a Categorical Pretreatment Standard is expressed only in terms of either the mass or the concentration of a pollutant in wastewater, the City Engineer may impose equivalent concentration or mass limits in accordance with Sections 12.18.020.2(F)—(G).

B. When the limits in a Categorical Pretreatment Standard are expressed only in terms of mass of pollutant per unit of production, the City Engineer may convert the limits to equivalent limitations expressed either as a mass of pollutant discharged per day or effluent concentration for the purposes of calculating effluent limitations applicable to individual industrial users.

C. When wastewater subject to a Categorical Pretreatment Standard is mixed with wastewater not regulated by the same Standard, the City Engineer shall impose an alternate limit in accordance with 40 CFR Part 403.6(e).

D. A CIU may obtain a net/gross adjustment to a Categorical Pretreatment Standard in accordance with the following paragraphs of this section:

(1) Categorical Pretreatment Standards may be adjusted to reflect the presence in the industrial user's intake water in accordance with this section. Any industrial user seeking to obtain credit for intake pollutants must make an application to the City. Upon request of the industrial user, the applicable Standard will be calculated on a "net" basis (i.e., adjusted to reflect credit for pollutants in the intake water) if the requirements of Section 12.18.020.2(D)(2) are met.

E. When a Categorical Pretreatment Standard is expressed only in terms of pollutant concentrations, an industrial user may request that the City convert the limits to equivalent mass limits. The determination to convert concentration limits to mass limits is within the discretion of the City Engineer. The City may establish equivalent mass limits only if the industrial user meets all the conditions set forth in Section 12.18.020.2(E)(1)(a)—(e).

(1) To be eligible for equivalent mass limits, the industrial user must:

(a) Employ, or demonstrate that it will employ, water conservation methods and technologies that substantially reduce water use during the term of its wastewater discharge permit;

(b) Currently use control and treatment technologies adequate to achieve compliance with the applicable Categorical Pretreatment Standard, and not have used dilution as a substitute of treatment;

(c) Provide sufficient information to establish the facility's actual average daily flow rates for all wastestreams, based on data from a continuous effluent flow monitoring device, as well as the facility's long-term average production rate. Both the actual average daily flow rate and the long-term average production rate must be representative of current operating conditions;

(d) Not have daily flow rates, production levels, or pollutant levels that vary so significantly that equivalent mass limits are not appropriate to control the discharge; and

(e) Have consistently complied with all applicable Categorical Pretreatment Standards during the period prior to the industrial user's request for equivalent mass limits.

(2) An industrial user subject to equivalent mass limits must:

(a) Maintain and effectively operate control and treatment technologies adequate to achieve compliance with the equivalent mass limits;

(b) Continue to record the facility's flow rates through the use of a continuous effluent flow monitoring device;

(c) Continue to record the facility's production rates and notify the City Engineer whenever production rates are expected to vary by more than twenty percent (20%) from its baseline production rates determined in Section 12.18.020.2(F) of this chapter. Upon notification of a revised production rate, the City Engineer will reassess the equivalent mass limit and revise the limit as necessary to reflect changed conditions at the facility; and

(d) Continue to employ the same or comparable water conservation methods and technologies as those implemented pursuant to Section 12.18.020.2(E)(1)(a) of this chapter so long as it discharges under an equivalent mass limit.

(3) When developing equivalent mass limits, the City Engineer:

(a) Will calculate the equivalent mass limit by multiplying the actual average daily flow rate of the regulated process(es) of the industrial user by the concentration-based daily maximum and monthly average standard for the applicable Categorical Pretreatment Standard and the appropriate unit conversion factor.

(b) Upon notification of a revised production rate, will reassess the equivalent mass limit and recalculate the limit as necessary to reflect changed conditions at the facility; and

(c) May retain the same equivalent mass limit in subsequent wastewater discharge permits terms if the industrial user's actual average daily flow rate was reduced solely as a result of the implementation of water conservation methods and technologies, and the actual average daily flow rates used in the original calculation of the equivalent mass limit were not based on the use of dilution as a substitute for treatment pursuant to Section 12.18.020.6 of this chapter. The industrial user must also be in compliance with Section 12.18.130.3 of this chapter.

F. The City Engineer may convert the mass limits of the Categorical Pretreatment Standards of 40 CFR Parts 414, 419, and 455 to concentration limits for the purposes of calculating limitations applicable to individual industrial users. The conversion is at the discretion of the City Engineer.

G. Once included in its wastewater discharge permit, the industrial user must comply with the equivalent limitations developed in this section in lieu of the promulgated Categorical Pretreatment Standards from which the equivalent limitations were derived.

H. Many Categorical Pretreatment Standards specify one limit for calculating maximum daily discharge limitations and second limit for calculating maximum monthly average, or 4-day average, limitations. Where such Categorical Pretreatment Standards are being applied, the same production or flow figure shall be used in calculating both the average and maximum equivalent limitation.

I. Any industrial user operating under a wastewater discharge permit incorporating equivalent mass or concentration limits calculated from a production-based Categorical Pretreatment Standard shall notify the City Engineer within two (2) business days after the user has a reasonable basis to know that the production level will significantly change within the next calendar month. Any user not notifying the City Engineer of such anticipated change will be required to meet the mass or concentration limits in its wastewater discharge permit that were based on the original estimate of the long-term average production rate.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.020.3 - State Pretreatment Standards.

Users must comply with all applicable State Pretreatment Standards.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.020.4 - Local limits.

A. The City is authorized to establish local limits pursuant of 40 CFR Part 403.5(c).

B. The following pollutant limits are established to protect against pass through and interference. No person shall discharge wastewater containing in excess of the following (daily maximum limit):

160[1] mg/L	Ammonia as N
0.11 mg/L	Arsenic (total recoverable)
1.0 mg/L	Benzene
220 mg/L	BOD_5
0.05 mg/L	Cadmium (total recoverable)
0.27 mg/L	Chromium (total recoverable)
1.37 mg/L	Chloroform
0.65 mg/L	Copper (total recoverable)
0.29 mg/L	Cyanide (total)
0.3 mg/L	Lead (total recoverable)
0.005 mg/L	Mercury (total)
0.27 mg/L	Nickel (total recoverable)
90 mg/L	Oil and grease (total)
0.030 mg/L	Selenium (total recoverable)
0.25 mg/L	Silver (total recoverable)
0.35 mg/L	Sulfide (total as S)
1.0 mg/L	Tetrachloroethylene
1.0 mg/L	Toluene
430 mg/L	Total suspended solids
0.004 mg/L	Tributyltin
1.0 mg/L	Xylene
1.0 mg/L	Zinc (total recoverable)

[1] The local limit for West County Landfill leachate is 100 pounds per day (lb/day). All other industrial users must achieve a local limit of 160 mg/L.

The above limits apply at the point where the wastewater is discharged to the WPCP. The City Engineer may impose mass limitations in addition to the concentration-based limitations above.

C. The City may develop BMPs, by ordinance or in an individual or general wastewater discharge permits, to implement local limits and the requirements of Section 12.18.020.1

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.020.5 - Right to revision.

The City reserves the right to establish, by ordinance or in individual or general wastewater discharge permits, more stringent Standards or Requirements on discharges to the WPCP consistent with the purpose of this chapter.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.020.6 - 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 Engineer may impose mass limitations on users who are using dilution to meet applicable Pretreatment Standards or Requirements, or in other cases where imposition of mass limitations is appropriate.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.030 - Pretreatment of wastewater.

12.18.030.1 - 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 set out in Section 12.18.020 of this chapter within the time limits 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 Engineer for review, and shall be acceptable to the City Engineer 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.030.2 - Fats, oils, and grease.

A. Fats, Oils, and Grease Program.
   (1) Fats, oils, and grease interceptors:
      (a) FOG separators and grease interceptors shall be provided, at the user's expense, where, in the opinion of the City Engineer, they are necessary for proper handling of wastes containing these substances in excessive amounts, or any flammable wastes or harmful ingredients. All grease interceptors shall be of a type and capacity approved by the City Engineer, and shall be located so it is readily and easily accessible for inspection and cleaning.
      (b) FOG separators and grease interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction and equipped with removable covers.
      (c) Where installed, all FOG separators or grease interceptors shall be maintained and in continuous efficient operation at all times.
   (2) These facilities must have a FOG Management Program Permit. An Authorized Inspector and/or the City Engineer shall have right of entry as described in Section 12.18.070.1 of this chapter.
   (3) Fees, charges, and penalties are pursuant of Section 12.18.140 of this chapter.
   (4) Dishwashers and food grinders are prohibited from discharging through the grease trap pursuant of the State of California Plumbing Code.
   (5) A grease collection service shall be required for all facilities that generate FOG.
   (6) If significant grease accumulation (e.g., a partial blockage) is found downstream or if significant grease wicking is found upstream of the process of concern, an Authorized Inspector and/or the City Engineer may inspect the facility. The inspection will include a review of the grease management program, treatment system, waste storage area, and drains not flowing to the treatment system. BMPs not in place, hauler receipts for the prior three (3) years not available, and/or training documents not current may result in future inspections with an assessed fee as published in the City's fee schedule (see Section 12.18.140).
   (7) If a business is shown to be the cause of a grease-related sewer overflow, the user will be responsible for the cost of clean-up as set forth in Section 12.18.140

B. Administration of FOG Program. The City shall administer a FOG program, which is intended to prevent fats, oils, and grease, and other substances that are likely to block or create a hazard within the sewer system from entering the system through use of grease interceptors or grease traps. The City may require any non-domestic user to install a grease interceptor or grease trap according to the guidelines set for in the City's Standard Specifications or other program prior to or at any time after connection to the WPCP if the City discovers or determines subsequent to the connection of the facility, the user produces a waste with characteristics that would require installation of a grease interceptor or grease trap pursuant of this chapter.

The installation of a proper grease interceptor or grease trap device shall be the responsibility of the user that applies for the connection or wastewater discharge permit. The City shall determine whether a grease interceptor, grease trap, or other interceptor is required on a case-by-case basis based on an evaluation of the following criteria including, but not limited to:

   (1) The type of facility (restaurant, bakery, cheese factory, yogurt shop, gas station, lube facility, etc.);
   (2) The volume of the user's business or operation (number of meals served, number of seats, hours of operation, etc.);
   (3) Size and nature of facilities (including kitchen facilities) based on size, type, number of fixtures, and types of processing and/or cooking equipment used;
   (4) The type of service provided or operation undertaken (such as dine-in meal service versus carry-out meal service);
   (5) The type of foods and other materials used in the cooking, processing, or manufacturing operations carried on within the user's facility;
   (6) The overall potential for grease-laden, flammable, or sand-laden discharges; and
   (7) The existence of devices, procedures, or processes which are designed to minimize the amount of grease, sand, oil, or other flammable liquids from entering the sewer system.

The design, location, and procedures for operation of a required grease interceptor or grease trap shall be approved by the City. Such approval shall be obtained prior to the user's connection of the facility to the WPCP, in the event of new construction or remodeling. In instances where a user has already connected and the City determines that a grease interceptor or grease trap must be installed, the user shall promptly provide for the installation of the device, including providing such design and operational plans as may be required. The installation of a grease interceptor or grease trap as required by this chapter on an existing user facility shall occur within a reasonable time not to exceed one hundred (100) days after the user has been provided notice that a grease interceptor or grease trap must be installed. This time limit may only be extended by the City in a written agreement.

C. Grease Interceptor Maintenance Procedures and Program. Any user, required by the City and/or this chapter to install and/or operate a grease interceptor or grease trap, shall adequately maintain the device so that the device is in proper working order at all times. Grease and oil interceptors shall be cleaned by a licensed and permitted waste hauler on a periodic basis to assure that the grease interceptor will operated as designed at all times. Any user, required to install or have in operation a grease interceptor or grease trap pursuant of this chapter, shall have a plan of operation or program for their facility that is intended to ensure that the grease interceptor or grease trap operates as designed to prevent grease, oil, sand, or other harmful constituents from entering the sewer system. These procedures may be include adoption of kitchen practices to minimize grease-laden garbage, which may ultimately enter the facility's drains and floor traps and/or other such procedures as may be required for proper operation of the grease interceptors.
   (1) Grease interceptors shall be cleaned out completely by a FOG collection service as necessary to assure that the grease interceptor will operate as designed at all times or as otherwise specified by the City.
   (2) Decanting or discharging of removed waste back into the grease interceptor, for the purpose of reducing the volume to be hauled, is prohibited.
   (3) The use of additives, directly or indirectly to the plumbing or sewer system, to emulsify grease and/or oil, is specifically prohibited.
   (4) The use of biological additives as a supplement to grease interceptor maintenance, including the addition of microorganisms, may be authorized by the City Engineer. Approval shall be obtained (in writing) prior to use of such additives.
   (5) Maintenance records indicating date of service, volume pumped, name of waste hauler, and waste disposal location for each pumping of the grease interceptor must be kept for a minimum of three (3) years. The records must be provided to the City Engineer when requested during normal business hours.
   (6) All waste removed from a grease interceptor must be disposed of at a facility permitted by Contra Costa County or other applicable regulatory agencies to receive such waste. Pumped out FOG shall not be returned to the sewer system, nor any private wastewater system, nor storm drains.
   (7) Any fixture connected to a grease interceptor shall have a non-removable, secured food strainer of such integrity so as to withstand daily operational usage.

D. Best Management Practices.
   (1) Drain Screen. After March 1, 2006, drain screens shall be installed on all drainage pipes for all new food services establishments deemed by the City Engineer to generate FOG.
   (2) Waste FOG:
      (a) All waste FOG shall be collected and stored properly in recycling barrels, drums, or bins.
      (b) Such recycling barrels, drums, or bins shall be maintained appropriately to ensure they do not leak or enter the City's stormwater collection system by direct discharge or by commingling with stormwater.
      (c) A licensed collection service must be used to dispose of waste FOG.
   (3) Food Waste. All food waste shall be disposed of directly into the trash or garbage and not in sinks.
   (4) Employee Training:
      (a) Employees of food service establishments shall be trained within three (3) months after the effective date of this chapter, and two (2) times each calendar year thereafter, on the following subjects:
         (i) How to "dry wipe" pots, pans, dishware, and work areas before washing to remove FOG.
         (ii) 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.
         (iii) The location and use of absorption products to clean under fryers and other locations where grease may be spilled or dripped.
      (b) Training shall be documented and employee signatures retained indicating each employee's attendance and understanding of the practices.
      (c) Training records shall be available for review at any reasonable time by an Authorized Inspector and/or the City Engineer.
   (5) Kitchen exhaust filters shall be cleaned as frequently as necessary in order to maintain good operating condition.
   (6) All BMPs shall be posted conspicuously in the food preparation and dishwashing areas and process areas at all times.

E. Grease Separators (Traps) for Treating FOG Wastes.
   (1) Facilities that have FOG, but are not required to have a grease interceptor, must have an adequate-sized grease trap as determined by the City Engineer.
   (2) Required connections to grease traps: all three compartment sinks, scullery (preparation) sinks, and pre-wash sinks at dishwashing stations.
   (3) Prohibited connections or additives to grease traps:
      (a) Final rinse discharge from automatic dishwashers/sanitizers shall not be connected to the grease trap.
      (b) Chemical additives, such as chlorinated solvents, or any other additives that causes the emulsification of grease, are strictly prohibited from use in any grease trap.
   (4) Maintenance of the grease trap shall be as often as required to maintain it in an efficient operating condition.
   (5) For ease of inspection and maintenance, the area around the grease trap must be kept free of storage and the top of the grease trap must not be bolted down.
   (6) A maintenance log for the grease trap must be kept for a minimum of three (3) years and must be provided at the request of the City.

F. Grease Interceptors for Treating FOG Wastes.

(1) Grease interceptors shall be required for new food handling facilities constructed after March 1, 2006.

(2) Grease interceptors are required for food handling facilities that generate FOG when there is remodeling, additions, alterations, or repairs valued at or greater than what is specified in the City's fee schedule.

(3) Effective March 1, 2006, those food handling facilities operating without a grease interceptor shall, within six (6) months of written notification by the City Engineer, be required to install a grease interceptor if the City Engineer determines that the food service establishment is not adhering to the BMPS set forth in Section 12.18.030.2(D) of this chapter, or that the food service establishment has caused or contributed to a sewer system blockage resulting in maintenance requirements and/or sewage spills.

(4) All new grease interceptors shall be designed, constructed, and installed in accordance with the current City of Richmond Building and Plumbing Codes, and shall be subject to approval by the Building Regulations Department.

(5) All submitted drawings shall be prepared by a licensed and registered professional engineer. Any false information or misleading calculations submitted shall be the responsibility of the user.

(6) All grease interceptors shall be located such that they are readily and easily accessible for cleaning, inspection, and removal of intercepted waste.

(7) A common grease interceptor shared by multiple businesses can be utilized if specifically authorized by the City Engineer upon evidence of legal operating and maintenance agreements between the involved users.

(8) All grease interceptors shall include an effluent sample box and a sanitary tee located on the discharge side of the sample box of a type and size approved by the City.

(9) Inspection by the City of installed grease interceptors and piping prior to backfilling is required. Piping shall meet the requirements of the City of Richmond Building and Plumbing Code.

(10) Grease interceptors shall have a clean-out installed after the sample box on the private lateral as required by the City of Richmond Building and Plumbing Code.

(11) Required connections to grease interceptors: all three compartment sinks, scullery (preparation) sinks, floor drains and mop sinks along the cook line, pre-wash sinks at dishwashing stations, and all other fixtures that contribute grease into the sewer system.

(12) No food service establishment or other identified user shall construct, remodel, or convert a grease interceptor without approval by the City.

(13) Prohibited connections or additives to grease interceptors:

(a) Final rinse discharge from automatic dishwashers/sanitizers shall not be connected to the grease interceptor.

(b) The use of any additive such as surfactants or chemicals shall not be connected to any type of grease interceptor. Chemical additives, such as chlorinated solvents, or another other additives that cause the emulsification of grease, are strictly prohibited from use in any type of grease interceptor.

G. Waivers for Treating FOG Wastes.

(1) A food handling facility, or business with a process of concern determined to have no immediate adverse impact on the sewer system because of business type may be granted a waiver from grease trap or grease interceptors installation requirements.

(2) The City Engineer may, at any time, revoke a waiver and require the food handling facility to install a grease interceptor.

(3) A grease interceptor or grease trap may not be required for business types listed below:

(a) Facilities only serving beverages;

(b) Facilities serving beverages and/or ready-to-eat, packaged, or unpackaged items;

(c) Ice cream parlors without any baking or other food preparation;

(d) Snack bars with no food preparation other than food warming;

(e) Bakeries with no food preparation other than food warming; or

(f) Other facilities serving only ready-to-eat foods with or without food warming.

H. Enforcement of FOG Program. Pursuant of this chapter and/or lawful direction from the City, any user who fails to maintain a grease interceptor or grease trap shall be subject to enforcement procedures set forth in Sections 12.18.100, 12.18.110, and/or 12.18.120 of this chapter. Enforcement actions may be initiated if the user fails to maintain, pump, and/or institute a proper grease or flammable substance reduction program and/or providing appropriate employee training.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.030.3 - Additional pretreatment measures.

A. Whenever deemed necessary, the City Engineer 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 wastestreams from industrial wastestreams, and other such conditions may be necessary to protect the WPCP and determine the user's compliance with the requirements of this chapter.

B. The City Engineer may require any person discharging to the WPCP 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.

C. Water Softeners. This chapter does not prohibit the use of water softener units which:

(1) Were installed and in operation on or before January 31, 1966; and

(2) Are regenerated by the owner at the place of use of the unit.

This requirement shall not apply to water softener units that are commercially recharged and are not regenerated at the user's address. The discharge of salt waste from any unit allowed continuance by the provisions of this chapter shall be prohibited if the existing unit is replaced or repairs are made thereto in excess of fifty percent (50%) of the original cost of the unit.

D. Users with the potential to discharge flammable substances may be required to install and maintain an approved combustible gas detection meter.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.030.4 - Accidental discharge/slug discharge control plan.

The City Engineer shall evaluate whether each SIU needs an accidental discharge/slug discharge control plan or other action to control slug discharges. The City Engineer 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 Engineer may develop such a plan for any user. An accidental discharge/slug discharge control plan shall address, at a minimum, the following:

A. Description of the discharge practices, including non-routine batch discharges;
B. Description of stored chemicals;
C. Procedures for immediately notifying the City Engineer of any accidental or slug discharge, as required by Section 12.18.060.6 of this chapter; and
D. 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.030.5 - Hauled wastewater.

A. Septic tank waste may be introduced into the WPCP only at locations designated by the City Engineer, and at such times as are established by the City Engineer. Such waste shall not violate Section 12.18.020 of this chapter or any other requirements established by the City. The City Engineer may require septic tank waste haulers obtain coverage under an individual or general wastewater discharge permit.
B. The City Engineer may require haulers of industrial waste to obtain coverage under an individual or general wastewater discharge permit. The City Engineer may require generators of hauled industrial waste to obtain coverage under an individual or general wastewater discharge permit. The City Engineer may also prohibit the disposal of hauled industrial waste. The discharge of hauled industrial waste is subject to all other requirements of this chapter.
C. Industrial waste haulers may discharge loads only at locations designated by the City Engineer. No load may be discharged without prior consent of the City Engineer. The City Engineer may collect samples of each hauled load to ensure compliance with applicable Standards. The City Engineer may require the industrial waste hauler to provide a waste analysis of any load prior to discharge.
D. Industrial waste haulers must provide a waste-tracking form for every load. This form shall include, at a minimum, the name and address of the industrial waste hauler, permit number, truck identification, names and address of sources of waste, and volume and characteristics of waste. The form shall identify the type of the industry, known or suspected waste constituents, and whether any wastes are RCRA hazardous wastes.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040 - Wastewater discharge permits.

12.18.040.1 - Wastewater analysis.

When requested by the City Engineer, a user must submit information on the nature and characteristics of its wastewater within ten (10) days of the request. The City Engineer is authorized to prepare a form for this purpose and may periodically require users to update this form.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040.2 - Wastewater discharge permit requirement.

A. No SIU shall discharge wastewater into the POTW without first obtaining coverage under an individual or general wastewater discharge permit from the City Engineer, except that an SIU that has filed a timely application pursuant to Section 12.18.040.5 of this chapter may continue to discharge for the time period specified therein.
B. The City Engineer may require other users to obtain coverage under an individual or general wastewater discharge permit as necessary to carry out the purposes of this chapter.
C. Any violation of the terms and conditions of a wastewater discharge permit shall be deemed a violation of this chapter, and subjects the permittee to sanctions set out in Sections 12.18.100, 12.18.110, and 12.18.120 of this chapter. Obtaining coverage under an individual or general wastewater discharge permit does not relieve the permittee of its obligation to comply with all Federal and State Pretreatment Standards or Requirements or with any other requirements of Federal, State, or local law.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040.3 - Wastewater discharge permitting: Existing connections.

Any user required to obtain coverage under an individual or general wastewater discharge permit who was discharging wastewater into the WPCP 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 Engineer for an individual or coverage under a general wastewater discharge permit in accordance with Section 12.18.040.5 of this chapter, and shall not cause or allow discharges to the WPCP to continue after ninety (90) days of the effective date of this chapter except in accordance with a wastewater discharge permit issued by the City Engineer.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040.4 - Wastewater discharge permitting: New connections.

Any user required to obtain coverage under an individual or general wastewater discharge permit who proposes to begin or recommence discharging into the WPCP must obtain such permit prior to the beginning or recommencing of such discharge. An application for this wastewater discharge permit, in accordance with Section 12.18.040.5 of this chapter, must be filed at least ninety (90) days prior to the date upon which any discharge will begin or recommence.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040.5 - Wastewater discharge permit application contents.

A. All users required to obtain coverage under an individual or general wastewater discharge permit must submit a permit application. The City Engineer may require users to submit all or some of the following information as part of a permit application:
   (1) Identifying Information.
      (a) The name and address of the facility, including the name of the operator and owner.
      (b) Contact information, description of activities, facilities, and plant production processes on the premises;
   (2) Environmental Permits. A list of any environmental control permits held by or for the facility.
   (3) Description of Operations.
      (a) A brief description of the nature, average rate of production (including each product produced by type, amount, processes, and rate of production), and SIC codes of the operation(s) carried out by the user. This description should include a schematic process diagram, which indicates points of discharge to the WPCP from the regulated processes.
      (b) Types of wastes generated, and a list of all raw materials and chemicals used or stored at the facility that are, or could accidentally or intentionally be, discharged to the WPCP;
      (c) Number and type of employees, hours of operation, and proposed or actual hours of operation;
      (d) Type and amount of raw materials processed (average and maximum per day);
      (e) 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;
   (4) Time and duration of discharges;
   (5) The location for monitoring all wastes covered by the permit;
   (6) Flow Measurement. Information showing the measured average daily and maximum daily flow, in gpd, to the WPCP from regulated process streams and other streams, as necessary, to allow use of the combined wastestream formula (40 CFR Part 403.6(e)).
   (7) Measurement of Pollutants.
      (a) The Categorical Pretreatment Standard applicable to each regulated process and any new categorical regulated processes for existing sources.
      (b) The results of sampling and analysis identifying the nature and concentration and/or mass, where required by the Standard or by the City Engineer, of regulated pollutants in the discharge from each regulated process.
      (c) Instantaneous, daily maximum, and long-term average concentrations, or mass, where required, shall be reported.
      (d) The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in Section 12.18.060.10 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 Engineer or the applicable Standards to determine compliance with the Standard.
      (e) Sampling must be performed in accordance with procedures set out in Section 12.18.060.11 of this chapter.
   (8) 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 a discharge based on Section 12.18.060.4(B) of this chapter (40 CFR Part 403.12(e)(2)).
   (9) Any other information as may be deemed necessary by the City Engineer to evaluate the permit application.

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

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040.6 - Wastewater discharge permitting: General permits.

A. The City Engineer, at his/her discretion, may use general wastewater discharge permits to control discharges to the WPCP if all facilities to be covered by the general wastewater discharge permit meet all the following conditions:
   (1) Involve the same or substantially similar types of operations;
   (2) Discharge the same types of wastes;
   (3) Require the same effluent limitations;
   (4) Require the same or similar monitoring; and
   (5) In the opinion of the City Engineer, are more appropriately controlled under a general wastewater discharge permit than under an individual wastewater discharge permit.

B. To be covered under a general wastewater discharge permit, the user must file a written request for coverage that identifies its contact information, production processes, types of wastes generated, location for monitoring all wastes covered by the general wastewater discharge permit, any requests in accordance with Section 12.18.060.4(B) for a monitoring waiver for a pollutant neither present nor expected to be present in the discharge, and any other information the City Engineer deems appropriate. A monitoring waiver for a pollutant neither present nor expected to be present in the discharge is not effective in the general wastewater discharge permit until after the City Engineer has provided written notice to the user that such a waiver request has been granted in accordance with Section 12.18.060.4(B).

C. The City Engineer will retain a copy of the general wastewater discharge permit, documentation to support the City's determination that a specific user meets the criteria of Sections 12.18.040.6(A)(1)—(5) and applicable State regulations, and a copy of the user's written request for coverage for three (3) years after the expiration of the general wastewater discharge permit.

D. The City Engineer may not control a user through a general wastewater discharge permit where the facility is subject to production-based Categorical Pretreatment Standards or Categorical Pretreatment Standards expressed as a mass of pollutant discharged per day or for users whose limits are based on the combined wastestream formula (40 CFR Part 403.6(e)) or net/gross calculations.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040.7 - Application signatories and certifications.

A.

All wastewater discharge permits applications, user reports, and certification statements must be signed by an Authorized Representative of the user (see Section 12.18.010.3(E)) and contain the certification statement in Section 12.18.060.14(A).

B. 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 user, a new written authorization satisfying the requirements of this section must be submitted to the City Engineer prior to or together with any reports to be signed by an Authorized Representative.

C. A facility determined to be a non-significant categorical industrial user by the City Engineer pursuant of Section 12.18.010.3(BI) must annually submit the signed certification statement in Section 12.18.060.14(B) (40 CFR Part 403.3(v)(2)).

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.040.8 - Wastewater discharge permit decisions.

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

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050 - Wastewater discharge permit issuance.

12.18.050.1 - Wastewater discharge permit duration.

An individual or coverage under a general wastewater discharge permit shall be issued for a specified period of time, 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 Engineer. Each wastewater discharge permit will indicate a specific date upon which it will expire.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050.2 - Wastewater discharge permit contents.

Wastewater discharge permit shall include such conditions as are deemed reasonably necessary by the City Engineer to prevent pass through or interference, protect the quality of the water body receiving WPCP effluent, protect worker health and safety, facility sludge management and disposal, and protect against damage to the WPCP.

A. Wastewater discharge permits must contain:
   (1) A statement that indicates the issuance date, expiration date, and effective date of the wastewater discharge permit;
   (2) A statement that the wastewater discharge permit is non-transferrable without prior notification to the City in accordance with Section 12.18.050.5 of this chapter, and provisions for furnishing the new owner or operator with a copy of the existing wastewater discharge permit;
   (3) Effluent limits, including BMPs, based on applicable Pretreatment Standards;
   (4) 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;
   (5) The process for seeking a waiver from monitoring for a pollutant neither present nor expected to be present in the discharge in accordance with Section 12.18.060.4(B);
   (6) A statement of applicable civil and criminal penalties for violation of Pretreatment Standards and Requirements, and any applicable compliance schedule. Such schedule may not be extend the time for compliance beyond that required by applicable Federal, State, or local law;
   (7) Requirements to control slug discharge, if determined by the City Engineer to be necessary; and
   (8) Any grant of the monitoring waiver by the City Engineer must be included as a condition in the user's permit.

B. Wastewater discharge permits may contain, but need not be limited to, the following conditions:
   (1) Limits on the average and/or maximum rate of discharge, time of discharge, and/or requirements for flow regulation and equalization;
   (2) 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 to the WPCP;
   (3) Requirements for the development and implementation of spill control plans or other special conditions including management practices necessary to adequately prevent accidental, unanticipated, or non-routine discharges;
   (4) Development and implementation of waste minimization plans to reduce the amount of pollutants discharged to the WPCP;
   (5) The unit charge or schedule of user charges and fees for the management of wastewater discharged to the WPCP;
   (6) Requirements for installation and maintenance of inspection and sampling facilities and equipment, including flow measurement devices;
   (7) 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 Requirements including those which become effective during the term of the wastewater discharge permit; and
   (8) Other conditions deemed appropriate by the City Engineer to ensure compliance with this chapter, and Federal and State laws, rules, and regulations.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050.3 - Permit appeals.

The City shall provide public notice of the issuance of all wastewater discharge permits. Any person, including the user, may petition the City Council to reconsider the terms of a wastewater discharge permit within thirty (30) days of notice of its issuance. The City Council shall give notice to the user of the time and place for a public hearing at least ten (10) days prior to the date of the public hearing. At the public hearing, the user may appear personally or through counsel, cross-examine witnesses, and present evidence in its behalf.

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 provision(s) objected to, the reasons for this objection, and the alternative conditions, if any, it seeks to place in the wastewater discharge permit.
C. The effectiveness of the wastewater discharge permit shall not be stayed pending appeal.
D. If the City Council fails to act within sixty (60) 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 modify a wastewater discharge permit shall be considered final administrative actions for purpose 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 Superior Court for Contra Costa County within thirty (30) days.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050.4 - Permit modification.

A. The City Engineer may modify an individual 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 WPCP 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 WPCP, City personnel, or the receiving waters;
(5) Violation of any terms or conditions of the wastewater discharge permit;
(6) Misrepresentation 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 Section 12.18.050.5

B. The City Engineer may modify a general 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) A change in the WPCP that requires either a temporary or permanent reduction or elimination of the authorized discharge;
(3) To correct typographical or other errors in the wastewater discharge permit; or
(4) To reflect a transfer of facility ownership or operation to a new owner or operator where requested in accordance with Section 12.18.050.5

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050.5 - Wastewater discharge permit transfer.

Individual or coverage under a general wastewater discharge permit may be transferred to a new owner or operator only if the permittee gives at least sixty (60) days advanced notice to the City Engineer, and the City Engineer approves the permit transfer. The notice to the City Engineer must include a written certification by the new owner or operator which:

A. States that the new owner/operator has no immediate intent to change the facility's operations and processes;
B. Identifies the specific date on which the transfer is to occur; and
C. Acknowledges full responsibility for complying with the existing wastewater discharge permit.

Failure to provide advance notice of a transfer renders a wastewater discharge permit void as of the date of the facility transfer.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050.6 - Wastewater discharge permit revocation.

The City Engineer may revoke an individual or coverage under a general wastewater discharge permit for good cause, including, but not limited to, the following reasons:

A. Failure to notify the City Engineer of significant changes to the wastewater prior to the changed discharge;
B. Failure to provide prior notification to the City Engineer pursuant of Section 12.18.060.5 of this chapter;
C. Misrepresentation or failure to fully disclose all relevant facts in the wastewater discharge permit application;
D. Falsifying self-monitoring reports and certification statements;
E. Tampering with monitoring equipment;
F. Refusing to allow the City Engineer timely access to the facility premises and records;
G. Failure to meet effluent limitations;
H. Failure to pay fines;
I. Failure to pay sewer charges;
J. Failure to meet compliance schedules;
K. Failure to complete a wastewater survey or wastewater discharge permit application;
L. Failure to provide advance notice of the transfer of business ownership of a permitted facility; or

M. Violation of any Pretreatment Standard or Requirement, or any terms of a wastewater discharge permit, or this chapter.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050.7 - Wastewater discharge permit reissuance.

A user with an expiring individual or coverage under a general wastewater discharge permit shall apply for wastewater discharge permit reissuance by submitting a complete permit application, in accordance with Section 12.18.040.5 of this chapter, a minimum of ninety (90) days prior to the expiration of the user's existing wastewater discharge permit.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.050.8 - Regulation of waste received from other jurisdictions.

A. If another jurisdiction, or user located within another jurisdiction, contributes wastewater to the POTW, the City Engineer shall enter into an agreement with the contributing jurisdiction.

B. Prior to entering into an agreement as required by Section 12.18.050.8(A), the City Engineer shall request the following information from the contributing jurisdiction:
   (1) A description of the quality and volume of wastewater discharged to the POTW by the contributing jurisdiction;
   (2) An inventory of all users located within the contributing jurisdiction that are discharging to the POTW; and
   (3) Other such information that the City Engineer deems necessary.

C. An agreement, as required by Section 12.18.050.8(A), shall contain the following conditions:
   (1) A provision specifying which pretreatment implementation activities, including wastewater discharge permit issuance, inspection and sampling, and enforcement, will be conducted by the contributing jurisdiction; which of these activities will be conducted by the City Engineer; and which of these activities will be conducted jointly by the contributing jurisdiction and City Engineer;
   (2) A requirement for the contributing jurisdiction to provide the City Engineer with access to all information that the contributing jurisdiction obtains as part of its pretreatment activities;
   (3) Limits on the nature, quality, and volume of the contributing jurisdiction's wastewater at the point where it discharges to the POTW;
   (4) Requirements for monitoring the contributing jurisdiction's discharge;
   (5) A provision ensuring the City Engineer access to facilities of users located within the contributing jurisdiction's boundaries for the purpose of inspection, sampling, and other duties deemed necessary by the City Engineer; and
   (6) A provision specifying remedies available for breach of the terms of the agreement.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060 - Reporting requirements.

12.18.060.1 - Baseline monitoring reports.

Users that become subject to new or revised Categorical Pretreatment Standards are required to comply with the following reporting requirements even if they have been designated as non-significant categorical industrial users.

A. Within either one hundred eighty (180) days after the effect 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 categorical industrial users currently discharging to or scheduled to discharge to the WPCP shall submit to the City Engineer a report which contains information listed in Section 12.18.060.1(B). At least ninety (90) days prior to commencement of their discharge, new sources, and sources that become categorical industrial users subsequent to the promulgation of an applicable Categorical Standard, shall submit to the City Engineer a report which contains the information listed in Section 12.18.060.1(B). A new source shall report the method of pretreatment it intends to use to meet applicable Categorical Standards. A new source shall also give estimates of its anticipated flow and quantity of pollutants to be discharged.

B. Users described above shall submit the information set forth below.
   (1) All information required in Sections 12.18.040.5(A)(1)(a), 12.18.040.5(A)(2), 12.18.040.5(A)(3)(a), and 12.18.040.5(A)(6).
   (2) Measurement of Pollutants.
      (a) The user shall provide the information required in Sections 12.18.040.5(A)(7)(a)—(d).
      (b) The user shall take a minimum of one (1) representative sample to compile data necessary to comply with the requirements of this paragraph.
      (c) 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 wastewater are mixed with the regulated wastewater prior to pretreatment, the user should measure the flows and concentrations necessary to allow use of the combined wastestream formula in 40 CFR Part 403.6(e) to evaluate compliance with 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.
      (d) Sampling and analysis shall be performed in accordance with Section 12.18.060.10
      (e) The City Engineer may allow the submission of a baseline report which utilizes only historical data as long as the data provide information sufficient to determine the need for industrial pretreatment measures.
      (f) 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 WPCP.
   (3) Compliance Certification. A statement, reviewed by the user's Authorized Representative (as defined in Section 12.18.010.3(E) and certified by a qualified professional, indicating whether Pretreatment Standard are being met on a consistent basis, and, if not, whether additional operation and maintenance and/or additional pretreatment is required to meet Pretreatment Standards and Requirements.

(4) Compliance Schedule. If additional pretreatment and/or operation and maintenance will be required to meet Pretreatment Standards, the shortest schedule by which the user will provide such additional pretreatment and/or operation and maintenance 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 of this section must meet the requirements set out in Section 12.18.060.2 of this chapter.

(5) Signature and Report Certification. All baseline monitoring reports must be certified in accordance with Section 12.18.060.14(A) of this chapter and signed by an Authorized Representative (as defined in Section 12.18.010.3(E)).

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.2 - Compliance schedule progress reports.

The following conditions shall apply to the compliance schedule required by Section 12.18.060.1(B)(4) of this chapter.

A. 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 the 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);

B. No increment referred to above shall exceed nine (9) months;

C. The user shall submit a progress report to the City Engineer 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

D. In no event shall more than nine (9) months elapse between such progress reports to the City Engineer.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.3 - 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 to the WPCP, any user subject to such Pretreatment Standards and Requirements shall submit to the City Engineer a report containing the information described in Sections 12.18.040.5(A)(6)—(7) of this chapter. For all other user[s] 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 Section 12.18.060.14(A) of this chapter. All sampling will be done in conformance with Section 12.18.060.10.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.4 - Periodic compliance reports.

All SIUs are required to submit periodic compliance reports even if they have been designated a non-significant categorical industrial user under the provisions of Section 12.18.060.4(C).

A. Except as specified in Section 12.18.060.4(C), all users must, at a frequency determined by the City Engineer, submit no less than twice per year (June 15 and December 15) 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 Engineer or the Pretreatment Standard necessary to determine the compliance status of the user.

B. The City may authorize a user subject to a Categorical Pretreatment Standard 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 only present 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:

(1) The waiver may be authorized where a pollutant is determined to be present solely due to sanitary wastewater being discharged from the facility provided that the sanitary wastewater is not regulated by an applicable Categorical Pretreatment Standard and otherwise includes no process wastewater.

(2) The monitoring waiver is valid only for the duration for 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. (See Section 12.18.040.5(A)(8).)

(3) In making a demonstration that a pollutant is not present, the user must provide data from at least one (1) sampling of the facility's process wastewater prior to any treatment present at the facility that is representative of all wastewater from all processes.

(4) The request for a monitoring waiver must be signed in accordance with Section 12.18.010.3(E), and include the certification statement in Section 12.18.060.14(A).

(5) Non-detectable sample results may be used only as a demonstration that a pollutant is not present if the EPA-approved method from 40 CFR Part 136 with the lowest minimum detection level for that pollutant was used in the analysis.

(6) Any grant of a monitoring waiver by the City Engineer 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 Engineer for three (3) years after the expiration of the waiver.

(7) Upon approval of the monitoring waiver and revision to the user's wastewater discharge permit by the City Engineer, the user must certify on each report with the certification statement in Section 12.18.060.14(C), that there has been no increase in the pollutant in its wastestream due to activities of the user.

(8)

In the event that a waived pollutant is found to be present or expected to be present because of changes that occur in the user's operations, the user must immediately comply with the monitoring requirements of Section 12.18.060.4(A), or other more frequent monitoring requirements imposed by the City Engineer, and notify the City Engineer.

(9) This provision does not supersede certification processes and requirements established in Categorical Pretreatment Standards, except as otherwise specified in the Categorical Pretreatment Standard.

C. The City may reduce the requirement for periodic compliance reports (40 CFR Part 403.12(e)(1)) to a requirement to report no less frequently than once per year, unless required more frequently in the Pretreatment Standard or by EPA or the State, where the user's total categorical wastewater flow does not exceed any of the following:

(1) 0.01 percent (0.01%) of the design dry weather hydraulic capacity of the WPCP, or five thousand (5,000) gpd, whichever is smaller, as measured by a continuous effluent flow monitoring device unless the user discharges in batches.

(2) 0.01 percent (0.01%) of the design dry weather organic treatment capacity of the WPCP; and

(3) 0.01 percent (0.01%) of the maximum allowable headworks loading for any pollutant regulated by the applicable Categorical Pretreatment Standard for which approved local limits were developed in accordance with Section 12.18.020.4 of this chapter.

Reduced reporting is not available to users that have in the last two (2) years been in significant noncompliance, as defined in Section 12.18.010.3(BI) of this chapter. In addition, reduced reporting is not available to a user with daily flow rates, production levels, or pollutant levels that vary so significantly that, in the opinion of the City Engineer, decreasing the reporting requirement for this user would result in data that are not representative of conditions occurring during the reporting period.

D. All periodic compliance reports must be signed and certified in accordance with Section 12.18.060.14(A) of this chapter.

E. 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 the 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.

F. If a user subject to the reporting requirement of this section monitors any regulated pollutant at the appropriate sampling location more frequently than required by the City Engineer, using the procedures prescribed in Section 12.18.060.11 of this chapter, the results of this monitoring shall be included in the report.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.5 - Reports of changed conditions.

Each user must notify the City Engineer of any significant changes to the user's operations or system which might alter the nature, quality, or volume of the its wastewater at least sixty (60) days before the change.

A. The City Engineer 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 Section 12.18.040.5 of this chapter.

B. The City Engineer may issue an individual or coverage under a general wastewater discharge permit under Section 12.18.050 of this chapter or modify the existing wastewater discharge permit under Section 12.18.050.4 of this chapter in response to changed conditions or anticipated changed conditions.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.6 - Reports of potential problems.

A. In cases 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 WPCP, the user shall immediately telephone and notify the City Engineer 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.

B. Within five (5) days following such discharge, the user shall, unless waived by the City Engineer, 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 WPCP, 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 of this chapter.

C. 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 Section 12.18.060.6(A). Employers shall ensure that all employees, who could cause such a discharge to occur, are advised of the emergency notification procedure.

D. SIUs are required to notify the City Engineer immediately of any changes at its facility affecting the potential for a slug discharge.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.7 - Reports from unpermitted users.

Users not required to obtain a wastewater discharge permit shall provide appropriate reports to the City Engineer as he/she may require.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.8 - Notice of violation/repeat sampling and reporting.

If sampling performed by a user indicates a violation, the user must notify the City Engineer 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 Engineer within thirty (30) days after becoming aware of the violation. Resampling by the user is not required if the City performs sampling at the user's facility at least once per month, or if the City performs sampling at the user's facility 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.9 - Notification of the discharge of hazardous waste.

A. Any user who commences 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 to the WPCP 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 WPCP, the notification shall also contain the following information to the extent that such information is known and readily available to the user:

(1) An identification of the hazardous constituents contained in the wastes;

(2) An estimation of the mass and concentration of such constituents in the wastestream discharged during that calendar month; and

(3) An estimation of the mass of constituents in the wastestream 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 needs to be submitted only once for each hazardous waste discharged. However, notifications of changed conditions must be submitted under Section 12.18.060.5 of this chapter. The notification requirement of this section does not apply to pollutants already reported by the users subject to Categorical Pretreatment Standards under the self-monitoring requirements of Sections 12.18.060.1, 12.18.060.3, and 12.18.060.4 of this chapter.

B. Users are exempt from the requirements of Section 12.18.060.9(A) 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.

C. In the case of any new regulations under Section 3001 of RCRA identifying additional characteristics of hazardous waste or listing any additional substances as a hazardous waste, the user must notify the City Engineer, the EPA Regional Waste Management Division Director, and State hazardous waste authorities of the discharge of such substance within ninety (90) days of the effective date of such regulations.

D. 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.

E. This provision does not create a right to discharge any substance not otherwise permitted to be discharged by this chapter, a wastewater discharge permit issued thereunder, or any applicable Federal or State law.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.10 - Analytical requirements.

All pollutant analyses, including sampling techniques, to be submitted as part of the 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 EPA determines that the Part 136 sampling and analysis are inappropriate for the pollutant in question, sampling and analyses shall be performed by using validated analytical methods for any other applicable sampling and analytical procedures, including procedures suggested by the City Engineer or other parties approved by EPA.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.11 - Sample collection.

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 the data that is representative of conditions occurring during the reporting period.

A. Except as indicated in Sections 12.18.060.11(B)—(C), the user must collect wastewater samples using twenty-four- (24-) hour flow-proportional composite sampling techniques, unless time-proportional composite sampling or grab sampling is authorized by the City Engineer. 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 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.

B. Samples for oil and grease, temperature, pH, cyanide, total phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.

C. For sampling required in support of baseline monitoring and 90-day compliance reports required in Sections 12.18.060.1 and 12.18.060.3, 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 Engineer may authorize a lower minimum. For the reports required in Section 12.18.060.4, the user is required to collect the number of grab samples necessary to assess and assure compliance with applicable Pretreatment Standards and Requirements.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.12 - 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.13 - 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 Section 12.18.020.4(C). Records shall include the date, exact place, method and time of sampling, and the name of the person(s) taking the samples; the date 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 Engineer.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.060.14 - Certification statements.

A. Certification of Wastewater Discharge 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 Section 12.18.040.7; users submitting baseline monitoring reports under Section 12.18.060.1(B)(5); user[s] submitting compliance reports on Categorical Pretreatment Standard deadlines under Section 12.18.060.3; users submitting periodic compliance reports required by Section 12.18.060.4 (A)—(D); and user[s] submitting an initial request to forego sampling of a pollutant on the basis of Section 12.18.060.4(B)(4). The following certification statement must be signed by an Authorized Representative as defined in Section 12.18.010.3(E):

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.

B. Annual Certification for Non-Significant Categorical Industrial Users. A facility determined to be a non-significant categorical industrial user by the City Engineer pursuant of Sections 12.18.010.3(BH)(3) and 12.18.040.7(C) must annually submit the following certification statement signed in accordance with the signatory requirements in Section 12.18.010.4(E). This certification must accompany an alternative report required by the City Engineer.

Based on my inquiry of the person or persons directly responsible for managing compliance with the Categorical Pretreatment Standards under 40 CFR Parts ;#rule;, I certify that, to the best of my knowledge and belief that during period from ;#rule;, ;#rule; to ;#rule;, ;#rule; [months, days, years]:

(1) The facility described as _____ [facility name] met the definition of a non-significant categorical industrial user as described in Section 12.18.010.3(BH)(3);

(2) The facility complied with all applicable Pretreatment Standards and requirements during this reporting period; and

(3) The facility never discharged more than one hundred (100) gallons of total categorical wastewater on any given day during this reporting period.

This compliance certification is based on the following information:

_____

_____

C. Certification of Pollutants Not Present. Users that have been approved a monitoring waiver based on Section 12.18.060.4(B) must certify on each report with the following statement that there has been no increase in the pollutant in its wastestream 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 (s) ;#rule; [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 ;#rule; [list pollutant(s)] in the wastewaters due to the activities at the facility since filing the last periodic report under Section 12.18.060.4(A).

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.070 - Compliance monitoring.

12.18.070.1 - Right of entry: Inspection and sampling.

An Authorized Inspector or the City Engineer 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 Authorized Inspector or City Engineer 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.

A. 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 Authorized Inspector or City Engineer shall be permitted to enter without delay for the purposes of performing specific responsibilities.

B. The Authorized Inspector or City Engineer shall have the right to set up on the user's premises, or require installation of, such devices as are necessary to conduct sampling and/or metering of the user's operations.

C. The City Engineer 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 according to manufacturer's specifications to ensure their accuracy.

D. 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 notice or verbal request of the City Engineer and shall not be replaced. The costs of clearing such access shall be borne by the user.

E.

Unreasonable delays in allowing the Authorized Inspector or City Engineer access to the user's premises shall be a violation of this chapter.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.070.2 - Search warrants.

If an Authorized Inspector or City Engineer has been refused access to a building, structure, or property, or any part thereof, and is able to demonstrate probable cause to believe 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 overall public health, safety, and welfare of the community, the City may seek issuance of a search warrant from the Contra Costa County Superior Court.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.080 - Confidential information.

Information and data on a user obtained from reports, surveys, wastewater discharge permit applications, wastewater discharge permits, and monitoring programs, and from 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 Engineer, 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 in 40 CFR Part 2.302 shall not be recognized as confidential information and shall be available to the public without restriction.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.090 - Publication of users in significant noncompliance.

The City shall publish annually, in a newspaper of general circulation that provides meaningful public notice within the jurisdictions served by the WPCP, a list of 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 the following:

A. Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all measurements taken for the same pollutant parameter during a six- (6-) month period exceed (by any magnitude) a numeric Pretreatment Standard or Requirement, including instantaneous limits as defined in Section 12.18.020
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 defined in Section 12.18.020 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 Section 12.18.020 (daily maximum, long-term average, instantaneous limit, or narrative standard) that the City Engineer determines has caused, alone or in combination with other discharges, interference, or pass through, including endangering the health of the WPCP personnel or the general public;
D. Any discharge of a pollutant that has caused imminent endangerment to the public or the environment, or has resulted in the City Engineer'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, period 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 Engineer determines will adversely affect the operation or implementation of the Pretreatment Program.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100 - Administrative enforcement remedies.

12.18.100.1 - Notification of violation.

When the City Engineer 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 Engineer may serve upon that user a written Notice of Violation. Within fourteen (14) 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 Engineer. 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 Engineer to take any action, including emergency actions or any other enforcement actions, without first issuing a Notice of Violation.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100.2 - Consent orders.

The City Engineer 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 of Sections 12.18.100.4 and 12.18.100.5 of this chapter and shall be judicially enforceable.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100.3 - Show cause hearing.

The City Engineer may order the user which has violated, or continues to violate, any provision of this chapter, wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standards or Requirement, to appear before the City Engineer and show cause why the proposed enforcement action should not be taken. Notice shall be served on the user specifying the time and place of 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. This notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least fourteen (14) days prior to the hearing. Such notice may be served on any Authorized Representative of the user (as defined in Section 12.18.010.3(E) and required by Section 12.18.040.7(A)). A show cause hearing shall not be a bar against, or prerequisite for, taking any other action against the user.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100.4 - Compliance orders.

When the City Engineer finds that a user has violated, or continues to violate, any provision of this chapter, wastewater discharge permit, or order issued hereunder, or any other Pretreatment Standard or Requirement, the City Engineer may issue an order to the user responsible for the discharge directing that the user comes 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100.5 - Cease and desist orders.

When the City Engineer 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 Engineer may issue an order to the user directing it to cease and desist all such violations and directing the user to:

A. Immediately comply with all requirements; and

B. Take such appropriate remedial or preventative 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100.6 - Administrative fines.

A. When the City Engineer 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 Engineer may fine such user in accordance with Section 12.20.055 of the City of Richmond Municipal Code. Such fines shall be assessed on a per-violation per-day basis. In the case of monthly or other long-term average discharge limits, fines shall be assessed for each day during the period of violation.

B. Unpaid charges, fines, and penalties shall, after thirty (30) days calendar days, be assessed an additional penalty of ten percent (10%) of the unpaid balance, and interest shall accrue thereafter at a monthly rate. A lien against the user's property shall be sought for unpaid charges, fines, and penalties.

C. Users desiring to dispute such fines must file a written request for the City Engineer to reconsider the fine along with full payment of the fine amount within thirty (30) days of being notified of the fine. Where a request has merit, the City Engineer 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 Engineer may add the costs of preparing administrative enforcement actions, such as notices and orders, to the fine.

D. Issuance of an administrative fine shall not be a bar against, or a prerequisite for, taking any other action against the user.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100.7 - Emergency suspension.

The City Engineer 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 Engineer may also immediately suspend a user's discharge after notice and opportunity to respond, that threatens to interfere with the operation of the WPCP, or which presents, or may present, an endangerment to the environment.

A. 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 Engineer may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the WPCP, its receiving stream, or endangerment to any individuals. The City Engineer may allow the user to recommence its discharge when the user has demonstrated to the

satisfaction of the City Engineer that the period of endangerment has passed, unless the termination proceedings in Section 12.18.100.8 of this chapter are initiated against the user.

B. 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 Engineer prior to the date of any show cause or termination hearing under Sections 12.18.100.3 or 12.18.100.8 of this chapter.

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

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.100.8 - Termination of discharge.

In addition to provisions in Section 12.18.050.6 of this chapter, any user who violates the following conditions is subject to discharge termination:

A. Violation of wastewater discharge permit conditions;
B. Failure to accurately report wastewater constituents and characteristics of its discharge;
C. Failure to report significant changes in operations or wastewater volume, constituents, and characteristics prior to discharge;
D. Refusal of reasonable access to the user's premises for the purpose of inspection, monitoring, or sampling; or
E. Violation of Pretreatment Standards in Section 12.18.020 of this chapter.

Such user will be notified of the proposed termination of its discharge and offered an opportunity to show cause under Section 12.18.100.3 of this chapter why the proposed action should not be taken. Exercise of this option by the City Engineer shall not be a bar to, or a prerequisite for, taking any other action against the user.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.110 - Judicial enforcement remedies.

12.18.110.1 - Injunctive relief.

When the City Engineer 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 Engineer may petition the Contra Costa County Superior Court through the City Attorney for 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 Engineer may also seek other action as 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.110.2 - Civil penalties.

A. 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 $10,000 per violation, per day. In the case of monthly or other long-term average discharge limit, penalties shall accrue for each day during the period of the violation.
B. The City may recover reasonable attorney's 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.
C. 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.
D. Filing a suit for civil penalties shall not be a bar against, or a prerequisite for, taking any other action against a user.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.110.3 - Criminal prosecution.

A. 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 fines and/or imprisonment in accordance with Section 1.04.100 of the City of Richmond Municipal Code.
B. A user who willfully or negligently introduces any substance to the WPCP which causes personal injury or property damage shall, upon conviction, be guilty of a misdemeanor, punishable by fines and/or imprisonment in accordance with Section 1.04.100 of the City of Richmond Municipal Code. This penalty shall be in addition to any other cause of action for personal injury or property damage available under State law.
C. A user who knowingly makes false statements, representations, or certifications in any application, record, report, plan, or documentation filed, or required to be maintained, pursuant of this chapter, a wastewater discharge permit, or order issued hereunder, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method under this chapter shall, upon conviction, be punished by a fine and/or imprisonment in accordance with Section 1.04.100 of the City of Richmond Municipal Code.
D. In the event of a second conviction, a user shall be punished by a fine and/or imprisonment in accordance with Section 1.04.100 of the City of Richmond Municipal Code.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.110.4 - Remedies nonexclusive.

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

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.120 - Supplemental enforcement action.

12.18.120.1 - Penalties for late reports.

A penalty shall be assessed to any user for each day that a report required by this chapter, a permit or order issued hereunder is late, beginning five (5) days after the date the report is due. Higher penalties may also be assessed where reports are more than thirty (30) to forty-five (45) days late. Actions taken by the City Engineer to collect late reporting penalties shall not limit his/her authority to initiate other enforcement actions that may include penalties for late reporting violations.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.120.2 - Performance bonds.

The City Engineer may decline to issue or reissue an individual or coverage under a general 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 of Richmond, in a sum not to exceed a value determined by the City Engineer to be necessary to achieve compliance.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.120.3 - Liability insurance.

The City Engineer may decline to issue or reissue an individual or coverage under a general 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 the user first submits proof that it has obtained financial assurances sufficient to restore or repair damage to the WPCP caused by its discharge.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.120.4 - Payment of outstanding fees and penalties.

The City Engineer may decline to issue or reissue an individual or coverage under a general 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.120.5 - Water supply severance.

Whenever a user has violated or continues to violate any provision of this chapter, an individual or general 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.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.120.6 - Public nuisances.

A violation of any provision of this chapter, a waste 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 Engineer. Any person(s) creating a public nuisance shall be subject to the provisions of Chapter 9.22 of the City of Richmond Municipal Code governing such nuisances, including reimbursing the City for any costs incurred in removing, abating, or remedying said nuisance.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.120.7 - Contractor listing.

Users which have not achieved compliance with applicable Pretreatment Standards and Requirements are not eligible to receive a contractual award for the sale of goods or services to the City. Existing contracts for the sale of goods and services to the City held by a user found to be in significant noncompliance with Pretreatment Standards or Requirements may be terminated at the discretion of the City Engineer.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.130 - Affirmative defenses to discharge violations.

12.18.130.1 - Upset.

A. For the purposes of this section, upset means an exceptional incident in which there is unintentional and temporary noncompliance with Categorical Pretreatment Standards because of factors beyond the reasonable control of the user. An upset does not include noncompliance

to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

B. An upset shall constitute an affirmative defense to an action brought for noncompliance with Categorical Pretreatment Standards if the requirements of Section 13.18.130.1(C) are met.

C. A user who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and the user can identify the cause(s) of the upset;

(2) The facility was at the time being operated in a prudent and workman-like manner and in compliance with applicable operation and maintenance procedures; and

(3) The user has submitted the following information to the City Engineer within twenty-four (24) hours of becoming aware of the upset (if this information is provided orally, a written submission must be provided within five [5] days):

(a) A description of the indirect discharge and cause of noncompliance;

(b) The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time of noncompliance is expected to continue; and

(c) Steps being taken and/or planned to reduce, eliminate, and prevent recurrence of noncompliance.

D. In any enforcement proceeding, the user seeking to establish the occurrence of an upset shall have the burden of proof.

E. Users shall have the opportunity for judicial determination of any claim of upset only in an enforcement action is brought for noncompliance with Categorical Pretreatment Standards.

F. Users shall control production of all discharges to the extent necessary to maintain compliance with Categorical Pretreatment Standards upon reduction, loss, or failure of its treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.130.2 - Prohibited discharge standards.

A user shall have an affirmative defense to an enforcement action brought against it for noncompliance with the prohibitions in Section 12.18.020 of this chapter if it can prove that it did not know, or have reason to know, that its discharge, alone or in conjunction with discharges from other sources, would cause pass through or interference and that either:

A. A local limit exists for each pollutant discharged and the user was in compliance with each limit directly prior to, and during, the pass through or interference; or

B. No local limit exists, but the discharge did not change substantially in nature or constituents from the user's prior discharge when the City was regularly in compliance with its NPDES permit, and in the case of interference, was in compliance with applicable sludge use or disposal requirements.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.130.3 - Bypass.

A. For the purposes of this section:

(1) Bypass means the intentional diversion of wastestream from any portion of a user's treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

B. A user may allow any bypass to occur which does not cause Pretreatment Standards or Requirements to be violated, but only if it is also for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Sections 12.18.130.3(C)—(D).

C. Bypass Notifications.

(1) If a user knows in advance of the need for a bypass, it shall submit prior notice to the City Engineer, at least ten (10) days before the date of the bypass, if possible.

(2) A user shall submit oral notice to the City Engineer of an unanticipated bypass that exceeds applicable Pretreatment Standards within twenty-four (24) hours from the time it becomes aware of the bypass. A written submission shall also be provided within five (5) days of the time the user becomes aware of the bypass. The written submission shall contain the following information:

(a) A description of the bypass and its cause;

(b) The duration of the bypass, including exact dates and times;

(c) If the bypass has not been corrected, the anticipated time it is expected to continue; and

(d) The steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

The City Engineer may waive the written report on a case-by-case basis if the oral report has been received within twenty-four (24) hours.

D. Bypass.

(1) Bypass is prohibited, and the City Engineer may take enforcement action against a user for a bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The user submitted notices as required in Section 12.18.130.3(C).

(2) The City Engineer may approve an anticipated bypass, after considering its adverse effects, if he/she determines that it will meet the three conditions listed in Sections 12.18.130.3(D)(1)(a)—(c).

(Ord. No. 18-11 N.S., § I, 7-26-2011)

12.18.140 - Wastewater treatment rates.

12.18.140.1 - Fees and charges.

In order to recover from users the cost of implementing the pretreatment program established in this chapter, the City Council shall adopt, by resolution, fees and charges, which may include:

A. Fees for reimbursement of costs of setting up and operating the City's pretreatment program;
B. Fees for monitoring, inspection, and surveillance procedures;
C. Fees for reviewing accidental discharge procedures and construction;
D. Fees for wastewater discharge permit applications;
E. Fees for filing appeals;
F. Fees for consistent removal by the City of pollutants otherwise subject to Pretreatment Standards or Requirements;
G. Fees for discharge of stormwater, surface water, groundwater, roof runoff containing pollutants or industrial waste, or pretreated hazardous wastewater;
H. FOG program fees:
    (1) Initial permit fee;
    (2) Permit fee for the fourth (4th) year;
    (3) Inspection and re-inspection fees;
I. Cost of inspecting and issuing NOVs;
J. Cost of re-inspection for violations;
K. Fees associated with grinders:
    (1) Food handling facilities with grinders and no treatment system will incur a ten percent (10%) surcharge to the sewer service fee.
    (2) Food handling facilities with grinders connected to the grease trap is a violation.
        (a) Five (5) working days shall be granted to correct violation;
        (b) If not corrected, then administrative orders will be issued;
        (c) The penalties to be imposed shall be $250 for the first violation, $500 for the second violation, and $1,000 for the third violation and each violation thereafter.
L. Blockages determined to be caused by FOG and associated with a responsible party with evidence (i.e., televised recording of the source lateral), shall pay the City for the costs incurred (equipment and personnel hours plus additional costs if lift stations are impacted with the subject FOG) to clear the line plus ten percent (10%) when it is the second incident. The user shall be warned subsequent to the first incident of their financial obligation to the City. The user shall also be liable for all incidental damage to all public and private property resulting from the blockage.
M. All fees, charges, and penalties, are due by the property owner.
N. Other fees as the City may deem necessary to carry out the requirements contained in this chapter.

(Ord. No. 18-11 N.S., § I, 7-26-2011)

FOOTNOTE(S):

*[15] **Editor's note**—Ord. No. 18-11 N.S., § I, adopted July 26, 2011, effective Sept. 1, 2011, amended Ch. 12.18 in its entirety to read as herein set out. Former Ch. 12.18, §§ 12.18.010—12.18.330, pertained to similar subject matter and derived from Ord. No. 8-06 N.S. Prior ordinance history: Ords. 30-88 N.S., 15-91 N.S., 19-91 N.S., 32-91 N.S., 11-93 N.S. and 3-00 N.S.* *(Back)*

Chapter 12.22 - STORMWATER MANAGEMENT AND DISCHARGE CONTROL

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12.22.010 - Intent and purpose.

(a) The intent of this chapter is to protect and enhance the water quality in the City of Richmond's watercourses pursuant to, and consistent with the Porter-Cologne Water Quality Control Act (Water Code Section 13000 et seq.) and the Federal Clean Water Act (33 U.S.C. Section 1251 et seq.).

(b) This chapter also carries out the conditions in the City's National Pollutant Discharge Elimination System (NPDES) permit that require effective February 15, 2005 implementation of appropriate source control and site design measures and stormwater treatment measures for projects that create or replace one acre or more of impervious surface, and that effective August 15, 2006 reduce the threshold to projects that create or replace 10,000 square feet or more of impervious surface.

(c) It is the purpose of the City Council in enacting this chapter to protect the health, safety and general welfare of Richmond's citizens by:

(1) Minimizing non-stormwater discharges, whose pollutants would otherwise degrade the water quality of local streams, to the stormwater system;

(2) Minimizing increases in nonpoint source pollution caused by stormwater runoff from development that would otherwise degrade local water quality;

(3) Controlling the discharge to the City's stormwater system from spills, dumping or disposal of materials other than stormwater;

(4) Reducing stormwater runoff rates and volumes and nonpoint source pollution whenever possible, through stormwater management controls and ensuring that these management controls are properly maintained and pose no threat to public safety.

12.22.020 - Definitions.

The following words and phrases when used in this chapter shall be as defined herein. Words and phrases in this chapter and not otherwise defined shall be interpreted as defined in the regulations issued by the U.S. Environmental Protection Agency to implement the provisions of the Federal Clean Water Act, and as defined by the State Water Resources Control Board to implement the Porter-Cologne Act:

(1) "Best management practices" or "BMP" are structural devices, measures, stormwater management facilities or activities that help to meet development runoff requirements at the premises. BMP also include schedules of activities, prohibitions or practices, general good housekeeping, pollution prevention practices, maintenance procedures and other management practices, to prevent or reduce the discharge of pollutants directly or indirectly to watercourses, water bodies, and wetlands.

(2) "City's NPDES permit" means the National Pollutant Discharge Elimination System permit issued to the City of Richmond, Permit No. CAS0029912, and any subsequent amendment, reissuance or successor to this NPDES permit.

(3) "Development runoff requirements" means the provisions in the City's NPDES permit that contain performance standards to address both the construction and post-construction phase impacts of new projects and redeveloped projects on stormwater quality. In the City's 1999 NPDES permit, these requirements are in Section C. 3.

(4) "Director" means the City Engineer of the City of Richmond or his or her designee.

(5) "Enforcement officer" or "officer" means those individuals designated by the Director to act as authorized enforcement officers.

(6) "Guidebook" means the most recent version of the Contra Costa Clean Water Program Stormwater C. 3. Guidebook.

(7) "Non-stormwater discharge" means any addition of any pollutant to the City's stormwater system, except discharges pursuant to a NPDES permit, or discharges further exempted in Sections 12.22.060(c) and (d) of this chapter.

(8) "Pollutant" means any material other than stormwater including, but not limited to, petroleum products or by-products, solid waste, incinerator residue, sewage, sewage sludge, heat, chemical waste, biological materials, radioactive materials, wrecked or discarded equipment, rock, sand, soil and industrial, municipal or agricultural waste discharged into the water or stormwater system.

(9) "Premises" means any building, structure, facility, or installation, (including a building's grounds or other appurtenances), and adjacent sidewalks and parking strips.

(10) "Responsible person" means the owner or occupant of any premises or who engages in any activity from which there is or may be a non-stormwater discharge or any person who releases pollutants to the City's stormwater system.

(11) "Stormwater" means flow on the surface of the ground resulting from precipitation.

(12) "Stormwater management facility" means any device designated to detain, retain, filter, or infiltrate stormwater.

(13) "Stormwater control plan" means a plan that meets those criteria contained in the most recent version of the Contra Costa Clean Water Program Stormwater C. 3. Guidebook.

(14) "Stormwater system" means that system of facilities by which stormwater may be conveyed to any stream, watercourse, other body of water or wetlands, including flood control channels, any roads with drainage systems, city streets, catch basins, curbs, gutters, ditches, improved channels, storm drains or storm drain system, which are not part of a Publicly Owned Treatment Works ("POTW") as that term is defined in 40 CFR Section 122.2.

12.22.030 - Responsibility for administration.

The Director or his designee shall administer this chapter for the City.

12.22.040 - Construction and application.

This chapter shall be construed consistent with the requirements of the Federal Clean Water Act and amendments thereto or applicable implementing regulations and the City's NPDES permit.

12.22.050 - Stormwater control plan required.

(a) Every application for a development project, including but not limited to a rezoning, tentative map, parcel map, conditional use permit, variance, site development permit, design review, or building permit that is subject to the development runoff requirements in the City's NPDES permit shall be accompanied by a stormwater control plan that meets the criteria in the most recent version of the Contra Costa Clean Water Program Stormwater C. 3. Guidebook.

(1) Effective February 15, 2005, this requirement shall apply to:

(A) All developments that create one acre (43,560 square feet) or more of impervious surface. Excluded from this category is the construction of one single-family home, which is not part of a larger plan of development, with appropriate pollutant source control and site design measures, and using landscaping to appropriately treat runoff from roof and house-associated impervious surfaces;

(B) Streets and road projects that create one acre (43,560 square feet) or more of new impervious surface. Excluded from this category are sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features;

(C) Projects on previously developed sites that result in the addition or replacement of a combined total of one acre (43,560 square feet) or more of impervious surface. Excluded from this category are interior remodels and routine maintenance or repair. Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed.

(2) Effective August 15, 2006, this requirement shall apply to:

(A) All developments that create 10,000 square feet or more of impervious surface. Excluded from this category is the construction of one single-family home, which is not part of a larger plan of development, with appropriate pollutant source control and site design measures, and using landscaping to appropriate treat runoff from roof and house-associated impervious surfaces;

(B) Streets and road projects that create 10,000 square feet or more of new impervious surface. Excluded from this category are sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features;

(C) Projects on previously developed sites that result in the addition or replacement of a combined total of 10,000 square feet or more of impervious surface. Excluded from this category are interior remodels and routine maintenance or repair. Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed.

(3) Subsections (a)(1) and (a)(2) shall be interpreted in a manner that is consistent with the development runoff requirements and exclusions in the City's NPDES permit.

(b) Implementation of an approved stormwater control plan and submittal of an approved stormwater control operation and maintenance plan by the applicant shall be a condition precedent to the issuance of a certificate of occupancy for a project subject to this section.

(c) All stormwater management facilities shall be designed in a manner to minimize the need for maintenance and reduce the chances of failure. Design guidelines are outlined in the guidebook.

(d) All stormwater management facilities shall be maintained according to the guidebook and the approved stormwater control operation and maintenance plan. The person(s) or organization(s) responsible for maintenance shall be designated in the plan. Unless a different time period is provided for in the plan, those responsible for maintenance shall inspect the stormwater management facility at least annually. The plan shall also describe how the maintenance costs will be funded. Upon the failure of a responsible person to maintain a stormwater management facility in accordance with this chapter or the plan, the City may perform the maintenance and recover its costs from the responsible person as provided in Sections 12.22.170 and 12.22.180

(e) For access to stormwater management facilities for inspections and maintenance, recorded covenants or easements shall be provided by the property owner for access by the City, the Contra Costa Mosquito and Vector Control District, and the Regional Water Quality Control Board.

12.22.060 - Prohibited discharges.

(a) The release of non-stormwater discharges to the City stormwater system is prohibited.

(b)

The discharge of stormwater from premises or an activity that causes or contributes to a violation of receiving water limitations in the City's NPDES permit is prohibited.

(c) The following discharges are exempt from the prohibition set forth in subsection (a) above:

(1) Any discharge in compliance with a NPDES permit issued to the discharger;

(2) Flows from riparian habitats and wetlands, diverted stream flows, springs, rising groundwater and uncontaminated groundwater infiltration.

(d) The following discharges are exempt from the prohibitions set forth in subsection (a) above if the Regional Water Quality Control Board approves the exempted category under Section C. 11. of the City's NPDES permit: uncontaminated pumped groundwater, foundation drains, water from crawl space pumps, footing drains, air conditioning condensate, irrigation water, landscape irrigation, lawn or garden watering, planned and unplanned discharges from potable water sources, water line and hydrant flushing, individual residential car washing, discharges or flows from emergency fire fighting activities, and dechlorinated swimming pool discharges.

12.22.070 - Discharge in violation of NPDES permit.

Any discharge that would result in or contribute to a violation of the City's NPDES permit either separately considered or when combined with other discharges, is prohibited. Liability for any such discharge shall be the responsibility of the person causing or responsible for the discharge, and such person shall defend, indemnify and hold harmless the City in any administrative or judicial enforcement action relating to such discharge.

12.22.080 - Unlawful discharge and unlawful connections.

(a) It is unlawful to establish, use, maintain or continue unauthorized drainage connections to the City's stormwater system, and to commence or continue any unauthorized discharges to the City's stormwater system.

(b) No discharge shall cause the following conditions, create a nuisance or adversely affect beneficial uses of waters of the state:

(1) Floating, suspended or deposited macroscopic matter or foam;

(2) Bottom deposits or aquatic growth;

(3) Alterations of temperature, sediment load, nutrient load, or dissolved oxygen, which cause significant adverse impacts to native aquatic biota;

(4) Visible, floating, suspended or deposited oil or products of petroleum origin; or

(5) Substances present in concentrations or quantities which cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption.

12.22.090 - Best management practices and standards.

(a) Generally. Any person owning or operating premises that may contribute pollutants to the City's stormwater system shall undertake all practicable best management practices to reduce the potential for pollutants entering the system. Examples of such premises include, but are not limited to, parking lots, gasoline stations, industrial facilities, and other commercial enterprises.

(b) Litter. No person shall throw, deposit, leave, keep or permit to be thrown, deposited, placed, left or maintained, any refuse, rubbish, garbage or other discarded or abandoned objects, articles or other litter in or upon any street, alley, sidewalk, business place, creek, stormwater system, fountain, pool, lake, stream, river or any other body of water, or upon any public or private parcel of land so that the same might become a pollutant, except in containers or in lawfully established waste disposal facilities.

(c) Sidewalks. The occupant or tenant, or in the absence of occupant or tenant, the owner or proprietor of any real property in front of which there is a paved sidewalk shall maintain said sidewalk free of dirt or litter to the maximum extent practicable. Sweepings from the sidewalk shall not be swept or otherwise made or allowed to go into the gutter or roadway, but shall be disposed of in receptacles maintained as required for the disposal of solid waste.

(d) Parking Lots, Paved Areas and Related Stormwater Systems. Persons owning, operating or maintaining a paved parking lot, the paved areas of a gasoline station, a paved private street or road, and related stormwater systems shall clean those premises as frequently and thoroughly as practicable in a manner that does not result in the discharge of pollutants to the City's stormwater system.

(e) Construction Activities. All construction shall conform to the requirements of the CASQA Stormwater Best Management Practices Handbooks for Construction Activities and New Development and Redevelopment, the ABAG Manual of Standards for Erosion & Sediment Control Measures, the City's grading and erosion control ordinance and other generally accepted engineering practices for erosion control as required by the Director when undertaking construction activities. The Director may establish controls on the rate of stormwater runoff from new developments and redevelopment as may be appropriate to minimize the discharge and transport of pollutants.

(f) Notification of Intent and Compliance with General Permits. Each discharger associated with construction activity or other discharger described in any general stormwater permit addressing discharges, as may be adopted by the United States Environmental Protection Agency, the State Water Resources Control Board, or the California Regional Water Quality Control Board, San Francisco Bay Region, shall provide the Director with the notice of intent, comply with and undertake all other activities required by any general stormwater permit applicable to such dischargers. Each discharger identified in an individual NPDES permit relating to stormwater discharges shall comply with and undertake all activities required by the permit.

(g) Development Runoff Requirements. For each new development and redevelopment project subject to the development runoff requirements, every applicant will submit a stormwater control plan and implement conditions of approval that reduce stormwater pollutant discharges through the construction, operation and maintenance of treatment measures and other appropriate source control and site design measures. Similarly, increases in runoff volume and flows shall be managed in accordance with the development runoff requirements.

(h) Compliance with Best Management Practices. Where best management practices guidelines or requirements have been adopted by any federal, state, regional, city or county agency, for any activity, or operation of premises which may cause or contribute to non-stormwater discharges, every person undertaking such activity, operation or owning and operating such premises shall comply with such guidelines or requirements. Failure to implement and maintain best management practices included in a stormwater permit are subject to administrative citations.

(i) Stormwater Pollution Prevention Plan. The Director may require any business or utility in the City that is engaged in activities that may result in non-stormwater discharges or runoff pollutants to develop and implement a stormwater pollution prevention plan, which must include an employee training program. Business activities which may require a stormwater pollution prevention plan include maintenance, storage,

manufacturing, assembly, equipment operations, vehicle loading, fueling, vehicle maintenance, food handling or processing, or cleanup procedures which are carried out partially or wholly out of doors. Failure to implement and maintain best management practices included in a stormwater pollution prevention plan are subject to administrative citations.

(j) Coordination with Hazardous Material Release Response and Inventory Plans. Any business subject to the Hazardous Material Release Response and Inventory Plan, Division 20, Chapter 6.95 of the California Health and Safety Code (commencing with Section 25500), shall include, in that plan, provision for compliance with this chapter, including the prohibitions of non-stormwater discharges and the requirement to reduce release of pollutants to the maximum extent practicable.

12.22.100 - Compliance certificates for stormwater management facilities.

(a) Every person who owns, leases or operates any premises containing a stormwater management facility or facilities is required to obtain annually a valid operation and maintenance certificate of compliance certifying to the inspection of and the proper operation and maintenance of the treatment measures and other appropriate source control and site design measures. Each responsible person subject to this requirement shall request an inspection from the City every 12 months. Upon the filing of such request, and the payment of a fee covering the cost of inspection, the City shall inspect the property and shall either issue such certificate upon a determination by the inspector that all treatment measures and other appropriate source control and site design measures have been properly maintained and are in good condition, or shall issue a conditional certificate noting deficiencies that must be corrected within a time indicated on the certificate, or shall deny the certificate. A certificate shall be valid for one year from the date of issuance. The City Council may by resolution establish the fee for the inspection and certificate.

(b) In lieu of a City inspection, such person may arrange for an inspection from a private company authorized to conduct inspections by the City. Such company shall use a City-approved inspection form that shall be executed under penalty of perjury. Should such inspection form establish that the treatment measures and other appropriate source control and site design measures have been properly maintained and are in good condition, the City may issue an operation and maintenance certificate of compliance or the City may at its cost re-inspect the property and proceed as described in subsection (a). The filing of a false inspection report shall be a misdemeanor.

12.22.110 - Authority to inspect.

(a) Generally. Routine or scheduled inspections shall be based upon as reasonable a selection process as may be deemed necessary to carry out the intent of this chapter, including, but not limited to, random sampling or sampling in areas with evidence of stormwater contamination, evidence of the discharge of non-stormwater to the stormwater system, or similar activities. Inspections may also be conducted in conjunction with routine or scheduled inspections conducted by other public agencies or special district, including but not limited to the Central Contra Costa Sanitary District, the Contra Costa County Fire Protection District, County Environmental Health Department, the Contra Costa Mosquito and Vector Control District, or the Regional Water Quality Control Board.

(b) Authority to Sample and Establish Sampling Devices. With the consent of the owner or occupant, or pursuant to a search or inspection warrant, any officer may establish on any property such devices as are necessary to conduct sampling or metering operations. During all authorized inspections, the officer may take any sample deemed necessary to aid in the pursuit of the inquiry or in the recordation of the activities on site.

(c) Notification of Spills. All persons in charge of the premises or responsible for emergency response for the premises have a responsibility to train premises' personnel and maintain notification procedures to ensure that immediate notification is provided to the City of Richmond any suspected, confirmed or unconfirmed release of pollutants creating a risk of non-stormwater discharge into the City stormwater system.

As soon as any person in charge of the premises or responsible for emergency response for the premises has knowledge of any suspected, confirmed or unconfirmed release of non-stormwater discharge entering the City stormwater system, such person shall take all necessary steps to ensure the detection and containment and clean up of such release and shall notify the City of Richmond of the occurrence by telephoning the Director. This notification requirement is in addition to and not in lieu of other required notifications.

(d) Requirement to Test or Monitor. Any officer may require that any person engaged in any activity or owning or operating any premises that may cause or contribute to non-stormwater discharges, undertake such monitoring activities or analysis and furnish such reports as the officer may specify. The burden, including costs of these activities, analysis and reports shall bear a reasonable relationship to the need for the monitoring, analysis and reports and the benefits to be obtained. The recipient of such request shall undertake and provide the monitoring, analysis and reports required.

12.22.120 - Violations constituting misdemeanors.

The violation of any provision of this chapter, or failure to comply with any of the mandatory requirements of this article shall constitute a misdemeanor, except that notwithstanding any other provisions of this article, any violation constituting a misdemeanor under this chapter may, at the discretion of the officer or City Attorney, be charged and prosecuted as an infraction.

12.22.130 - Penalty for violation.

(a) Upon conviction of a misdemeanor, a person shall be subject to payment of a fine, or imprisonment, or both, not to exceed the limits set forth in California Government Code Section 36901.

(b) Upon conviction of an infraction, a person shall be subject to payment of a fine, not to exceed the limits set forth in California Government Code Section 36900.

(c) Administrative citations shall be $250 for the first issuance, $500 for the second issuance, and $1,000 for the third and all subsequent issuances.

12.22.140 - Continuing violation.

Every day that any violation of this chapter shall continue shall constitute a separate offense.

12.22.150 - Concealment.

Concealing, aiding or abetting a violation of any provision of this chapter shall constitute a violation of such provision.

12.22.160 - Acts potentially resulting in violation of the Federal Clean Water Act or Porter-Cologne Act.

Any person who violates any provision of this chapter, or the provisions of any permit issued pursuant to this chapter, or who releases a non-stormwater discharge, or who violates any cease and desist order, prohibition or effluent limitation, may also be in violation of the Federal Clean Water Act or the Porter-Cologne Act and may be subject to the enforcement provisions of those acts, including civil and criminal penalties. Any enforcement actions authorized pursuant to this chapter may also include notice to the violator of such potential liability pursuant to federal or state law.

12.22.170 - Violations deemed a public nuisance.

In addition to the penalties provided herein, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to the public health, safety and welfare. Such condition is hereby declared and deemed to be a public nuisance, which may be abated as provided in Chapter IX (commencing with Section 9.22.100) of this Code, including the assessment of the costs of abatement which may be collected at the same time and in the same manner as ordinary municipal taxes as provided by Government Code Section 38773.5, and by civil action to abate, enjoin or otherwise compel the cessation of such nuisance by the City Attorney.

12.22.180 - Civil actions.

(a) In addition to any other remedies provided in this chapter, any violation of this chapter may be enforced by civil action brought by the City. In any such action, the City may seek, as appropriate, any and all of the following remedies:
  (1) A temporary restraining order, preliminary injunction and permanent injunction;
  (2) An action for an unlawful business practice pursuant to Business and Professions Code Section 17206.

(b) In addition any person violating this chapter shall be liable for:
  (1) Reimbursement for the costs of any investigation, inspection or monitoring which led to the discovery of the violation;
  (2) Costs incurred in removing, correcting, or terminating the adverse effect(s) resulting from the violation;
  (3) Compensatory damages for the loss of, or destruction to, water quality, wildlife, fish or aquatic life. Costs and damages under this subsection shall be paid to the City and shall be used exclusively for costs associated with monitoring and establishing a stormwater discharge pollution control system and implementing or enforcing the provisions of this chapter;
  (4) The cost of maintenance and repair of any BMP or stormwater management facility that is not maintained in accordance with the guidebook or the stormwater control plan;
  (5) The reasonable costs of preparing and bringing administrative action under this chapter.

12.22.190 - Remedies not exclusive.

The remedies identified in this chapter are in addition to, and do not supersede or limit, any and all other remedies, administrative, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive.

12.22.200 - Notice of violation.

Any person required to perform monitoring, analysis, reporting or corrective activity by any officer may be informed of such decision, in writing, by a notice of violation. Any person aggrieved by the decision of the officer, may file a written appeal of the notice of violation to the Director within 10 (ten) days following the date of the notice of violation. Upon receipt of such request, the Director shall request a report and recommendation from the officer and shall set the matter for hearing at the earliest practical date. At said hearing, the Director may hear additional evidence, and may reject, affirm or modify the officer's decision. The decisions of the Director shall be final.

12.22.210 - Judicial review.

The provisions of Code of Civil Procedure Section 1094.5 are applicable to judicial review of determinations made by the Director pursuant to this chapter.

(Source: Ordinance No. 4-05 N.S.)

Chapter 12.24 - REIMBURSEMENT CONTRACTS FOR SEWER CONSTRUCTION

Sections:

12.24.010 - Reimbursement contracts provided for.
12.24.020 - Provisions not retroactive.
12.24.030 - Special sewer extension fund.
12.24.040 - Fees are additional to other permit fees required by city.
12.24.050 - Violation of provisions a misdemeanor.

12.24.010 - Reimbursement contracts provided for.

Whenever any person, hereinafter called the applicant, wishes to construct sewer facilities with their own money, which facilities in the opinion of the City Council will benefit property owned by persons who are not contributing toward the cost of the construction of the sewer facilities, and if such facilities are dedicated to the public, the City Council may enter into a contract with the applicant to reimburse the applicant, subject to the following provisions and conditions:

(a) The reimbursement contract shall be entered into simultaneously with acceptance of application by the City Engineer.

(b) Within thirty days after execution of the reimbursement contract, the City Engineer shall prepare plans and specifications for construction of sewer facilities requested by the applicant; or in lieu thereof, the applicant may elect to have plans and specifications prepared by a licensed civil engineer of his own choosing, subject to approval of the City Engineer. Upon completion of the plans and specifications, and written approval of the applicant, the City Engineer shall call for sealed bids from at least three qualified sewer construction contractors, the bids to be opened at the specified time and place in the presence of at least one designated representative of the public works department, the finance department and the applicant (if he elects to be represented). The City Engineer shall immediately thereafter prepare an engineer's estimate of the entire cost of the project, based on the lowest responsible bid price and overhead costs for engineering, inspection and incidental expenses, and shall serve notice on the applicant to post a deposit with the director of finance in the full amount of the estimated cost. After the applicant has posted the specified amount with the director of finance, the City Engineer shall submit all bids to the City Council for award of contract to the lowest responsible bidder.

(c) The construction of all sewer facilities shall be under the general supervision of the City Engineer, who shall certify as to the progress payments and completion of the work.

(d) Immediately upon completion of the sewer facilities, the City Engineer shall distribute and assess the reasonable cost, hereinafter referred to as "cost," of the construction against all lots or property which are benefited by the construction in relation to the benefit received. The assessment shall be submitted, within twenty days after acceptance of construction by the City Engineer, to the City Council. The City Council shall, within twenty days thereafter, complete its review of the assessments and make any changes it deems necessary to conform to its determination as to benefits received by the assessed properties. The assessments as determined by the City Engineer, with any change made by the City Council, shall be final and conclusive at the end of the twenty-day period. The assessment shall be placed on file in the office of the City Clerk.

(e) No property owner shall be permitted to connect to the sewer facilities unless he has paid to the special sewer extension fund of the City of Richmond, as set forth in Section 12.24.030 of this chapter, the charge placed against his property as provided in paragraph numbered (d) above.

(f) Prior to the establishment of the assessments, the City Engineer may allow a property owner to connect to the sewer facility upon the owner guaranteeing to pay the amount of the assessment when it is determined, and upon the deposit of an amount of money estimated by the City Engineer to be adequate as a guarantee of the payment of the assessment.

(g) The City shall endeavor to collect the charges and cause the sum so collected to be refunded as provided in the paragraph designated as (h) hereafter, but it shall not be liable for any failure to make such collection or refund, and the obligation to collect the charges shall terminate fifteen years from the date of the contract.

(h) All sums so paid by any property owner shall be refunded to the applicant who shall have contributed toward the construction of the sewer facilities and who entered into a contract with the City of Richmond, in proportion that the amount contributed bears to the entire cost, until the applicant has received the entire amount contributed less that portion distributed against the property of the applicant.

(i) It shall be the obligation of the applicant to inquire of the City whether any said amounts have been paid in to the City by a property owner who did not contribute toward the cost of the construction of the sewer facilities. If any such money remains on deposit with the City without being claimed by the party rightfully entitled to it within one year after it is deposited, the money shall be forfeited to the City of Richmond, and then it shall be transferred to the general fund of the City of Richmond.

(j) The City of Richmond may contribute toward the construction of any such sewer facilities, and if it does so it shall be entitled to a refund under the same provisions and method as set forth above.

(Amended by Ordinance No. 355 N.S.)

12.24.020 - Provisions not retroactive.

All contracts heretofore entered into between the City and persons, firms or corporations where the latter parties constructed sewer facilities with their own money, and which facilities benefited property the owners of which did not contribute toward the cost of the construction of the sewer facilities, shall continue in effect under their terms and conditions, and any property owners desiring to connect to the sewer facility, if the property or the owner thereof did not contribute toward the cost of construction of the sewer facility, shall not be permitted to connect to the sewer facility unless he first pays the charge placed against his property pursuant to the provisions of the contract.

12.24.030 - Special sewer extension fund.

All moneys received under Section 12.24.010 shall be deposited in the special sewer extension fund of the City of Richmond, which fund may be used only for the acquisition, construction, reconstruction, maintenance and operation of sanitation or sewerage facilities to the sole benefit of the contributors to the fund; except that such fund may be used, in the discretion of the City council, for reimbursement in the manner and under the conditions set forth in Section 12.24.010.

12.24.040 - Fees are additional to other permit fees required by city.

The fees established by this chapter are in addition to those permit fees required by other regulations of the City of Richmond not inconsistent herewith, provided, however, that no fee required by this chapter to be paid shall be collected for additional connections where the fee for the original connection shall have been paid.

12.24.050 - Violation of provisions a misdemeanor.

Any person who connects or causes to be connected any property directly or indirectly to any public sewer constructed as herein provided without first paying the charge placed against said property as in this chapter provided is guilty of a misdemeanor.

(Source: Ordinance No. 1668)

Chapter 12.28 - STREETS AND SIDEWALKS

Sections:

12.28.030 - Official datum plane from which elevations shall be determined.
12.28.040 - Placing of building material or obstructions upon public streets regulated—Permit required.
12.28.050 - Same—-Superintendent of streets to direct.
12.28.060 - Same—Extent of permit.
12.28.070 - Placing, erection, etc., of electric poles, etc. regulated.
12.28.080 - Same—Application to new construction.
12.28.090 - Same—Application to street railway wires.
12.28.100 - Hedges along public street or highway—Timing.
12.28.130 - Digging up and disturbance of roadways, etc.—Permit required.
12.28.140 - Same—Requirements for issuance of permit.
12.28.150 - Same—Conditions.
12.28.160 - Same—Inspections and back-filling.
12.28.170 - Same—Applicability to public service corporations.
12.28.180 - Same—Cost to public service corporation for resurfacing by city.
12.28.190 - Same—Effect of arrearages.
12.28.200 - Same—Safety requirements.
12.28.210 - Same—Restoration.
12.28.220 - Same—Limitations of permit.
12.28.230 - Same—Removal of wearing—surface of streets.
12.28.240 - Same—Exceptions.
12.28.250 - Same—Emergency repairs and parkway excavations excepted.
12.28.260 - Set-back lines—Definitions.
12.28.270 - Establishment of set-back lines.
12.28.280 - Same—Procedure.
12.28.290 - Same—Effect of resolution on issuance of permits.
12.28.300 - Same—Hearing of objections and action of council.
12.28.310 - Same—Final resolution of council.
12.28.320 - Same—Violations.
12.28.330 - Same—Duty of clerk.
12.28.340 - Construction, hanging and use of awnings and signs regulated—Obstructions on sidewalks prohibited without an encroachment permit.
12.28.350 - Same—Height and projection of awnings.
12.28.355 - Awnings, marquees or canopies.
12.28.360 - Same—Permission required.
12.28.365 - Temporary encroachment permit for use of sidewalk.
12.28.370 - Monuments.

12.28.030 - Official datum plane from which elevations shall be determined.

Beginning on the effective date of this section, for the purpose of establishing grades and elevations of the streets, avenues, boulevards, highways, lanes, alleys, curb and block intersections or other public thoroughfare of the city of Richmond, the following named datum plane shall be taken as the basis:

Mean Sea Level Datum of 1929, established by the U.S. Coast and Geodetic Survey.

(Source: Ordinance No. 1786)

12.28.040 - Placing of building material or obstructions upon public streets regulated—Permit required.

No person shall place or cause to be placed on any street, sidewalk or public place in the city of Richmond any material, machinery or apparatus for building, paving or other purposes and allow the same to there remain for over twenty-four hours without a permit from the superintendent of streets. Such permit shall specify the portion of the street or sidewalk to be used and the period of such use, which period shall not be larger than may be reasonably necessary and may be extended only in case of necessity.

12.28.050 - Same—-Superintendent of streets to direct.

Every person having control of any such material, machinery or apparatus, shall obey every lawful direction of the superintendent of streets as to such building material, whether contained in said permit or made after issuance thereof.

12.28.060 - Same—Extent of permit.

The extent of occupation of sidewalks and streets to be covered by the terms of permits for street obstruction shall be as follows:

(a) Such permits shall not authorize the occupation of any sidewalk or street, or part thereof, other than that immediately in front of the premises of the building for the construction of which said permit is issued. During the progress of building operations at least one-half the space between curb and property line shall be at all times kept clear of rubbish and dirt for the free and unobstructed use of pedestrians.

(b)

Whenever the conditions are such that the sidewalk must be occupied or removed, a temporary plank walk not less than three feet in width with substantial railings shall be constructed around the outside of the obstructions and maintained during the obstruction of the sidewalk.

(c) If there are excavations on either side of the sidewalk said sidewalk must be protected by substantial railings not less than two and one -half feet high from the floor of said wall Said railings to be maintained so long as such excavations continue to exist.

(d) It shall be permitted, for the purpose of delivering material to the basements of buildings, to construct elevated temporary sidewalks not less than four feet in width and of a height not exceeding four feet above the curb level of the street; and in case the sidewalk is so elevated it shall be provided with good substantial steps at each end of the same, and shall have railings as before specified on both sides thereof.

(e) All approaches to excavations and depressions must be barricaded.

(f) If the building to be erected is more than three stories in height and is set at or near the street line, there shall be built over such sidewalks a roof having a framework and covering composed of supports and stringers of three-by-twelve timbers, not more than four feet from centers, covered with two layers of two-inch plank. Said roof shall be maintained as long as material is being used or handled on said street front and above the level of such sidewalk.

(g) In all cases such temporary sidewalks, railings and approaches and the roofs over same shall be made as regards ease of approach, strength and safety, to the satisfaction of the Superintendent of Streets.

(h) All gutters and waterways must be bridged over and kept clear of obstruction to the free passage of water.

(i) Material or other obstructions must not be placed within twelve feet of any hydrant of the city used for fire purposes.

(j) Lighted lanterns must be displayed and maintained at each end of every pile of material or other obstructions in the street, and at each end of every excavation, from six p.m. to six a.m.

(k) Earth taken from excavations and rubbish taken from buildings must not be stored either upon sidewalks or roadways of streets, and must be removed from day to day as rapidly as produced. When dry rubbish, apt to produce dust, is being handled it must be kept wetted down so as to prevent its being blown about by the wind.

(l) Whenever it becomes necessary for the safety of pedestrians to erect a fence in front of a building under construction said fence, if built upon the street or sidewalk, shall not exceed six feet in height and shall contain no advertising matter.

(m) The occupation of the street for the storage of building materials shall never exceed, in front of any one building, one-quarter of the width of the roadway of the same, and in streets containing railroad tracks such occupation shall not come within four feet of such railroad track.

(Source: Ordinance No. 103)

12.28.070 - Placing, erection, etc., of electric poles, etc. regulated.

No person shall, within the corporate limits of the City of Richmond:

(a) Run, place, erect, or maintain in said City any wire or cable used to conduct or carry electricity on any pole (or on any cross arm, bracket, or other appliance attached to such pole), within the distance of thirteen inches from the center line of said pole; provided that the foregoing provisions of this paragraph (a) shall be held not to apply to such wires or cables in case the same are run or placed vertically on the poles, nor to "brindle" or "jumper" wires on any pole, nor to any "aerial" cable, as between such cable and pole on which it originates or terminates, nor wires run from "circuit" wires to arc lamps placed upon poles, nor to any wire or cable where the same is attached to the top of a pole, as between it and the said pole.

(b) Run, place, erect or maintain from all new or renewed construction in said City in the vicinity of any pole (and attached thereto) within the distance of thirteen inches from the center line of said pole, any wire or cable used to conduct or carry electricity, or place, erect or maintain in said City any pole (to which is attached any wire or cable used to conduct or carry electricity), within the distance of thirteen inches (measured from the center of such pole), from any wire or cable used to conduct or carry electricity; provided that as between any wire or cable and any pole as in this paragraph (b) named, only the wire, cable or pole last in point of time run, placed, erected or maintained shall be held to be run, placed, erected or maintained in violation of the provisions of the said paragraph.

(c) Run, place, erect or maintain in said City, above ground, within the distance of four feet from any wire or cable conducting or carrying less than six hundred volts of electricity, any wire or cable conducting or carrying more than six hundred volts of electricity, or run, place, erect or maintain within the distance of four feet from any wire or cable which conducts or carries at any one time more than six hundred volts of electricity any wire or cable conducting or carrying less than six hundred volts of electricity; provided that the foregoing provisions of this paragraph (c) shall be held not to apply to any wire or cable conducting or carrying a "secondary" current, and attached to or connected with a "transformer" within the distance of four feet (measured along the line of said wire or cable) from the point where such wire or cable is attached to or connected with such transformer, nor to electric wires or cables within buildings or other structures, nor to electric wires or cables in cases where the same are run from underground and placed vertically on poles, nor to any "lead" wire or cable between the point where same is made to leave any pole for the purpose of entering any building or other structure, and the point at which it is made to enter such building or structure; and provided further that as between any two wires or cables, or any wire and cable run, placed, erected or maintained in violation of the provisions of this paragraph (c), only the wire or cable last in point of time run, placed, erected or maintained shall be held to be run, placed, erected or maintained thus in violation of said provisions.

(d) Run, place, erect or maintain in said City any wire or cable used to conduct or carry at any one time more than six hundred volts of electricity without each cross-arm or such other appliance as may be used in lieu thereof to which said wire or cable is attached to be at all times kept painted a bright yellow color.

(e) Run, place, erect or maintain in said City of Richmond any "guy" wire or "guy" cable attached to any pole or appliance to which is attached any wire or cable used to conduct or carry electricity, without causing said "guy" wire or cable to be effectively insulated at all times at a distance of not less than eight feet nor more than twelve feet near its upper end from the pole to which it is attached, measured in a horizontal line from which pole, and at a point not less than eight feet nor more than twelve feet from the ground near its lower end measured vertically from such point to the ground; provided that in case such "guy" wire or cable is "metal anchored" at its lower end, insulation as herein said or otherwise shall not be required.

(f)

Run, place, erect or maintain in said City vertically on any pole any wire or cable used to conduct or carry electricity without causing such wire or cable to be at all times wholly encased in a metal conduit or casing of wooden material, which material shall be not less than seven eights inch thick.

(g) Erect, place or maintain in said City on any pole (or on any cross arm or other appliance on said pole) which carries, or upon which is placed any electric "arc" lamp or "arc" light, any "transformer" or "transforming" electric currents.

(h) The "kingpin" construction shall not be used where the wire attached thereto shall at any time carry a voltage between three hundred volts and six thousand volts.

(i) Run, place, erect or maintain any wire or cable carrying a voltage in excess of four thousand five hundred volts below a minimum height of thirty feet above ground.

The provisions in the foregoing paragraph (i) shall apply only to pole line construction located on public thoroughfare.

(j) Place, erect or maintain any pole within the sidewalk area, the street face of which is less than twelve inches nor more than fourteen inches from the established curb line, except by special permission of the City Council granted on application made in writing therefor.

(k) Run, place, erect or maintain any "guy" wire or cable attached to any trolley or direct source of trolley power, without placing some approved form of strain insulator in said wire or cable, not less than ten feet from pole or building, provided said trolley or direct current source of trolley power be more than ten feet distant.

12.28.080 - Same—Application to new construction.

The provisions of the foregoing section shall only apply to renewed and new construction from and after the passage of this chapter.

12.28.090 - Same—Application to street railway wires.

This chapter does not apply to street railway construction, except where street railway wires are carried upon the poles of other companies. Then said street railway wires must conform to Section 12028.070, subsection (a) of this chapter.

(Source: Ordinance No. 155)

12.28.100 - Hedges along public street or highway—Timing.

All hedges along the line of any public street or highway within the corporate limits of the City of Richmond shall be kept trimmed and in such condition that no part of the same shall project over the property onto the sidewalk or the street.

(Source: Ordinance No. 276)

12.28.130 - Digging up and disturbance of roadways, etc.—Permit required.

It shall be unlawful for any person to make or cause to be made any excavation in or under the surface of any public street, alley, sidewalk or other public place in the City of Richmond for the installation, repair or removal of any pipe, conduit, duct or tunnel, or for any other purpose, without first obtaining from the Superintendent of Streets of the City of Richmond a written permit to make such excavation, and the making of a deposit to cover the cost of restoring said public street, alley, sidewalk or other public place to its original condition, all as hereinafter provided.

12.28.140 - Same—Requirements for issuance of permit.

The Superintendent of Streets shall, before issuing said permit, require: First: A written application therefor to be made and filed with said Superintendent of Streets wherein the applicant shall set forth the name and residence or business address of the person making such application, and shall state in detail the location and area of each excavation intended to be made and shall state the purpose for which the excavation is to be made and used.

Second: The presentation of a plat showing the location of each proposed excavation and the dimensions thereof, and such other details as the Superintendent of Streets may require to be shown upon said plat, provided that the filing of plats shall not be required for the location of rouble in conduits or in pipes or for making repairs thereto.

Third: Where application is made for permits to excavate in the public streets for side sewer connection, payment shall be made to the City of Richmond in accordance with fee schedules established by resolution of the City Council.

When the applicant for such permit complies with these provisions and the regulations of the Council of the City of Richmond, the application and plat shall be approved by the superintendent of streets, and a permit issued by him.

12.28.150 - Same—Conditions.

All excavations for service connections made in public streets under the provisions of these regulations shall be made by open ditch and no tunneling shall be done, except under car tracks, curbs or sidewalks. All such excavations shall be made not more than two feet in width at the top and may slope in so as to be not more than twelve inches wider than the outside of the pipe to be laid in such excavations.

Where application is made for a permit to excavate in any public street for the purpose of repairs only, the holder of such permit shall immediately, upon the completion of the making of such excavation, pay the city of Richmond for such excavation in accordance with fee schedules established by resolution of the city council.

12.28.160 - Same—Inspections and back-filling.

The holder of any permit for side sewer connections as herein provided shall proceed without unnecessary delay after the issuing of such permit to complete the work for which such permit was issued, and upon completion thereof shall notify the sewer and street inspector of the city of Richmond thereof. Immediately after the sewer and street inspector has passed and approved the work for which such permit was issued, the holder

of such permit shall, under the supervision and direction of the sewer and street inspector, back-fill such excavation at his own cost and expense and in the following manner: Fine dirt shall be carefully deposited and compacted by hand tampers in layers not exceeding eight inches to a level of one foot above the top of the pipe. The trench shall then be back-filled in layers not to exceed five feet to within a distance of one foot from the surface of the roadway and compacted by jetting water into the fill material to the satisfaction of the sewer and street inspector. If hand or machine tampers are to be used, the trench shall be back-filled and compacted in six inch layers to within one foot of the surface of the roadway.

The top one foot of back-fill shall be hand or machine tamped and the paving material excavated from the street shall be placed on top of fill and compacted as thoroughly as possible so that the roadway may be left in a safe and passable condition for vehicles.

12.28.170 - Same—Applicability to public service corporations.

Every public service corporation desiring to make any excavation in any public street in the city of Richmond shall comply with all the foregoing provisions as to the obtaining of a permit therefor except that payment of the sums hereinbefore mentioned by a public service corporation may be waived upon a determination by the director of public works that such corporation has demonstrated satisfactory compliance with this chapter. Such public service corporation upon the completion of the laying of pipe in any excavation made by it in any public street of the city of Richmond shall immediately thereafter proceed to refill such excavation and to restore such street to its original condition without unnecessary delay. Provided, further, that upon the completion of the work of refilling any such excavation the space left for the wearing-surface shall, between the time of finishing of such refilling and the repaving of the street, be filled with either slabs of surfacing removed by it in making such excavation, or by boards or other smooth material which will afford a temporary safe and passable crossing for vehicles.

(Amended by Ordinance No. 17-71 N.S.)

12.28.180 - Same—Cost to public service corporation for resurfacing by city.

Any public service corporation desiring that any resurfacing over any excavation made by it shall be done by the city of Richmond shall pay to the superintendent of streets the cost of such work plus twenty-five percent; provided, that if any work of restoring any street to its original condition by any public service corporation after the making of any excavation therein shall not be properly done, or shall thereafter sink or rise above the level of the adjoining portion of such street, such corporation shall upon notice from the superintendent of streets immediately proceed to repair such street to the satisfaction of the superintendent of streets and in the event that such corporation shall fail or neglect, within ten days after receipts of such notice, to so repair or restore such street then the superintendent of streets may perform such work and such corporation shall thereupon be liable and shall pay to the city of Richmond the cost thereof plus twenty-five percent, which amount may be deducted from the deposit of two hundred fifty dollars, or if such deposit shall be insufficient to pay the cost thereof, then such corporation shall be liable to the city of Richmond for the balance of the cost of such work; and provided, further, that it shall be the duty of any such public service corporation to keep the deposit up to the full sum of two hundred dollars at all times.

12.28.190 - Same—Effect of arrearages.

No person in arrears to the city of Richmond by reason of any obligation or liability arising under these provisions shall be granted any further permits to make excavations in any street of the city of Richmond until such arrearage shall have been fully paid.

12.28.200 - Same—Safety requirements.

It shall be the duty of every person making any excavation in a public street, alley or other public place to maintain safe crossings for vehicle and pedestrian traffic at all street intersections. Free access must be provided to all fire hydrants and all materials excavated shall be laid compactly along the side of the trench and kept trimmed so as to cause as little inconvenience as possible to public travel.

If the street is not wide enough to hold the excavated materials without using part of the adjacent sidewalk, the person by whom the excavation is made shall erect a tight board fence upon and along such sidewalk and keep a passageway at least four feet in width upon and along such sidewalk. All gutters shall be maintained free and unobstructed for the full depth of the adjacent curb and for at least one foot in width from the face of such curb at the gutter line.

12.28.210 - Same—Restoration.

When the applicant has completed the work of installing any pipe, conduit, duct or tunnel for which a permit has been granted, the Superintendent of Streets shall be immediately notified thereof and the said Superintendent of Streets shall thereupon proceed to restore such street, alley, sidewalk or other public place to its former condition except in the case of a public service corporation electing to do such work as aforesaid.

12.28.220 - Same—Limitations of permit.

No permit shall be issued unless the applicant has legal authority to occupy and use, for the purposes mentioned in the application, the streets, alleys, sidewalks or other public places covered by such application. No permit shall be transferrable. Such permit shall become void unless the excavation to be made in pursuance thereof is commenced within ten days from the date of the issuance of such permit.

After such excavation is commenced, the work of making the same and installing the pipe, conduit, duct or tunnel for which such permit has been granted, including the restoring of the street, shall be prosecuted with due diligence so as not to obstruct the street or other public place of travel more than in actually necessary.

12.28.230 - Same—Removal of wearing—surface of streets.

Wherever practicable, any person making any excavation for which a permit has been obtained shall remove the wearing-surface of any improved street in slabs of at least four feet in length.

12.28.240 - Same—Exceptions.

None of these provisions shall apply to any work done or to be done in or along any public street, alley or public place pursuant to any law of the State of California for the improvement thereof, or to any work done or to be done along, in or upon any such street, alley or other public place pursuant to any contract for improvement authorized by the Council of the City of Richmond; nor shall these provisions apply to excavations made by any department, board or officer of the City of Richmond in the discharge of its or his official duties.

12.28.250 - Same—Emergency repairs and parkway excavations excepted.

It is hereby provided that in cases of emergency where it shall become necessary at any time other than the business hours of any day for a public service corporation to make an immediate repair to any pipe or conduit maintained by it in any public street in the City of Richmond such work may be done without first obtaining the permit herein required; provided that the application for such permit shall be made for the performance of such work upon the next business day.

It is hereby further provided that these provisions shall not apply to excavations made in parkways between the curb and sidewalk, provided that the refill of such excavations shall be done to the satisfaction of the Superintendent of Streets of the City of Richmond.

(Source: Ordinance No. 1780)

12.28.260 - Set-back lines—Definitions.

For the purpose of Sections 12.28.270 through 12.28.330, inclusive, certain words used therein are defined as follows:

(a) The word STREET shall mean a main street, avenue or highway which forms the boundary of a block, as distinguished from a lane or alley.

(b) The word BLOCK shall mean a plat of land bounded by main streets, or by main streets and a boundary line of the City.

(c) The word LOT shall mean one of the separate pieces or parcels of land into which a block has been divided for purposes of sale, as shown and delineated on the last official map showing such lot and block on file in the office of the County Recorder.

(d) The words CORNER LOT shall mean a lot situated at the junction of two streets.

(e) The words LINE OF THE STREET shall mean the dividing line between a street and the property abutting thereon.

(f) The word STRUCTURE shall mean any work or construction or other object or thing any part of which extends more than five feet in height above the sidewalk level.

(g) The plural shall include the singular, and the masculine shall include the feminine.

12.28.270 - Establishment of set-back lines.

The Council of the City of Richmond may establish or re-establish building lines on private property within the City along and parallel with the whole or any portion of any street, between which lines and the line of the street no structure as herein defined shall be located. Said lines shall be known as "set-back lines," shall be measured from the line of the street, and shall be established in accordance with the procedure set forth herein. Any set-back line so established may be changed thereafter by following the same procedure. One or more set-back lines may be established along one or more streets or portions thereof in one and the same proceeding.

12.28.280 - Same—Procedure.

Whenever in the opinion of the Council, public health, safety and general welfare require that structures thereafter to be erected shall be set back a certain distance from the line of a street in order to reduce danger from conflagration or of vehicular accidents at private driveways or street intersections, or insure more equitable rights in light, air or vision to adjacent structures then erected or thereafter to be erected, the Council shall pass a resolution of intention declaring its intention to establish the set-back line at which such structures shall set back from the line of the street. Said resolution of intention shall refer to the street by the name under which it is commonly known and describe the distance of the proposed set-back line from the line of the street, and shall fix a time and place when and where any owners of property fronting on the portions of the street affected, objecting to the proposed set-back line or claiming that their property would be damaged by its establishment, may appear before the Council and have their objections or claims heard and determined.

Said resolution of intention under a heading "NOTICE OF INTENTION TO ESTABLISH SET-BACK LINE" shall be published once in a newspaper of general circulation in the City at least ten days before the date of said hearing; and said resolution of intention, under a like heading in letters not less than one inch in height, shall be posted conspicuously in front of each block or portion of block along which such set-back line is proposed to be established, at least ten days before the date of said hearing. The City Clerk shall cause said notice to be published and the Superintendent of Streets shall cause said notice to be posted as herein provided.

12.28.290 - Same—Effect of resolution on issuance of permits.

After the passage of said resolution of intention and until the proceeding is finally disposed of no building permit shall be issued for the location of any structure as herein defined in the space between the proposed set-back line and the line of the street, and any permit so issued shall be void.

12.28.300 - Same—Hearing of objections and action of council.

At any time before said hearing any interested property owner objecting to the establishment of the proposed set-back line may file with the City Clerk his written objections thereto, setting forth therein the grounds and nature of.his objections. Any person claiming his property would be damaged by the establishment of the proposed set-back line shall file a verified claim thereof with the City Clerk at any time before said hearing, setting forth therein the amount and nature of the damage claimed. No other objections or claims shall be considered. At the time of said hearing, or any time to which it may be continued, the Council shall hear the objectors and their witnesses, and pass upon the objections, also all claims for damages. In considering claims for damages and estimating the amount thereof the Council may take into consideration, among other things, the opinions of owners of property near or adjacent to the property of claimants on the question as to the amount of damage. If after hearing the testimony and considering such other competent evidence as may be presented the Council is of the opinion that any of the claimants would suffer

damages to their property in excess of benefits their property would receive, the Council may abandon the proceedings as provided in Section 12.28.310, or determine in what amount such damages will exceed the benefits and make provision for payment thereof; provided, the Council may find and determine that the damages are wholly offset by the benefits in which case no damages shall be payable.

Failure to file any objections or make any claim for damages in the times form and manner herein prescribed shall be deemed a waiver thereof.

The establishment of set-back lines shall be deemed a benefit to the whole City in all cases, therefore, in the event that any damages are found and awarded the same shall be paid out of the treasury of the City.

12.28.310 - Same—Final resolution of council.

At the conclusion of the hearing the Council may pass a resolution establishing the set-back line or lines referred to in the resolution of intention; provided the Council may sustain any objection and abandon the proceedings; or the Council may establish setback lines at less distance from the line of the street than was proposed in the resolution of intention without new proceedings; provided, further, the Council may establish set-back lines along a portion of the street to the exclusion of other portions thereof. In establishing set-back lines the Council shall take into consideration in all cases such matters as the width of the street, height of existing structures and the fire-resisting qualities of the materials of which they are constructed.

12.28.320 - Same—Violations.

It shall be unlawful for any person to locate any structure as herein defined in the space between any set-back line so established and the line of the street; and the building inspector shall refuse to issue a permit for the location of any such structure in said space.

The establishment of a set-back line shall never be deemed to divest any owner of property of any of his right, title, interest, use or right of possession thereof except to the extent herein provided, and the City shall not have any right hereunder to exercise any jurisdiction, dominion or control over the private property lying between said set-back line and the line of the street, except such as is vested in the City government under its police powers and to the extent herein provided, for the protection of public health, safety and general welfare.

12.28.330 - Same—Duty of clerk.

The City Clerk is hereby directed to mark in red ink on the official zone map of said City each set-back line established under these provisions and show thereon the distance between said setback line and the line of the street.

(Source: Ordinance No. 621)

12.28.340 - Construction, hanging and use of awnings and signs regulated—Obstructions on sidewalks prohibited without an encroachment permit.

No person owning or occupying any premises fronting on a public street shall place any goods, wares or merchandise, for the purpose of exhibitions display or advertisement, on any portion of the sidewalk in front of said premises, nor suffer any such goods, wares or merchandise, or any advertising banner or device over any portion thereof.

No person shall place any crates, cases, barrels or boxes on the sidewalks nor suffer anything to remain thereon in front of premises occupied by him which will in any manner restrict the public use thereof. No sign shall be suspended above and across any sidewalk except as hereinafter provided. No flag, canvas, banner, nor any advertising device of any description whatever shall be stretched across any street or sidewalk without permission of the City Council of the City of Richmond.

The prohibitions set forth in this section shall not prevent a business from obtaining an encroachment permit pursuant to Section 12.28.365.

(Ord. No. 25-10 N.S., § 2, 8-2-2010)

12.28.350 - Same—Height and projection of awnings.

All awnings extending over the sidewalk in front of any buildings shall be securely fastened to such building and be at such height that no part of such awning shall be within seven feet of the surface of the sidewalk over which it is suspended, nor shall any such awning extend beyond the outer curb line of the sidewalk.

12.28.355 - Awnings, marquees or canopies.

Whenever any awning, marquee, or canopy extending over a public sidewalk interferes with, impedes or prevents the performance of any public work function or public improvement in or upon such sidewalk, the owner of such awning, marquee, or canopy shall, upon written notice by the superintendent of streets, at the owner's cost and expense, take such remedial action as will cause the awning, marquee, or canopy not to interfere with, impede or prevent the performance of such public work function or public improvement.

The owner so notified by the superintendent of streets shall within ten days after the receipt of such notice commence the required remedial action and shall continue and complete such work without delay and within the time specified in the notice by the superintendent of streets.

(Added by Ordinance No. 346 N.S.)

12.28.360 - Same—Permission required.

Except as otherwise provided in this code, no person shall place, erect or maintain any obstruction on any portion of any street or sidewalk of the city of Richmond without permission of the city council of the city of Richmond.

(Amended by Ordinance No. 38-78 N.S.)

12.28.365 - Temporary encroachment permit for use of sidewalk.

(a) A business occupying premises fronting on a public street may obtain or renew a permit to encroach upon the public sidewalk for a period of up to one year provided all of the following conditions are satisfied:

(1) The sidewalk adjacent to the business is at least ten feet wide.

(2) The proposed encroachment will leave an unobstructed pedestrian travel lane of at least five feet in width.

(3) The proposed encroachment will not inhibit use of or access to facilities addressing the needs of the mobility impaired, as required by the Americans with Disabilities Act.

(4) The proposed encroachment will not inhibit use of or access to legally existing encroachments, such as utility service boxes.

(5) The applicant submits to the Engineering Division plans drawn to scale showing the proposed dimensions of all encroaching structures, facilities, furniture, landscaping, and appurtenances, and demonstrating compliance with subparagraphs (1)—(4), above.

(6) The applicant submits to the Engineering Division a brief description of the nature of the encroachment and the proposed duration of the encroachment. The permit fee for an encroachment remaining in place for less than one year will be a prorated portion of the annual fee.

(7) The applicant submits to the Engineering Division written verification that the City of Richmond Planning Department and Fire Department, as well as the California Department of Alcoholic Beverage Control if the applicant proposes to serve alcohol within the public-right-of-way, have reviewed and approve the proposed encroachment.

(8) The applicant pays all plan review fees and all encroachment permit fees.

(b) Within ten business days after submittal of all required application materials and the payment of plan review fees, the Engineering Division will render a decision on an encroachment permit application. Encroachments may be permitted for up to one year and may be renewed for periods of up to one year. The Engineering Division may attach such conditions to an encroachment permit as are necessary to preserve the public health, safety and welfare.

(Ord. No. 25-10 N.S., § 3, 8-2-2010)

12.28.370 - Monuments.

Any monument of granite, concrete, iron or other lasting material set for the purpose of locating or preserving the lines and/or elevation of any public street or right-of-way, property, subdivision, or a precise survey point or reference point shall not be removed, moved or disturbed or caused to be removed, moved, or disturbed without first obtaining permission from the city engineer to do so, said permission to be granted in conformance with requirements as set forth in specifications established by the city engineer. Replacement of a removed or disturbed monument shall be at the expense of the permittee, and the city engineer may require a suitable cash deposit, bond, or other security from the permittee to assure that the replacement cost will be met by the permittee.

(Added by Ordinance 346 N.S.)
(Source: Ordinance No. 1482)

Chapter 12.30 - VIDEO SERVICE PROVIDER, UTILITY AND SPECIAL DISTRICT ENCROACHMENTS

Sections:

12.30.010 - Purpose.
12.30.020 - Definitions.
12.30.030 - Applicability.
12.30.040 - Application.
12.30.050 - Findings and conditions.
12.30.060 - Posting and appeal.
12.30.070 - Relocation of facilities.
12.30.080 - Transfer.
12.30.090 - Violations—Revocation and other penalties.

12.30.010 - Purpose.

The public rights-of-way are unique public resources held in trust for the benefit of the public. These physically limited resources require proper management to maximize their efficiency and minimize the costs to taxpayers, to protect against foreclosure of future economic expansion because of premature exhaustion of the public rights-of-way, and to minimize the inconvenience to and negative effects on the public from use of the public rights-of-way by video service providers, utilities and special districts.

12.30.020 - Definitions.

As used in this chapter:

"Agency" means the Richmond Community Redevelopment Agency, a public body corporate and politic.

"Arterial street" means any street with a traffic volume of 7,500 to 15,000 vehicles per day, including Barrett Avenue, Castro Ranch Road, Garrard Boulevard, Harbor Way, Macdonald Avenue, Pennsylvania Avenue, Potrero Avenue, Rheem Avenue, Seventh Street, Solano Avenue and Thirty-Seventh Street.

"City" means the government of the City of Richmond, a chartered city and a municipal corporation duly organized and validly existing under the laws of the State of California, and all departments, divisions and offices thereof.

"Communications service equipment" and "communications service facilities" mean the equipment and facilities used by a video service provider to provide cable or video service.

"Encroach" means constructing or placing temporary or permanent structures, improvements, facilities or materials in, on, over, or under any public right-of-way or using any right-of-way so as to prevent, obstruct, or interfere with the normal use of that way, including, but not limited to, the performance of any of the following acts:

(1) Excavating or disturbing the public right-of-way;
(2) Erecting or maintaining any post, sign, pole, fence, guard-rail, wall, pipe, conduit, cable, wire, communication service equipment, or other facility or structure on, over, or under a public right-of-way;
(3) Planting any tree, shrub, grass or other growing thing within the public right-of-way;
(4) Placing or leaving on the public right-of-way any rubbish, brush, earth or other material;
(5) Constructing, placing, or maintaining on, over, under or within a public right-of-way any pathway, sidewalk, driveway or other surfacing; any culvert or other surface drainage or subsurface drainage facility; or any pipe, conduit, wire, communication service equipment or facilities, or cable;
(6) Constructing, placing, planting or maintaining any structure, embankment, excavation, tree or other object adjacent to the public right-of-way which causes or may cause an encroachment.

"Engineer" means the City Engineer, or his or her designee.

"Facility" means any fiber-optic, co-axial, or copper cable; communication service equipment; telephone, telecommunications, electric or other wire, line or equipment; utility structure; oil, gas, or other pipeline; duct; conduit; cabinet; tunnel; vault; drain; manhole; splice box; surface location marker; pole; subsurface tiebacks; soil nails; stairs; access ramps; subsurface foundations; landscape features, including curbs around planter areas; planter boxes; clocks; bus shelters; phone booths; bike racks; fencing; retaining walls; benches; stockpiles; building materials; and other appurtenances or tangible thing located in, upon, above, beneath, or across any public right-of-way.

"Major arterial street" means any street with a traffic volume of more than 15,000 vehicles per day, including Carlson Boulevard, Central Avenue, Cutting Boulevard, Hilltop Drive, May Road, R.H. Miller Drive, San Pablo Avenue, San Pablo Dam Road, Thirteenth Street, Twenty-Second Street and Twenty-Third Street.

"Permittee" means any person, video service provider, utility or special district that has been issued a permit pursuant to this chapter, including any lawful successor, transferee, or assignee of the original permittee. All obligations, responsibilities, and other requirements of the permittee shall be binding on successors in interest of the original permittee.

"Person" means any natural person, firm, joint venture, joint stock company, partnership, association, club, company, corporation, business trust, organization, or the manager, lessee, agent, servant, officer or employee of any of them or any other entity which is recognized by law as the

subject of rights or duties, not including the City of Richmond, the Richmond Community Redevelopment Agency, or the City's or Agency's officers, employees or agents.

"Public right-of-way" means the area in, upon, above, beneath, or across any land or interest therein which by deed, conveyance, agreement, easement, dedication, usage or process of law is reserved for or dedicated to the use of the general public for travel, and includes any public street, road, highway, freeway, bridge, lane, court, alley, boulevard, sidewalk, median, parkway or emergency vehicle easement.

"Public street" means the full width of the surfaced or traveled portion, including shoulders, of any road, street, path, lane or alley dedicated to, reserved for or used by or for the general public when those roads, streets, paths, lanes and alleys have been accepted as and declared to be part of the city system of public streets, except highways forming a part of the state highway system.

"Special district" means any agency of the state for the local performance of governmental or proprietary functions within limited boundaries, and includes a county service area, a maintenance district or area, an improvement district or improvement zone, or any other zone or area formed for the purpose of designating an area within which a property tax rate will be levied to pay for a service or improvement benefitting that area.

"Structure" means any physical alteration or improvement, including, but not limited to, a building, post, cabinet, fence, vault, sign, pole, guard -rail, wall, facility, pedestrian walking path, sidewalk, driveway, track, surfacing, culvert, drainage facility, pipe, embankment or excavation.

"Underground utility district" has the meaning set forth in Chapter 12.48 of this Code.

"Utility" means any person or entity providing electricity, gas, telephone, telecommunications, water, or other services to customers, and which pursuant to state law or local franchise is entitled to install its facilities in the public rights-of-way.

"Video service" has the meaning set forth in California Public Utilities Code Section 5830(s).

"Video service provider" has the meaning set forth in California Public Utilities Code Section 5830(t) and, in addition, refers collectively to any cable operator as defined in Public Utilities Code Section 5830(b), or open-video system operator as defined in Public Utilities Code Section 5830 (n).

12.30.030 - Applicability.

(a) Except as specified in subsection (b), below, before placing any encroachment in, on, over, or under any public right-of-way within the City, a video service provider, utility or special district must obtain a permit in accordance with this chapter.

(b) Notwithstanding subsection (a), above, no permit shall be required pursuant to this chapter for any of the following:

(1) The actions of any officer or employee of the City or Agency engaged in the discharge of official duties;

(2) The performance of work under contracts to the City or Agency, including work for City or Agency projects;

(3) Encroachments existing prior to the effective date of this chapter; provided, however, that nothing in this chapter shall preclude the Engineer from requiring an appropriate permit or license for or removal of any such preexisting encroachment where the Engineer determines the encroachment adversely affects the safety, capacity or integrity of the City's public right-of-way;

(4) Maintenance or repair by a video service provider, utility or special district of existing pipes, facilities, conduits or other structures lawfully on or under a public right-of-way where such maintenance or repair work will not disrupt traffic in an arterial or major arterial street;

(5) The making of an emergency street cut or excavation in the public right-of-way by a video service provider, utility or special district to repair a broken or defective pipe, facility or conduit lawfully on or under a public arterial street, as may be necessary for the preservation of life and property when an urgent necessity therefor arises and the offices of the City are closed, provided that reasonable vehicular and pedestrian barriers or other traffic controls shall be provided during the performance of any such repairs. The video service provider, utility or special district performing the repair work shall notify the City's Engineering Department and Police Department by telephone at the time any such repair work is commenced and must apply for a permit within one calendar day after the offices of the City are again opened;

(6) Tree work, including, but not limited to, planting, trimming, or removal of any new or existing tree within the public right-of-way where a permit has been issued for such work pursuant to Chapter 10.08 of this Code, and no traffic lane closure is anticipated;

(7) Sidewalk cafes and restaurants, which shall be governed by the provisions and requirements of Chapter 15.04 of this Code;

(8) Street closures for special events specifically approved by the City Council.

(c) Any video service provider, utility or special district encroachment that requires but does not have a permit shall be deemed a violation of this chapter and a public nuisance, which may be abated by the City pursuant to any applicable provision of law including, but not limited to, Chapter 9.22 of this Code.

12.30.040 - Application.

(a) An application for a video service provider, utility or special district encroachment permit, including renewal of an existing permit, shall be on a form prescribed by the Engineer, shall be signed by the applicant, and shall include all of the following materials unless the submittal is waived in writing by the Engineer:

(1) The name, address and telephone number of the applicant;

(2) The name, address and telephone number of the contractor(s) if any proposed work is to be done by a contractor(s);

(3) The location, purpose, extent and nature of the proposed work;

(4) The period of time when the proposed work will be performed;

(5) A traffic and pedestrian control plan for the location of the proposed work;

(6) A certificate of insurance from the applicant and contractor's insurance carrier in a form satisfactory to the City, and naming the City as additional insureds;

(7) A key map and detailed improvement plan showing all facilities to be located in the public right-of-way, including the material of construction and horizontal and vertical locations with respect to the property lines and grade lines, existing utilities and all other

pertinent facilities and information required by the Engineer. Unless exempted by state law, the detailed improvement plan shall be prepared by a California Registered Professional Civil Engineer;

(8) Any other specifications, analyses or materials the Engineer may require to describe the work, its location in and its effect on the right-of-way, including the mode of operation, maintenance and use;

(9) Current maps and records of the underground facilities at the site;

(10) The encroachment permit fee set forth in the City's Master Fee Schedule.

(b) For those applications where an aboveground encroachment is proposed, the Engineer shall provide written notice by first class mail to occupants and to owners (as shown on the County Assessor's latest tax roll) of properties located within 300 feet of the proposed encroachment, and to the Neighborhood Council and any homeowners' association in the neighborhood of the proposed encroachment, advising of the filing of an application for approval of an encroachment into the public right-of-way, describing the proposed encroachment and its location, and providing an opportunity to submit written comments regarding the application to the Engineer within fifteen (15) days from the date of the letter and prior to the Engineer's action on the application. Notwithstanding the foregoing, no notice shall be required for any application limited to installation of utility poles, anchors or small cabinets less than four (4) cubic feet in size or for any underground excavations or related work.

(c) In signing the application, the applicant attests that all information provided in support of the application is true and correct. When the applicant has submitted a completed and signed application form, all supporting documents and information, and the required fee, the application will be complete. The Engineer shall act upon an application for a video service provider, utility or special district encroachment permit within sixty (60) days after the application is complete.

(d) A renewal application, supporting materials, and fee must be submitted at least sixty (60) days prior to the termination date of a video service provider, utility or special district encroachment permit or the permit may lapse. A lapsed permit may be deemed a violation of this chapter and the unpermitted encroachment may be considered a public nuisance, subject to abatement by the City pursuant to any applicable provision of law including but not limited to Chapter 9.22 of this Code.

12.30.050 - Findings and conditions.

A video service provider, utility or special district encroachment permit shall be approved by the Engineer upon making the following findings, and shall be subject to all requirements of this chapter and to all of the following conditions:

(1) Findings.

(A) The proposed encroachment has no potential for causing a significant effect on the environment.

(B) The application is complete and all of the necessary supporting information has been provided.

(C) The applicant has made reasonable efforts to erect, construct, use, operate, and maintain facilities underground; provided, however, from and after the effective date of the establishment of any underground utility district, the applicant shall erect, construct, use, operate, and maintain its facilities underground. Where undergrounding is not feasible (except in any area declared to be an underground utility district), the applicant has made reasonable efforts to co-locate facilities on existing poles or other aboveground structures.

(D) The proposed location of the facilities is the best available option to minimize adverse impacts on the use of the public right-of-way and on adjoining properties.

(E) If the application is for a renewal of an existing permit, the permittee is in compliance with the current permit and conditions.

(F) With the conditions imposed, the proposed encroachment shall not be detrimental to the public health, safety and welfare.

(2) Conditions.

(A) All application materials are incorporated into the permit by reference and all representations made in the application are conditions of permit approval.

(B) The permittee and all of its contractors performing work in the public right-of-way shall secure a policy of broad form commercial general liability insurance naming the City as additional insured in an amount not less than two million dollars ($2,000,000.00) per occurrence, or as approved by the City's risk manager, unless permittee is exempt by law from having to procure such insurance before establishing or maintaining any works or facilities in, on, under or above the public right-of-way. All contractors' policies secured in compliance with this condition shall be in effect for the duration of the contractor's work in the public right-of-way; all permittees' policies secured in compliance with this condition shall be in effect for as long as the encroachment remains in the public right-of-way.

(C) The permittee and all of its contractors performing work in the public right-of-way shall furnish to the City, and file with the City Clerk, a corporate surety bond to guaranty the faithful performance of the construction of such work and a separate bond to secure payment of the claims of laborers, mechanics, and material suppliers employed in the construction of such work. The performance bond and payment bond shall each be in an amount equal to one hundred percent (100%) of the total amount of the cost of construction of the work to be performed in the public right-of-way. All bonds shall be issued by a corporate surety admitted in the State of California and shall name the City as a co-obligee.

(D) All work done under the permit shall conform to standard specifications or, in the absence of standard specifications, to recognized standards of design, construction and practices in placing encroachments in, on, under or above the public right-of-way.

(E) All facilities shall be constructed, operated, and maintained in the time, place and manner that cause the least interference with the public's use of the public right-of-way, the City's management and use of the right-of-way, and the rights or reasonable convenience of property owners who adjoin the public right-of-way.

(F) Except when emergency repairs are required, at least forty-eight (48) hours prior to commencing any work that will obstruct or impede the flow of vehicular and/or pedestrian traffic, the permittee shall post the area that will be affected with notifications satisfactory to the Engineer.

(G) During construction, the permittee shall keep a copy of the permit issued pursuant to this chapter at the job site.

(H) During construction and maintenance, the permittee shall provide appropriate traffic warnings, safeguards and controls, as approved by the Engineer.

(I)

During construction and maintenance, the permittee shall provide temporary pedestrian access facilities as necessary to comply with local, state and federal law, including the Americans with Disabilities Act, and with the written direction of the Engineer, if any.

(J) The permittee shall maintain all structures, facilities, and landscaping within the encroachment area in a safe and clean manner, and shall at all times observe and enforce all applicable local, state, and federal safety orders, rules and regulations.

(K) The permittee shall promptly remove all graffiti on any structure or facility within the encroachment area.

(L) The permittee shall notify the Richmond Police Department and the Engineer and shall promptly repair any damage to structures or facilities caused by criminal activity, including, but not limited to, theft of copper.

(M) As may be required by Section 4216 et seq. of the California Government Code, the permittee shall contact Underground Service Alert (USA) prior to commencing, and as appropriate during, any permitted work.

(N) Upon the request of any person who has contracted to perform work on a public right-of-way, the permittee shall provide accurate detailed information regarding the location of its existing and proposed structures in the public right-of-way.

(O) To the maximum extent allowed by law, permittee shall indemnify, defend, release, and hold harmless the City, its agents, officers, employees, boards, commissions and contractors ("Indemnitees") against any and all liabilities, losses, claims, actions, causes of action or demands whatsoever against any of them, including claims for any injury to or death of any person or damage to property or other liability of any nature, including, but not limited to, Attorney's and expert fees and court costs, arising out of or connected in any way with the installation, operation and maintenance of any facilities in, or the use of any public right-of-way by, permittee or permittee's employees, officers, officials, agents, transferees, contractors or subcontractors pursuant to the permit or agreement issued under this chapter; provided, that the obligation to indemnify the City under this subsection shall not apply to any liabilities, losses, claims, actions, causes of action or demands caused by indemnitee's sole negligence, willful misconduct or criminal acts.

(P) To the maximum extent allowed by law, permittee shall indemnify, defend, release, and hold harmless Indemnitees against any claim, action or proceeding brought to attack, set aside, void or annul the environmental review process for and/or approval of a permit issued pursuant to this chapter.

(Q) The City reserves the right to inspect any structure or facility installed in the public right-of-way and to demand of the permittee timely correction of any deficiencies in operation or maintenance. The City further reserves the right to demand at any time that within ten (10) business days the permittee produce current, complete and accurate maps, plans, diagrams, and records pertaining to any structure or facility installed in the public right-of-way.

(R) Installation or construction of structures and facilities in the public right-of-way shall be completed and all construction-related damage to the public right-of-way shall be repaired within two (2) years from the date the encroachment permit is issued, unless for good cause the Engineer grants a written extension of the time to complete installation, construction or repair.

(S) The permittee shall operate and use the structures and facilities placed in the public right-of-way solely and exclusively for the purposes and uses expressly stated in the application. A change in purpose, use, or operator of the structures and facilities requires approval of a transfer in accordance with Section 12.30.080 of this chapter.

(T) The Engineer reserves the right to suspend the encroachment permit if necessary to protect the public from imminent danger and to take such action as is necessary to correct the condition posing the danger. In the event of an emergency suspension, the Engineer shall notify the permittee and provide an opportunity for a hearing in accordance with the procedures set forth in Section 12.30.090 of this chapter.

(U) If placement of structures and/or facilities in the public right-of-way conflicts with the City's construction, reconstruction or maintenance work in the public right-of-way, the permittee shall, at its own expense, relocate the structures and/or facilities in accordance with Section 12.30.070 of this chapter.

(V) When the facilities and/or structures encroaching in the public right-of-way are removed and/or abandoned, the permittee shall, at its own expense, restore the public right-of-way to a condition the same as or better than its condition before the facilities and/or structures were installed. Failure to so restore the public right-of-way may be deemed a violation of this chapter and a public nuisance, subject to abatement by the City pursuant to any applicable provision of law including, but not limited to, Chapter 9.22 of this Code.

(W) Such other reasonable conditions, including installation of facilities or structures to address accessibility and drainage, as may be deemed necessary by the Engineer to protect the public health, safety and welfare.

(X) Notwithstanding anything to the contrary in Section 12.30.050(1)(C) of this chapter, whenever any area of the City is declared to be an underground utility district, it shall be unlawful for any video service provider, utility or special district to erect, construct, use, operate or maintain their facilities aboveground.

(3) Where the insurance and indemnification conditions stated in subsection (2), above, conflict with the provisions of a franchise or other agreement between a video service provider, utility or special district and the City or state, the provisions of such franchise or other agreement shall apply.

(4) A video service provider, utility or special district encroachment permit shall terminate on the date specified therein, or upon abandonment of the facilities and/or structures constructed pursuant to such permit. If no date is specified in the encroachment permit, it shall be considered to be of indeterminate duration.

12.30.060 - Posting and appeal.

(a) Posting of Decision. The Engineer's decision to grant or to deny a permit shall be in writing and shall be delivered to the applicant within five (5) calendar days of the decision. Notice of a decision to deny a permit shall specify the reason(s) for denial. Notice of a decision to approve a permit shall be posted at the City of Richmond Engineering Services public counter commencing on the date of the decision and shall be posted at the site of the approved encroachment for a period of not less than ten (10) calendar days commencing within five (5) calendar days from the date of the decision (cumulatively, the "appeal period"). No permit shall be issued until after the expiration of the appeal period, if no appeal is timely filed, or until the final resolution of any appeal.

(b) Appeal. Any person aggrieved by the Engineer's decision on a video service provider, utility or special district encroachment permit application may appeal by submitting a written appeal to the City Clerk, along with the applicable appeal fee as provided in the City's Master Fee Schedule, within fifteen (15) days of the date of the decision. The City Council shall hold a hearing on the appeal at a regularly scheduled meeting not less than fourteen (14) days and not more than forty-five (45) days after receipt of the appeal, and shall give the applicant and

the appellant at least ten (10) days written notice of the date and time of the hearing. The decision by the City Council on the appeal shall be final.

12.30.070 - Relocation of facilities.

(a) If any future construction, reconstruction or maintenance work is required by the City or Agency in the public right-of-way that necessitates the relocation, removal or abandonment of an encroachment, the permittee shall relocate, remove or abandon the encroachment at the permittee's sole expense, unless such requirement is in conflict with any applicable state or local statute or franchise.

(b) When relocation is required, the Engineer shall make written demand of the permittee that the encroachment be relocated within the public right-of-way to a satisfactory location provided by the Engineer, and shall designate a reasonable time for such relocation or removal. In determining what is a reasonable time under this section, the Engineer shall take into consideration the nature of the encroachment, the urgency of the need for its removal, the cost of its removal, the difficulty of its removal, the value of the property to the owner, and other facts peculiar to the particular situation.

12.30.080 - Transfer.

No video service provider, utility or special district encroachment permit may be transferred by the permittee to another person or entity without the express written consent of the Engineer, at his or her sole discretion.

12.30.090 - Violations—Revocation and other penalties.

Any violation of this Chapter may be enforced either as an infraction or as a misdemeanor, or by any remedy available to the City under this Code or under state law. Potential enforcement measures include but are not limited to the following:

(1) Fine. Whenever a City inspector finds that a video service provider, utility or special district subject to this chapter has placed or is placing an encroachment in the public right-of-way without the appropriate permit, the video service provider, utility or special district shall be required to (1) stop work, if construction is on-going, (2) apply for a permit, and (3) pay both the permit fee and a fine equal to the permit fee;

(2) Suspension. Whenever the Engineer finds that a suspension of an encroachment permit is necessary to protect the public health or safety from imminent danger, the Engineer may immediately suspend any such permit pending a hearing for remedial action or revocation. The Engineer shall, within three (3) working days of the emergency suspension, give written notice of such suspension to the permittee, by personal service or by first class mail, postage prepaid, to the last known address of the permittee. The permittee may, within fifteen (15) days after service of such a written notice of suspension, file with the City Manager a request for hearing regarding the suspension. The City Manager or his or her designee shall schedule a hearing on the suspension within five (5) working days of receipt of a request for hearing. If the City Manager or his or her designee, after the hearing, finds that the public health or safety requires correction or alteration of any condition caused by, or existing on the site of the encroachment, he or she shall issue one or more of the following:

(A) An order to correct any particular noncompliance,

(B) A revocation of the encroachment permit,

(C) A continued suspension of the encroachment permit, until such time as the dangerous condition is corrected,

(D) A modification or reinstatement of the encroachment permit, with conditions as necessary to prevent harm to the public.

The City Manager or his or her designee shall, within ten (10) days of the hearing, render a written opinion, stating the findings upon which the decision is based, and the action taken. The decision of the City Manager or his or her designee shall be final, except a decision to revoke the permit which may be appealed to the City Council in accordance with Section 12.30.060(b) of this chapter;

(3) Revocation. The Engineer may recommend that the City Manager revoke a permit where she or he finds that:

(A) The permittee has violated any provision of this Code or condition of the permit,

(B) The permittee has failed to pay any required fees, or to post or maintain any bond or insurance required by this chapter, or

(C) The encroachment for which the permit was granted adversely affects the safety, capacity or integrity of the City's public right-of-way or increases the City's liability exposure,

(D) The encroachment is causing the City to incur substantial additional maintenance costs, or

(E) Material misrepresentations, omissions or inaccuracies were made in the application for the permit.

The Engineer shall give the permittee at least ten (10) days' written notice of a hearing before the City Manager or his or her designee on the proposed revocation of a permit issued pursuant to this chapter, setting forth the grounds for such action. If, after reviewing all evidence presented before or at the public hearing, the City Manager or his or her designee makes any one of the five findings set forth above, he or she may revoke the permit. The City Manager or his or her designee shall, within ten (10) days after the close of the hearing, render a written opinion, stating the findings upon which the decision is based, and the action taken. The decision of the City Manager or his or her designee may be appealed to the City Council in accordance with Section 12.30.060(b) of this chapter.

(Source: Ordinance No. 21-08 N.S.)

Chapter 12.32 - MAINTENANCE OF PIPES, MAINS, CONDUITS AND CAR TRACKS

Sections:

12.32.010 - Moving pipes, mains, etc. likely to interfere with improvement.
12.32.020 - Removal and replacement of water pipes likely to damage improvement.
12.32.030 - Removal and replacement of water pipes likely to damage existing pavement.
12.32.040 - Notice to alter.
12.32.050 - Work to be done without delay.
12.32.060 - Service of notice.

12.32.010 - Moving pipes, mains, etc. likely to interfere with improvement.

Whenever any pipe, main, conduit or car track in or upon any public street in the city of Richmond is situated or located so as to interfere with, impede or prevent the performance of any public work or improvement in or upon such street, or whenever any such pipe or main used for the carrying or transmission of water is so situated or located that it is likely to become broken, crushed or damaged in the performance of any such public work or improvement the person owning, operating or maintaining such pipe, main, conduit or car track shall upon written notice, in the form as hereinafter provided in Section 12.32.040, from the superintendent of streets of the city of Richmond lower, raise or otherwise move such pipe, main, conduit or car track so that the same shall not so interfere with or be so damaged by such public work or improvement.

12.32.020 - Removal and replacement of water pipes likely to damage improvement.

Whenever any existing pipe line or main or portion thereof used for the carrying or transmission of water in any public street in the City of Richmond being improved or about to be improved as aforesaid is found by the superintendent of streets to be deteriorated to such extent that it is leaking or likely to leak and therefore likely to injure and damage any pavement, base or subgrade being constructed or about to be constructed in or upon such street, the person owning, operating or maintaining such pipe or main shall upon written notice in the form hereinafter provided in Section 12.32.040 from the superintendent of streets remove such deteriorated pipe and replace it with new pipe.

12.32.030 - Removal and replacement of water pipes likely to damage existing pavement.

Whenever any existing pipe or main or portion thereof used for the carrying or transmission of water in any paved public street in the City of Richmond has deteriorated to such an extent that by reason of leakage of water therefrom the pavement, base or subgrade of such street is being damaged, the person owning, operating or maintaining such pipe or main shall, upon written notice in the form as hereinafter provided in Section 12.32.040 from the superintendent of streets, remove such deteriorated pipe and replace it with new pipe.

12.32.040 - Notice to alter.

Whenever it becomes necessary for any of the reasons hereinabove set forth to require the lowering, raising or otherwise moving of any pipe, main, conduit or car track or to require the removal and replacing of any existing pipe or main used for the carrying or transmission of water, the superintendent of streets shall give written notice to the person owning, operating or maintaining the same to forthwith at his own cost and expense and in the manner prescribed and set forth in such notice, raise, lower or otherwise move such pipe, main, conduit or car track or remove and replace such pipe or main used for the carrying or transmission of water; and the person so notified as aforesaid shall within twenty-four hours after the receipt of such notice commence the work required thereby to be done and shall continue and complete such work without delay and within the time specified in the notice by the superintendent of streets.

12.32.050 - Work to be done without delay.

In the event any such pipe, main, conduit or car track so required to be raised, lowered or otherwise moved or any such pipe or main so required to be removed and replaced is being used by any person for furnishing water, gas, electric light, heat or power, transportation or other service to the general public such person shall conduct said required work in such manner as to not unnecessarily delay said public service.

12.32.060 - Service of notice.

Any notice provided in this chapter to be given may be served in the same manner that a summons is required to be served in any civil action under the laws of the state of California.

(Source: Ordinance No. 664.)

Chapter 12.36 - MAINTENANCE AND CONSTRUCTION OF SIDEWALKS, DRIVEWAYS, CURBS AND GUTTERS

Sections:

12.36.010 - Title.
12.36.020 - Scope.
12.36.025 - Property owner responsibility to repair and maintain sidewalk.
12.36.030 - Actions prohibited.
12.36.040 - Guarantee deposit fee.
12.36.050 - Transfer of guarantee deposit.
12.36.060 - Permit.
12.36.070 - Inspection—Fee.
12.36.080 - Transfer of permit for construction of sidewalks, driveways, curbs or gutters.
12.36.090 - Control of work—Construction of sidewalks, driveways, curbs and gutters—Compliance with permit and adopted specifications.
12.36.100 - Driveway defined—Approved width.
12.36.110 - Elimination of abandoned driveway—Authority of director of public works.
12.36.120 - Same—Notice.
12.36.130 - Same—Proceedings to assess costs.
12.36.140 - Temporary obstructions.
12.36.150 - Same—Public safety.
12.36.160 - Removal of obstructions.
12.36.161 - Parking strip.
12.36.170 - Schedule of fees.
12.36.180 - Incorporation of Chapter 22, Improvement Act of 1911.
12.36.190 - Incorporation of Chapter 27, Improvement Act of 1911.

12.36.010 - Title.

This chapter shall be known as the sidewalk ordinance.

12.36.020 - Scope.

This chapter sets forth rules and regulations to control the repair and construction of sidewalks, driveways, curbs and gutters, and the removal of obstructions from sidewalks, driveways, curbs and gutters; establishes the administrative procedures for issuance of permits; and provides for the control of obstructions placed where the construction, alteration or repair work is performed for the purpose of safeguarding persons and property against unreasonable hazards resulting from uncontrolled construction practices, in the interest of public health, welfare and safety.

12.36.025 - Property owner responsibility to repair and maintain sidewalk.

(a) The owner of a parcel of real property which fronts on any portion of a sidewalk between the property line of the parcel and the street line, including the parking strip and the curb, is responsible for the repair and maintenance of the sidewalk and shall pay the cost and expense of repair and maintain said sidewalk area whether or not the City has notified the owner of the need for such repairs or maintenance or has performed similar repairs or maintenance in the past.

(b) The owner of a parcel of real property is under a duty to members of the general public, including but not limited to users of the sidewalk, to keep the portion of any sidewalk described in subsection (a) in a safe condition.

(c) The failure of the owner to fulfill the duties imposed by subsections (a) and (b), or the performance of such duties and obligations by the owner in a negligent manner, shall constitute negligence. An owner shall be liable to any member of the general public injured on or by a sidewalk area if the owner's negligence hereunder is a proximate cause of the injury. The City shall not be liable for an injury caused by the negligence of an owner.

(Ord. No. 14-00 N.S., § 1, 5-9-2000)

12.36.030 - Actions prohibited.

It is unlawful for any person to perform any work within the scope of this chapter except for the removal of obstructions, without first having obtained a permit from the department of public works pursuant to this chapter.

12.36.040 - Guarantee deposit fee.

A licensed concrete contractor desiring a permit pursuant to this chapter must first deposit with the director of public works of the City of Richmond a guarantee deposit fee as hereinafter provided. No fee is required when a homeowner desires a permit pursuant to this chapter to do work on the frontage of his own home.

The guarantee deposit shall be retained by the City of Richmond for a period of twelve months after the date of the completion of the work called for in the last permit issued, and no permit shall be issued unless such guarantee deposit shall be reimbursed by the depositor for any deductions made as provided in this chapter. If within twelve months after the completion of the work called for in any permit the sidewalk and/or curb and gutter and/or driveway should break, disintegrate or otherwise fail to comply with the provisions of this chapter, the director of public works shall notify the person making the deposit of such break, disintegration, or failure, and specify the repairs needed or work to be done, and such person shall, within ten days from the date of such notice, make such specified repairs. If such repairs are not made within the fixed time, the same may be made by the director of public works and the cost thereof shall be paid from the guarantee deposit on hand with the City.

After a lapse of twelve months from the date of completion of work called for in the last permit issued to any permittee, upon written demand of such permittee, or his successors or assigns, where such transfers or assignment is made in the manner as hereinafter provided, accompanied by a certificate from the director of public works stating that all needed repairs have been made, and that all the conditions of this chapter have been complied with, the City of Richmond shall return the guarantee deposit, or such portion thereof as may remain after deduction of all fees for repairs and work done as aforesaid, to the permittee or his said successors or assigns.

(Amended by Ordinance No. 58-79 N.S.)

12.36.050 - Transfer of guarantee deposit.

The guarantee deposit may be transferred to another party where such transfer is made pursuant to a judgment of court, or by an agreement of dissolution of a partnership or upon a bona fide sale of the business of the person having ceased to do work under the permit, and entitled to a return of the deposit as provided in this chapter. In the event of any transfer, the receipt for such deposit, or satisfactory proof of the loss of same, must be delivered to the director of public works for verification. No transfer shall be made of the deposit other than as provided in this section.

In the event of a transfer of the guarantee deposit, such transfer shall in no way affect the liability of the deposit for any work done by the person transferring the deposit, nor shall it in any way affect the liability of such person under the provisions of this chapter.

12.36.060 - Permit.

The director of public works shall charge a fee for each and every permit issued, in addition to inspection and engineering fees as hereinafter provided in this chapter. In no case shall a permit be granted to construct sidewalks, curbs and/or gutters where the council has declared its intention to construct such sidewalks, curbs and/or gutters under the general laws of the state of California, and also provided that in the event any of the terms or conditions of this chapter are not complied with, no further permit shall be issued to such person while noncompliance continues to exist, or while such person is indebted to the City of Richmond for money expended in accordance with the terms and conditions of this chapter.

12.36.070 - Inspection—Fee.

It shall be the duty of the director of public works to cause an inspection to be made of sidewalks, driveways, curbs and gutters constructed under the permit, to ascertain whether such work is being done, or has been done, in accordance with the provisions of this chapter and the permit issued therefor.

The director of public works shall charge an inspection fee for all installations of sidewalk, driveway, curb or gutter as hereinafter provided.

(Amended by Ordinance No. 58-79 N.S.)

12.36.080 - Transfer of permit for construction of sidewalks, driveways, curbs or gutters.

No construction and/or repair of sidewalks, driveways, curbs and/or gutters to be performed under a permit issued pursuant to this chapter shall be performed except by or under the supervision of the designated permittee, who shall also be the person who is responsible to the owner or contractor for the work. In the event that it shall be ascertained that any work is being done, or has been done, under a permit issued to anyone other than the person responsible to the owner for the work, and in the event it shall be proven that the use of the permit was with the knowledge and consent, express or implied, of the designated permittee, then the guarantee deposit made by such permittee shall become forfeited to the City of Richmond.

12.36.090 - Control of work—Construction of sidewalks, driveways, curbs and gutters—Compliance with permit and adopted specifications.

All sidewalks, driveways, curbs and/or gutters must be repaired and/or constructed in every particular in accordance with the permit therefor issued; must be completed within thirty days from the date of the permit, unless an extension of time thereon is granted by the director of public works. If all of the construction and/or repair work of any sidewalk and/or driveway is not completed at the expiration of the time allowed by the permit appertaining thereto, and in accordance with the terms of this chapter, the director of public works may notify the contractor to complete the work within two days, and if no so completed, the director of public works is authorized to have the same done at the expense of the contractor, and his guarantee deposit, or as much thereof as may be necessary, shall be applied in payment therefor. Such work must be in accordance with such specifications as may be adopted by the City of Richmond, from time to time, for the construction and/or repair of sidewalks, driveways, curbs and/or gutters.

12.36.100 - Driveway defined—Approved width.

A "driveway" is defined as any approach leading to or from a street which passes over or upon the curbing, parking, or sidewalk area, for the purpose of a vehicular approach. Such driveway width shall not be less than twelve feet or more than twenty feet at the curbline except that with the approval of the director of public works, such driveway may be constructed to a greater width.

12.36.110 - Elimination of abandoned driveway—Authority of director of public works.

The director of public works shall have the power and authority to determine that the use for which a driveway was constructed has been abandoned and give written notice requiring that, at the owner's expense, the curb, parkway and sidewalk shall be restored to its original condition, or that a curb be constructed if none previously existed and that the parkway and sidewalk be constructed to established grade.

12.36.120 - Same—Notice.

Such notice, as required in Section 12.36.110, shall particularly specify what work is required to be done, how the same is to be accomplished, and what materials shall be used. The notice shall be given personally by service upon the owner or person in possession of the property facing such driveway, or by placing such notice in the United States mail in a sealed envelope addressed to the person in possession of

such property, or to the owner thereof, addressed to his last known address as the same appears on the last equalized assessment rolls of the City of Richmond, and when no address so appears, to general delivery, City of Richmond, with postage prepaid.

12.36.130 - Same—Proceedings to assess costs.

If such work is not commenced within two weeks after such notice is given as aforesaid and diligently without interruption prosecuted to completion, the director of public works shall proceed to cause such work to be done in the manner and pursuant to the provisions of this chapter.

12.36.140 - Temporary obstructions.

The permit granted pursuant to this chapter shall carry with it the right to place, or cause to be placed, upon the street adjacent to the place where the construction, alteration or repair work is to be performed, such materials or equipment as may be necessary for use in performing such work, provided, however, that such materials and equipment shall not occupy more than one-third of the roadway in front of the construction work, and shall be placed thereon subject to the direction and approval of the director of public works. In no event shall the equipment or materials be placed within five feet of any railroad track. All materials, debris, and equipment shall be so placed as not to obstruct any gutterway, and shall be so cared for as to prevent material from being blown or otherwise carried into any gutterway, or any catch basin, or any portion of the street other than that lawfully occupied by such obstruction. No material or other obstruction shall be placed within fifteen feet of fire hydrants, which must remain at all times readily accessible to the fire department.

The permit shall prescribe the date when work shall begin, and the time of occupancy of the street, provided, however, that the director of public works may order the materials, equipment and debris, or any portion thereof, to be removed within three days after written notice, and in the event the same is not removed within the time prescribed by the director of public works, or in the permit, as the case may be, the director of public works may cause the same to be removed and charge the costs thereof against the guarantee deposit. The placing of materials and equipment upon the street for the purpose of such construction work and the removal thereof shall be held to be part of such construction work. In the construction and/or repair of sidewalks, driveways, curbs and/or gutters, all rejected and refuse materials shall be removed immediately and all surplus materials shall be removed from the site within two days after completion of the work.

12.36.150 - Same—Public safety.

Whenever the construction or repair of sidewalks, driveways, curbs and/or gutters, or other improvement contracts or undertakings require the temporary occupancy of any portion of a public street or a public sidewalk and a permit has been granted for such occupancy pursuant to the provisions of this chapter, such permit and such occupancy shall be subject to the provision that permittee furnish and maintain such facilities as fences, barriers, "street closed" signs, lights and watchmen as may be necessary to provide adequate protection and prevention of avoidable accidents to the public.

Where such facilities or any of them are not provided or are out of service and an emergency exists that necessitates protective measures, the director of public works, or his representative, may provide such facilities during the emergency and the cost thereof shall be paid by the permittee or deducted from any deposit made with the City of Richmond as a condition to the granting of such permit.

The director of public works, or his representative, before taking the above-mentioned emergency action, shall take all steps reasonable under the circumstances to notify the permittee, or his known representative, of the existing conditions and allow such permittee to care for the same, provided he acts promptly and expeditiously.

12.36.160 - Removal of obstructions.

Every owner of real property in the City of Richmond shall keep the entire width of the sidewalks in front of such property from curb to lot line, free and clear of all weeds, rubbish, debris, or other obstructions, excepting obstructions permitted by law, which from any cause whatever shall have accumulated or may accumulate upon the sidewalk above the established grade of the same.

The director of public works may order the weeds, rubbish, debris, obstructions or materials to be removed within two weeks after written notice is given, and in the event same is not removed within the time prescribed by the director of public works, the director of public works may cause the same to be removed and the cost of the same shall be a lien on the property.

12.36.161 - Parking strip.

It is unlawful to place loose rock, decorative stones or pebbles, bark, asphalt or any other surfacing not specified hereafter in any strip of land used and maintained for parking between any property line and street. It is lawful to pave with concrete, brick, or exposed aggregate concrete in such a parking strip by first obtaining a permit from the director of public works.

In any of the above-mentioned situations, the director of public works may require that planting areas be left in the parking strip for the planting of street trees and may require the planting of such trees as a condition of such permit.

(Added by Ordinance No. 4-70 N.S.)

12.36.170 - Schedule of fees.

The applicant shall pay to the City of Richmond in the office of the director of public works such fees as may be established from time to time by resolution of the council of the City of Richmond in the following categories:

(a) Permit Fee. A separate application and permit fee is required for each and every site.

(b) Inspection Fee. Based on the total area of sidewalk, driveway and gutter and the linear feet of curb, as herein provided.

(c) Engineering Services. When engineering services are necessary for the proper construction of improvements, such services shall be furnished by the director of public works and fees shall be charged therefor.

(d) Guarantee Deposit Fee. A deposit fee to guarantee contractor's work from any failure or breakage for a twelve-month period.

(Amended by Ordinance No. 58-79 N.S.)

12.36.180 - Incorporation of Chapter 22, Improvement Act of 1911.

The provisions of Chapter 22 of Part 3, Division 7, Streets and Highways Code of the state of California (cited as the "Improvement Act of 1911") are hereby expressly referred to and by such reference are made a part of this chapter.

12.36.190 - Incorporation of Chapter 27, Improvement Act of 1911.

The provisions of Chapter 27 of Part 3, Division 7, Streets and Highways Code of the state of California (cited as the "Improvement Act of 1911") are hereby expressly referred to and by such reference are made a part of this chapter.

(Source: Ordinance No. 1804)

Chapter 12.44 - EXCAVATION, GRADING AND EARTHWORK CONSTRUCTION*

Sections:

12.44.010 - General provisions.
12.44.020 - Definitions.
12.44.030 - Permits, reports, fees and surety.
12.44.040 - Control of work.
12.44.050 - Safety and general requirements.
12.44.060 - Design standards and grading regulations.
12.44.070 - Appeals.
12.44.080 - Nuisances.

12.44.010 - General provisions.

(a) Purpose and Intent. The primary purposes of this chapter are to protect life, limb and property, to promote and enhance the general public welfare and a superior community environment, and insofar as it is economically feasible, to ensure the maximum possible preservation of the natural scenic character of major portions of the City, by establishing minimum standards and requirements relating to land grading, excavations and fills, and procedures by which these standards and requirements may be enforced. It is intended that this chapter be administered with the foregoing purposes in mind and with a view to:

(1) Ensuring that future development of lands, particularly in the hillside areas of the City, occurs in the manner most compatible with surrounding areas and so as to have the least adverse effect upon other persons or lands, or upon the general public;

(2) Ensuring that soil will not be stripped and removed from lands within the City, leaving them barren, unsightly and susceptible to erosion, subsidence and faulty drainage;

(3) Ensuring the regulation of grading private property in order to control erosion, control sedimentation and to protect the water quality of water courses, waterbodies and wetlands;

(4) Encouraging the planning, design and development of building sites in such fashion as to provide the maximum in safety and human enjoyment, while adapting development to and taking advantage of the best use of the natural terrain;

(5) Encouraging and directing special attention toward retaining and protecting, insofar as practical, the natural planting and a maximum number of existing trees.

(b) Scope.

(1) This chapter sets forth rules and regulations to control excavation, grading, and earthwork construction, including fills or embankments; establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction.

(2) The provisions of this chapter are supplementary and in addition to the zoning and subdivision regulations of the City. The provisions of this chapter shall be read and construed in connection with and as an integrated part of the zoning and subdivision chapters and the patterns of land development control established thereby.

(3) In the event of conflict between this chapter and Chapter 33 of the most recently adopted Uniform Building Code entitled "Excavation and Grading," this chapter shall take precedence.

(c) Actions Prohibited. It shall be unlawful for any person to:

(1) Perform any work within the scope of this chapter without a permit from the Building Official.

(2) Grade in such a manner so as to:

(A) Cause erosion or sedimentation on other property or on public streets;

(B) Obstruct or otherwise interfere with drainage, or deposit sediment in natural or artificial drainage facilities; or

(C) Construct or alter drainage facilities or alter drainage courses without first obtaining a grading permit pursuant to Section 12.44.030(c) of this chapter.

(d) Administration. The Building Official, or the Building Official's designee, is hereby designated responsible for the administration of this chapter.

(e) Title. This chapter shall be known as the "City of Richmond Grading Ordinance."

12.44.020 - Definitions.

(a) Definitional Preamble. For the purpose of this chapter, unless it is plainly evident from the context that a different meaning is intended, certain words, terms and phrases used herein are defined as set out in this section.

"Applicant" means any person, partnership, corporation, groups of persons or agency requesting permission to engage in any grading activity. Upon issuance of permit, the applicant is the designated permittee.

"Bedrock" means a relatively solid, structured material in place either at the ground surface or beneath surficial deposits of soil.

"Bench" means a step terrace, or flat land area constructed in the face of a cut or fill slope for maintenance, access, and drainage purposes.

"Borrow" means earth material acquired from an off site location for use in grading on a site.

"Building pad" means that area of a lot, parcel or site which will be occupied by the building structure, and includes any other structure or improvement attached, adjoining or adjacent thereto.

"California Storm Water Best Management Practices Hand Books" or "Hand Book" means the latest published editions of the three manuals entitled Industrial/Commercial, Construction, and Municipals published by the State of California.

"Civil engineer" means an engineer licensed by the State of California to engage in the practice of civil engineering.

"Compaction" means the act of compacting or densifying soil and rock material to a specified density, and the resulting densified state of the material.

"Critically expansive soil and other soil problems" means soil conditions which have the potential to cause damage to improvements, including streets, structures and buildings. Such soils shall be tested by acceptable procedures to provide data suitable for making adequate designs for the improvements.

"Diversion" means a temporary or permanent facility including a channel, ditch, or berm constructed across a sloping land surface to intercept and divert surface runoff in order to control its erosion potential.

"Earth material" means any rock, soil or any combination thereof.

"Engineering geologist" means a geologist licensed by the State of California to engage in the practice of engineering geology.

"Engineering geology" means the application of geological data and principles to engineering problems dealing with naturally occurring rock and soil for the purpose of forming an opinion that geological factors are recognized and adequately interpreted in engineering practice.

"Erosion" means the wearing away, detachment and movement of the ground surface by wind, water, ice or gravity.

"Erosion and Sediment Control Manual" means the latest edition entitled, "Manual of Standards for Erosion and Sediment Control Measures," published by the Association of Bay Area Governments (ABAG).

"Excavation" means any act by which earth material is cut into, dug, quarried, uncovered, removed, displaced or relocated and shall include the conditions resulting therefrom.

"Fill" means a deposit of earth material placed by artificial means and shall include the condition resulting therefrom.

"Final Erosion and Sediment Control Plan" means a plan that depicts the permanent erosion control measures designed for a completed project.

"Geological report" means a report prepared by an engineering geologist, based on a study and investigation of the site by an engineering geologist, including such geological structures and characteristics as fault line, fault creep, and landslide, and shall include recommendations for the execution, testing, and control of all grading operations proposed.

"Geotechnical engineer" means a civil engineer licensed by the State of California to engage in the practice of civil engineering who is experienced in and is engaged in professional practice in the field of geotechnical engineering.

"Geotechnical engineering" means the application of the principles of soil mechanics in the investigation, evaluation, and design of civil works involving the use of earth materials and the inspection and testing of the construction thereof.

"Geotechnical and geological reconnaissance report" means a report as described in Section 12.44.030(g).

"Grade" means the vertical locations of the ground surface.

(1) "Existing or natural grade" means the grade prior to disturbance.
(2) "Rough grade" means the stage at which the grade approximately conforms to the approved plan.
(3) "Finished grade" means the final grade of the site which conforms to the approved plan.

"Grading" means any excavation, stripping, cutting, filling, stockpiling, clearing and grubbing, or any combination thereof which alters land or vegetation.

"Hillside site" means a site having an average slope of fifteen percent (15%) or greater.

"Interim Erosion and Sediment Control Plan" means a plan that depicts a set of erosion control measures designed for a project in an active or passive construction mode between October 1st and April 15th. An active construction project is a site where improvement progress is made within the rainy season. A passive project is a site which is not disturbed during the rainy season, with the exception of erosion control maintenance.

"Key" means a trench or step cut into natural ground to hold fill on an existing slope.

"Mulching" means the application of plant residue or other suitable materials to the land surface to conserve moisture, hold soil in place, and aid in establishing plant growth.

Private Storm Drain Facility Easement. This "easement" means the perpetual maintenance obligations incurred by an owner of a subdivided (improved) parcel containing storm drain facilities installed by permittee within parcel.

"Quarry" means any premises or site from which any rock, sand, gravel, stone, earth, soil, or mineral is removed or excavated for the purpose of disposition away from the immediate premises, whether such disposition is immediate or in the future; excepting excavation necessary for the construction of a building or structure on the site of the excavation for which valid permits have been issued, and excepting excavation which is all or part of a grading operation to change the contours of the land in conformance with a plan approved by the Building Official for which a grading permit has been issued.

"Rainy season" means the period of time between October 1st and the following April 15th.

"Runoff" means the surface flow of water.

"Sedimentation" means the process by which mineral, organic matter or soil is removed from its site of origin, transported, and then deposited by water, wind, or gravity.

"Sediment basin" means a reservoir which retards flow sufficiently to cause or allow deposition of transported sediment.

"Site" means any lot or parcel of land or contiguous combination where grading is to be performed or permitted.

"Site Grading Plan" (or "Grading Plan") means a plan as required by Section 12.44.030(d).

"Slope" means an inclined ground surface the inclination of which can be expressed as either a ratio of horizontal distance to vertical distance or the ratio of vertical distance to horizontal (100-foot increment) expressed as a percentage.

"Soil" means earth material of whatever origin that overlies bedrock.

"Stockpile" means a supply of earth, rock, gravel, sand, or other similar material temporarily accumulated and stored prior to final disposition.

"Terrace" means a relatively level step of flat area constructed in the face of the graded slope surface for drainage and maintenance purposes.

"Watercourse" means a drainage channel or natural creek carrying water for a substantial part of the year.

12.44.030 - Permits, reports, fees and surety.

(a) Grading Permit Required. Except as otherwise provided in Section 12.44.030(b), no person shall do any grading without first obtaining a grading permit from the Building Official for any of the following activities:

(1) The excavation or removal of earth or rock from the surface layers of the ground;

(2) The movement of earth around, along, over, or on the surface of the ground;

(3) The deposition, placement, or compaction of earth materials for the construction of embankments;

(4) The stockpiling of earth materials or importing of borrow from off-site locations. A permit shall be required from the jurisdiction which has authority over the borrow site;

(5) The clearing of vegetation preparatory to a grading operation. A separate permit shall be required for each site, unless the sites are contiguous and the entire area is included in the plans accompanying the application. One permit may cover both an excavation clearing and a fill on the same site.

(b) Exception to Permit Requirement. A grading permit is not required for the following:

(1) An excavation which:

(A) Is less than five (5) feet in depth below natural grade and adequately supported by a retaining structure designed in accordance with the Uniform Building Code, or

(B) Does not create a cut slope greater than seven (7) feet in height, or steeper than two (2) horizontal to one (1) vertical, or

(C) Does not exceed fifty (50) cubic yards;

(2) A fill not intended to support structures and which does not obstruct a drainage course or alter existing drainage patterns if:

(A) Such fill is placed on natural grade that has a slope not steeper than five (5) horizontal to one (1) vertical, or

(B) Is less than three (3) feet in depth at its deepest point, measured vertically upward from natural grade to the surface of the fill, or

(C) Does not exceed fifty (50) cubic yards;

(3) Minor land leveling for agricultural farming, if the average ground elevation is not changed more than three (3) feet;

(4) Cemetery graves;

(5) An excavation below finished grade for basements and footings of structures authorized by a valid building permit or trench excavations for the purpose of installing underground utilities, if to be backfilled to natural grade;

(6) Grading in refuse disposal areas and sanitary landfills, mining, quarrying, processing or stockpiling of rock, sand, gravel, aggregate, or clay, for which a use permit has been granted by the City, provided that such operations do not affect the lateral support or increase the stresses in, or pressure upon, any adjacent or contiguous property and are consistent with the grading practices set forth herein, and where the work does not block or divert any natural drainage way or increase runoff or sedimentation onto any adjacent or contiguous property;

(7) Improvement of watercourses and construction of drainage, irrigation, and domestic water supply systems and facilities performed under the supervision of the Flood Control District, an agency of the federal or state government, a water or sanitation district, or an irrigation or reclamation district, or the City;

(8) The construction, repair and maintenance of levees for river and local drainage control performed by a governmental agency;

(9) Emergency work, as authorized by the Building Official, necessary to protect life, limb or property, or to maintain the safety, use or stability of a public way or drainage way;

(10) Excavation for installation of underground storage tanks where the capacity of the tanks does not exceed twenty thousand (20,000) gallons;

(11) Grading in an isolated, self-contained area if the Building Official determines that no danger to private or public property is likely to result from the grading operations;

(12) The structural section of subdivision streets in tracts for which subdivision improvement plans have been reviewed by the City Engineer and the work is being inspected by that department;

(13) Temporary local borrow pits for road materials and topsoil for landscaping situated within a larger ownership being subdivided into smaller tracts, if the material is being used entirely within the tracts being subdivided, and if the excavation does not endanger properties under other ownerships or create a public nuisance or safety hazard as determined by the Building Official. The land shall be graded to comply with this chapter on cessation of excavation within the pit areas;

(14)

Temporary stockpiles of topsoil materials required for landscaping lots being graded in the immediate area for building purposes if the stockpiles are not placed within a public right-of-way, do not obstruct drainage ways, are not subject to erosion which will cause silting problems in drainage ways, do not endanger other properties, and do not create a public nuisance or safety hazard, as determined by the Building Official. The land shall be graded to comply with this chapter after removal of stockpiles;

(15) Fire trails, and access roads to public utility, gas and electric transmission lines;

(16) Clearing vegetation when all of the following conditions are met:

(A) The slope of the ground is ten percent (10%) or less,

(B) The area to be cleared is one (1) acre or less,

(C) Land disturbance is at least within one hundred (100) feet from the centerline of the watercourse or at least one hundred (100) feet from the water line of a water body;

(17) Subsections 12.44.030(b)(1) through (b)(16) notwithstanding, where the excavation or fill occurs on slopes with a natural slope of 3:1 and the height of such slope is seven feet or greater, no exception shall be provided unless determined by the Building Official.

(c) Application for Permit.

(1) An application for a grading permit shall be in writing and filed with the Building Official on forms provided for such purpose. The application shall be signed by the owner of the property where the work is to be performed or by his duly authorized agent, provided that an agent's authority must be shown in writing. The application shall contain the following information:

(A) Description of the site by lot, block and tract designation, and by a street address or similar description sufficient to readily identify the site;

(B) The name and address of the owner of the site, the person who is to perform the work, and the geotechnical and civil engineer if such work is to be performed as supervised grading;

(C) The estimated cost of performing the work;

(D) Such other information as may be required by the Building Official.

(2) Each application shall be accompanied by four (4) sets of plans, specifications and calculations that meet the requirements set forth in Section 12.44.030(d).

(3) Each application shall include the name, address and phone number of the civil engineer, geotechnical engineer and/or engineering geologist will be employed to give technical supervision or make inspections of the work, whenever approval of the plans and issuance of the permit is based upon the condition that such professional person be so employed.

(4) Each application shall authorize the Building Official to conduct a field investigation and site evaluation of a lot or parcel. The investigation shall determine what additional information, engineering data or plans (including NOI (notice of intent), if applicable) will be required to be submitted with the application for grading and/or building permits and under what conditions the permits would be issued, prior to permit approval for a grading and/or building permit.

(d) Grading Plans and Specifications. The plans shall be prepared, stamped and signed by a civil engineer and the plans and specifications shall contain the following:

(1) A vicinity sketch or other means of adequately indicating the site location;

(2) Boundary lines of the site;

(3) Each lot or parcel of land into which the site is proposed to be divided;

(4) The location of any existing buildings or structures on the property where the work is to be performed, and the location of any buildings or structures on adjacent land which may be affected by the proposed work;

(5) Accurate contours showing the topography of the existing ground to two hundred (200) feet beyond project parcel boundary;

(6) All of the proposed uses of the site, and if the site is to be divided, the proposed use of each lot or parcel of land;

(7) Elevations, location, extent and slope of all proposed grading shown by contours, cross-sections or other means and location of any rock disposal areas, buttress fills or other special features to be included in the work;

(8) Detailed plans of all drainage systems and facilities, walls, cribbing, or other erosion protection devices to be constructed in connection with, or as a part of the proposed work, together with a map showing the drainage area and estimated runoff of the area served by any drainage systems of facilities;

(9) A Final Erosion and Sediment Control Plan and/or an Interim Erosion and Sediment Control Plan (Section 12.44.030(e)), as required by the Building Official;

(10) The extent and method of the cutting of trees and the clearing of vegetation, the disposal of same, and the measures to be taken for the protection of undisturbed trees and vegetation. All existing trees on or overhanging the site shall be indicated;

(11) The grading plan must be signed by a registered civil engineer and must be prepared by or under said civil engineer's direction;

(12) An estimate of the cost of the work described and delineated on the grading plan;

(13) A statement of the quantities of material to be excavated and/or filled and the amount of such material to be imported to, or exported from, the site;

(14) A statement of the estimated starting and completion dates for work covered by the permit;

(15) Routes of travel to be used;

(16) Hours and days of work;

(17) The signature of the geotechnical engineer whose report was used in the design of the grading;

(18) Such other information as the Building Official deems necessary to show conformance of the proposed grading with the requirements of this chapter and other related ordinances.

(e) Final and Interim Erosion and Sediment Control Plan.

(1) A Final Erosion and Sediment Control Plan, prepared by a registered civil engineer, shall be submitted unless all of the following conditions are met:

(A) The area of land disturbed is less than one-half (½) acre;

(B) Natural and finished slopes are less than ten percent (10%);

(C) Volume of the grading operation is less than fifty (50) cubic yards;

(D) The temporary storage of any soil is less than one hundred fifty (150) cubic yards;

(E) The grading operation is not within one hundred (100) feet of the centerline of any watercourse, within one hundred (100) feet of the water line of any water body or the Bay (high tide) or manmade drainage structure;

(F) The proposed grading does not pose a threat to adjacent or downstream properties as determined by the Building Official;

(G) The proposed grading does not obstruct water courses;

(H) The proposed grading is deemed to have no significant environmental impact as determined pursuant to the provisions of the California Environmental Quality Act, as amended, and the regulations promulgated by the California Resources Agency and the Richmond City Council to implement such Act.

(2) The Final Erosion and Sediment Control Plan shall through the use of permanent control features minimize soil erosion and maximize sediment interception from the completed project site and shall also provide for the control of runoff from the site.

(3) The Final and Interim Erosion and Sediment Control Plans shall contain the following information:

(A) A description and delineation of the vegetative measures to be taken to minimize erosion and sedimentation. (The ultimate landscape plan for the site is deemed to satisfy this criteria;)

(B) A description and delineation of the temporary and permanent measures to be taken to protect manufactured or disturbed slopes from erosion by mechanical means such as mulches, diversion dikes, etc.;

(C) The delineation of the drainage control measures to be taken which shall include surface runoff and sediment yield calculations;

(D) The extent and method of the cutting of trees and the clearing of vegetation, the disposal of same, and the measures to be taken for the protection of undisturbed trees and vegetation;

(E) The methods to be used for the disposal of excess materials;

(F) The methods to be used for the control of dust;

(G) A description and delineation of the temporary and permanent measures to be taken to retain sediment on the site;

(H) A description of the measures to be taken to maintain the devices shown on the plan during grading operations and construction on the site;

(I) The extent of disturbed ground that will exist, what streets will be paved, and what drainage devices will be installed prior to the start of each rainy season;

(J) Any other information required by the Building Official;

(K) A schedule for installation and maintenance of erosion and sediment control measures.

(4) The Final and Interim Erosion and Sedimentation Control Plans are to be prepared in accordance with the latest editions of either the "Manual of Standards for Erosion and Sediment Control Measures" by ABAG or provisions of the "California Storm Water Best Management Practices Hand Books," for both temporary and permanent erosion control measures. These plans shall be prepared by a registered civil engineer. The plans shall include the names and telephone numbers of twenty-four (24) hour standby work crews during the October 1st to April 15th rainy season.

(5) Minor work such as trenching or maintenance which meets the intent of the aforementioned "Manual of Standards for Erosion and Sediment Control Measures" may be excluded from the requirement of preparing the Erosion and Sediment Control Plan provided that the owner, contractor, or developer first obtains a written waiver from the Building Official.

(6) An Interim Erosion and Sediment Control Plan is required prior to each rainy season during construction for a staged project. The Building Official will determine by July 15th if an interim plan will be necessary and on what stage of project completion the plan shall be based.

(7) An estimate of the cost of the work described and delineated on the Final and Interim Erosion and Sediment Control Plans and the permit must be submitted in a form which is acceptable to the Building Official. This plan when required is considered an integral part of the project grading plan, and fees for plan check and inspection shall be paid as set forth in Section 12.44.030(j).

(8) The applicant shall submit tentative start and completion grading dates with the grading permit application. Prior to issuance of a grading permit, the grading contractor shall review the proposed start and completion dates and supply the Building Official with a schedule including a breakdown of equipment and personnel that will be used to complete the job within the time frame submitted. Issuance of permits for grading to be performed during the following periods will require the following:

(A) April 15th to August 15th. If grading is initiated during this period and can be completed before October 1st, no Interim Erosion and Sediment Control Plan needs to be submitted with the application. On or before July 15th, the Building Official shall evaluate all projects for compliance with a completion date of September 30th. If the Building Official determines that the project cannot be completed by September 30th, the applicant shall prepare an Interim Erosion and Sediment Control Plan to be submitted by August 15th.

(B) August 16th to September 30th. The Building Official shall determine if the grading can be completed during this period based on the grading plans and submission of schedule. If it is determined that the project cannot be completed, the applicant shall prepare as part of the grading plan application an Interim Erosion and Sediment Control Plan. The grading plan shall be designed so that provision of the Interim Erosion and Sediment Control Plan can be implemented fully by September 30th.

(C) October 1st to April 14th. During this period, all grading plans submitted for permits which cannot be exempted under subsection (e)(1) of this section shall include an Interim Erosion and Sediment Control Plan as part of their grading plan which reflects the active construction mode anticipated for the site per Section 12.44.040(f).

(f) Geological Report. The Building Official may require a geological report based on the most recent grading plan proposal. The engineering geological report shall include an adequate description of the geology of the site and conclusions and recommendations regarding the effect of geological conditions on the proposed development.

(g) Geotechnical Report. The Building Official may require a geotechnical report based on the proposed grading plan. Such report shall be prepared by a geotechnical engineer based upon adequate test borings or excavations. The report shall indicate the presence of critically expansive soils or other soils problems, which if not corrected could lead to defects in structures, buildings or other improvements; and, when it so indicates, the report shall further report on an investigation of each lot of the development including recommended corrective action which is likely to prevent such defects or damage to each building, structure or improvement to be constructed. The geotechnical report shall contain:

(1) Reports on the suitability of the earth material for construction of stable embankments and excavation slopes, including those necessary for any artificial or natural drainage channels;

(2) Recommendations for construction procedures to obtain required stability;

(3) Maximum design velocities for any natural or artificial drainage channel; and

(4) Any other recommendations concerning slides, unstable soil condition, springs and seepage conditions, or drainage facilities to enable proper development of the site.

(h) Review of Reports. All reports shall be subject to review by the Building Official. Supplemental reports and data may be required as deemed necessary. Recommendations included in the reports and approved by the Building Official shall be incorporated in the development plan or specifications.

(i) Issuance or Denial of Permit, Conditions and Limitation.

(1) Issuance. Upon receiving an application for grading permit, together with all of the submittals required by Sections 12.44.030(c), (d) and (e) and 12.44.040(e) and (f), the deposit of fees as required by Section 12.44.030(j), and the posting of surety as required by Section 12.44.030(l), the Building Official shall examine the application and related documents, and, if satisfied that the application meets all requirements of this chapter and of other applicable laws, ordinances, rules, and regulations, the Building Official shall issue the permit. The application for a permit shall contain, but shall not be limited to the following provisions:

(A) A provision which requires that pre-construction conference shall be scheduled with all principal decision makers present to discuss and coordinate various aspects of the grading project;

(B) A provision which states that the grading shall not be excessive and that the grading shall not go beyond that necessary for the permitted use of the site;

(C) A provision which provides that the slopes can be effectively protected against erosion and slippage;

(D) A provision which requires that the finish contours be relatively natural and that the finish contours not distort the natural contours;

(E) A provision which requires that hillside sites be suitable for development in the manner proposed;

(F) A provision which mandates that the removal of natural vegetation not be excessive and that the vegetation removal be done in a manner which will minimize erosion;

(G) A provision which requires that drainage not be constructed or directed in a way which damages other property or increases erosion.

The permit that is issued pursuant to this section shall be issued only to the owner or his agent. The permit shall be kept on site, securely displayed in a conspicuous location.

(2) Grounds for Permit Denial.

(A) Hazardous Grading. The Building Official shall not issue a permit where the determination is made that the work as proposed by the applicant has the potential to endanger any public or private property through grading or removal of vegetation or result in the deposition of debris on any public or private way or interfere with any existing drainage course or alter water quality. If it can be shown to the satisfaction of the Building Official that the hazard can be essentially eliminated by the construction of retaining structures, buttress fills, or drainage devices, or by other means, the Building Official may issue the permit with the condition that such work be performed.

(B) Geological or Flood Hazard. If, in the opinion of the Building Official, the land area for which grading is proposed is subject to geological or flood hazard to the extent that no reasonable amount of corrective work can eliminate or sufficiently reduce the hazard to human life or property, the grading permit shall be denied.

(C) Noncompliance With Land Use Conditions. The Building Official shall not issue a grading permit for work that does not or has no reasonable expectation to comply with conditions of approval imposed on a project, the provisions of this Code, or any condition imposed by the approving authority on approval of the use.

(D) Existing Building Code or Zoning Ordinance Violations. The Building Official shall not issue a grading permit if any building code or zoning ordinance violation exists on the site.

(3) Limitations of Permit. The issuance of a permit under this chapter shall constitute an authorization to do only that work which is described or illustrated on the application for the permit or on the site plans and specifications approved by the Building Official.

(A) Compliance with Plans and Requirements. All permits issued hereunder shall be presumed to include the provision that the applicant and their agents, contractors and employees shall carry out the proposed work in accordance with the approved plans and specifications and in compliance with all the requirements of this chapter.

(B) Time Limits. The permittee shall fully perform and complete all of the work required to be done pursuant to the grading permit within the time limit specified. If no limit is specified, the permittee shall complete the work within one hundred eighty (180) days after the date of the issuance of the grading permit.

If unable to complete the work within the specified time, the permittee shall request, prior to the expiration of the permit, in writing to the Building Official for an extension of time, setting forth the reasons for the requested extension. If, in the opinion of the Building Official, such an extension is warranted, the Building Official may grant additional time for the completion of the work for which additional fees may be applicable. Denial of an extension of time shall not preclude the right of the permittee to apply for a new permit for the remaining balance of the work. Written consent of the surety to any extension of time must be furnished before the approval of the extension becomes effective, unless the security consists of a cash deposit.

(C) Liability and Hold Harmless. Neither the issuance of a permit under the provisions of this chapter, nor the compliance with the provisions thereof or with any conditions imposed in the permit issued hereunder, shall relieve any person from responsibility for injury to people or damage to property. The permittee shall execute a hold harmless clause on the permit which shall read as follows:

The permittee, for themselves, their contractors, and employees, agrees to save, indemnify, defend, and hold harmless the City of Richmond and its officers, employees, and agents from all liabilities and claims for damages by reason of injury or death to any person or persons or damage to property from any cause whatsoever while in, upon, or in any way connected with the work covered by this grading permit.

(D) Jurisdiction of Other Agencies. Permits issued under the requirements of this chapter shall not relieve the permittee of any requirements or responsibilities for fully conforming to any other requirements for the work to be done, including but not limited to securing permits and licenses established by any law, ordinance, rule, or regulation of the City of Richmond, or employee thereof, or of any other Public Agency having jurisdiction over such work.

(4) Conditions of Permit. In granting any permit under this chapter, the Building Official and the Planning Director shall impose such conditions thereon as are reasonably necessary to prevent the proposed operations from being conducted in such a manner as to constitute or create a nuisance or a hazard to life or property. Such conditions may include, but shall not be limited to:

(A) Improvement of any existing grading to bring it up to the standards of this chapter;

(B) Requirements for fencing of excavations or fills which otherwise would be hazardous and for fencing around drip lines of trees;

(C) Screen planting, landscaping or other treatment to maintain good appearance of graded area and reduce the detrimental impact on adjacent properties or the community;

(D) Completion of the work within a period approved by the Building Official;

(E) Cleaning up the area and planting in accordance with approved plan;

(F) Designation of the area in which work may be done;

(G) Designation of the slope or the grade and elevation of the excavation or fill;

(H) Reasonable provisions for controlling excessive dust;

(I) Normal hours of operations established by the City or as modified in the permit;

(J) Safety precautions to guide pedestrian and vehicular traffic in, around, and by the operation;

(K) Posting of good, sufficient and separate surety to assure compliance with the conditions;

(L) The route and time of travel over public streets so as to cause the least interference with general traffic and to cause the least damage to public streets. A separate surety may be required if, in the estimation of City Engineer, there is the possibility of damage to public streets due to excessive loadings or truck trips;

(M) The removal of rock, earth, or other materials that may be deposited on public streets by reason of said grading operations;

(N) The payment to the City of the cost of repairing damage to or cleaning of public streets caused by trucking operations in connection with said grading operations;

(O) The installation of suitable fencing, barricades, and lighting surrounding the grading operations;

(P) Conformance at all times with the approved Interim and Final Erosion and Sediment Control Plans;

(Q) A licensed land surveyor or registered civil engineer authorized to do surveying must delineate the boundary lines of the site;

(R) The disposal site for any material removed from the grading site must be approved by the Building Official if located within the City. If the disposal site is not located within the City, then permittee shall provide an approved grading permit from the jurisdiction where the receiving disposal site is located;

(S) The extent of unprotected slopes allowed at any one time and the time such slopes are allowed to remain unprotected;

(T) Other conditions deemed necessary by the Building Official and based on accepted engineering practices.

(j) Fees. Fees shall be collected by the Building Official as established by a resolution of the City Council.

(k) Refunds.

(1) Filing fees, permit transfer fees, penalty fees and site investigation fees are not refundable.

(2) In cases of a reduction of planned work, the approval of an amended permit by the Building Official and satisfactory completion of the work covered by an amended permit, the permittee may apply to the Building Official within thirty (30) days after issuance of the certificate of completion for a refund of a portion of the permit fee based on the revised cost of the work in the amended permit.

(l) Surety.

(1) Surety Required. If the Building Official determines that the nature of the proposed work is such that, if left incomplete, it will interfere with any natural or artificial drainage, or will endanger persons or public or private property, or will constitute a nuisance or if he determines that the proposed work involves the removal or deposition of more than fifty (50) cubic yards of material, the applicant for the grading permit shall post with the Building Official a surety executed by the applicant and secured, at the option of applicant, by

(A) A corporate surety bond executed by a surety company authorized to do business in the State of California; or

(B) By deposit with the City of Richmond of cash money or its equivalent; or

(C) By deposit with the City of Richmond of an instrument of credit from a financial institution subject to regulation by the State of California or the federal government pledging that the funds necessary to meet the performance are on deposit and guaranteed for payment upon demand and agreeing that the funds designated by the instrument shall be trust funds for the purposes set forth in the instrument. The form of the bond and the security shall be subject to approval by the Building Official and the City Attorney.

(2) Amount of Surety. The amount of the surety shall be based upon the cost of the total number of cubic yards of material moved, plus the cost of all drainage erosion control or other protective devices or work necessary to eliminate geological hazards or to protect persons or public or private property. The amount of surety shall reflect market value to perform subject work or revert site back to original condition.

When the rough grading has been completed in conformance with the requirements of this chapter, the Building Official may, at the Building Official's discretion, consent to a proportionate reduction of the surety to an amount estimated to be adequate to insure completion of the grading work, site development, or planting remaining to be performed. The costs referred to in this section shall be as estimated by the Building Official.

(3) Conditions of Surety. Among other appropriate provisions, every bond shall include the following conditions to which the principal and surety shall each be bound:

(A) To comply with all of the provisions of this chapter and all other applicable laws, ordinances, rules, and regulations;

(B) To comply with all of the terms and conditions of the permit for excavation or fill to the satisfaction of the Building Official;

(C) To complete the work contemplated under the permit within the time limit specified in the permit. (The Building Official may, for sufficient cause, extend the time specified in the permit, but no such extension shall release the surety;)

(D) To pay all reasonable costs incurred or expended by the City of Richmond, including but not limited to court costs and attorney's fees, in doing or causing to be done any of the work set forth in the permit, any other work which in the judgment of the Building Official is required to be done as a result of any work or activity done under the permit, or any abatement of any nuisance created by any work or activity done under the permit, or in collecting money or damages in connection with any of the foregoing.

(4) Term of Surety. The term of the bond shall begin on the date of its posting and shall end on the satisfactory completion of the terms and conditions of the permit. Completion shall be evidenced by a certificate of completion to be issued by the Building Official and filed with the records of the permit. A copy of the certificate shall be furnished to any interested party upon request.

(5) Notice of Default. Whenever the Building Official finds that a default has occurred in the performance of any term or condition of any permit, he shall give written notice thereof separately to the permit holder and to his surety. Such notice shall state the work or other things necessary to be done in order to cure such default, its estimated cost, if known, and the period of time deemed reasonably necessary by the Building Official to complete such work, and to do such other things which are necessary to be done in order to cure such default. Such notice shall be served personally or by deposit in the United States mail in a sealed envelope, with postage fully prepaid, addressed to the permit holder and to his surety at the mailing address, or, if there is no mailing address, the business address, shown in the application or in the surety, as the case may be.

(6) Duty of Surety. Upon service of the notice of default, the surety shall be obligated to have the work done within the time specified in the notice.

(7) Disposition of Cash Security. If cash money or its equivalent or an instrument of credit has been deposited to secure the bond, and if notice of default has been served upon the permit holder and he has failed to do the work and other things required to be done by the notice within the time specified in the notice, the Building Official may use such deposit in order to have such work and other things done, by contract or other means in the discretion of the Building Official. The balance, if any, shall be returned to the depositor after completion of the work and other things.

(8) Right of Entry. In the event of any default in the performance of any term or condition of the permit, the surety, if any, or any person employed or engaged on its behalf, or the Building Official or any person employed or engaged on his behalf, shall have the right to go upon the premises to complete the work and do other things required by the permit. It shall be unlawful for any person in any way to hinder, obstruct, or prevent such entry.

(9) Erosion and Sediment Control Surety. If a grading permit requires the preparation of an Erosion and Sediment Control Plan, the applicant shall secure the performance of the work described and delineated in the plan as follows:

(A) The Building Official shall review the Interim and Final Erosion and Sediment Control Plans and estimate to determine the bond amount to cover the Erosion and Sediment Control Plans, their implementation and maintenance. If the approved engineer's estimate of cost of the Erosion and Sediment Control Plans is less than ten thousand dollars ($10,000), a cash bond in that amount is to be provided to the City. If the approved engineer's estimate of cost of construction of the Erosion and Sediment Control Plans is more than ten thousand dollars ($10,000), then a cash bond of at least ten thousand dollars ($10,000) shall be posted with the City to cover the work outlined in the Erosion and Sediment Control Plans. After reviewing the grading plans and the Erosion and Sediment Control Plans, the Building Official shall determine the final amount of the cash bond. If permanent site landscaping is an element of the Final Erosion and Sediment Control Plan, then the value of that improvement may be deducted if a separate landscape surety is being required.

(B) When a cash bond amount has been determined, the differences between the cash bond and the total surety requirement shall be provided to the City in the form of bonds or other surety acceptable to the City Attorney. As part of the Erosion and Sediment Control Plan, the applicant shall submit a time schedule outlining specific dates when each element of the plan is proposed to be completed. After the schedule has been agreed to by both the City and the applicant, this schedule shall be the triggering mechanism for the City performing the work in lieu of the applicant's contractor. If the contractor has not or cannot install the Interim and Final Erosion and Sediment Control Plan items by scheduled dates, the City, at its option, can install the items necessary to protect the project site and other property. Such items of work shall be paid for from the applicant's cash deposit. In addition, any items of Erosion and Sediment Control Plan work that have been installed and are not being adequately maintained to protect the site as determined by the Building Official shall be remedied, and any associated cost shall be paid for from the applicant's cash bond. During storm periods, if the applicant's contractor cannot be contacted or cannot perform required work needed to protect the site as determined by Building Official the City shall cause the work to be performed and any associated costs shall be paid from the applicant's cash bond.

(C) In accepting the grading permit, the applicant acknowledges the right of the City or its representative to come on to the applicant's property to perform any or all needed work, as previously outlined in this section.

(D) Notice of Default. Whenever the Building Official finds that a default has occurred in the performance of any term or condition of any permit, the Building Official shall give written notice thereof separately to the permit holder and to the permit holder's surety. Such notice shall state the work necessary to be done in order to cure such default, its estimated cost, if known, and the period of time deemed reasonably necessary by the Building Official to complete such work, and to do such other things which are necessary to be done in order to cure said default. Such notice shall be served personally or by deposit in the United States mail in a sealed envelope, with postage fully prepaid, addressed to the permit holder and to his surety at the mailing address; or, if there is no mailing address, the business address, shown in the application or in the bond, as the case may be.

(E) If any part of the cash bond needs to be expended by the City to undertake work items outlined in subsection (l)(9)(b) of this section, the associated grading permit is automatically terminated. The applicant shall submit a new grading permit application, a new grading plan with an Erosion and Sediment Control Plan acceptable to the Building Official and provide the appropriate bonds and fees required by the City. There is no guarantee that a new permit will be issued.

(F) When all grading as shown in the approved grading plans has been completed, and all items of work in the Erosion and Sediment Control Plan have been installed to the satisfaction of the Building Official, the applicant may request exoneration of grading and Final Erosion and Sediment Control Plan bonds. The Building Official shall review all requests for exoneration of grading bonds, but Final Erosion and Sediment Control Plan bonds shall not be considered for exoneration until the site has weathered a storm season from October 1st to April 15th with Final Erosion and Sediment Control Plan elements including permanent landscaping in place. The Building Official can, upon request, make a determination on minor grading projects whether or not the Erosion and Sediment Control Plan bonds need to be held through a storm season.

(m) Job Plans. When an application is approved and a permit issued, one set of plans and accompanying documents shall be clearly marked as approved and shall be returned to the applicant. This set shall be kept available for reference at the job site during grading and construction. The applicant may furnish additional sets of plans and documents for notation as reviewed for return to the applicant for his use.

(n) Amendment of Permit.

(1)

Any changes in the plans, grades, or extent of work shall be submitted to the Building Official for written approval and incorporated into the permit, accompanied by any necessary fees, before any change in the approved work is begun. The Building Official may amend the permit to approve altered plans, or may deny approval of the changes.

(2) Failure to obtain prior approval for any change in the work shall be cause for the Building Official to order suspension of all work until approval is obtained, and may result in revocation of the permit if he deems the changes will increase the hazard to adjoining properties or public roads, or otherwise be detrimental to public welfare.

(o) Transfer of Permit.

(1) Any transfer of a permit from the permittee to another party is prohibited unless approved by the Building Official.

(2) The transferee shall agree to comply with the requirements and conditions of the original permit and to any modification thereof that may be required because of changes in the condition of the site or change in plans since the permit was issued. The transferee shall furnish the required sureties before the transfer of the permit will be approved.

(p) Suspension and Revocation of Permit.

(1) Grounds. A permit may be suspended or revoked if the Building Official finds that:

(A) Conditions at the site vary appreciably from those shown and stated in the application and development plans;

(B) Grading or construction does not conform to the approved plans, grades, Interim or Final Erosion and Sediment Control Plan, or other conditions of the permit;

(C) Cessation of work before completion that has left the site in a condition hazardous to the public or to the adjacent properties, and the permittee has not complied with reasonable requirements for completion of the work within the time specified in the permit or an approved extension of time;

(D) The permittee does not comply with reasonable requirements to safeguard the workers, the public, or other persons acting in a lawful manner, during grading or construction operations;

(E) In transporting materials or in the operation of equipment the applicant causes materials or litter to encroach, obstruct, or be deposited on pavement or in drainage channels within the public right-of-way, or causes unauthorized obstruction or diversion of drainage channels within the site area; or

(F) The permittee fails to have a qualified inspector working under the geotechnical engineer on the site during grading or construction, when required, or failure to have the work under proper supervision at all times.

(2) Procedure. Upon determination that grounds for revocation or suspension of a grading permit exist, the Building Official may fix a time and place for a hearing on revocation or suspension and shall give written notice thereof separately to the permit holder and to the surety, if any, stating in general terms the grounds for revocation or suspension. Such notice shall be given at least five (5) days before the hearing, and it shall be served personally or by deposit in the United States mail in a sealed envelope, with postage fully prepaid, addressed to the permit holder and to his surety at the mailing address, or, if there is no mailing address, the business address, as shown in the application or in the bond, as the case may be.

Within thirty (30) days of the conclusion of the hearing, the Building Official shall make his findings and decision and file same in his office and shall serve a copy thereof separately upon the permit holder and his surety, if any, in the manner provided above for service of notice of hearing.

(3) Exception. If the Building Official determines that emergency conditions exist on the site which constitute a threat to the public health, safety, and welfare, the grading operation in its entirety or portion thereof shall immediately cease.

(q) Notice to Cease Work.

(1) Upon notification from the Building Official of the suspension of the permit, the permittee shall cease all work in connection with the permit with the exception of the work necessary to correct the conditions which caused the suspension of the permit. The permittee shall proceed at once to correct such objectionable or emergency conditions.

(2) If the permittee fails to correct such objectionable or emergency conditions, the Building Official may cause the work necessary to correct said conditions to be done, and the Building Official may take action against the permittee's surety to cover the cost of performing the work.

(3) Any permit which has been suspended may be either reinstated or revoked by the Building Official.

(4) Whenever a permit has been revoked, work shall not commence until a new application has been filed and approved incorporating the necessary revisions required to fulfill the intent of this chapter, and a new permit has been issued.

12.44.040 - Control of work.

(a) City Inspection. The Building Official and other authorized City representatives shall have the right to enter the site at all times to insure compliance with permit conditions.

(b) Supervised or Regular Development Work. All work involving a fill intended to support improvements, or grading where the Building Official determines that special conditions or unusual construction hazards exist, shall be performed under the inspection of a civil engineer and/or geotechnical engineer and shall be designated "supervised development work." Work other than supervised development work shall be designated "regular development work."

(c) Inspection and Reports of Regular Development Work.

(1) For regular development work the Building Official or designated representative, upon notification from the permittee or his agent, shall inspect the work at the following stages of the work and shall either approve the portion then completed or shall notify the permittee or their agent of the inspection results.

(A) Initial. When the site has been cleared of vegetation and unapproved fill and has been scarified, benched or otherwise prepared and before any fill is placed.

(B) Rough. When rough grading has been completed and approximate final elevations have been established; drainage terraces, swales and other drainage devices have been graded and are ready for paving; and berms have been installed at the top of slopes.

(C) Final. When work has been completed with all drainage devices, systems and facilities installed and slope planting established.

(2) In addition to the inspections specified above, the Building Official may:

(A)

Make such other inspections as the Building Official deems necessary to determine that the work is being performed in compliance with the requirements of this chapter; and

(B) Require investigations and reports by a geotechnical engineer and/or engineering geologist.

(d) Inspection and Reports for Supervised Development Work. The following inspections and reports shall be required for supervised development work:

(1) It shall be the responsibility of the geotechnical engineer and/or civil engineer to inspect the operations and provide qualified full-time inspection to assure compliance of the work with the approved development plans and with the requirements of the Building Official. The geotechnical engineer and/or civil engineer shall certify in writing to the satisfactory completion of each stage of the work specified in Section 12.44.040(c).

(2) The geotechnical engineer shall submit compaction data and geotechnical engineering recommendations made during the development operation to the Building Official.

(3) The civil engineer shall submit inspection reports regarding drainage facilities, lot drainage and finish grades to the Building Official.

(4) The engineering geologist shall submit inspection reports regarding geological conditions to the Building Official.

(e) Interim Erosion and Sediment Control Inspection.

(1) Site Observation. Between October 1st and April 15th, an inspector shall visit the site a minimum once a day. A log will be kept indicating the time of inspection, and relevant comments on progress and site conditions. During storm periods, an inspector shall visit the site twice a day including weekends and shall be accompanied by the contractor's superintendent and shall check as a minimum the following items:

(A) V-ditches shall be checked for proper operation (i.e., flow, silt build-up, deterioration of banks);

(B) Straw bales shall be checked for silt build-up and bales removed or replaced as necessary;

(C) Sand bags shall be checked for damage and silt plugged bags replaced as needed;

(D) Detention/retention basins shall be checked for damages and silt removed periodically as determined necessary;

(E) Overflow spillways shall be checked for proper operation;

(F) Filter fabric shall be checked. Plugged and damaged fabric shall be replaced as necessary.

(2) The time of inspection, the personnel visiting the site, the condition of the site and the adequacy of the erosion control facilities shall be logged.

(3) If corrections need to be made to protect the site, the items of work and time scheduled to perform the work by the contractor shall also be noted.

(f) Interim and Final Erosion Control Measures. Erosion control measures shall be installed for all rainy season active and passive construction projects. Grading operations may commence in or continue through rainy season, at the discretion of the Building Official, provided that erosion control measures in conformance with approved plans are immediately installed and are kept continuously in place, as the case may be. The only control measures which may be altered are those in direct conflict with daily construction activity, as long as such controls are replaced at the end of construction activity that day or start of storm event. Erosion control measures shall include, but not necessarily be limited to, the following:

(1) The Erosion and Sediment Control Handbook and California Storm Water Best Management Practices Hand Book shall be used as guides for the design and suitability of erosion and sediment control measures.

(2) The faces of cut and fill slopes shall be protected against damage by erosion and the methods utilized for each protection must offer effective erosion control prior to the beginning of, as well as during, the rainy season.

(3) Where graded slopes are steeper than three (3) feet horizontal to one (1) foot vertical or are higher than ten (10) feet, they shall be protected with a temporary soil stabilization measure such as jute matting or an equivalent mulch until planting is established.

(4) The surface of all cut slopes higher than five (5) feet and all fill slopes higher than three (3) feet shall be permanently protected against damage by erosion by the planting and establishment of protective vegetation.

(5) Slopes higher than fifteen (15) feet shall be planted with one shrub per one hundred (100) square feet of slope and one (1) tree per four hundred (400) square feet of slope. Geometric spacing should be avoided. Massing of trees is encouraged. Size and species of plant material shall be subject to review.

(6) The planting of seeding or vegetation protection must be effective. If the vegetation does not grow and offer proper protection, it must be replanted or reseeded.

(7) The maintenance of vegetative protection on graded slopes shall be the responsibility of the permittee and shall be guaranteed until the vegetation is well established as determined by the Building Official or until the maintenance is officially assumed by another party approved by the Building Official.

(8) Sediment control facilities shall be operational prior to the beginning of the rainy season and must effectively prevent sediment from being transported downstream.

(9) The outlet from any sedimentation basin must be designed to handle 1.5 times the maximum design inflow.

(10) A standby emergency crew must be provided by the permittee and must be available at all times during the rainy season to repair and maintain the erosion and sediment control devices.

(11) Erosion control materials must be stockpiled on the site for emergency repairs during the rainy season.

(12) Trunk storm drain facilities, if determined by the Building Official to be essential to the operation of the erosion control measures, shall be installed in place with grading operations and shall not be delayed until grading completion.

(13) After each rainfall, the permittee shall inspect all erosion and sediment control devices and shall clean them and repair any damage.

(14) Erosion control devices must be installed where drainage facilities discharge into natural channels. The devices may be rip-rap or concrete channel protection, stilling basins, check dams, drop structure or other devices which will effectively minimize erosion in the opinion of the Building Official.

(15) Erosion Control Planting as set forth in Section 12.44.060(g).

(g) Notification of Noncompliance. If the soil or civil engineer finds that the work is not in conformance with this chapter or with the plans approved by the Building Official, or with good accepted practices, they shall immediately notify the permittee and the Building Official verbally and in writing of the nonconformity and of the corrective measures to be taken.

(h)

Termination of Services. If the civil engineer, or the geotechnical engineer, or the geologist are relieved of or otherwise terminates duties prior to completion of the work shown on the grading plan, they shall report the fact in writing to the Building Official within forty-eight (48) hours with a report on the status of the work.

(i) Compliance With Laws. In addition to the requirements of the permit, the permittee shall comply with all laws, ordinances, and regulations of the State Department of Industrial Relations, relating to the character of the work, equipment, and labor personnel involved in the project.

(j) Cessation of Work. If the permittee ceases work for any reason before the work is completed, all necessary steps shall be taken to leave the premises in a condition that will be safe and will not cause damage to adjoining properties or to the public roads or to any natural or artificial drainage facilities through erosion of materials, landslides, or other instability of slopes and materials.

(k) Certificate of Completion. The Building Official shall issue a certificate of completion upon satisfactory completion of work under an approved permit.

(1) The geotechnical engineer and/or engineering geologist must certify that all compaction requirements have been complied with and sub-drains are located where shown on plans or plans are modified, as the case may be.

(2) A licensed surveyor or registered civil engineer authorized to do survey work must certify that the horizontal and vertical controls conform to the plans or any approved changes to them.

(3) The Building Official must be in receipt of a set of mylar plans which include all details of the grading operation and related details.

12.44.050 - Safety and general requirements.

(a) General Safety Precautions.

(1) Adequate provisions shall be made to prevent any surface waters from damaging the cut face of an excavation or sloping surface of a fill. Retaining walls or cribbing constructed in accordance with the requirements of the Building Official shall be used wherever necessary to prevent the surface of any excavation or fill from exceeding at any point the maximum allowable slopes set forth herein.

(2) All site drainage shall be conveyed to the nearest adequate storm drain, natural watercourse, or street approved by the Building Official as appropriate to deposit and receive such waters.

(b) Storm Damage Precautions. All persons performing any grading operations shall put into effect all safety precautions which are necessary in the opinion of the Building Official and shall remove all loose dirt from the grading site and provide adequate anti-erosion and/or drainage devices, debris basins, or other safety devices to protect the life, limb, health, and welfare of private and public property of others from damage of any kind.

(c) Protection of Utilities. During grading operations the permittee shall be responsible for the prevention of damage to any public utilities or services. This responsibility applies within the limits of grading and along any routes of travel of equipment.

(d) Protection of Adjacent Property.

(1) No excavation shall be made sufficiently close to the property line to endanger any adjoining public street, sidewalk, alley, or other public property or any adjoining private property without supporting and protecting such adjoining public or private property from settling, cracking or other damage in a manner approved by the Building Official.

(2) No person shall grade, whether or not a permit is required therefor under this chapter, so that dirt, soil, rock, debris, or other material washed, eroded, or moved from the property by natural or artificial means creates a public nuisance or hazard, or an unlawful encroachment on private property or on a public road or street. Any such material deposited within the right-of-way of a public road or street which may constitute a nuisance or hazard to public traffic shall be removed immediately, and failure to do so on notice from the City authorizes the City to have the material removed at the expense of the permittee.

(3) Whenever any portion of the work requires entry onto adjacent property for any reason, the permit applicant shall obtain the written consent of the adjacent property owner or their authorized representative, and shall file a copy of such consent with the Building Official before a permit for such work may be issued.

(e) Removal of Ground Cover. Removal of ground cover shall be performed pursuant to the requirements set forth in Section 12.44.030(e).

(f) Water Obstruction. No person shall obstruct, impede or interfere with the natural flow of storm waters, whether unconfined upon the surface of the land, within land depressions or natural drainage ways, within unimproved channels or watercourses, or within improved ditches, channels or conduits, except for construction operations permitted by the City.

(g) Levees. No person shall do any grading work on any levee without approval of the governmental agency responsible for the maintenance of the levee.

(h) Public Rights-of-Way. No person shall perform any work or construct any facility (including excavation or embankment, trenching, driveway construction, or drainage facility) within the right-of-way of a public road or street, or within an easement under the jurisdiction of this City, without a permit from the City.

(i) Precautions Imposed by Building Official. If, at any stage of grading, the Building Official determines by inspection that the nature of the construction is such that further work as authorized by an existing permit is likely to endanger any property or public way, the Building Official may require as a condition to allowing the work to be continued that such reasonable safety precautions be taken as the Building Official considers advisable to avoid such danger. Remedial actions may include but shall not be limited to specifying a flatter exposed slope, construction of additional drainage facilities, berms, terracing, compaction, cribbing, or retaining walls, or planting of slopes.

(j) Abatement of Hazardous Conditions. Whenever the Building Official determines that any existing excavation or embankment or fill has become a hazard to life and limb, or endangers property, or adversely affects the safety, use, or stability of a public way or drainage channel, the owner of the property upon which the excavation or fill is located, or other person or agent in control of such property, upon receipt of notice in writing from the Building Official shall within the period specified therein repair or eliminate such excavation or embankment so as to eliminate the hazard and be in conformance with the requirements of this chapter,

12.44.060 - Design standards and grading regulations.

(a) General Design Intent. It is the general intent of the regulations of this Chapter that site development design shall preserve to the extent that is reasonable and feasible the existing natural scenic value of hills and valleys and contours of land.

(b) General Criteria for Design. All site development work, whether or not a permit is required under this chapter, shall be designed to:

(1) Retain trees and other native vegetation which stabilizes steep hillsides, retains moisture, prevents or minimizes erosion, and enhances the natural scenic beauty, insofar as practical;

(2) Place building pads in such a manner as to permit ample room for adequate landscaping and drainage between and around the buildings;

(3) Minimize scars from cuts and fills and avoid permanent scarring of the hillsides;

(4) Round off, in a natural manner, sharp angles at the top and toe of cut and fill slopes, and conform to existing terrain, both with respect to building sites and to road cross-sections;

(5) Limit development on steep or dangerous terrain;

(6) Take into consideration geologic hazards and adverse soil conditions and their effect on the future stability of the development.

(c) Regulations for Excavations.

(1) Maximum Slope. Cuts shall not be steeper in slope than two (2) horizontal to one (1) vertical unless the owner furnishes a soil or a geological report certifying that the site has been investigated and indicating that the proposed deviation will not endanger any public or private property or result in the deposition of debris on any public way or place or interfere with any existing drainage course.

The Building Official may require the excavation to be made with a cut face flatter in slope than two (2) horizontal to one (1) vertical if he finds it necessary for stability and safety.

(2) Drainage Terraces. Cut slopes exceeding thirty (30) feet in vertical height shall have drainage terraces not less than eight (8) feet in width, measured from the outer edge of the terrace to the invert of the drain, at vertical intervals not to exceed twenty-five (25) feet except that where only one (1) such terrace is required it shall be located at mid-height. For cut slopes exceeding one hundred (100) feet in vertical height, the drainage terrace near mid-height shall be not less than twelve (12) feet in width. Design and construction of drainage terraces shall conform to the requirements of Section 12.44.060(f). All cut slopes shall be examined for evidence of seepage at completion of grading to determine if installation of horizontal drains is necessary.

(3) Variations. Variations from the regulations in this section may be allowed by the Building Official if the variations will provide equivalent safety, stability, and protection against erosion, as recommended by a geotechnical engineer or engineering geologist.

(d) Regulations for Fills.

(1) Compaction. Except as otherwise provided in subsection (d)(2) of this section, all fills shall be compacted throughout their full extent to a minimum of ninety percent (90%) of maximum density as determined by the current ASTM D1557 test method. Field density shall be determined by a method acceptable to the Building Official. All existing on-site fills and backfills shall be excavated and stockpiled for reuse in planned fill areas.

(2) Exceptions to Compaction Requirement.

(A) Special Compaction. Compaction may be reduced to eighty-five percent (85%) of maximum density as determined by the specified test in subsection (d)(1) of this section, within the outer eight (8) inches of fill slope surfaces when such compaction is provided by grid rolling or equivalent means.

(B) Nonstructural Fills. Fills not intended to support structures, subdivision streets or improvements need not be compacted to the standard set forth in subsection (d)(1) of this section if the Building Official determines that such compaction is unnecessary as a safety measure. In making this determination, the Building Official may require that an investigation be made by an approved soil testing agency to establish the characteristics of the soil, the amount of settlement to be expected and the susceptibility of the soil to erosion or slippage.

(C) Planted Slopes. Slope surfaces may be prepared for planting by scarifying, by the addition of topsoil, or by other methods, if such loose material does not exceed a depth of three inches and said slopes otherwise comply with the requirements of this section.

(3) Preparation of Ground. The natural ground surface shall be pared to receive fill by removing vegetation, noncomplying fill, topsoil, and, where slopes are five (5) horizontal to one (1) vertical or steeper, by benching into sound bedrock or other competent material. Five (5) feet of the lowermost bench shall be exposed beyond the toe of the fill. The bench shall be sloped for sheet overflow or a paved drain shall be provided.

(4) Fill Slope. No compacted fill shall be made which creates an exposed surface steeper in slope than two (2) horizontal to one (1) vertical. The Building Official may require that the fill be constructed with an exposed surface flatter than two (2) horizontal to one (1) vertical if he finds this necessary for stability and safety.

(5) Fill Material. No organic or other reducible material shall be incorporated in fills. Except as recommended by the geotechnical engineer and approved by the Building Official, no rock or similar irreducible material with a maximum dimension greater than four (4) inches shall be buried or placed within forty-eight (48) inches of finish grade. Expansive adobe soils shall not be used in fills within five (5) feet of finish grade in street and building areas and shall not be placed in the slope area of high fills.

(6) Drainage Terraces. Fill slopes exceeding thirty (30) feet in vertical height shall have drainage terraces not less than eight (8) feet in width, measured from the outer edge of the terrace to the invert of the drain, at vertical intervals not exceeding twenty-five (25) feet except that where only one (1) such terrace is required it shall be located at mid-height. For fill slopes exceeding one hundred (100) feet in vertical height, the drainage terrace near mid-height shall be not less than twelve (12) feet in width. Design and construction of drainage terraces shall conform to the requirements of Section 12.44.060(f).

(7) Slopes to Receive Fill. Where fill is to be placed above the top of an existing or proposed cut or natural slope steeper than three (3) horizontal to one (1) vertical, the toe of the fill shall be set back from the top edge of the slope a minimum distance of six (6) feet, measured horizontally, or such other distance as may be specifically recommended by a geotechnical engineer or engineering geologist and approved by the Building Official. Fills shall not toe out on slopes steeper than three (3) horizontal to one (1) vertical.

(e) Slope Location and Setbacks.

(1) The property line of any proposed or existing site or parcel located within the grading project shall be located at the top of the slope or along any slope drainage terrace.

(2) Excavation and fill slopes shall be set back a minimum of three (3) feet plus one-fifth (1/5) the vertical height of the slope from the project boundary line, with a maximum of ten (10) feet.

(3) Buildings and structures shall be set back from excavation or fill slopes a minimum of four (4) feet plus one-fifth (1/5) of the vertical height of the slope, with a maximum of ten (10) feet.

(4) Variations from the regulations in this subsection (e) may be allowed by the Building Official if they will provide equivalent safety, stability, and protection against erosion, as recommended by a geotechnical engineer or engineering geologist.

(f) Regulations for Drainage.

(1) General. Storm drainage structures, systems and facilities shall be provided as required by the Building Official and in accordance with standard specifications on file with the Building Official. In addition, storm drain structures, systems and facilities shall be in compliance with State and Federal National Pollution Discharge Elimination System (NPDES) requirements. In satisfaction of these requirements, the Building Official may require the installation of grease traps, sediment basins, storm water monitoring stations and such other devices and systems which the Building Official determines are necessary for compliance with NPDES requirements. The design of all storm drainage structures, systems and facilities shall be in accordance with recognized principles of hydraulics. Such devices shall be considered components of the Final Erosion and Sedimentation Control Plan.

(2) Disposal. All drainage facilities shall be designed to carry surface waters to the nearest practical street, storm drain, or natural watercourses, approved by the Building Official as appropriate to discharge such waters. If the drainage device discharges onto natural ground, rip-rap or a similar energy dissipator may be required. City standard curbs and gutters shall also be installed at the property line adjoining the public right-of-way for the purpose of conveying site runoff to storm drain facilities.

(3) Site Drainage. Graded building sites (building pads) shall have a minimum slope of one percent (1%) towards a public street or drainage facility approved to receive storm waters. A lesser slope may be approved by the Building Official for sites graded in relatively flat terrain, or where special drainage provisions are made, when he finds such modification will not result in unfavorable drainage conditions.

(4) Terrace Drains.

(A) All unlined swales or ditches on drainage terraces shall have a uniform longitudinal grade of not less than one percent (1%) nor more than three percent (3%) and a minimum depth of one (1) foot at the shallowest point. Such terraces shall drain into a paved gutter, pipe or approved watercourse adequate to convey the water to a safe disposal area.

(B) The geotechnical engineer may approve steeper slopes based on sediment transport analysis.

(C) The drainage terrace shall be provided with a lined ditch, if required by the geotechnical engineer for stability or prevention of erosion.

(5) Overflow Protection. Berms, swales or other devices shall be provided at the top of cut or fill slopes to prevent surface water from flowing over or onto, and damaging the face of the slope. Special drainage provisions shall be made where a building or structure exists within five (5) feet of the top of a slope.

(6) Maintenance of Drainage. The permittee shall maintain drainage facilities, in conformance with the requirements of this chapter, during construction. The owner of the subdivided parcel shall maintain forever such drainage facilities as may be contained in a private storm drain easement.

(7) Subdrains. Subdrains and laterals shall be as determined by the geotechnical engineer. Subdrain designs shall be approved by the Building Official. Provisions shall be made for carrying off collected water from all slopes to suitable disposal points.

(8) Variations. Variations from the regulations of this section may be allowed by the Building Official if they will provide equivalent safety, stability, and protection against erosion and storm water pollution as recommended by a geotechnical engineer or engineering geologist and by the Contra Costa County Flood Control District.

(g) Erosion Control Planting.

(1) The surface of all erodible cut slopes more than five (5) feet in height and fill slopes more than three (3) feet in height shall be protected against erosion by planting with landscape materials as prescribed in Section 12.44.030(e). The plants and planting methods shall be suitable for the soil and climatic conditions of the site and in accordance with standard specifications on file with the Building Official.

(2) Irrigation System.

(A) Planted slopes shall be provided with an approved system of irrigation. A functional test of the system may be required. For slopes less than twenty (20) feet in vertical height hose bibs may be allowed where a hose no longer than fifty (50) feet is necessary for irrigation.

(B) The requirements for permanent irrigation systems may be modified, when approved by the Building Official, because the type of plants selected, planting methods used, and soil and climatic conditions at the site make irrigation of the slope planting unnecessary.

(3) Approval. The planting and irrigation system shall be installed after final grading. Final approval of the work and release of the bond shall be made when growth is established on the slopes.

(4) Variations. Variations from the regulations of this subsection may be allowed by the Building Official if the variations will provide equivalent safety, stability, and protection against erosion, as recommended by a geotechnical engineer or engineering geologist.

(h) Other Regulations.

(1) Hours of Work. If operations under the permit are within five hundred (500) feet of residential or commercial occupancies, grading operations shall be limited to the hours between 8 a.m. and 5 p.m. Monday through Friday, or as approved by the Building Official, except that maintenance and service work on equipment may be performed until 9:00 p.m.

(2) Encroachments on Public Rights-of-Way. Encroachment of operations on public rights-of-way without a valid encroachment permit is prohibited except for hauling of legal loads by vehicles permitted by law to operate on public roads.

(3) Nuisances. Operations shall be controlled to prevent nuisances to public and private ownerships because of dust, drainage, removal of natural support of land and structures, encroachment, noise, and/or vibration.

(4) Explosives. Blasting or other use of explosives shall be conducted in accordance with regulations by the City Council, the State Fire Marshal, and local fire authorities.

(i) Responsibility of Permittee.

(1) Compliance With Plans and This Chapter. The permittee, his agent, contractor or employee, shall carry out the proposed work only in accordance with the approved plans and specifications and in compliance with all the requirements of this chapter.

(2) Notice of Work. In performing regular development work it shall be the responsibility of the permittee to notify the Building Official at least one working day in advance so that the required inspections can be made.

(j) Reports Required and Final Approval. The Building Official may require the following reports, as cited in Section 12.44.040(k) and shall not finally approve any development or work until all required maps and reports have been submitted and approved, including the following:

(1)

A final report by the civil engineer certifying that all grading, lot drainage and drainage facilities have been completed and the slope planting installed in conformance with the approved plans and the requirements of this chapter with a final contour map if the work is not in substantial conformity with the approved plans.

(2) A report by the geotechnical engineer including the recommended soil-bearing capacity, a statement as to the expansive qualities of the soil, summaries of field and laboratory tests, and his opinion as to the adequacy of the work completed and its conformity with plans and specifications. The location of such tests and the limits of the compacted fill shall also show by plans and cross section the location of any subdrains, rock disposal areas and/or buttress fills in the work.

(3) An engineering geologist's report based on the final contour map including specific approval of the grading as affected by geological factors. The report shall include a revised geologic map and cross sections, with recommendations regarding the location of buildings or sewage disposal systems.

(k) Evaluation of Existing Fill. The Building Official may require the submission of a preliminary soil investigation report and/or engineering geological report before issuing a building permit for a structure to be placed on any fill or embankment constructed before the enactment of this chapter, or excepted from the requirement for a grading permit, or on any other lot or parcel on which critically expansive soils, slide conditions, or other soils, or geologic hazards exist or may reasonably be anticipated to exist. If the Building Official determines that the action recommended in this report is likely to prevent structural damage to the proposed structure, he shall recommend that the requirements contained in the report shall become a part of the required construction as a condition of the permit.

12.44.070 - Appeals.

(a) Any applicant or any permittee or his surety, if any, taking exception to any condition imposed upon his grading permit, or to any denial thereof, or to the revocation or suspension thereof, shall have the right to a hearing before the City Manager, or the City Manager's designee, prior to the implementation of the condition or adverse permit action.

(b) Prior to any denial, revocation or suspension of the permit, the Building Official shall give the appellant written notice of the denial, revocation or suspension. The notice shall set forth the ground or grounds for the denial, revocation or suspension and shall inform the appellant that the appellant has ten days from the date of receipt of the notice to file a written request for a hearing.

(c) Within ten days of the written notice by the Building Official regarding a permit denial, suspension or revocation, or within ten days of receipt of a permit which contains an objected to condition, the appellant may appeal by submitting a request to the Building Official for a hearing before the City Manager, or the City Manager's designee. Such request must be made in writing and must set forth the specific grounds for the appeal. If the applicant or permittee files a timely hearing request, the City Manager, or the City Manager's designee, shall set a time and place for the hearing. All parties involved shall have the right to offer testimonial, documentary and tangible evidence bearing on the issues, to be represented by counsel and to confront and cross-examine any witnesses against them. The decision of the City Manager, or the City Manager's designee, shall be in writing and shall be the final administrative decision.

(d) If no timely appeal is taken, the action of the Building Official shall be deemed final. If a timely appeal request is made by a permittee with regards to a permit suspension or revocation, the permit shall remain in force and effect until a decision on appeal has been made by the City Manager, or the City Manager's designee.

12.44.080 - Nuisances.

(a) What Constitutes Nuisance. The following shall constitute a public nuisance:

(1) Any grading without a permit where same is required by this chapter;

(2) Any grading or other work done in violation of any of the conditions imposed thereon by a permit issued pursuant to this chapter;

(3) Any grading or other work which fails to be done as required by any conditions of a permit issued pursuant to this chapter;

(4) The existence of a hazardous condition as defined in Section 12.44.050(j) of this chapter upon the determination by the Building Official as provided in said section that such condition exists.

(b) Abatement of Nuisance. The Building Official, or the Building Official's designee, may summarily abate or cause to be abated any condition which is declared in Section 12.44.080(a) to be a public nuisance or may abate or cause to be abated any such public nuisance in any other manner established by statute, law, ordinance, rule, or regulation of the State of California or of the City of Richmond, or may apply to a court of competent jurisdiction for appropriate relief, including but not limited to an order requiring or causing the abatement of any such public nuisance. The costs and expenses of such abatement shall become a lien upon the real property or premises upon which such public nuisance exists.

(c) Procedure Not Exclusive. The procedure provided in this chapter shall be cumulative and in addition to any other procedure or procedures provided in ordinances of this City or by State law for the abatement of any of the conditions described herein, and abatement hereunder shall not prejudice or affect any other action, civil or criminal, for the maintenance of any other action, civil or criminal, for the maintenance of any such condition.

(Source: Ordinance No. 19-97 N.S.)

Chapter 12.48 - UNDERGROUND UTILITIES*

Sections:

12.48.010 - Definitions.
12.48.020 - Public hearing by council.
12.48.030 - Council may designate underground utility districts by resolution.
12.48.040 - Unlawful acts.
12.48.050 - Exception, emergency or unusual circumstances.
12.48.060 - Other exceptions.
12.48.070 - Notice to property owners and utility companies.
12.48.080 - Responsibility of utility companies.
12.48.090 - Responsibility of property owners.
12.48.100 - Responsibility of city.
12.48.110 - Extension of time.
12.48.120 - Penalty.

12.48.010 - Definitions.

As used in this chapter, the following words shall have the following meanings:

(a) "Commission" means the Public Utilities Commission of the state of California.

(b) "Underground utility district" or "district" means that area in the City within which overhead structures are prohibited as such area is described in a resolution adopted pursuant to the provisions of Section 12.48.030 of this chapter.

(c) "Person" means and includes individuals, firms, corporations, partnerships and their agents and employees.

(d) "Overhead structures" means poles, towers, supports, wires, conductors, guys, stubs, platforms, crossarms, braces, transformers, insulators, cutouts, switches, communication circuits, appliances, attachments and appurtenances located above ground within a district and used or useful in supplying electric, communication or similar or associated service.

(e) "City" means the City of Richmond, California.

(f) "Council" means the City Council of the City of Richmond, California.

(g) "Utility" includes all persons or entities supplying electric, communication or similar or associated service by means of electrical materials or devices.

(h) "County" means the county of Contra Costa, California.

(i) "Director of Public Works" means the Director of Public Works of the City of Richmond or said director's designee.

12.48.020 - Public hearing by council.

The council may from time to time call public hearings to ascertain whether the public necessity, health, safety or welfare requires the removal of overhead structures within designated areas of the City and the installation underground of wires and facilities for supplying electric, communication or similar or associated service. The City Clerk shall notify by mail all affected property owners as shown on the last equalized assessment roll of Contra Costa County and all concerned utilities of the time and place of such hearings at least ten days prior to the date thereof. Each hearing shall be open to the public and may be continued from time to time. At each hearing all persons interested shall be given an opportunity to be heard. The decision of the council shall be final and conclusive.

A public hearing shall be unnecessary in the case of a new subdivision which is to become an underground utility district pursuant to the provisions of Section 15.08.620 of the Municipal Code of the City of Richmond.

12.48.030 - Council may designate underground utility districts by resolution.

(a) If, after any public hearing the council finds that the public necessity, health, safety or welfare requires the removal of overhead structures and the underground installation of wires and facilities within a designated area, the council shall, by resolution, declare said designated area an underground utility district and order removal and underground installation. The resolution shall include a description of the area comprising the underground utility district and shall fix the time within which removal and underground installation shall be accomplished and within which affected property owners must be ready to receive underground service. A reasonable time shall be allowed for removal and underground installation, having due regard for the availability of labor, materials and equipment necessary for said removal and for the installation of such underground facilities as may be occasioned thereby.

(b) In the case of a new subdivision, the area shall become an underground utility district upon the filing with the county recorder of the final map or parcel map of said subdivision, pursuant to the provisions of Section 15.08.620 of the Municipal Code of the City of Richmond. Affected property owners must be ready to receive underground service, remove the overhead structures and perform the underground installation prior to obtaining the City's approval of the subdivision improvements.

12.48.040 - Unlawful acts.

Whenever the council creates an underground utility district and orders the removal of overhead structures therein as provided in Section 12.48.030 of this chapter, it shall be unlawful for any person or utility to erect, construct, place, keep, maintain, continue, employ or operate overhead structures in the district after the date when said overhead structures are required to be removed, except when said overhead structures may be needed to facilitate the performance of the underground work required or as otherwise provided in this chapter.

12.48.050 - Exception, emergency or unusual circumstances.

Notwithstanding the provisions of this chapter, overhead structures may be installed and maintained for a period, not to exceed ten days, without authority of the Director of Public Works in order to provide emergency service. The Director of Public Works may grant special permission, on such terms as he may deem appropriate, in cases of unusual circumstances, without discrimination as to any person or utility, to erect, construct, install, maintain, use or operate overhead structures.

12.48.060 - Other exceptions.

This chapter and any resolution adopted pursuant to Section 12.48.030 of this chapter shall not apply, unless otherwise provided in such resolution, to the following types of facilities:

(a) Any municipal facilities or equipment installed under the supervision and to the satisfaction of the Director of Public Works;

(b) Poles or electroliers used exclusively for street lighting;

(c) Overhead wires (exclusive of supporting structures) crossing any portion of a district within which overhead structures have been prohibited, when such wires originate in an area from which overhead structures are not prohibited;

(d) Overhead structures used for the transmission of electric energy at nominal voltages in excess of thirty-four thousand five hundred volts;

(e) Overhead wires attached to the exterior surface of a building by means of a bracket or other fixture and extending from one location on the building to another location on the same building or to an adjacent building without crossing any public street;

(f) Antennae, associated equipment and supporting structures, used by a utility for furnishing communication services;

(g) Equipment appurtenant to underground facilities, such as surface-mounted transformers, pedestal-mounted terminal boxes and meter cabinets and concealed ducts;

(h) Temporary overhead structures used or to be used in conjunction with construction projects.

12.48.070 - Notice to property owners and utility companies.

Within ten days after the effective date of a resolution adopted pursuant to Section 12.48.030 of this chapter, the Director of Public Works shall notify all affected utilities and all persons owning real property within the district created by the resolution of the adoption thereof. The Director of Public Works shall further notify such affected property owners of the necessity that, if they or any person occupying such property desire to continue to receive electric, communication or similar or associated service, they or such occupant shall provide all necessary facility changes on their premises so as to receive such service from the lines of the supplying utility or utilities at a new location, subject to applicable rules, regulations and tariffs of the respective utility or utilities on file with the commission.

Notification by the Director of Public Works shall be made by mailing a copy of the resolution adopted pursuant to Section 12.48.030 together with a copy of this chapter, to affected property owners as such are shown on the last equalized assessment roll of Contra Costa County and to the affected utilities.

12.48.080 - Responsibility of utility companies.

If underground construction is necessary to provide utility service within a district created by any resolution adopted pursuant to Section 12.48.030 of this chapter, the supplying utility shall furnish that portion of the conduits, conductors and associated equipment required to be furnished by it under the applicable rules, regulations and tariffs on file with the commission.

12.48.090 - Responsibility of property owners.

(a) Every person owning, operating, leasing, occupying or renting a building or structure within a district shall perform construction and provide that portion of the service connection on his property between the facilities referred to in Section 12.48.080 of this chapter and the termination facility on or within said building or structure being served. Said construction and service connections shall be done in accordance with applicable rules, regulations and tariffs which the respective utility has on file with the commission. If the above is not accomplished by any person within the time provided for in the resolution enacted pursuant to Section 12.48.030 of this chapter, the Director of Public Works shall notify, in writing, the person in possession of such premises (hereinafter referred to as "occupant") and the owner thereof that the required underground facilities must be provided within thirty days after receipt of such notice.

(b) The notice to provide the required underground facilities may be given either by personal service or by mail. If notice is given by mail, such notice shall be deemed to have been received by the person to whom it has been sent within forty-eight hours after the mailing thereof.

(c) The notice given by the Director of Public Works to provide the required underground facilities shall particularly specify what work is required to be done, and shall state that if said work is not completed within thirty days after receipt of such notice, the Director of Public Works may (1) provide such required underground facilities, in which case the cost and expense thereof will be assessed against the owner of the property benefited, and/or (2) order the disconnection and removal of any and all overhead service wires and associated facilities supplying utility service to the property benefited.

(d) Within the time specified in the notice, the owner or occupant may request a hearing before the Director of Public Works. Such a request must be in writing and should set forth the reasons why the owner and/or occupant should be granted an extension of time in order to comply with the notice requirements.

(e) The Director of Public Works shall conduct a hearing. Based upon what transpires at the hearing, the Director of Public Works shall determine whether or not a time extension shall be granted.

(f) If the Director of Public Works determines that a time extension should be granted to allow the owner and/or occupant time in which to comply with the notice requirements, the Director of Public Works shall so notify, in writing, the owner and/or occupant and specify the time within which the previous notice requirements must be met.

(g) If upon the expiration of the thirty-day period specified in the original notice or the time period specified in the notice sent after the hearing, the required underground facilities have not been provided, then the Director of Public Works may forthwith proceed to do the work; provided, however, that if such premises are unoccupied and no electric or communication services are being furnished thereto, the Director of Public

Works shall, in lieu of providing the required underground facilities, have the authority to order the disconnection and removal of any and all overhead service wires and associated facilities supplying utility service to said property. Upon completion of the work by the Director of Public Works, he shall file a written report with the City Council setting forth the fact that the required underground facilities have been provided and the cost thereof, together with a legal description of the property against which such cost is to be assessed. The council shall thereupon fix a time and place for hearing protests against the assessment of the cost of such work upon such premises.

(h) After the protest hearing date has been scheduled by the council, the Director of Public Works shall notify, in writing, the premises' owner of the time and place that the council will hear protests against the assessment. Such notice shall be given ten days in advance of the protest hearing and shall set forth the amount of the proposed assessment.

(i) Upon the date and hour set for the hearing of protests, the council shall hear and consider the report and all protests. Based upon the merits of the protests, the council may make such revision, correction or modifications in the report as it may deem just, after which, by resolution, the report as submitted or as revised, corrected or modified shall be confirmed.

(j) The cost of providing the required underground facilities may be assessed by the council against the owner of the parcel of property benefited and such cost so assessed, if not paid within five days after its confirmation by the council, shall constitute a special assessment against the owner of the parcel of property and shall be placed on the property tax assessment rolls maintained by the Contra Costa County auditor.

12.48.100 - Responsibility of city.

City shall remove at its own expense all city-owned equipment from all overhead structures required to be removed under this chapter in ample time to enable the owner or user of such overhead structures to remove the same within the time specified in the resolution enacted pursuant to Section 12.48.030 of this chapter.

12.48.110 - Extension of time.

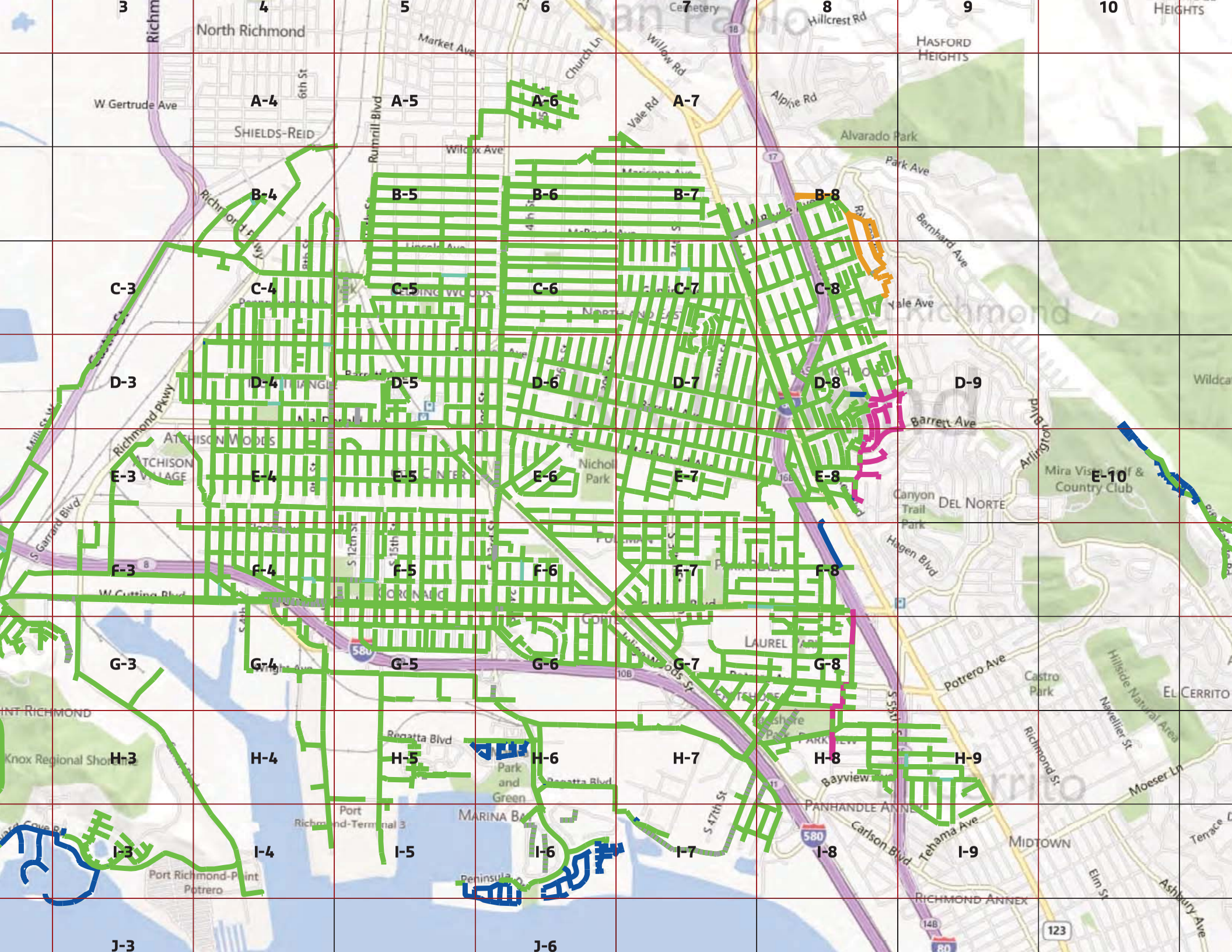
In the event that any act required by this chapter or by a resolution adopted pursuant to Section 12.48.030 of this chapter cannot be performed within the time provided on account of shortage of materials, war, restraint by public authorities, strikes, labor disturbances, civil disobedience or any other circumstances beyond the control of the actor, then the time within which such act will be accomplished shall be extended for a period equivalent to the time of such limitations.

12.48.120 - Penalty.

It shall be unlawful for any person to violate any provision of this chapter. Any person failing to comply with any of this chapter's provisions shall be deemed guilty of a misdemeanor.

(Source: Ordinance No. 10-83 N.S.)

Appendix C
Element 4 (Operations and Maintenance Program) Supporting Documents


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North Richmond
San Pablo
Hillcrest Rd
Hasford Heights
Market Ave
Church Ln
Willow Rd
W Gertrude Ave
6th St
Shields-Reid
Rumrill Blvd
Wilcox Ave
Vale Rd
Alpine Rd
Alvarado Park
Park Ave
Richmond Pkwy
Bernhard Ave
Yale Ave
Barrett Ave
Atchison Woods
Nicholl Park
Canyon Trail Park
Del Norte
Mira Vista Golf & Country Club
Hagen Blvd
S Garrard Blvd
W Cutting Blvd
Laurel
Potrero Ave
Castro Park
El Cerrito
Hillside Natural Area
Navellier St
Regatta Blvd
Knox Regional Shoreline
Point Richmond
Marina Bay Park and Green
Port Richmond-Terminal 3
Port Richmond-Point Potrero
Peninsula
Bayview
Panhandle Annex
Carlson Blvd
Tehama Ave
Midtown
Richmond Annex
Moeser Ln
Terrace
Elm St
Ashbury Ave
580
80
123

Water Resource Recovery-22

Wastewater Division



Digester Station



Energy Project



Plant Improvements

Mission: Protecting Richmond's public health and environment, and transforming wastewater into resources – through an effective source control program and responsible wastewater conveyance, treatment, resource recovery, and discharge practices.

Overview

The operation and maintenance tasks are provided via a 20-year contract (expires in May 2022) with Veolia Water North America under the direction of the Director of Water Resource Recovery. The wastewater collection system consists of sewer collection pipelines and 13 sewer lift stations. The wastewater treatment system includes screening, grit removal, primary sedimentation, conventional activated sludge biological secondary treatment, secondary clarification, anaerobic sludge digestion, chlorination, and de-chlorination.

Wastewater collection and treatment system Capital Improvement Plan (CIP) projects are evaluated using the following criteria established by the City and Veolia:

- Projects needed for health and safety
- Projects needed to maintain the quality of effluent flow
- Projects driven by regulatory requirements
- Projects that ensure adequate process reliability
- Projects that improve efficiency and effectiveness
- Projects needed to meet requirements in the Baykeeper settlement agreement

Plan Highlights

Biosolids and Energy Plan

Project Cost: $400,000 Total Project Cost over one fiscal year
Funding Source: Enterprise Fund

This project is for engineering services to prepare a holistic Biosolids and Energy Plan for the Wastewater Treatment Plant (WWTP). Project elements include: evaluating digester gas production, electrical demand of the treatment plant, local sources of additional digester feedstock to improve gas production, potential biosolids-to-energy (B2E) projects and the impacts to the treatment plant processes, and sources of grant funding to build an energy generating facility. The end product will be a physical document, and a City Council study session.

Mobile Equipment Purchase

Project Cost: $550,000 Total Project Cost over one fiscal year
Funding Source: Enterprise Fund

This project is the purchase of mobile equipment to replace equipment that has reached the end of its useful life. These equipment items are needed for use in the sewer collection system and wastewater treatment plant. The individual equipment items are: 2 pickup trucks, 1 mechanical rudder, 1 forklift, and 1 maintenance truck with hoist. Procurement will be handled through the DIMO Equipment Services Division, and funded out of the Wastewater Enterprise.

Tewksbury Sewer Realignment

Project Cost: $150,000 Total Project Cost over one fiscal year
Funding Source: Enterprise Fund

This project is the realignment of sewer pipes on Tewksbury Avenue, Marine Street, and Morgan Avenue in Point Richmond; to improve 1) conveyance of wastewater in this area, and 2) maintenance access to this area of the sewer collection system. Phase I of this project is to install 3 new manholes, install 275 feet of new sewer pipe, and clean out the existing pipe once the new manholes are installed. Phase II is installing sewer pipe along Marine Street.

Wastewater Treatment Plant Perimeter Stormwater Runoff Evaluation

Project Cost: $150,000 Total Project Cost over one fiscal year
Funding Source: Enterprise Fund

Additional Plan Highlights – funded by future Bond Issuance, State Revolving Fund Loan, and Enterprise Fund

This project is for engineering services to prepare a plan for diverting hillside Stormwater runoff so that it does not enter the treatment plant processes. Project elements include: topographic surveying, hydrological analysis, and evaluation of alternative construction projects. Ultimately one alternative project will be selected, and then implementation of that project will be performed as a separate capital improvement project.

13th and South 23rd Streets Sewer Capacity Improvements

Project Cost: $15,480,000 Total Project Cost over multiple fiscal years.
Funding Source: Revenue Bonds and Enterprise Fund

This project replaces sewer pipe upstream of the 13th Street interceptor, and upsizes pipe on 13th Street between Costa and Garvin Avenues. It also includes replacing a collapsed sewer pipe on South 23rd Street between Cutting Boulevard and Ohio Avenue.

Electrical Distribution System Upgrade

Project Cost: $10,650,000 Total Project Cost over multiple fiscal years.
Funding Source: Enterprise Fund

This project primarily consists of safety upgrades to the wastewater treatment plant electrical system.

Sanitary Sewer Wet Weather Capacity Improvements

Project Cost: $5,863,000 Total Project Cost over multiple fiscal years.
Funding Source: Clean Water State Revolving Fund Loan, Revenue Bonds, and Enterprise Fund

This project relieves capacity issues within existing trunk sewers within Cutting and Carlson Boulevards through the rehabilitation of aging upstream collection sewer pipelines. This project will also relieve capacity issues near Hoffman Boulevard, directly south of Cutting Boulevard, through the replacement of aging collection sewer pipelines.

Wastewater Treatment Plant Critical Improvements

Project Cost: $62,600,000 Total Project Cost over multiple fiscal years.
Funding Source: Clean Water State Revolving Fund Loan, Revenue Bonds, and Enterprise Fund

This project rehabilitates or replaces treatment plant process equipment and structures that have reached the end of their useful life, and are a liability from a regulatory and safety standpoint. Project elements include: grit and screening, aeration system for the biological secondary treatment process, secondary clarifiers, sludge thickening, dechlorination, and protecting plant assets and property from rockslides.

Water Resource Recovery Department-22
Wastewater CIP Overview

TOTAL CIP BUDGET - HISTORICAL COMPARISON

	FY2016-17 Adopted	FY2016-17 Actual 3/31/2017	FY2017-18 Adopted	FY2018-19 Proposed	FY2019-20 Proposed	FY2020-21 Proposed	FY2021-22 Proposed	5 Year Total
SOURCES BY FUND								
Wastewater - 4003	14,009,645	2,626,176	1,257,000	100,000	100,000	100,000	100,000	1,657,000
TOTAL SOURCES BY FUND	**14,009,645**	**2,626,176**	**1,257,000**	**100,000**	**100,000**	**100,000**	**100,000**	**1,657,000**
USES BY PROJECT								
Biosolids and Energy Plan			400,000					400,000
Electrical System Distribution System Upgrade	2,900,000							-
Force Main System Assessment	248,000	5,811						-
Mobile Equipment Replacement	127,000		550,000	100,000	100,000	100,000	100,000	950,000
NonCapAsset/Comp Hardware <5k (cell phone, IPADS, Laptops, &			7,000					7,000
Pt. Molate Sinkhole	46,000							-
Sanitary Sewer Improvements	795,137	334,299						-
Sanitary Sewer Wet Weather Capacity Improvements	1,646,644	371,312						-
Sewer Line Repairs	503,904	301,281						-
Tewksbury Sewer Realignment			150,000					150,000
Wastewater Treatment Plant Critical Improvements	2,408,000	990,894						-
Wastewater Treatment Plant Improvements	5,204,960	622,579						-
Wastewater Treatment Plant Perimeter Stowmwater Evaluation	130,000		150,000					150,000
TOTAL USES BY PROJECT	**14,009,645**	**2,626,176**	**1,257,000**	**100,000**	**100,000**	**100,000**	**100,000**	**1,657,000**
USES BY ORG CODE								
Wastewater CIP - 40322931	14,009,645	2,626,176	1,257,000	100,000	100,000	100,000	100,000	1,657,000
TOTAL USES BY ORG CODE	**14,009,645**	**2,626,176**	**1,257,000**	**100,000**	**100,000**	**100,000**	**100,000**	**1,657,000**

FY2017-18 to FY2021-22 Capital Improvement Plan

City of Richmond
Capital Improvement Plan
FY2018 through FY2022
Project Description Report

Project Name:	Biosolids and Energy Plan		
Project Manager:	Ryan Smith		
Department Responsible:	Water Resource Recovery - Wastewater		
Project Description:	This project is for engineering services to prepare a Biosolids and Energy Plan for the Wastewater Treatment Plant (WWTP).		
	Project ID:	22214	
	Project Location:	N/A	
	Planning and Design:	$ 400,000	
	Construction:	$ -	
	Equipment:	$ -	
	Contingency/Other:	$ -	
	Total:	**$ 400,000**	
	Estimated Start Date:	7/1/2017	
	Estimated Completion Date:	1/31/2018	
Justification:	A holistic evaluation of digester gas and sludge production is needed before proceeding with selecting a sludge dewatering technology and energy production facility. Richmond must begin dewatering its own digester sludge and cease delivery of sludge to West County Wastewater District within the next 5 years. An energy production facility will offset utility gas and electric charges.		
Total Estimated Cost:	**$ 400,000**		



SOURCE OF FUNDING						
Fund No.	**Fund Name**	**FY2018**	**FY2019**	**FY2020**	**FY2021**	**FY2022**
4003	Wastewater	$ 400,000	$ -	$ -	$ -	$ -
Total	$ 400,000	**$ 400,000**	**$ -**	**$ -**	**$ -**	**$ -**

Estimated Operation and Maintenance Cost:	***$ -***

City of Richmond
Capital Improvement Plan
FY2018 through FY2022
Project Description Report

Project Name:	Mobile Equipment Replacement		
Project Manager:	Ryan Smith		
Department Responsible:	Water Resource Recovery - Wastewater		
Project Description:	This project is the purchase of mobile equipment to replace equipment that has reached the end of its useful life. These equipment items are needed for use in the sewer collection system and Wastewater Treatment Plant. The individual equipment items are: 2 pickup trucks, 1 mechanical rodder, 1 forklift, and 1 maintenance truck with hoist. Procurement will be handled through the DIMO Equipment Services Division, and funded out of the Wastewater Enterprise.		
	Project ID:		03C04
	Project Location:		N/A
	Planning and Design:	$	-
	Construction:	$	-
	Equipment:	$	950,000
	Contingency/Other:	$	-
	Total:	**$**	**950,000**
	Estimated Start Date:		7/1/2017
	Estimated Completion Date:		6/30/2022
Justification:	This project is the purchase of mobile equipment to replace equipment that has reached the end of its useful life.		
Total Estimated Cost:	**$ 950,000**		



SOURCE OF FUNDING						
Fund No.	**Fund Name**	**FY2018**	**FY2019**	**FY2020**	**FY2021**	**FY2022**
4003	Wastewater	$ 550,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Total	$ 950,000	**$ 550,000**	**$ 100,000**	**$ 100,000**	**$ 100,000**	**$ 100,000**

Estimated Operation and Maintenance Cost: ***$*** ***-***

City of Richmond
Capital Improvement Plan
FY2018 through FY2022
Project Description Report

Project Name:	Tewksbury Sewer Realignment		
Project Manager:	Ryan Smith		
Department Responsible:	Water Resource Recovery - Wastewater		
Project Description:	This project is the realignment of sewer pipes on Tewksbury Avenue, Marine Street, and Morgan Avenue in Point Richmond. Phase I of this project is to install 3 new manholes, install 275 feet of new sewer pipe, and clean out the existing pipe once the new manholes are installed. Phase II is installing sewer pipe along Marine Street.		
	Project ID:	22215	
	Project Location:	Tewksbury Ave., Marine St. and Morgan Ave.	
	Planning and Design:	$ -	
	Construction:	$ 150,000	
	Equipment:	$ -	
	Contingency/Other:	$ -	
	Total:	**$ 150,000**	
	Estimated Start Date:	7/1/2017	
	Estimated Completion Date:	1/31/2018	
Justification:	The sewer in this area is old and has tree roots in the pipes, which causes sewer overflows (SSOs). The way the sewers in this area were constructed make maintenance of the system extremely difficult and time consuming.		
Total Estimated Cost:	**$ 150,000**		



SOURCE OF FUNDING						
Fund No.	**Fund Name**	**FY2018**	**FY2019**	**FY2020**	**FY2021**	**FY2022**
4003	Wastewater	$ 150,000	$ -	$ -	$ -	$ -
Total	$ 150,000	**$ 150,000**	**$ -**	**$ -**	**$ -**	**$ -**

Estimated Operation and Maintenance Cost:	***$ -***

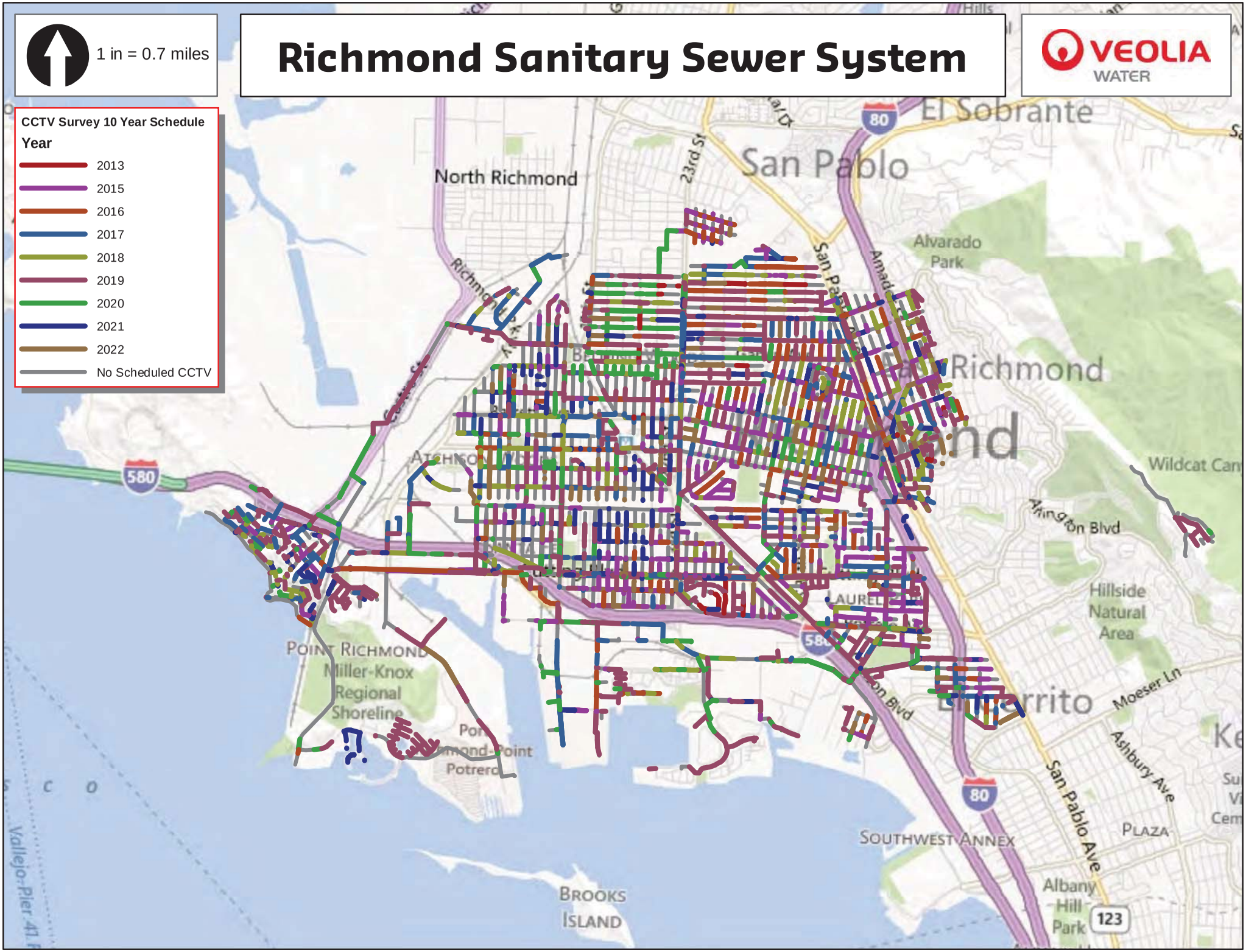
City of Richmond
Capital Improvement Plan
FY2018 through FY2022
Project Description Report

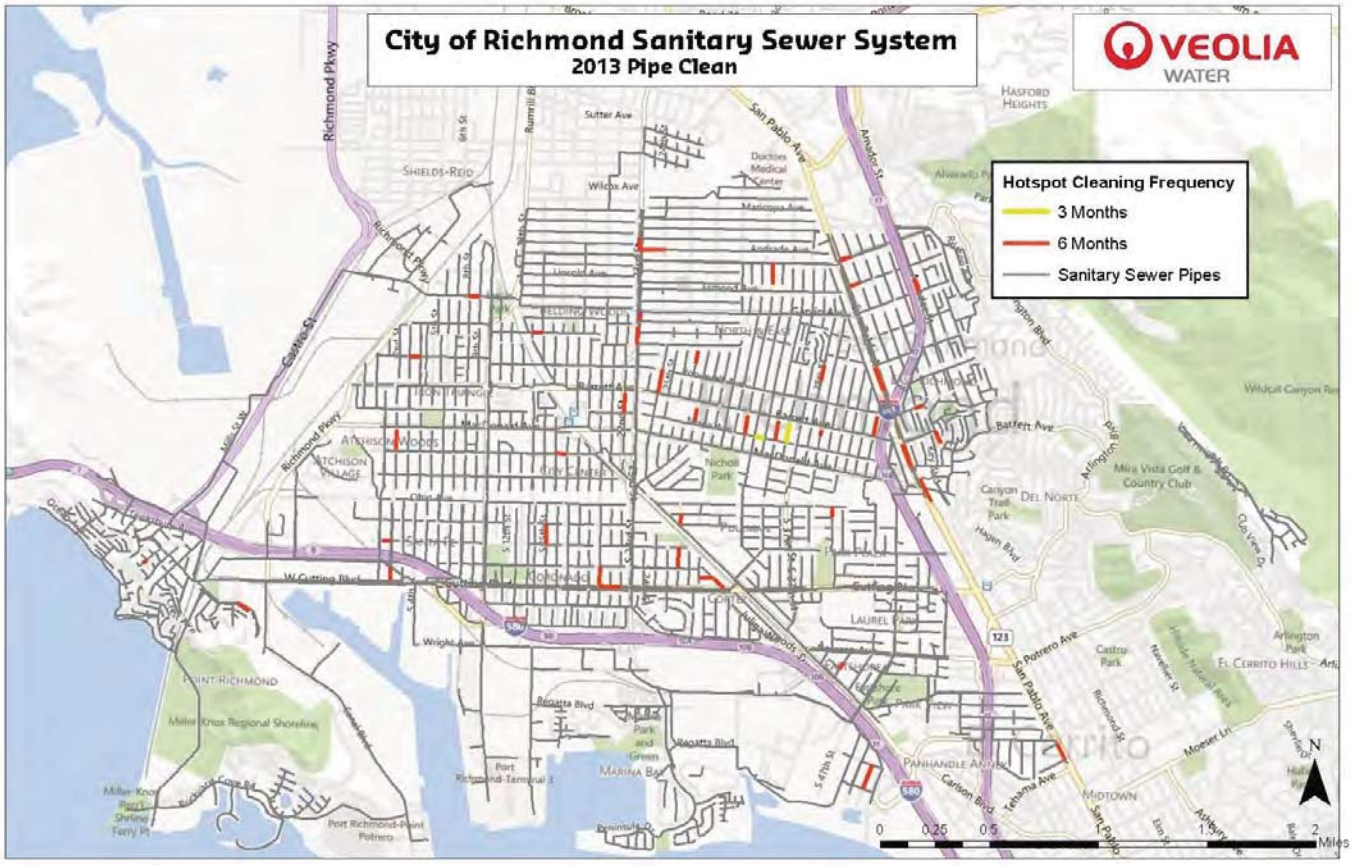
Project Name:	Wastewater Treatment Plant (WWTP) Perimeter Stormwater Evaluation		
Project Manager:	Ryan Smith		
Department Responsible:	Water Resource Recovery - Wastewater		
Project Description:	This project is for engineering services to prepare a plan for diverting hillside stormwater runoff so that it does not enter the treatment plant processes.		
	Project ID:		22216
	Project Location:		601 Canal Blvd.
	Planning and Design:	$	150,000
	Construction:	$	-
	Equipment:	$	-
	Contingency/Other:	$	-
	Total:	**$**	**150,000**
	Estimated Start Date:		7/1/2017
	Estimated Completion Date:		1/31/2018
Justification:	During wet weather, stormwater runoff from the hillside adjacent to the WWTP enters plant storm drains which drain to the sanitary sewer system. During storms, this flow rate can exceed 2 million gallons per day, which: 1) does not need to be treated, 2) adds to amount of blended water discharged to the bay, and 3) limits the capacity of the Wet Weather Storage Facility.		
Total Estimated Cost:	**$ 150,000**		

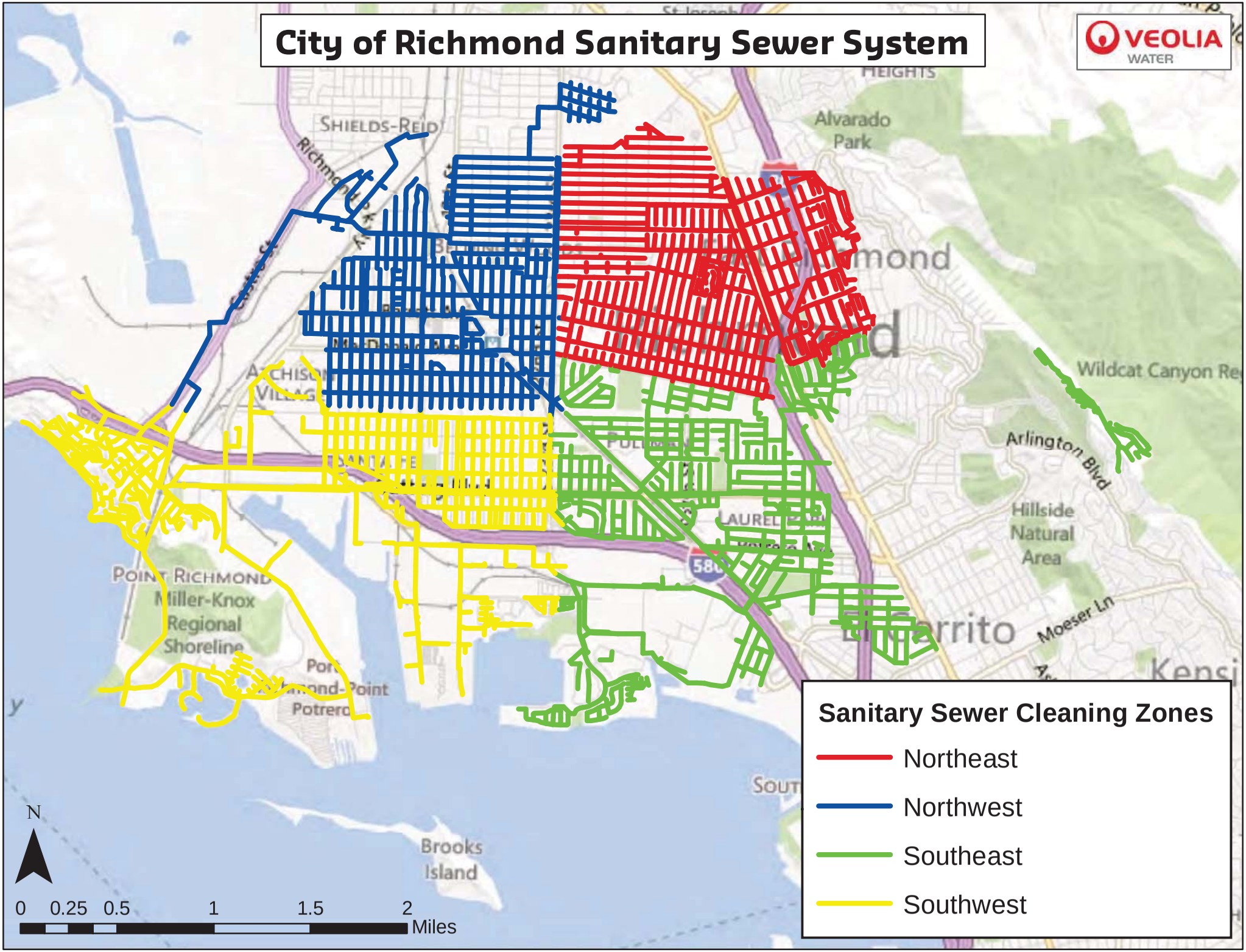


SOURCE OF FUNDING						
Fund No.	**Fund Name**	**FY2018**	**FY2019**	**FY2020**	**FY2021**	**FY2022**
4003	Wastewater	$ 150,000	$ -	$ -	$ -	$ -
Total	$ 150,000	**$ 150,000**	**$ -**	**$ -**	**$ -**	**$ -**

Estimated Operation and Maintenance Cost: ***$ -***


1 in = 0.7 miles
Richmond Sanitary Sewer System
VEOLIA WATER
CCTV Survey 10 Year Schedule
Year
2013
2015
2016
2017
2018
2019
2020
2021
2022
No Scheduled CCTV
North Richmond
San Pablo
El Sobrante
Alvarado Park
Richmond
Point Richmond
Miller-Knox Regional Shoreline
Brooks Island
Hillside Natural Area
Wildcat Can
Arlington Blvd
Moeser Ln
Ashbury Ave
San Pablo Ave
Plaza
Southwest Annex
Albany Hill Park
23rd St
Richmond Pkwy
Cutting Blvd
Vallejo-Pier 41
580
80
123


City of Richmond Sanitary Sewer System
2013 Pipe Clean
VEOLIA
WATER
Hotspot Cleaning Frequency
3 Months
6 Months
Sanitary Sewer Pipes
Richmond Pkwy
Sutter Ave
San Pablo Ave
Hasford Heights
Shields-Reid
Wilcox Ave
Doctors Medical Center
Maricopa Ave
Andrade Ave
Lincoln Ave
Hamilton Ct
Nystrom Village
Atchison Village
Nicholl Park
Barrett Ave
Canyon Trail Park
Del Norte
Mira Vista Golf & Country Club
Hazen Blvd
Olivera Dr
W Cutting Blvd
Cutting Blvd
Wright Ave
Laurel Park
Point Richmond
Miller Knox Regional Shoreline
Regatta Blvd
Marina Bay
Port Richmond-Terminal 3
Port Richmond-Point Potrero
Miller-Knox Point Shirley Ferry Pt
Peninsula Dr
Panhandle Annex
Midtown
El Cerrito Hills
Castro Park
Arlington Park
Potrero Ave
Carlson Blvd
Tehama Ave
Moeser Ln
Richmond St
Newhall St
Ashbury Ave
0 0.25 0.5 1 1.5 2 Miles
N


City of Richmond Sanitary Sewer System
VEOLIA WATER
Sanitary Sewer Cleaning Zones
Northeast
Northwest
Southeast
Southwest
N
0 0.25 0.5 1 1.5 2
Miles
Shields-Reid
Alvarado Park
Wildcat Canyon Re
Arlington Blvd
Hillside Natural Area
Moeser Ln
Point Richmond
Miller-Knox Regional Shoreline
Brooks Island
580

Manhole Inspection Survey

SOPs:

I have read and understand all the task and safety procedures associated with manhole inspections:

- ☐ Yes

Sketch:

Photo Exterior:	Photo Interior:

Date/Time Scheduled:	Manhole ID:
1/8/2013 6:07 PM	

Street:	Building Number:

City:	Location Details (To Assist with Locating MH):

Existing Known Manhole?	Survey ID:
☐ Yes	

Date/Time Started:	Contractor:
1/8/2013 6:07 PM	

Technician:	Tech Certificate Number:

Project Number:

X (Easting): (ft)

Y (Northing): (ft)

Depth Measurements:

Rim To Grade: (in)

Rim To Invert: (in)

Grade To Invert: (in)

System Type:

Depth of flow (in)

If Combined MH, then Type:

Inspection Status (if 'Not Found', check 'Completed' at end):

H2S Gas Reading:

Gas Type:

Date Cleaned:

1/8/2013

Pre-Cleaning:

Purpose of Survey:

Weather:

Evidence of Surcharge:

- ☐ Yes
- ☐ No

Location Code:

Surface Type

Asphalt	Concrete	Grass/Dirt	Gravel
☐	☐	☐	☐

Other

☐

Potential For Surface Runoff Inflow:

Manhole Component Observations

Cover Data

Cover Shape: | Cover Diameter: (in) | Cover Material:

Cover Bearing Surface Diameter (in) | How Does Cover Fit on Frame:

Vent-Hole Diameter (in): | Number of Vent Holes:

Cover Type

Bolted	Gasketed	Inner	Locking	Solid	Vented
☐	☐	☐	☐	☐	☐

Cover Condition

Bolts Missing	Broken	Corroded/Pitted	Cracked	Missing	Good
☐	☐	☐	☐	☐	☐

Cover Insert (Dish) Data

Cover Insert Type:

Cover Insert Condition

Cracked/Torn	Insert Fell	Leaking	Poor Fit	Good
☐	☐	☐	☐	☐

Adjustment Ring Type: | Adjustment Ring Height (in)

Adjustment Ring Condition

Broken	Corroded	Cracked	Leaking	Bad Install	Good
☐	☐	☐	☐	☐	☐

Seal Condition

Cracked	Loose/Not Attached	Offset	Good
☐	☐	☐	☐

Frame Data

Frame Material:	Frame Clear Open Diameter (in)

Frame Bearing Surface Width (in)	Frame Bearing Surface Depth (in)

Frame Condition

Broken	Coated	Corroded/Pitted/Worn	Cracked	Missing	Good
☐	☐	☐	☐	☐	☐

Frame Offset Distance (in)	Frame Depth (in)	Frame Seal Inflow:

Chimney Data

1st Chimney Material:	2nd Chimney Material:	Chimney Inflow/Infiltration:

Internal Chimney Lining:	External Chimney Lining:

Chimney Depth (in)

Chimney clear opening (in)

Cone Data

Cone Type:

Cone Material:

Cone Depth: (in)

Interior Cone Lining:

Exterior Cone Lining:

Wall/Bench Data

Wall Material:

Wall Depth (in)

Wall diameter (in)

Interior Wall Lining:

Exterior Wall Lining:

Bench Present:

Bench Material:

Bench Lining:

Channel/Step Data

Channel Installed:

- ☐ Yes
- ☐ No

Channel Type:

Channel Material:

Channel Exposure:

Number of Steps:

Step Material:

Defects (Clock Position By Compass Reading)

Defect Code
Detail Image
Quant/ dim 1
Vertical location (ft)
Direction At
Direction To
Continuous Defect
Joint
Descriptive Location
Remarks

US Pipe/Pipes In (Clock Position By Compass Reading)

US MH ID(Confirm IDs and Add if Needed)
Pipe ID
Rim To Invert (in)
Direction
Height (in)
Width (in)
Shape
Material
Seal Condition
Special Condition
Remarks
Lining Material

DS Pipe/Pipes Out (Clock Position By Compass Reading)

DS MH ID(Confirm IDs and Add if Needed)
Pipe ID
Direction
Rim To Invert (in)
Height (in)
Width (in)
Shape
Material
Seal Condition
Special Condition
Remarks
Lining Material

Attachments

Attach Extra Photos or Documents:

Item Name	URL

Resource Details:

Resource ID:	Actual hours:	Actual overtime hours:	Actual double time hours:

Notes:

Date/Time Completed:	Survey Date:
1/8/2013 6:08 PM	1/8/2013

Task status	

Appendix D
Element 5 (Design and Construction Standard) Supporting Documents

These standards are kept in a separate binder due to the large volume of pages.

Appendix E
Element 6 (Overflow Emergency Response Plan) Supporting Documents

Veolia Water North America
City of Richmond, CA

Overflow Emergency Response Plan



Effective Date: _____

Revised Date: _____

Approved by: _____

Signature: _____

Date: _____

Prepared by David Patzer, DKF Solutions Group
(707) 373-9709 dpatzer@dkfsolutions.com

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Sanitary Sewer Overflow Emergency Response Plan (OERP)

(ref. SWRCB Order No. 2006-0003-DWQ Element VI)

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2. Policy
3. Definitions as used in this OERP
4. Regulatory Requirements for OERP Element of SSMP
5. Goals
6. Sanitary Sewer Overflow (SSO) Detection and Notification
7. SSO Response Procedures
8. Recovery and Cleanup
9. Water Quality
10. Sewer Backup Into/Onto Private Property Claims Handling Policy
11. Notification, Reporting, Monitoring and Recordkeeping Requirements
12. Post SSO Event Debriefing
13. Failure Analysis Investigation
14. SSO Response Training
15. Authority
16. References

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- Duration and Flow Rate Photo Comparison ..... -6b
- Area Volume Estimation ..... -6c
- Sewage contained in gutter ..... -6d
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- Flow Out of Manhole with Cover in Place ..... -6f
- Flow Out of Manhole Vent or Pick Hole ..... -6g

CCTV Report ..... -7
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- Instructions ..... envelope
- Customer Information CS-1
- Sewer Spill Reference Guide ..... pamphlet

Regulatory Notifications Packet ..... See contents list above
Door Hanger ..... n/a

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- Duration and Flow Rate Photo Comparison ..... -3b
- Area Volume Estimation ..... -3c
- Sewage contained in gutter ..... -3d
- Upstream Lateral Connections ..... -3e
- Flow Out of Manhole with Cover in Place ..... -3f
- Flow Out of Manhole Vent or Pick Hole ..... -3g

CCTV Report ..... -4
Collection System Failure Analysis Form ..... -5
Regulatory Notifications Packet ..... See contents list above
Sewer Spill Reference Guide ..... pamphlet
Public Posting ..... n/a
Door Hanger ..... n/a

Appendix D: Water Quality Monitoring Plan

Appendix E: Contractor Orientation

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1. Purpose

The purpose of the Veolia Water - City of Richmond Overflow Emergency Response Plan (OERP) is to support an orderly and effective response to Sanitary Sewer Overflows (SSOs). The OERP provides guidelines for Veolia Water - City of Richmond personnel to follow in responding to, cleaning up, and reporting SSOs that may occur within the City's service area. This OERP satisfies the SWRCB Statewide General Waste Discharge Requirements (GWDR), which require wastewater collection agencies to have an Overflow Emergency Response Plan.

2. Policy

City and Veolia Water employees are required to report all wastewater overflows found and to take the appropriate action to secure the wastewater overflow area, properly report to the appropriate regulatory agencies, relieve the cause of the overflow, and ensure that the affected area is cleaned as soon as possible to minimize health hazards to the public and protect the environment. The City's goal is to respond to sewer system overflows as soon as possible following notification. City and Veolia Water staff will follow reporting procedures in regards to sewer spills as set forth by the San Francisco Regional Water Quality Control Board (*SFRWQCB)* and the California State Water Resources Control Board (*SWRCB)***.**

3. Definitions As Used In This OERP

BAY AREA CLEAN WATER ASSOCIATION (BACWA): Association comprised of Bay Area wastewater treatment and collection system agencies. BACWA represents the interests of public wastewater agencies in regulatory matters and to support the exchange of information. Website: http://www.bacwa.org

BLOCKAGE: An object that partially or fully hinders flow 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. Also known as a stoppage.

CALIFORNIA INTEGRATED WATER QUALITY SYSTEM (CIWQS): Refers to the State Water Resources Control Board online electronic reporting system that is used to report SSOs, certify completion of the SSMP, and provide information on the sanitary sewer system.

FOG – Fats, Oils, and Grease: FOG refers to fats, oils, and grease typically associated with food preparation and cooking activities that can cause blockages in the sanitary sewer system.

LATERAL OR PRIVATE LATERAL: The privately-owned sewer pipeline that conveys wastewater from the premises of a user to the City's sewer system. The upper lateral extends from the building to property line (or easement line). The lower lateral extends from the property or easement line to the connection to the pipe.

LEGALLY RESPONSIBLE OFFICIAL (LRO): Refers to an individual who has the authority to certify reports and other actions that are submitted through CIWQS.

MAINLINE SEWER: Refers to City wastewater collection system piping that is not a private lateral connection to a user.

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MAINTENANCE HOLE OR MANHOLE: Refers to an engineered structure that is intended to provide access to a sanitary sewer for maintenance and inspection.

NOTIFICATION OF AN SSO: Refers to the time at which the City becomes aware of an SSO event through observation or notification by the public or other source.

NUISANCE - California Water Code section 13050, subdivision (m), defines nuisance as anything that meets all of the following requirements:

a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

c. Occurs during, or as a result of, the treatment or disposal of wastes.

OVERFLOW EMERGENCY RESPONSE PLAN: This document identifies measures that are needed to respond to sanitary sewer overflows in a way that maximizes the protection of public health and the environment.

PREVENTATIVE MAINTENANCE: Refers to maintenance activities intended to prevent failures of the wastewater collection system facilities (e.g. cleaning, CCTV, inspection).

PRIVATE LATERAL SEWAGE DISCHARGES – Sewage discharges that are caused by blockages or other problems within a privately owned lateral.

ROOTS – Tree root invasion presents an additional problem related to FOG (Fats, Oils, and Grease). If a mat of root hair forms in the sewer line it slows the flow of wastewater and exacerbates the rate of accumulation of FOG materials.

SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD: Also known as Region 2 or RWQCB. This regulatory agency preserves, enhances and restores the quality of California's water resources, and ensures their proper allocation and efficient use for the benefit of present and future generations. Website: http://www.waterboards.ca.gov/sanfranciscobay

SANITARY SEWER OVERFLOW (SSO) - Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include:

(i) Overflows or releases of untreated or partially treated wastewater that reach waters of the United States;

(ii) Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and

(iii) Wastewater backups into buildings and on private property that are caused by blockages or flow conditions within the publicly owned portion of a sanitary sewer system.

SSOs that include multiple appearance points resulting from a single cause will be considered one SSO for documentation and reporting purposes in CIWQS.

NOTE: Wastewater backups into buildings caused by a blockage or other malfunction of a building lateral that is privately owned are not SSOs.

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SSO Categories:

Category 1: Discharge of untreated or partially treated wastewater of any volume resulting from a sanitary sewer system failure or flow condition that either:

- Reaches surface water and/or drainage channel tributary to a surface water; or
- Reached a Municipal Separate Storm Sewer System (MS4) and was not fully captured and returned to the sanitary sewer system or otherwise captured and disposed of properly.

Category 2: Discharge of untreated or partially treated wastewater greater than or equal to 1,000 gallons resulting from a sanitary sewer system failure or flow condition that either:

- Does not reach surface water, a drainage channel, or an MS4, or
- The entire SSO discharged to the storm drain system was fully recovered and disposed of properly.

Category 3: All other discharges of untreated or partially treated wastewater resulting from a sanitary sewer system failure or flow condition.

SANITARY SEWER SYSTEM: Any publicly-owned system of pipes, pump stations, sewer lines, or other conveyances, upstream of a wastewater treatment plant headworks used to collect and convey wastewater to the publicly owned treatment facility. Temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundments, tanks, etc.) are considered to be part of the sanitary sewer system, and discharges into these temporary storage facilities are not considered to be SSOs.

SENSITIVE AREA: Refers to areas where an SSO could result in a fish kill or pose an imminent or substantial danger to human health (e.g. parks, aquatic habitats, etc.)

SEWER SERVICE LATERAL: Refers to the piping that conveys sewage from the building to the City's wastewater collection system.

STATE WATER RESOURCES CONTROL BOARD: Also called the State Board. This agency developed and passed the Statewide Waste Discharge Requirements for collection systems and maintains the SSO reporting web site.

STATEWIDE WASTE DISCHARGE REQUIREMENTS: The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems was adopted by the SWCRB in 2006 to provide a structure and guidance for SSMP development. Also known as Order No. 2006-0003-DWQ.

UNTREATED OR PARTIALLY TREATED WASTEWATER: Any volume of waste discharged from the sanitary sewer system upstream of a wastewater treatment plant headworks.

WATERS OF THE STATE*:* Waters of the State (or waters of the United States) means any surface water, including saline waters, within the boundaries of California. In case of a sewage spill, storm drains are considered to be waters of the State unless the sewage is completely contained and returned to the wastewater collection system and that portion of the storm drain is cleaned.

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4. State Regulatory Requirements for Element 6, Overflow Emergency Response Plan

GWDR Requirement

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.

The Sewer System Management Plan and critical supporting documents are available to the public at www.ci.richmond.ca.us.

5. Goals

The City's goals with respect to responding to SSOs are:

- Work safely;
- Respond quickly to minimize the volume of the SSO;
- Eliminate the cause of the SSO;
- Prevent sewage system overflows or leaks from entering the storm drain system or receiving waters to the maximum extent practicable;
- Contain the spilled wastewater to the extent feasible;
- Minimize public contact with the spilled wastewater;
- Mitigate the impact of the SSO;
- Meet the regulatory reporting requirements;
- Evaluate the causes of failure related to certain SSOs; and
- Revise response procedures resulting from the debrief and failure analysis of certain SSOs.

6. SSO Detection and Notification

ref. SWRCB Order No. 2006-0003-DWQ VI(a)

Veolia Water North America – City of Richmond has adopted SSO response procedures that assure rapid response to minimize or eliminate impacts resulting from each SSO. The RMSD manages the sewer collection system through a contract with Veolia Water. Veolia provides SSO assistance and response during business and non-business hours.

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6.1 PUBLIC OBSERVATION

The City is most often notified of an SSO by Veolia staff. However on occasion, SSOs may be called into a particular City department in which case Veolia staff is contacted to execute a response. Veolia learns of the SSO through its crews, contractors, or a member of the public. When a member of the public notices an overflow or blockage, they report this occurrence to the Veolia SSO hotline. The hotline is answered by Veolia staff at the Wastewater Treatment Plant (601 Canal Boulevard, Richmond, CA). The Veolia number for reporting SSOs is (510) 412-2001. The Veolia hotline is included in the telephone book and on the City's website, which can be accessed through the link: http://www.ci.richmond.ca.us under the "Wastewater" tab.

Normal Work Hours
Normal business hours are Monday through Friday from 7:00 AM to 4:00 PM. Service calls received during normal business hours are taken immediately by the Veolia Collection System Planner/Scheduler who fills out the Service Call Report form and then dispatches the call to the Veolia Field Crew who respond within 30 minutes to one hour of an SSO event.

After Hours
After normal business hours, service calls are taken by the Veolia Water answering service center, which relays the information to the Veolia Field Crew on-call representative, who responds within a one hour time frame. The Veolia representative completes a standardized form available through the Infonet mobile tablet that records start time of the incident and other information related to the SSO.

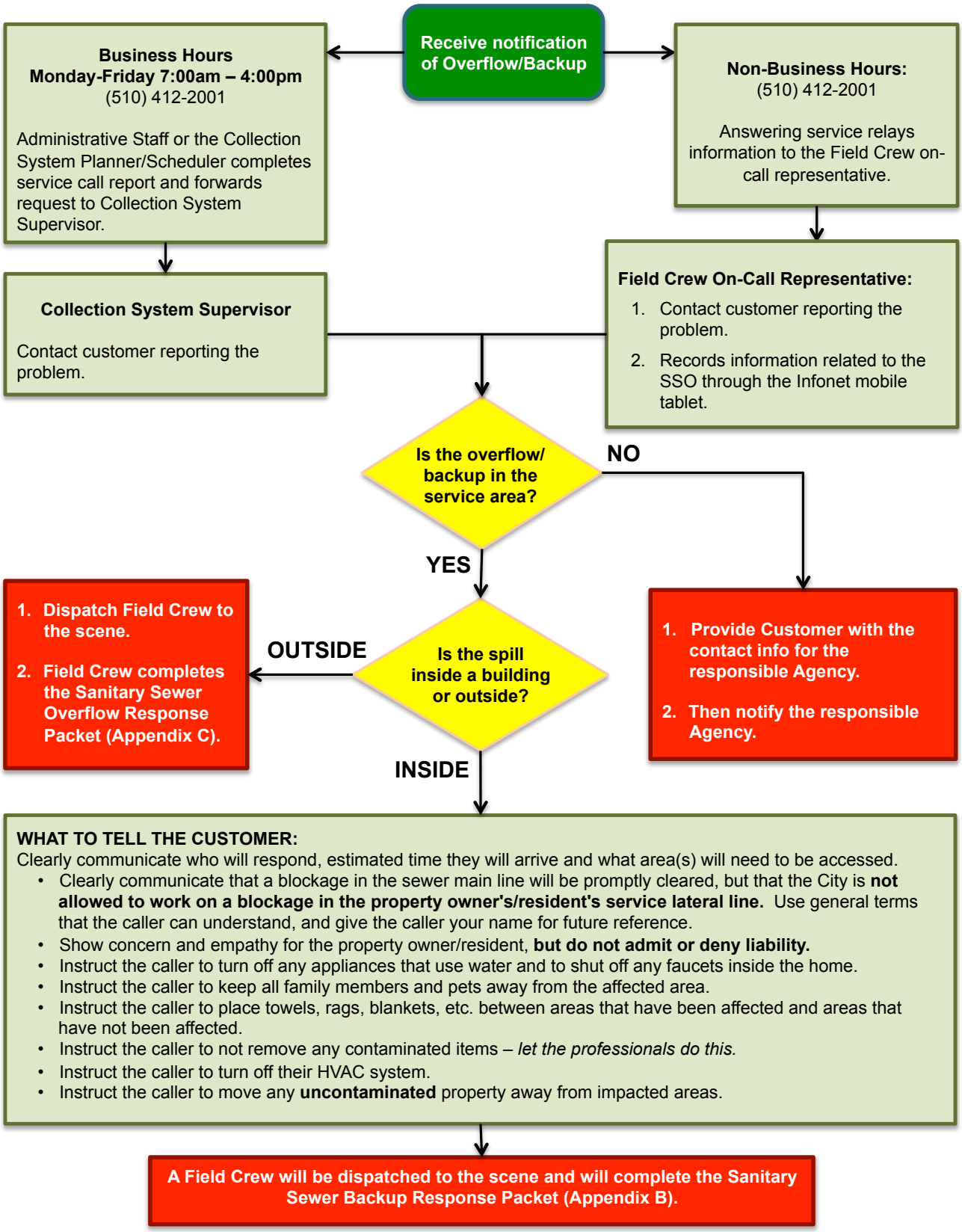
When calls are received, either during normal work hours or after hours, the individual receiving the call will collect the following information:

- Time and date of call
- Specific location of potential overflow or incident
- Nature of call
- In case of SSO, estimated start time of overflow and how long it has been occurring
- Caller's name, telephone number, and address
- Caller's observations (e.g., odor, duration, location on property, known impacts, indication if surface water impacted, appearance at cleanout or manhole)
- Other relevant information

The following (Figure 6.1) is an overview of receiving a sewage overflow or backup report *(see next page):*

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Figure 6.1 Overview of Receiving a Sewage Overflow or Backup Report Procedure



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6.2 NOTIFICATION FROM PUMP STATION SCADA ALARMS

Any overflows associated with a lift station are detected and reported through the SCADA remote monitoring and MISSION alarm system to Veolia on call staff. Pump or equipment failures and high wet well levels produce alarms, which may require a response depending on the circumstances. The on call person would initiate a support response by the field crew as necessary. A lift station overflow may also be relayed by the public to Veolia and addressed as described above.

6.3 CITY STAFF OBSERVATION

City staff conducts periodic inspections of its sewer system facilities as part of their routine activities. Any problems noted with the sewer system facilities are reported to appropriate City staff that, in turn, notify Veolia Water staff so they can respond to emergency situations. Work orders are issued to correct non-emergency conditions.

6.4 CONTRACTOR OBSERVATION

The following procedures are to be followed in the event that a contractor causes or witnesses a Sanitary Sewer Overflow. If the contractor causes or witnesses an SSO they will:

1. Immediately notify the City
2. Protect storm drains
3. Protect the public
4. Provide Information to City/Veolia Water Staff such as start time, appearance point(s), suspected cause, weather conditions, etc.
5. Direct ALL media and public relations requests to the City of Richmond Public Information Officer.

Appendix E includes a handout for Contractors with a flowchart of the above procedures.

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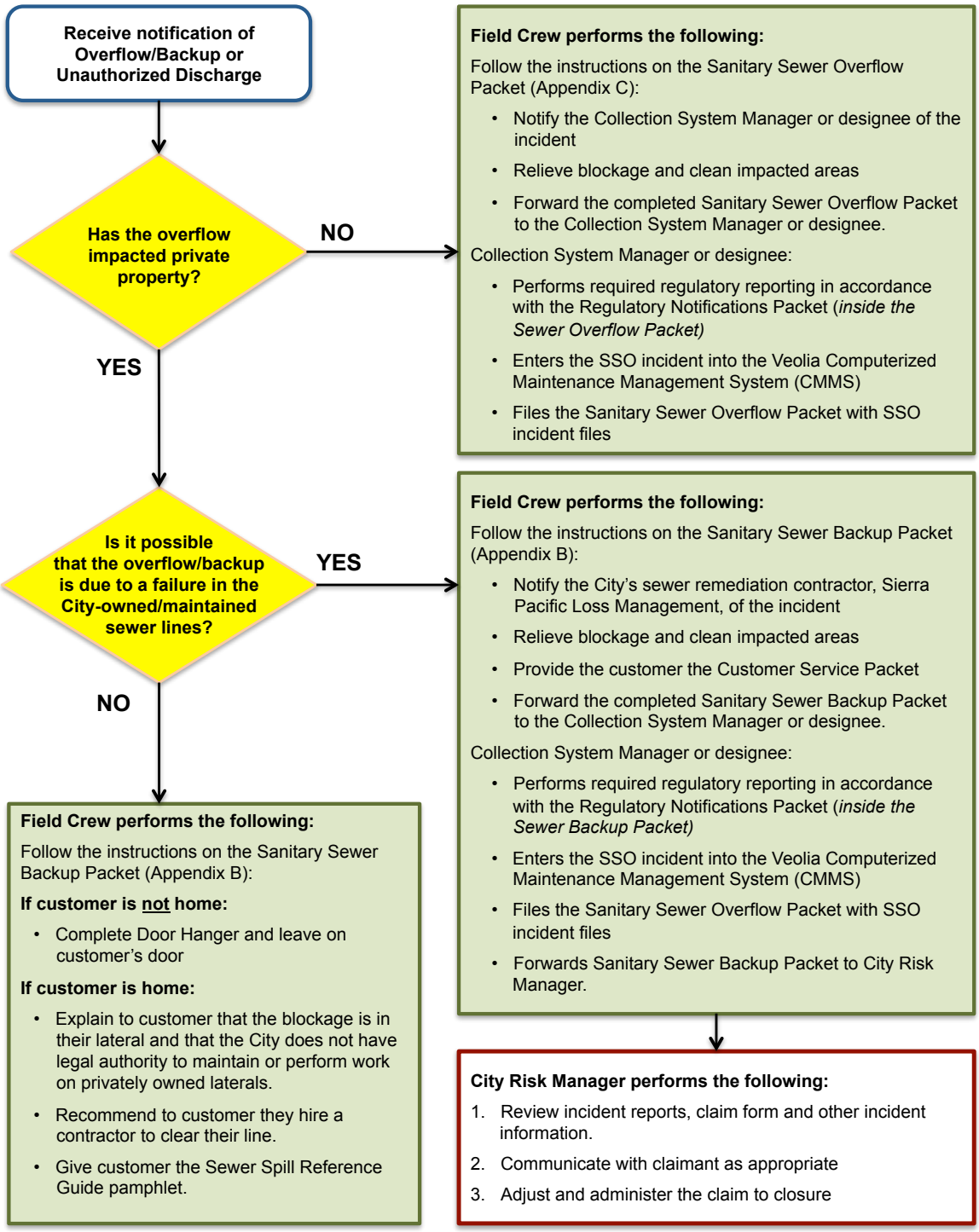
7. SSO Response Procedures

ref. SWRCB Order No. 2006-0003-DWQ Element 6(b)

7.1 Sewer Overflow/Backup Response Summary

The City/Veolia Water staff will respond to SSOs as soon as feasible following notification of an overflow/backup or unauthorized discharge. The following (Figure 7.1) is an overview of the response activities.

Figure 7.1 Overview of SSO/Backup Response



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7.2 First Responder Priorities

The first responder's priorities are:

- To follow safe work practices.
- To respond promptly with the appropriate and necessary equipment.
- To contain the spill wherever feasible.
- To restore the flow as soon as practicable.
- To minimize public access to and/or contact with the spilled sewage.
- To promptly notify the Field Supervisor and Collection System Manager in event of major SSO.
- To return the spilled sewage to the sewer system.
- To restore the area to its original condition (or as close as possible).
- To photograph and document affected and unaffected areas from a spill.
- To protect storm drains/waters of the state.

7.3 Safety

The first responder is responsible for following safety procedures at all times. Special safety precautions must be observed when performing sewer work. There may be times when City/Veolia Water personnel responding to a sewer system event are not familiar with potential safety hazards peculiar to sewer work. In such cases it is appropriate to take the time to discuss safety issues, consider the order of work, and check safety equipment before starting the job. This includes use of gas monitoring detectors for air quality in manholes and traffic controls at the site.

7.4 Initial Response

The first responder must respond to the reporting party/problem site and visually check for potential sewer stoppages or overflows.

The first responder will:

- Note arrival time at the site of the overflow/backup.
- Verify the existence of a public sewer system spill or backup.
- Determine if the overflow or blockage is from a public or private sewer.
- Identify and assess the affected area and extent of spill.
- Contact caller if time permits.
- If the spill is large or in a sensitive area, document conditions upon arrival with photographs. Decide whether to proceed with clearing the blockage to restore the flow or to initiate containment measures. The guidance for this decision is:
    - Small spills (i.e., spills that are easily contained) – proceed with clearing the blockage.
    - Moderate or large spill where containment is anticipated to be simple – proceed with the containment measures.
    - Moderate or large spills where containment is anticipated to be difficult – proceed with clearing the blockage; however, whenever deemed necessary, call for additional assistance and implement containment measures.
- Take steps to contain the SSO. For detailed procedures refer to Appendix B: Sanitary Sewer Backup Procedures, and Appendix C: Sanitary Sewer Overflow Packet.

7.5 Initiate Spill Containment Measures

The first responder will attempt to contain as much of the spilled sewage as possible using the following steps:

- Determine the immediate destination of the overflowing sewage.

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- Plug storm drains using air plugs, sandbags, and/or plastic mats to contain the spill, whenever appropriate. If spilled sewage has made contact with the storm drainage system, attempt to contain the spilled sewage by plugging downstream storm drainage facilities.
- Contain/direct the spilled sewage using dike/dam or sandbags.
- Pump around the blockage/pipe failure.

For detailed procedures refer to Appendix C: Sanitary Sewer Overflow Packet.

7.6 Restore Flow

Using the appropriate cleaning equipment, set up downstream of the blockage and hydro-clean upstream from a clear manhole. Attempt to remove the blockage from the system and observe the flows to ensure that the blockage does not reoccur downstream. If the blockage cannot be cleared within a reasonable time from arrival, or sewer requires construction repairs to restore flow, then initiate containment and/or bypass pumping. If assistance is required, immediately contact other employees, contractors, and equipment suppliers. For detailed procedures refer to Appendix C: Sanitary Sewer Overflow Packet.

7.7 Equipment

Veolia has a variety of equipment available for clearing blockages and impact mitigation and cleanup activities, including the following:

- Three (3) Combination Sewer Cleaning Trucks (vacuum and jetter/hydroflush). Two of these trucks are provided by the City as part of the contract between the City and Veolia.
- One (1) Rodder Truck.
- Two (2) CCTV Trucks.
- One (1) Emergency Response Trailer
- Two (2) Traffic Utility Trucks
- One (1) Small Gas Generator
- One (1) 1 ½" Portable Pump
- One (1) 3" Honda Portable Pump

8. Recovery and Cleanup

ref. SWRCB Order No. 2006-0003-DWQ Element 6(e)

The recovery and cleanup phase begins immediately after the flow has been restored and the spilled sewage has been contained to the extent possible. The SSO recovery and cleanup procedures are:

8.1 Estimate the Volume of Spilled Sewage

Use the methods outlined in the Sanitary Sewer Backup Packet (Appendix B), Sanitary Sewer Overflow Packet (Appendix C), and/or the Field Guide to estimate the volume of the spilled sewage. Wherever possible, document the estimate using photos and/or video of the SSO site before and during the recovery operation.

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8.2 Recovery of Spilled Sewage

Vacuum up and/or pump the spilled sewage and rinse water, and discharge it back into the sanitary sewer system.

8.3 Clean-up and Disinfection

Clean up and disinfection procedures will be implemented to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and will be modified as required for wet weather conditions. Where cleanup is beyond the capabilities of City staff, a cleanup contractor will be used.

Private Property
City crews are responsible for the cleanup when the property damage is minor in nature and is outside of private building dwellings, such as in front, side and backyards, easements, etc. In all other cases, affected property owners can call a water damage restoration contractor to complete the cleanup and restoration. If the overflow into property is caused by a failure in the City-owned wastewater collection infrastructure, Veolia or City of Richmond staff will call out a water damage restoration contractor to complete the cleanup and restoration as soon as they are made aware of the problem. In both cases, City claim forms may be issued if requested by the property owners.

Hard Surface Areas
Collect all signs of sewage solids and sewage-related material either by protected hand or with the use of rakes and brooms. Wash down the affected area with clean water and/or deozyme or similar non-toxic biodegradable surface disinfectant until the water runs clear. The flushing volume will be approximately three times the estimated volume of the spill. Take reasonable steps to contain and vacuum up the wastewater. Allow area to dry. Repeat the process if additional cleaning is required.

Landscaped and Unimproved Natural Vegetation
Collect all signs of sewage solids and sewage-related material either by protected hand or with the use of rakes and brooms. Wash down the affected area with clean water until the water runs clear. The flushing volume will be approximately three times the estimated volume of the spill. Either contain or vacuum up the wash water so that none is released. Allow the area to dry. Repeat the process if additional cleaning is required.

Natural Waterways
The Department of Fish and Wildlife will be notified by CalOES for SSOs greater than or equal to 1,000 gallons.

Wet Weather Modifications
Omit flushing and sampling during heavy storm events (i.e., sheet of rainwater across paved surfaces) with heavy runoff where flushing is not required and sampling would not provide meaningful results.

8.4 Public Notification

Signs will be posted and barricades put in place to keep vehicles and pedestrians away from contact with spilled sewage. County Environmental Health instructions and directions regarding placement and language of public warnings will be followed when directed. Additionally, the City of Richmond staff will use their best judgment regarding supplemental sign placement in order to protect the public and local

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environment. Signs will not be removed until directed by County Environmental Health, Collections System Manager, or designee.

Creeks, streams and beaches that have been contaminated as a result of an SSO will be posted at visible access locations until the risk of contamination has subsided to acceptable background bacteria levels. The warning signs, once posted, will be checked at least every day to ensure that they are still in place. Photographs of sign placement will be taken.

In the event that an overflow occurs at night, the location will be inspected first thing the following day. The field crew will look for any signs of sewage solids and sewage-related material that may warrant additional cleanup activities.

When contact with the local media is deemed necessary, the City of Richmond Public Information Officer will provide the media with all revelvant information.

9. Water Quality

ref. SWRCB Order No. 2006-0003-DWQ Element 6(f)

9.1 Water Quality Sampling and Testing

Water quality sampling and testing is required for Category 1 SSOs of 50,000 gallons or greater to determine the extent and impact of the SSO. The water quality sampling procedures must be implemented within 48 hours and include the following:

- The City staff will collect samples as soon as possible, but no later than 48 hours after the discovery and mitigation of the SSO event.
- Upon notice of a Category 1 SSO, the Monitoring Coordinator will determine where the field crew will sample. The Monitoring Coordinator will be responsible for determining the sampling locations. At a minimum, sampling will occur where the SSO enters the surface water body. If it is safe, samples will also be taken 50 - 100 feet upstream of the entry point, and at least one point downstream of the entry point. The downstream location(s) will be determined from visual monitoring and estimated spill travel time. The Monitoring Coordinator will provide a detailed description of potential monitoring site locations to the Field Crew.
- Upon arrival at the monitoring sites, the Field Crew will determine the best locations to sample by assessing the hydrology of the receiving water and any safety precautions. The Field Crew should look for locations where the receiving water can easily be entered or sampled mid-channel by a grab pole. Once the sampling site location is selected, but before sampling starts, the Field Crew will record the latitude and longitude of the sampling location into the Field Form.
- The samples shall then be brought to the Caltest Laboratory within eight hours of collection time. If the Caltest Laboratory is closed an alternate testing laboratory may be used that is certified for the required water quality tests.

9.2 Water Quality Monitoring Plan

The City Water Quality Monitoring Plan will be implemented immediately upon discovery of any Category 1 SSO of 50,000 gallons or more in order to assess impacts from SSOs to surface waters. The SSO Water Quality Monitoring Program will:

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

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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 City becoming aware of the SSO, require water quality sampling for ammonia and total and fecal coliform.
6. Observe proper chain of custody procedures.

9.3 SSO Technical Report

The City will submit an SSO Technical Report to 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. The City's Legally Responsible Official (LRO) will supervise the preparation of this report and will certify this report. This report, which does not preclude the Water Boards from requiring more detailed analyses if requested, shall include at a minimum, the following:

Causes and Circumstances of the SSO:

- Complete and detailed explanation of how and when the SSO was discovered.
- Diagram showing the SSO failure point, appearance point(s), and final destination(s).
- Detailed description of the methodology employed and available data used to calculate the volume of the SSO and, if applicable, the SSO volume recovered.
- Detailed description of the cause(s) of the SSO.
- Copies of original field crew records used to document the SSO.
- Historical maintenance records for the failure location.

City/Veolia Water Response to SSO:

- Chronological narrative description of all actions taken by the City to terminate the spill.
- Explanation of how the SSMP Overflow Emergency Response Plan was implemented to respond to and mitigate the SSO.
- Final corrective action(s) completed and/or planned to be completed, including a schedule for actions not yet completed.

Water Quality Monitoring:

- Description of all water quality sampling activities conducted including analytical results and evaluation of the results.
- Detailed location map illustrating all water quality sampling points.

10. Sewer Backup Into/Onto Private Property Claims Handling Policy

It is the policy of the City that a claims form shall be offered to anyone wishing to file a claim. The following procedures will be observed for all sewer overflows/backups into/onto private property:

- City staff will offer a City claim form irrespective of fault whenever it is possible that the sanitary sewer backup may have resulted from an apparent blockage in the City-owned sewer lines or whenever a City customer requests a claim form. The claim may later be rejected if subsequent investigations into the cause of the loss indicate the City was not at fault.

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- It is the responsibility of the Field Crew to gather information regarding the incident and notify the Collection System Supervisor or his/her designee.

- It is the responsibility of the City Risk Manager to review all claims and to oversee the adjustment and administration of the claim to closure.

11. Notification, Reporting, Monitoring and Recordkeeping Requirements

ref. SWRCB Order No. 2006-0003-DWQ Element 6(c)

In accordance with the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (SSS GWDRs), the City of Richmond maintains records for each sanitary sewer overflow. Records include:

- Documentation of response steps and/or remedial actions
- Photographic evidence to document the extent of the SSO, field crew response operations, and site conditions after field crew SSO response operations have been completed. The date, time, location, and direction of photographs taken will be documented.
- Documentation of how any estimations of the volume of discharged and/or recovered volumes were calculated including all assumptions made.

Regulator required notifications are outlined in Section 11.1 on the following page.

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11.1 Regulator Required Notifications

ELEMENT	REQUIREMENT	METHOD
NOTIFICATION	Within two hours of becoming aware of any Category 1 SSO 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, the City/Veolia Water will notify the California Office of Emergency Services (CalOES) and obtain a notification control number.	Call Cal OES at: **(800) 852-7550**
REPORTING	• Category 1 SSO: The City/Veolia Water will 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: The City/Veolia Water will 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: The City will submit certified report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: The City will 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: The City will 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: The City will update and certify every 12 months	Enter data into the CIWQS Online SSO Database[1] (http://ciwqs.waterboards.ca.gov/) certified by the Legally Responsible Official(s)[2]. Information required by CIWQS will be captured in the Sanitary Service Report Form. Certified SSO reports may be updated by amending the report or adding an attachment to the SSO report within 120 calendar days after the SSO end date. After 120 days, the State SSO Program Manager must be contacted to request to amend an SSO report along with a justification for why the additional information was not available prior to the end of the 120 days.
WATER QUALITY MONITORING	The City will conduct water quality sampling within 48 hours after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.	Water quality results will be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.
RECORD KEEPING	The City/Veolia Water will maintain the following records: • 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.

[1] In the event that the CIWQS online SSO database is not available, the Collections System Manager will notify SWRCB by phone and will fax or e-mail all required information to the RWQCB office at (510) 622-2460 in accordance with the time schedules identified above. In such an event, the City will submit the appropriate reports using the CIWQS online SSO database when the database becomes available. A copy of all documents that certify the submittal in fulfillment of this section shall be retained in the SSO file.

[2] The City always has at least one LRO. Any change in the LRO(s) including deactivation or a change to contact information, will be submitted to the SWRCB within 30 days of the change by calling (866) 792-4977 or emailing help@ciwqs.waterboards.ca.gov.

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For reporting purposes, if one SSO event of whatever category results in multiple appearance points in a sewer system, a single SSO report is required in CIWQS that 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 cause the SSO, and descriptions of the locations of all other discharge points associated with the single SSO event.

11.2 Complaint Records

The City/Veolia Water maintains records of all complaints received whether or not they result in sanitary sewer overflows. These complaint records include:

- Date, time, and method of notification
- Date and time the complainant or informant first noticed the SSO or occurrence related to the call
- Narrative description describing the complaint
- A statement from the complainant or informant, if they know, of whether or not the potential SSO may have reached waters of the state
- Name, address, and contact telephone number of the complainant or informant reporting the potential SSO (if not reported anonymously)
- Follow-up return contact information for each complaint received (if not reported anonymously)
- Final resolution of the complaint with the original complainant
- Work service request information used to document all feasible and remedial actions taken

All complaint records will be maintained for a minimum of five years whether or not they result in an SSO. SSO records are maintained in the Computerized Maintenance Management System (CMMS).

12. Post SSO Event Debriefing

ref. SWRCB Order No. 2006-0003-DWQ Element 6(d)

Every SSO event is an opportunity to evaluate the City/Veolia Water response and reporting procedures. Each overflow event is unique, with its own elements and challenges including volume, cause, location, terrain, climate, and other parameters.

As soon as possible after Category 1 and Category 2 SSO events, the Collection System Manager, and all of the participants, from the person who received the call to the last person to leave the site, will meet to review the procedures used and to discuss what worked and where improvements could be made in preventing or responding to and mitigating future SSO events. The results of the debriefing will be documented and tracked to ensure the action items are completed as scheduled.

13. Failure Analysis Investigation

ref. SWRCB Order No. 2006-0003-DWQ Element 6(d)

The objective of the failure analysis investigation is to determine the “root cause” of the SSO and to identify corrective action(s) needed that will reduce or eliminate future potential for the SSO to recur or for other SSOs to occur.

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The investigation will include reviewing all relevant data to determine appropriate corrective action(s) for the line segment. The investigation will include:

- Reviewing and completing the Sanitary Service Report Form and any other documents related to the incident
- Reviewing the incident timeline and other documentation regarding the incident
- Reviewing communications with the reporting party and witness
- Reviewing volume estimate, volume recovered estimate, volume estimation assumptions and associated drawings
- Reviewing available photographs
- Interviewing staff that responded to the spill
- Reviewing past maintenance records
- Reviewing past CCTV records,
- Conducting a CCTV inspection to determine the condition of all line segments immediately following the SSO and reviewing the video and logs,
- Reviewing any Fats, Oils, Roots and Grease (FROG) related information or results
- Post SSO debrief records
- Interviews with the public at the SSO location

The product of the failure analysis investigation will be the determination of the root cause and the identification and scheduling of the corrective actions. The Collection System Failure Analysis Form will be used to document the investigation.

14. SSO Response Training

ref. SWRCB Order No. 2006-0003-DWQ Element 6(d)

This section provides information on the training that is required to support this Overflow Emergency Response Plan.

14.1 Initial and Annual Refresher Training

All City/Veolia Water personnel who may have a role in responding to, reporting, and/or mitigating a sewer system overflow will receive training on the contents of this OERP. All new employees will receive training before they are placed in a position where they may have to respond. Current employees will receive annual refresher training on this plan and the procedures to be followed. The City/Veolia Water will document all training.

Affected employees will receive annual training on the following topics by knowledgeable trainers:

- The City/Veolia Water Overflow Emergency Response Plan and Sanitary Sewer Management Plan
- Sanitary Sewer Overflow Volume Estimation Techniques
- Researching and documenting Sanitary Sewer Overflow Start Times
- Impacted Surface Waters: Response Procedures
- State Water Resources Control Board Employee Knowledge Expectations
- Employee Core Competency Evaluations on Sanitary Sewer Operations
- Water Quality Sampling Plan

The City/Veolia Water will verify that annual safety training requirements are current for each employee,

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and that employees are competent in the performance of all core competencies. This will be verified through electronic testing, interviews and observations. The City/Veolia Water will address, through additional training/instruction, any identified gaps in required core competencies.

Through SWRCB Employee Knowledge Expectations training the employee will be able to answer the following:

1. Please briefly describe your name and job title.
2. Please describe for us approximately when you started in this field and how long you have worked for your agency.
3. Please expand on your current position duties and role in responding in the field to any SSO complaints.
4. Please describe your SOPs used to respond/mitigate SSOs when they occur.
5. Describe any training your agency provides or sends you to for conducting spill volume estimates.
6. We are interested in learning more about how your historical SSO response activities have worked in the field. We understand from discussions with management earlier that you use the OERP from the SSMP. Please elaborate on how you implement and utilize the procedures in the plan.
7. Historically, before any recent changes, can you please walk us through how you would typically receive and respond to any SSO complaints in the field?
8. Can you tell us who is responsible for estimating SSO volumes discharged? If it is you, please describe how you go about estimating the SSO volume that you record on the work order/service request forms?
9. What other information do you collect or record other than what is written on the work order form?
10. Describe if and when you ever talk with people that call in SSOs (either onsite or via telephone) to further check out when the SSO might have occurred based on what they or others know? If you do this, can you tell us where this information is recorded?
11. We understand you may be instructed to take pictures of some sewer spills/backups into structures. Other than these SSOs, when else would you typically take any pictures of an SSO?
12. Please walk us through anything else you'd like to add to help us better understand how your field crews respond and mitigate SSO complaints.

14.2 SSO Response Drills

Periodic training drills or field exercises will be held to ensure that employees are up to date on these procedures, equipment is in working order, and the required materials are readily available. The training drills will cover scenarios typically observed during sewer related emergencies (e.g. mainline blockage, mainline failure, and lateral blockage). The results and the observations during the drills will be recorded and action items will be tracked to ensure completion.

14.3 SSO Training Record Keeping

Records will be kept of all training that is provided in support of this plan. The records for all scheduled training courses and for each overflow emergency response training event and will include date, time, place, content, name of trainer(s), and names and titles of attendees.

14.4 Contractors Working On City Sewer Facilities

All construction contractors working on City sewer facilities will be required to develop a project-specific OERP, will provide project personnel with training regarding the content of the contractor's

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OERP and their role in the event of an SSO, and to follow that OERP in the event that they cause or observe an SSO. Emergency response procedures shall be discussed at project pre-construction meetings, regular project meetings and after any contractor involved incidents.

All service contractors will be provided, and required to observe contractor procedures. See Appendix E: Contractor Orientation.

15. Authority

- Health & Safety Code Sections 5410-5416
- CA Water Code Section 13271
- Fish & Wildlife Code Sections 5650-5656
- State Water Resources Control Board Order No. 2006-0003-DWQ
- State Water Resources Control Board Order 2013-009-DWQ effective September 9, 2013

16. References

- Sanitary Sewer Overflow and Backup Response Field Guide, 2013, DKF Solutions Group, LLC
- Appendix A: Regulatory Notifications Packet
- Appendix B: Sanitary Sewer Backup Packet
- Appendix C: Sanitary Sewer Overflow Packet
- Appendix D: Field Sampling Kit
- Appendix E: Contractor Orientation

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Appendix A

REGULATORY NOTIFICATIONS PACKET

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Regulatory Notifications Packet

Instructions:

1. Receive call from on-site crew reporting a Sanitary Sewer Overflow.
2. Open this packet.
3. Refer to the Regulatory Reporting Guide (A-1) for instructions.
4. Use the SSO Reporting Checklist for the appropriate category of SSO (A-2a or A-2b) to document that all notifications are made according to the reporting schedule.

Contents:

Form	Page Number
Regulatory Reporting Guide	A-1
Reporting Checklist: Category 1	-2a
Reporting Checklist: Categories 2 and 3	-2b
RWQCB Notification Fax	-3

Print on 6”x9” envelope

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Reporting Instructions

Deadline	See reverse side for definitions of the categories of spills of untreated or partially treated wastewater from publically owned sanitary sewer system			Spill from Private Lateral
	Category 1	Category 2	Category 3	
2 hours after awareness of SSO	• If the SSO is greater than or equal to 1,000 gallons, call CalOES at (800) 852-7550 and obtain a control number. • Notify Contra Costa County Environmental Health Division	-	-	-
48 Hours after awareness of SSO	If 50,000 gal or more will likely reach receiving waters, begin water quality sampling and initiate impact assessment	-	-	-
3 Days after awareness of SSO	Submit Draft Spill Report in the CIWQS* database	Submit Draft Spill Report in the CIWQS* database	-	-
15 Days after response conclusion	Certify Spill Report in CIWQS*. Update as needed until 120 days after SSO end time	Certify Spill Report in the CIWQS* database. Update as needed until 120 days after SSO end time	-	-
30 Days after end of calendar month in which SSO occurred	-	-	Certify Spill Report in the CIWQS* database. Update as needed until 120 days after SSO end time	-
45 days after SSO end time	If 50,000 gal or more were not recovered, submit SSO Technical Report using CIWQS*	-	-	-

* In the event that the CIWQS online SSO database is not available, do the following until the CIWQS online SSO database becomes available: (See contact information on Side B)

1. Make required notifications to the San Francisco Regional Water Quality Control Board (SFRWQCB office) using A-3, and
2. Notify the State Water Resources Control Board (SWRCB) by phone or email

Note: For reporting purposes, if one SSO event results in multiple appearance points, complete one SSO report in the CIWQS SSO Online Database, and report the location of the SSO failure point, blockage or location of the flow condition that caused the SSO, in the CIWQS SSO Online Database, including all the discharge points associated with the SSO event.

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Contact Information

Contact	Telephone/Fax/Email
CalOES	(800) 852-7550
Contra Costa County Environmental Health Division	Telephone: (925) 692-2500 Fax: (925) 692-2502
San Francisco Regional Water Quality Control Board (SFRWQCB):	Telephone: (510) 622-2369 Fax: (510) 622-2460
State Water Resources Control Board (SWRCB):	
Russell Norman, P.E.	(916) 323-5598 Russell.Norman@waterboards.ca.gov
Gil Vazquez, Water Resources Control Engineer	(916) 322-1400 Gil.Vazquez@waterboards.ca.gov

Authorized Personnel

The City's Legally Responsible Officials (LROs) are authorized to perform regulatory reporting and to electronically sign and certify SSO reports in CIWQS:

LRO Name	Job Title	Telephone
Mary Phelps	Senior Administrative Analyst, Water Resource Recovery Department	(510) 621-1269
Ryan Smith	Director of Water Resource Recovery	(510) 620-5486

Definitions of SSO Categories

Category	Definition
Category 1:	Discharge of untreated or partially treated wastewater of any volume resulting from a sanitary sewer system failure or flow condition that either: • Reaches surface water and/or drainage channel tributary to a surface water; or • Reached a Municipal Separate Storm Sewer System (MS4) and was not fully captured and returned to the sanitary sewer system or otherwise captured and disposed of properly.
Category 2:	Discharge of untreated or partially treated wastewater greater than or equal to 1,000 gallons resulting from a sanitary sewer system failure or flow condition that either: • Does not reach surface water, a drainage channel, or an MS4, or • The entire SSO discharged to the storm drain system was fully recovered and disposed of properly.
Category 3:	All other discharges of untreated or partially treated wastewater resulting from a sanitary sewer system failure or flow condition

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Regulatory Notifications Packet
Category 1 SSO Reporting Checklist

A-2a

Use this Checklist for Category 1 SSOs only
To be completed by the Collections System Manager

STEP 1: Receive call from crew.

☐ If the SSO is greater than or equal to 1,000 gallons, confirm whether or not they have notified CalOES. If so, complete the information in Step 2.

STEP 2: 2-hour Notification

If the SSO is greater than or equal to 1,000 gallons, notify CalOES within 2 hours of the time the City was notified of the SSO.

☐ **Notify CalOES** at (800) 852-7550:

- Date Called: _____
- Time called: _____ : _____ ☐AM ☐PM
- CalOES Control number: _____
- City personnel who called CalOES: *Name* _____
  Title _____
- Individual they spoke to at CalOES: _____

STEP 3: Within 48-Hours after awareness of SSO

☐ Only if 50,000 gallons or more was not recovered, implement Water Quality Monitoring Plan.

STEP 4: Within 3 Days after awareness of SSO

☐ Submit a Draft Spill Report using the CIWQS online reporting database.

STEP 5: Within 15 Days after response conclusion

☐ LRO must certify the Spill Report using the CIWQS online reporting database. Amendments to the Spill Report may be made for up to 120 days following the conclusion of the SSO Response.

STEP 6: Within 45 Days after SSO end date

☐ Within 45 days after the SSO end date, submit an SSO Technical Report using the CIWQS online reporting database only if 50,000 gallons or more was spilled to surface waters.

This form completed by: _____ *Name* _____ *Title* _____ *Date*

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Regulatory Notifications Packet

Category 2 & 3 SSO Reporting Checklist

A-2b

Use this Checklist for Category 2 and 3 SSOs only
To be completed by the Collections System Manager

STEP 1: Receive call from crew.

- If the volume ≥1,000 gallons proceed to Step 2.
- If the volume <1,000 gallons enter information in CIWQS System and proceed to Step 3.

STEP 2: Submit Draft Spill Report (Category 2 only)

☐ Submit a Draft Spill Report using the CIWQS online reporting database within 3 days after awareness of Category 2 SSO.

STEP 3: Certify Spill Report

☐ Certify the Spill Report using the CIWQS online reporting database:
- Category 2 SSO: Within 15 days after the conclusion of the response
- Category 3 SSO: Within 30 days after the end of the calendar month in which the SSO occurred

☐ Updates to the Spill Report may be made for up to 120 days following the conclusion of the SSO Response.

This form completed by: _____ _____ _____

Name *Title* *Date*

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Regulatory Notifications Packet

Regional Water Quality Control Board Notification Fax

A-3

NOTE TO City of Richmond Staff: Only use this form in the event that the CIWQS online SSO database is not available

FAX TO: San Francisco Regional Water Quality Control Board
Fax Number: (510) 622-2460

Date: _____
Pages: _____

FROM: Veolia Water – City of Richmond
Fax Number: (510) 235-3354
Telephone: (510) 412-2001

Address of SSO: _____ City: _____

County: _____ Date/Time: _____

SSO Start Time: _____ SSO Stop Time: _____

Volume of SSO: _____ Volume Recovered: _____

Final Disposition: _____

_____

Affected Water Body: _____

Samples Collected? ☐YES ☐NO

Taken to: _____

Crew Members: _____

Agencies Notified	Number(s)			Contact	Time	Date
CalOES	(800) 852-7550	☐YES	☐NO			
CIQWS		☐YES	☐NO			
OTHER:						

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Appendix B

SANITARY SEWER BACKUP RESPONSE PACKET

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Sanitary Sewer Backup Response Packet
Table of Contents

Form	Form Number
Instructions and Chain of Custody	packet envelope
Backup Response Flowchart	B-1
Bubbled Toilets Letter	-2
First Responder Form	-3
Declination of Cleaning Services (3-copy NCR)	-4
Sanitary Service Report Form	-5
Volume Estimation Forms	-6a, -6b, -6c, -6d, -6e, -6f, -6g
CCTV Report	-7
Claims Submittal Checklist	-8
Collection System Failure Analysis Form	-9
Customer Service Packet	
Instructions	packet envelope
Customer Information	CS-1
Claim Form	-2
Sewer Spill Reference Guide	pamphlet
Regulatory Notifications Packet	
Instructions	envelope
Regulatory Reporting Guide	A-1
Category 1 SSO Reporting Checklist	-2a
Category 2 & 3 SSO Reporting Checklist	-2b
RWQCB Notification Fax	-3
Door Hanger	n/a

For pre-assembled packets contact DKF Solutions Group at (707) 373-9709 or losscontrol@sbcglobal.net

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In the event of a **Sewer Backup** into a home/business
READ THIS FIRST

If this is a Category 1 SSO greater than or equal to 1,000 gallons:
the notification to CalOES at (800) 852-7550 must be made within 2 hours
(see below for contact information)

Notifications Trigger:	Contact Immediately:	Telephone:
For a Category 1 SSO greater than or equal to 1,000 gallons contact one of the following	Collections System Field Supervisor	(510) 542-3247
	Collection System Manager	(510) 426-0008
For all backups into/onto private property possibly due to problems in the public sewer	City Risk Manager	(510) 620-6605
For restoration/remediation	Sierra Pacific Loss Management, Bruce Bennett	Office: (707) 252-5525 Cell: (707) 479-1375
For any media requests	Public Information Officer	(510) 620-5486

Collection System Field Crew:

- ❑ Follow the instructions on the Sewer Backup Response Flowchart (B-1). Note: If multiple dwelling units are affected, use one packet per unit and check here: ☐
- ❑ If indicated on the flowchart, give the customer the Bubbled Toilets Letter and/or the Customer Service Packet and have them initial here:
  Customer acknowledgement of receipt of Bubbled Toilets Letter: _____
  Customer acknowledgement of receipt of Customer Service Packet: _____
- ❑ Place completed forms in this envelope, complete the Chain of Custody record (right) and forward this packet to the Collection System Manager.



Print Name: _____

Initial: _____

Date: _____

Time: _____

Collection System Manager:

- ❑ Review the enclosed forms.
- ❑ Complete the Regulatory Notifications Packet.
- ❑ Complete the Claims Submittal Checklist.
- ❑ Enter the incident into the Veolia Computerized Maintenance Management System (CMMS)
- ❑ Complete the Chain of Custody record (right) and forward this packet to the City Risk Manager.

Print Name: _____

Initial: _____

Date: _____

Time: _____

City Risk Manager:

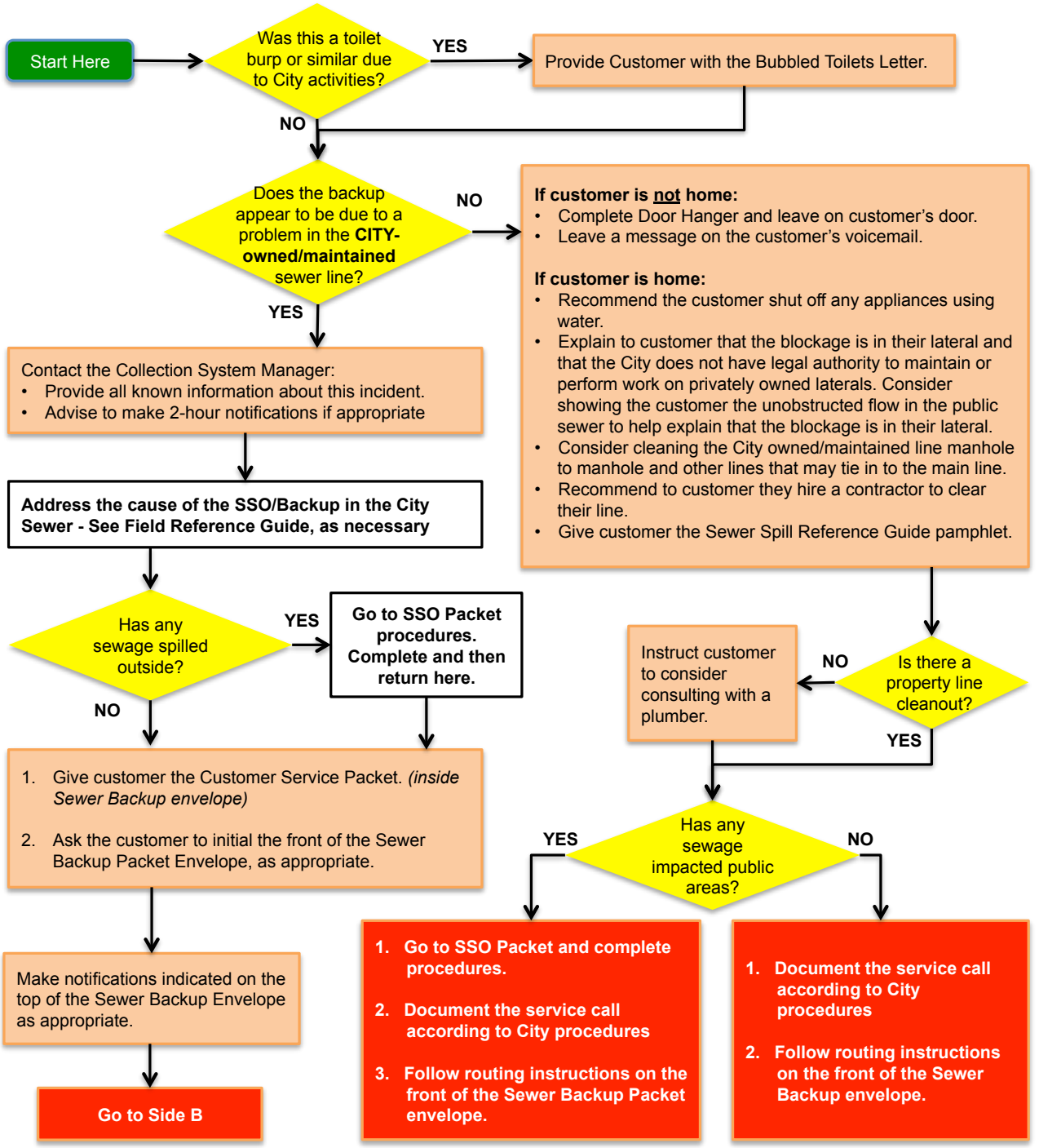
- ❑ Refer to the Claims Submittal Checklist.

Veolia Water North America – City of Richmond Overflow Emergency Response Plan:
Sanitary Sewer Backup Packet

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Sanitary Sewer Backup Response Packet
Backup Response Flowchart

B-1
Side A



MEDIA AND PUBLIC RELATIONS GUIDELINES:

Exercise caution in contacts with the public or media when you respond to a spill. Any information you provide or statements you make may become pertinent in the event of possible court action, it is important to **AVOID THE FOLLOWING**:

- Giving out the wrong information,
- Making accusations against customers, businesses or other agencies
- Speculating about the situation you are responding to
- Providing incorrect facts about a company or other agency

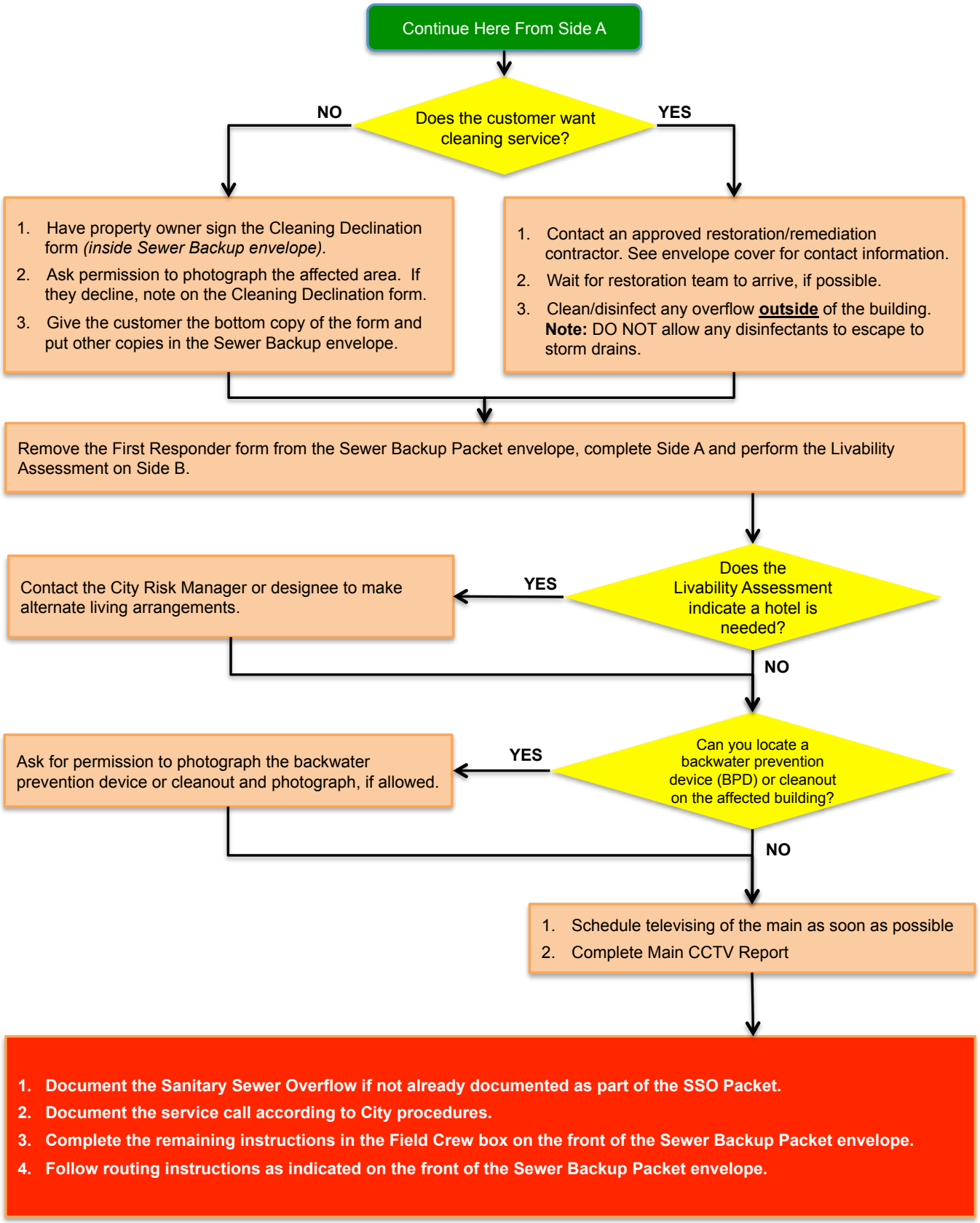
Be courteous and attempt to provide accurate information to questions within the limits above. In some cases, it may be appropriate to say that we do not have any information, or to delay answering a question and then to say when an answer might be available.

In most cases, refer media requests to the media coordinator indicated on the front of the Sewer Overflow Packet envelope.

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Sanitary Sewer Backup Response Packet
Backup Response Flowchart

B-1
Side B



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Sanitary Sewer Backup Response Packet
Bubbled Toilets Letter

B-2

Dear City of Richmond Customer,

Thank you for informing us that your toilet bubbled while our crews were working in proximity of your property. We apologize for the inconvenience and hope that this letter will answer some of your questions about bubbling toilets.

1. **Is this a health risk?**
   The water that came out of your toilet is potable water from the toilet bowl. Unless your toilet was in use when this occurred, this water is no different than that encountered while cleaning your toilet.

2. **What is the City doing in the street?**
   In order to insure reliable sewer service, the City inspects, cleans, and repairs its sewer system on a continuous basis.

3. **How does sewer cleaning cause my toilet to bubble?**
   Typical industry cleaning equipment uses high-pressure water to clean sewers. The first step is to use the high-pressure water jets to propel the hose and cleaning nozzle upstream as far as 800 feet. During this process, air within the main pipe is displaced and sometimes goes up the private lateral pipe and releases though the toilet. This can also happen during the cleaning phase, when high-pressure water is pulled downstream to the cleaning truck.

4. **What causes the air to come from my toilet?**
   Over the years, City crews have found that the bubbling of toilets have many causes, some of which are:
   - Obstructed vent pipes;
   - Vent pipes that are positioned too far from the toilet;
   - Lateral pipes that may be in use as the crew is cleaning (e.g. draining washing machine, draining bathtub, etc.);
   - Lateral pipes that may have obstructions that are causing them to hold water (e.g. roots, grease, etc.).

5. **What does City staff do, once informed of a bubbling toilet?**
   City staff will authorize cleanup by an approved remediation contractor and also notify the homeowner that they will be required to install a Backflow Prevention Device.

6. **What can I do to prevent my toilet from bubbling?**
   When a sewer begins to drain slowly, it may be a sign that it needs to be cleaned or repaired. Trees and shrubs may have root structures that are entering the lateral pipe. The homeowner needs to make sure to have a clean-out for accessing the line. It is the homeowner's responsibility to keep the sewer lateral pipe in good working condition.

It is always a good idea to keep the toilet lid down when not in use, and not install carpets in the bathroom unless they can be easily removed and cleaned. For more information please call the Collections System Manager (510) 426-0008.

Sincerely,

City of Richmond

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Sanitary Sewer Backup Response Packet

First Responder Form

B-3
Side A

Fill out this form as completely as possible.
Ask customer if you may enter the home. If so, take photos of all damaged and undamaged areas.

PERSON COMPLETING THIS FORM: Name: _____ Title: _____	PHONE: DATE: TIME:
TIME STAFF ARRIVED ON-SITE:	
DID CUSTOMER CALL CLEANING CONTRACTOR? ☐ Yes ☐ No If YES, name of contractor:	
RESIDENT NAME: ☐ Owner ☐ Renter	IF RENT, PROPERTY MANAGER(S): OWNER:
STREET ADDRESS: CITY, STATE AND ZIP: PHONE:	STREET ADDRESS: CITY, STATE AND ZIP: PHONE:
Is nearest upstream manhole visibly higher than the drain/fixture that overflowed? ☐ Yes ☐ No	
# OF PEOPLE LIVING AT RESIDENCE:	

Approximate Age of Home:	# of Bathrooms:	# of Rooms Affected:
Approximate Amount of Spill (gallons):	Approximate Time Sewage Has Been Sitting (hrs/days):	

Numbers of Photographs or Videos Taken: ☐ Photographs ☐ Video	Where are photos/video stored?
Does property have a Property Line Cleanout or BPD? ☐ YES ☐ NO ☐ Unknown	
If yes, was the Property Line Cleanout/BPD operational at the time of the overflow? ☐ YES ☐ NO ☐ Unknown	
Have there ever been any previous spills at this location? ☐ YES ☐ NO ☐ Unknown	
Has the resident had any plumbing work done recently? ☐ YES ☐ NO *If YES, please describe:*	

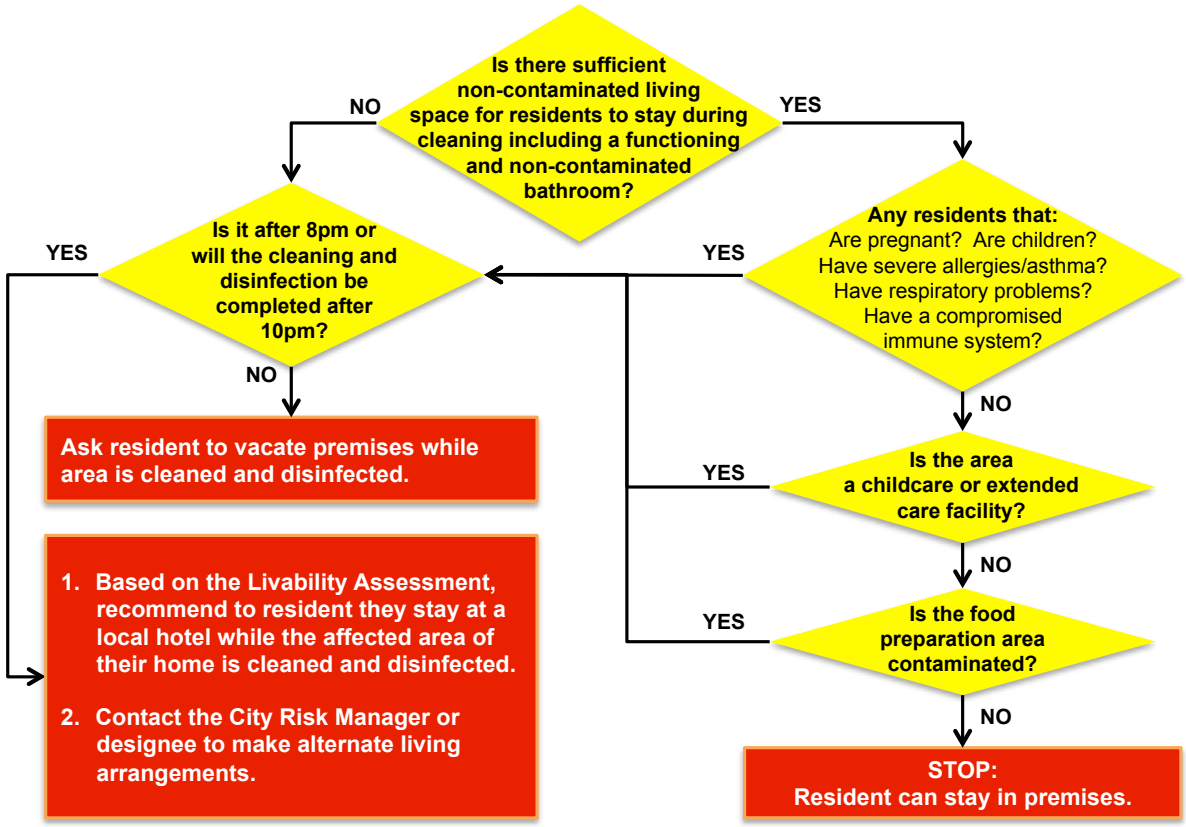
GO TO SIDE B

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Sanitary Sewer Backup Response Packet
First Responder Form

B-3
Side B

LIVABILITY ASESSMENT



SANITARY SEWER LINE BLOCKAGE LOCATION

PLEASE CHECK THE BOXES THAT DESCRIBE YOUR OBSERVATIONS:

Customer Cleanout Was:	Public Cleanout was:
☐ Non-Existent	☐ Non-Existent
☐ Full	☐ Full
☐ Empty	☐ Empty

On the diagram below, indicate the location of the sewer line and where the problem occurred.

Affected House

Upstream House

Recommended Follow-Up Action(s):

Did sewage go under buildings? ☐ Yes ☐ No ☐ Unsure

Place completed form in Sewer Backup Envelope and follow routing instructions

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B-4

Sanitary Sewer Backup Response Packet
Declination of Sewage Cleaning Services

Customer Information		
NAME:	ADDRESS:	TELEPHONE:

ON (date)	AT (time)	Approximately (quantity)	GALLONS OF:
			☐ Sewage ☐ Grey Water ☐ Toilet Bowl Water ☐ Odor ☐ Other (describe):

Overflowed from (or odor emanating from)
- ☐ Toilet
- ☐ Shower/Tub
- ☐ Washer
- ☐ Other (describe):

The overflow affected the following areas *(check one)*:
- ☐ Bathroom ☐ Bedroom
- ☐ Hallway ☐ Garage
- ☐ Kitchen ☐ Crawlspace
- ☐ Other (specify):

The overflow affected the following flooring:
- ☐ Tile ☐ Wood Flooring
- ☐ Linoleum ☐ Carpet
- ☐ Other (specify):

and/or additional materials:
- ☐ Area Rugs ☐ Towels
- ☐ Clothing ☐ Other (specify):

Were photos taken?: ☐ Yes ☐ No If yes, where are photos stored?

This Form Completed By: Name: _____ **Date:** _____

(Write legibly) Title: _____ **Time:** _____

CUSTOMER, please read the following and sign below:
I/We acknowledge that City of Richmond, CA (*City)* has offered to provide professional cleaning and decontamination services to remediate the sewage backup and/or overflow described above and that we declined the offer. We further understand and acknowledge that because we have declined, any necessary remediation activities will be conducted without City assistance, and that the City will not accept responsibility for work performed by persons other than those engaged by the City. The City will also not accept responsibility for any charges related to this incident that are not usual and customary. Please refer to the Customer Service Packet for whom to contact if you have any questions.

Customer Signature*:		**Date:**
The information above was explained to the customer by the following employee:	**Name:**	**Title:**
	Signature:	**Date:**

**Note to responders: if customer declines to sign this form, then have a co-worker sign here as a witness:*

Name: _____ *Signature:* _____ *Date:* _____

Recommendations to customer to clean up the spill:

- Keep pets and children out of the affected area
- Turn off heating/air conditioning systems
- Wear rubber boots, rubber gloves, and goggles during cleanup of the affected area.
- Remove and discard items that cannot be washed and disinfected (such as: mattresses, rugs, cosmetics, baby toys, etc.)
- Remove and discard drywall and insulation that has been contaminated with sewage or flood waters.
- Thoroughly clean all hard surfaces (such as flooring, concrete, molding, wood and metal furniture, countertops, appliances, sinks and other plumbing fixtures) with hot water and laundry or dish detergent.
- Help the drying process with fans, air conditioning units, and dehumidifiers.
- After completing cleanup, wash your hands with soap and water. Use water that has been boiled for 1 minute (allow water to cool before washing your hands.) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.
- Wash all clothes worn during the cleanup in hot water and detergent (wash separately from uncontaminated clothes).
- Wash clothes contaminated with flood or sewage water in hot water and detergent. Use a laundromat for washing large quantities of clothes and linens until your onsite wastewater system has been professionally inspected and services.
- Seek immediate attention if you become injured or ill.

Distribution Instructions – Top Copy to City records; Middle Copy to Collections System Manager; Bottom Copy to Customer

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Sanitary Service Report Form B-5

VEOLIA WATER

City of Richmond

☐ SSO ☐ Surface Overflow ☐ In a Structure | ☐ Non-SSO

1. Call Taken By: MARIE GRACE HERNANDEZ Date: _____ Time: _____

Resident Name: _____ Telephone: _____

Address: _____ Cross-Street: _____

2. Caller/Complaint Details: _____

_____

_____

Veolia Observation: ☐ Confirmed ☐ Not Confirmed Comments: _____

3. Field Observations: ☐ Blockage in Main ☐ No Blockage in Main ☐ Blockage in Lateral

☐ Debris in Main ☐ Gravel or Rocks ☐ Grease (IPP) ☐ Industrial Waste ☐ Overflow in MH

☐ Odor ☐ Roots in Main ☐ Soft Stoppage ☐ Overflow Lateral ☐ Overflow in Home

4. Referral to Other Department/Agency for Follow-up: ☐ EBMUD ☐ IPP

☐ Building Regulations (BR) ☐ City Public Works Inspector (PW) ☐ County Health ☐ Risk Managment (RM)

☐ Stege Sanitary District ☐ West County (WCCSD)

Person Contacted: _____ Date: _____ Time: _____

5. Spill Details: Spill Amount: ☐ None ☐ Greater than 0, Less than 1,000 gal ☐ Greater than or equal to 1000 gal

Entered Stormdrain or Waterway? ☐ YES ☐ NO Lateral? ☐ YES ☐ NO

On the Ground? ☐ YES ☐ NO Mainline MH? ☐ YES ☐ NO

In or Under Structure? ☐ YES ☐ NO

Est. Discharge Start Date: _____ Start Time: _____ End Time: _____ Total Gal: _____

*If spill is greater than 1000 gallons, notify OES @ 1-800-852-7550. OES Report #: _____

Vol. Contained (gal): _____ Vol. Uncontained not in StateWaters (gal): _____

Vol. that Reached StateWaters (gal): _____ Weather Type: ☐ Dry ☐ Heavy Rain ☐ Light Rain

6. Pipe Information: *Line Segment:* Up Manhole # _____ Down Manhole # _____

Feet Cleared: _____ Feet to Blockage: _____ Feet ran for Preventive Maintenance Credit: _____

7. Status: Recommended Action: ☐ CCTV ☐ Clean ☐ Follow-up Inspection

Follow-up Priority: ☐ Emergency ☐ High ☐ Low

Caller Notifty Date: _____ Caller Notifty Time: _____ Notifty By: _____

8. Supervisor Action: Supervisor Review: _____ Review Date: _____

☐ Action Taken: WO# _____ ☐ No Action Taken

9. Personnel: Operator Name: A) _____ B) _____ Hours: A) _____ B) _____

10. Vehicle: Truck Number: _____ Hours: _____

Sanitary Sewer Backup Response Packet

Volume Estimation: Eyeball Estimation Method

B-6a

Use this method only for small SSOs of less than 200 gallons.

SSO Date: _____ Location: _____

STEP 1: Position yourself so that you have a vantage point where you can see the entire SSO.

STEP 2: Imagine one or more buckets or barrels of water tipped over. Depending on the size of the SSO, select a bucket or barrel size as a frame of reference. It may be necessary to use more than one bucket/barrel size.

STEP 3: Estimate how many of each size bucket or barrel it would take to make an equivalent spill. Enter those numbers in Column A of the row in the table below that corresponds to the bucket/barrel sizes you are using as a frame of reference.

STEP 4: Multiply the number in Column A by the multiplier in Column B. Enter the result in Column C.

	A	B	C
Size of bucket(s) or barrel(s)	**How many of this size?**	**Multiplier**	**Estimated SSO Volume (gallons)**
1 gallon water jug		x 1 gallons	
5 gallon bucket		x 5 gallons	
32 gallon trash can		x 32 gallons	
55 gallon drum		x 55 gallons	
Other: _____ gallons		x _____ gallons	
Estimated Total SSO Volume:			

STEP 5: Is rainfall a factor in the SSO? ☐ Yes ☐ No

If yes, what volume of the observed spill do you estimate is rainfall? _____ gallons

If yes, describe how you determined the amount of rainfall in the observed spill?

STEP 6: Calculate the estimated SSO volume by subtracting the rainfall from the SSO volume:

_____ gallons – _____ gallons = _____ gallons

Estimated SSO Volume — Rainfall — **Total Estimated SSO Volume**

This worksheet completed by:

Name: _____ Signature: _____

Job Title: _____ Date: _____

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Sanitary Sewer Backup Response Packet

Volume Estimation: Duration and Flow Rate Comparison Method

SSO Date: _____ Location: _____

STEP 1: Compare the SSO to reference images on Page 2 to estimate flow rate of the current overflow. Describe which reference photo(s) were used and any additional factors that influenced applying the reference photo data to the actual SSO:

Flow Rate Based on Photo Comparison: _____gallons per minute (gpm)

STEP 2: Refer to the **Sanitary Service Report Form** to determine the duration of the SSO. Enter the duration here in minutes:

SSO Duration: _____minutes

STEP 3: Multiply the flow rate by the SSO duration to calculate the estimated SSO volume.

_____gpm	X	_____minutes	=	_____gallons
Flow Rate		SSO Duration		Estimated SSO Volume

STEP 4: Did the SSO occur during a period of consistent flow in this portion of the system? □Yes □ No

If no, explain how, based on this portion of the collection system and its users, you believe it may have impacted the estimated SSO volume:

By what percentage are you adjusting the estimation? □ increase □ decrease _____%

Translate the percentage into gallons: _____gallons

STEP 5: Calculate the adjusted SSO volume estimate:

_____gallons	+ or -	_____gallons	=	_____gallons
Estimated SSO Volume		Adjustment		**Estimated SSO volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

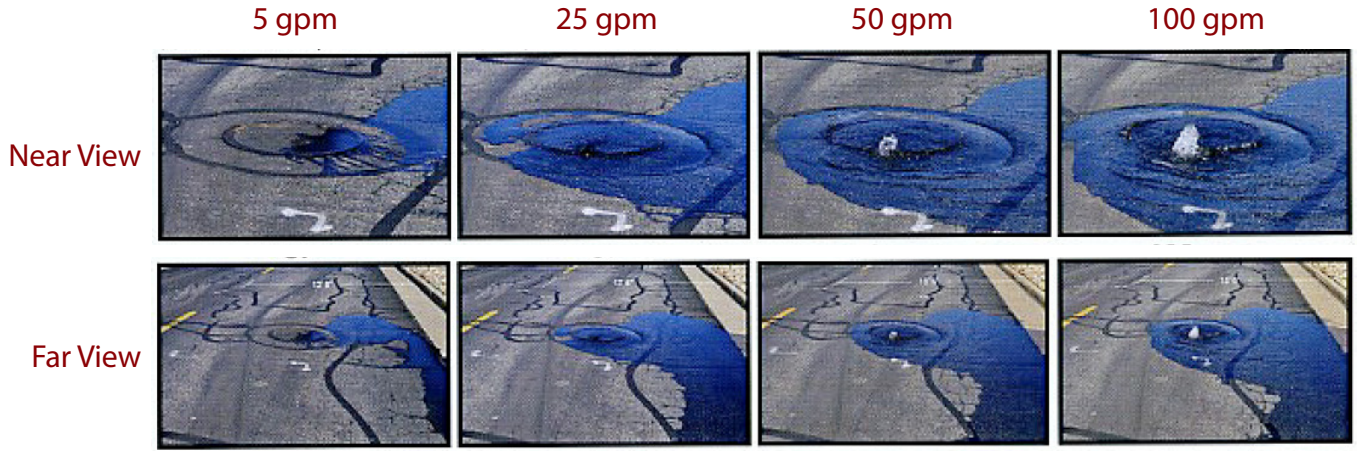
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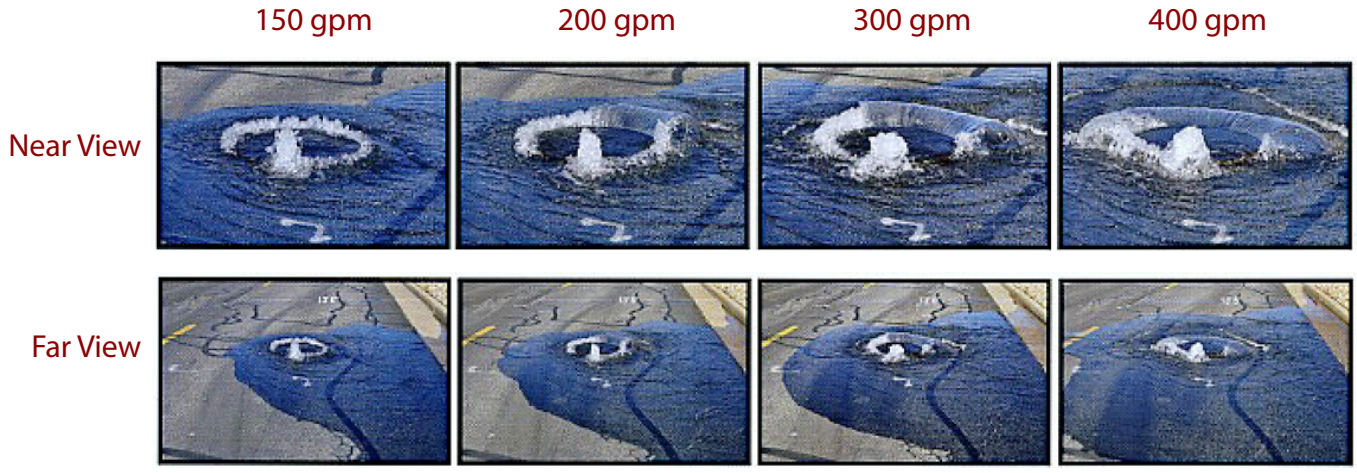
IMPORTANT NOTE:

These photographs are provided as examples only and will change with many factors.

SSCSC Manhole Overflow Gauge

CWEA Southern Section Collections Systems Committee
Overflow Simulation courtesy of Eastern Municipal Water District





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Sanitary Sewer Backup Response Packet

Volume Estimation: Area/Volume Estimation Method

Note: Refer to Page 3 for computation formulas and guides

SSO Date: _____ Location: _____

STEP 1: Describe SSO area surface: □Asphalt □Concrete □Dirt □Landscape □Inside Building

□ Other: _____

STEP 2: Draw/sketch the outline (footprint) of the SSO. Then break the footprint down into recognizable shapes. Refer to the example on Page 3.

STEP 3: Calculate the area of the footprint by completing the table below for each shape in Step 2.
If two shapes overlap, select one of the two shapes and estimate the percentage of that shape that does not overlap. Enter that percentage in the % Not Overlapping column. This will ensure that the overlap area is only counted once. Refer to the example on Page 3.

Rectangles	Length	X	Width	X	% Not Overlapping*	=	Area
	ft	X	ft	X	%	=	ft^2
	ft	X	ft	X	%	=	ft^2
	ft	X	ft	X	%	=	ft^2

Triangles	Base	X	Height	Multiplier	X	% Not Overlapping*	=	Area
	ft	X	ft	÷ 2	X	%	=	ft^2
	ft	X	ft	÷ 2	X	%	=	ft^2
	ft	X	ft	÷ 2	X	%	=	ft^2

Circles	π	X	Radius	X	Radius	X	% Not Overlapping*	=	Area
	3.14	X	ft	X	ft	X	%	=	ft^2
	3.14	X	ft	X	ft	X	%	=	ft^2
	3.14	X	ft	X	ft	X	%	=	ft^2

Total SSO Area (sum of all three tables above): _____ ft^2

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STEP 4: Calculate the volume of the SSO that **was NOT absorbed** into the ground. If the entire SSO was absorbed, skip to Step 5.

a. If SSO is of varying depths, take several measurements at different depths and find the average.

_____ inches ÷ _____ = _____ inches ÷ 12 = _____ feet
sum of measurements | # of measurements | average depth in inches | average depth in feet of ponded sewage

b. Calculate SSO volume of ponded sewage in cubic feet by multiplying the Total SSO Area in Step 3 by the average depth calculated in Step 4a. Convert from cubic feet to gallons by multiplying by 7.48.

_____ ft^2 x _____ ft = _____ ft^3 x 7.48 gal = _____ gallons
SSO area (Step 3) | average depth (Step 4a) | SSO volume in cubic feet | estimated volume of ponded sewage

STEP 5: Calculate the volume of the SSO that **was absorbed** into the ground. If only a wet stain is observed, use the guidelines on B-6c Page 3 for the average depth. When estimating the volume that was absorbed, take into consideration:

- How long the sewage has been sitting
- The air temperature on the day of the SSO
- Soil type for the area (e.g., hard-packed clay vs. loose or gravely soil)

When estimating the volume of the SSO that was absorbed into the ground, it is also advisable to dig down far enough to reach dry soil and take the depth of the wet soil into consideration.

Estimated volume that was absorbed into the soil: _____ gallons

Explain how this estimation was determined:

STEP 6: Add the volume not absorbed (Step 4) plus the volume absorbed (Step 5) to get the total estimated volume:

_____ gallons + _____ gallons = _____ gallons
volume not absorbed | volume absorbed | **Total Estimated SSO Volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

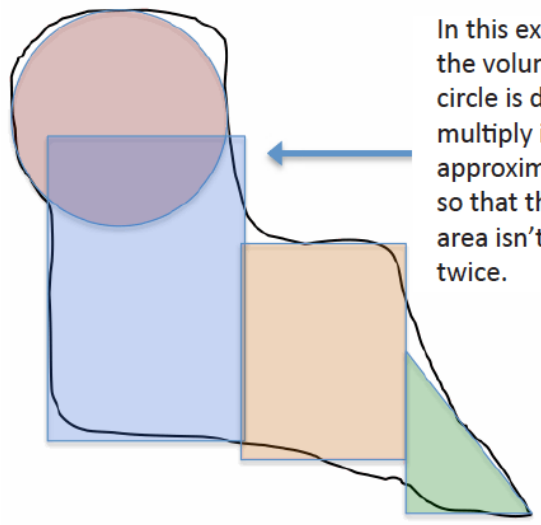
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Miscellaneous Computations

To convert inches to feet	Divide the inches by 12 or use the chart on the bottom right of this page.
Volume of one cubic foot	7.48 gallons of water
Area: Two-dimensional measurement represented in square feet	Square/rectangle: Area = Length x Width Circle: Area = πr^2 (where $\pi \approx 3.14$ and r = radius = ½ diameter) Triangle: Area = ½ (Base x Height)
Volume: Three-dimensional measurement represented in cubic feet	Rectangle/square footprint: Volume = Length x Width x Depth Circle footprint (cylinder): Volume = πr^2 x Depth (where $\pi \approx 3.14$ and r = radius = ½ diameter) Triangle footprint: Volume = ½ (Base x Height) x Depth
Depth: Contained or "Ponded" sewage	Measure actual depth of standing sewage whenever possible. When depth varies, measure several representative sample points and determine the average. Add the depth of the sample points and then divide that total by the number of sample points. If the depth is not measurable because it is only a wet stain, consider using the following estimated depths: • Depth of a wet stain on concrete surface: 0.0026' (1/32") • Depth of a wet stain on asphalt surface: 0.0013' (1/64")

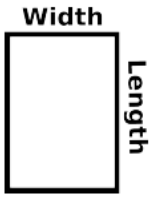
Example of how to draw/sketch the outline (footprint) of the spill for Step 2:

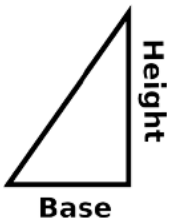
1. Sketch the outline of the spill (black line).
2. Break the sketch down into recognizable shapes (circles, squares, etc.) as well as you can.

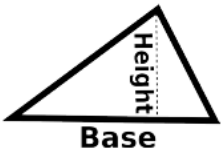


In this example, after the volume of the circle is determined, multiply it by approximately 65% so that the overlap area isn't counted twice.









Convert Inches to Feet	
Inches	Feet
1/8"	0.01'
1/4"	0.02'
3/8"	0.03'
1/2"	0.04'
5/8"	0.05'
3/4"	0.06'
7/8"	0.07'
1"	0.08'
2"	0.17'
3"	0.25'
4"	0.33'
5"	0.42'
6"	0.50'
7"	0.58'
8"	0.67'
9"	0.75'
10"	0.83'
11"	0.92'
12"	1.00'

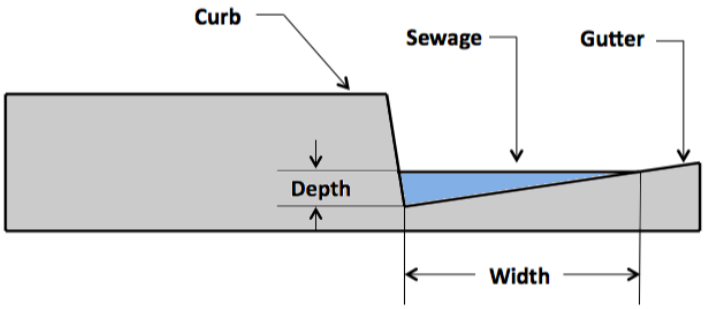
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Sanitary Sewer Backup Response Packet

Volume Estimation: Sewage Contained in a Roadway Gutter

B-6d

SSO Date: _____ Location: _____



Convert Inches to Feet	
Inches	Feet
1/8"	0.01'
1/4"	0.02'
3/8"	0.03'
1/2"	0.04'
5/8"	0.05'
3/4"	0.06'
7/8"	0.07'
1"	0.08'
2"	0.17'
3"	0.25'
4"	0.33'
5"	0.42'
6"	0.50'
7"	0.58'
8"	0.67'
9"	0.75'
10"	0.83'
11"	0.92'
12"	1.00'

STEP 1: Measure the length of the contained SSO in feet: _____ feet

STEP 2: Measure the depth and width of the overflow in the gutter in feet at the upstream and downstream ends and at evenly spaced intervals if the slope changes in the flooded gutter length. Use the chart to the right as needed to convert inches to feet. For each location measured, calculate the cross-sectional area in square feet by multiplying the depth by the width and dividing by 2.

Location	Depth in Feet	x	Width in Feet	÷ 2	Cross-sectional Area
Upstream End	ft	x	ft	÷ 2	ft^2
Downstream End	ft	x	ft	÷ 2	ft^2
Interval (optional)	ft	x	ft	÷ 2	ft^2
Interval (optional)	ft	x	ft	÷ 2	ft^2
Interval (optional)	ft	x	ft	÷ 2	ft^2

STEP 3: Average all the area calculations from Step 2 by adding them together and dividing by the number of intervals (#). Calculate the volume in cubic feet by multiplying by length (Step 1).

_____ ft^2	÷	_____	=	_____ ft^2	×	_____ ft	=	_____ ft^3
Sum of Areas		#		Average Area		Length		Est. SSO volume in cubic feet

STEP 4: Convert the overflow volume from cubic feet to gallons:

_____ ft^3	×	7.48	=	_____ gallons
Estimated SSO volume in cubic feet				**Estimated SSO volume**

This worksheet completed by:

Name: _____ Signature: _____

Job Title: _____ Date: _____

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Sanitary Sewer Backup Response Packet

Volume Estimation: Upstream Lateral Connections Method

B-6e

SSO Date: _____ Location: _____

STEP 1: Determine the number of Equivalent Dwelling Units (EDUs) for this SSO: _____ EDUs
NOTE: A single-family residential home = 1 EDU. For commercial buildings, refer to agency documentation.

STEP 2: This volume estimation method utilizes daily usage data based on flow rate studies of several jurisdictions in California. Column A shows how an average daily of usage of 180 gallons per day is distributed during each 6-hour period. Adjust the table as necessary to accurately represent the actual data.

Complete Column E by entering the number of minutes the SSO was active during each 6-hour time period. Multiply column D times Column E to calculate the gallons spilled during each time period. Add the numbers in Column F together for the Total Estimated SSO Volume per EDU.

	Flow Rate Per EDU				SSO	
	A	**B**	**C**	**D**	**E**	**F**
Time Period	Gallons per Period	Hours per period	A ÷ B = Gallons per Hour	C ÷ 60 = Gallons per Minute	Minutes SSO was active during period	D × E = Gallons spilled per period
6am-noon	72	6	12	0.20		
noon-6pm	36	6	6	0.10		
6pm-midnight	54	6	9	0.15		
midnight-6am	18	6	3	0.05		
Total Estimated SSO Volume per EDU:						

STEP 3: Multiply the Estimated SSO Volume per EDU from Step 2 by the number of EDUs from Step 1.

_____ gallons X _____ = _____ gallons
Volume per EDU # of EDUs Estimated SSO Volume

STEP 4: Adjust SSO volume as necessary considering other factors, such as activity that would cause a fluctuating flow rate (doing laundry, taking showers, etc.). Explain rationale below and indicate adjusted SSO estimate (attach a separate page if necessary):

Estimated SSO Volume: _____ gallons

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

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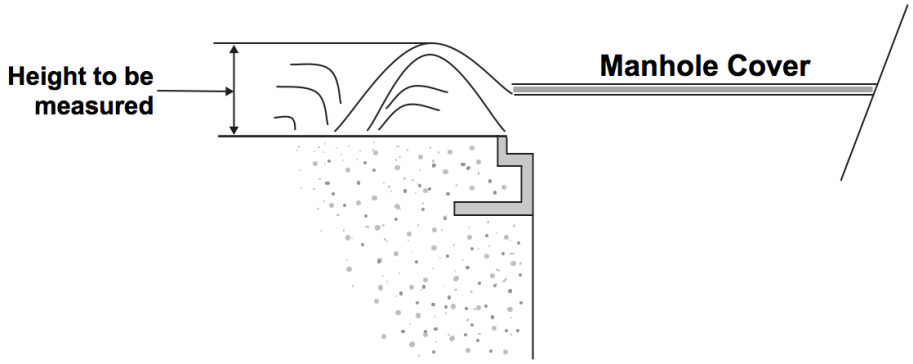
Sanitary Sewer Backup Response Packet

Volume Estimation: Flow Out of Manhole with Cover in Place

SSO Date: _____ Location: _____

STEP 1: Determine the size (nominal diameter) of the manhole cover. Check one: □ 24" Cover □ 36" Cover
Do not use this estimation method for other manhole cover sizes.

STEP 2: Measure the height of the spout above the manhole rim in inches: _____ inches
Note: Be as accurate as possible. A small difference in spout height can make a major difference in estimated SSO volume! Describe how the spout height was determined:



STEP 3: Determine the SSO Rate by referring to the table on Page 2. Use the table on the left for a 24-inch cover or the table on the right for a 36-inch cover. Find the height measured in Step 2 in the left column. Read the SSO Rate in the next column (gpm = gallons per minute).

SSO Rate = _____ gpm

STEP 4: Refer to the **Sanitary Service Report Form** to determine the duration of the SSO. Enter the duration here in minutes:

SSO Duration: _____ minutes

STEP 5: Multiply the SSO rate by the SSO duration to calculate the estimated SSO volume.

_____ gpm	X	_____ minutes	=	_____ gallons
SSO Rate		SSO Duration		**Estimated SSO Volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

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Sanitary Sewer Backup Response Packet
Volume Estimation: Flow Out of Manhole with Cover in Place

NOTE: This table is provided for general reference. The agency is strongly encouraged to develop site-specific data.

24" Cover

Height of spout above manhole rim in inches	SSO Flow Q		Min. sewer size in which these flows are possible
	in gpm	in MGD	
1/4	1	0.001	
1/2	3	0.004	
3/4	6	0.008	
1	9	0.013	
1 1/4	12	0.018	
1 1/2	16	0.024	
1 3/4	21	0.030	
2	25	0.037	
2 1/4	31	0.045	
2 1/2	38	0.054	
2 3/4	45	0.065	
3	54	0.077	
3 1/4	64	0.092	
3 1/2	75	0.107	
3 3/4	87	0.125	
4	100	0.145	
4 1/4	115	0.166	
4 1/2	131	0.189	
4 3/4	148	0.214	
5	166	0.240	
5 1/4	185	0.266	
5 1/2	204	0.294	
5 3/4	224	0.322	6"
6	244	0.352	
6 1/4	265	0.382	
6 1/2	286	0.412	
6 3/4	308	0.444	
7	331	0.476	
7 1/4	354	0.509	
7 1/2	377	0.543	
7 3/4	401	0.578	8"
8	426	0.613	
8 1/4	451	0.649	
8 1/2	476	0.686	
8 3/4	502	0.723	

36" Cover

Height of spout above manhole rim in inches	SSO Flow Q		Min. sewer size in which these flows are possible
	in gpm	in MGD	
1/4	1	0.002	
1/2	4	0.006	
3/4	8	0.012	
1	13	0.019	
1 1/4	18	0.026	
1 1/2	24	0.035	
1 3/4	31	0.044	
2	37	0.054	
2 1/4	45	0.065	
2 1/2	55	0.079	
2 3/4	66	0.095	
3	78	0.113	
3 1/4	93	0.134	
3 1/2	109	0.157	
3 3/4	127	0.183	
4	147	0.211	
4 1/4	169	0.243	
4 1/2	192	0.276	
4 3/4	217	0.312	6"
5	243	0.350	
5 1/4	270	0.389	
5 1/2	299	0.430	
5 3/4	327	0.471	
6	357	0.514	
6 1/4	387	0.558	8"
6 1/2	419	0.603	
6 3/4	451	0.649	
7	483	0.696	
7 1/4	517	0.744	
7 1/2	551	0.794	
7 3/4	587	0.845	10"
8	622	0.896	
8 1/4	659	0.949	
8 1/2	697	1.003	
8 3/4	734	1.057	
9	773	1.113	

Disclaimer:

This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

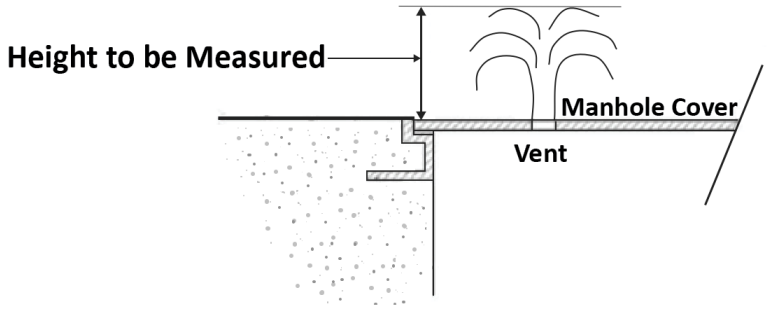
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Sanitary Sewer Backup Response Packet

Volume Estimation: Flow Out of Manhole Vent or Pick Hole

SSO Date: _____ Location: _____

STEP 1: Measure the water height flowing out of the vent or pick hole in inches: _____ inches
Note: Be as precise as possible. A small difference in spout height can make a major difference in estimated SSO volume! Describe how the spout height was determined:



STEP 2: Determine the SSO Rate by referring to the table on Page 2. Find the height measured in Step 1 in the left column. Read the SSO Rate in the next column (gpm = gallons per minute).

SSO Rate = _____ gpm

STEP 3: Refer to the **Sanitary Service Report Form** to determine the duration of the SSO. Enter the duration here in minutes:

SSO Duration: _____ minutes

STEP 4: Multiply the SSO rate by the SSO duration to calculate the estimated SSO volume.

_____ gpm	X	_____ minutes	=	_____ gallons
SSO Rate		SSO Duration		**Estimated SSO Volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

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Volume Estimation: Flow Out of Manhole Vent or Pick Hole

This table is based on a 7/8-inch diameter pick hole

NOTE: This table is provided for general reference. Use site-specific data if available.

Height of spout above manhole cover in inches	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 manhole cover in inches	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

Disclaimer:

This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

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Sanitary Sewer Backup Response Packet

CCTV Report

B-7

PLEASE COMPLETE AS THOROUGHLY AS POSSIBLE

PERSON COMPLETING THIS FORM:

DATE:
PHONE:

CAMERA TYPE:

LOCATION OF CAMERA ENTRY:

AFFECTED PROPERTY STREET ADDRESS:

LOCATION OF CAMERA STOP:

CITY, STATE AND ZIP:

DESCRIBE AREA TV'd:

PHONE

UPSTREAM MANHOLE #:

WEATHER AT TIME OF CCTV WORK:

PLEASE CHECK ALL THAT WERE DISCOVERED – *Describe Extent & Location Using Camera Entry Point As Reference*:

- ❒ Broken Main – Describe:
  Depth:
- Roots – Severity: ☐ Light ☐ Moderate ☐ Heavy
- ❒ Grease – Severity: ☐ Light ☐ Moderate ☐ Heavy
- ❒ Sag – Describe:
  Depth:
- ❒ BPD – Describe:
  Location:
- ❒ Cleanout – Describe:
  Location:
- ❒ Joint/Junction – Describe:
  Depth
- ❒ Grade – Describe:
- ❒ Grit – Severity: ☐ Light ☐ Moderate ☐ Heavy
- ❒ Other – Describe:

TIME OF OVERFLOW:

TIME BLOCKAGE RELIEVED:

TIME MAIN TV'd:

DEPTH OF MAIN:

RECOMMENDED
FOLLOW UP WORK ACTIONS:

Mark for USA location? ☐ Yes ☐ No

Main Locations Marked in Green Paint? ☐ Yes ☐ No

SIGNATURE OF EMPLOYEE PERFORMING TV WORK:

DATE

If applicable, place completed form in Sewer Backup Packet and follow routing instructions.

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Sanitary Sewer Backup Response Packet
Claims Submittal Checklist

B-8

Collection System Manager

1. **Complete the following information:**

   Title: _____

   Name: _____

   Phone: _____

   Today's Date: _____

2. **Copy the items listed below and retain originals for internal archiving purposes.**

3. **Place the copies in the Backup Response Envelope and forward to the City Risk Manager:**

   - ☐ **Form B-3: First Responder Form**
   - ☐ **Form B-4: Declination of Cleaning Services**
   - ☐ **Form B-5: Sanitary Service Report Form**
   - ☐ **Form B-6: Volume Estimation Forms**
   - ☐ **Form B-7: CCTV Report**
   - ☐ **Form B-8: Claims Submittal Checklist** *(this form)*
   - ☐ **All photos taken: Check here if digital photographs will be forwarded separately** ☐
   - ☐ **Any other information you feel is important in this claim**

4. **Go to Regulatory Notifications Packet and make all appropriate notifications.**

5. **Complete Form BP-9: Collection System Failure Analysis**

City Risk Manager

1. **Verify claims packet is complete.**
2. **Adjust and administer the claim to closure**

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Sanitary Sewer Backup Response Packet
Collection System Failure Analysis

B-9
Side A

To be completed by the Collections System Manager

Incident Report #		Prepared By	
SSO/Backup Information			
Event Date/Time	Address		
Volume Spilled	Volume Recovered		
Cause			
Summary of Historical SSOs/Backups/Service Calls/Other Problems			
Date	Cause	Date Last Cleaned	Crew
Records Reviewed By:		Record Review Date:	
Summary of CCTV Information			
CCTV Inspection Date		Tape Name/Number	
CCTV Tape Reviewed By		CCTV Review Date	
Observations			

Go to Side B

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Sanitary Sewer Backup Response Packet
Collection System Failure Analysis

B-9
Side B

Recommendations					
✓	Type	Specific Actions	Who is Responsible?	Completion Deadline	Who Will Verify Completion?
	No Changes or Repairs Required	n/a	n/a	n/a	n/a
	Repair(s)				
	Construction				
	Capital Improvement(s)				
	Change(s) to Maintenance Procedures				
	Change(s) to Overflow Response Procedures				
	Training				
	Misc.				
Comments/Notes:					
Review Date:					

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Customer Service Packet

Contents:

Form	Form Number
Customer Information Letter	CS-1
Claim Form	-2
Sewer Spill Reference Guide	pamphlet

Instructions:

1. Review the Customer Information letter to determine actions that need to be taken immediately.
2. See the Customer Information letter for information about filing a claim.
3. Review the Sewer Spill Reference Guide pamphlet.

If you have any questions contact:

Regarding Sewer Issues:
Collections System Manager at (510) 412-2001

Regarding Submitting a Claim for Damages:
City Risk Manager at (510) 620-6605

This packet provided by: _____ **Phone:** _____

Print on 6” x 9” envelope

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Sanitary Sewer Backup Response Packet

Customer Information Regarding Sewer Backup Claims

CS-1

Dear Resident:

We recognize that sewer back flow incidents can be stressful and require immediate response when all facts concerning how an incident occurred are unknown. Rest assured that we do all we can to prevent this type of event from occurring. Nevertheless, occasionally tree roots or other debris in the sewer lines cause a backup into homes immediately upstream of the blockage. At this time Veolia Water North America – City of Richmond is investigating the cause of this incident.

If the City is found to be responsible for the incident, we are committed to cleaning and restoring your property, and to protecting the health of those affected during the remediation process.

The cleaning contractor provided by the City has been selected because of their adherence to established protocols that are designed to assure all parties thorough, cost-effective and expeditious cleaning services. You also have the right to select your own cleaning contractor, but the City does not guarantee payment of fees/expenses incurred and reserves the right to dispute fees/expenses deemed not usual and customary.

If you wish to discuss this matter, please contact the Collections System Manager at (510) 412-2001. If you wish to submit a claim for damages, please contact the City Risk Manager (510) 620-6605 for instructions on how to obtain a City Claim Form and to receive instructions on claims filing procedures. Completed Claims Forms are to be submitted to the City Clerk at 450 Civic Center Plaza, 3rd Floor, Richmond, CA 94804.

What you need to do now:

The City has prepared this brief set of instructions to help you minimize the impact of the loss by responding promptly to the situation.

- Do not attempt to clean the area yourself; let the cleaning and restoration company handle this.
- Keep people and pets away from the affected area(s).
- Turn off all appliances that use water.
- Turn off heating/air conditioning systems.
- Do not remove items from the area – the cleaning and restoration company will handle this.
- If you had recent plumbing work, contact your plumber or contractor and inform them of this incident.
- If you intend to file a claim, do so as soon as practical in order to have your claim considered.
    - **Please Note:** The general provisions for the filing of claims against public entities are contained in Part 3 (*commencing at Section 900)* of Division 3.6 of the Government code. Certain claims are not governed by these provisions, including tax and assessment matters, liens, employee compensations, workers' compensation, unemployment compensation, welfare, securities, and others.
    - The form and contents of a claim are specified by Section 910, et seq. A claim relating to a cause of action for death or for injury to person or to personal property or growing crops shall be presented not later than six months after accrual of the cause of action; other claims shall be presented within one year (*Section 911.2).*
    - Claims are to be presented by delivery or mailing to City Clerk at 450 Civic Center Plaza, 3rd Floor, Richmond, CA 94804 *(Section 915).*
    - It is suggested that the claimant refer to claims law and be fully advised with respect to the exceptions and further provisions contained therein.

Important Legal Notice: For your protection, read carefully, obtain a reliable translation, and/or consult your attorney.

Noticia Legal Importante: Para su proteccion lea usted con cuidado debe de obtener una translacion que sea punctual y de confianza o consulte con su abogado.

Send Claim Forms To:
CITY CLERK
450 Civic Center Plaza, 3rd Floor
Richmond, CA 94804
(510) 620-6514

INSTRUCTIONS FOR FILING A CLAIM AGAINST THE CITY OF RICHMOND

Information on your claim:

1. To ensure proper processing of your claim, complete each item on the liability claim form. Failure to do so may result in the rejection of your claim.
2. Once your claim is received, it will be forwarded to the City's Risk Manager for review and then referred to the City's contract Claims Administrator for the purpose of investigating the claim.
3. You will be sent a letter acknowledging receipt of your claim from the Claims Administrator within two weeks from receipt of your claim.
4. Once the investigation into your claim has been completed, you will be notified in writing whether the claim has been accepted or rejected along with further instructions.
5. If you have any questions about completing this form or the claims process please contact the Human Resources Department at (510) 620-6810.
6. Presentation for allowance or payment of a false or fraudulent claim, with intent to defraud, is a crime punishable as a felony under California Penal Code, Section 72, and the Insurance Code, Section 1871.1.

Completing the form:

Please type or print clearly with a ball-point pen all of the information requested on the claim form. The following provides specific instructions for completing each section of the claim form.

1. **Name, Mailing Address, Telephone Numbers-** State the full name, mailing address, and telephone numbers claiming damage or injury. If there is a different address to which notices from the City are to be directed, please also note that address.
2. **Where Did the Damage or Injury Occur?** Include the street address, intersection or other location where the damage/injury allegedly occurred.
3. **When Did the Damage or Injury Occur?** State the exact month, day, year, and approximate time of the incident, which caused the alleged damage/injury.
   Under State Law, claims relating to causes of action for personal injury, wrongful death, property damage, and crop damage must be presented to the City Clerk no later than six months after the incident date. Please note that evidence of "presentation" includes a clear postmark date on an envelope or a certification of personal service.
   When filing a claim beyond a six month period, you must explain the reason why the claim was not filed within the six month period. The explanation is called an "application for leave to present a late claim." In considering your claim, the City will first decide whether the late claim application should be granted or denied. (See Government Code Section 911.4 for the legally acceptable reasons a claim may be filed late). Only if the late claim application is granted will the City then consider the merits of the claim. Claims relating to any cause of action other than personal injury, wrongful death, property damage, and crop damage must be presented no later than one year after the incident date.
4. **Circumstances that led to claim-** Provide in full detail a description of the damage/injury that allegedly resulted from the incident. State all of the facts which support your claim against the City of Richmond. If applicable, please also include employee(s) names that allegedly caused the damage or injury.
5. **What Damage Occurred?** - Provide in full detail a description of the damage/injury that allegedly resulted from the incident.
6. **Dollar Amount of Claim-** State the total amount you are claiming as a result of the alleged damage/injury. If damage/injury is continuing or anticipated in the future, indicate with a "+" following the dollar figure. Provide a breakdown of how the total amount that you are claiming was computed. You may declare expenses incurred and/or future, anticipated expenses. If available, please attach copies of all bills, payment receipts, and cost estimates.
7. **Names and Addresses of Any Witnesses to the Occurrence-** Provide names of witnesses to the actual occurrence of the claim.
8. **Date of Birth-** Provide the date of birth of the person asserting the claim.
9. **Names, Addresses, and Telephone Numbers of Doctors or Hospitals-** Please provide names of doctors or hospitals having knowledge relevant to the claim.
10. **Signature-** The claim shall be signed by the claimant or by attorney/representative of the claimant. The City Clerk will not accept the claim without proper signature. Government Code Section 910.2 provides: "The claim shall be signed by the claimant or by some person on his or her behalf."

CLEAR FORM

PRINT & SIGN

Stamp of receipt:

City Clerk/Deputy Clerk

CS-2
Page 2

Before completing this form, please read the instructions on the back of this form. You may make copies for your records, and submit all original copies to the City Clerk. Claimants are responsible for making their own copies. City Clerk's Office will not provide photocopies. You must complete each section of this form or your claim may be returned to you as insufficient. A claim must be presented, as prescribed by Government Code Section 910, by the claimant or a person acting on his/her behalf and shall show the following:

1. Name and mailing address of claimant(s)

_____ _____

Name Phone Number(s)

_____ _____ _____ _____

Mailing Address City State Zip

Address to which notices from the City are to be directed (if different than above):

Name:_____

Address:_____

2. Where did the damage or injury occur? (Please include street address and intersection if applicable)

_____

3. When did the damage or injury occur?

_____

Month Day Year Time

4. Please explain the circumstances that led to the alleged damage or injury, state all the facts which support your claim against the City of Richmond. If known, identify the name of the employee(s) that allegedly caused the damage or injury. _____

_____

_____

_____

_____

_____

5. What specific damage or injury do you claim resulted from the alleged action?_____

_____

_____

_____

_____

6. If amount claimed totals less than $10,000: The amount claimed, if less than ten thousand dollars ($10,000) as of the date of presentation of the claim, including the estimated amount of any prospective injury, damage, or loss, insofar as it may be known at the time of the presentation of the claim, together with the basis of computation of the amount claimed. Amount Claimed and basis for computation: _____

_____

_____

If amount claimed exceeds $10,000: If the amount claimed exceeds ten thousand ($10,000), a dollar amount is not required to be stated. However, please indicate whether the claim would be a limited civil case. A limited civil case is one where the recovery sought, exclusive of attorney fees, interest and court costs do not exceed $25,000. An unlimited civil case is one in which the recovery sought is more than $25,000. (See CCP Section 86.)

☐ Limited Civil Case $_____ ☐ Unlimited Civil Case $_____

You are required to provide the information requested above in order to comply with Government Code Section 910. Additionally, in order to conduct a timely investigation and possible resolution of your claim, the City of Richmond requests that you answer the following questions:

7. Name, address, and telephone number of any witnesses to the occurrence or transaction which gave rise to the claim asserted:

_____

_____

8. Claimants(s) Date of Birth: _____

9. If the claim involves medical treatment for a claimed injury, please provide the name, address and telephone number of any doctors or hospitals providing treatment. _____

_____

_____

10. Signature of Claimant: _____ **Date:** _____

I declare under penalty of perjury that the foregoing is true and correct, and I understand that presentation of a false or fraudulent claim, with intent to defraud, is a crime punishable as a felony under California Penal Code, Section 72, and Insurance Code, Section 1871.1.

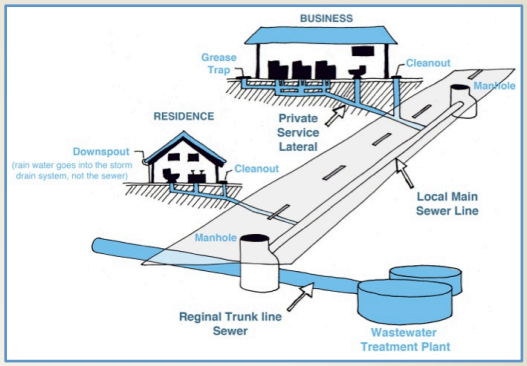
Before completing this form, please refer to the instructions on the back.

PRINT & SIGN

Revised on 01/11/2012

How a Sewer System Works

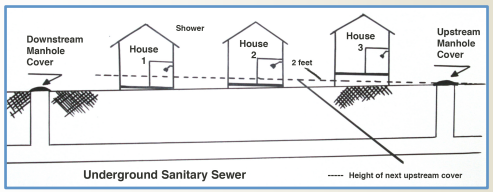
A property owner's sewer pipes are called ***service laterals*** and are connected to larger local main and regional trunk lines.
Service laterals run from the connection at the home to the connection with the public sewer. These laterals are the responsibility of the property owner and must be maintained by the property owner.



Is my home required to have a backflow prevention device?

Section 710.1 of the Uniform Plumbing Code (U.P.C.) states: *"Drainage piping serving fixtures which have flood level rims located below the elevation of the next upstream manhole cover or private sewer serving such drainage piping* ***shall*** *be protected from backflow of sewage by installing an approved type of backwater valve."* The intent of Section 710.1 is to protect the building interior from mainline sewer overflows or surcharges.

Additionally, U.P.C. 710.6 states: *"Backwater valves* ***shall*** *be located where they will be accessible for inspection and repair at all times and, unless continuously exposed, shall be enclosed in a masonry pit fitted with an adequately sized removable cover."*



If you have a sewage spill from your private sewer line that impacts storm drains, waterways or public property, contact:

Veolia Water North America – City of Richmond
(510) 412-2001

Contra Costa County Environmental Health
(925) 692-2500

California Health and Safety Code, Sections 5410-5416 requires:

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution, or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
  - Must immediately notify the local health agency of the discharge.
  - Shall reimburse the local health agency for services that protect the public's health and safety.
  - Who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between $500–$1,000) and/or imprisonment for less than one year.

San Francisco Regional Water Quality Control Board
(510) 622-2300

Requires the prevention, mitigation, response to, and reporting of sewage spills.

California Governor's Office of Emergency Services (CalOES)
(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271 & California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260 require:

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters shall immediately notify the Office of Emergency Services.
- Any person who fails to provide the notice required by this section is guilty of a misdemeanor and shall be punished by a fine (less than $20,000) and/or imprisonment for not more than one year.

Sewer Spill Reference Guide

Your Responsibilities as a Private Property Owner

Provided to you by:

Veolia Water North America
City of Richmond

601 Canal Street
Richmond, CA 94804
(510) 412-2001

www.ci.richmond.ca.us

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How do sewage spills happen?

Sewage spills occur when the wastewater in underground pipes overflows through a manhole, cleanout, or broken pipe. Most spills are relatively small and can be stopped and cleaned up quickly, but left unattended they can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways, and beaches.

CAUTION!

When trying to locate a sewer problem, never open manholes or other public sewer structures. Only our crews are allowed to open & inspect these structures.

Common causes of sewage spills

- Grease build-up
- Tree roots
- Broken/cracked pipes
- Missing or broken cleanout caps
- Undersized sewers
- Groundwater/rainwater entering the sewer system through pipe defects and illegal connections

Prevent most sewage backups with a Backflow Prevention Device

This type of device can help prevent sewage backups into homes and businesses. If you don't already have a Backflow Prevention Device, contact a professional plumber or contractor to install one as soon as possible.

Protect the environment!

If you let sewage from your property discharge to a gutter or storm drain, you may be subject to penalties and/or out-of-pocket costs for clean-up and enforcement efforts. A property owner may be charged for costs incurred by agencies responding to spills from private properties.

What to look for:

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas. Look for:

- Drain backups inside the building.
- Wet ground and/or water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains
- Unusual odorous wet areas: sidewalks, external walls, ground/landscape around a building.

The following are indicators of a possible obstruction in your sewer line:

- Water comes up in floor drains, showers or toilets.
- Toilets, showers or floor drains below ground level drain very slowly.

What to do if there is a spill:

Immediately notify Veolia Water – City of Richmond. Our crews locate the blockage and determine if it is in the public sewer. If it is, the crew removes the blockage and arranges for cleanup.

If the backup is in your private internal plumbing or in the private service laterals, you are required to immediately:

- Control and minimize the spill by shutting off or not using the water
- Keep sewage out of the storm drain system using sandbags, dirt and/or plastic sheeting
- Call a plumbing professional to clear blockages and make repairs as needed. Look in the yellow pages under "Plumbing Drain & Sewer Cleaning" or "Plumbing Contractors."
- Always notify your sewer/public works department or public sewer district of sewage spills.

Spill cleanup inside the home:

For large clean ups, a professional cleaning firm should be contacted to clean up impacted areas, You can locate local firms by looking in the Yellow Pages under "Water Damage" or "Fire Damage." If you hire a contractor, it is recommended to get estimates from more than one company. Sometimes, homeowner's insurance will pay for the necessary cleaning due to sewer backups. Not all policies have this coverage, so check with your agent.

If you decide to clean up a small spill inside your home, protect yourself from contamination by observing the following safety measures. Those persons whose resistance to infection is compromised should not attempt this type of clean up.

Other Tips:

- Keep children and pets out of the affected area until cleanup has been completed.
- Turn off heating/air conditioning systems
- Wear rubber boots, rubber gloves, and goggles during cleanup of the affected area.
- Discard items that cannot be washed and disinfected (such as: mattresses, rugs, cosmetics, baby toys, etc.)
- Remove and discard drywall and insulation that has been contaminated with sewage or flood waters.
- Thoroughly clean all hard surfaces (such as flooring, concrete, molding, wood and metal furniture, countertops, appliances, sinks and other plumbing fixtures) with hot water and laundry or dish detergent.
- Help the drying process with fans, air conditioning units, and dehumidifiers.
- After completing cleanup, wash your hands with soap and water. Use water that has been boiled for 1 minute (allow the water to cool before washing your hands) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.
- Wash clothes worn during cleanup in hot water and detergent (wash apart from uncontaminated clothes).
- Wash clothes contaminated with sewage in hot water and detergent. Consider using a Laundromat until your onsite wastewater system has been professionally inspected and serviced.
- Seek immediate attention if you become injured or ill.

Spill cleanup outside the home:

- Keep children and pets out of the affected area until cleanup has been completed.
- Wear rubber boots, rubber gloves, and goggles during cleanup of affected area.
- Clean up sewage solids (fecal material) and place in properly functioning toilet or double bag and place in garbage container.
- On hard surfaces areas such as asphalt or concrete, it is safe to use a 2% bleach solutions, or ½ cup of bleach to 5 gallons of water, but don't allow it to reach a storm drain as the bleach can harm the environment.
- After cleanup, wash hands with soap and water. Use water that has been boiled for 1 minute (allow to cool before washing your hands) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.
- Wash clothes worn during cleanup in hot water and detergent (wash apart from uncontaminated clothes).
- Wash clothes contaminated with sewage in hot water and detergent. Consider using a Laundromat until your onsite wastewater system has been professionally inspected and serviced.
- Seek immediate attention if you become injured/ill.

Veolia Water – City of Richmond

On (date) _____, at (location)

_____,
we responded to a reported blockage of the sanitary sewer service to your property.

We discovered a blockage in:

- ☐ The sanitary sewer main and cleared the line
- ☐ The City-maintained portion of your sanitary sewer lateral and cleared the line.
- ☐ Your portion of the sanitary sewer lateral, which is your responsibility to maintain. We also found the City's portion of the lateral and the main to be flowing normally.

If you require assistance to clear your portion of the lateral you can look in the Yellow Pages of your telephone book under "Sewer Contractors" or "Plumbing Drains & Sewer Cleaning". If you plan to hire a contractor we recommend getting estimates from more than one company.

Veolia Water – City of Richmond representative:

_____

Notes: _____

_____

_____

For questions or comments, please call:

Veolia Water – City of Richmond
(510) 412-2001

Veolia Water – City of Richmond

On (date) _____, at (location)

_____,
we responded to a reported blockage of the sanitary sewer service to your property.

We discovered a blockage in:

- ☐ The sanitary sewer main and cleared the line
- ☐ The City-maintained portion of your sanitary sewer lateral and cleared the line.
- ☐ Your portion of the sanitary sewer lateral, which is your responsibility to maintain. We also found the City's portion of the lateral and the main to be flowing normally.

If you require assistance to clear your portion of the lateral you can look in the Yellow Pages of your telephone book under "Sewer Contractors" or "Plumbing Drains & Sewer Cleaning". If you plan to hire a contractor we recommend getting estimates from more than one company.

Veolia Water – City of Richmond representative:

_____

Notes: _____

_____

_____

For questions or comments, please call:

Veolia Water – City of Richmond
(510) 412-2001

Appendix C

SANITARY SEWER OVERFLOW RESPONSE PACKET

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Sanitary Sewer Overflow Response Packet
Table of Contents

Form	Form Number
Instructions and Chain of Custody	envelope label
Responding to a Sanitary Sewer Overflow	C-1
Sanitary Service Report Form	-2
Volume Estimation Forms	-3a, -3b, -3c, -3d, -3e, -3f, -3g
CCTV Report	-4
Collection System Failure Analysis Report	-5
Regulatory Notifications Packet	
Instructions	envelope
Regulatory Reporting Guide	A-1
Category 1 SSO Reporting Checklist	-2a
Category 2 & 3 SSO Reporting Checklist	-2b
RWQCB Notification Fax	-3
Public Posting	n/a
Door Hanger	n/a
Pamphlet	n/a

For pre-assembled packets contact DKF Solutions Group at (707) 373-9709 or kpatzer@dkfsolutions.com

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In the event of a **Sanitary Sewer Overflow**
READ THIS FIRST

- **If this is a Category 1 SSO greater than or equal to 1,000 gallons:** Contact the Collections System Field Supervisor at (510) 542-3247 or the Collections System Manager at (510) 426-0008 to make the 2-hour notification to CalOES at (800) 852-7550
- For any media requests: Public Information Officer (510) 620-5486
- For processing of water samples: CalTest Laboratory (888) 258-8378
- Check here if you believe that fats, oils and/grease (FOG) caused or contributed to the SSO: ☐
- Check here if you believe that tree roots caused or contributed to the SSO: ☐

Instructions



Collections System Field Crew:

- ❑ Follow the instructions on the Sewer Overflow Response Flowchart (C-1).
- ❑ Refer to the Field Guide as necessary.
- ❑ Place completed forms in this envelope, complete the Chain of Custody record (right) and forward this packet to the Collection System Manager.

Print Name: _____

Initial: _____

Date: _____

Time: _____

Collections System Manager:

- ❑ Review the enclosed forms.
- ❑ Complete the Regulatory Notifications Packet.
- ❑ Archive this packet and all other information regarding this overflow incident according to City policy.
- ❑ Debrief using the Collection System Failure Analysis Form.

Print Name: _____

Initial: _____

Date: _____

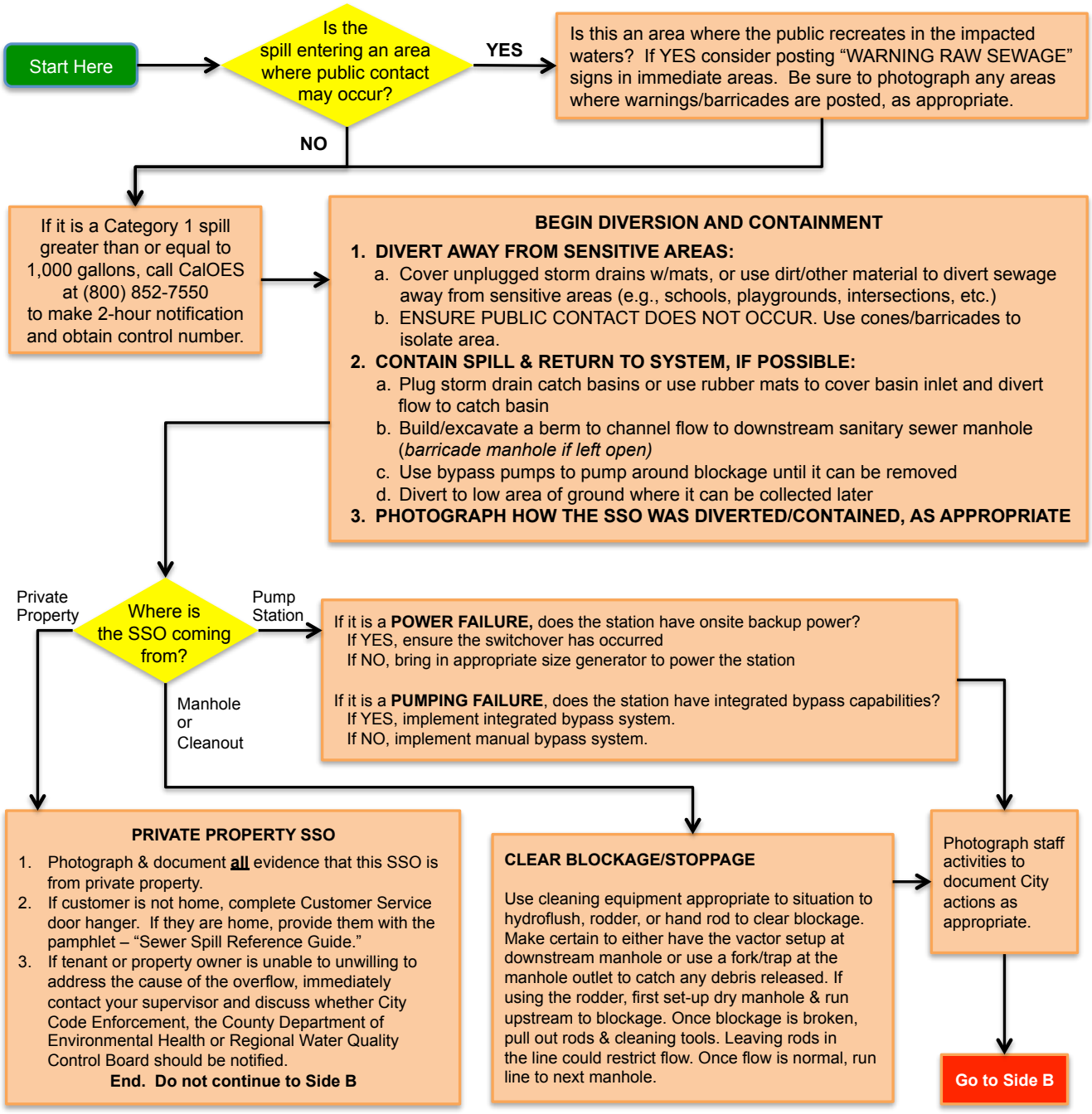
Time: _____

Veolia Water North America – City of Richmond Overflow Emergency Response Plan: Sanitary Sewer Overflow Packet

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Sanitary Sewer Overflow Response Packet
Overflow Response Flowchart

C-1
Side A



MEDIA AND PUBLIC RELATIONS GUIDELINES:

Exercise caution in contacts with the public or media when you respond to a spill. Any information you provide or statements you make may become pertinent in the event of possible court action, it is important to **AVOID THE FOLLOWING**:

- Giving out the wrong information including providing incorrect facts about a company or other agency
- Making accusations against customers, businesses or other agencies
- Speculating about the situation you are responding to

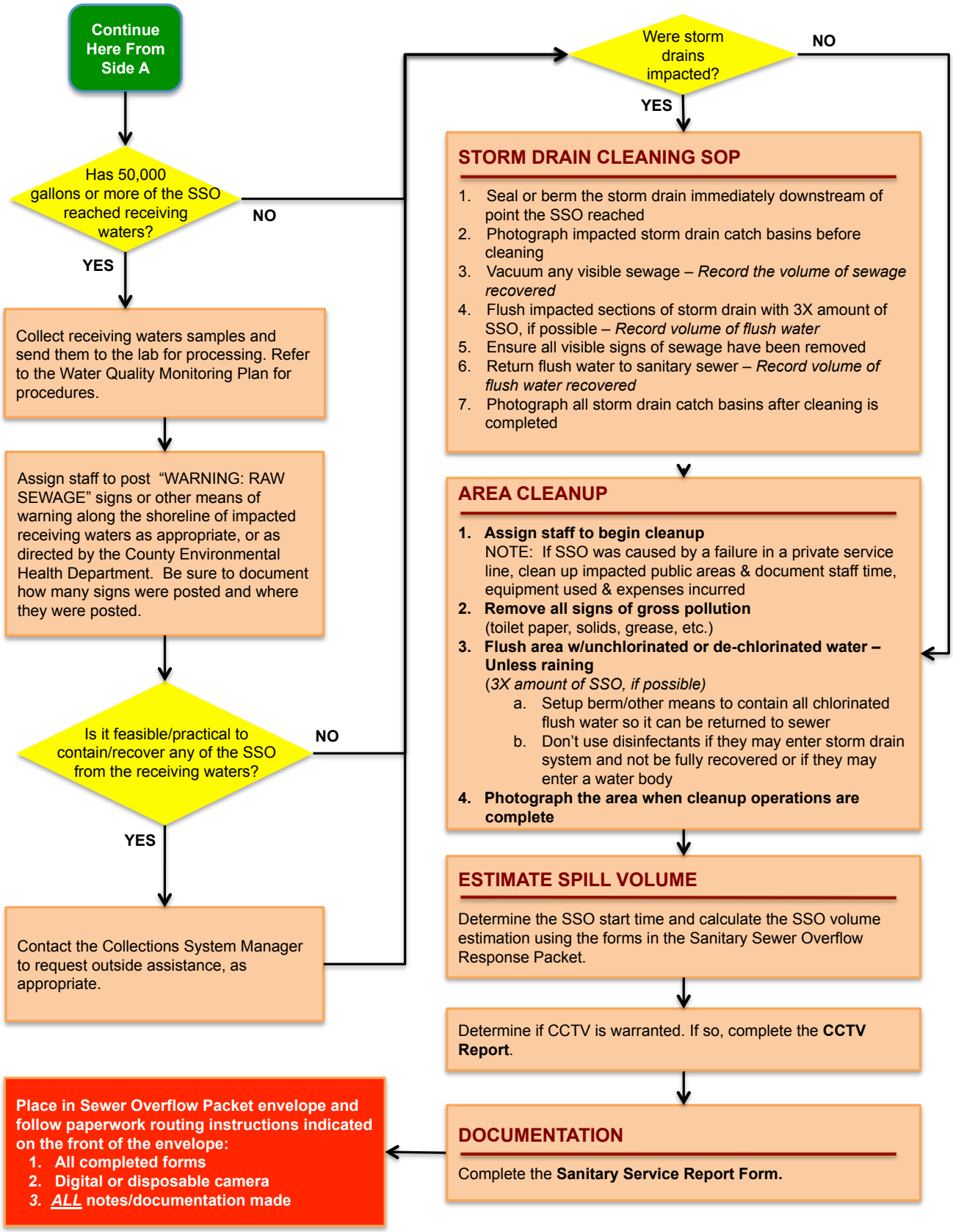
Be courteous and attempt to provide accurate information to questions within the limits above. In some cases, it may be appropriate to say that we do not have any information, or to delay answering a question and then to say when an answer might be available.

In most cases, refer media requests to the media coordinator indicated on the front of the Sewer Overflow Packet envelope.

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Sanitary Sewer Overflow Response Packet
Overflow Response Flowchart

C-1
Side B



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VEOLIA WATER

Sanitary Service Report Form

C-2

City of Richmond

☐ SSO ☐ Surface Overflow ☐ In a Structure | ☐ Non-SSO

1. Call Taken By: MARIE GRACE HERNANDEZ Date: _____ Time: _____

Resident Name: _____ Telephone: _____

Address: _____ Cross-Street: _____

2. Caller/Complaint Details: _____

_____

_____

Veolia Observation: ☐ Confirmed ☐ Not Confirmed Comments: _____

3. Field Observations: ☐ Blockage in Main ☐ No Blockage in Main ☐ Blockage in Lateral

☐ Debris in Main ☐ Gravel or Rocks ☐ Grease (IPP) ☐ Industrial Waste ☐ Overflow in MH

☐ Odor ☐ Roots in Main ☐ Soft Stoppage ☐ Overflow Lateral ☐ Overflow in Home

4. Referral to Other Department/Agency for Follow-up: ☐ EBMUD ☐ IPP

☐ Building Regulations (BR) ☐ City Public Works Inspector (PW) ☐ County Health ☐ Risk Managment (RM)

☐ Stege Sanitary District ☐ West County (WCCSD)

Person Contacted: _____ Date: _____ Time: _____

5. Spill Details: Spill Amount: ☐ None ☐ Greater than 0, Less than 1,000 gal ☐ Greater than or equal to 1000 gal

Entered Stormdrain or Waterway? ☐ YES ☐ NO Lateral? ☐ YES ☐ NO

On the Ground? ☐ YES ☐ NO Mainline MH? ☐ YES ☐ NO

In or Under Structure? ☐ YES ☐ NO

Est. Discharge Start Date: _____ Start Time: _____ End Time: _____ Total Gal: _____

*If spill is greater than 1000 gallons, notify OES @ 1-800-852-7550. OES Report #: _____

Vol. Contained (gal): _____ Vol. Uncontained not in StateWaters (gal): _____

Vol. that Reached StateWaters (gal): _____ Weather Type: ☐ Dry ☐ Heavy Rain ☐ Light Rain

6. Pipe Information: *Line Segment:* Up Manhole # _____ Down Manhole # _____

Feet Cleared: _____ Feet to Blockage: _____ Feet ran for Preventive Maintenance Credit: _____

7. Status: Recommended Action: ☐ CCTV ☐ Clean ☐ Follow-up Inspection

Follow-up Priority: ☐ Emergency ☐ High ☐ Low

Caller Notifty Date: _____ Caller Notifty Time: _____ Notifty By: _____

8. Supervisor Action: Supervisor Review: _____ Review Date: _____

☐ Action Taken: WO# _____ ☐ No Action Taken

9. Personnel: Operator Name: A) _____ B) _____ Hours: A) _____ B) _____

10. Vehicle: Truck Number: _____ Hours: _____

Sanitary Sewer Overflow Response Packet

Volume Estimation: Eyeball Estimation Method

C-3a

Use this method only for small SSOs of less than 200 gallons.

SSO Date: _____ Location: _____

STEP 1: Position yourself so that you have a vantage point where you can see the entire SSO.

STEP 2: Imagine one or more buckets or barrels of water tipped over. Depending on the size of the SSO, select a bucket or barrel size as a frame of reference. It may be necessary to use more than one bucket/barrel size.

STEP 3: Estimate how many of each size bucket or barrel it would take to make an equivalent spill. Enter those numbers in Column A of the row in the table below that corresponds to the bucket/barrel sizes you are using as a frame of reference.

STEP 4: Multiply the number in Column A by the multiplier in Column B. Enter the result in Column C.

	A	B	C
Size of bucket(s) or barrel(s)	**How many of this size?**	**Multiplier**	**Estimated SSO Volume (gallons)**
1 gallon water jug		x 1 gallons	
5 gallon bucket		x 5 gallons	
32 gallon trash can		x 32 gallons	
55 gallon drum		x 55 gallons	
Other: _____ gallons		x _____ gallons	
Estimated Total SSO Volume:			

STEP 5: Is rainfall a factor in the spill? ☐ Yes ☐ No

If yes, what volume of the observed spill volume do you estimate is rainfall? _____ gallons

If yes, describe how you determined the amount of rainfall in the observed spill?

STEP 6: Calculate the estimated SSO volume by subtracting the rainfall from the SSO volume:

_____ gallons – _____ gallons = _____ gallons

Estimated SSO Volume – Rainfall = **Total Estimated SSO Volume**

This worksheet completed by:

Name: _____ Signature: _____

Job Title: _____ Date: _____

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Sanitary Sewer Overflow Response Packet

Volume Estimation: Duration and Flow Rate Comparison Method

SSO Date: _____ Location: _____

STEP 1: Compare the SSO to reference images on Page 2 to estimate flow rate of the current overflow. Describe which reference photo(s) were used and any additional factors that influenced applying the reference photo data to the actual SSO:

Flow Rate Based on Photo Comparison: _____gallons per minute (gpm)

STEP 2: Refer to the **Sanitary Service Report Form** to determine the duration of the SSO. Enter the duration here in minutes:

SSO Duration: _____minutes

STEP 3: Multiply the flow rate by the SSO duration to calculate the estimated SSO volume.

_____gpm	X	_____minutes	=	_____gallons
Flow Rate		SSO Duration		Estimated SSO Volume

STEP 4: Did the SSO occur during a period of consistent flow in this portion of the system? □Yes □ No

If no, explain how, based on this portion of the collection system and its users, you believe it may have impacted the estimated SSO volume:

By what percentage are you adjusting the estimation? □ increase □ decrease _____%

Translate the percentage into gallons: _____gallons

STEP 5: Calculate the adjusted SSO volume estimate:

_____gallons	+ or -	_____gallons	=	_____gallons
Estimated SSO Volume		Adjustment		**Estimated SSO volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

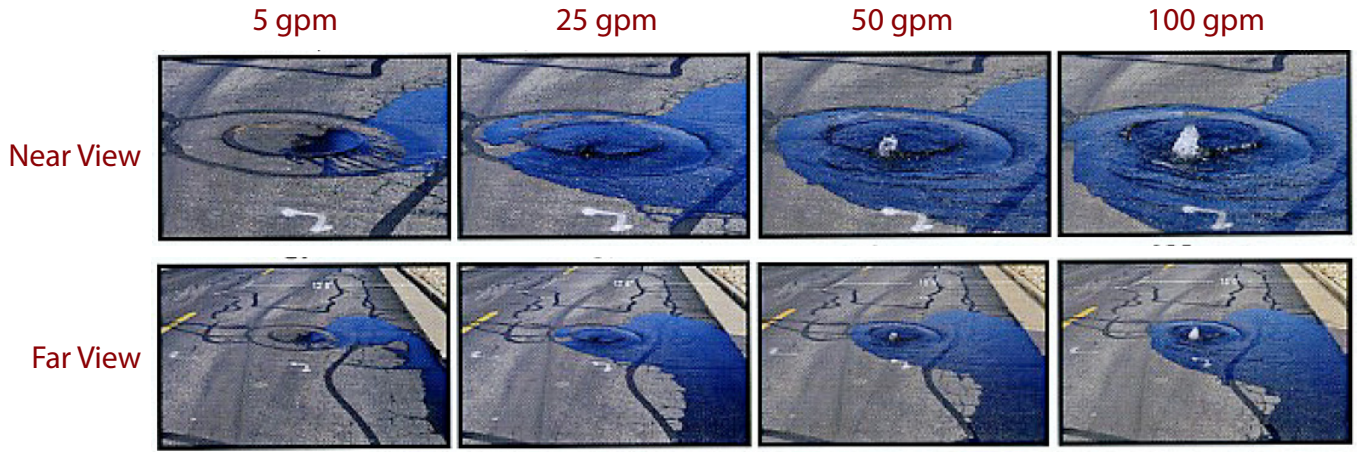
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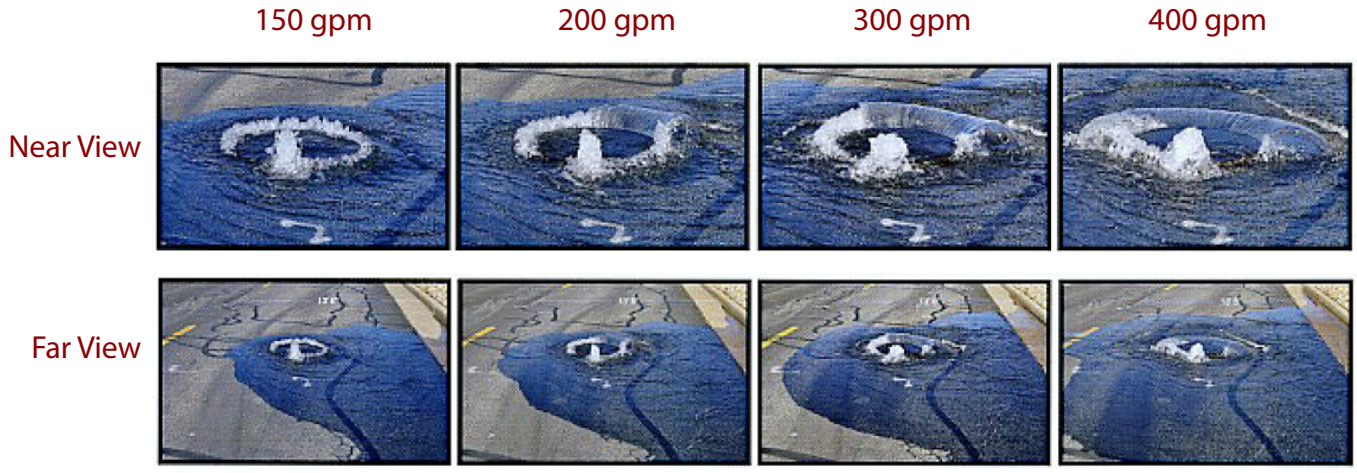
IMPORTANT NOTE:

These photographs are provided as examples only and will change with many factors.

SSCSC Manhole Overflow Gauge

CWEA Southern Section Collections Systems Committee
Overflow Simulation courtesy of Eastern Municipal Water District





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Sanitary Sewer Overflow Response Packet

Volume Estimation: Area/Volume Estimation Method

Note: Refer to Page 3 for computation formulas and guides

SSO Date: _____ Location: _____

STEP 1: Describe SSO area surface: □Asphalt □Concrete □Dirt □Landscape □Inside Building
□ Other: _____

STEP 2: Draw/sketch the outline (footprint) of the SSO. Then break the footprint down into recognizable shapes. Refer to the example on Page 3.

STEP 3: Calculate the area of the footprint by completing the table below for each shape in Step 2. If two shapes overlap, select one of the two shapes and estimate the percentage of that shape that does not overlap. Enter that percentage in the % Not Overlapping column. This will ensure that the overlap area is only counted once. Refer to the example on Page 3.

Rectangles	Length	X	Width	X	% Not Overlapping*	=	Area
	ft	X	ft	X	%	=	ft^2
	ft	X	ft	X	%	=	ft^2
	ft	X	ft	X	%	=	ft^2

Triangles	Base	X	Height	Multiplier	X	% Not Overlapping*	=	Area
	ft	X	ft	÷ 2	X	%	=	ft^2
	ft	X	ft	÷ 2	X	%	=	ft^2
	ft	X	ft	÷ 2	X	%	=	ft^2

Circles	π	X	Radius	X	Radius	X	% Not Overlapping*	=	Area
	3.14	X	ft	X	ft	X	%	=	ft^2
	3.14	X	ft	X	ft	X	%	=	ft^2
	3.14	X	ft	X	ft	X	%	=	ft^2

Total SSO Area (sum of all three tables above): _____ ft^2

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STEP 4: Calculate the volume of the SSO that **was NOT absorbed** into the ground. If the entire SSO was absorbed, skip to Step 5.

a. If SSO is of varying depths, take several measurements at different depths and find the average.

_____ inches ÷ _____ = _____ inches ÷ 12 = _____ feet
sum of measurements | # of measurements | average depth in inches | average depth in feet of ponded sewage

b. Calculate SSO volume of ponded sewage in cubic feet by multiplying the Total SSO Area in Step 3 by the average depth calculated in Step 4a. Convert from cubic feet to gallons by multiplying by 7.48.

_____ ft^2 x _____ ft = _____ ft^3 x 7.48 gal = _____ gallons
SSO area (Step 3) | average depth (Step 4a) cubic feet | SSO volume in ponded sewage | estimated volume of

STEP 5: Calculate the volume of the SSO that **was absorbed** into the ground. If only a wet stain is observed, use the guidelines on C-3c Page 3 for the average depth. When estimating the volume that was absorbed, take into consideration:

- How long the sewage has been sitting
- The air temperature on the day of the SSO
- Soil type for the area (e.g., hard-packed clay vs. loose or gravely soil)

When estimating the volume of the SSO that was absorbed into the ground, it is also advisable to dig down far enough to reach dry soil and take the depth of the wet soil into consideration.

Estimated volume that was absorbed into the soil: _____ gallons
Explain how this estimation was determined:

STEP 6: Add the volume not absorbed (Step 4) plus the volume absorbed (Step 5) to get the total estimated volume:

_____ gallons + _____ gallons = _____ gallons
volume not absorbed | volume absorbed | **Total Estimated SSO Volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

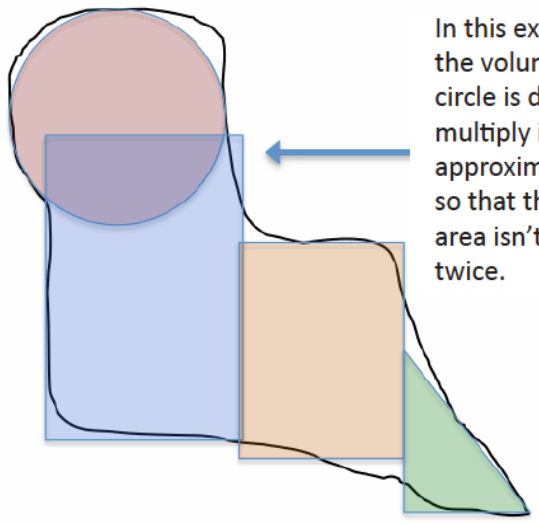
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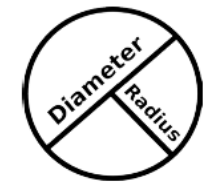
Miscellaneous Computations

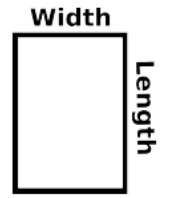
To convert inches to feet	Divide the inches by 12 or use the chart on the bottom right of this page.
Volume of one cubic foot	7.48 gallons of water
Area: Two-dimensional measurement represented in square feet	Square/rectangle: Area = Length x Width Circle: Area = πr^2 (where $\pi \approx 3.14$ and r = radius = ½ diameter) Triangle: Area = ½ (Base x Height)
Volume: Three-dimensional measurement represented in cubic feet	Rectangle/square footprint: Volume = Length x Width x Depth Circle footprint (cylinder): Volume = πr^2 x Depth (where $\pi \approx 3.14$ and r = radius = ½ diameter) Triangle footprint: Volume = ½ (Base x Height) x Depth
Depth: Contained or "Ponded" sewage	Measure actual depth of standing sewage whenever possible. When depth varies, measure several representative sample points and determine the average. Add the depth of the sample points and then divide that total by the number of sample points. If the depth is not measurable because it is only a wet stain, consider using the following estimated depths: • Depth of a wet stain on concrete surface: 0.0026' (1/32") • Depth of a wet stain on asphalt surface: 0.0013' (1/64")

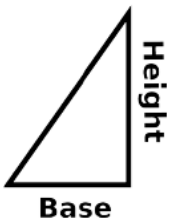
Example of how to draw/sketch the outline (footprint) of the spill for Step 2:

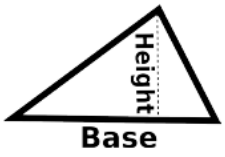
1. Sketch the outline of the spill (black line).
2. Break the sketch down into recognizable shapes (circles, squares, etc.) as well as you can.











Convert Inches to Feet	
Inches	Feet
1/8"	0.01'
1/4"	0.02'
3/8"	0.03'
1/2"	0.04'
5/8"	0.05'
3/4"	0.06'
7/8"	0.07'
1"	0.08'
2"	0.17'
3"	0.25'
4"	0.33'
5"	0.42'
6"	0.50'
7"	0.58'
8"	0.67'
9"	0.75'
10"	0.83'
11"	0.92'
12"	1.00'

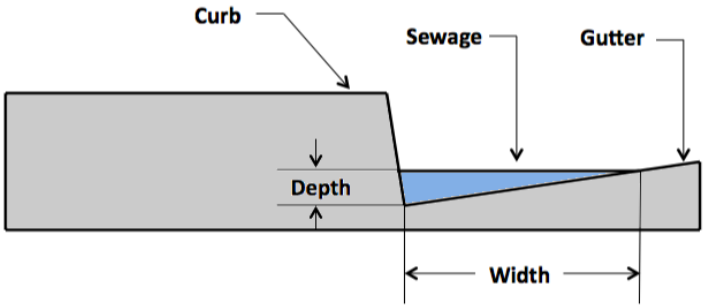
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Sanitary Sewer Overflow Response Packet

Volume Estimation: Sewage Contained in a Roadway Gutter

C-3d

SSO Date: _____ Location: _____



Convert Inches to Feet	
Inches	Feet
1/8"	0.01'
1/4"	0.02'
3/8"	0.03'
1/2"	0.04'
5/8"	0.05'
3/4"	0.06'
7/8"	0.07'
1"	0.08'
2"	0.17'
3"	0.25'
4"	0.33'
5"	0.42'
6"	0.50'
7"	0.58'
8"	0.67'
9"	0.75'
10"	0.83'
11"	0.92'
12"	1.00'

STEP 1: Measure the length of the contained SSO in feet: _____ feet

STEP 2: Measure the depth and width of the overflow in the gutter in feet at the upstream and downstream ends and at evenly spaced intervals if the slope changes in the flooded gutter length. Use the chart to the right as needed to convert inches to feet. For each location measured, calculate the cross-sectional area in square feet by multiplying the depth by the width and dividing by 2.

Location	Depth in Feet	x	Width in Feet	÷ 2	Cross-sectional Area
Upstream End	ft	x	ft	÷ 2	ft^2
Downstream End	ft	x	ft	÷ 2	ft^2
Interval (optional)	ft	x	ft	÷ 2	ft^2
Interval (optional)	ft	x	ft	÷ 2	ft^2
Interval (optional)	ft	x	ft	÷ 2	ft^2

STEP 3: Average all the area calculations from Step 2 by adding them together and dividing by the number of intervals (#). Calculate the volume in cubic feet by multiplying by length (Step 1).

ft^2	÷		=	ft^2	×	ft	=	ft^3
Sum of Areas		#		Average Area		Length		Est. SSO volume in cubic feet

STEP 4: Convert the overflow volume from cubic feet to gallons:

ft^3	×	7.48	=	gallons
Estimated SSO volume in cubic feet				**Estimated SSO volume**

This worksheet completed by:

Name: _____ Signature: _____

Job Title: _____ Date: _____

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Sanitary Sewer Overflow Response Packet

Volume Estimation: Upstream Lateral Connections Method

C-3e

SSO Date: _____ Location: _____

STEP 1: Determine the number of Equivalent Dwelling Units (EDUs) for this SSO: _____ EDUs
NOTE: A single-family residential home = 1 EDU. For commercial buildings, refer to agency documentation.

STEP 2: This volume estimation method utilizes daily usage data based on flow rate studies of several jurisdictions in California. Column A shows how an average daily of usage of 180 gallons per day is distributed during each 6-hour period. Adjust the table as necessary to accurately represent the actual data.

Complete Column E by entering the number of minutes the SSO was active during each 6-hour time period. Multiply column D times Column E to calculate the gallons spilled during each time period. Add the numbers in Column F together for the Total Estimated SSO Volume per EDU.

	Flow Rate Per EDU				**SSO**	
	A	**B**	**C**	**D**	**E**	**F**
Time Period	Gallons per Period	Hours per period	A ÷ B = Gallons per Hour	C ÷ 60 = Gallons per Minute	Minutes SSO was active during period	D × E = Gallons spilled per period
6am-noon	72	6	12	0.20		
noon-6pm	36	6	6	0.10		
6pm-midnight	54	6	9	0.15		
midnight-6am	18	6	3	0.05		
Total Estimated SSO Volume per EDU:						

STEP 3: Multiply the Estimated SSO Volume per EDU from Step 2 by the number of EDUs from Step 1.

_____ gallons X _____ = _____ gallons
Volume per EDU # of EDUs Estimated SSO Volume

STEP 4: Adjust SSO volume as necessary considering other factors, such as activity that would cause a fluctuating flow rate (doing laundry, taking showers, etc.). Explain rationale below and indicate adjusted SSO estimate (attach a separate page if necessary):

Estimated SSO Volume: _____ gallons

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

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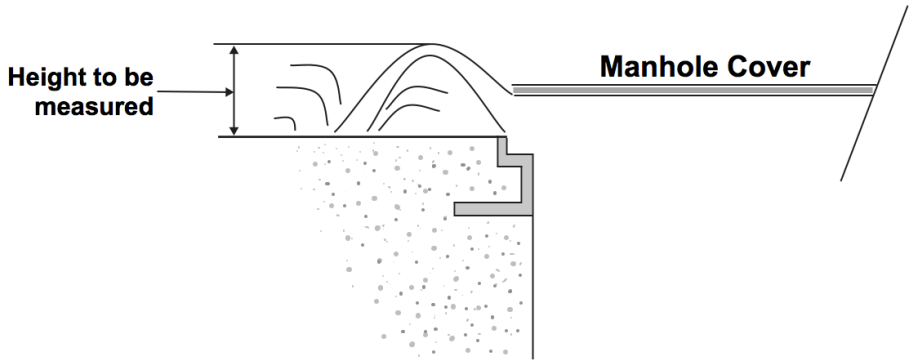
Sanitary Sewer Overflow Response Packet

Volume Estimation: Flow Out of Manhole with Cover in Place

SSO Date: _____ Location: _____

STEP 1: Determine the size (nominal diameter) of the manhole cover. Check one: □ 24" Cover □ 36" Cover
Do not use this estimation method for other manhole cover sizes.

STEP 2: Measure the height of the spout above the manhole rim in inches: _____ inches
Note: Be as accurate as possible. A small difference in spout height can make a major difference in estimated SSO volume! Describe how the spout height was determined:



STEP 3: Determine the SSO Rate by referring to the table on Page 2. Use the table on the left for a 24-inch cover or the table on the right for a 36-inch cover. Find the height measured in Step 2 in the left column. Read the SSO Rate in the next column (gpm = gallons per minute).

SSO Rate = _____ gpm

STEP 4: Refer to the **Sanitary Service Report Form** to determine the duration of the SSO. Enter the duration here in minutes:

SSO Duration: _____ minutes

STEP 5: Multiply the SSO rate by the SSO duration to calculate the estimated SSO volume.

_____ gpm	X	_____ minutes	=	_____ gallons
SSO Rate		SSO Duration		**Estimated SSO Volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

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Sanitary Sewer Overflow Response Packet
Volume Estimation: Flow Out of Manhole with Cover in Place

NOTE: This table is provided for general reference. The agency is strongly encouraged to develop site-specific data.

24" Cover

Height of spout above manhole rim in inches	SSO Flow Q		Min. sewer size in which these flows are possible
	in gpm	in MGD	
1/4	1	0.001	
1/2	3	0.004	
3/4	6	0.008	
1	9	0.013	
1 1/4	12	0.018	
1 1/2	16	0.024	
1 3/4	21	0.030	
2	25	0.037	
2 1/4	31	0.045	
2 1/2	38	0.054	
2 3/4	45	0.065	
3	54	0.077	
3 1/4	64	0.092	
3 1/2	75	0.107	
3 3/4	87	0.125	
4	100	0.145	
4 1/4	115	0.166	
4 1/2	131	0.189	
4 3/4	148	0.214	
5	166	0.240	
5 1/4	185	0.266	
5 1/2	204	0.294	
5 3/4	224	0.322	6"
6	244	0.352	
6 1/4	265	0.382	
6 1/2	286	0.412	
6 3/4	308	0.444	
7	331	0.476	
7 1/4	354	0.509	
7 1/2	377	0.543	
7 3/4	401	0.578	8"
8	426	0.613	
8 1/4	451	0.649	
8 1/2	476	0.686	
8 3/4	502	0.723	

36" Cover

Height of spout above manhole rim in inches	SSO Flow Q		Min. sewer size in which these flows are possible
	in gpm	in MGD	
1/4	1	0.002	
1/2	4	0.006	
3/4	8	0.012	
1	13	0.019	
1 1/4	18	0.026	
1 1/2	24	0.035	
1 3/4	31	0.044	
2	37	0.054	
2 1/4	45	0.065	
2 1/2	55	0.079	
2 3/4	66	0.095	
3	78	0.113	
3 1/4	93	0.134	
3 1/2	109	0.157	
3 3/4	127	0.183	
4	147	0.211	
4 1/4	169	0.243	
4 1/2	192	0.276	
4 3/4	217	0.312	6"
5	243	0.350	
5 1/4	270	0.389	
5 1/2	299	0.430	
5 3/4	327	0.471	
6	357	0.514	
6 1/4	387	0.558	8"
6 1/2	419	0.603	
6 3/4	451	0.649	
7	483	0.696	
7 1/4	517	0.744	
7 1/2	551	0.794	
7 3/4	587	0.845	10"
8	622	0.896	
8 1/4	659	0.949	
8 1/2	697	1.003	
8 3/4	734	1.057	
9	773	1.113	

Disclaimer:

This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

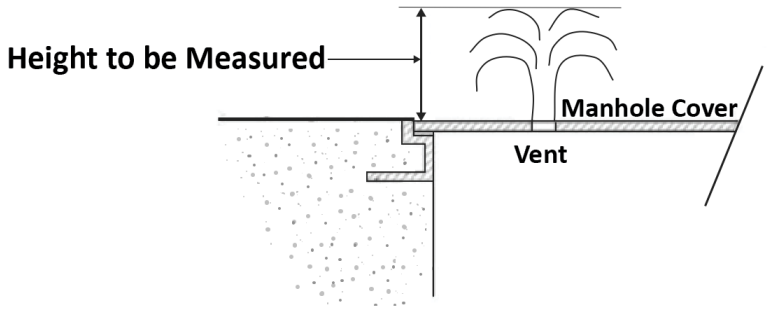
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Sanitary Sewer Overflow Response Packet

Volume Estimation: Flow Out of Manhole Vent or Pick Hole

SSO Date: _____ Location: _____

STEP 1: Measure the water height flowing out of the vent or pick hole in inches: _____ inches
Note: Be as precise as possible. A small difference in spout height can make a major difference in estimated SSO volume! Describe how the spout height was determined:



STEP 2: Determine the SSO Rate by referring to the table on Page 2. Find the height measured in Step 1 in the left column. Read the SSO Rate in the next column (gpm = gallons per minute).

SSO Rate = _____ gpm

STEP 3: Refer to the **Sanitary Service Report Form** to determine the duration of the SSO. Enter the duration here in minutes:

SSO Duration: _____ minutes

STEP 4: Multiply the SSO rate by the SSO duration to calculate the estimated SSO volume.

_____ gpm	X	_____ minutes	=	_____ gallons
SSO Rate		SSO Duration		**Estimated SSO Volume**

This worksheet completed by:
Name: _____ Signature: _____
Job Title: _____ Date: _____

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Sanitary Sewer Overflow Response Packet
Volume Estimation: Flow Out of Manhole Vent or Pick Hole

This table is based on a 7/8-inch diameter pick hole

NOTE: This table is provided for general reference. Use site-specific data if available.

Height of spout above manhole cover in inches	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 manhole cover in inches	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

Disclaimer:

This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

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Sanitary Sewer Overflow Response Packet

CCTV Report

C-4

PLEASE COMPLETE AS THOROUGHLY AS POSSIBLE

PERSON COMPLETING THIS FORM:

DATE:
PHONE:

CAMERA TYPE:

LOCATION OF CAMERA ENTRY:

AFFECTED PROPERTY STREET ADDRESS:

CITY, STATE AND ZIP:

PHONE

LOCATION OF CAMERA STOP:

DESCRIBE AREA TV'd:

UPSTREAM MANHOLE #:

WEATHER AT TIME OF CCTV WORK:

PLEASE CHECK ALL THAT WERE DISCOVERED – *Describe Extent & Location Using Camera Entry Point As Reference*:

- ❒ Broken Main – Describe:
  Depth:
  Roots – Severity: ☐ Light ☐ Moderate ☐ Heavy
- ❒ Grease – Severity: ☐ Light ☐ Moderate ☐ Heavy
- ❒ Sag – Describe:
  Depth:
- ❒ BPD – Describe:
  Location:
- ❒ Cleanout – Describe:
  Location:
- ❒ Joint/Junction – Describe:
  Depth
- ❒ Grade – Describe:
- ❒ Grit – Severity: ☐ Light ☐ Moderate ☐ Heavy
- ❒ Other – Describe:

TIME OF OVERFLOW:

TIME BLOCKAGE RELIEVED:

TIME MAIN TV'd:

DEPTH OF MAIN:

RECOMMENDED
FOLLOW UP WORK ACTIONS:

Mark for USA location? ☐ Yes ☐ No

Main Locations Marked in Green Paint? ☐ Yes ☐ No

SIGNATURE OF EMPLOYEE PERFORMING TV WORK:

DATE

If applicable, place completed form in Sewer Overflow Packet and follow routing instructions.

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Sanitary Sewer Overflow Response Packet

Collection System Failure Analysis

C-5
Side A

To be completed by the Collections System Manager

Incident Report #	Prepared By
SSO/Backup Information	
Event Date/Time	Address
Volume Spilled	Volume Recovered
Cause	

Summary of Historical SSOs/Backups/Service Calls/Other Problems			
Date	Cause	Date Last Cleaned	Crew
Records Reviewed By:		Record Review Date:	

Summary of CCTV Information	
CCTV Inspection Date	Tape Name/Number
CCTV Tape Reviewed By	CCTV Review Date
Observations	

Go to Side B

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Sanitary Sewer Overflow Response Packet

Collection System Failure Analysis

C-5
Side B

Recommendations					
✓	Type	Specific Actions	Who is Responsible?	Completion Deadline	Who Will Verify Completion?
	No Changes or Repairs Required	n/a	n/a	n/a	n/a
	Repair(s)				
	Construction				
	Capital Improvement(s)				
	Change(s) to Maintenance Procedures				
	Change(s) to Overflow Response Procedures				
	Training				
	Misc.				
Comments/Notes:					
Review Date:					

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Overflow Emergency Response Plan
Public Posting

DANGER

RAW SEWAGE • AVOID CONTACT



PELIGRO

AGUA CONTAMINADA • EVITE TODO CONTACTO

Veolia Water – City of Richmond

(510) 412-2001

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Veolia Water – City of Richmond

On (date) _____, at (location)

_____,
we responded to a reported blockage of the sanitary sewer service to your property.

We discovered a blockage in:

- ☐ The sanitary sewer main and cleared the line
- ☐ The City-maintained portion of your sanitary sewer lateral and cleared the line.
- ☐ Your portion of the sanitary sewer lateral, which is your responsibility to maintain. We also found the City's portion of the lateral and the main to be flowing normally.

If you require assistance to clear your portion of the lateral you can look in the Yellow Pages of your telephone book under "Sewer Contractors" or "Plumbing Drains & Sewer Cleaning". If you plan to hire a contractor we recommend getting estimates from more than one company.

Veolia Water – City of Richmond representative:

_____

Notes: _____

_____

_____

For questions or comments, please call:

Veolia Water – City of Richmond
(510) 412-2001

Veolia Water – City of Richmond

On (date) _____, at (location)

_____,
we responded to a reported blockage of the sanitary sewer service to your property.

We discovered a blockage in:

- ☐ The sanitary sewer main and cleared the line
- ☐ The City-maintained portion of your sanitary sewer lateral and cleared the line.
- ☐ Your portion of the sanitary sewer lateral, which is your responsibility to maintain. We also found the City's portion of the lateral and the main to be flowing normally.

If you require assistance to clear your portion of the lateral you can look in the Yellow Pages of your telephone book under "Sewer Contractors" or "Plumbing Drains & Sewer Cleaning". If you plan to hire a contractor we recommend getting estimates from more than one company.

Veolia Water – City of Richmond representative:

_____

Notes: _____

_____

_____

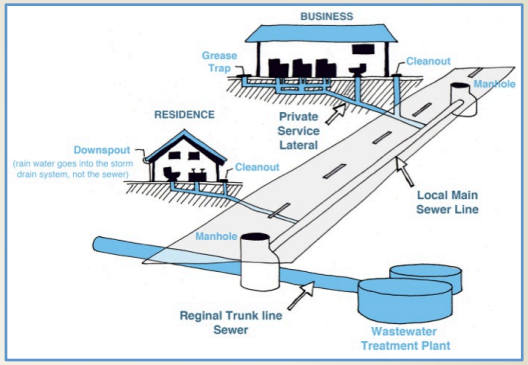
For questions or comments, please call:

Veolia Water – City of Richmond
(510) 412-2001

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How a Sewer System Works

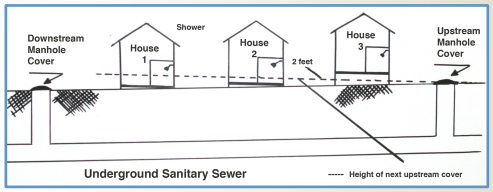
A property owner's sewer pipes are called ***service laterals*** and are connected to larger local main and regional trunk lines.
Service laterals run from the connection at the home to the connection with the public sewer. These laterals are the responsibility of the property owner and must be maintained by the property owner.



Is my home required to have a backflow prevention device?

Section 710.1 of the Uniform Plumbing Code (U.P.C.) states: *"Drainage piping serving fixtures which have flood level rims located below the elevation of the next upstream manhole cover or private sewer serving such drainage piping* ***shall*** *be protected from backflow of sewage by installing an approved type of backwater valve."* The intent of Section 710.1 is to protect the building interior from mainline sewer overflows or surcharges.

Additionally, U.P.C. 710.6 states: *"Backwater valves* ***shall*** *be located where they will be accessible for inspection and repair at all times and, unless continuously exposed, shall be enclosed in a masonry pit fitted with an adequately sized removable cover."*



If you have a sewage spill from your private sewer line that impacts storm drains, waterways or public property, contact:

Veolia Water North America – City of Richmond
(510) 412-2001

Contra Costa County Environmental Health
(925) 692-2500

California Health and Safety Code, Sections 5410-5416 requires:

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution, or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
  - Must immediately notify the local health agency of the discharge.
  - Shall reimburse the local health agency for services that protect the public's health and safety.
  - Who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between $500–$1,000) and/or imprisonment for less than one year.

San Francisco Regional Water Quality Control Board
(510) 622-2300

Requires the prevention, mitigation, response to, and reporting of sewage spills.

California Governor's Office of Emergency Services (CalOES)
(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271 & California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260 require:

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters shall immediately notify the Office of Emergency Services.
- Any person who fails to provide the notice required by this section is guilty of a misdemeanor and shall be punished by a fine (less than $20,000) and/or imprisonment for not more than one year.

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Sewer Spill Reference Guide

Your Responsibilities as a Private Property Owner

Provided to you by:

Veolia Water North America
City of Richmond

601 Canal Street
Richmond, CA 94804
(510) 412-2001

www.ci.richmond.ca.us

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How do sewage spills happen?

Sewage spills occur when the wastewater in underground pipes overflows through a manhole, cleanout, or broken pipe. Most spills are relatively small and can be stopped and cleaned up quickly, but left unattended they can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways, and beaches.

CAUTION!

When trying to locate a sewer problem, never open manholes or other public sewer structures. Only our crews are allowed to open & inspect these structures.

Common causes of sewage spills

- Grease build-up
- Tree roots
- Broken/cracked pipes
- Missing or broken cleanout caps
- Undersized sewers
- Groundwater/rainwater entering the sewer system through pipe defects and illegal connections

Prevent most sewage backups with a Backflow Prevention Device

This type of device can help prevent sewage backups into homes and businesses. If you don't already have a Backflow Prevention Device, contact a professional plumber or contractor to install one as soon as possible.

Protect the environment!

If you let sewage from your property discharge to a gutter or storm drain, you may be subject to penalties and/or out-of-pocket costs for clean-up and enforcement efforts. A property owner may be charged for costs incurred by agencies responding to spills from private properties.

What to look for:

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas. Look for:

- Drain backups inside the building.
- Wet ground and/or water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains
- Unusual odorous wet areas: sidewalks, external walls, ground/landscape around a building.

The following are indicators of a possible obstruction in your sewer line:

- Water comes up in floor drains, showers or toilets.
- Toilets, showers or floor drains below ground level drain very slowly.

What to do if there is a spill:

Immediately notify Veolia Water – City of Richmond. Our crews locate the blockage and determine if it is in the public sewer. If it is, the crew removes the blockage and arranges for cleanup.

If the backup is in your private internal plumbing or in the private service laterals, you are required to immediately:

- Control and minimize the spill by shutting off or not using the water
- Keep sewage out of the storm drain system using sandbags, dirt and/or plastic sheeting
- Call a plumbing professional to clear blockages and make repairs as needed. Look in the yellow pages under "Plumbing Drain & Sewer Cleaning" or "Plumbing Contractors."
- Always notify your sewer/public works department or public sewer district of sewage spills.

Spill cleanup inside the home:

For large clean ups, a professional cleaning firm should be contacted to clean up impacted areas, You can locate local firms by looking in the Yellow Pages under "Water Damage" or "Fire Damage." If you hire a contractor, it is recommended to get estimates from more than one company. Sometimes, homeowner's insurance will pay for the necessary cleaning due to sewer backups. Not all policies have this coverage, so check with your agent.

If you decide to clean up a small spill inside your home, protect yourself from contamination by observing the following safety measures. Those persons whose resistance to infection is compromised should not attempt this type of clean up.

Other Tips:

- Keep children and pets out of the affected area until cleanup has been completed.
- Turn off heating/air conditioning systems
- Wear rubber boots, rubber gloves, and goggles during cleanup of the affected area.
- Discard items that cannot be washed and disinfected (such as: mattresses, rugs, cosmetics, baby toys, etc.)
- Remove and discard drywall and insulation that has been contaminated with sewage or flood waters.

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- Thoroughly clean all hard surfaces (such as flooring, concrete, molding, wood and metal furniture, countertops, appliances, sinks and other plumbing fixtures) with hot water and laundry or dish detergent.
- Help the drying process with fans, air conditioning units, and dehumidifiers.
- After completing cleanup, wash your hands with soap and water. Use water that has been boiled for 1 minute (allow the water to cool before washing your hands) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.
- Wash clothes worn during cleanup in hot water and detergent (wash apart from uncontaminated clothes).
- Wash clothes contaminated with sewage in hot water and detergent. Consider using a Laundromat until your onsite wastewater system has been professionally inspected and serviced.
- Seek immediate attention if you become injured or ill.

Spill cleanup outside the home:

- Keep children and pets out of the affected area until cleanup has been completed.
- Wear rubber boots, rubber gloves, and goggles during cleanup of affected area.
- Clean up sewage solids (fecal material) and place in properly functioning toilet or double bag and place in garbage container.
- On hard surfaces areas such as asphalt or concrete, it is safe to use a 2% bleach solutions, or ½ cup of bleach to 5 gallons of water, but don't allow it to reach a storm drain as the bleach can harm the environment.
- After cleanup, wash hands with soap and water. Use water that has been boiled for 1 minute (allow to cool before washing your hands) OR use water that has been disinfected (solution of 1/8 teaspoon of household bleach per 1 gallon of water). Let it stand for 30 min. If water is cloudy, use ¼ teaspoon of household bleach per 1 gallon of water.
- Wash clothes worn during cleanup in hot water and detergent (wash apart from uncontaminated clothes).
- Wash clothes contaminated with sewage in hot water and detergent. Consider using a Laundromat until your onsite wastewater system has been professionally inspected and serviced.
- Seek immediate attention if you become injured/ill.

Appendix D

WATER QUALITY MONITORING PLAN

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March 2017

CITY OF RICHMOND

Sanitary Sewer Overflow Water Quality Monitoring Plan

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A PROJECT MANAGEMENT

A.1 PROJECT ORGANIZATION

This monitoring program will be conducted under the direction of the Richmond Municipal Sewer District (RMSD) with guidance provided by Larry Walker Associates (LWA). Caltest Analytical Laboratory of Napa (Caltest) will serve as the primary laboratory, but alternatives might be used due to logistics and timing. The Project Contact list is provided in **Table 1.**

Table 1. Project Contact List

Name	Role	Agency/Company	Phone Number	Email
Joanne Le	Monitoring Coordinator	RMSD	510-290-9149	joanne_le@ci.richmond.ca.us
Terri Mason	Field Crew	RMSD	510-447-3582	terri_mason@ci.richmond.ca.us
Max Potter	Field Crew	RMSD	510-942-5315	maxwell_potter@ci.richmond.ca.us
Steven Maricle	MRP Technical Advisor	Larry Walker Associates	530-753-6400 (o)	stevem@lwa.com
Todd Albertson	Laboratory Project Manager	Caltest	707-258-4000 (o)	todd@caltestlabs.com

A.2 BACKGROUND

In 2006, the State Water Resources Control Board (State Water Board) adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (SSS WDRs), Order No. 2006-0003-DWQ. The Monitoring and Reporting Program (MRP) established monitoring, record keeping, reporting, and public notification requirements. On September 9, 2013, Order No. WQ 2013-0058-EXEC became effective that clarified and expanded requirements of the original MRP and defined new sanitary sewer overflow (SSO) categories. The SSO definitions, as well as the notification, monitoring, and technical reporting requirements are shown in **Figure 1**.

This monitoring plan addresses water quality monitoring requirements for Category 1 SSOs that are greater than or equal to 50,000 gallons. As defined by Order No. WQ 2013-0058-EXEC, the following elements must be included in an SSO Water Quality Monitoring Plan to comply with subsection D.7(v) of the SSS WDRs:

1. 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. Water quality monitoring analyses for ammonia and bacterial indicators to be performed by an accredited or certified laboratory.

4. Procedures for proper maintenance and calibration of monitoring instruments and devices used to implement the SSO Water Quality Monitoring Program and documentation of maintenance and calibration, as necessary, to ensure their continued accuracy.

5. Water quality sampling within 48 hours of the RMSD becoming aware of the SSO, for, at a minimum, the following constituents:

    a. Ammonia

    b. Total Coliform

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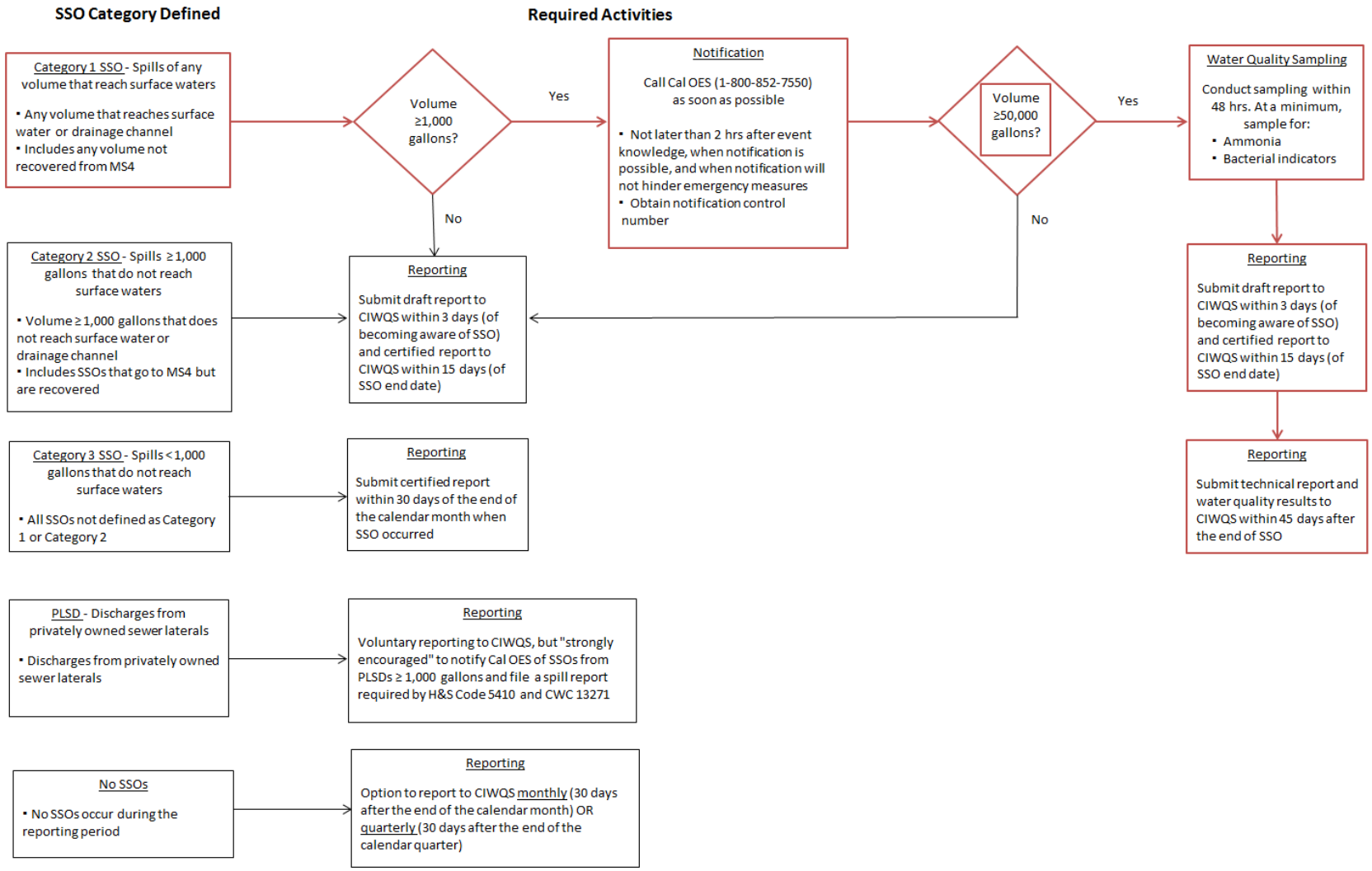


Figure 1. SSO Action Flow Chart (Based on Order No. WQ 2013-0058-EXEC)

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B DATA GENERATION AND ACQUISITION

B.1 SAMPLING PROCESS DESIGN

B.1.1 Sampling Event Timing

The Monitoring Coordinator will determine when the field crew will be mobilized to sample the receiving water. Sampling must be conducted within 48 hours after initial Category 1 SSO and spill volume notification. The monitoring coordinator will target daylight sampling within the first 24 hours of the SSO notification, but sample timing may be shifted due to safety and logistical issues.

Sampling will not be conducted if there are any concerns regarding field crew safety. These concerns may include heavy rain events, which compromise access points through flooding and swift currents. Thunderstorms will also be avoided when lightning is occurring. Sampling will only be conducted if there are at least two members of the field crew team available.

B.1.2 Monitoring Site Locations

Upon notice of a Category 1 SSO, the Monitoring Coordinator will determine where the field crew will sample. The Monitoring Coordinator will be responsible for determining the sampling locations. At a minimum, sampling will occur where the SSO enters the surface water body. If it is safe, samples will also be taken 50 - 100 feet upstream of the entry point, and at least one point downstream of the entry point. The downstream location(s) will be determined from visual monitoring and estimated spill travel time (see Section B.3.1). The Monitoring Coordinator will provide a detailed description of potential monitoring site locations to the Field Crew.

Upon arrival at the monitoring sites, the Field Crew will determine the best locations to sample by assessing the hydrology of the receiving water and any safety precautions. The Field Crew should look for locations where the receiving water can easily be entered or sampled mid-channel by a grab pole. Once the sampling site location is selected, but before sampling starts, the Field Crew will record the latitude and longitude of the sampling location into the Field Form (**APPENDIX A**).

B.2 EQUIPMENT PREPARATION

The Field Crew shall maintain a sampling kit with the necessary supplies to conduct a monitoring event. **Table 2** lists the equipment and supplies that will be included in the sampling kit.

Table 2. Monitoring Equipment List

- Storm Kit
  - Spare sample labels
  - Pencils (2) and waterproof pens/markers (2)
  - Powder-free nitrile gloves
  - Camera
  - Duct tape
  - Spare batteries for camera
- SSO Water Quality Monitoring Plan
- Log books/ Field forms
- Chain-of-custody forms
- *New* sample bottles
- Intermediate containers

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Coolers and ice
Cellular phone
Any necessary safety gear
Sub-surface sampling pole
Paper towels
Trash bags

B.2.1 Sampling Containers

The Field Crew will maintain a supply of sample bottles for at least 4 events. The Field Crew will order bottles directly from the laboratory and will reorder bottles if they are unused for six months. **Table 3** includes the required bottle types, sample volumes, and preservatives for ammonia and total coliform samples.

Table 3. Constituents to be Analyzed, Sample Volume Required, and Sample Type

Constituent	Optimum Vol. (L)	Min. Vol. (L)	Collection Method	Bottle Type	Preservation	Analytical Lab
Ammonia (NH_3)	0.500	0.100	Indirect or Direct Fill	500mL Plastic	H_2SO_4, <6° C	Caltest
Total Coliform	0.100	0.100	Indirect or Direct Fill	100mL Sterile Plastic	<6° C	Caltest

B.2.2 Field Meter Calibration

All field meters will be properly calibrated and maintained by the Field Crew. Calibrations will be performed according to the methods and frequency recommended by the equipment manufacturer. When calibrating the instruments, the Field Crew will document all pertinent information in a Calibration Log (**APPENDIX B**) and keep it with the rest of the project documentation.

B.3 WATER QUALITY MONITORING

The Field Crew will be responsible for the following tasks upon arrival at the monitoring location:

1. Determine best sampling locations and record latitude and longitude readings for the upstream, SSO entry point, and downstream sampling sites.

2. Calculate spill travel time at the downstream monitoring site (if possible)

3. Collect water quality samples in the following order: first at the SSO entry point, second at the downstream site(s) – if possible, and third at the upstream monitoring site(s) - if possible

4. Complete all field forms and prepare the samples for delivery to the laboratory.

The following sections outline the necessary steps the Field Crew must take when performing the above actions.

B.3.1 Spill Travel Time

When the Field Crew arrives at the downstream monitoring site, they will try to estimate spill travel time by calculating travel time within enclosed storm drains (distance traveled/initial spill rate) and within open surface waters. Travel time within the open surface waters can be determined two different ways depending on the accessibility and safety of the monitoring site.

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B.3.1.1 Velocity Probe

Using a velocity probe is the preferred method of spill travel time calculation, but it requires extra safety precautions, since the Field Crew will have to wade and cross the surface water body."

Since the receiving water bodies for the areas around the RMSD are unsafe to enter, the RMSD has determined that it will not be the method used for determining spill travel time.

B.3.1.2 Visual Velocity Estimation

If the receiving water body is unsafe to enter, the velocity can be measured by observing floating debris.

1. The Field Crew members will stand on the edge of the channel, 30 feet apart.

2. The Field Crew member standing upstream will indicate when a large piece of debris passes their point. At this time the Field Crew member standing downstream will start timing.

3. Once the same piece of debris passes the downstream Field Crew member, they will stop timing and calculating the velocity (ft/sec) by dividing 30 feet by the number of seconds it took for the debris to travel that length.

If there isn't any large debris floating in the surface water, the upstream Field Crew member can use a nearby stick or other buoyant object (field crew is not to add "debris" or any other material that could be considered "trash" to waters to check velocity, unless the object can be easily retrieved).

B.3.2 Sample Collection Methods

Sample collection methods will vary depending on the surface water and the safety of the Field Crew. Clean, powder-free, nitrile gloves will be worn for all bottle handling. The direct fill sample collection method is the preferred sampling method, since it does not use an intermediate container. In cases where the direct fill method cannot be used due to accessibility or safety an intermediate bottle and a grab pole can be used.

B.3.2.1 Direct Fill Sample Collection (this process has been determined unsafe and is NOT to be used by City Staff).

The direct fill sample collection method will be used in cases where the surface water can be entered safely by the Field Crew. Field Crew will wear waders and ensure that the water level and velocity of the surface water are low enough to provide a safe entry and sampling environment.

Ammonia and bacteriological sample bottles will be filled by direct submersion to approximately mid-depth as follows.

1. Wade to approximately the area of the water body with the highest flow rate and face upstream. This will most likely be midstream, but can be in a different portion of the stream, depending on the hydrology.

2. Submerge the sample bottle with its cap on to approximately mid-depth at a location of significant flow (avoid stagnant water). Hold the bottle upright under the surface while it is still capped.

3. Open the lid carefully just a little to let water run in. Fill the bottle and screw the cap tightly while the bottle is still underneath the surface.

4. Remove bottle from stream and place on ice.

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B.3.2.2 Intermediate Container Sample Collection (method to be used most often)

If the flow, water level and/or access point are deemed unsafe then an intermediate bottle attached to a grab pole will be used for sample collection. A clean, new intermediate bottle will be used for each sampling event and sampling site.

Ammonia and bacteriological sample bottles will be filled by intermediate container sample collection as follows:

1. Attach the new, clean intermediate bottle to a subsurface sampling pole.
2. Submerge the intermediate bottle, attached to expandable pole, to approximately mid-depth at a location of significant flow (avoid stagnant water).
3. Pull the release lever on the sample pole. You should see bubbling below the surface. This indicates the bottle is filling.
4. Remove bottle from water, pull the lever and empty contents. Repeat this twice more.
5. Once the intermediate bottle is properly rinsed, submerge the intermediate bottle, attached to expandable pole, to approximately mid-depth at a location of significant flow (avoid stagnant water).
6. Pull the release lever on the subsurface sampling pole. You should see bubbling below the surface. This indicates the bottle is filling.
7. Carefully remove the pole (with the bottle attached) from the water.
8. Unscrew the bottle from the subsurface sampling pole, being careful not to spill the contents.
9. Using the sample bottle (that was attached to the pole), fill the bacteriological sample containers and then the ammonia bottle. Ensure that none of the bottles overflow and that the preservative stays in the sample container.
10. After the bottles have been filled, replace bottle lids, label each bottle with sample label information, remove bottle and place in cooler on ice.

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B.4 SAMPLE HANDLING AND CUSTODY

The Field Crew will ensure that all samples are collected and submitted to their respective labs by the maximum hold times listed in Table 4. If timing or logistics prevent a hold time being met, the Field Crew will contact the Monitoring Coordinator.

Table 4. Constituent Hold Times and Analytical Methods

Sample Parameter	Analytical Method[1]	Maximum Hold Times	Analytical Lab
Ammonia (NH_3)	SM 4500-NH3-G	28 days	Caltest
BOD	SM 5210-B	48 hours	Caltest
Total Coliform	SM 9221-B/E	8 hours	Caltest
Fecal Coliform	SM 9221-C/E	8 hours	Caltest

B.4.1 Sample Bottle Labels

The Field Crew will label all sample bottles with a waterproof label, which will contain the Location, Lab Identification (Field ID), sample collection date, sample collection time, analysis requested, sample type, preservative, and Inspector's initials.

The sample parameter and analysis methods are shown in **Table 4** and the station identification protocols are shown in **Table 5**.

Sampling protocol will be as follows:

MMDDYY-Two Letter Identifier Two Letter location(US/SC/DS)-001-Sample Number

Example: Sample taken Upstream at Harbour and Wright on December 12, 2014:

121214-HWUS-001-01

Table 5. Site Names for Sample Handling

Station Number	Station Name
MMDDYY-LOUS-001-01	Surface Water ***Upstream***
MMDDYY-LOSC-001-01	Surface Water Point of Entry (***Source***)
MMDDYY-LODS-001-01	Surface Water ***Downstream*** 1
MMDDYY-LODS-001-0X[1]	Surface Water ***Downstream*** XXX[1]

1 Additional downstream monitoring sites will be labeled in sequential order starting from the SSO surface water point of entry.

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Example sample bottle label:

Sample Bottle Label

LOCATION: _____
LAB I.D._____
DATE: _____ TIME:_____
INSPECTORS: _____
SAMPLE TYPE ☐ GRAB ☐ COMPOSITE
ANALYSIS: _____
_____ **PRESERVATIVE**

B.4.2 Transport

All samples will be kept on ice from the time of collection to the time of receipt by laboratory personnel. It is imperative that all samples are analyzed within maximum holding times (see **Table 4**). Samples will be shipped/delivered as specified in **Table 6**.

Table 6. Analytical Laboratories

Analytical Laboratory	Analysis	Shipping Method
Caltest Attn. Todd Albertson 1885 North Kelly Road Napa, CA 94558 707-258-4000	Bacterial & Ammonia	Courier pick-up

B.4.3 Chain of Custody Form

Chain-of-Custody (COC) forms will be filled out by the Field Crew for all samples submitted to the laboratories. COCs will contain the following information:

- Sampler name
- Address (where the results will be sent)
- To whom the laboratory results are being sent
- Sample collection date and time
- Sample location
- Analysis method requested
- Sample container type and number
- Comments/special instructions
- Samples relinquished by (signature, print name, date)
- Samples received by (signature, print name, date)

Example lab COCs are included in **APPENDIX C.**

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C REPORTING

A Category 1 SSO in which 50,000 gallons or greater are spilled to a surface water requires multiple stages of notification and reporting. The RMSD will adhere to the required timeline outlined in **Table 7**, which begins when the RMSD becomes aware of an SSO. The specific requirements for notification and reporting are specified by Order No. WQ-2013-0058-EXEC and detailed in the RMSD's Sanitary Sewer Management Plan.

Table 7. Notification and Reporting Timeline

Time Period	Requirement
<2 Hours	Notification to CalOES
Within Three Business Days	Draft Category 1 SSO Report to CIWQS
Within 15 Calendar Days	Certified Category 1 SSO Report to CIWQS
Within 45 Calendar Days	SSO Technical Report with water quality results to CIWQS

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Appendix E

CONTRACTOR ORIENTATION

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CONTRACTOR ORIENTATION

The following procedures are to be followed in the event that you cause or witness a Sanitary Sewer Overflow.

Contractor causes or witnesses a Sanitary Sewer Overflow

↓

Immediately Notify Veolia Water North America – City of Richmond

(510) 412-2001

↓

Protect the Storm Drains using mats, dikes, berms, etc.

↓

Protect the Public

If the spill is entering an area where public contact may occur, and if it is safe to do so, prevent, to the extent possible, public contact with the sewage until a Collections System Field Crew arrives.

↓

Provide Information

Provide Collections System Field Crew with information about the overflow such as start time, appearance point, suspected cause, weather conditions, etc.

↓

Direct ALL media and public relations requests to:

City of Richmond Public Information Officer at (510) 620-5486

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Sanitary Sewer Overflows

How to avoid them and what to do if you don't

What? A sanitary sewer overflow (SSO) is a discharge of untreated human and industrial waste before it reaches the wastewater treatment facility.

Where? SSOs usually occur through manholes, plumbing fixtures and service cleanouts.

Why? SSOs are usually caused by grease, debris, root balls, or personal hygiene products blocking the sewer lines, or by unusually high flow volume.

How to prevent SSOs:

…when clearing plugged sewer laterals:

- Remove root balls, grease blockages and any other debris from the sewer
- If you can't prevent root balls, grease or debris from entering the sewer main, call us at (510) 412-2001, so we can work with you to remove the blockage and prevent blockages further downstream
- Use plenty of water to flush lines.

…when constructing or repairing sewer laterals:

- Contact the Engineering Department at (510) 307-8091 for a permit and lateral specifications.
- Check your work area. Make sure there is no debris left in the sewer line before you backfill.
- Avoid offset joints, which may make sewer lines vulnerable to root intrusion and grease or debris accumulation. Properly bed your joints and don't hammer tap.

If you cause or witness an SSO, immediately contact:

Veolia Water North America – City of Richmond

(510) 412-2001

Veolia Water North America
City of Richmond

601 Canal Boulevard
Richmond, CA 94804

www.ci.richmond.ca.us

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Appendix F
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Richmond Municipal Sewer District's FOG Control Program

Introduction

Fats, Oils, and grease, abbreviated as FOG, are an issue due their ability to cause sanitary sewer blockages that may result in discharges of untreated wastewater on Food Handling Facilities (FHF's) and to storm drains, creeks and the San Francisco Bay. FOG discharges result from improper management of food waste in residences and commercial FHF's.

Background

The City of Richmond FOG source control program was initiated in 2003. A field survey identified all food service facilities with and without grease control devices. Periodic inspection of food service facilities began in 2004. In 2006, the City of Richmond Municipal Codes were revised to require that new FHS's install grease pretreatment devices that conform to the current version of the UPC. Continued accumulation of grease in the collection system is calling for increased effort to control discharge of grease.

Baykeeper responds to the City's FOG program

In 2006, Baykeeper brought a lawsuit against the City of Richmond for its excessive Sanitary Sewer Overflows. One component of the settlement agreement was that the City of Richmond needed to increase its inspection frequency of food service establishments, and improve their public education and outreach program.

Goals

State Water Resource Control Board adopted Order 2006-0003-DWQ which calls for owners of sanitary sewer collection systems to develop Sanitary Sewer Management Plans (SSMP) to reduce potential for sanitary sewer overflows. A component of the model plan requires a fats, oils, and grease (FOG) control program. This document summarizes the City of Richmond's FOG Source Control Program.

Justification for the FOG Program

The justification of sewer line preventive maintenance (hydro-jetting), FOG buildup in lift stations, the volume of grease collection and removal at the WWTP and the more than 165 commercial FOG generators in the service area conclude that a FOG program is warranted.

Disposal of FOG Within Richmond Municipal Sewer District

FOG discharge to the sewer is prohibited. Users are required to properly dispose of pretreatment wastes (brown grease) and cooking grease (yellow grease).

At present time, the City of Richmond CANNOT accept any amount of grease for disposal at the Richmond Water Pollution Control Plant.

Commercial/Industrial

However, there are other facilities near the City of Richmond who will accept FOG for a fee. They are listed in Attachment A.

There are several commercial/industrial FOG Waste hauling Companies serving Contra Costa County. They are listed in Attachment B.

Residential

The City of Richmond has a food recycling program for Residents that allow them to mix their grease in with their food scraps. This is the "green can" recycling program. This waste is not hauled to the local landfill, but used as composting.

See "***Pretreatment System Maintenance***" for other requirements

Cleaning Maintenance Schedule and FOG Blockages

Problem Area Identification

A FOG problem area is identified by a line blockage determined to be the result of FOG or segments of the sewer where preventive maintenance has identified accumulations of FOG. Potential FOG problem areas consist mainly of trunk line segments in commercial districts that serve a concentration of food service facilities. Problem areas also appear to be associated with multi-family dwelling complexes, although sewer back-ups at these sites appear to be due a combination of factors, including grease, line sags, and roots. Any commercial facility that prepares food is considered a FOG generator.

Sewer Line FOG Obstruction/Blockage Preventive Maintenance Program

Prevention of FOG-related interference to the sewer system consists of a two-prong approach: scheduled preventive maintenance (PM) of problem areas and source control. Hydro-jetting is the most common method of truck line preventive maintenance. Known problem areas are prioritized based on qualitative findings of previous preventive maintenance results, such as a surcharged condition or significant grease collected on the jetting nozzle. High priority segments are put on a quarterly preventive maintenance schedule and the findings are forwarded to the Source Control Program for follow-up. The segment will remain on a quarterly PM until subsequent

observations determine that potential for obstruction or blockage have been reduced or eliminated.

SSMP Enhanced FOG Source Control Program

The City of Richmond has an approved Pretreatment Program. The FOG component is being enhanced by adding food handling facilities to the program's waste discharge permit program and increasing public outreach.

The City of Richmond's Source Control program staff manages plan check and specifications for newly constructed and remodeled FHF's to ensure items required by the Richmond Municipal Code are completed prior to approval of building permits.

New buildings constructed to house food handling facilities are required to include a covered area for a dumpster. If the area cannot be covered, the facility must ensure that the dumpster is covered and the area is designed to prevent any water run-on to the area and run-off from the area. Any drains installed in the area must be connected to a grease removal device and must be protected so that no stormwater from the area is discharged to the sanitary sewer.

The City of Richmond's Finance Department also issues a new listing each month for every business who files for a Business License in the City of Richmond. This list is reviewed by Source Control Program staff to ensure that all FHF's that are listed are inspected and, if necessary, issued a FOG wastewater discharge permit.

Legal Authority to Prohibit Discharges – Sewer Use Ordinance

Sanitary Sewer Use Ordinance

The City of Richmond Sewer Use Ordinance provides the legal authority to implement the pretreatment program for FOG. A summary of the enabling authority as follows:

RMC	Section Title
12.18.010.3	Definitions of "Food Handling Facility", "Fats, Oils, and Grease"
12.18.020.1B(3)	Prohibited Discharge Standards: Solid or viscous substances, such as, but not limited to, grease, garbage….. in amounts that will cause obstruction in flow in the WPCP resulting in interference.
12.18.030.2	Fats, Oils, and Grease
12.18.030.2A.(2)	These facilities must have a FOG Management Program Permit. An authorized Inspector and/or the City Engineer shall have right of entry as described in Section 12.18.070.1 of this ordinance.
12.18.030.2B	Administration of FOG Program

12.18.030.2C	Grease Interceptor Maintenance Procedure Program
12.18.030.2D	Best Management Practices
12.18.030.2E	Grease Separators (Traps) for Treating FOG Wastes
12.18.030.2F	Grease Interceptors for Treating FOG Wastes
12.18.030.2G	Waivers for Treating FOG Wastes
12.18.030H	Enforcement of FOG Program
12.18.070.1	Right of Entry: Inspection and Sampling
12.18.100.1	Notice of Violation
12.18.100.2	Consent Orders
12.18.100.3	Show Cause Hearing
12.18.100.4	Compliance Orders
12.18.100.5	Cease and Desist Orders
12.18.100.6	Administrative Fines
12.18.100.7	Emergency Suspension
12.18.100.8	Termination of Discharge

Administration

The City of Richmond Engineer is charged with implementing a source control program throughout the Richmond Municipal Sewer District service area. The City of Richmond Source Control Division administers the source control program. Building Regulations issue permits for installation of grease control devices in conformance to requirements of the Uniform Plumbing Code.

Installation of Grease Removal Devices

Design and Sizing

The ordinance(s) provides the following direction. The requirement is implemented by the Source Control Program.

- FOG separators and grease interceptors shall be provided, at the User's expense, where, in the opinion of the City Engineer, they are necessary for the proper handling of wastes containing these substances in excessive amounts, or any flammable wastes or harmful ingredients.
- All grease interceptors shall be of a type and capacity approved by the City Engineer, and shall be located so it is readily accessible for inspection and cleaning.
- FOG separators and grease interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction and equipped with removable covers.

Pretreatment System Maintenance

- Facilities must have a FOG Maintenance Management Program and/or Wastewater Discharge Permit.
- A grease collection service shall be required for all facilities that generate FOG.
- Dishwashers and food grinders are prohibited from discharging through the grease trap pursuant to the State of California Uniform Plumbing Code.
- Grease interceptors shall be cleaned out completely by a FOG collection service as necessary to assure that the grease interceptor will operate as designated at all times or as otherwise specified by the City of Richmond.
- Maintenance records indicating date of service, volume pumped, name of waste hauler, and waste disposal location for each pumping of the grease interceptor must be kept for a minimum of three (3) years. The records must be provided to the Source Control Program Inspector when requested during normal business hours.
- Pumped out FOG shall NOT be returned to the sewer system, nor any private wastewater system, nor storm drains.
- If significant grease accumulation (e.g., partial blockage) is found downstream of the process of concern, a Source Control Inspector and/or the City Engineer may inspect the facility.
- If a business is shown to be the cause of a grease-related sewer overflow the User will be responsible for the cost of clean-up as set forth in Section 12.18.140.

Authority to Inspect - Waste Discharge Permits

Policy and Applicability

The waste discharge permit program as applied to the FOG source control is summarized as follows:

- Issue waste discharge permits to facilities that are required to have pretreatment systems.
- Food handling facilities are required to have pretreatment systems.
- A food handling facility is defined as any facility that prepares and/or services food for commercial use or sale.
- FOG pretreatment system maintenance frequency is established in inspection reports based on a grading system. The higher the grading number, the more frequently a facility will be inspected. The numbering system is based on a scale of 1 – 5).

Permit Contents

The Food Handling Facility permit package consists of the facility information and specific requirements page, Best Management Practices (Attachment C), Maintenance Log Sheet (Attachment D), and Employee Training Record (Attachment E). Waste Discharge Permits follow a standard format for all applications and contain the following provisions:

- Designated industrial waste streams shall discharge through pretreatment system indentified in the permit.
- Bypass or modification of waste treatment systems is strictly prohibited.
- Maintain waste treatment systems per manufacturer instructions or at frequency as indicated in permit, which ever is more frequent. Maintenance is defined as removal of collected contents and the unit kept in optimal physical/mechanical condition.
- Keep records of waste treatment system maintenance, including pumping and/or cleanout dates, and disposition of treatment system wastes.
- Conform to reporting requirements as mandated.
- Do not discharge any hazardous waste or other problem wastes.
- Notify the City of Richmond immediately of any abnormally high volume or concentration of waste discharge that has occurred or is imminent.
- Train employees on waste discharge requirements, including pretreatment system maintenance recommendations and requirements, and best management practices.

Inspection and Enforcement

Inspections are conducted to assess compliance with permit requirements. Compliance is determined by visual inspection of the Pretreatment system, interview with owner/staff about general operations and waste handling; and documentation of Pretreatment maintenance, Pretreatment waste disposition and employee training. A copy of the inspection form is attached (Attachment F).

Regulatory/Outreach Strategy

Commercial/Industrial Component

The current commercial program consists of periodic inspections of *commercial* food handling facilities. We have expanded that list to include schools, churches, and health care facilities. The rationale behind that is:

- Schools operate on a seasonal basis and could be a large contributing factor of grease due to lack of knowledge of interceptor systems.
- Maintenance of grease traps and interceptors for schools are largely performed by staff that may not be located on site, therefore “out of site, out of mind” philosophy exists and we need to educate on-site staff regarding the problems the school could be creating.
- Church functions operate on weekends and rarely have staff “in the know” of how to properly dispose of grease. Initial inspections indicated that most do not have adequate grease removal devices. The Source Control program will provide BMP material that educates church staff to practice “From the Pan to the Can”.

- Health care facilities (skilled nursing homes) prepare meals for their patients, but did not fall under any of normal commercial food handling facility categories. Most of them did have large grease traps. However, they were not being maintained on a regular basis. We have added them to our regular inspection schedule and placed them on permit.
- Posters for BMP's for handling FOG are distributed. The Bay Area Pollution Prevention Group (BAPPG) funded CalFOG to create a poster that is available in English, Spanish, Korean, Chinese, and Vietnamese. These posters are printed by the City of Richmond in any language the Facility should request.

Multi-family/Residential Component

The Residential Outreach Element includes:

- Dispensing of educational brochures at public facilities (libraries, schools, etc.), and issuing public service announcements, and updating our "What's New" on the web page to remind residents how to properly dispose of their deep fat fryer grease, etc.
- We meet with Richmond Neighborhood Coordinating Council periodically to discuss various topics. We provide them hand-outs for their local Neighborhood Groups regarding the proper disposal of grease.
- FOG door hangers are distributed in areas where the Collection Crew has reported a back-up due to grease.
- Food Scrapers, with the City of Richmond's insignia and information about the FOG program, are also left as door hangers in areas where excessive grease is reported by the Collection Crew and in areas where a back-up has occurred due to grease.

List of Documents (Attachments)

Attachment 7A:	Facilities accepting FOG
Attachment 7B:	FOG Waste Haulers
Attachment 7C:	Best Management Practices
Attachment 7D:	Maintenance Log Sheet
Attachment 7E:	Employee Training Record
Attachment 7F:	Inspection Form



Fats, Oil & Grease Collection

West Contra Costa County Residents Only

Thinking of frying a turkey for the holidays? Not sure what to do with the leftover used cooking oil and grease?

Never wash cooking fats, oil or grease down the drain, as they can cause the sewer line to back up into your home, streets and storm drains which flow to the Bay. Instead recycle it! EBMUD and the West Contra Costa Integrated Waste Management Authority have partnered to provide a free drop-off program. Most cooking fats will be turned into bio diesel. Please do NOT mix with automotive waste and ***no restaurants*** will be serviced. Fifteen (15) gallons per person maximum.

We also accept many household hazardous wastes, so load up old paint and pesticides and just make one trip. Remember to keep all wastes in separate containers -- never mix different substances. Visit www.recyclemore.com for a list of acceptable household hazardous waste or call 1-888-412-9277.

West Contra Costa Household Hazardous Waste Facility
101 Pittsburg Avenue, Richmond, 94801 – off the Richmond Parkway
Open – Thursdays, Fridays and the first Saturday each month
9:00am – 4:00pm (closed 12-12:30pm for lunch)
1-888-412-9277
www.recyclemore.com

And the link to EBMUD's website is…
http://www.ebmud.com/wastewater/residential_pollution_prevention/Residential_FOG_Drop-off/default.htm

Grease Hauling and Rendering Companies Serving Locations in the State of California

(this is a list for convenience provided by the City of Richmond and not an endorsement)

Counties	Hauler Name	Phone Number
All Counties		
All Counties	Darling International	(800) 473-4890
All Counties	Liquid Environmental Solutions	(866)-694-7327
All Counties	Portosan Santa Rosa	(707) 566-2000
All Counties	Rescue Rooter	(800) 869-6917
All Counties	Roto Rooter	(800) 269-3747
Contra Costa		
Contra Costa	A-1 Septic Tank Service	(510) 697-8083
Contra Costa	A-1 Septic Tank Service	(800) 730-4471
Contra Costa	AAA Fire Protection Services	(925) 932-4521
Contra Costa	Able Septic	(408) 377-9990
Contra Costa	All Valley Environmental, Inc.	(559) 498-8378
Contra Costa	Ameriguard Maintenance Services	(800) 347-7876 xt 14
Contra Costa	Bay Pumping	(831) 320 5229
Contra Costa	Miller & Gibson (prev Able Septic Tank Service)	(408) 377-9990
Contra Costa	Miller & Gibson (prev Able Septic Tank Service)	(408) 398-4990
Contra Costa	ModestoTallow/Florin Tallow Co.	(209) 522-7224
Contra Costa	ModestoTallow/Florin Tallow Co.	(800) 564-7204
Contra Costa	One More Time	(800) 624-5504
Contra Costa	Pioneer Liquid Transport	(800) 804-7327
Contra Costa	Sacramento Rendering Co.	(800) 339-6493
Contra Costa	Salinas Tallow	(800) 621-9000
Contra Costa	Sweet Septic Systems	(800) 622-8768

FOG BMPs

FOG BEST MANAGEMENT PRACTICES (BMP'S)

Prevent Blockages in the Sanitary Sewer System			
BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
Train kitchen staff and other employees about how they can help ensure BMPs are implemented.	People are more willing to support an effort if they understand the basis for it.	All of the subsequent benefits of BMPs will have a better chance of being implemented.	Talk to the establishment manager about the training program that he/she has implemented.
Post "No Grease" signs above all sinks and on the front of dishwashers.	Signs serve as a constant reminder for staff working in kitchens.	These reminders will help minimize grease discharge to the traps and interceptors and reduce the cost of cleaning and disposal.	Check appropriate locations of "No Grease" signs.
Use water temperatures less than 140° F in all sinks, especially the pre-rinse sink before the mechanical dishwasher. The mechanical dishwasher requires a minimum temperature of 160° F, but the Uniform Plumbing Code (UPC) prohibits discharging the dishwasher to grease traps.	Temperatures in excess of 140° F will dissolve grease, but the grease can re-congeal or solidify in the sanitary sewer collection system as the water cools.	The food service establishment will reduce its costs for the energy – gas or electric – for heating the water.	Check boiler or hot water heater discharge temperature. Measure the temperature of the hot water being discharged from the closest sink.
Use a three-sink dishwashing system, which includes sinks for washing, rinsing, and sanitizing in a	The three-sink system uses water temperatures less than 140° F where a mechanical dishwasher requires a minimum temperature of 160° F. (See above)	The food service establishment will reduce its costs for the energy - gas or electric - for heating the water for the	Measure temperature of the hot water at the three-sink system.

50-100 ppm bleach solution. Water temperatures are less than 140° F. (See above)	Note: The Uniform Plumbing Code (UPC) prohibits the discharge of dishwasher water to grease traps.	mechanical dishwasher and for operating the dishwasher.	
Recycle waste cooking oil.	There are many waste oil recyclers throughout Delaware. This is a cost recovery opportunity.	The food service establishment will be paid for the waste material and will reduce the amount of garbage it must pay to have hauled away.	Obtain name of recycler used. Review recycling records. Confirm records with recycler.
"Dry wipe" pots, pans, and dishware prior to dishwashing.	The grease and food that remains in pots, pans, and dishware will likely go to the landfill. By "dry wiping" and disposing in garbage receptacles, the material will not be sent to the grease traps and interceptors.	This will reduce the amount of material going to grease traps and interceptors, which will require less frequent cleaning, reducing maintenance costs.	Observe dishwashing practices.
Dispose of food waste by recycling and/or solid waste removal.	Some recyclers will take food waste for animal feed. In the absence of such recyclers, the food waste can be disposed as solid waste in landfills by solid waste haulers.	Recycling of food wastes will reduce the cost of solid waste disposal. Solid waste disposal of food waste will reduce the frequency and cost of grease trap and interceptor cleaning.	Inspect grease traps and interceptors for food waste accumulation. Confirm the recycler or solid waste removal company with the establishment manager.

Prevent Fats, Oil, and Grease From Entering Creeks and Streams Through the Storm Drain System

BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
Cover outdoor grease and oil storage containers. Some local jurisdictions will have BMPs in place for storm water also.	Uncovered grease and oil storage containers can collect rainwater. Since grease and oil float, the rainwater can cause an overflow onto the ground. Such an overflow will eventually reach the storm water system and nearby streams.	The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.	Observe storage area for signs of oil and grease. Inspect containers for covers. Remove covers to ensure containers have not overflowed and do not have excess water.
Locate grease dumpsters and storage containers away from storm drain catch basins.	The farther away from the catch basin, the more time someone has to clean up spills or drainage prior to entering the storm drain system. Be aware of oil and grease dripped on the ground while carrying waste to the dumpster, as well as oil and grease that may "ooze" from the dumpster.	The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.	Observe storage area for signs of oil and grease. Inspect the closest catch basin for signs of accumulated grease and oil.
Use absorbent pads or other material in the storm drain catch basins if grease dumpsters and containers must be located nearby. Do not use free flowing absorbent materials such as "kitty litter" or sawdust.	Absorbent pads and other materials can serve as an effective barrier to grease and oil entering the storm drain system.	The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.	Check the nearest catch basin and drainage paths for signs of grease and oil. Require absorbent pads if the basin is within 20 feet of grease dumpsters or containers or if there are signs of grease in the catch basin at any distance. Do not permit the use of free flowing absorbent material such as "kitty litter."

Use absorbent pads or other material to clean up spilled material around outdoor equipment, containers or dumpsters. Do not use free flowing absorbent materials such as "kitty litter" or sawdust that can be discharges to the storm drain system.	Absorbent pads or materials can help clean up grease and oil that is spilled on the ground and prevent it from flowing to the storm drain system.	The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.	If grease and oil are observed on the ground in the storage area, recommend the use of absorbents to minimize movement of the grease and oil. Do not permit the use of free flowing absorbent material such as "kitty litter."
Routinely clean kitchen exhaust system filters.	If grease and oil escape through the kitchen exhaust system, it can accumulate on the roof of the establishment and eventually enter the storm drain system when it rains.	The discharge of grease and oil to the storm drain system will degrade the water quality of receiving streams by adding biological and chemical oxygen demand to the stream. Discharge of grease and oil to the storm drain might also result in legal penalties or fines.	Inspect roof (if safely accessible) for signs of oil and grease. Require a maintenance schedule and records for cleaning exhaust filters. Cleaning is usually by washing, which will discharge the grease to the interceptor where it can be controlled.

Properly Maintain Grease Traps and Interceptors to Prevent Introduction into the Sanitary Sewer System			
BMP	Reason For	Benefits to Food Service Establishment	Pretreatment Inspection Tips
Witness all grease trap or interceptor cleaning/maintenance activities to ensure the device is properly operating.	Grease trap/interceptor pumpers may take shortcuts. If the establishment manager inspects the cleaning operation and ensures it is consistent with the procedures in the section on Grease Trap and Interceptor Maintenance they are more assured of getting full value for their money.	The establishment will ensure it is getting value for the cost of cleaning the grease trap or interceptor. Otherwise the establishment may be paying for cleaning more often than necessary.	None.
Clean under sink grease traps weekly, or more frequently, if needed. If grease traps are more than 50% full when cleaned weekly, the cleaning frequency needs to be increased.	Under sink grease traps have less volume than grease interceptors. Weekly cleaning of under sink grease traps by the establishment's own maintenance staff will reduce the cost of cleaning the grease interceptor. If the establishment does not have a grease interceptor, the under sink grease trap is the only means of preventing grease from entering the sanitary sewer system. If the grease trap is not providing adequate protection, the local sewer agency may require installation of a grease interceptor.	This will extend the length of the cleaning cycle for grease interceptors that the establishment maintains.	Visually inspect the contents of the under sink grease trap. Inspect cleaning records.

Clean grease interceptors routinely, at least monthly.	Grease interceptors must be cleaned routinely to ensure that grease accumulation does not cause the interceptor to operate poorly. The cleaning frequency is a function of the type of establishment, the size of the interceptor, and the volume of flow discharged by the establishment.	Routine cleaning will prevent plugging of the sewer line between the food service establishment and the sanitary sewer system. If the line plugs, the sewer line may back up into the establishment, and the business will need to hire someone to unplug it.	Interceptor should have no more than 1/3 the depth as grease, and, Interceptor should have no more than 1/4 the depth as sediment, and No more than 25% of the depth should be a combination of grease (top) and sediment (bottom).
Keep a maintenance log.	The maintenance log serves as a record of the frequency and volume of cleaning the interceptor. It is required by the pretreatment program to ensure that grease trap/interceptor maintenance is performed on a regular basis.	The maintenance log serves as a record of cleaning frequency and can help the establishment manager optimize cleaning frequency to reduce cost.	Inspect maintenance log. Provide the establishment with a sample maintenance log if it does not have one. Confirm the maintenance log with the grease hauler identified.

FATS, OILS AND GREASES (FOG) PROGRAM MAINTENANCE REPORTING FORM

For: City of Richmond
Source Control Program 510-621-1269

Company Name & Address: _____

_____

Reporting Period: _____

Date	Maintenance Performed (Inspection or Cleaning)	Performed By: (Company or Employee)	Gallons Removed (Trap/Interceptor)	Manager's Signature

FATS, OILS AND GREASES (FOG) PROGRAM TRAINING REPORTING FORM

For: City of Richmond
Source Control Program 510-621-1269

Company Name & Address: _____

_____

Reporting Period: _____

Date	Training Performed*	Performed By: (Company or Employee)	Names of employees trained	Manager's Signature

*i.e. Device Cleaning, BMP's

FOG Inspection Report for Food Services

City of Richmond
Industrial Pretreatment Program
450 Civic Center Plaza, 94804

Facility Name:		Inspection Date:
Address:		ID Number:
Owner or Authorized Rep Present:		Telephone:
Property Owner:		Telephone:
City Inspector/s:		APN:
Handouts provided	Tips: □ English □ Mandarin □ Spanish	Posters: □ English □ Mandarin □ Spanish

Type of Facility Business Activity(Check all that apply)

Fast Food (Carryout)	Restaurant	Bakery	Donut Shop	Deli	Meat Market	Other (write in type)
□	□	□	□	□	□	□

Grease & Oil Removal System

	Type	Oil/Grease Bin	Vault	Trap	Mechanical	Manual	None
1	Size (inches-GPH-lbs/day)						□
2	Condition	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	□
3	Garbage Grinder/Disposal Unit: □ Yes □ No			Sink Screen in place: □ Yes □ No □ Provided			
4	Number of meals served per day:						

Equipment Washing Procedures

5	BMP's	1 2 3 4 5	Comments:		
6	Training	1 2 3 4 5	Comments:		
7	Dry Wipe & Food Scraping	□Yes □No	Comments:		
8	Posted material/Poster	□ Yes □ No	Comments:		
9	Cleaning mats, filters, trash receptacles □ No mats □ No filters	□ inside □ outside	□ to storm drain □ covered	□ to sanitary sewer □ covered	Other:
10	Dumpster area clean	1 2 3 4 5	Comments:		
11	Outdoors area (dining, & parking) swept	1 2 3 4 5	Comments:		
12	Dry sweep spills	□ Yes □ No	Comments:		
13	Stormdrain marked/stenciled	□ Yes □ No	Comments:		

Grease & Waste Oil Storage/Disposal/Maintenance

14	Inspection Type	□ Routine □ Monitoring □ Enforcement □ Follow up	Comments:
15	Maintenance Records on site	□ Yes □ No □ N/A □ Need to submit	Comments:
16	Hauler Name		Comments:
17	Date Last Serviced		Comments:
18	Grease/Oil Bin Location	□ inside □ outside □ covered	Comments:
19	Grease/Removal Device Inspection Results	□ pass □ fail	Comments:

Sustainability Survey for Food Packaging & Untinsels

20	Styrofoam Materials	□ Yes □ No	Comments:
21	Compostable Materials	□ Yes □ No	Comments:

Required actions

22	Photo/Videos Taken	□ Yes □ No	Invoice #:	Comments:
23	Citation/Warning Issued	□ Yes □ No	Cite #:	Comments:
24	Follow-up Inspection	□ Yes □ No	Comments:	
25	Is removal device adequate	□ Yes □ No □ N/A	Comments:	
26	Are BMP's adequate	□ Yes □ No	Comments:	
27	Is a removal device required	□ Yes □ No □ N/A	Comments:	

General Comments:

Required actions

General Communications Log

Date	Time	Comments

LAU VÀ ĐỔ VÀO THÙNG RÁC ĐỒ THỪA HAY DẦU MỠ TRONG NỒI TRƯỚC KHI RỬA NỒI





THU VÀ TÁI CHẾ DẦU ĂN ĐÃ SỬ DỤNG

LAU CHÙI BỘ PHẬN CHẶN VÀ LƯỚI CHẮN DẦU MỠ ĐỀU ĐẶN



DÙNG ĐỒ CHẤM ĐỂ THẤM DẦU MỠ ĐỔ RA NGOÀI TRƯỚC KHI LAU



QUITE LOS RESTOS DE COMIDA Y GRASA Y TÍRELAS A LA BASURA ANTES DE LAVAR LAS OLLAS





JUNTE Y RECICLE EL ACEITE DE COCINA

LIMPIE LAS COLADERAS E INTERCEPTORES DE GRASA CON REGULARIDAD



USE MATERIALES ABSORBENTES PARA RECOGER LA GRASA QUE SE HAYA CAIDO ANTES DE TRAPEAR EL PISO



냄비나 후라이 팬 등에 묻어 있는 음식물 찌꺼기와 기름기는 설거지 하기 전에 종이 타월 등으로 씻어내어 쓰레기 통에 버리십시오





식용유는 사용하신 후에 다시 모아두었다가 재사용하십시오

싱크대 아래 폐유 수집해주는 장치는 정기적으로 청소해주십시오



대걸레로 바닥 청소를 하실 때에는 바닥에 떨어진 기름기를 흡수용지로 먼저 닦아낸 다음에 하십시오



WIPE FOOD AND GREASE OUT OF POTS BEFORE WASHING AND DISCARD WASTE INTO THE TRASH





COLLECT AND RECYCLE USED COOKING OIL

HAVE GREASE INTERCEPTORS AND TRAPS CLEANED ON A ROUTINE SCHEDULE



USE ABSORBENTS TO CLEAN UP GREASY SPILLS BEFORE MOPPING



清洗鍋子前先擦掉食物殘渣和油脂，然後將廢棄物丟入垃圾桶





收集和回收煮過的食用油

定期清理油脂阻截箱和截納箱

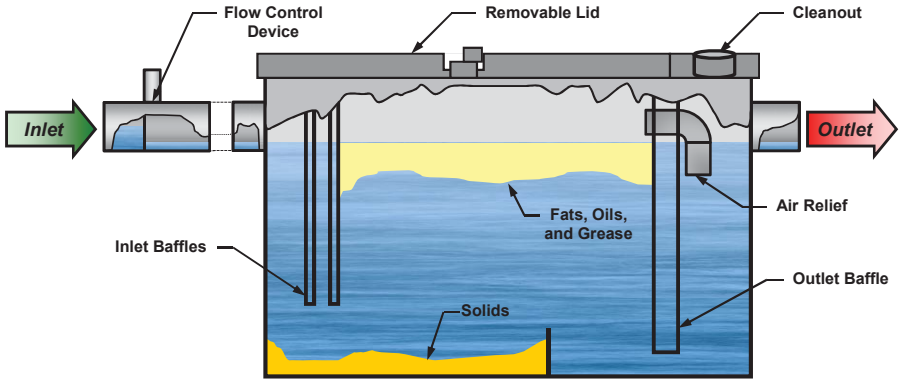


拖地前先用吸油物品清除外濺的油脂



Hydromechanical Grease Interceptor (HGI)
Fact Sheet

Hydromechanical grease interceptors (HGIs) (formerly named grease traps) treat kitchen wastewater from food service establishments (FSEs) using gravity separation aided by vented flow control. They are typically installed indoors and connected to one to four sinks in the kitchen. They accumulate fats, oil and grease (FOG) and solids over time in a relatively small separator tank allowing the treated wastewater to discharge to the sanitary sewer (see the figure below).



Hydromechanical Grease Interceptor
Indoor, Above Ground (Typical)
15-60 Gallons, 20-50 GPM (Typical)
40-100 Pounds of FOG Storage (Typical)

Design and Sizing

HGIs are made of steel, fiberglass or polyethylene, typically consisting of a single compartment with baffles, and sized according to the Uniform Plumbing Code (UPC). Chapter 10, Table 10-2 of the 2006 UPC and the 2009 UPC provide two different sizing methods for HGIs. Regardless of the sizing method, HGIs are sized based on flow rate and the pounds of FOG that they can store. Typically, they treat 20-50 gallons per minute (GPM), store 40-100 pounds of FOG, and are 15-60 gallons in volume. Vented flow control devices must be installed upstream of HGIs to control the wastewater flow to match the certified flow rate of the HGI. If this flow control device is not installed, the HGI may not perform properly when the flow exceeds the certified flow rate.

Certification and Approval

HGIs are tested and certified to ASME A112.14.3 or PDI-G101 standards at the HGI's specified maximum flow rate. Sewering agencies often require that HGIs be certified to these standards before they can be approved for use in their service area. Plan check approvals should make sure that one or more HGIs are connected to all the significant grease waste drains (e.g., pot sink, pre-rinse sink, wok station).

Proper Maintenance

HGIs should be cleaned before the floating FOG and settled solids accumulation exceeds 25% of the HGI's overall capacity. In order to prevent this, daily to weekly cleaning of the HGI by kitchen staff or pumping contractors may be required to ensure proper operation. If performed by kitchen staff, solids and FOG should be dewatered (e.g., mixed with kitty litter) and discarded in the trash.



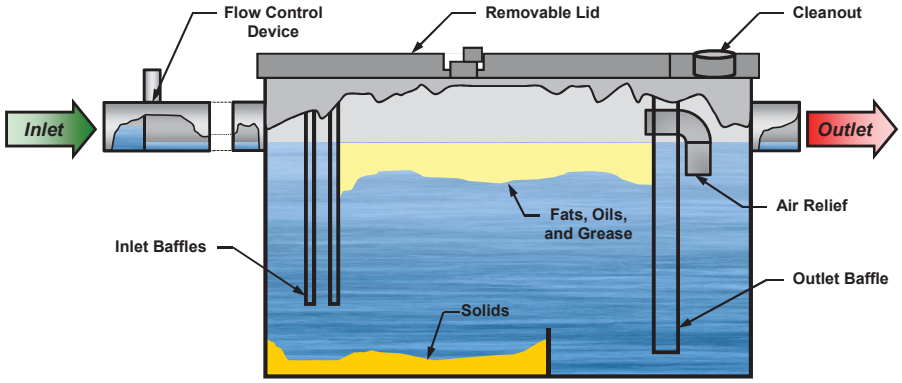
Inspections

Agency inspections should focus on making sure that the HGIs are in proper working order and are being cleaned frequently enough to prevent an over-accumulation of FOG and solids. Inspectors will typically notify the FSE if the HGI needs more frequent cleaning or maintenance. FSEs are often required to save pumper receipts or maintain logs to show the inspector that the proper maintenance is being performed.

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Hydromechanical Grease Interceptor (HGI)
Fact Sheet

Hydromechanical grease interceptors (HGIs) (formerly named grease traps) treat kitchen wastewater from food service establishments (FSEs) using gravity separation aided by vented flow control. They are typically installed indoors and connected to one to four sinks in the kitchen. They accumulate fats, oil and grease (FOG) and solids over time in a relatively small separator tank allowing the treated wastewater to discharge to the sanitary sewer (see the figure below).



Hydromechanical Grease Interceptor
Indoor, Above Ground (Typical)
15-60 Gallons, 20-50 GPM (Typical)
40-100 Pounds of FOG Storage (Typical)

Design and Sizing

HGIs are made of steel, fiberglass or polyethylene, typically consisting of a single compartment with baffles, and sized according to the Uniform Plumbing Code (UPC). Chapter 10, Table 10-2 of the 2006 UPC and the 2009 UPC provide two different sizing methods for HGIs. Regardless of the sizing method, HGIs are sized based on flow rate and the pounds of FOG that they can store. Typically, they treat 20-50 gallons per minute (GPM), store 40-100 pounds of FOG, and are 15-60 gallons in volume. Vented flow control devices must be installed upstream of HGIs to control the wastewater flow to match the certified flow rate of the HGI. If this flow control device is not installed, the HGI may not perform properly when the flow exceeds the certified flow rate.

Certification and Approval

HGIs are tested and certified to ASME A112.14.3 or PDI-G101 standards at the HGI's specified maximum flow rate. Sewering agencies often require that HGIs be certified to these standards before they can be approved for use in their service area. Plan check approvals should make sure that one or more HGIs are connected to all the significant grease waste drains (e.g., pot sink, pre-rinse sink, wok station).

Proper Maintenance

HGIs should be cleaned before the floating FOG and settled solids accumulation exceeds 25% of the HGI's overall capacity. In order to prevent this, daily to weekly cleaning of the HGI by kitchen staff or pumping contractors may be required to ensure proper operation. If performed by kitchen staff, solids and FOG should be dewatered (e.g., mixed with kitty litter) and discarded in the trash.



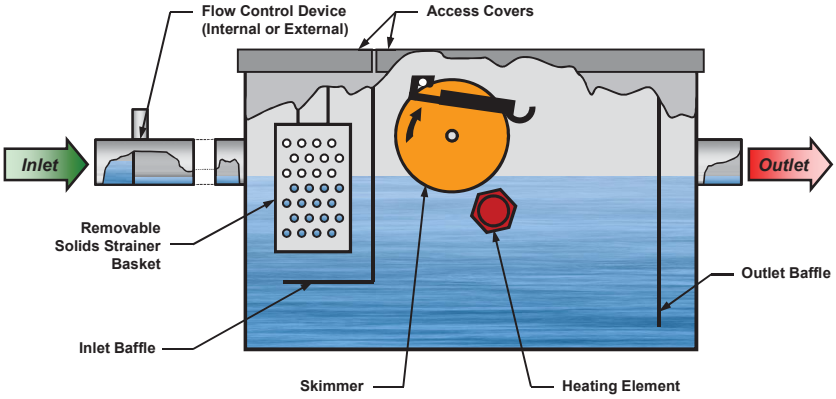
Inspections

Agency inspections should focus on making sure that the HGIs are in proper working order and are being cleaned frequently enough to prevent an over-accumulation of FOG and solids. Inspectors will typically notify the FSE if the HGI needs more frequent cleaning or maintenance. FSEs are often required to save pumper receipts or maintain logs to show the inspector that the proper maintenance is being performed.

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Grease Removal Device (GRD)
Fact Sheet

Grease Removal Devices (GRDs) are a type of hydromechanical grease interceptor (HGI) that treats kitchen wastewater from food service establishments (FSEs) and are equipped with automatic grease removal features. They are typically installed indoors and connected to one to four sinks in the kitchen. They accumulate fats, oil and grease (FOG) in a relatively small separator tank. The accumulated FOG is automatically removed from the GRD and transferred to a separate FOG waste container reducing the need for cleaning (see the figure below).



Grease Removal Device
Skimmer Style Shown. Other Style Units are Available
Indoor, Above Ground (Typical)
15-60 Gallons (Typical), 20-50 GPM (Typical)

Design and Sizing

GRDs are typically made of corrosion resistant materials and are equipped with baffles, screens, and external waste containers to store the removed FOG waste. Some are equipped with heaters, skimmers, pumps or hydrostatic pressure chambers to assist in removal of the FOG. They are sized according to the same Uniform Plumbing Code (UPC) sizing methods that are used for HGIs (Chapter 10, Table 10-2). Flow control devices must be installed internal or external of GRDs to control the wastewater flow to match the certified flow rate of the GRD.



Certification and Approval

GRDs are tested and certified to ASME A112.14.3 and ASME A112.14.4 standards at the GRD's specified maximum flow rate. Sewering agencies often require that GRDs be certified to these standards before they can be approved for use in their service area. Plan check approvals should make sure that one or more GRDs are connected to all the significant grease waste drains (e.g., pot sink, pre-rinse sink, wok station).

Proper Maintenance

GRDs should be maintained through daily emptying of the solids basket into the trash and emptying the FOG waste container into a larger FOG waste container for proper disposal or recycling. Because many GRDs have heaters and skimmers and other critical mechanical equipment, these must be maintained by the FSE and cleaned or replaced, as needed.

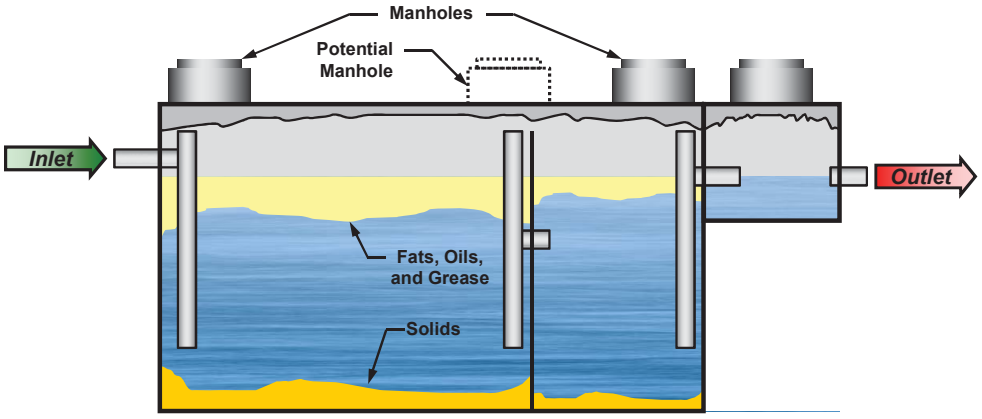
Inspections

Agency inspections should focus on making sure that the GRDs are in proper working order and are being maintained frequently enough to prevent an over-accumulation of FOG and solids. Inspectors will typically notify the FSE if the GRD needs more frequent cleaning or maintenance. FSEs are often required to maintain logs to show the inspector that the proper maintenance is being performed.

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A Committee of Bay Area Clean Water Agencies

Gravity Grease Interceptor (GGI)
Fact Sheet

Gravity grease interceptors (GGIs) treat kitchen wastewater from food service establishments (FSEs) using gravity separation. They accumulate fats, oil and grease (FOG) and solids over time allowing the treated wastewater to discharge to the sanitary sewer (see the figure below).



Gravity Grease Interceptor
Outdoor, In-ground
500 – 1,500 Gallons (Typical)

Design and Sizing

GGIs are made of precast concrete, steel, fiberglass or PVC and are sized according to the Uniform Plumbing Code (UPC). Chapter 10, Table 10-3 of the 2006 and 2009 UPC sizes GGIs based on the number of drainage fixture units (DFUs) connected to the interceptor. Typically, GGIs are 500 - 1,500 gallons in volume, depending upon the number of kitchen drains connected.

Certification and Approval

The International Association of Plumbing and Mechanical Officials (IAPMO) provides certifications for a wide variety of GGI products and sizes. Agencies often require that GGIs be certified by IAPMO before they can be approved for use in their service area.

Proper Maintenance and The 25% Rule

Many California sewering agencies require that GGIs be cleaned (pumped) out completely at a mandatory minimum frequency of once every 90 days to prevent the over-accumulation of floating FOG and settled solids. A complete pump-out means that all of the contents of the interceptor must be pumped out and no liquids can be returned to the interceptor unless specific permission has been granted in writing by the sewering agency for this practice. Some GGIs may need to be pumped out more frequently than once every 90 days if the floating FOG and settled solids accumulation exceeds 25% of the overall capacity of the interceptor prior to the 90 day period (i.e, the 25% Rule).



Inspections

Agency inspections should focus on making sure that the GGI is working properly and that the internal plumbing and baffle walls are intact. If an inspector determines that the floating FOG and settled solids accumulation is excessive in the GGI, they will typically notify the FSE that the GGI must be pumped more often. FSEs are often required to save pumper receipts or maintain logs to show the inspector that the proper maintenance is being conducted.



BAY AREA POLLUTION PREVENTION GROUP
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CIty of Richmond
FOG Activities 2014 - Present
SSO Information

Street Address	Location Description	Potential Source	Action Taken	SSO Source	SSO Cause	Date/Time of SSO
432 28th Street	Residential	Church	Church was closed that day, but had large event previous weekend. Explained to pastor about FOG and maintaining sewer lines.	Clean-out	Grease Deposition (FOG)	2014.01.07 14.30.00
1039 S. 55th Street	Residential	Not able to determine	Door Hangers	Manhole	Grease Deposition (FOG)	2014.02.15 12.27.00
350 29th Street & 2829 Nevin Ave	Residential	Not able to determine	Door Hangers	Inside Building or Structure	Grease Deposition (FOG)	2014.02.28 02.00.00
2321 Potrero Avenue	Residential	Not able to determine	Door Hangers	Gravity Mainline	Grease Deposition (FOG)	2014.03.04 21.15.00
579 5th Street	Residential	Not able to determine	Door Hangers	Inside Building or Structure	Grease Deposition (FOG)	2014.05.07 12.30.00
1737 Hellings Ave	Residential	Not able to determine	Door Hangers	Gravity Mainline	Debris-Rags and Grease	2014.05.21 12.00.00
441 South 17th Street	Residential	Not able to determine	Door Hangers	Inside Building or Structure	Grease Deposition (FOG)	2014.07.20 11.00.00
253 3rd Street	Residential	Not able to determine	Door Hangers	Inside Building or Structure	Grease Deposition (FOG)	2014.09.08 13.00.00
San Pablo Ave & Garvin Avenue	Commercial	Gas Station w/ Mini Mart	Inspected Grease Traps for Valero (no issues)	Gravity Mainline	Grease Deposition (FOG)	2014.10.11 11.25.00
23rd Street & Humphrey Avenue	Commercial	Restaurants near location	Inspected Grease Traps for La Selva (warning notice)	Manhole	Grease Deposition (FOG)	2014.10.18 13.15.00
12999 San Pablo Avenue	Commercial	Restaurants near location	Inspected Grease Traps for Burger King (warning notice)	Manhole	Grease Deposition (FOG)	2014.11.23 19.00.00
2347 Maricopa Avenue	Residential	School near area	Inspected Richmond High (no issues). Do not (currently) inpsect elementary schools.	Other sewer system structure	Rags and Grease	2014.12.23 14.00.00
South 21st and Cutting Blvd.	Commercial	Shields Reid Nursing Facility	Inspected Grease trap (letter of warning)	Gravity Mainline	Grease Deposition (FOG)	2015.02.21 17.30.00
7th Street & Hensley Street	Commercial	No facility in area with FOG	None	Manhole	Grease Deposition (FOG)	2015.04.16 23.42.00

Street Address	Location Description	Potential Source	Action Taken	SSO Source	SSO Cause	Date/Time of SSO
23rd Street and Downer Avenue (2317 Downer Ave)	Residential	Near School (kitchen?)	School District states elementary school have no cooking on site	Lateral Clean Out (Private)	Grease Deposition (FOG)	2015.06.20 12.15.00
327 South 17th St.	Residential	Near church (kitchen?)	Church was closed. No activity	Other sewer system structure	Grease Deposition (FOG)	2015.07.31 08.56.00
2533 Maine Ave.	Residential	Not able to determine	None	Manhole	Grease Deposition (FOG)	2015.08.17 09.30.00
2325 Lowell Ave.	Residential	Near potential FOG facilities	Inspected facilities in area (Philadelphia Hoagie and Pepito's)	Lateral Clean Out (Private)	Grease Deposition (FOG)	2015.08.26 09.00.00
4210 Roosewood Ave.	Residential	Not able to determine	None	Lower Lateral (Private)	Grease Deposition (FOG)	2015.09.16 13.00.00
1201 34th St.	Residential	Not able to determine	None	Manhole	Grease Deposition (FOG)	2015.11.25 22.30.00
609 37th Street, Richmond, CA 94805	Residential	Holy Trinity Church	Church was closed. No activity. Met with Pastor later to provide outreach information regarding proper disposal of Fats, Oils and Grease	Manhole	Grease Deposition (FOG)	2016.05.09 13.04.00
38 Washington St., Richmond, CA	Commercial	Hotel Mac	Inspected Grease Trap - no violation, but informed manager of potential issues	Upper Lateral (Private)	Grease Deposition (FOG)	2016.05.21 15.00.00
2319 Maricopa Ave., Richmond, CA	Residential/Commercial	Taquerida Y Raspados	Inspected Grease Trap at Taquerida. Letter of Warning issued for Grease Trap. Reinspected 1 week later. Rating: 3	Manhole	Grease Deposition (FOG)	2016.06.05 20.00.00
S. 35th Street and Cutting blvd	Commercial	Possibly Bethel Temple Pentecostal Church	Church was closed. No activity. Met with Pastor later to provide outreach information regarding proper disposal of Fats, Oils and Grease. He stated that rarely is church used for public events	Lateral Clean Out (Private)	Grease Deposition (FOG)	2016.11.06 19.35.00
12890 San Pablo Ave., Richmond, Ca	Commercial	Pho Thai Hung Restaurant	Inspected grease trap and issued Letter of Warning	Lateral Clean Out (Public)	Grease Deposition (FOG)	2016.11.27 14.14.00

Appendix G
Element 8 (System Evaluation and Capacity Assurance) Supporting Documents

In June 2010, Veolia Water (Veolia), the contract operator for the City of Richmond (City) collection system, retained West Yost Associates (West Yost) to complete a wastewater collection system master plan. The master plan assesses the conveyance capacity of the City's collection system within the Richmond Municipal Sewer District (RMSD). The draft Master Plan was completed in March 2011. Since this time, additional flow monitoring and alternatives analyses have been conducted, and some priority projects are underway. In November 2010, the City and Veolia asked West Yost to update the Master Plan to reflect the recent findings and activities.

ES.1 BACKGROUND AND INTRODUCTION

The primary purpose of this sewer collection system master plan (Master Plan) is to evaluate the City of Richmond gravity sewer collection system under a specific design storm, using a computerized hydraulic model, to determine whether the system can convey flows without sewer system overflows (SSOs). Where SSOs are predicted by the hydraulic model, this Master Plan provides recommended solutions.

The City and Veolia have developed two prior master planning studies, in 2006 and 2007. However, both of these studies relied on incomplete flow data. As a result, neither of these studies was able to replicate system operational conditions or to identify surcharge and capacity issues to the level of assurance of this Master Plan.

In 2010, the City and Veolia completed a new flow monitoring study upon which this Master Plan is based. In 2011, Veolia conducted additional flow monitoring with a specific focus on measuring tidal response in the southern portion of the system. The 2010 and 2011 flow monitoring studies were successful in capturing flow data throughout the system during several reasonably sized storm events and additional tidal events. This Master Plan benefits from this additional data, and is intended to supersede the prior planning studies completed by the City and Veolia for the sewer collection system.

This Master Plan is comprised of the following nine chapters:

- Chapter 1 – Introduction
- Chapter 2 – Existing Wastewater System
- Chapter 3 – System Flows
- Chapter 4 – Flow Monitoring Program
- Chapter 5 – Hydraulic Model Development
- Chapter 6 – Planning Criteria
- Chapter 7 – Capacity Analysis
- Chapter 8 – Pipeline Repair and Replacement Program
- Chapter 9 – Capital Improvement Plan

The Master Plan was developed to meet the following objectives:

- Evaluate system-wide flow characteristics to identify areas contributing to high inflow and infiltration (I&I);
- Assess the existing hydraulic capacity of the collection system;
- Evaluate modeled pump station firm capacity under design storm conditions;
- Summarize previously developed pipeline condition and replacement needs; and
- Develop a prioritized capital improvement program (CIP) that strategically replaces or repairs facilities over time to first meet the requirements of the settlement agreement between the City and San Francisco Baykeeper, and also provide long-term system reliability.

The recommendations that are presented in this Master Plan must be considered in conjunction with proposed improvements at the City's wastewater treatment plant. Master planning activities for the treatment plant are in progress by others. The success of the recommended collection system improvements in addressing wet weather sewer system overflows (SSOs) depends on the City's ability to maintain 42 million gallons per day (mgd) of pumping capacity[1] at the wastewater treatment plant influent pump station, and subsequently, to maintain or exceed this capacity in the primary and secondary processes at the plant.

ES.2 EXISTING WASTEWATER SYSTEM

The City's Richmond Municipal Sewer District (RMSD) provides wastewater collection service to a majority of the City of Richmond, as well as a small area within unincorporated county limits, all located within Contra Costa County in the San Francisco Bay Area. The City of Richmond and RMSD collection system service area are shown on Figure ES-1.

Abutting the City of Richmond's service area, West County Wastewater District (WCWD) provides sewer collection service to a small portion of the City on the northern border of the City, adjacent to the City of San Pablo, and Stege Sanitary District (Stege) collects wastewater for a portion of the City in the eastern hills, adjacent to the City of El Cerrito. The City, WCWD, and Stege convey flows to three separate wastewater treatment plants.

The City's existing sewer collection system is comprised of approximately 187 miles of active gravity sewer pipelines with sizes ranging from 4 to 66 inches in diameter, 15 miles of pressure pipelines, and 14 pump stations, according to the California Integrated Water Quality System (CIWQS) database. The City conveys all flows to its wastewater treatment plant that is located on Canal Boulevard, south of I-580. Information on the existing system is summarized in this section and is also presented in Chapter 2 of this report.

[1] Maximum influent pump station pumping capacity as provided by Veolia.

ES.2.1 Population Served & Land Use Characteristics

The estimated population for the City of Richmond is 103,701 based on the 2010 census. The City's RMSD service area includes a wide range of mixed land uses, as shown in Figure ES-2. These land uses were provided by the City and were supplemented with Contra Costa County public GIS resources.

ES.2.2 Collection System Facilities

The City's sewer system is comprised of approximately 187 miles of pipe ranging in diameter from 4 to 66 inches. The predominant pipeline material for small diameter pipelines is vitrified clay pipe. The City's service area is comprised of ten sewer drainage basins. Flows from each of the sewer basins were monitored by the City under a flow monitoring program that began in February 2010 and was concluded in June 2010. This flow monitoring program collected system data and also collected additional flow data to pinpoint the impact and locations of tidal infiltration in the southern portions of the service area. A subsequent flow monitoring study to further evaluate tidal inflow was completed in July 2011.

The City owns and operates 14 pump stations. Three of these pump stations, Canyon Estates 1, 2, and 3, are considered outside of the RMCD service area because they discharge to the Stege Sanitary District. Five of the City's pump stations were included in the hydraulic model; these stations, which include the Keller Beach, Ferry Point, ICI, Marina Bay Cove, and Marina Bay Parkway pump stations each convey flow directly to a modeled trunk sewer.

ES.2.3 Overview of Legal and Regulatory Mandates

Veolia and the City operate and maintain the City's collection system plant in accordance with a number of regulatory documents, including:

- Regional Water Quality Control Board (RWQCB) National Pollution Discharge Elimination System permit,
- RMSD Sewer System Management Plan (SSMP), and
- 2006 City of Richmond-Baykeeper settlement agreement.

These mandates form the basis for recommendations in the Master Plan, and are discussed further in Chapter 2 of this report.

ES.3 SYSTEM FLOWS

Sewer system dry weather flows were estimated using land use information, unit flow factors, aerial photography, industrial discharge data, service area boundary data, the sewer network, and data collected during the City's 2010 flow monitoring program.

Land use information was provided in GIS format from the City of Richmond, and supplemented by public GIS information available through Contra Costa County. The City also provided West Yost with industrial wastewater discharge data. These flows were added as calculated point loads to the more generalized land use-based flows more accurately depict basin-specific dry weather flows.

Because the RMSD service area limits are not the same as the City limits, parcels that straddled the service area boundary were included or excluded from flow calculations using a 50 percent rule. This rule included flow from parcels when at least 50% of the parcel's area was included within the service area boundary. There were numerous exceptions to this rule, as defined in Chapter 3 of this report.

The City's demographics and stable population base justified calculation of average dry weather flow using unit flow factors and land use designations. Flow factors for each land use category, ranging from very low residential to various categories of commercial and industrial uses were developed and applied to the land use on a sewershed by sewershed basis (the system included 883 individual sewersheds).

Flows from twelve large industries as provided by the City were then added to the calculation to ensure that the absence of large discharger data would not skew calculated results. The combined flows were then adjusted until calculated flows per basin were within approximately ten percent of measured flows. The segregated industries included the following:

- Chevron
- Department of Health Services
- Bio-Rad Laboratories
- Kinder Morgan
- Kaiser Foundation
- California Fats and Oils
- West Contra Costa Unified School District
- Social Security
- U.C. Richmond Field Station
- Catellus Development Corp
- U.C. Regents
- T&T Richmond LP

Diurnal patterns were applied to the flows to most accurately represent flow patterns that were measured during the flow monitoring program.

ES.4 FLOW MONITORING AND INFLOW & INFILTRATION ANALYSIS

In early 2010, the City and Veolia completed a system-wide flow monitoring program. The program was conducted by V&A from February to June 2010. In addition, from May 2010 to June 2010, five additional flowmeters were installed at new locations within the southern portion of the service area to refine and supplement data for areas with tidal inflow and high groundwater infiltration. In July 2011, six flowmeters were installed in the southern basins to further evaluate potential tidal inflows. Data and results are presented in the V&A reports titled, *Flow Monitoring and Inflow/Infiltration Study (December, 2010, Flow Monitoring of Five Tidal Sites (September, 2010), and Sanitary Sewer Flow Monitoring and Tidal Inflow and Infiltration*

Study (September, 2011). The V&A Reports are included in Appendix B. The flow monitoring program and results are discussed further in Chapter 4 of this report.

The flow monitoring program included twelve (12) gravity meters that measured flows from ten basins, and two (2) rain gauges. Figure ES-3 presents the flow meter locations and associated collection system basins. The basins were named by West Yost in development of the hydraulic model.

The 2010 flow monitoring program captured rainfall events with a statistical recurrence interval of less than 2 years (*i.e.,* 50 percent probability of occurring in any given year) through twelve gravity meters that measured flows from ten drainage basins. Peak flows generated by these rainfall events resulted in surcharge conditions in all but two of the metered locations throughout the collection system.

The primary contributors to wet weather I&I in the City's system are 1) direct tidal inflow in the southern basins, 2) groundwater infiltration including a tidal saturation infiltration component, 3) storm runoff inflow from direct connections between stormwater facilities and the sewer system, and 4) rainfall dependent infiltration.

The highest level of tidal inflow was found in the southern sewer basins. After the flow monitoring period, Veolia addressed several sources of tidal inflow through the installation of duck-bill check valves on the wet weather outfall structures. The 2011 flow monitoring effort has confirmed the positive impact that these activities have had on reducing tidal inflows. The highest levels of rainfall dependent inflow and infiltration (RDII) were found in the Castro, 1st Street, and Canal Boulevard basins, which were monitored by Meters 1, 3, and 4, respectively.

ES.5 CAPACITY ANALYSIS

A capacity analysis was conducted using a computer-based hydraulic model of the City's RMSD wastewater collection system, developed using Innovyze® InfoWorks™ CS software. The hydraulic model includes the City's main trunk sewers (typically 12-inch diameter and larger) and associated facilities, and is a skeletonized representation of the City's RMSD sewer system in its configuration and operation. This section summarizes the components of the capacity analysis that are discussed further in Chapter 5 of this report.

Veolia Water developed the hydraulic model network and provided this network to West Yost for further development and analysis. The hydraulic model comprises a skeletonized network of nodes (*e.g.*, manholes) and conduits (*e.g.,* pipelines).

The structural components of the hydraulic model network, (*i.e.*, nodes and conduits) were initially developed by Veolia staff and provided to West Yost in September 2010. The hydraulic model consists of approximately 47 miles of sewer pipeline ranging in diameter from 4-inches to 66-inches. The model includes all 12-inch diameter and larger trunk lines, and associated manholes and lift stations. Many 10-inch diameter pipelines have been included, as provided by Veolia staff, as well as 4-inch, 6-inch and 8-inch diameter lines in selected areas as needed to provide connectivity. The 47 miles of pipeline represent approximately 25 percent of the City's RMSD system.

Five of the City's fourteen pump stations are included in the hydraulic model: Marina Bay Parkway, ICI, Ferry Point, Marina Bay Cove, and Keller Beach. In addition, the hydraulic model includes the influent pump station wet well at the wastewater treatment plant. Figure ES-4 shows the RMSD sewer network and modeled assets.

ES.5.1 Dry Weather Flow Generation

West Yost delineated 883 subcatchments within the hydraulic model. Subcatchments were generally defined to encompass a single land use that flows to a single model node. Wastewater flows were generated for each subcatchment or sewershed, and were comprised of one or more of the following components:

- Base wastewater flow (BWF);
- Tidal saturation infiltration (TSI), which results when tidal activity saturates the soil and infiltrates into the pipeline network through defects in the system, during dry weather and wet weather periods; and
- Rainfall-dependent Infiltration and Inflow (RDII).

Base wastewater flows were calculated based on land uses, with the exception of twelve industrial point loads that were provided by the City and applied to specific nodes. For the City's hydraulic model, industry-standard unit flow factors (verified through flow monitoring data) were applied to land use to generate BWF. Diurnal patterns were applied to the flows in each monitoring basin as needed to match the flow pattern in each basin to measured flows.

Tidal Saturation Infiltration (TSI) was then included in the model to account for measured groundwater infiltration in the southern sewer basins. TSI was calculated using base flow measurements that were consistently present and that exceeded anticipated dry weather flows during off-peak (*i.e.*, nighttime) hours. Calculated TSI was distributed across selected pipe segments based on the product of pipe diameter and length.

These dry weather flows were calibrated within the hydraulic model to closely reflect measured flow values. The average dry weather weekday flow measured during the 2010 flow monitoring period was 6.3 mgd.

ES.5.2 Wet Weather Flow Generation

The City's model uses the RTK method to calculate wet weather inputs to the hydraulic model. The RTK method generates hydrographs from each subcatchment that represent flows during and immediately after rainfall events caused by seepage of water into the collection system. The RTK method generates a series of three triangular hydrographs that represent short-term, medium-term, and long-term rainfall response. The RTK parameters include:

1. R is the area of the graph representing the portion of rainfall falling on a subcatchment that enters the sewer collection system.
2. T is the time from the onset of rainfall to the peak of the triangle.
3. K is the ratio of the "time to recession" to the "time to peak" of the hydrograph.

RTK parameters were adjusted by basin, beginning with the upstream basins, until measured flows during the calibration storm closely matched model-generated flows in temporal distribution and volume.

Tidal Inflows (TI) were also included in the model for use during wet weather flow simulations. TI were derived to represent measured flows in excess of dry weather flows during non-rainfall periods.

During the calibration storm, significant surcharging occurred throughout the system. During the flow monitoring period, incoming flows exceeded the available pumping capacity of the WWTP's influent pump station and the wet well water level rose to its maximum level. The wet well level created a hydraulic gradeline that was carried back through all of the low-lying portions of the service area. As a result, in some basins, measured flow peaks were difficult to replicate in the model.

However, despite the surcharge condition, only one meter, Meter 10, experienced consistent backwater effects. Therefore, the data collected during the calibration storm was sufficient to calibrate the hydraulic model to measured flow volumes and general flow patterns. The peak hourly measured wet weather flow during the flow monitoring season was approximately 33 mgd.

ES.6 PLANNING CRITERIA

Planning criteria addresses items such as collection system capacity, gravity sewer slopes, and maximum depth of flow. As required by the City-Baykeeper settlement agreement, the City evaluated the system under a design storm with a recurrence interval of 10 years (*i.e.*, 10 percent probability of occurring in any given year) and duration of 24 hours.

Flow characteristics for the 10-year, 24-hour design storm were derived from data that is maintained by the Contra Costa County Flood Control District. Using the County's depth-frequency-duration curves in conjunction with the County's Mean Seasonal Isohyet map, total rainfall depth of 4.2 inches was used to represent a 10-year, 24-hour design storm in the City of Richmond. This rainfall depth was then distributed using the Natural Resource Conservation Service SCS Type 1 rainfall distribution curve.

Pipelines were considered to have a capacity deficiency when, under peak wet weather flow conditions for the design storm, the water level or hydraulic grade line (HGL) exceed ground surface level.

A lift station was considered capacity deficient if the station did not have sufficient firm capacity, *i.e.* capacity with the largest pump out of service, to convey peak hourly flows during the design storm. Based on pump station characteristics that were documented in the City's prior master planning efforts, all pump stations were sufficiently sized to convey design flows.

New or replacement pipelines were sized to convey model-generated peak flows without significant surcharge. Capacity constraints were addressed through the addition of parallel pipelines, located along the same alignment and depth as the existing, surcharged pipe. Optimized pipeline alignments were not included this Master Plan. Optimizations to pipeline

alignments and flow diversions should be considered during the preliminary design phase for each project.

ES.7 HYDRAULIC CAPACITY ANALYSIS RESULTS

The City's modeled collection system network was evaluated for its capacity to convey flows that are predicted to occur during a design storm event. The analysis was completed using a design storm with a published recurrence interval of 10 years and duration of 24 hours (10-year, 24-hour design storm). The system was evaluated for its ability to convey all flows from the design storm without overflows. Recommended capacity assurance projects are shown in Figure ES-5. Additional information on the projects listed below is presented in Chapter 7 of this Master Plan.

Due to the relatively flat topography of the lower third of the service area, wet weather flows are significantly impacted by the operating level at the wastewater treatment plant influent pump station. The proposed capacity improvements reduce flows to the wastewater treatment plant to more closely match the influent pump station capacity of 42 mgd. Flows are controlled through the addition of a new relief sewer and wet weather storage facility. Following the wet weather event, stored flows are conveyed through existing pipelines to the treatment plant.

The hydraulic model identified the need to store flows of approximately 7.5 million gallons during the design storm event, in order to control and reduce flows to the treatment plant. The preferred location for wet weather storage is a location near or within the existing Chevron facility at West Gertrude Avenue and Richmond Parkway. This location has received preliminary discussion between the City and Chevron regarding the potential for Chevron to allow the City to use the basins as wet weather storage, thereby establishing a beneficial use for the facility as desired by Chevron. Chevron believes that they have up to 20 million gallons of storage available for use by the City for wet weather storage.

The storage location would include a pumping facility to return flows back to the system after the rainfall event. The storage facility would include pre-screening, and should be designed to maximize scouring velocities and minimize odors. Storage will likely require the acquisition of easements and/or property, as well as community endorsement. The addition of storage will require environmental clearance under the California Environmental Quality Act.

The hydraulic model identified eight project areas where the water surface or hydraulic gradeline exceeded the ground surface elevation. These locations were identified as having sewer system overflows during the design storm event. General descriptions for the associated capacity improvement projects are listed below. More detailed information on each project is presented in Chapter 7 of this Master Plan.

- Hensley Street Capacity Improvements. 3.8 miles of relief sewers conveying flows from the northern half of the service area west, to a new storage location near the existing Chevron pond facility.
- Cutting and Hoffman Boulevard Sewer Capacity Improvements – 2.4 miles of relief sewers from Carlson Boulevard to Harbour Way South, and along Hoffman Boulevard south of Cutting Boulevard.

- 1st Street, MacDonald, and Virginia Avenue Sewer Capacity Improvements - 1.8 miles of relief and replacement sewers from Pennsylvania and 4th Street down to 1st Street and West Cutting Boulevard, on MacDonald Avenue near 23rd Street, and on Virginia Avenue near Harbour Way.
- San Pablo Avenue and Carlson Boulevard Sewer Capacity Improvements – 1.7 miles of new and relief sewers from Amador Street and Eastmond Avenue to San Pablo Avenue, ending at the intersection of Richmond Greenway Trail and South 47th Street, and on Carlson Boulevard.

The hydraulic model identified sufficient capacity in each of the five modeled pump stations to convey design flows. In addition to the five modeled pump stations, the City operates nine smaller stations within the sewer collection system. This Master Plan did not assess the capacity of these smaller stations to convey design flows. As trunk sewers and associated infrastructure are replaced over time, the City should review the firm capacity of these unmodeled collection system pump stations.

Table ES-1, also presented as Table 7-4 in the report, summarizes the capacity improvement projects and associated costs. Construction costs include the total construction cost estimate including contingency. Total costs add project design and construction administration to the total construction cost.

Table ES-1. Capacity Improvement Project Estimated Costs

Project Name	Project	Estimated Construction Cost	Estimated Total Cost
Hensley Street Pipelines	Parallel Relief Sewer and New Trunk Sewer	$13.7M	$16.1M
Cutting & Hoffman Boulevards	Parallel Relief Sewers	$6.5M	$7.6M
First Street, MacDonald Avenue, Virginia Avenue	Parallel Relief and Trunk Sewers	$6.5M	$7.7M
San Pablo & Carlson Boulevards	Parallel Relief and Trunk Sewers	$3.6M	$4.2M
Total Estimate for Pipeline Projects		$30.3M	$35.6M
Total Estimate for Storage (8MG)		$20.8M	$24.4M

ES.8 PIPELINE REHABILITATION AND REPLACEMENT PROGRAM

This Master Plan scope included a review and reprioritization of previously-generated system rehabilitation and replacement (R&R) projects. Two documents previously prepared by West Yost summarize the City's previously-defined R&R needs, which are also listed in priority order below. These documents are included as an appendix to Chapter 8 of this Master Plan.

- Elimination of stormwater inflow: This description includes multiple projects over time to systematically address sources of tidal inflow into the collection system.

- Cypress Point sewer replacement project: Original a component of the Keller Beach interceptor replacement project, this project has been identified as a standalone project due to its criticality and history of sewer system overflows.
- Keller Beach interceptor replacement project: This project replaces existing pipelines and collectors sewers in the Point Richmond neighborhood of the City. A large portion of the interceptor system is submerged within the San Francisco Bay.
- Ongoing pipeline repairs and replacements: This project summarizes point repairs and pipeline replacements that were previously identified to eliminate the City's most significant pipeline structural defects, including pipe failures and significant offsets.

ES.9 PRIORITIZED CAPITAL IMPROVEMENT PLAN

Chapter 9 of this Master Plan presents the recommended Capital Improvement Program (CIP) for the City's RMSD gravity sewer collection system. The recommended CIP identifies the needed improvements at a master planning level, and does not constitute conceptual or preliminary design of these improvements. Subsequent alignment studies and preliminary designs are required to finalize pipeline configuration and alignment, and to determine the final sizes, locations, and details of the proposed improvements.

The CIP was developed to create a fundable program that addresses the City's competing needs for capacity improvement and reliability. The following criteria were used to prioritize the various projects and develop a timeline for implementation.

- Projects to Eliminate SSOs in compliance with the existing settlement agreement between the City and San Francisco Baykeeper.
- Projects to Reduce Maintenance-Related SSOs, including critical condition-related rehabilitation projects and projects that are needed to render the collection system pipes accessible to CCTV inspection equipment.

The proposed CIP begins implementation in Fiscal Year 2011/12 and extends into Fiscal Year 2020/2021. The total estimated 10-year CIP cost is $98.5 million. Of this amount, $60.2 million is needed to meet the capacity requirements that are included in the City-Baykeeper settlement agreement, and are recommended for completion within the Baykeeper settlement agreement timeframe. If this schedule is not achievable, these improvements are recommended within the 10-year CIP timeframe. The remaining costs were spread through the 10-year timeframe of this CIP, but can be further distributed into future programs.

The City-Baykeeper settlement agreement requires completion of the proposed capacity improvement projects by September 1, 2014. However, the schedule for implementation of the capacity improvements is constrained by the timeframe needed to secure environmental clearances for the proposed storage project, which must be initiated first, as well as currently available funds. Therefore, as desired by the City and Veolia, projects needed to provide in-system storage are planned for completion by 2013/14, in order to substantially meet the contractual requirement. The storage facility will help address the most significant historical capacity issues for the City, including the two combined sewer/stormwater discharges to the Richmond Inner Harbor. The remaining pipeline capacity improvements will eliminate more localized predicted sewer system overflow issues over time. If the City is able to implement the

proposed project on an accelerated schedule, then the project implementation timelines will be adjusted accordingly.

The proposed rehabilitation projects that are discussed above provide needed ongoing rehabilitation on a parallel track with the City's capacity improvements. The estimated cost of the City's priority rehabilitation and replacement projects is $28.3 million.

The balance of the CIP provides a $10 million placeholder for unknown project that arise during the implement of the capital program. This item includes the project needed to eliminate the Harbour and Wright overflow structure that is currently under discussion outside of the recommendations of this master plan.

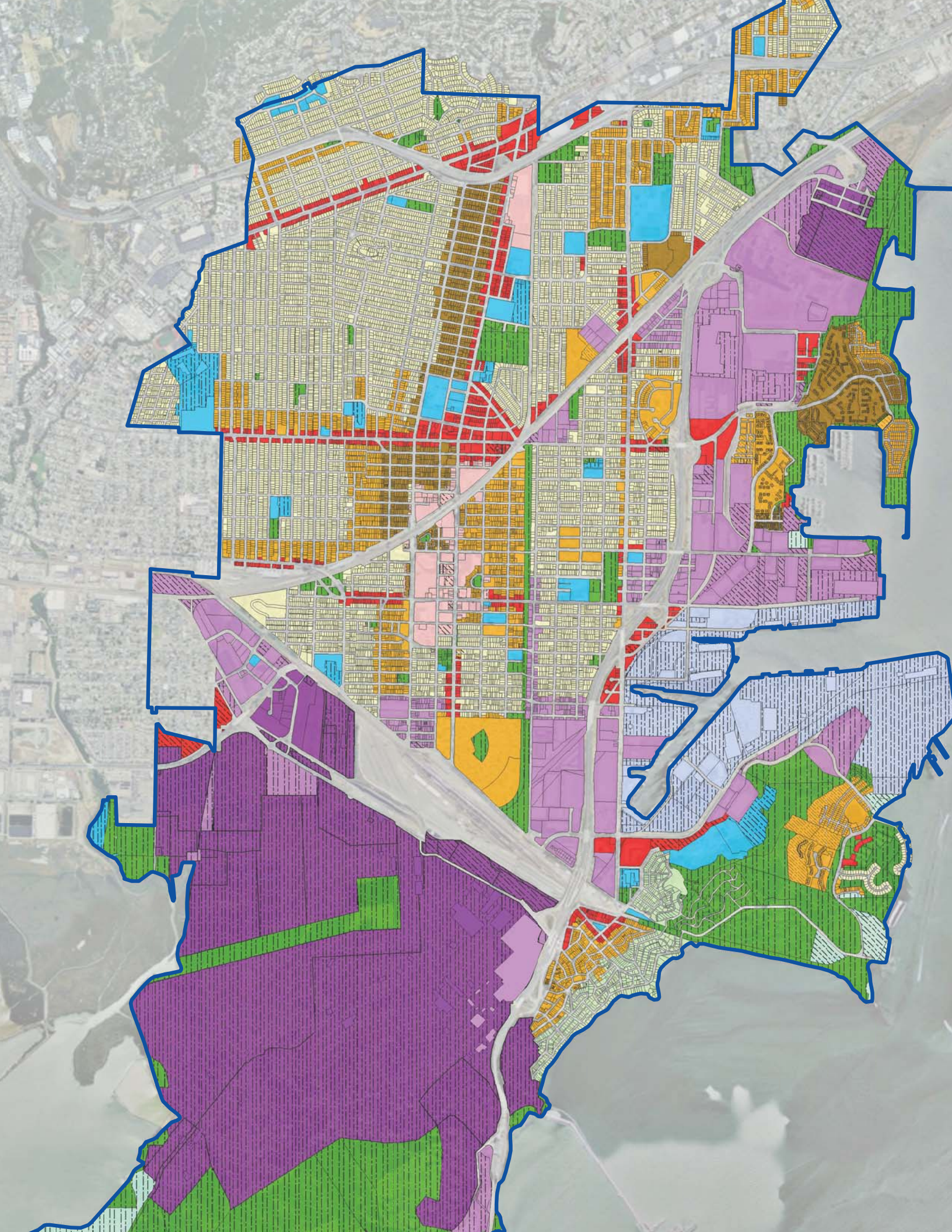
The proposed CIP is presented as Table ES-1, and again as Table 9-1.

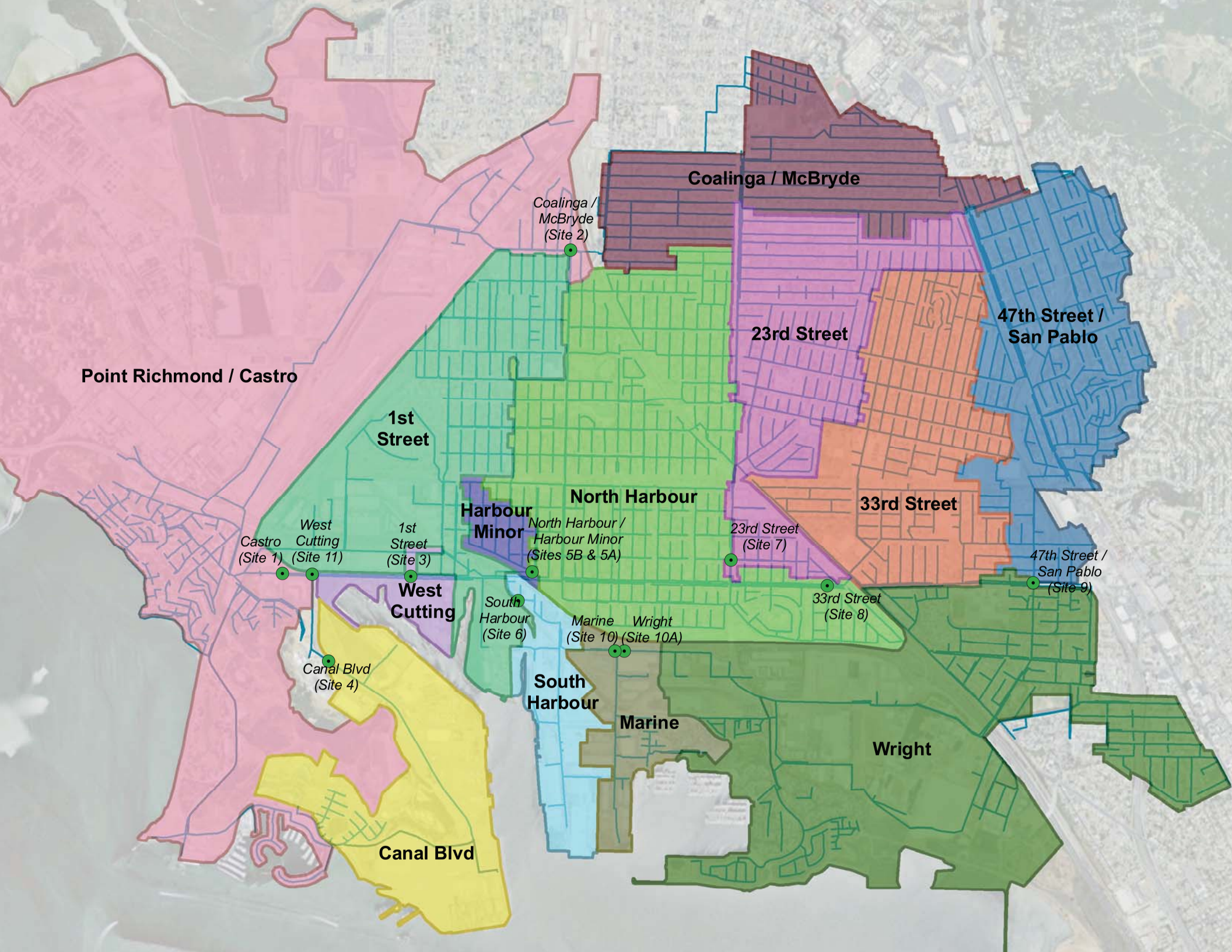
ES.10 NEXT STEPS

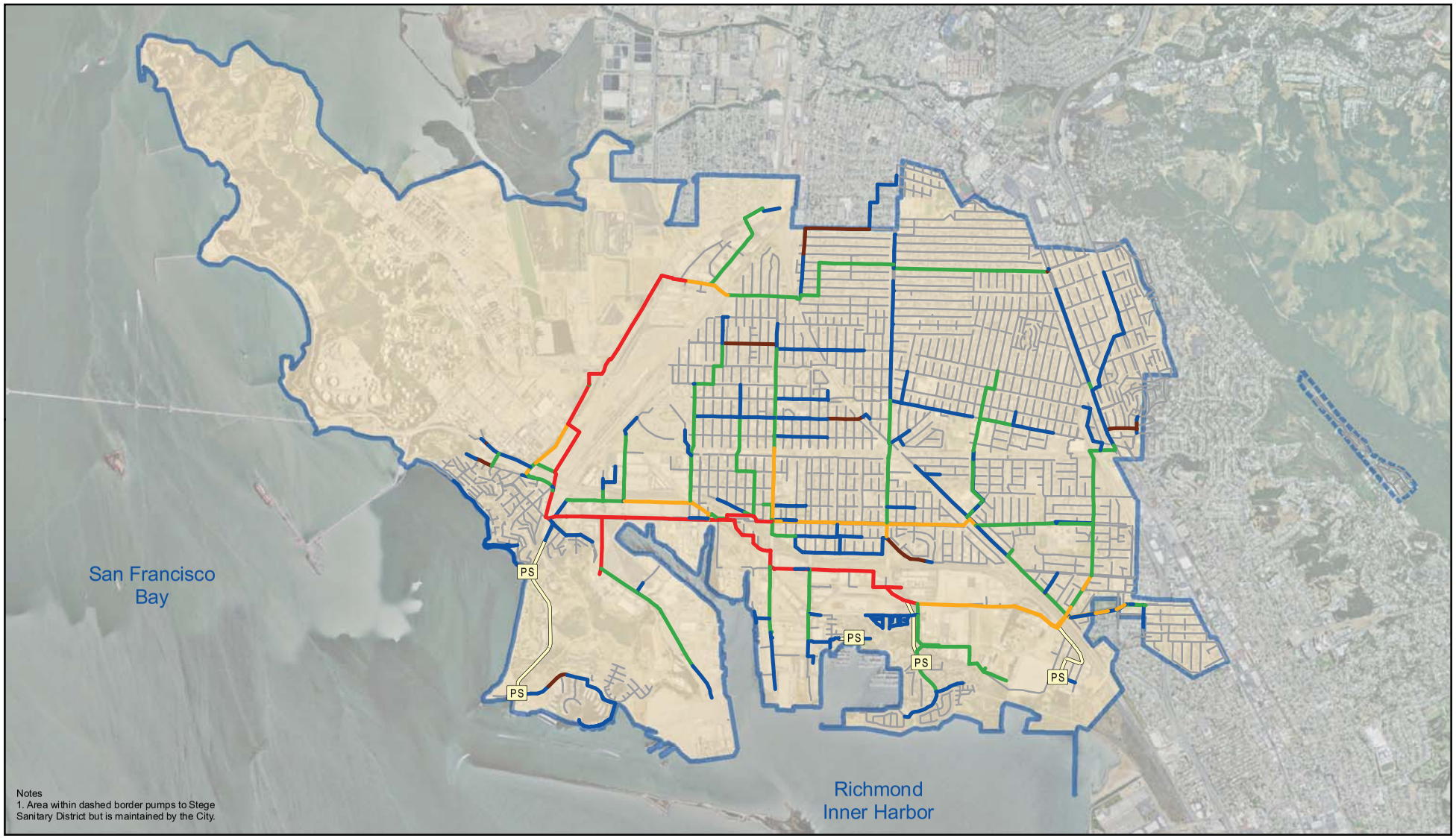
This Master Plan is designed to be a working document that is updated over time to reflect current knowledge about system issues and needs. The City's highest priority in the implementation of the Master Plan recommendations is to address SSOs to meet the requirements of San Francisco Baykeeper, and to meet the requirements established by the Regional and State Water Resources Control Board. The following specific tasks are recommended in the near term as the City implements the recommendations in this Master Plan:

- Conduct system-wide wet weather flow and rainfall monitoring in 2011/12, and include locations in the system that are needed to refine the requirements of the proposed Barrett Avenue Relief Sewer project. The objective of the 2011/12 flow monitoring program is to capture additional data that will assist in refining model development and calibration in order to remove possible conservatism in predicted results.
- Complete the I&I reduction projects (pipeline rehabilitation and replacement) that are currently underway. After the current projects are completed, the City should consider conserving remaining available funds for capacity improvement projects and emergency/urgent rehabilitation needs.
- Continue planning activities for the Hensley Street Wet Weather Storage project, and begin planning and design for the other proposed capacity improvement projects.
- Confirm that the City's permitted dry weather flow dischargers are holding flow during periods of dry weather and also periods of high tide.
- Continue to investigate and address tidal inflow from the 1st Street basin and also from the South Harbour area.
- Evaluate and address storm drain cross-connections that may be present in North Harbour basin, as indicated by the City's previous smoke testing activities.
- Evaluate operational activities that may unnecessarily elevate WWTP influent pump station levels, as these levels have a direct and significant impact on system flows during both wet and dry weather.


n Francisco
Bay
Richmond
Inner Harbor




Coalinga / McBryde
Coalinga / McBryde (Site 2)
23rd Street
47th Street / San Pablo
Point Richmond / Castro
1st Street
North Harbour
Harbour Minor
33rd Street
North Harbour / Harbour Minor (Sites 5B & 5A)
23rd Street (Site 7)
47th Street / San Pablo (Site 9)
West Cutting (Site 11)
Castro (Site 1)
1st Street (Site 3)
West Cutting
South Harbour (Site 6)
33rd Street (Site 8)
Marine (Site 10)
Wright (Site 10A)
Canal Blvd (Site 4)
South Harbour
Marine
Wright
Canal Blvd



LEGEND

Modeled Pipes

- 4" - 8"
- 10" - 12"
- 15" - 21"
- 24" - 30"
- > 30"

PS Modeled Pump Station

Force Main

Unmodeled Sewer Pipes

Service Area

N

0 0.5 1

Miles

FIGURE ES-4

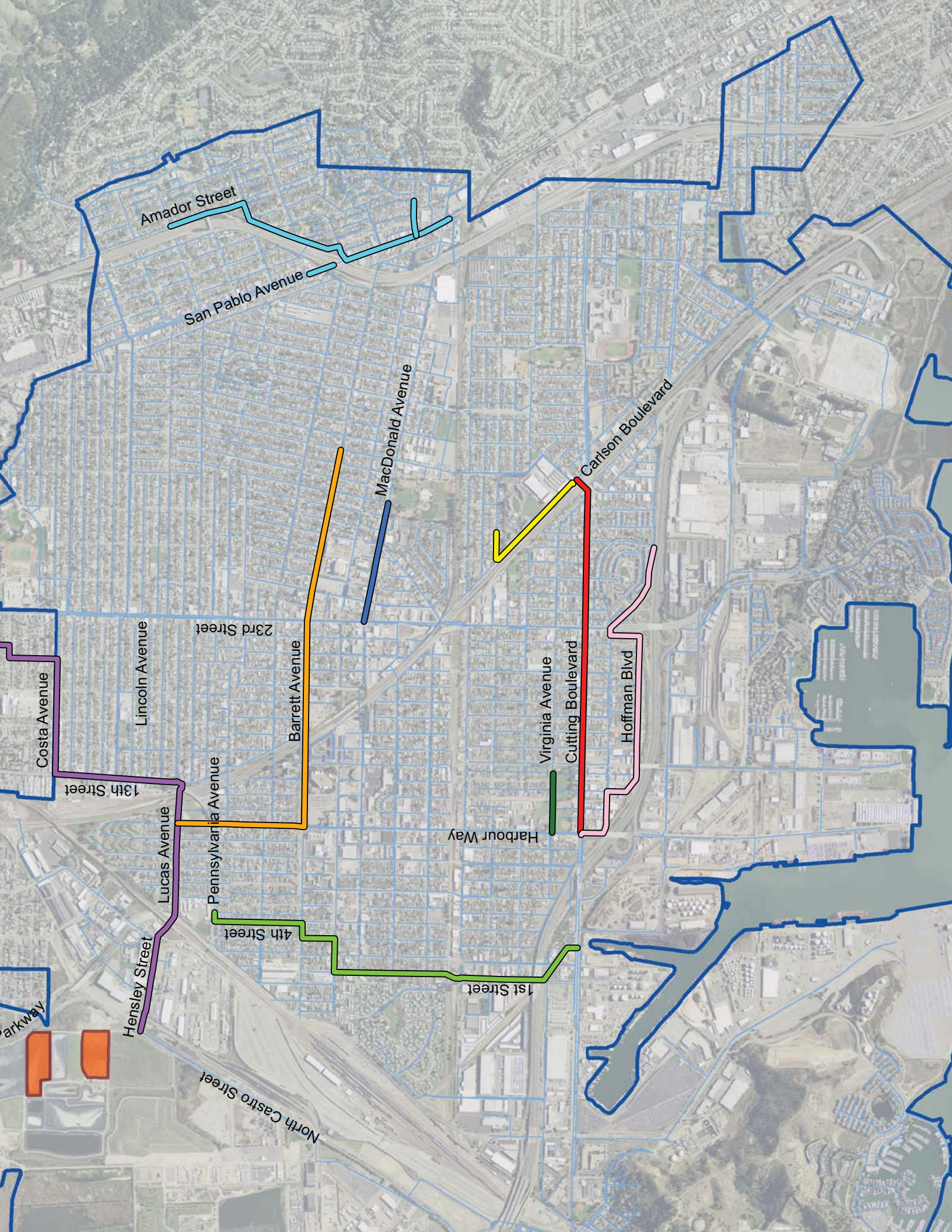
City of Richmond
Sewer Collection System Master Plan

MODELED SEWER COLLECTION SYSTEM FACILITIES

VEOLIA WATER

WEST YOST ASSOCIATES Consulting Engineers

O:\Clients\356 Veolia Water\02-10-05 Hydraulic Model Update & 2010 Capacity Analysis\GIS\Figure ES-4 (Modeled Collection System).mxd 3/18/2011


Amador Street
San Pablo Avenue
MacDonald Avenue
Carlson Boulevard
23rd Street
Lincoln Avenue
Barrett Avenue
Costa Avenue
13th Street
Pennsylvania Avenue
Lucas Avenue
Hensley Street
Virginia Avenue
Cutting Boulevard
Hoffman Blvd
Harbour Way
4th Street
1st Street
North Castro Street

Appendix H
Element 9 (Monitoring, Measurement & Modifications
Placeholder for Future Supporting Documents

Appendix I
Element 10 (SSMP Program Audits) Supporting Documents

WASTEWATER COLLECTION SYSTEM INSPECTION CHECKLIST

Agency:	
Inspection Team:	
Facility Representatives:	
Date of Inspection:	

A. SEWER SYSTEM OVERVIEW

Please provide responses to the information requested in the right column below or in a separate attachment as appropriate.

Item	**Response**
1. Population served by your agency's sewer system	
2. Service Area (sq. mi.)	
3. Are other agencies/communities discharging into this sewer system? If so, please provide a list of these agencies/communities. Does an interagency agreement exist and who is responsible for maintaining the other system(s)?	
4. Map showing major interceptors, trunk lines and pump stations	
5. Flow monitoring program in place? If so, please briefly describe the program and provide actual sewer system flows in #6 below.	
6. Provide design and actual sewer system flows: a. Average daily dry weather flow (MGD): b. Peak dry weather flow (MGD): c. Peak wet weather flow (MGD): d. Seasonal dry weather flow (MGD):	
7. Basis of peak flow (storm frequency):	1 in ____ year occurrence
8. Average annual precipitation (in):	
9. Miles of sewer (total)	
10. Miles of gravity sewers	
11. Miles of forced mains and other pressure systems	
12. What percentage of your sewer system was constructed between the years of: a. 2000-Present b. 1980-1999 c. 1960-1979 d. 1940-1949	

Item	Response
e. 1920-1939 f. Before 1919	
13. Responsibility for laterals? (e.g., at main line connection or from main line to property line (or easement or cleanout) or beyond property line)	
14. # of Pump stations	
15. % Pump stations with remote status monitoring	
16. % Pump stations with backup power sources	

Please present a general overview of the information requested in Sections B-E below. Please provide one hard copy and if available an electronic-copy of the documents indicated. Please note that some documents should only be made available for viewing purposes during the site inspection and will be indicated as such. When appropriate, please provide responses in the right column or in a separate attachment (provide one hard copy and if available an electronic copy). In some cases, the Agency may be requested to provide a demonstration and/or present an overview of the information requested during the site visit.

B. SEWER SYSTEM MANAGEMENT AND SPILL RESPONSE:

Item	Response
1. Sewer maps (viewing only) and/or demonstration of GIS	
2. Presentation and a copy of the 11 Elements of the District's Sewer System Management Plan (SSMP) a. Goals b. Organization c. Overflow Emergency Response Plan d. Fats, Oils and Grease (FOG) Control Program e. Legal Authority f. Measures and Activities (map; resources and budget; prioritized preventive maintenance; scheduled inspections and condition assessment; sewer cleaning and maintenance inventory, spare parts inventory; training; and outreach to plumbers and building contractors) g. Design and Construction Standards h. Capacity Management (assessment, system evaluation and capacity assurance plan) i. Monitoring, Measurement and Program Modifications j. SSMP Audit k. Communication Program	
3. Number of current vacancies to operate and maintain sewer system in your organization	
4. Annual Budget for current and past three fiscal years	
5. Most recent Sewer Master Plan. Is the City on schedule with the implementation of projects recommended in its most recent Sewer	

Item	Response
Master Plan?	
6. List of capital improvement projects completed in the past three years; List of current and future capital improvement projects.	
7. Sources of funding for sewer O&M and capital improvement projects (i.e. sewer fees, general fund, bonds)	
8. Average current residential sewer fee, basis of sewer rate fee, and allocations of sewer fees. Sewer rates for the past five fiscal years. Provide copy of the most recent sewer rate study and discuss any plans if any to increase your Agency's sewer rates.	
9. Average time from spill report to on-site response for each calendar year for the past three years and current year.	
10. Demonstration of spill response tracking system (manual or computerized information management system). Make available for viewing customer complaint records, field spill reports, and office spill reports.	
11. Contingency equipment and replacement inventories. If not already included in the SSMP, provide an up-to-date list of critical spare parts, major equipment for O&M and for effective response to emergency conditions.	
12. Pump Station Inventory. Provide a list of pump stations including type and configuration, flow, percent of service area served by pump station, number of pumps and capacity, backup power, and alarms listing.	
13. Overflow Emergency Response Plan. If the plan is only referenced and not summarized in the SSMP, please provide a copy of the plan.	

C. SEWER SYSTEM MAINTENANCE:

Item	Response
1. Demonstration of maintenance management system (manual, computerized management information system or computer-based maintenance management system (CCMS)). Make available for viewing service request reports, work orders, system inventory, sewer inspection and condition assessment records, maintenance and cleaning records, and pump station O&M records/log books.	
2. Demonstration of telemetered monitoring and supervisory control systems (i.e. Supervisory Control And Data Acquisition (SCADA) system or system to gather data, supervise and control operations of the sewer collection system)	
3. Sewer cleaning statistics for last three full calendar years per year a. System cleaning production (miles per year) b. System cleaning frequency (years) c. Pipes cleaned at least once per year (% of system)	

Item	Response
d. Number of manholes inspected annually e. Force mains inspected annually (miles or feet)	
4. Hot spot cleaning/inspection schedule (a-e above) and workload	
5. Average frequency of Food Service Establishments inspection over the past five full calendar years	
6. Summary of CCTV condition assessment rating	
7. Written explanation of pipe condition rating system	

D. SEWER SYSTEM CAPACITY

Item	Response
Has the system undergone a capacity and an Inflow/Infiltration (I/I) assessment? If so, please provide date and a summary of the findings.	
Is the District currently implementing an I/I reduction program? If so, please discuss any capital improvement projects or measures your Agency has implemented in the past 3 years and plans to implement in the future to reduce I/I into the system.	
Copy of Capacity assessment reports and Inflow/Infiltration (I/I) studies	

E. FINANCIAL INFORMATION

Complete Table 1 below utilizing previously audited budgets. Please estimate net assets for current fiscal year.

Table 1: Agency's Financial Summary

	FY 2009/2010 Actual	FY 2010/2011 Actual	FY 2011/2012 Actual	FY 2012/2013 Budgeted
Operating Revenue				
Operating Expenses				
Net Non-Operating Revenues				
Change in Net Assets				
Net Assets, Beginning of Year				
Net Assets, End of Year				

Please provide a list of your Agency's primary sources of revenue for collection system operation and maintenance, and for collection system capital improvement projects (i.e. sewer

service charges, inspection fees, connection fees, bonds, etc). For a municipality, please also provide a financial summary of the operating revenue and expenses associated with the operation and maintenance of the sewer collection system and implementation of related CIPs.

F. Sanitary Sewer Overflow (SSO) Event(s) and Unauthorized Discharge(s) Information:

Please provide additional information regarding the SSO Event(s) and unauthorized discharge event(s) that occurred on the following date(s). Please provide a response in the right column or in a separate attachment as appropriate. Please provide copies (one hard copy and if available one electronic copy of documents indicated below).

Item	Response
When applicable, specific questions or documentation needed regarding a specific SSO event(s) will be listed in this section.	

Richmond Municipal Sewer District

SSMP Audit Report Form

Audit Period Covered: January 1, 2012 through December 31, 2013

Audit completed by: V. W. Housen & Associates, Inc. on 4/27/2013

Introduction	Yes	No
Is the current system description complete and up to date? Are all infrastructure statistics current and complete?	X	

Discussion:

The City's SSMP was updated and re-adopted in 2013, and updated again in 2014 to reflect the new WDR Monitoring and Reporting requirements. This SSMP audit is based on the 2014 SSMP update.

	Element 1 – Goals	Yes	No
A	Are the goals stated in the SSMP still appropriate and accurate?	X	

Discussion:

	Element 2 -- Organization	Yes	No
A	Is the Contact Information current?	X	
B	Is the Sanitary Sewer Overflow Responder List current?	X	
C	Is the Organization Chart in Figure 2-1 of the SSMP current?	X	
D	Are the position descriptions an accurate portrayal of staff responsibilities?	X	
E	Is the chain of communication for reporting and responding to SSOs accurate and up-to-date?	X	
Discussion:			

	Element 3 – Legal Authority	Yes	No
Does the SSMP contain current references to the City's Code documenting the City's legal authority to:			
A	Prevent illicit discharges?	X	
B	Require proper design and construction of sewers and connections?	X	
C	Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the City?	X	
D	Limit discharges of fats, oil and grease?	X	
E	Enforce any violation of its sewer ordinances?	X	
F	Were any changes or modifications made in the past year or since the last SSMP audit to City Ordinances, Regulations, or standards?	No	
Discussion:			

	Element 4 – Operations and Maintenance	Yes	No
Collection System Maps			
A	Does the SSMP reference the current process and procedures for maintaining the City's sanitary sewer system maps?	X	
B	Are the City's wastewater collection system maps complete, current, and sufficiently detailed?	X (note 1)	
Prioritized Preventive Maintenance			
C	Does the SSMP describe current preventive maintenance activities and the system for prioritizing the cleaning of sewer lines?		Note 2
D	Based upon the SSO information in CIWQS and the Annual SSO Report, are the City's (i.e., Veolia's) preventive maintenance activities sufficient and effective in minimizing SSOs and blockages?		Note 3
Rehabilitation and Replacement Program			
E	Is there an ongoing condition assessment program sufficient to rank the condition of sewer pipes and schedule rehabilitation? Are the current components of this program documented in the SSMP?	X (note 4)	
F	Does the rehabilitation and replacement plan include a capital improvement plan that addresses proper management and protection of the infrastructure assets? Does the plan 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?	X (note 5)	
Contingency Equipment and Replacement Inventory			
G	Does the SSMP list the major equipment currently used in the operation and maintenance of the collection system?	X	
H	Are contingency equipment and replacement parts sufficient to respond to emergencies and properly conduct regular maintenance?	X (note 6)	
Training			
I	Are the training records current?	X	
J	Does the SSMP document current training expectations and programs?	X	

Element 4 – Operations and Maintenance	Yes	No

Discussion:

1. Veolia and the City meet to discuss changes to the system maps. This audit did not include a review of the Veolia maps vs. City maps to confirm consistency. If there are inconsistencies, the Veolia maps take precedence.
2. Veolia is developing a written O&M program and intends to provide this document to the City for review in 2014.
3. Reported SSOs were below the maximum number established in the SF-Baykeeper agreement for 2013. However, a plan is required to assure that SSOs remain below the 2014 maximum amount, which is much lower than the limit established for 2013.
4. CCTV is conducted on a 10-year cycle and projects are prioritized or pipelines repaired based on CCTV results. This note is a reminder for Veolia to document its process for prioritizing and implementing CCTV inspection. In particular, Veolia should identify CCTV inspection completed for the prior 5 years and planned for the next 5 years, which would together comprise the full ten-year cycle since that last data compilation in 2009.
5. The City, through Veolia, regularly repairs pipe segments to address system reliability issues. The current implementation schedule is outdated. During the next audit period (i.e., by the end of calendar year 2015), it is recommended that the City review and update the CIP to reflect these completed projects and potential new priorities.
6. Veolia will provide the City with a list of stored replacement parts in 2014.

	Element 5 – Design and Performance Standards	Yes	No
A	Does the SSMP reference current design and construction standards for the installation of new sanitary sewer systems, pump stations and other appurtenances and for the rehabilitation and repair of existing sanitary sewer systems?	X (Note 1)	
B	Does the SSMP document current procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and the rehabilitation and repair of existing sewer lines?	X	

Discussion:

1. Although the SSMP references the City's design standards, these standards are currently being updated and finalized, and a new set of standards will be available in 2014.

	Element 6 – Overflow and Emergency Response Plan	Yes	No
A	Does Veolia's Overflow Emergency Response Plan (OERP) contain proper notification procedures so that the primary responders and regulatory agencies are informed of all sanitary sewer overflows (SSOs) as required by the WDR and MRP?	X	
B	Does the OERP have a program to ensure an appropriate response to all overflows?	X	
C	Does the OERP contain procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities of all SSOs that potentially affect public health or reach waters of the State in accordance with the MRP? Does the SSMP identify the officials who will receive immediate notification of such SSOs?	X	
D	Are staff and contractor personnel aware of and appropriately trained on the procedures of the OERP?	X (Note 1)	
E	Does the OERP contain procedures to address emergency operations such as traffic and crowd control and other necessary response activities?	X	
F	Does the OERP ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge?	X	
G	Considering SSO performance data, is the OERP effective in handling SSOs in order to safeguard public health and the environment?	X	
H	Is the Water Quality Monitoring Plan current and has it been trained on and practiced by staff that would be involved in a SSO of large volume?		Note 1
I	Was sampling conducted within 48 hours for all SSOs greater than 50,000 gallons and were results entered for these SSOs through the CIWQS website?	n/a (Note 3)	
J	Has the City prepared a Technical Report for all SSOs larger than 50,000 gallons? Have all Technical Reports been filed on the CIWQS website as required?	n/a (Note 3)	

Element 6 – Overflow and Emergency Response Plan	Yes	No

Discussion:

1. The City and Veolia updated the SSMP in April 2014 to include the updated SSMP Monitoring and Reporting Requirements. Staff are aware and understand the new requirements. However, formal training has not been provided to Veolia staff, and it is not known whether Veolia has conducted formal training. The City will provide necessary training to staff and confirm Veolia training by June 2014.
2. There were nine SSOs > 50,000 gallons in 2012. These SSOS occurred between March 14, 2012 and December 28, 2012. No SSOs over 50,000 gallons in volume occurred after the updated WDR requirements became effective on September 9, 2013. Therefore, Veolia and the City did not complete Technical Reports for these SSOs.
   As relayed by Veolia, these SSOS occurred in areas that did not allow sampling. Samples were therefore not taken or recorded in CIWQS.

	Element 7 – Fats, Oils, and Grease (FOG) Control Program	Yes	No
A	Does the Fats, Oils, and Grease (FOG) Control Program include a description of public education outreach efforts that promote proper handling and disposal of FOG?	X	
B	Does the FOG program include a plan for the disposal of FOG generated within the sewer system service area?	X	
C	Does the City have sufficient legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG?	X	
D	Are there requirements to install grease removal devices (such as traps or interceptors), best management practices (BMP) requirements, record keeping, maintenance requirements and reporting requirements established in the City's FOG Control Program?	X	
E	Does the City have authority to inspect grease producing facilities and have sufficient staff to inspect and enforce the FOG ordinance?	X	
F	Does the FOG control program identify sections of the collection system subject to FOG blockages, establish a cleaning schedule and address source control measures to minimize these blockages?		Note 1

	Element 7 – Fats, Oils, and Grease (FOG) Control Program	Yes	No
G	Does the FOG control program implement source control measures for all sources of FOG discharged to the collection system?	X	
H	Is the current FOG program effective in minimizing blockages of sewer lines resulting from discharges of FOG to the system?		Note 2

Discussion:

1. Veolia is in the process of development an O&M program. This program, which will identify FOG-related hotspots and their associated maintenance schedules, will be provided to the City in 2014.
2. In 2012, the RMSD had 6 FOG-related SSOs of 46 total SSOs (approximately 13 percent). In 2013, the RMSD had 7 FOG-related SSOs of 29 total SSOs (approximately 24 percent). Although the total SSO number decreased, FOG-related SSOs stayed consistent. The City and Veolia should review the FOG-related SSOs that occurred in 2012 and 2013 to determine whether corrective action is appropriate.

	Element 8 – System Evaluation and Capacity Assurance Plan	Yes	No
A	Does the System Evaluation and Capacity Assurance Plan evaluate hydraulic deficiencies in the system and provide estimates of peak flows associated with conditions similar to those causing overflow events, if applicable?	X	
B	Does the City's capital improvement program (CIP) establish a schedule of approximate completion dates for both short-term and long-term improvements and is the schedule reviewed and updated to reflect current budgetary capabilities and activity accomplishment?	X (Note 1)	
C	Does the City take steps needed to establish a short and long-term CIP to address hydraulic deficiencies, including prioritization, alternatives analysis, and schedules? Are repair and replacement projects developed based upon condition assessment and/or field maintenance results?	X	

Discussion:

1. The City is continuously constructing projects to address system capacity, and is currently in design/build for wet weather storage facilities. The current implementation schedule is outdated. During the next audit period (i.e., by the end of calendar year 2015), it is recommended that the City review and update the CIP to reflect these completed projects and potential new priorities.

	Element 9 – Monitoring, Measurement, and Program Modifications	Yes	No
A	Does the City maintain relevant information that can be used to establish and prioritize appropriate SSMP activities?	X (Note 1)	
B	Does the City monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP?		Note 2
C	Does the City assess the success of the preventive maintenance program?	X	
D	Does the City update program elements, as appropriate, based upon monitoring or performance evaluations?	X	
E	Does the SSMP identify and illustrate SSO trends, including frequency, location and volume of SSOs?		Note 3

Discussion:

1. Veolia stores and maintains all system O&M data
2. Although progress in maintaining and managing the sewer collection system is monitored and discussed, this assessment does not specifically identify progress related to the individual SSMP Elements. This level of monitoring will be implemented during the 2014/2015 audit cycle.
3. Performance metric had not been established for the current audit period. However, SSMP audits will identify and illustrate SSO trends as described, beginning with the 2014-15 SSMP audit. Future audits will be included in Appendix I for reference.

	Element 10 – SSMP Audits	Yes	No
A	Does the audit focus on the effectiveness of the SSMP? If not, what needs to be changed to increase the effectiveness of the overall collection system program?	X	
B	Were the audit results shared with the City Council? And the public, via the City website?	X (Note 1)	
C	Will the SSMP Audit be completed, reviewed, and filed as an Appendix to the SSMP on a biennial basis?	X	
D	Do any proposed changes to the SSMP require Board approval as they have a substantial change in the policies and procedures for collection system operations and maintenance?		X

Discussion:

1. The audit results will be included in Appendix I of the SSMP, which will be uploaded to the City's website by June 2014.

	Element 11 – Communication Program	Yes	No
A	Does the City communicate on a regular basis with the public and other agencies about the development and implementation of the SSMP? Does the communication system provide the public the opportunity to provide input as the program is developed and implemented? Were annual progress reports and metrics of implementation of the SSMP provided to the City Council?	X (note 1)	

Discussion:

In early 2014, the City re-approved the updated SSMP in a public meeting that allowed public review and comment. The most recent update will be uploaded to the City's internet website by June 2014.

	Change Log	Yes	No
A	Is the SSMP Change Log current and up to date?	X	
Discussion:			

City of Richmond
SSMP Biennial Audit Report Form

Date of Audit:	***From: January 1, 2016***	***Through: June 30, 2017***
Prepared by:	Tim O'Connor	
Reviewed by:		

Introduction	**Yes**	**No**
Is the current system description complete and up to date? Are all infrastructure statistics current and complete?	X	
Discussion: This SSMP audit is based on the 2017 SSMP update.		

Element 1 – Goals	**Yes**	**No**
Are the goals stated in the SSMP still appropriate and accurate?	X	
Discussion:		

	Element 2 -- Organization	Yes	No
A	Is the Contact Information current?	X	
B	Is the Sanitary Sewer Overflow Responder List current?	X	
C	Is the Organization Chart in Figure 2-1 of the SSMP current?	X	
D	Are the position descriptions an accurate portrayal of staff responsibilities?	X	
E	Is the chain of communication for reporting and responding to SSOs accurate and up-to-date?	X	
Discussion:			

	Element 3 – Legal Authority	Yes	No
Does the SSMP contain current references to the City's Code documenting the City's legal authority to:			
A	Prevent illicit discharges?	X	
B	Require proper design and construction of sewers and connections?	X	
C	Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the City?	X	
D	Limit discharges of fats, oil and grease?	X	
E	Enforce any violation of its sewer ordinances?	X	
F	Were any changes or modifications made in the past year or since the last SSMP audit to City Ordinances, Regulations, or standards?	X See note 1	
Discussion: 1. Revised Construction Standards are to be approved and adopted by the City Council June 2017			

	Element 4 – Operations and Maintenance	Yes	No
Collection System Maps			
A	Does the SSMP reference the current process and procedures for maintaining the City's sanitary sewer system maps?	X	
B	Are the City's wastewater collection system maps complete, current, and sufficiently detailed?	X See note 1	
Prioritized Preventive Maintenance			
C	Does the SSMP describe current preventive maintenance activities and the system for prioritizing the cleaning of sewer lines?	X	
D	Based upon the SSO information in CIWQS and the Annual SSO Report, are the City's preventive maintenance activities sufficient and effective in minimizing SSOs and blockages?	X	
Rehabilitation and Replacement Program			
E	Is there an ongoing condition assessment program sufficient to rank the condition of sewer pipes and schedule rehabilitation? Are the current components of this program documented in the SSMP?	X	
F	Does the rehabilitation and replacement plan include a capital improvement plan that addresses proper management and protection of the infrastructure assets? Does the plan 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?	X See note 2	
Contingency Equipment and Replacement Inventory			
G	Does the SSMP list the major equipment currently used in the operation and maintenance of the collection system?	X	
H	Are contingency equipment and replacement parts sufficient to respond to emergencies and properly conduct regular maintenance?	X See note 3	

Element 4 – Operations and Maintenance		Yes	No
Training			
I	Are the training records current?	X	
J	Does the SSMP document current training expectations and programs?	X	

Discussion:
1. Veolia and the City meet and discuss changes on a bi-weekly basis. This audit did not include a review of the Veolia maps vs. City maps to confirm consistency. If there are inconsistencies, Veolia maps take precedence.
2. CCTV is conducted on a 10-year cycle and projects are prioritized or pipelines repaired based on CCTV results. Veolia uses CCTV data completed for the prior 5 years and planned for the next 5 years which comprises the full ten-year cycle to identify and prioritize Capital Improvement Projects using data compiled 2010 to current.
3. A comprehensive equipment/parts list is currently being compiled using Veolia's OWAM CMMS.

Element 5 – Design and Performance Standards		Yes	No
A	Does the SSMP reference current design and construction standards for the installation of new sanitary sewer systems, pump stations and other appurtenances and for the rehabilitation and repair of existing sanitary sewer systems?	X See note 1	
B	Does the SSMP document current procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and the rehabilitation and repair of existing sewer lines?	X	

Discussion:
1. Design and Construction standards have been updated and finalized and are being presented to Richmond City Council for approval in June 2017

	Element 6 – Overflow and Emergency Response Plan	Yes	No
A	Does the City's Overflow Emergency Response Plan (OERP) contain proper notification procedures so that the primary responders and regulatory agencies are informed of all sanitary sewer overflows (SSOs) as required by the WDR and MRP?	X See note 1	
B	Does the OERP have a program to ensure an appropriate response to all overflows?	X	

	Element 6 – Overflow and Emergency Response Plan	Yes	No
C	Does the OERP contain procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities of all SSOs that potentially affect public health or reach waters of the State in accordance with the MRP? Does the SSMP identify the officials who will receive immediate notification of such SSOs?	X	
D	Are staff and contractor personnel aware of and appropriately trained on the procedures of the OERP?	X	
E	Does the OERP contain procedures to address emergency operations such as traffic control and other necessary response activities?	X	
F	Does the OERP ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge?	X	
G	Considering SSO performance data, is the OERP effective in handling SSOs in order to safeguard public health and the environment?	X	
H	Is the Water Quality Monitoring Plan current and has it been trained on and practiced by staff that would be involved in a SSO of large volume?	X	
I	Was sampling conducted within 48 hours for all SSOs greater than 50,000 gallons and were results entered for these SSOs through the CIWQS website?	Mary please verify	
J	Has the City prepared a Technical Report for all SSOs larger than 50,000 gallons? Have all Technical Reports been filed on the CIWQS website as required?	Mary please verify	

Discussion:

1. Veolia's Overflow Emergency Response plan was updated May 2017

	Element 7 – Fats, Oils, and Grease (FOG) Control Program	Yes	No
A	Does the Fats, Oils, and Grease (FOG) Control Program include a description of public education outreach efforts that promote proper handling and disposal of FOG?	X	
B	Does the FOG program include a plan for the disposal of FOG generated within the sewer system service area?	X	
C	Does the City have sufficient legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG?	X	
D	Are there requirements to install grease removal devices (such as traps or interceptors), best management practices (BMP) requirements, record keeping, maintenance requirements and reporting requirements established in the City's FOG Control Program?	X	
E	Does the City have authority to inspect grease producing facilities and have sufficient staff to inspect and enforce the FOG ordinance?	X	
F	Does the FOG control program identify sections of the collection system subject to FOG blockages, establish a cleaning schedule and address source control measures to minimize these blockages?	X	
G	Does the FOG control program implement source control measures for all sources of FOG discharged to the collection system?	X	
H	Is the current FOG program effective in minimizing blockages of sewer lines resulting from discharges of FOG to the system?	X	
Discussion:			

	Element 8 – System Evaluation and Capacity Assurance Plan	Yes	No
A	Does the System Evaluation and Capacity Assurance Plan evaluate hydraulic deficiencies in the system and provide estimates of peak flows associated with conditions similar to those causing overflow events, if applicable?	X	
B	Does the City's capital improvement program (CIP) establish a schedule of approximate completion dates for both short-term and long-term improvements and is the schedule reviewed and updated to reflect current budgetary capabilities and activity accomplishment?	X See note 1	
C	Does the City take steps needed to establish a short and long-term CIP to address hydraulic deficiencies, including prioritization, alternatives analysis, and schedules? Are repair and replacement projects developed based upon condition assessment and/or field maintenance results?		

Discussion:
1. The City in continuously constructing project to address system capacity and has currently ready to begin construction to address system deficiencies due to capacity at multiple sites in 2017/2018.

	Element 9 – Monitoring, Measurement, and Program Modifications	Yes	No
A	Does the City maintain relevant information that can be used to establish and prioritize appropriate SSMP activities?	X See note 1	
B	Does the City monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP?	See note 2	
C	Does the City assess the success of the preventive maintenance program?	X	
D	Does the City update program elements, as appropriate, based upon monitoring or performance evaluations?	X	

E	Does the SSMP identify and illustrate SSO trends, including frequency, location and volume of SSOs?	See note 3	

Discussion:

1. Veolia stores and maintains all system O&M data
2. Veolia's progress in maintaining and managing the wastewater collection system is monitored and discussed, this assessment does not specifically identify progress related to the individual SSMP Elements.
3. Performance metrics have been established and future audits will identify and illustrate SSO trends.

	Element 10 – SSMP Audits	Yes	No
A	Does the audit focus on the effectiveness of the SSMP? If not, what needs to be changed to increase the effectiveness of the overall collection system program?	X	
B	Were the audit results shared with the City Council? And the public, via the City website?	X	
C	Will the SSMP Audit be completed, reviewed, and filed as an Appendix to the SSMP on a biennial basis?		
D	Do any proposed changes to the SSMP require Board approval as they have a substantial change in the policies and procedures for collection system operations and maintenance?		X
Discussion:			

	Element 11 – Communication Program	Yes	No
A	Does the City communicate on a regular basis with the public and other agencies about the development and implementation of the SSMP? Does the communication system provide the public the opportunity to provide input as the program is developed and implemented? Were annual progress reports and metrics of implementation of the SSMP provided to the City Council?	X See note 1	

Discussion:

1. The City will approve the updated SSMP in public meeting and will be uploaded the the City's internet website following approval during a June, 2017 City Council Meeting.

	Change Log	Yes	No
A	Is the SSMP Change Log current and up to date?		
Discussion:			

Appendix J
Element 11 (Communication Plan) Placeholder for Future Supporting Documents



SANITARY SEWER STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION

JULY 2017

RICHMOND, CALIFORNIA

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APPENDIX A ..... Error! Bookmark not defined.

APPENDICES

APPENDIX A – DOHS Criteria for Separation of Water Mains and Non-Potable Pipelines

SECTION 1 - INTRODUCTION, CODE PROVISIONS, AND POLICY

1-1.01 INTRODUCTION

The Sanitary Sewer Standard Specifications for Design and Construction shall govern sewer design and construction work by private individuals, public agencies and businesses within the boundaries of the City of Richmond (COR). The jurisdiction of the City of Richmond includes the entire sewerage system and its appurtenances from the point of connection with each building's plumbing to the discharge terminus of the treatment plant outfall. The City of Richmond Code and all uncodified ordinances of the City of Richmond shall be considered a part of these Specifications and all Plans, profiles, cut sheets, right-of-way documents, and specifications shall conform to the standards and requirements herein established.

Addenda to these Specifications may be issued periodically. Addenda will be distributed to active Job Engineers and Contractors registered with the City of Richmond, and will be made available to the public at the City of Richmond's offices.

1-1.02 AUTHORITY OF THE CITY OF RICHMOND

The authority of the City of Richmond to establish and enforce these Specifications is provided in the City of Richmond Municipal Code.

1-1.03 LAWS TO BE OBSERVED

The Contractor shall comply with federal, state, county, district, municipal and local laws, ordinances, orders, and regulations, which in any manner affect the work and/or those engaged or employed in the work.

The Contractor shall defend, protect, indemnify, and hold the City of Richmond, and all of the City of Richmond's officers, directors, employees and agents free and harmless from and against claim, loss and/or liability, including attorneys' fees arising from or based on the violation of any such law, ordinance, regulation, or order, whether by the Contractor or its employees, subcontractors or agents.

If the Contractor finds any discrepancy or inconsistency between information included in the Plans, or these Specifications and any law, ordinance, regulation, or order, it shall promptly notify the City of Richmond.

1-1.04 LICENSES AND PERMITS

Contractors doing sewer work within the City of Richmond boundaries shall be properly licensed in accordance with the provisions of Division 3, Chapter 9, Business and Professions Code, of the State of California, as amended; as required under the City of Richmond Municipal Code, and as specified in the Special Provisions.

Prior to beginning any work, the Contractor shall obtain all permits and licenses, pay all inspection charges and permit fees, and give all notices necessary for compliance with applicable federal, state, county, district, municipal and local laws, ordinances, orders and regulations.

1-1.05 SAFETY

The Contractor shall be responsible for the safety of its plant, equipment and personnel, and the public in the immediate vicinity of work subject to these Specifications; and in addition to complying with applicable state and/or federal safety regulations, shall fully comply with the requirements of Section 4 of these Specifications.

1-1.06 USE OF EXPLOSIVES

When the use of explosives is necessary for the performance of the sewer work, the Contractor shall ensure that it has the proper Cal/OSHA license to handle and use explosives for such work. The Contractor shall ensure that all explosives shall be stored in accordance with the provisions of Division XI of the Health and Safety Code. The Contractor shall take utmost care to avoid danger or damage to life and property. The Contractor shall obtain a permit for blasting from the local Fire Chief. The City of Richmond may inspect blasting licenses and/or permits at any time. The Contractor shall notify Cal/OSHA and the City of Richmond Inspection regarding the time and place of the Contractor's use of explosives.

1-1.07 RIGHTS IN LAND AND IMPROVEMENTS

Nothing in these Specifications shall be construed as allowing the Contractor to make any arrangements with any person or entity to permit occupancy or use of any land, structure, or building within the work zone for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the City of Richmond and any Owner, former Owner, or tenant of such land, structure, or building.

1-1.08 PERSONAL LIABILITY

No City of Richmond director, officer, employee, or agent shall be personally responsible for any liability arising under or by virtue of the performance of the work.

1-1.09 SEWER SERVICE

The Contractor shall be solely responsible for providing uninterrupted sewer service to all connected properties affected by its work. The Contractor shall defend, protect, indemnify, and hold the City of Richmond, its officers, directors, agents, and employees free and harmless against any loss, claim, or liability, including attorneys' fees, arising from or based on failure to provide such continuous service.

ACRONYMS, ABBREVIATIONS AND TERMS

1-1.10 ACRONYMS, ABBREVIATIONS AND TERMS

Wherever in these Specifications, or in any documents or instruments where these Specifications are referenced, any of the following acronyms, abbreviations, or terms is used, the intent and meaning shall be interpreted as follows unless the context clearly indicates that another meaning is intended:

Acronyms:

AAN – American Association of Nurserymen
AASHTO – American Association of State Highway and Transportation Officials
AB – Aggregate Base
AC – Asphalt Concrete
ACI – American Concrete Institute
ANSI – American National Standards Institute
APN – Assessor’s Parcel Number
AREA – American Railway Engineering Association
ASCE – American Society of Civil Engineers
ASME – American Society of Mechanical Engineers
ASTM – American Society of Testing and Materials
AWPA – American Wood Preservers Association
AWS – American Welding Society
AWWA – American Water Works Association
BC – Beginning of Horizontal Curve
BVC – Beginning of Vertical Curve
CAD – Computer Aided Design
Cal/OSHA – California Division of Occupational Safety and Health Act
CISPI – Cast Iron Soil Pipe Institute
CL – Class
CLSM – Controlled Low Strength Material
C.O. – Cleanout
COR – City of Richmond
CRSI – Concrete Reinforcing Steel Institute
CSA – Canadian Standards Association
CTM – California Test Method
DR – Dimension Ratio (pipe O.D. divided by minimum wall thickness)
DWV – Drain, Waste, and Vent
EC – End of Horizontal Curve
EVC – End of Vertical Curve
FNPT – Female National Pipe Thread

GOE – Grant of Easement
GPD – (or gpd) Gallons per Day
GRD – Grease Removal Device
GWI – Groundwater Infiltration
HDD – Horizontal Direction Drilling
HGI – Hydromechanical Grease Interceptor
HWA – High Water Alarm
HWL – High Water Level
IAPMO – International Association of Plumbing and Mechanical Officials
I.D. – Inside Diameter
ILPS – Individual Lot Pumping Systems
IOD – Irrevocable Offer of Dedication
LFL – Lower Flammable Limit
LWA – Low Water Alarm
LWL – Low Water Level
MH – Manhole
MNPT – Male National Pipe Thread
MSDS – Material Safety Data Sheet
MULPSS – Multiple User Low Pressure Sewer System
NACE – National Association of Corrosion Engineers
NEMA – National Electrical Manufacturers Association
NRTE – Nationally Recognized Testing Entity
O.D. – Outside Diameter
OPD – Overflow Protection Device
PPI – Polyolefin Pipe Industry
PSSE – Private Sanitary Sewer Easement
PTFE – Polytetrafluorethylene (Teflon)
PUE – Public Utility Easement
RI – Rodding Inlet
RMC – Richmond Municipal Code
ROW – Right-of-way
RUE – Residential Unit Equivalent
RV – Recreational Vehicle
RWQCB – Regional Water Quality Control Board
SDR – Standard Dimension Ratio (pipe O.D. divided by minimum wall thickness)
SSE – Sanitary Sewer Easement
SWPPP – Storm Water Pollution Prevention Plan
SWRCB – State Water Resources Control Board
TMH – Trunk Manhole
TV – Television
UL – Underwriters Laboratory
USA – Underground Services Alert
VOC – Volatile Organic Compound
WEF – Water Environment Federation
WOG – Water/oil/gas (pressure rating in psi for values)
UPC – Universal Product Code

<u>Pipe Types:</u>
ABS – Acrylonitrile Butadiene Styrene
ACP – Asbestos Cement Pipe
CIP – Cast Iron Soil Pipe
CIPP – Cured In Place Pipe
CL – Concrete Lined Steel Cylinder
CL&C – Concrete Lined and Coated Steel Cylinder
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
HDPE – High Density Polyethylene
PE – Polyethylene

PMP – Perforated Metal Pipe
PVC – Polyvinyl Chloride
RCP – Reinforced Concrete Pipe
SDR-PR – Specification for Polyethylene Plastic Pipe
VCP – Vitrified Clay Pipe

A. Definition of Terms:

Acceptance - The formal written acceptance by the City of Richmond of an entire job which has been completed in all aspects in accordance with the Plans and Specifications and any modifications thereof previously issued.

Annexation - The inclusion of property within the City of Richmond boundaries by proper legal procedures.

Applicant – See "Owner". An individual owner or owner's developer, builder, engineer, or other authorized representative who applies as the owner's official agent to the City of Richmond for sewer service.

Applicant's Engineer – See "Job Engineer". The Engineer licensed by the State of California as a Civil Engineer, retained or employed by the Applicant, under whose direction plans, profiles, and details for the Work are prepared and submitted to the City of Richmond for review and approval.

Approved Materials List - The list of City of Richmond-approved materials allowed for use in the construction and/or repair of sanitary sewers in accordance with these Standard Specifications.

Bedding and Backfill - Material as specified in these Specifications used to replace material excavated from trenches during sewer installation. Terms used to differentiate between zones of Bedding and Backfill are defined below:

Pipe Zone: the portion of the trench excavation between the bottom of the trench or the top of required foundation material and a horizontal plane twelve (12) inches above the highest point on the outside surface of the pipe barrel excepting bells.

"Bedding" is that portion of the Pipe Zone between the bottom of the trench or the top of required foundation material and the lowest point on the outside surface of the pipe barrel excepting bells;

"Haunching" is that portion of the Pipe Zone between the top of the Bedding and the horizontal centerline of the pipe;

"Shading" is that portion of the Pipe Zone between the top of the Haunching and a horizontal plane twelve (12) inches above the highest point on the outside surface of the pipe barrel excepting bells.

Trench Zone: the portion of the trench excavation between the top of the Shading and the ground surface in unpaved areas, and the horizontal plane at lowest point of the pavement structural section in paved areas.

"Trench Backfill" is that portion of the Trench Zone between the top of the Shading and the ground surface in unpaved areas or a horizontal plane two (2) feet below the lowest point of the pavement structural section in paved areas;

"Final Backfill" is that portion of the Trench Zone in paved areas between the top of the trench backfill and the lowest point of the pavement structural section.

Building Drain - The building drain is the lowest part of a wastewater piping system and connects other wastewater pipes from within a building with the side sewer.

California Plumbing Code - The California Plumbing Code adopted by the State of California Building Standards Commission, latest edition.

Caltrans - State of California, Department of Transportation

COR – Abbreviation for the City of Richmond, California, and its employees, and/or authorized representatives.

City - The City of Richmond, California and the Richmond Municipal Sewer District, and its employees, and/or

authorized representatives.

Contractor - Any contractor who meets the City of Richmond requirements and is licensed by the State of California to enter into contracts for and to perform the work of installing sewers under the City of Richmond jurisdiction.

County - The County of Contra Costa, State of California.

Cut Sheets - Sheets of tabulated data, indicating stations, structures, fittings, angle points, beginnings of curves, points on curves, ends of curves, sewer slopes, staking offsets, various elevations, offset cuts, and sewer depth.

Definition of Words - Wherever, in these Specifications, the words directed, required, permitted, ordered, designated, or words of like importance are used, they shall be understood to mean the direction, requirement, permission, or order of designation of the City of Richmond. Similarly, the words approved, acceptable, satisfactory, shall mean approved by, acceptable to, or satisfactory to the City of Richmond.

District - The City of Richmond and the Richmond Municipal Sewer District, Contra Costa County, California, and its employees, and/or authorized representatives.

Easements - Rights in real property granted or dedicated to the City of Richmond for the purposes stated in the document establishing the easement. Generally, these rights include the right to construct, alter, replace, repair, maintain, and operate sewer pipes, appurtenances, and appliances together with the reasonable right of access to such easements for these purposes over the remaining lands of the grantor.

Engineer – The City Manager, unless indicated otherwise.

Fixture Unit Equivalents - The unit equivalent of plumbing fixtures as tabulated in the Uniform Plumbing Code, latest edition.

Inspector - The person for the City of Richmond duly authorized and responsible for inspections and enforcement of the City of Richmond regulations relating to construction of public and private sewers, including pipelines, structures, materials, instruments, and appurtenances.

Irrevocable Offers of Dedication - A legal document used to create easements for the City of Richmond.

Job Engineer - The Engineer licensed by the State of California as a civil engineer, under whose direction plans, profiles, and details for the work are prepared and submitted to the City of Richmond for review.

Manufacturer’s Name - Any manufacturer's name, specification, catalog number, or type used herein is specified to establish the standard required for the item. Other items will be considered providing they are substantially equivalent to the established standard.

Optimum Moisture Content - The moisture content at the maximum dry density of the soil or soil aggregate as determined by laboratory test ASTM D1557.

Owner - Any individual, partnership, firm, or corporation by whom the Job Engineer has been retained or who, as the Property Owner, is making arrangements with the City of Richmond.

Parcel Number - An arbitrary number assigned to each parcel of right-of-way, including easements and miscellaneous encroachments, as shown in the right-of-way log and/or on the sewer construction plans.

Paved Surface - Any form of pavement used on street, sidewalk, or other areas composed of concrete, asphalt, oil, brick, or treated crushed rock or any combination of said forms of pavement having a dense, cohesive, stable surface.

Permits or Licenses - Documents indicating permission or authorization to perform specific work under specific conditions at specific locations.

Person - Any individual, firm, company, corporation, or association.

Plans - Construction plans, including system maps, sewer plans and profiles, cross sections, detail drawings, etc., or reproductions thereof, which show the location, character, dimensions, and details for the work to be done and which constitute a supplement to these Specifications.

Plumbing System - All plumbing fixtures and traps, or soil, waste, special waste, and vent pipes within a building.

Preliminary Review - Plans stamped "Preliminary Review," dated and signed by the City of Richmond, indicate that the Plans have been reviewed, and may now be submitted as a part of the requirements for the final review for construction.

Profile - Cross-sectional detail (side view) drawing which show the vertical relationship between the sewer line invert, the ground surface at time of construction and the finish surface, and other existing and/or proposed underground facilities.

Property Owner - The person who holds record title to a parcel of property.

Public Sewer - A sewer located within a public right-of-way, easement or dedicated reservation which has been accepted by the City of Richmond.

Record Drawings - Plans signed and dated by the City of Richmond or design consultant, indicating that the Plans have been reviewed and revised, if necessary, to record as-built construction details to the maximum extent.

Relative Compaction - The percentage ratio of the field dry density of the soil or soil aggregate (determined by ASTM 6938) to the maximum dry density as determined by laboratory test ASTM D1557.

Review for Construction - The stamp, "Final Review of Construction Plans," on the Plans signed and dated by the City of Richmond, indicates that construction may proceed.

Right-of-way - All land or interest therein which by deed, conveyance, agreement, easement, dedication, usage, or process of law is reserved for or dedicated to the use of the general public, within which the City of Richmond shall have the right to construct, alter, replace, repair, maintain, and operate sewer pipes, appurtenances, and appliances together with the reasonable right of access to such easement for said purposes over the remaining lands of the grantor.

Riparian Tree – A tree that is within thirty (30) feet of the edge of a creek bank.

Roadway - All of a right-of-way dedicated, granted, used, or to be used for vehicle movement.

Sanitary District - Richmond Municipal Sewer District, Contra Costa County, California.

Section - Any reference to a Section which is not accompanied by further reference refers to a Section or Sections of these Specifications.

Sewers:

• Trunk Sewers - A public sewer which has been or is being constructed to accommodate the flow from one (1) or more main sewers and is not generally used for side sewer connections. Trunk Sewers are generally twelve (12) inches in diameter or larger.

• Main Sewer - A public sewer which has been or is being constructed to accommodate the flow from one (1) or more side sewers. Main Sewers are generally eight (8) or ten (10) inches in diameter.

• Side Sewer - A privately owned and maintained sewer line which connects the sanitary or waste plumbing (building drain) of a house or other building with the main sewer or site collector sewer. The side sewer begins at its point of connection (including the connection tap or wye) with the main sewer and terminates at its point of connection to the building drain, and is a collective term that includes both the lateral sewer and building sewer. The point of connection to the building drain shall be at the point where the plumbing first extends outside the foundation. Side Sewers are generally four (4) or six (6) inches in diameter.

• Site Collector Sewer - A privately-owned and maintained sewer line constructed to serve one (1) or more side sewers.

Site Collector Sewers are generally six (6) or eight (8) inches in diameter.

• Lateral Sewer - The privately owned and maintained portion of the side sewer from its connection at the main sewer including the connection tap or wye and extending to a point five (5) feet beyond the property or easement line.

• Building Sewer - That portion of the side sewer from the end of the lateral sewer to the point of connection to the building drain.

Shell Building - A building intended to accommodate a variety of non-residential uses where the specific uses for particular spaces within the building cannot be determined at the time of connection to the public sewer system.

Single-Family Residence - A single living structure designed to accommodate one (1) family.

Special Approval - Approval given by the City of Richmond, either in writing or as approved on the plans, for special construction considerations which may not meet the regulations and/or standards set forth in these Specifications or the City of Richmond Code.

Specifications - The City of Richmond Sanitary Sewer Standard Specifications for Design and Construction.

Standard Drawings - The drawings of structures or devices commonly used on the City of Richmond work and referred to on the plans and in these Specifications.

State - The State of California.

State Standard Specifications - The Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation (Caltrans), current edition.

Streets or Roads - Any public or private highway, road, street, avenue, alley, way, easement, or right of way used or to be used for vehicle movement.

Structures - Those structures or devices commonly used in the City of Richmond work such as manholes, rodding inlets, etc., as mentioned in these Standard Specifications.

Subcontractor - Any individual, partnership, firm, or corporation entering into a contract with the Contractor to perform part of the work.

Superintendent - The representative of the Contractor, present and responsible for the work at all times.

Surveyor - A Professional Land Surveyor or registered Professional Engineer (Civil) licensed by the State of California to perform land surveying.

System Maps - Scale maps on the first sheet or sheets of the job plans showing the relationship and ties between the properties to be improved and the nearest intersection of existing county or city improved road on each side of the property.
The system maps also show all proposed sewer improvements and all parcels to be served by the improvements.

Travelled Way - The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

Uniform Plumbing Code - The Uniform Plumbing Code adopted by the International Association of Plumbing and Mechanical Officials, latest edition.

Work - All the work to be done under the City of Richmond Encroachment permit or inspection, in accordance with the Plans, these Specifications, and/or permit conditions.

CODE PROVISIONS AND POLICIES

1-1.11 THE CITY OF RICHMOND MUNICIPAL CODE

The City of Richmond Municipal Code of Ordinances provides the authority of the Engineer; states that only

Contractors licensed in the state of California (and Property Owners in particular cases) may perform work on private or public sewers; requires Contractor registration; and provides for Plan review, inspection, connection and other service charges.

1-1.12 ENFORCEMENT

Subject to due process, the City of Richmond may impose fines, disconnect sewers and pursue other enforcement provided in the Richmond Municipal Code (RMC) and/or take legal action against any person or persons who violate provisions of the City of Richmond Code. If work subject to the City of Richmond's jurisdiction, whether performed under a City of Richmond Encroachment permit or without permit, is determined to be deficient under these Specifications, the City of Richmond may:

A. Correct deficiencies itself or by others at the Contractor or Owner's expense.

B. Reject the work and disconnect the work from the City of Richmond system at the Contractor or Owner's expense.

C. Revoke or suspend permits or a Contractor's City of Richmond registration for a period of time.

1-1.13 REGULATION OF PRIVATE SEWAGE DISPOSAL SYSTEMS

The design, construction, and maintenance of private sewage disposal systems including septic tanks and leach fields, and methods of sewage disposal other than the City of Richmond's public sewer system are governed by the statutes, ordinances, rules, and regulations of West Contra Costa County and the State of California.

1-1.14 ANNEXATION

Only properties within the boundaries of the City of Richmond and the Richmond Municipal Sewer District may receive sewer service through the Richmond Municipal Sewer District facilities.

1-1.15 BASIC SEWER SERVICE POLICY

Each property having a separate assessor's parcel number shall have a public sewer extended to it and a separate private side sewer extending from each building’s waste plumbing discharge on the property to the public sewer, including to the connection tap or wye at the public sewer. The City of Richmond shall permit an exception to this policy if a property is the last lot that can reasonably be served from a public sewer via a private side sewer serving only the excepted property installed within a recorded, appurtenant easement across a single intervening property adjacent to the public sewer. Public sewers are owned, operated and maintained by the City of Richmond. Private side sewers shall be owned and maintained by the Property Owner.

1-1.16 THE LINE SIZE AND SERVICE POLICY

A. The minimum nominal size of any new public gravity sewer shall be eight (8) inches in diameter.

B. Side sewers should only be connected to "trunk" sewers through a variance granted by COR or at a manhole. Private Side Sewers shall be four (4) inches in diameter for single-family residences. Other side sewers shall be six (6) inches in diameter or larger. Side Sewers shall be connected to public sewers six (6), eight (8), ten (10) and twelve (12) inches in diameter at manholes or by installation of approved taps, wyes or sanitary tees. Side Sewer connections to public sewers over twelve (12) inches in diameter shall only be made at manholes unless a specific written Special Approval for installation for installation of a tap is obtained from the City of Richmond. All Side Sewers shall be equipped with an approved Overflow Protection Device.

1-1.17 PAYMENT OF FEES AND CHARGES

Plan review and inspection fees, if required, must be paid before any sewer work is started. Annexation charges and other connection fees must be paid prior to the time of the connection of buildings to the sanitary sewer system.

1-1.18 REIMBURSEMENT PROGRAM

The Reimbursement Program shall follow Chapter 12.24 of the City of Richmond Municipal Code and all other associate sanitary sewer Chapters and Sections.

SECTION 2 - DESIGN STANDARDS

2-1.01 DESIGN CRITERIA

A. GENERAL

When the estimated average base wastewater flow for the job exceeds 45,000 GPD, or additional flow carrying capacity may be required for existing or future connections upstream of the job, the Job Engineer shall provide a capacity study report when plans are submitted for preliminary review. The capacity study report shall include a table that presents the proposed pipe diameter, slope, length, Manning's roughness coefficient, full pipe capacity, design capacity (see below) and the percentage of design capacity utilized for each proposed sewer reach. The percentage of design capacity utilized shall be calculated by dividing the design flow by the design capacity and multiplying by one hundred (100).

B. DESIGN FLOW

Design Flow = (Average base wastewater flow times Peaking Factor) plus (groundwater infiltration factor times acres).

NOTE: Peaking Factor - The peaking factor for the above equation shall be obtained from Figure 2-1, Peak Flow Curve.

Average Base Wastewater - The average base wastewater unit flow factors are presented in the following table:

AVERAGE BASE WASTEWATER UNIT FLOW FACTORS

Land Use Category	Units	Unit Flow Factor (gpd/Unit)
Residential, Single Family	Residential Unit	195
Residential, Multiple Family	Residential Unit	105
Commercial, Industrial, Institutional (Government, Schools, Churches, etc.)	1,000 square feet	100

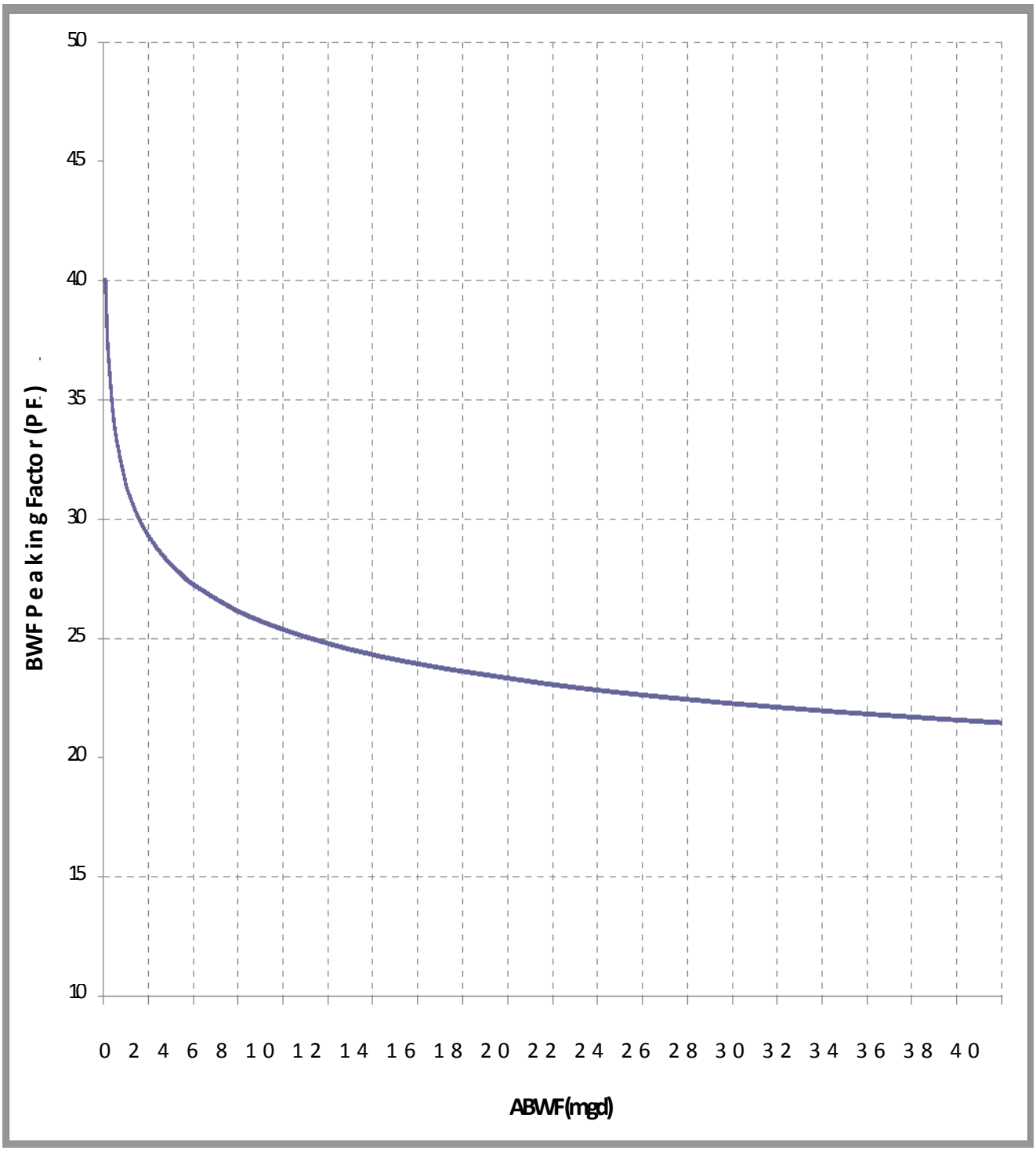
Groundwater Infiltration (GWI) - The GWI rate for use in the above “Design Flow” equation shall be 170gpd/acre, unless the City of Richmond provides the Job Engineer with an area-specific rate. This rate is an average for summertime GWI following wet weather seasons with higher-than-average rainfall in sewers constructed in the City of Richmond after 1985.

C. DESIGN CRITERIA –

Gravity sewers within the City of Richmond shall be designed in accordance with the following design criteria.

1. Design Capacity - Main and trunk sewers shall be designated on the following basis: (See Figure 2-1).

FIGURE 2-1 – PEAK FLOW CURVE



a. For sewers eight (8) and ten (10) inches in diameter, design capacity shall be based on pipes flowing two-thirds full (d/D < or = 0.67).

b. For sewers twelve (12) inches and larger in diameter, design capacity shall be based on pipes flowing full without surcharging (d/D < or = 1.0).

2. Velocity and Slope - The minimum acceptable slope for sewer pipe is based upon a velocity of three (3) feet per second for main sewers and a velocity of two (2) feet per second for trunk sewers, both when flowing full. The minimum and maximum design flows for each pipe size at the minimum acceptable slope is provided in Section 2-1.03.A.4. However, the City of Richmond, at its sole discretion, may allow a lesser slope and/or a larger pipe size on a case-by-case basis where the elevation of the existing system constrains the available elevation drop. When the slope of the sewer exceeds twenty percent (20%), ductile iron pipe conforming to the requirements of Section 4-1.32 Ductile Iron Pipe of these Specifications shall be used.

3. Pipe Diameter - Diameter of gravity sewers shall be determined by Manning's pipe friction formula, using a roughness coefficient, "n," of 0.013 or the pipe manufacturer's recommendation, whichever is greater.

4. Pipe Cover and Clearance - Minimum pipe covers and clearance, as specified in Section 2-1.03C, 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 on the sewer profile on the Plans. Special Approval is required for each location where pipe cover or clearances are proposed to be less than the minimums specified. Special pipe, bedding, and/or backfill shall be as directed by.

D. Individual Lot Pumping Systems will be allowed only in cases where no feasible gravity sewering alternative exists. If a sewage pumping system is proposed, the Contractor shall comply with the requirements of Section 4-1.28 of these Specifications.

2-1.02 HILLSIDE AND CREEK AREA

A. The Job Engineer shall submit a geotechnical report prepared by a registered Geotechnical Engineer or a Civil Engineer practicing in Geotechnical Engineering whenever:

1. Sewers are proposed to be installed in easement locations where the existing or proposed cross-slope grade exceeds twenty-five percent (25%).

2. Sewers are proposed to be installed within twenty-five (25) feet of the top of a creek bank or fifty (50) feet of the centerline (flowline) of a creek.

3. Sewers are proposed to be installed in historical slide locations or within the area of influence of a potentially unstable hillside.

B. The geotechnical report shall address the following:

1. Geological setting, general soils and bedrock conditions along the proposed sewer alignment, and recommended setbacks from slides and creeks.

2. Slope instability or other geotechnical hazards in the vicinity of the proposed sewer alignment.

3. Potential groundwater issues.

4. The effect of trenching and sewer installation on slope stability

5. Recommended requirements for trenching, bedding, backfill, or special supports that may be recommended.

6. Erosion potential of soils around sewer near water courses.

7. Recommended corrective work if geotechnical hazards are identified.

C. Installation of sewers in unrepaired slide areas will not be allowed.

1. If an acceptable gravity route is feasible around an unrepaired slide, the sewer must be installed around the slide.

2. If the only feasible gravity route is through a slide area, a complete study of the slide must be made by a Geotechnical Engineer. The Geotechnical Engineer shall propose a slide repair acceptable to the City of Richmond.

3. If a satisfactory gravity sewering alternative does not exist, an alternative utilizing sewage pumping individual may be considered.

D. Sewers shall not be located in creek beds or at the bottom of swales.

E. If it is not feasible to locate gravity sewers on the downslope side of homes while maintaining a safe distance from drainage ways, an alternative utilizing sewage pumping shall be considered.

F. Sewer crossings at creeks or swales shall be as nearly perpendicular to the centerline (flowline) of the drainage way as feasible, and in no case at an angle less than forty-five (45) degrees to the centerline (flowline) of the creek or swale.

1. The need for bank and bottom protection shall be evaluated by a Geotechnical Engineer and recommended protection shall be installed in the drainage way as part of the crossing installation.

2. The Job Engineer shall pay particular attention to designing adequate support foundations and protection for the foundation.

G. The following design standards shall be used by the Job Engineer when designing sewers in hillside and/or creek areas.

1. Sewers to be installed in easements and private streets which are located in hillside and/or creek areas shall be restrained joint ductile iron pipe when the soil in which the sewer will be installed is fine grained, such as clay.

2. Pipe material other than ductile iron may be used for sewers to be installed in easements and private streets which are located in hillside and/or creek areas when the soil in which the sewer will be located is coarse grained (including unfractured bedrock).

3. Pipe material other than ductile iron may be used for sewers to be installed in public streets which are located in hillside and/or creek areas.

4. If groundwater is present in the trench area, sewers shall be ductile iron (no bedding) regardless of the type of soil.

5. Subdrains may be installed to convey underground water from its source to a storm drain or channel. These subdrains must be maintained perpetually by a permanent entity other than the City of Richmond.

6. For sewers proposed parallel to existing swales or creeks, the sewer shall be located at least fifty (50) feet from the centerline (flowline) of the creek or swale, and at least twenty-five (25) feet from the top of the bank if the bank is defined, to minimize the potential slope failure in the vicinity of the sewer resulting from undercutting at the toe. A Geotechnical Engineer shall review the proposed alignment and furnish recommendations regarding long-term erosion and slope stability potential.

7. Manholes to be installed at creek crossings shall be located at least fifty (50) feet from the center line of the creek, and at least twenty-five (25) feet from the top of the creek bank if the creek bank is defined.

2-1.03 MINIMUM PIPE SIZES AND STANDARDS

A. Main Sewers and Trunk Sewers

1. Size - Minimum nominal diameter for main sewers shall be eight (8) inches.

2. Pipe Selection - Pipe cover and trench configuration requirements for the various allowable pipe materials are specified on Trench Section Detail, SS-10 & SS-11. The Job Engineer shall select pipe material and the strength or thickness class for each reach to be installed under the Job, subject to the City of Richmond review.

3. Pipe to be installed between successive structures shall be of the same size, material, strength or thickness class and manufacturer unless otherwise approved by the City of Richmond.

4. Minimum Acceptable Slope - The minimum allowable slopes for sewer pipe sizes and corresponding minimum and maximum design flows are as follows:

MAIN SEWERS

Nominal Pipe Size In Inches	Minimum Design Flow (Cubic feet per second)	Maximum Design Flow (Cubic feet per second)	Minimum Slope In Feet Per Foot
8	0.0	0.81	0.0077
10	0.82	1.28	0.0057

TRUNK SEWERS

12	1.29	1.57	0.0022
15	1.58	2.45	0.0015
18	2.46	3.53	0.0012
21	3.54	4.81	0.00095
24	4.82	6.28	0.0008
27	6.29	7.95	0.0007
30	7.96	9.81	0.0006
33	9.82	11.87	0.00055

36	11.88	14.13	0.0005

B. Side Sewers (Lateral and House Sewers)

GENERAL - Each individual property with a separate Assessor's Parcel Number (APN) shall be connected by a separate private side sewer.

1. Size and Slope

a. Minimum sizes and slopes for side sewers shall not be less than indicated below:

Description	**Size**	**Slope**
Homes (up to four RUE)	4”	2.0%
Trash Enclosures	4”	2.0%
All Other Uses	6”	1.1%

The size of the side sewer shall not be smaller than the size the building waste plumbing at its connection to the side sewer.

b. The maximum slope of any portion of a side sewer shall not be greater than one hundred fifty percent (150%).

2. Discharge Flow - The discharge from any side sewer at its connection to the main sewer shall not exceed one hundred gallons per minute (100 gpm) unless otherwise approved by the City of Richmond.

3. Fixture Units - The fixture unit equivalents for plumbing fixtures shall be based on the tables of the Uniform Plumbing Code, latest edition.

4. Pipe Material and Class - Lateral sewers installed concurrently with a main sewer extension shall be of the same material and class as the main sewer.

5. Vertical and Horizontal Deflections - Lateral sewers shall have an alignment that provides an angle of intersection with the downstream section of main sewer of no less than ninety degrees (90°). The maximum allowable deflection at any point in a side sewer shall be ninety degrees (90°). Consecutive bends shall be separated by a straight pipe segment at least two (2) feet in length.

6. Building Waste Plumbing - For new construction, the building waste plumbing shall be designed so that the point of its connection to the side sewer is on the side of the building facing the public sewer main.

7. Cleanouts - Cleanouts shall be provided in the side sewer system at the following locations:

a. At the point of connection to the building drain within two (2) feet of building foundation.

b. At any single bend greater than forty-five degrees (45°).

c. At intervals along the side sewer system where the cumulative total of deflection from the point of connection to the main sewer or from another cleanout equals or

exceeds ninety degrees (90°).

d. At intervals not to exceed one hundred (100) feet. (Cleanout risers shall conform to the requirements specified on detail SS-8B)

8. Overflow Protection Devices - No person shall construct, alter, or repair a side sewer without confirming that an approved overflow protection device has been properly installed on the side sewer in conformance to the requirements specified on SS-9C of the Standard Drawings. Where reasonably possible, overflow protection devices shall be located in areas away from vehicular and foot traffic. If an overflow protection device must be located in an area which will have concrete or asphalt paving, such as a driveway or sidewalk, the device shall be installed in a City of Richmond-approved reinforced concrete utility box fitted with a metal grate.

C. Pipe Cover and Clearance

The following minimum and maximum allowable pipe cover and clearances shall be achieved in design and construction of sanitary sewers unless otherwise specifically approved in writing by the City of Richmond. Any portion of a Job, as shown on the Plans or encountered in the field, which does not meet the minimum cover or clearance requirements, must be revised or receive Special Approval before proceeding with the work.

Where sanitary main or trunk sewers are being designed for parallel installation with other utility pipe and/or conduits, the Job Engineer shall design the vertical alignment of the sewer so that future side or main sewer connections can be installed without conflict with parallel utilities or abrupt changes in the alignment of the main or side sewers. Other utilities shall not be installed directly over sanitary sewers or with crossings at angles less than thirty degrees (30°) to the centerline of the sewer.

1. Main and Trunk Sewers - Minimum and maximum allowable cover for installation of main sewer extensions shall be as specified on SS-12. Where sewers are to be installed in existing roadways that are not expected to receive major grade or surfacing changes, the pipe cover may be measured from the existing road surface to the top of pipe. Where sewers are to be installed in new roadways and/or in areas expected to become roadway, or in existing roadways that are intended to receive major grade or surfacing changes, the pipe cover shall be measured from the lower surface of the road structural section (bottom of the subbase) to the top of pipe. No sewer work shall begin in new or existing roadways that are scheduled for major improvement, until the roadway has been graded to within six (6) inches of design subgrade elevation at the lower surface of the road structural section (bottom of the subbase).

2. Side Sewers - Side sewers shall have the following pipe cover:

a. Minimum and maximum allowable cover for laterals shall be as specified on SS-12.

b. Minimum cover for side sewers in driveways, parking, and all other traffic areas within properties shall be as specified on SS-12 for laterals.

c. The minimum cover for side sewers outside of traffic areas from the property line to a point within eight (8) feet of the building waste plumbing connection shall be as specified on SS-12.

d. Minimum cover for side sewers at the point of connection to the building waste plumbing (within two (2) feet of the foundation) shall be eighteen (18) inches.

e. Where available grade for side sewer installation is less than two percent (2%) and where the side sewer is more than one hundred (100) feet in length, field staking of

cuts by a licensed surveyor, submittal of cut sheets and installation using an industrial-standard laser grade control system to confirm that the pipe is installed to the proper grade shall be required. Requirements for operation of laser grade control systems shall be as specified in Section 4-1.30 of these Specifications.

3. Clearance from Other Improvements - Sewer pipes and structures shall be designed and constructed with a minimum of twelve (12) inches vertical and three (3) feet wall to wall horizontal clearance from all other utilities and improvements, except public water lines, unless a Special Approval is received from the City of Richmond.

4. Clearance from Public Water Lines - Sewers to be installed in the vicinity of potable water pipelines, shall be designed and constructed so as to provide wall-to-wall sewer-to-water pipeline separation (not including bells) in conformance with the minimum requirements shown on SS-13 of the Standard Drawings. Sewers shall not be designed in the "Special Permission" zone unless specific written approval of the water utility is obtained prior to issuance of the City of Richmond Encroachment permit for construction.

D. Horizontal and Vertical Curves

1. Curved Alignments - All sewer lines should be laid straight line from manhole to manhole. If a curved alignment is deemed necessary due to other utility conflict, then it should be evaluated on a case by case basis and a variance granted by COR. Layout of curved alignments shall conform to the requirements specified in the applicable Section of these Specifications for the particular pipe material being used. The radius, deflection angle (delta), and length of all curves shall be indicated on the Plans adjacent to the curve. Curved alignments may be accomplished by:

   a. Forced bending of the pipe if the radius of curvature is greater than the minimum allowable radius specified in the applicable Section of the Technical Specifications for the particular pipe material being used.

   b. Using straight pipe segments, each of at least the minimum length specified in the applicable section of these Specifications for the particular pipe material being used, joined with fittings, couplings or bell and spigot joints installed. The joint deflection between any two (2) successive pipe segments shall not exceed the maximum deflection recommended in writing by the pipe, fitting or coupling manufacturer (see Approved Materials List). The maximum deflection between successive straight segments of pipe shall not exceed eleven and one quarter degrees (11-1/4°). The location of fittings and/or couplings and the length of straight pipe segments shall be shown on the Plans. The sum of the deflections of horizontal curves between consecutive structures shall not exceed forty-five degrees (45°).

E. Sewer Connections to Existing Systems

Connection of new main or trunk sewers to the existing sewer system shall be made at existing manholes or by constructing a new manhole at the point of connection, or by using an approved bell and spigot joint or repair coupling and matching pipe size, type, class, slope and alignment.

F. Sewer Alignment

Where sewer lines are to be installed within street or road rights of way, they shall, wherever practical, be designed and installed on the centerline of the existing or future roadway. Where a sewer line cannot be designed along the centerline of a roadway, it shall be located within the paved area of the street or road, with not less than one (1) foot between the vertical projection of the outside surface of the pipe or structure at the surface and the nearest gutter or edge of pavement. Where practical, all sewer lines within easements or reserves shall be designed and installed on the center line of the sewer easement or reserve.

G. Sewer Pipe Plugs/Stubs

Stubs or plugs shall be designed and installed in all manholes from which future sewer line extensions are anticipated. The outboard end of stubs shall be a standard pipe joint end and shall be plugged with a standard watertight plug or cap, as supplied by the pipe manufacturer.

H. Sewer Line Extensions

In all new roadways, including all roads fronting or within subdivisions or other new developments where sewer lines are expected to be extended to adjacent properties, the sewer line shall be designed and installed to the end of the proposed roadway improvement prior to final paving of such roadway improvement. The sewer extension shall terminate with the proper structure or fitting, which will minimize the amount of pavement to be disturbed by future sewer extensions.

I. Sewers to Be Installed In Existing Improved Roadways

Where sewers are being designed for installation in existing improved city and/or county roadways, the Job Engineer shall submit the Plans for the proposed work to the city and/or county public works department for location and encroachment approval. The public works approval shall be obtained prior to submitting plans to the City of Richmond and shall be placed on the tracing for the first sheet of the Plans and shall appear on all subsequent prints of the Plans.

The City and/or County approval shall be preceded by the following note: "The following acknowledged public agency has reviewed these Plans and hereby approves the location of the proposed work and agrees to issue all necessary encroachment permits."

J. Railroad and Special Utility Crossings

Where sewers are to be constructed across or within utility or railroad rights of way requiring tunnels, bores, and/or special pipe, the tunnel, bore or special pipe shall extend the full length of the sewer line within the particular right of way. The minimum interior diameter of metal casings, when required, shall be eight (8) inches greater than the maximum outside diameter of the pipe barrel (excepting bells).

K. Sewer Installation Method

Unless otherwise indicated on the Plans, sewer shall be installed by the open-cut method. Alternate methods of installation may be proposed by the Job Engineer during the Plan Review process subject to the following requirements:

1. Horizontal Directional Drilling (HDD) - The minimum design slope for pipelines proposed for installation by HDD be three percent (3%; S = 0.0300). Design of pipelines proposed for installation by HDD shall fully comply with the requirements of Section 4-1.10.

2. Boring and Jacking - Design of pipelines proposed for installation by boring and jacking shall fully comply with the requirements of Section 4-1.11.

3. Pipe Bursting - Replacement of pipelines with existing sags greater than allowed under these Specifications (i.e., > 0.125 times the nominal diameter of the pipe) shall not be installed by pipe bursting. Design of pipelines proposed for installation by pipe bursting shall fully comply with the requirements of Section 4-1.12.

4. Cured In Place Pipe (CIPP) - Replacement of pipelines with existing sags greater than allowed under these Specifications (i.e., > 0.125 times the nominal diameter of the pipe) shall not be installed using the CIPP method. Design of pipelines proposed for installation by pipe bursting shall fully comply with the requirements of Section 4-1.13.

2-1.04 SEWER STRUCTURES

A. Manholes

1. Locations - Manholes shall be located at all trunk and main sewer intersections, at all points where trunk or main sewer size changes and at intervals not greater than five hundred (350) feet unless allowed by the City of Richmond Special Approval. Where practical, manholes shall be located at the center of street or road intersections.

2. Drop Across Structures - Where the horizontal deflection angle between an incoming sewer and outgoing sewer at a structure will be more than thirty degrees (30°), the vertical drop across the structure from the inlet to outlet shall be at least twenty five hundredths (0.25) of a foot.

   The maximum vertical drop between any incoming sewer and the outgoing sewer at a structure shall be one (1) foot plus the nominal diameter of the outlet sewer. The invert of any inlet sewer shall not be higher than the top of the shelf (i.e., drop manholes shall not be used unless specific Special Approval is obtained from the City of Richmond).

3. Deflection at Structures - The horizontal deflection angle between incoming and outgoing sewers at a manhole shall not be greater than ninety degrees (90°).

4. Connections to Existing Structures - Connections of new public and private sewers at existing manholes shall conform to the requirements shown on the Standard Drawings for manholes

5. Cul-de-sac Requirements - A special cul-de-sac manhole conforming to the requirements shown on SS-6B of the Standard Drawings shall be located at the end of any main line terminating within a cul-de-sac.

6. Manhole Protection Walls - Reinforced concrete, concrete masonry unit or interlocking block retaining walls shall meet industry standards and be installed around manhole rims and top blocks where required by the City of Richmond.

7. Stationing and Elevations - For calculation purposes, the stationing of a manhole and the "thru" elevation of a manhole shall be considered as being located in the center of the manhole.

B. Use of Rodding Inlets

Rodding inlets are considered temporary terminal structures and may only be used when: 1) future main sewer extensions are possible beyond the proposed upstream end of the Job; and 2) a future sewer main sewer extension would not require a manhole at the proposed upstream end of the current Job under the criteria specified in this Section.

C. Structures for Multiple-User Low-Pressure Sewer Systems (MULPSS)

1. Manholes - MULPSS manholes shall be installed at each private pressure lateral service connection, point of intersection of branch main sewers and at any other location indicated on the plans or directed by the City of Richmond.

2. Flushing Inlets - Flushing Inlets shall be installed at intervals not to exceed one thousand (1,000) feet, at the terminus of each MULPSS main sewer and at any other location indicated on the plans or directed by the City of Richmond.

D. Test Fittings

All test fittings, unless otherwise approved, shall be wye or tee branches of the same size, material and strength, pressure and/or thickness class as the line in which they are being installed.

E. Bolt-Down Manhole Frames and Covers

Bolt-down (watertight) manhole frames and covers shall be installed in conformance with the requirements of SS-7A & SS-7B of the Standard Drawings where drainage conditions may cause storm waters to inundate sewer structures and in other locations required by the City of Richmond, in conformance with the requirements of SS-7A & SS-7B of the Standard Drawings.

F. Temporary Access Structures

Temporary Access Structures in conformance with the requirements of SS-15 of the Standard Drawings shall be installed at the upstream end of inactive stubs to provide access for cleaning, testing, TV inspection and location of the stub for future main sewer extension.

G. Check Dams

Check Dams shall be installed at intervals not exceeding twenty (20) feet, or at the locations and intervals otherwise indicated on the Plans or as directed by the City of Richmond, in sewer trenches located in swales to limit erosion of soil over the pipeline.

H. Trench Dams

Trench Dams in conformance with the requirements of SS-16 of the Standard Drawings shall be installed at the locations and at the intervals indicated on the Plans, or as directed by the City of Richmond, to prevent the migration of groundwater through the pipe zone.

I. Pipe Anchors

Pipe Anchors in conformance with the requirements of SS-17 of the Standard Drawings shall be installed at intervals not exceeding forty (40) feet, or at the locations and intervals otherwise indicated on the Plans or as directed by the City of Richmond, in sewer trenches where the slope of sewer exceeds thirty percent (30%).

J. Special Structures

Manholes proposed for trunk sewers forty-five (45) inches in diameter or larger, metering manholes, siphons, sewage pumping systems, vehicle/equipment wash racks, trailer/RV dump stations, all above ground wastewater facilities and other unusual structures or features shall require specific design review by the City of Richmond.

- END OF SECTION -

SECTION 3 - CONTROL OF WORK AND MATERIALS

CONTROL OF THE WORK

3-1.01 AUTHORITY OF THE INSPECTOR

A. The Inspector shall decide all questions that arise in the field regarding the quality or acceptability of materials and/or equipment, completed work and/or the interpretation of the plans and/or these Specifications. The Inspector's decision shall be final.

B. The Inspector may suspend a Contractor's work under a City of Richmond permit, completely or in part, for such periods as he/she may deem necessary, due to unsuitable weather, such other conditions as he/she considers unfavorable for the suitable prosecution of the work, or due to the failure on the part of the Contractor to carry out directions given, or to perform any provision of the permit. The Contractor shall immediately comply with the Inspector's order to suspend the work. The work may be resumed when conditions are suitable and the Contractor is willing and able to properly resume work, as determined by the Inspector.

C. In the event that a suspension of work is ordered as provided above, the Contractor shall do all work necessary to provide for safe, smooth and unobstructed passage for public traffic through the construction zone during the period of the suspension of work, or at the end of each work day.

D. No decisions rendered, nor directions given by the Inspector shall relieve the Contractor, the Job Owner or the owner's surety of their obligations or responsibilities to diligently prosecute the job, or establish any contingent liability on the part of the City of Richmond.

E. Should the Contractor fail to act promptly or diligently in the prosecution of work done under the City of Richmond permit, or should the urgency of a particular situation require that repairs or replacement be made before the Contractor can be notified or can respond to notification, the City of Richmond may make or cause the necessary repairs or replacements to be made or perform the necessary work, and the Contractor shall be charged and shall pay to the City of Richmond the cost of such work plus the current City of Richmond overhead rate to compensate the City of Richmond for administration of work (City of Richmond Code.

3-1.02 PLANS

A. No changes shall be made in any plan or drawing after it has been approved by the City of Richmond, except with the City of Richmond's written concurrence.

B. The Contractor shall keep copies of the City of Richmond-stamped final plans for the project, these Specifications and all other governing agency specifications incidental to the work at the jobsite during prosecution of the work, and shall make the copies available to the Inspector upon request. The Plans, these Specifications and required supplementary documents are considered requirements of the work, and the Contractor shall familiarize itself and fully comply with as such requirements.

C. Submittal of shop drawings and/or other information not included in the Plans is required under various subsections of Section 4 of these Specifications. These submittals may include, but are not limited to schedules, fabrication detail drawings, certifications that materials comply with the specification, evidence of worker's special qualifications, and information regarding proposed alternate materials, methods and/or equipment. The Contractor shall provide the required submittals, and receive favorable review prior to commencing work involving these workers, materials, methods or equipment.

D. Review of the Contractor's submittals by the City of Richmond shall not relieve the Contractor of its responsibility for the accuracy of dimensions and details or for completion of permitted work in compliance with these Specifications.

3-1.03 CONFORMITY WITH THE PLANS AND ALLOWABLE DEVIATIONS

A. Finished surfaces shall conform to the lines, grades, cross-sections, and dimensions shown on the Plans. Only deviations from the Plans and working drawings as may be required by the constraints of construction and approved in advance by the City of Richmond will be allowed.

B. The City of Richmond reserves the right to order such alterations, deviations, additions to, or deletions from the Plans and Specifications covered by any permit or agreement, as it may determine during the progress of the work to be necessary and advisable for the proper completion or subsequent operation of the improvements being constructed.

3-1.04 COORDINATION OF PLANS AND SPECIFICATIONS

A. These Specifications, the Plans, and all required supplementary documents are each an essential part of the permit or agreement, and a requirement cited in one is as binding as though cited in all. Each component document is intended to be coordinated with the others, and to describe and provide for properly completed improvements.

B. The requirements of these Specifications shall govern over citations on the Plans, unless deviation from the Specifications is specifically authorized by the City of Richmond in writing. The permit for work under signed Plans stamped by the City of Richmond shall expire three (3) months from the date affixed on the stamp, unless work has begun within that period.

3-1.05 INTERPRETATION OF PLANS AND SPECIFICATIONS

A. The Contractor shall request clarification, additional information or direction from the City of Richmond if it believes that the work to be done is not sufficiently clear, detailed or explained in the Plans and/or these Specifications. Upon receipt of such a request, the City of Richmond will render a determination as expediently as is practical, and the determination made shall be final.

B. In the event of a discrepancy between the graphical representation and the words or figures written on a drawing, the words and figures shall be taken as correct.

C. In the event that a Property Owner, Developer, Job Engineer, Contractor or other person fails to comply with these Specifications, the City of Richmond Code, or a specific instruction of the Inspector relative to any work under a City of Richmond Encroachment permit or agreement, the City of Richmond may suspend or revoke the permit or agreement until such differences or deficiencies are resolved.

3-1.06 SUPERINTENDENCE

A. The Contractor, or a representative of the Contractor who is authorized to make field decisions, shall be present at the jobsite at all times when work is in progress. The Inspector will communicate any needed determinations or instructions to the Contractor or its authorized representative. Any determination or instruction given by the Inspector that is not otherwise required by these Specifications or the City of Richmond Code to be in writing will, on request of the Contractor, be given or confirmed by the City of Richmond in writing.

B. Prior to being issued a City of Richmond permit, the Contractor shall submit the names of its authorized representative(s), business address and telephone number(s), as part of the City of Richmond Contractor Registration process. Delivery of correspondence or notices to this address by hand delivery, courier service, express carrier or U.S. Mail shall be deemed sufficient service.

3-1.07 LINES AND GRADES

A. When the Contractor requires stakes or marks, it shall notify the Job Engineer of the requirements in advance of starting operations that require such stakes or marks. The Contractor shall request utility marking from U.S.A. prior to staking, and favorable review by the Inspector of stakes in the field is

required prior to the commencement of work. If, in the judgment of the Inspector, the stakes or marks suggest that the new work may conflict with existing improvements, the Contractor shall pothole the existing improvements to determine whether redesign of the work is required.

B. Stakes and marks shall be carefully preserved by the Contractor. If any such stakes and marks necessary to complete construction are destroyed or damaged, the Contractor shall arrange for such stakes and marks to be replaced.

C. All distances and measurements will be made in a horizontal plane. Grades are given from the top of hubs or nails or other points designated by the Job Engineer.

3-1.08 EMERGENCY WORK

A. When a Contractor is contacted by one of its customers for immediate response to clear or repair a blocked line at any time outside of the City of Richmond regular inspection hours (see below), the work may be done as an "emergency" response only to the extent required to restore sewer service. The Contractor may proceed with emergency work only after leaving a message stating the location and nature of the work required on the City of Richmond's Inspection voicemail system. Excavations for repair work shall not be backfilled until favorable City of Richmond inspection is received; however, excavations shall be properly protected with four feet (4') x eight feet (8') sheets of one and one-half (1-1/2) inch thick plywood in non-traffic areas or with trench plates in traffic areas, to ensure public safety whenever work is not in progress. The Contractor shall apply for a City of Richmond Encroachment Permit for the work on the first City of Richmond working day following any emergency response, and shall obtain the permit prior to requesting inspection of the work.

3-1.09 INSPECTION

A. The Inspector shall have access to the work at all times during construction, and the Contractor shall provide proper and safe facilities for such access and for inspection. The Inspector shall be furnished with every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements and intentions of the Plans and these Specifications. All work done and all materials furnished shall be subject to inspection. The Contractor shall submit properly authenticated documents or samples of materials demonstrating the Contractor's compliance with the requirements of these Specifications at any time so requested by the City of Richmond.

B. In the event that the Inspector determines that any work completed or in-progress does not comply with the requirements of the Plans or these Specifications, or any applicable rules and regulations, the Inspector may order that the noncompliant work be corrected, or removed and replaced, so as to fully comply with the requirements. If the Contractor fails to comply with any order made under the provisions of this article within a reasonable time, the City of Richmond may have the defective work corrected or removed and replaced at the Contractor's expense.

C. The Contractor shall call to arrange for the City of Richmond inspections required by these Specifications a minimum of one (1) business day prior to the commencement of work. No work shall begin prior to scheduling of an inspection. The Contractor's customer or the Property Owner may choose to be present during inspections, including during required pre-permit TV inspections. The Contractor shall notify the Inspector of any changes in work schedule affecting inspections as soon as possible to allow time for rescheduling.

D. All inspection work performed by the City of Richmond during hours other than between 8:30 a.m. and 5:00 p.m. on regular working days shall be considered as overtime inspection work. The fees for overtime inspection established by the City of Richmond shall be charged to and paid by the Contractor. If amounts owed for such services are not paid within thirty (30) days from the date of billing, no permits for additional work will be issued until the amounts owed plus delinquent charges are paid.

E. Contractor will be responsible to provide video inspection of the new pipeline or repair upon completion of the job and prior to the end of the 1 year warranty period. The video provided to COR will be PACP

compliant and compatible with the City's database.

3-1.10 WORKERS

A. The Contractor shall employ a sufficient number of competent workers or subcontractors to produce the work required. If, in the judgment of the Inspector, an employee of the Contractor or any subcontractor is incompetent, appears to be under the influence of alcohol or illegal drugs, or acts in an unsafe, disorderly, or improper manner, the Contractor shall remove that person from the work immediately upon the receipt of notice from the Inspector. However, nothing contained in this paragraph shall be construed to shift the responsibility for supervision of employees of the Contractor or any subcontractor from the Contractor or subcontractor to the City of Richmond, or to require the City of Richmond to take any action with regard to any employee of the Contractor or subcontractor.

3-1.11 EQUIPMENT

A. The Contractor shall provide adequate and suitable equipment (including, but not limited to, Personal Protective Equipment, shoring, trench plates, traffic cones, etc.) needed to produce the quality of work required prior to commencing each day's work and, when ordered by the Inspector, shall remove unsuitable equipment from the work.

B. Each machine or piece of equipment shall be operated by a person experienced in handling the particular make of machine or piece of equipment in use, at a speed or rate of production not to exceed that recommended by the manufacturer.

3-1.12 NOTICE TO ADJACENT PROPERTY OWNERS AND RESIDENTS

A. The Contractor or Job Owner shall provide written notice to property owners and/or residents who may be impacted by main sewer extension or private side sewer work. The notice shall describe the City of Richmond-permitted sewer installation or repair work to be done and the tentative schedule for the work. For main sewer extension jobs, this notice shall be made and a copy including a list of addressees shall be provided to the City of Richmond prior to the final construction plan review submittal. For private side sewer work on property owned by someone other than the Contractor's customer, the notice shall be made at minimum of two (2) working days prior to the beginning of any work.

3-1.13 PUBLIC CONVENIENCE

A. The Contractor shall provide for the safe passage of traffic, including emergency response vehicles, through the work during construction if work is located in or affects traffic in any public or private road, right-of-way or access easement. The attention of the Contractor is directed to the encroachment permit requirements of Caltrans and/or Contra Costa County and/or cities within the County with regard to the Contractor's responsibility for providing for the convenience of the public in connection with its operations.

B. The Contractor shall conduct its operations so as to pose the least possible obstruction and inconvenience to public traffic, and it shall have under construction no greater length or amount of work than it can prosecute properly with due regard to the rights and convenience of the public. Attention is directed to Section 4-1.22, Trench Excavation, Part D regarding maximum length of open pipe trench. Where existing roads are not available for use as detours, all traffic shall be permitted to pass through the work with as little inconvenience and delay as possible. Spillage resulting from hauling operations along or across the traveled way shall be removed immediately.

C. Convenience of abutting Property Owners along the road or sewer shall be provided for as far as practicable. Convenient access to driveways, houses and buildings along the line of the work shall be maintained and temporary approaches to crossings or intersecting highways shall be provided and kept in good condition. It is the Contractor's responsibility to provide adequate prior notice of start of construction to owners affected by such construction.

D. Right is reserved to cities, local and county authorities, and to water, gas, telephone, cable and electric power transmission utilities to enter upon any public highway, road or right-of-way for the purpose of making repairs and changes that have become necessary by the reason of the sewer installation.

E. All fences subject to interference shall be maintained by the Contractor until the work is completed, at which time they shall be restored to the condition existing prior to starting the work.

F. Excavation and backfill shall be conducted in such a manner as to provide a reasonably smooth and even surface satisfactory for use by public traffic at all times. When possible, sewer construction shall be conducted on one-half the width of the traveled way at a time and that portion of the traveled way being used by public traffic shall be kept open and unobstructed until the opposite side of the traveled way is completely ready for use by traffic.

G. While trenching and paving operations are under way, Contractor shall ensure that traffic can use the shoulders and the side of the roadbed opposite the one under construction. When sufficient width is available, a passageway wide enough to accommodate two (2) lanes of traffic shall be kept open at all times at locations where construction operations are in active progress.

H. Bridges designed by a Registered Professional Engineer and approved by the City of Richmond shall be installed and maintained across the trench at all crosswalks, intersections, and at such other points where, in the opinion of the Inspector, traffic conditions make it advisable for the convenience of public pedestrian traffic.

I. In order to expedite the passage of public traffic through or around the work and where ordered by the State, municipal, local, and/or county authorities having jurisdiction and/or the Inspector, the Contractor shall install signs, lights, flares, barricades, and shall furnish a pilot car and driver and other facilities for the sole convenience and direction of public traffic. Whenever the Contractor's operations create a hazardous condition or where directed by the State, municipal, local, and/or county authorities having jurisdiction, the Contractor shall provide and station competent flaggers whose sole duties shall consist of directing the movement of public traffic through or around the work.

J. In addition to the requirements specified for furnishing facilities and flaggers to expedite the passage of public traffic through or around the work, the Contractor shall furnish and erect, within or adjacent to the limits of the work, such warning and directional signs as may be required by the previously named agencies having jurisdiction.

3-1.14 MAINTENANCE OF ACCESS AND DETOURS

A. The Contractor shall maintain an adequate number of trench plates on the jobsite to effect immediate access for emergency vehicles and reasonable access for property owners affected by the work. If required, the Contractor shall construct, maintain, and remove detours to direct both pedestrian and vehicular traffic through or around the jobsite, as shown on the Plans, or as directed by the Inspector or other public agency having jurisdiction.

B. At the end of each work day, the Contractor shall ensure that excavations are properly secured, shored and covered with trench plates so as to provide for public safety and unobstructed safe access for vehicular and pedestrian traffic.

C. Where the Contractor's operations are not being satisfactorily controlled or maintained by the Contractor for safe passage of public traffic, the Inspector and/or other public agencies having jurisdiction may order the Contractor to correct any unsafe conditions, and the Contractor shall comply with such orders.

D. The failure or refusal of the Contractor to properly provide emergency or Property Owner access, or to employ, control or maintain detours shall be sufficient cause for suspension of the work until proper access and/or detours are provided by the Contractor.

3-1.15 CLEANLINESS OF JOBSITE

A. The Contractor shall keep the jobsite reasonably clean and orderly and shall sweep streets affected by the work daily. During and upon completion of work, the Contractor shall promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by work in a neat and clean condition. Adjacent structures shall be cleaned of dust, dirt, and debris resulting from demolition or construction operations, as directed by the City of Richmond or other local jurisdictions, and adjacent areas shall be returned to the condition existing prior to start of work.

3-1.16 WATER QUALITY PROTECTION

A. The Contractor shall employ best management practices for control of erosion and jobsite runoff, pollution prevention and protection of water quality as specified in the CASQA Best Management Practices for Protection of Water Quality, latest edition.

3-1.17 FINAL INSPECTION

A. When the work covered by a City of Richmond Encroachment permit or agreement has been completed, including correction of any deficiencies, the Inspector will, upon request by the Contractor, make the final inspection of the work.

B. Final inspections for private developments such as subdivisions, tracts, townhouses, condominiums and commercial centers will be made only after the installations of all other utilities and permanent structural site improvements such as roadway surfacing, curbs, gutters, sidewalks, etc.

C. Before final inspection of the work, as provided above, the Contractor shall clean all roadways, rights of way, and all ground used in connection with the work, of all rubbish, excess materials, falsework, temporary structures, and equipment, and all parts of the work shall be left in a neat and presentable condition. Nothing herein, however, shall require the Contractor to remove warning and directional signs prior to acceptance by the City of Richmond, but the Contractor must do so immediately after acceptance.

3-1.18 ACCEPTANCE AND WARRANTY OF WORK

A. Acceptance of the work will be made in writing by the City of Richmond only after the following requirements have been met:

1. The final inspection has been made in accordance with Section 3-1.17 of these Specifications;

2. The Job Engineer, if applicable, has been notified in writing by the Contractor that the work has been completed; and

3. Manufacturer's guarantees, instructions, and parts lists have been delivered to the City of Richmond.

B. Immediately upon acceptance of the work by the City of Richmond, a one (1) year warranty period on all work shall commence. Contractor will be responsible to provide video inspection of the new pipeline or repair upon completion of the job and prior to the end of the 1 year warranty period. The video provided to COR will be PACP compliant and compatible with the City's database.

C. Any defective materials, faulty workmanship, and/or deficiencies which are discovered within the warranty period shall be corrected and/or replaced by the Contractor. The warranty period shall be extended for an additional one (1) year after acceptance of such correction or replacement.

D. The one (1) year warranty shall be in addition to and not in limitation of any other guarantee of marketability or warranty/guarantee required by law.

CONTROL OF MATERIAL

3-1.19 CONTRACTOR FURNISHED MATERIALS

The Contractor shall furnish all materials required to complete the work. The Contractor shall ensure that materials needed on a particular day are on the jobsite prior to commencing that day's work.

3-1.20 SOURCE OF SUPPLY AND QUALITY OF MATERIALS

Only materials listed on the current Approved Materials List shall be used in the work. Alternative materials conforming to the requirements of these Specifications and favorably reviewed by the City of Richmond will be added to the Approved Materials List and may be used in the work. All materials proposed for use may be inspected or tested by the City of Richmond at any time during their preparation and use. If it is found that sources of supply which have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish material from other sources on the current Approved Materials List. No material, which after approval has in any way become unfit for use, shall be used in the work.

3-1.21 LOCAL MATERIALS

The Contractor shall satisfy itself as to the quantity of acceptable material which may be produced at or obtained from local sources.

3-1.22 ACQUISITION OF MATERIALS

The Contractor shall have on hand, at the time construction starts on any section of the work, all materials necessary to complete that particular section of the work in a reasonable time period.

3-1.23 STORAGE OF MATERIALS

Materials shall be stored in an approved staging area so as to ensure the preservation of their quality and fitness for the work. When determined to be necessary by the Inspector, materials shall be covered and/or placed on wooden platforms or other hard, clean surfaces and not on the ground. Stored materials shall be located so as to facilitate prompt inspection.

3-1.24 DEFECTIVE MATERIALS

Materials that do not conform to the requirements of these Specifications shall be deemed defective. Such defective materials, whether in place or not, shall be rejected and removed immediately from the site of the work, unless otherwise permitted by the Inspector. The City of Richmond may remove and replace defective material should the Contractor fail to comply promptly with any order made under the provisions of this paragraph. Any cost incurred by the City of Richmond will be charged to the Contractor and/or owners.

3-1.25 TRADE NAMES AND ALTERNATIVES

For convenience, certain equipment or materials may be designated on the Plans in these Specifications, or in the Approved Materials List by trade name or manufacturer citing model and/or part numbers. The use of alternative equipment and/or materials that are of equal quality and of the required characteristics for the purpose intended may be permitted in accordance with the following requirements:

A. All information necessary for evaluation of proposed alternative equipment or materials shall be submitted on the City of Richmond-standard form a minimum of thirty (30) days prior to the date that the equipment or materials must be ordered by the Contractor to ensure that there is no unacceptable delay in the work. This information shall include: the names of the manufacturer and supplier of the item, the manufacturer's model or part number, trade name or other item identification, the manufacturer's published application, installation and/or operation manuals and any guarantees, warranties, catalog cuts, data sheets, and certification of compliance with standards testing agency specifications or other test procedures used for product quality assurance.

B. Within thirty (30) days of its receipt of a complete request for consideration of proposed alternative equipment and/or materials, the City of Richmond will render a determination regarding the suitability of the proposed alternative for addition to the Approved Materials List, and its determination shall be final.

If the Contractor does not submit timely requests for consideration of proposed alternative equipment and/or materials, it shall use only equipment and/or materials that are specifically named in these Specifications, shown on the Plans or listed in the current Approved Materials List in the work.

3-1.26 TESTING MATERIALS

A. Whenever reference is made in these Specifications to a test designation of the American Society for Testing and Materials (ASTM), or any other recognized national testing or standards organization, it is to be understood that the most current test method in use on the date of these Specifications shall prevail.

B. Whenever abbreviations are used in these Specifications or on the Plans in connection with a reference to material or work requirements or test methods, such abbreviations shall be construed as set forth under Section 1 of these Specifications.

C. When requested by the Inspector, the Contractor shall furnish samples of materials proposed for use in the work. Materials may be tested at any time during the progress of the work. Material found to be defective shall be rejected.

3-1.27 INSPECTION AT SOURCE OF SUPPLY

The City of Richmond may inspect equipment and/or materials proposed for use in the work at the source of supply or manufacture. Representatives of the City of Richmond shall be provided reasonable access to such parts of production facilities that are related to the manufacture or production of equipment and/or materials proposed for use in the work. The City of Richmond assumes no obligation to inspect materials at the source of supply.

SECTION 4 - TECHNICAL SPECIFICATIONS

4-1.01 SAFETY

GENERAL

THE REQUIREMENT

A. The Contractor shall be responsible for and shall have the duty to ensure safety on the jobsite and all areas affected by job-related activities. The Contractor and its subcontractors shall comply with all applicable federal, state and local safety rules, regulations, requirements and orders in the performance of the work. In addition, the Contractor and its subcontractors shall comply with all requirements and procedures of this Section. The Contractor shall take any additional precautions it deems necessary to prevent injury to people (employees, subcontractors and the public) and damage to property (both public and private).

B. The Contractor shall be responsible for informing its employees, subcontractors, and suppliers of the safety requirements on its jobsite, and shall enforce these requirements. The Contractor shall not allow employees or subcontractors to begin work on jobs under City of Richmond permits without a safety orientation specific to the potential hazards of the job.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 3 - Control of the Work

B. Section 4-1.06 - Shoring, Excavation Support and Protective Systems

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. State of California Department of Transportation: “Manual of Traffic Controls for Construction and Maintenance Work Zones” (latest edition)

B. Cal/OSHA Construction Safety Orders

C. California Code of Regulations General Industry Safety Orders

EXECUTION

GENERAL

A. Use of alcoholic beverages and/or illegal drugs shall be strictly prohibited on the jobsite. Workers who use prescription and non-prescription drugs that may interfere with their ability to work safely shall be prohibited from the jobsite.

B. The Contractor shall maintain all portions of the jobsite in a safe, neat, clean and sanitary condition at all times.

C. Toilets shall be furnished by the Contractor for use of its employees, and their use shall be strictly enforced.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

A. The Contractor shall be responsible for providing and assuring the use of PPE including but not limited to hard hats, eye and face protection, hearing protection, respirators and foot protection.

B. The Contractor’s personnel shall wear hard hats and appropriate foot protection at all times while on the

jobsite, except in offices or vehicles.

C. Proper eye and/or face protection shall be worn whenever there is a risk of exposure to airborne particulates, liquids, or compressed gases.

POWER TOOLS

A. Electric powered hand tools shall be protected by approved ground fault circuit interrupters, or shall be double insulated.

B. Fixed electric power tools such as table saws, pipe threaders, etc. shall be properly wired and grounded.

C. Pneumatically driven power tools shall be disconnected from air lines when not in use. Air lines shall be properly clipped together.

D. Powder actuated tools shall be used only by licensed personnel who have a valid license in their possession.

TRAFFIC CONTROL

A. The Contractor shall provide for the traffic safety of its workers, City of Richmond personnel and the public during construction. Traffic shall be permitted to pass through the work zone safely and with minimum delay.

B. The Contractor shall comply with the State of California Department of Transportation's "Manual of Temporary Traffic Controls for Construction and Maintenance Work Zones" (latest edition), and any applicable local agency encroachment permit requirements when work is done in streets, roadways, or similar thoroughfares subject to vehicular traffic. No work may be performed in any public right-of-way without first obtaining an encroachment permit from the agency having local jurisdiction (i.e., local traffic engineering, public works department, and/or police).

C. When a job requires that work be done in streets or roads, the Contractor shall submit a detailed traffic safety plan for rerouting and/or restricting traffic to City of Richmond for review and to the local agency having jurisdiction for approval before any work is started. The traffic plan shall show locations of signs, flaggers, traffic control devices and barriers relative to the working area. Flaggers shall be properly trained as required by Cal/OSHA.

D. If the Contractor needs to employ detours, other traffic rerouting or restrictions to facilitate its work, it shall acquire a written permit from the state local agency having jurisdiction. No detours, traffic restrictions or reroutings shall be initiated prior to the Inspector's receipt of a copy of the permit and compliance by the Contractor with all permit conditions.

E. Contractors doing work in public streets or public right-of-ways shall:
1. Obtain all necessary permits.
2. Provide timely notification to all affected agencies including:
    a) Police
    b) Fire
    c) Public Works
    d) Bus and Transit
    e) Local Hospitals
    f) Postal Service
    g) Schools
    h) Garbage Service
3. Coordinate the work with all affected agencies.
4. Provide timely notice to occupants of abutting properties and local residents of access limitations made necessary by the work.
5. Install and maintain required traffic control devices.

6. Provide trained and appropriately equipped flag persons when required.
7. Schedule and expedite the work to cause the least inconvenience to the public.
8. Provide adequate safeguards for workers, City of Richmond personnel and the general public.
9. Assure that employees working in or adjacent to a traveled roadway wear vests or jackets of an approved color. For night work, the vests or jackets shall be affixed with approved reflecting stripes.
10. Regularly inspect the jobsite to ensure that all traffic control devices are in place and operate as intended at all times.
11. Remove traffic control devices when they are no longer needed.

TRENCHING/EXCAVATIONS

The Contractor shall comply with the requirements of Section 4-1.06 - Shoring, Excavation Support and Protective Systems, whenever any excavation or trenching work is done.

FIRST AID

The Contractor shall provide first aid and medical treatment for its employees and comply with the first aid requirements of the Cal/OSHA Construction Safety Orders.

FIRE PREVENTION

A. The Contractor shall follow the requirements in California Code of Regulations, Title 8, Construction Safety Orders, Article 36 and General Industry Safety Orders, Article 88.

B. When work is being performed that generates sparks or open flame, the Contractor shall provide an adequate number of fire extinguishers of the appropriate types at the work site. All employees shall be trained to use fire extinguishers.

CONFINED SPACE ENTRY

A. The Contractor shall comply with the provisions of California Code of Regulations General Industry Safety Orders, Title 8, Chapter 4, Subchapter 7, Group 106, Article 108 for confined spaces. In addition, the Contractor shall comply with the requirements contained herein.

B. The following paragraphs contain minimum requirements for project work. City of Richmond or the Contractor may impose stricter requirements dictated by specific conditions. A written copy of the Contractor's confined space operating and rescue procedures shall be kept at the site and be available for review by the City of Richmond representative at all times. The Contractor shall be responsible for ensuring that only properly trained employees perform confined space work.

C. Scheduling

The Contractor shall schedule any confined space entry at least one (1) working day prior to the planned entry and at that time, shall submit a plan for the entry including the exact location of the space to be entered, the nearest cross street, exact house or business address, City of Richmond grid coordinate, or site map, and a list of the Contractor's personnel that will be working on the confined space entry. If there is any change in the plan prior to the entry, the Contractor shall provide the updated information to the Inspector before the actual entry takes place.

D. Communications

1. The Contractor shall notify the Inspector and ensure that communication devices are functioning properly immediately prior to the actual entry. Generally, cellular phones are the only approved method of emergency communication. The Contractor shall note that 911 may not be readily accessible by cellular phones in certain areas of City of Richmond. The Contractor shall verify and confirm that phone contact with emergency responders is accessible before the confined space entry, and shall establish an alternative method of communication if necessary to ensure the safety of its personnel.

2. A fully charged cellular phone with a back-up battery or vehicle adaptor shall be available prior to the entry. The phone shall be positioned immediately adjacent to the point of entry so that emergency assistance can be summoned directly. If this equipment is not available, no entry into the space shall be made. If the cellular phone becomes inoperative during a confined space entry, the entry shall be terminated and rescheduled. This practice does not, however, relieve the Contractor of his/her responsibility to immediately notify the Inspector of any unusual occurrence at the confined space entry site.

3. City of Richmond Right to Cancel

4. City of Richmond may deny a planned confined space entry or cancel an in-progress confined space entry if conditions (e.g., noncompliance with procedures, inclement weather, unacceptable interruptions to operating systems, etc.) so dictate.

E. Pre-entry Procedures

1. Entry Permit: The Contractor may submit its own confined space entry permit form for approval, or may use the City of Richmond's form. The Contractor shall provide the Inspector with a complete entry permit form at least one (1) working day prior to commencing a confined space entry. Immediately prior to the confined space entry, the form shall be signed by the Contractor and the Inspector. The Confined Space Entry Permit shall be kept at the job-site, and shall be returned to the Inspector when the confined space entry has been completed.
2. Blocking or Plugging Sewers: The Contractor shall obtain the Inspector's permission prior to blocking or plugging any sewers.
3. Gas Detection Meters: Gas detection meters shall be acceptable to the City of Richmond representative and shall have sensing elements capable of detecting and monitoring flammable gas, vapor or mists; oxygen; hydrogen sulfide; and carbon monoxide. Physical properties to be monitored include:
    - flammable gas, vapor, or mists lower flammable limit (L.F.L.) – (10 percent L.E.L. maximum)
    - oxygen - (19.5 percent minimum, 23.5 percent maximum)
    - hydrogen sulfide concentration - (10 ppm maximum)
    - carbon monoxide concentration - (25 ppm maximum)

    Although flammables, hydrogen sulfide, oxygen deficiency, and carbon monoxide are of primary concern, other gas detection equipment may be required if other contaminants are suspected.
4. Meters shall have digital readout displays for the sensing elements. Alarms shall be both audio and visual. Meters shall have lights or other visual means of warning of sensor failure or when batteries need recharging. The Contractor shall calibrate the gas detection equipment according to manufacturer's specifications. Equipment shall provide a means for remote sensing.
5. Testing: The Contractor shall test the air with properly calibrated and maintained gas detection equipment. The Contractor shall check gas detection equipment daily for proper operation including verifying that the equipment is electrically functional and has been tested with the calibration gas. The Contractor shall make a written record of the daily maintenance check. The Contractor shall record pre-entry air monitoring results on the permit and shall continue to record air monitoring results on the permit at intervals not to exceed fifteen (15) minutes.
6. Retrieval Systems (Side Entry): Each Contractor's employees working in a confined space where entry is made through a side opening such as a pipeline or tunnel shall wear a safety harness with line attached which meets the requirements of Cal/OSHA.
7. Retrieval Systems (Vertical Entry): Each Contractor's employee working in a confined space where entry must be made through a top opening shall wear a safety harness with line attached. The harness and line shall meet the requirements of Cal/OSHA. A hoisting device such as a tripod and winch that meets the requirements of Cal/OSHA shall be provided for lowering and lifting employees out of the space.
8. Equipment and Training: Prior to commencing any confined space entry, the Contractor shall provide workers associated with confined space entries with the appropriate equipment and adequate training. Rescue and emergency personnel shall be CPR/First Air trained and respirator qualified. Attendance records of training sessions shall be maintained by the Contractor. These records shall be available to City of Richmond upon request.
9. Non-permit Confined Spaces: Certain projects may include work on existing manholes where complete bypassing is used and sewer inlets and outlets are plugged, newly constructed sanitary sewers, or newly constructed manholes where existing sewers have not been broken into and no coatings are being applied. If the Contractor complies with the following minimum requirements, these newly constructed sanitary

sewers and manholes will be considered non-permitted confined spaces and the following procedures shall be employed:

a. The atmosphere's air quality in the manhole or sewer shall be initially checked prior to entry using an acceptable gas detection meter to ensure that a safe atmosphere exists.
b. The air quality in the manhole or sewer shall be continuously monitored using gas detection meters with readings on the meter being regularly monitored at intervals not to exceed fifteen (15) minutes.
c. Continuous mechanical ventilation shall be provided into manholes or sewers throughout the duration of the entry.

10. Minimum Number of Workers Required:
    a. Entry Permit: The Contractor shall assign a minimum of three (3) workers to Confined Space work where an Entry Permit is required: at least one (1) worker to enter and work in the Confined Space at least one (1) worker to continually observe and supervise the work from outside the space; and at least one (1) worker assigned to provide the required continuous communications duties.
    b. Non-Permit: A minimum of two (2) workers shall be assigned to work in Non-Permit Confined Spaces: at least one (1) worker to enter and work in the Non-Permit Confined Space; and at least one (1) worker to continually observe, supervise the work and provide the required continuous communications duties from outside the space.

4-1.02 WATER QUALITY PROTECTION

THE REQUIREMENT

The Contractor shall:

A. Maintain all portions of the jobsite in a safe, neat, clean and sanitary condition at all times.

B. Not impair work the operations of existing utilities (including storm drains and channels).

C. Implement controls to prevent the discharge of sediment and pollutants from various sources to waterways.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 3 – Control of the Work

B. Section 4-1.04 – Excavation Dewatering

C. Section 4-1.07 – Excavation, Bedding and Backfill

D. Section 4-1.08 – Erosion Control (VEGETATIVE)

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Field Management Practices for Water Quality Protection – Sewer and Utility Improvement Projects (City of Richmond).

B. California State Water Resources Control Board (SWRCB) and California Regional Water Quality Control Board – San Francisco Bay Region (RWQCB).

PRODUCTS

EROSION CONTROL

A. Stabilizing Materials
    1. Vegetable fibers (straw, hay)

2. Wood bark chips
3. Hydraulic mulches made from wood or recycled fiber
4. Bonded fiber matrices
5. Geotextile blankets (combinations of straw and/or coconut fiber in 6'x50' rolls)

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Due to the ability of natural ground cover to filter sediment and pollutants and regulate the volume of runoff from land surfaces to adjacent storm drains and/or streams, land disturbance should be minimized to the extent practical.

C. The Contractor shall follow all applicable federal, state, and local regulations for disposing of contaminated storm water, groundwater and contaminated soils resulting from or discovered during excavation.

DRILLING (TUNNELING) OPERATIONS

A. Regardless of whether construction activity occurs in wet or dry weather, the Contractor shall implement controls for the large quantities of water encountered in dewatering and used in microtunneling operations to reduce sediment and associated pollutants transported by splash, wind and vehicle tracking.

B. Slurry from drilling and microtunneling operations which contain additives (such as Bentonite or Polymer solution) is unsuitable for discharge from the site. The wastewater shall be treated through a liquid/solid separation process and the clarified effluent recycled back to the microtunneling operation.

C. All excess slurry liquid from the microtunneling liquid/solid separation process tank shall be discharged into a three (3)-compartment Baker Tank prior to off-hauling by a tank truck for proper disposal. An overflow line from the separation process tank and from the Baker Tank shall be piped to the jacking pit to prevent overflow to the ground surface. Dewatered solids may be required to be managed as regulated waste and hauled to a designated disposal site.

STOCKPILING EXCAVATED MATERIALS

A. Regardless of wet or dry weather season, stockpiles of excavated materials shall be contained in bermed areas and covered with tarps or erosion control blankets to prevent wind or splash erosion and/or runoff.

B. Soils which are not contaminated shall be contained with a berm of sand/gravel bags, silt fencing or staked-in fiber roll(s) provided that they are placed a minimum of two (2) feet from the base of the stockpiled materials.

C. The Contractor shall immediately cease any and all work at the location upon the discovery of contaminated soil or materials.

D. Stockpiled soils shall be protected from rain infiltration, erosion and runoff. Contaminated soils shall be contained to prevent contact with runoff by placing the pile in a debris box or on top of plastic and covering it with roofing, tarps or erosion control blankets.

E. If flows come in contact with contaminated soils, that water shall be considered as a regulated waste and managed as such. In such cases, the Contractor shall provide for disposal in a manner acceptable to the San Francisco Bay RWQCB.

DEWATERING

A. Dewatering operations shall be managed to prevent injury to the public health and private property. The Contractor shall dewater the trench and provide a dry construction site. Discharge of any material with the potential to degrade water quality or adversely impact or threaten fish or wildlife is prohibited. In general, only clear, uncontaminated water may be discharged from a project to a storm drain, waterway or sanitary sewer.

B. Discharging sediment-laden water from a dewatering site into any storm drain, waterway or sanitary sewer without proper settling and/or filtration is prohibited. As such, proper dewatering procedures as specified in Section 4-1.04 – Excavation Dewatering shall be used before construction begins.

C. For fine particles such as clay colloidal suspensions, a more aggressive dewatering strategy including secondary filtration shall be necessary.

D. If work is conducted within an area of known groundwater contamination or if contamination is found, water from dewatering operations shall be tested prior to discharge. If the water quality meets RWQCB standards and is approved by Engineer, it may be discharged to a storm drain or creek. If not, the water shall be hauled off site for proper disposal.

E. Dewatering facilities shall be inspected by the Contractor daily during operation and maintained, repaired or replaced once sediment build-up decreases their efficiency. The Contractor shall remove sediment and pollutants from dewatering flows prior to discharge into storm drains or drainage channels. If the dewatering water becomes polluted, the water shall not be discharged to storm drains or streams.

RESTABILIZATION

A. The Contractor shall cover exposed soils with temporary pavement, final pavement, gravel, topsoil or hydromulch/seed as soon as backfilling is complete to prevent erosion. Backfill shall be furnished and installed in conformance with the requirements set forth in Section 4-1.07 – Excavation, Bedding and Backfill.

B. Disturbed soils shall be stabilized by repaving. A temporary pavement, known as a “cut-back”, shall be placed over exposed soils to allow traffic to resume. Cut-back is made from asphalt which remains pliable in most situations but may leach oil when in contact with water. The use of cut-back shall be minimized during the rainy season. Cut-back pavement shall be replaced by final pavement to match existing pavement sections as soon as possible.

C. Disturbed soils shall be stabilized using one of the following controls unless specified otherwise: hydroseeding, erosion control blankets, or mulch (straw/wood chips/bark). Disturbed areas shall be completely covered.

EROSION CONTROL

A. Disturbed soils shall be temporarily or permanently stabilized and protected against erosion as necessary dependent on slope steepness, accessibility, weather conditions and desired longevity as follows, unless otherwise specified. Erosion control materials shall be installed in conformance with the requirement set forth in Section 4-1.08 – Erosion Control (VEGETATIVE) and in the following manner:
   1. Apply seed and fertilizer to the bare soil (optional)
   2. Apply loose hay or straw (preferred) over the top of the seed at a rate of four thousand five hundred (4,500) kg/ha (2 tons/ac) either by machine or by hand distribution until soil is completely covered
   3. Anchor the mulch in place by using a tackifier (100 to 300 lbs/acre) such as garden sprayed glue, netting, or crimp it into the soil mechanically (Note: Crimping requires wet soils).

EROSION CONTROL BLANKETS AND GEOTEXTILES

A. Blankets are recommended to protect slopes steeper than 2:1, disturbed areas in sensitive areas (such as streams, wetlands), and in channels with flow velocities no greater than 0.6 m/s.

B. Blankets shall be installed according to manufacturer's recommendations, generally as follows:
   1. Begin at the top of the slope and anchor the blanket in a six (6) inch deep by six (6) inch wide trench.
   2. Backfill trench and tamp earth firmly.
   3. Unroll blanket downslope in the direction of water flow, not horizontally.
   4. Lay blankets loosely to maintain direct contact with the soil. Do not stretch.
   5. If more than one blanket is required, overlap the edges of adjacent parallel rolls fifty (50) mm (2 in) to seventy-five (75) mm (3 in) and staple every one (1) m (3 ft).
   6. Staple blankets as specified.

C. The Contractor shall inspect blankets after installation and before and during significant rain events. Failures shall be repaired immediately. If washout, mat undermining or breakages occur, the Contractor shall determine the source of failures, correct it and repair damage to the slope or channel (rills, gullies etc.) before re-installing and re-anchoring blankets.

D. Plastic sheeting does not decrease runoff and, as such, shall be limited to covering stock piles or very small graded areas as a temporary measure and for only short periods of time. Plastic sheeting shall be disposed of at a landfill.

INLET PROTECTION AND ENERGY DISSIPATION

A. To maintain the function of the storm drain, storm drain inlet grates shall not be covered with filter fabric or with solid barriers, such as metal inlet covers. Storm drains shall be protected using temporary sediment control and energy dissipation practices, as allowed by local encroachment permit requirements, constructed along the flow path and around storm drains to improve the quality of water being discharged to inlets or catch basins. Inlet protection and energy dissipation devices shall be removed when no longer required. The Contractor shall be cautious when utilizing any device which may result in a public hazard.

B. To be effective, controls shall slow water, pond sediment-laden runoff, and increase settling time. Ponding shall not encroach into highway traffic or onto eroded surfaces and/or slopes.

C. If high flow conditions are expected, the Contractor shall stabilize slopes and treat disturbed areas with erosion controls (such as geotextile blankets, fiber rolls, mulch), in addition to providing inlet protection.

D. The Contractor shall provide frequent maintenance of inlet protection devices to minimize short-circuiting and to remove silt deposits and buildup. Sediment shall be collected and usually can be disposed of on site. Excess sediment, which could become re-suspended in a rain event, shall be removed immediately and disposed of off-site.

INLET PROTECTION – SAND / GRAVEL BAG BARRIERS

A. Gravel bag barriers are applicable when heavy rains are expected, when construction is conducted in wet weather, and when the drain inlet is the lowest point for discharge.

B. For drainage areas larger than one(1) acre, runoff shall be routed to a sediment-trapping device designed for larger flows.

C. Inlet protection shall be used only when ponding will not encroach into traffic lanes or onto erodible surfaces or slopes. The Contractor shall use traffic barricades to maintain the integrity of inlet protection.

D. Frequent Contractor maintenance shall be provided to remove silt deposits and buildup and to minimize short-circuiting and overtopping.

SEDIMENT CONTROL / ENERGY DISSIPATION

A. Controls to divert flow, slow flow velocity, and pond and filter runoff shall be implemented in flow areas.

B. Every attempt should be made to stabilize disturbed soils at the source. If sediment or polluted water is making its way into the drain inlet, the Contractor shall locate the source and contain it using appropriate controls.

C. A check dam constructed of sand or gravel bags will slow flow velocity, pond water and allow sediment to settle. Check dams are appropriate in small open channels draining ten (10) acres or less.

D. The Contractor shall maintain check dams by removing trapped sediment to prevent its re-suspension in subsequent storms. The Contractor shall inspect check dams after significant rain events and replace loosed materials (rocks, gravel bags) as necessary.

FIBER ROLL DIKES

A. Fiber rolls shall be entrenched and anchored according to the following installation specifications:
   1. Fiber rolls may be used for small areas or short slopes (3:1 or flatter) with low surface flows not to exceed one (1) cfs:
      a) Along the face of exposed and erodible slopes to shorten slope length.
      b) At grade breaks where slopes transition to a steeper slope.
      c) In drainage swales to slow flows.
      d) Along stream banks to assist stabilization and re-vegetation (wattles favorable for plant establishment).
      e) Behind sidewalks or curbs.

B. Contractor shall inspect and maintain fiber rolls to maintain performance. Split, torn, unraveling or slumping rolls shall be repaired or replaced as necessary.

SILT FENCING

A. Silt fencing may be used along the perimeter of the site, along (not across) streams and channels, and around temporary stockpiles. Silt fence material shall be entrenched a minimum of four (4) inch to six (6) inch. The Contractor shall not anchor silt fencing without first entrenching it.

B. Use of a silt fence shall be limited to locations suitable for temporary ponding or deposition of sediment. Silt fences shall not be used to divert flow and shall be placed along the contour.

C. Silt fencing shall be routinely inspected by the Contractor, and all undercutting, split, torn or slumping material immediately repaired. The Contractor shall remove silt fencing when no longer necessary for sediment control.

STABILIZED CONSTRUCTION ENTRANCE

A. At an unpaved site (for example: an unpaved microtunneling or pump station site or contractor staging area), the point of ingress/egress shall be stabilized to minimize the tracking of mud and dirt onto public roads by construction vehicles according to the following specifications:
   1. Design the entrance to support the heaviest vehicles which will use it.
   2. Grade the entrance to prevent runoff from the construction site.
   3. The rock egress pad shall be twenty (20) feet wide x forty (40) feet long x eight (8) feet deep consisting of six (6) inch to eight (8) inch diameter fractured stone aggregate placed over a geotextile fabric.
   4. Mud grates and/or a tire wash shall be used at the intersection of paved roadways and access roads for construction sites adjacent to creek areas.

5. The Contractor shall require that all employees, subcontractors, and suppliers utilize the stabilized construction entrance.
6. The Contractor shall inspect for damage and remove and replace aggregate of egress pad, as necessary, and repair the structure when needed.

STORAGE / MAINTENANCE YARD AND DISPOSAL SITES

A. If the Contractor enters into separate agreements with property owners for use of parcels for a Contractor's yard for any of the purposes listed below – those sites will not be under the control of City of Richmond. However, the Contractor shall ensure that there are no adverse environmental impacts related to use of parcels where City of Richmond has no control.
   1. Defined as any area to be used for:
      a) Loading or unloading
      b) Materials storage
      c) Vehicle and equipment maintenance
      d) Concrete truck washout
      e) Temporary storage of excess materials or debris
      f) Storage or disposal of spoil materials (such as excess construction material and excavated material not suitable for use as backfill material).

B. In cases in which the Contractor enters into agreement with a property owner, the Contractor shall submit a separate Notice of Intent (NOI) to comply with the National Pollutant Discharge Elimination System General Permit to the SWRCB.

C. In compliance with the General Permit, the Contractor shall prepare a separate Storm Water Pollution Prevention Plan (SWPPP) for the disposal site in accordance with the requirements of the California State Water Resources Control Board and local agency ordinance, unless the site has a separate SWPPP or a separate discharge permit from the SWRCB. The SWPPP shall be signed by both the Contractor and the property owner. A copy of the Contractor's SWPPP shall be submitted to CITY OF RICHMOND prior to any activities in the site. If the Contractor's SWPPP is revised during work progress, all revisions shall be submitted to City of Richmond.

D. Permit application fees and costs incurred in preparing and/or amending the SWPPP developed for the site shall be at the expense of the Contractor.

SOLID AND DEMOLITION WASTE MANAGEMENT

A. Upon approval of Inspector, only clean, uncontaminated water may be discharged to the storm drain, waterway, or sanitary sewer. Non-hazardous, solid demolition wastes shall be managed according to the following specifications:
   1. Waste collection areas shall be located away from streets, gutters, and storm drains.
   2. Dumpsters shall be secured at night and during rain events.
   3. Leaky dumpsters shall be replaced and returned for cleaning as necessary.
   4. Arrangements for disposal shall be made to ensure dumpsters do not overflow.

B. Examples of Non-Hazardous Materials:
   1. Drilling fluid additives
   2. Wood, framing, etc.
   3. Concrete, brick, cement mortar
   4. Asphalt
   5. Cleared vegetation, tree trimmings, plant material
   6. Dry paint/non-hazardous paint chips/dust from stripping and sand blasting of non-hazardous paint
   7. Absorbent material (rags, mats) used to absorb non-hazardous spills (materials used to absorb oil-based spills shall be disposed of as hazardous waste)
   8. Steel and metal scraps
   9. Pipe, conduit and wire cuttings
   10. Ground and/or broken paving materials

11. Domestic solid wastes (containers, cans, cups, etc.)

HAZARDOUS WASTE AND MATERIALS MANAGEMENT

A. The Contractor shall manage hazardous wastes and materials according to the following specifications:
   1. Chemical and/or hazardous materials storage and handling areas shall be located away from watercourses and storm drains.
   2. Secondary containment shall have capacity to contain twice the contents of the largest container, and large enough to capture any accidental releases.
   3. Leaks or spills shall be cleaned up immediately, including within the secondary diked area.
   4. Contractor shall ensure that trailers carrying hazardous materials are covered during transit (Illegal transit of hazardous waste is a violation subject to fine and/or jail time).
   5. Hazardous waste shall be disposed of only at authorized treatment, storage, and disposal facilities (Illegal dumping of hazardous waste is a violation subject to fine and/or jail time).
   6. Contractor shall use only a licensed company to transport and dispose of contaminated materials.

B. If storm water runoff enters the storage area or otherwise comes in contact with construction material, the Contractor shall determine if the storm water has become contaminated. Only clean, uncontaminated rain water shall be discharged to a storm drain, waterway, or the sanitary sewer.

C. If the storm water runoff has come in contact with the construction materials, the Contractor shall provide an appropriate collection system for disposal of the storm water runoff in a manner acceptable to the RWQCB. The Contractor shall use only a licensed hazardous waste handling company to clean up large spills.

D. Major contamination, large spills, and other serious hazardous waste incidents will require initial containment and immediate response from specialists. Spills of any material (e.g. sediment-laden wastewater) hazardous or not, shall be reported immediately. Contractor shall notify the Inspector, the Office of Emergency Service (OES) at 800-852-7550, the RWQCB at 510-622-2300, and the County Health Department when a hazardous spill occurs. If there is indecision as to whether water quality will be impacted, the Contractor shall contact the RWQCB to discuss the situation. If long-term remedial action is necessary, the RWQCB may issue enforcement orders to assure proper cleanup. Failure to report a spill resulting in discharge to a storm drain or waterway will result in greatly increased cleanup costs and enforcement action by the RWQCB.

E. Example of Hazardous Waste Materials:
   1. Drilling fluid additives
   2. Petroleum products, such as oil, fuel, and grease
   3. Asphalt products
   4. Concrete curing compounds
   5. Herbicides and pesticides
   6. Chemical additives
   7. Septic wastes
   8. Paints, thinners, and solvents
   9. Materials used to absorb hazardous spills
   10. Acids, lime, glues, and curing compounds
   11. Any other material considered a hazardous waste by the State of California

F. The following pre-existing site conditions may make contamination likely:
   1. Areas of previous commercial or industrial activity.
   2. Sites with a history of illegal dumping on the site or on adjacent properties.
   3. Sites subject to Superfund, state or local cleanup order.
   4. Ponded storm water, groundwater, or dewatering areas, which exhibit an oily sheen or smell of petroleum.
   5. Soils which appear discolored, smell of petroleum, or exhibit other unusual properties.
   6. Sites where abandoned storage tanks, drums, or other buried debris are encountered during construction activity.

PAVEMENT MANAGEMENT

A. Concrete, asphalt, and seal coat shall be applied during dry, appropriately temperatured weather to prevent contaminants from coming in contact with storm water runoff. Storm drain inlets, catch basins, and manholes shall be covered while applying seal coat, tack seal, slurry seal, fog seal or similar materials. Paving machines shall consistently be placed over drip pans or absorbent materials since they tend to drip continuously.

B. Unless approved by the Inspector, during wet weather or when rain is forecast within twenty-four (24) hours, the Contractor shall not pave or oil the street. If rain occurs during paving, the Contractor shall arrange for a container to be delivered to the site to intercept rain water.

C. The Contractor shall not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into gutters, storm drains, or creeks. The Contractor shall either; collect the sand and return it to the stockpile or dispose of it in a trash container.

D. The Contractor shall prevent saw cut slurry from entering catch basins and storm drains. The slurry should be removed using a wet vacuum. The area over which the slurry may spread should also be limited.

E. When making saw cuts, Contractor shall not allow saw-cutting water to enter a storm drain, waterway, or sanitary sewer under any conditions. Water use should as little as possible.

F. Contractor shall protect the drain inlet by covering it completely with filter fabric and containing the slurry by placing barriers around the catch basin (bag/gravel bag dams). The Contractor shall also shovel, absorb, or vacuum the slurry residue from pavement or gutter as necessary and remove from site at the end of the day/job.

CONCRETE MANAGEMENT

A. The Contractor shall perform concrete washout in a designated area where the water will flow into a temporary pit or bermed area in the dirt area from where it can be pumped or disposed of by a hazardous waste disposal program. The water may not be discharged to storm drain, waterway, or sanitary sewer.

B. The Contractor's concrete wash water pit shall be located away from watercourses and storm drains and shall be sized large enough to hold the maximum volume of waste expected. The Contractor shall drain wash water of exposed aggregate concrete to a dirt area or onto stockpiles of aggregate base or sand. Water shall be allowed to percolate into the soil and hardened concrete disposed of in a trash container. If a suitable dirt area is not available, the Contractor shall collect the waste water into a steel, leak-proof debris box.

VEHICLE AND EQUIPMENT SERVICES

A. The Contractor shall use secondary containment, such as a drip pan, to catch leaks or spills any time that vehicle or equipment fluids are dispensed, changed, or poured, and shall clean up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and cleanup materials as a hazardous waste.

B. The Contractor shall inspect vehicles and equipment arriving on site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repairs are made. The Contractor shall perform maintenance and fueling of vehicles or equipment in areas that will not allow run-on of storm water or runoff of spills to storm drains and provide for confined clean-up. The Contractor shall not contaminate the soils or groundwater with such maintenance and fueling activities. The Contractor shall encourage fueling and major maintenance/repair and washing off site whenever possible.

C. Water from equipment washing shall not be allowed to be discharged to a storm drain, waterway, or the

sanitary sewer. The Contractor shall perform vehicle or equipment cleaning with water only in a designated, bermed area that will not allow rinse water to run off site into streets, gutters, storm drains, or creeks. Soaps, solvents, degreasers, steam-cleaning equipment, or equivalent methods will not be allowed. Sumps associated with the wash areas shall be serviced regularly.

SECONDARY CONTAINMENT

A. Wet and dry building materials with the potential to pollute runoff shall be handled and delivered with care and stored under cover and/or surrounded by berms to prevent contact with runoff.

B. The Contractor shall also include containment areas and provide for proper disposal of these materials, their containers, and materials or soil that may be contaminated with these materials.

C. Perimeter controls, containment structures, and covers shall be repaired as necessary to ensure their proper functioning.

D. The Contractor shall maintain the site in a neat and clean and well organized condition.

E. Potential pollutants include:
1. Pesticides and herbicides
2. Fertilizers
3. Detergents
4. Asphalt and concrete compounds
5. Petroleum products, such as fuel, oil, and grease
2. Acids, lime glues, adhesives, curing compounds, etc.
3. Paints and solvents

F. All hazardous materials shall be labeled and stored according to local, state, and federal regulations and according to fire code requirements. The Contractor shall keep an inventory of hazardous material for use in emergency and shall post proper storage instructions at all times in an open and conspicuous location. The Contractor shall use mats during transport and storage and shall not apply hazardous chemicals outdoors during wet weather.

G. The Contractor shall immediately clean up all spills, including but not limited to: Slurry from boring operations, excess concrete and grout, coatings, controlled low-strength material, concrete curing compounds, lubricants and paint.

PAINT MANAGEMENT

A. Only clean rain water shall be discharged to storm drains and/or waterways. The Contractor shall remove as much excess paint as possible from brushes, rollers, and equipment before starting cleanup. The Contractor may discharge very small amounts of cleaning wastes from brushes, rollers, buckets, and tools contaminated with latex (water-based) paints to the sanitary sewer system provided they do not contain certain additives which are pollutants of concern (mercury, tributyltin). Brushes, rollers, and tools containing latex paints may be washed over a sink with plenty of water. Buckets containing latex paints shall first be emptied into the original can or discarded as above.

B. For water based paints, paint out brushes to the maximum extent possible and rinse to a drain leading to the sanitary sewer (indoor plumbing). Where not possible, clean with water, disperse wash water over soil, and spade in.

C. For oil-based paints, paint out brushes to the extent possible; filter and reuse thinner/solvents.

D. Dried latex paint, old brushes, rollers etc. shall be disposed of as non-hazardous waste. The Contractor shall dispose of thinner, solvent, sludge from cleaning equipment and tools, and excess oil and water-based paint as a hazardous waste. Hazardous materials that are not recyclable shall be disposed of by a licensed hazardous waste hauler.

E. Hazardous and non-hazardous paint-related materials, paint wastes, adhesives and cleaning fluids shall be recycled when possible and disposed of properly to prevent contact with stormwater and discharge into storm drains / watercourses. Contractor shall designate an area for cleaning of painting equipment and tools. Contractor shall ensure that clean brushes or rinse containers are not washed into street gutters, storm drains or waterways.

4-1.03 CLEARING, GRUBBING, DEMOLITION, ABANDONMENT, REMOVAL, DISPOSAL AND SALVAGE

GENERAL

THE REQUIREMENT

The Contractor shall furnish all tools, equipment, materials, supplies and labor required for the clearing, grubbing, demolition, abandonment, removal, disposal, and salvage of structures, pavement, improvements, utilities, vegetation, and facilities from the sewer right-of-way, roadways, and other construction areas along with the protection of existing fences, vegetation, structures, and associated improvements, streets, and utilities adjacent to the construction area.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.05 – Bypassing Wastewater

B. Section 4-1.06 – Shoring, Excavation Support and Protective Systems

C. Section 4-1.07 – Excavation, Bedding and Backfill

D. Section 4-1.14 – Asphalt Concrete Pavement and Base Restoration

E. Section 4-1.25 – Grout

F. Section 4-1.30 – Piping, General

CONTRACTOR SUBMITTALS

The Contractor shall submit a map identifying the location of any construction staging areas to be utilized, unless shown on the plans. The Contractor shall also submit written authorization from each site owner.

PRODUCTS

SAFETY AND NOISE BARRIERS

Proximity of existing structures or trees will require construction of an appropriate safety barrier such as temporary fencing, berms, acoustic barriers, or similar facilities. The Contractor shall submit drawings defining the type and extent of proposed safety measures prior to any construction activity.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. All clearing, grubbing, demolition, abandonment, and salvage work shall comply with applicable local,

state, and federal statutes, ordinances, codes, standards, rules, procedures, regulations and safety orders. The Contractor shall obtain required permits and file required reports in a timely manner.

C. CITY OF RICHMOND assumes no responsibility for actual condition of the facilities to be abandoned or demolished. The Contractor shall visit the site and inspect all facilities to become familiar with all existing conditions and utilities. Before beginning any cutting, trenching, abandonment or demolition work, the Contractor shall carefully survey existing facilities and improvements.

D. The Contractor shall take all necessary precautions to prevent damage to existing facilities and improvements that are to remain in place. Any damage to street improvements, building elements, and other existing facilities to remain, caused by the Contractor's operations shall be repaired or replaced. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to their original condition or better to that at the start of work.

E. The Contractor shall carefully consider all bearing loads and capacities for placement of equipment and material. The Contractor shall construct and provide shoring, bracing, and supports, as required. The Contractor shall insure that structural elements are not overloaded and shall be responsible for increasing structural support or adding new support as a result of any cutting, abandonment, removal or demolition work. In the event of any questions as to whether an area to be loaded has adequate bearing capacity, the Contractor shall at its own expense consult with a registered professional engineer and notify City of Richmond prior to the placement of such equipment or material. The Contractor shall remove all temporary protection when authorized by the Inspector.

ABANDONMENT

A. For sewer main and trunk abandonment, the Contractor shall cut back and remove the pipe to be abandoned for a distance of five (5) feet from any connecting structures (manhole rodding inlet, etc.) or other pipes. Holes at existing structures shall be repaired per paragraph 3.2.D below. The remaining pipe to be abandoned shall be completely filled with abandonment grout (as specified in Section 4-1.25 - Grout) and capped at both ends prior to backfilling the access excavations.

B. Lateral sewers shall be abandoned at the point of connection to the public main sewer. The Contractor shall use the following methods for lateral abandonment:

1. Where the section of the main pipe contains a preexisting tap, wye, or tee, the contractor will remove and replace with a section of compatible/approved pipe in the area of the abandonment as stated in section 2.b below.
2. Where the end of the lateral protrudes into the public main sewer or where the tap, tee or wye is damaged, a main sewer repair shall be required. The Contractor shall make the repair employing the following procedures:
    a. If necessary, wastewater in the main sewer shall be bypassed around the location of the repair in accordance with the requirements of Section 4-1.05 Bypassing Wastewater.
    b. Excavate and properly support an access hole large enough to allow removal of a minimum five (5) foot long section of the main sewer including the tap, tee or wye in accordance with Section 4-1.06 Shoring, Excavation Support and Protective Systems.
    c. Remove the section of existing main sewer including the tap, tee or wye.
    d. Place bedding; replace the section of main sewer and backfill the excavation in accordance with Section 4-1.07 Excavation, Bedding and Backfill, and Section 4-1.30 Piping, General.
    e. If in paved area, restore pavement structural section in accordance with Section 4-1.14 Asphalt Concrete Pavement and Base Restoration.

C. Sewer manholes to be abandoned shall have the top block, cover, frame, grade rings and the cone section removed. A minimum of two (2) perforations, at least two (2) inches in diameter each, shall be made at the bottom of the lowest barrel section to allow drainage. The remaining structure shall be backfilled and compacted per the requirements for structure backfill in Section 4-1.07 - Excavation, Bedding and Backfill with Class II aggregate base and compacted to a minimum of ninety-five (95) percent maximum density. Compaction tests are required.

D. When existing piping is removed from an existing structure to remain in service, the Contractor shall fill all resulting holes in the structures with non-shrink grout and reinforcement as required, or as shown. The repair shall be watertight and the finished rehabilitated structure shall appear as a new homogeneous unit.

E. No sewer facility shall be abandoned until replacement facilities have been accepted by City of Richmond and placed in operation.

DEMOLITION

A. The Contractor shall minimize the extent of the demolition.

B. Asphalt pavement and concrete curbs and gutters shall be removed as necessary to perform the required work and shall be saw cut at the limits of removal.

C. Existing reinforcement to remain in place shall be protected, cleaned and extended into new concrete. Existing reinforcement not to be retained shall be cut-off as follows:
   1. Where new concrete joins existing concrete at the removal line, reinforcement shall be cut-off flush with the concrete surface at the removal line.
   2. Where the concrete surface at the removal line is the finished surface, the reinforcement shall be cut back two (2) inches below the finished concrete surface, the ends painted with epoxy paint and the remaining holes patched with non-shrink grout.

BELOW-GRADE DEMOLITION

A. Footings, foundation walls, below-grade construction and concrete slabs on grade shall be demolished and removed to a depth so as not to interfere with new construction, but not less than three (3) feet below existing ground surface or future ground surface, whichever is lower.

B. Below-grade areas and voids resulting from demolition of structures shall be completely filled. All fill and compaction shall be in accordance with Section 4-1.07 - Excavation, Bedding and Backfill.

C. After backfilling and compaction, surfaces shall be graded to meet adjacent contours and provide flow to surface drainage structures.

DISPOSAL OF DEMOLITION DEBRIS

A. Demolition and removal of debris shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Alternate routes shall be provided around closed or obstructed traffic ways.

B. Site debris, rubbish, and other materials resulting from demolition operations shall be removed and disposed of legally.

C. The use of burning for the disposal of refuse, debris, and waste materials is not permitted.

SALVAGE

The Contractor may salvage and reuse such items as fences, gates, street signs, retaining walls, road barriers, guardrails, and other similar items when in reasonably good condition and approved by City of Richmond. Items not in salvageable condition shall be, removed, and replaced.

DUST AND POLLUTION CONTROL

A. The Contractor shall employ water sprinkling, temporary enclosures, chutes, and other suitable methods acceptable to City of Richmond and the local agency having jurisdiction shall be used to limit dust and

dirt rising from and scattering beyond the area of construction.

B. Water shall not be used when it creates hazardous or objectionable condition such as mud, flooding, or pollution.

C. The Contractor shall employ best management practices for control of erosion and jobsite runoff, pollution prevention and protection of water quality as specified in the City of Richmond Field Management Practices for Protection of Water Quality, latest edition.

PROTECTION

A. Safe passage of persons around the area of the work shall be ensured. Operations shall be conducted to prevent injury to people or damage to adjacent buildings, structures, or other facilities.

B. Structure and excavation shoring, bracing, or supports, per Section 4-1.06 - Shoring, Excavation Support and Protective Systems, shall be provided to prevent movement, settlement or collapse of structures to be demolished, or damage to adjacent facilities to remain.

C. Existing landscaping materials, structures and appurtenances, which are not to be demolished, shall be protected.

CLEARING, GRUBBING AND STRIPPING

A. All construction areas shall be cleared of grass and weeds to at least a depth of six (6) inches and cleared of structures, concrete, or masonry debris, pavement, trees, logs, upturned stumps, loose boulders, and any other objectionable material of any kind that would interfere with the performance or completion of the work, create a hazard to safety, or impair the work's subsequent usefulness or obstruct its operation. Loose boulders within ten (10) feet of cut lines shall be incorporated in landscaping or removed from the site. Trees and other natural vegetation outside the actual lines of construction shall be protected from damage with chain link fencing or straw bale barricades during construction.

B. Within the limits of clearing, the areas below the natural ground surface shall be grubbed to a depth necessary to remove all stumps, roots, buried logs, and all other objectionable material. Underground structures, debris, or waste shall be totally removed if they are found on the site. All objectionable material from the clearing and grubbing process shall be removed from the site. Trees, shrubs, fences, and all other improvements that are removed to permit construction, shall be replaced (not including native trees under three (3) inches in diameter at the base and native brush) by the Contractor in kind and size or with substitutes acceptable to the property owner. Native trees larger than three (3) inches in diameter at the base shall not be removed without City of Richmond's consent.

C. Any trees, shrubs, fences or other improvements outside of sewer easements or rights of way deemed necessary to be removed by the Contractor, shall not be removed without the consent of the Property Owner, and shall be replaced if required.

CLEANING

A. The Contractor shall clean and sweep streets daily.

B. During and upon completion of work, the Contractor shall promptly remove unused tools and equipment, surplus materials, rubbish, debris and dust and shall leave areas affected by work in a neat and clean condition.

C. Adjacent structures shall be cleaned of dust, dirt and debris resulting from demolition or construction operations, as directed by City of Richmond or governing authorities and adjacent areas shall be returned to the condition existing prior to start of work.

4-1.04 EXCAVATION DEWATERING

GENERAL

THE REQUIREMENT

The Contractor shall:

A. Secure and comply with the provisions of permits required for dewatering operations, including permits from the Contra Costa County Environmental Health Division for exploration, construction and abandonment of dewatering wells. No water shall be discharged into existing sanitary sewers, or new sanitary sewers constructed unless a Industrial Waste Discharge is obtained from City of Richmond.

B. Provide all labor, materials, and equipment necessary to adequately dewater excavations so that pipe and structures that are installed in excavations are free from standing, flowing or boiling groundwater, surface water, storm water, precipitation, or wastewater; filter soil; and prevent loss of ground from dispersion or erosion.

C. Drawdown the groundwater level a minimum of two (2) feet below the trench bottom and beyond excavation sidewalls where shoring is not designed to resist hydrostatic pressures.

D. Control the rate and effect of dewatering so as to avoid settlement, subsidence or damage to structures or facilities adjacent to areas of proposed dewatering.

E. Provide adequate standby equipment to ensure efficient dewatering and maintenance of dewatering operations during power failure.

F. Be fully responsible and liable for all damages that result from failure to adequately keep excavations dewatered, and shall repair, restore and/or replace facilities or structures damaged as a result of dewatering operations.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.19 - Pipeline Cleaning, Testing and Televising

CONTRACTOR SUBMITTALS

The Contractor shall submit a plan for all excavation dewatering procedures to the Inspector. The dewatering plan shall include the following:

A. Location(s) where water is to be disposed.

B. Scale drawings showing locations of dewatering systems.

C. Details of dewatering systems, such as:
   1. Drilled hole and well casing diameter, slotted and solid lengths;
   2. Sand packer gradation;
   3. Size and capacity of pumps.

QUALITY ASSURANCE

A. Where structures, utilities and/or facilities exist adjacent to areas of proposed dewatering, the Contractor shall establish reference points and shall survey these reference points daily to quickly detect any settlement, subsidence or damage that may develop during or following dewatering operations.

B. If disposal of water to the sanitary sewer is allowed, televising and cleaning of downstream sewers may be required at the Inspector's discretion, and shall be done per the requirements set forth in Section 4-1.19 - Pipeline Cleaning, Testing and Televising.

PRODUCTS

EQUIPMENT

Dewatering, where required, may include the use of wells, well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, standby pumps and/or generators, and other means.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. The Contractor's dewatering operations shall not interfere with vehicle or pedestrian traffic. Under no circumstances shall dewatering water be allowed to flood streets or cause hazardous conditions for traffic. Dewatering pump noise shall be mitigated, especially at night, as required by the applicable local jurisdiction (City or Contra Costa County).

C. Dewatering for structures and pipelines shall commence when groundwater is first encountered, and shall continue until water can be allowed to rise without affecting structures, piping, and other project features.

D. Site grading shall promote drainage. Surface runoff shall be diverted prior to it entering excavations to maintain the bottom of the excavation free from standing water.

E. Dewatering shall be conducted so as to preserve the undisturbed bearing capacity of the subgrade soils at the proposed bottom of excavation, filter soil particles and prevent loss of ground due to dispersion and erosion. Dewatering shall lower the water outside the excavation, if necessary to insure that seepage and migration of soil particles does not occur through openings in the shoring.

F. If subgrade soils are disturbed or loosened by the seepage or flow of water, the affected areas shall be excavated and replacement backfill placed in accordance with Section 4-1.07 - Excavation, Bedding and Backfill.

G. The Contractor shall prevent pipeline and/or structure flotation by maintaining a positive and continuous removal of water.

H. If dewatering wells are used, they shall be adequately spaced to provide the required dewatering, and the Contractor shall use sand packing and/or other means to prevent pumping of soil particles (e.g., fine sand) from the subsurface. The Contractor shall continuously monitor the dewatering water discharge to ensure that subsurface soil is not being removed by the dewatering operation.

I. The demobilization of dewatering operations shall be performed so as to allow groundwater to rise to its ambient (static) level without disturbing natural foundation soils or compacted backfill, and prevent flotation or movement of structures, pipelines, and sewers.

J. The Contractor is advised that it is possible that sand, silty sand and/or gravel strata inter-bedded with less permeable clay and silty clay materials varying in depth, thickness and location may exist in the project area. These potentially water-bearing strata may represent areas of increased trench dewatering difficulty. The Contractor shall carefully consider the possibility of encountering these strata, and plan dewatering operations accordingly.

K. The Contractor shall properly dispose of water without nuisance or damage to adjacent property, in accordance with its Storm Water Pollution Prevention Plan. Water shall be settled or filtered using an approved method to remove sand, silt and fine soil particles before disposal into any storm drainage or sanitary sewer system, including but not limited to the use of a debris trap. The Contractor shall remove and dispose of any material that accumulates in the drainage systems used for water discharge as a result of dewatering operations.

4-1.05 BYPASSING WASTEWATER

PART 1 -- GENERAL

THE REQUIREMENT

When work on a job requires that an existing sewer be taken out of operation to ensure that the work can be safely and efficiently completed without overflow or spillage of wastewater from the sewer, the Contractor shall:

A. Secure and comply with the provisions of permits required for wastewater bypassing operations, including encroachment permits for equipment and piping from the applicable local jurisdiction (City or Contra Costa County).

B. Furnish all labor, materials, tools, equipment and supplies required to convey wastewater from a point upstream to a point downstream of the work.

CONTRACTOR SUBMITTALS

The Contractor shall submit the following to City of Richmond, and receive favorable review prior to installation of sewage bypass equipment:

A. A plan for bypassing wastewater, which shall identify the type, size, and quantity of all service and standby pumps, motors, and power equipment; the type and size of all piping, fittings, and connections; the proposed location of bypass pumps and pipes; and the proposed schedule for bypass operation.

B. A unique Emergency Action Plan for each bypass location. The plan shall include the restoring of normal sewage flows, resumption of the bypass pumping operation, and the reporting and clean-up of any spills.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.19 – Pipe Cleaning, Testing and Televising.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Flow in existing sewers shall not be dammed or otherwise restricted for any period of time without the approval of the Inspector. All wastewater facilities shall remain in continuous operation during construction.

C. Bypassing of wastewater to surface water or drainage courses is prohibited. The Contractor shall adhere to all applicable local jurisdiction restrictions regarding the transport and conveyance of wastewater.

D. All pumps and piping shall be adequately sized to convey the flows anticipated at each bypass location.

The bypass system shall be watertight; no leakage from bypass equipment, hoses, or pumps onto private property, gutters, streets, sidewalks, or into storm drains or creeks will be allowed.

E. Prior to commencing bypassing operations at a particular location, all workers, materials, fittings, supports, equipment, and tools shall be staged at that location.

TEMPORARY PUMPING

A. Bypassed sewage shall be contained in an enclosed hose or pipe and shall be redirected into the sanitary sewer system. Dumping, overland or open channel flow of sewage is strictly prohibited. Flushing of sewage from spills or from bypass equipment leakage into storm drains or creeks is also prohibited. Any spill or leakage shall be immediately contained and conveyed to a sanitary sewer or hauled to the Wastewater Treatment Plant without undue delay per the Contractor's Emergency Action Plan.

B. Where bypass pipelines are required to cross traffic lanes, the piping and fittings shall be buried a minimum of four (4) inches below the pavement surface and backfilled with temporary asphalt concrete surfacing unless otherwise allowed by the local agency and City of Richmond. Traffic lane closure will be at the sole discretion of the agency with jurisdiction.

C. Temporary ramps may be constructed over pipelines six (6) inches in diameter, or less, to allow access to driveways. Pipelines larger than six (6) inches in diameter crossing driveways shall be buried a minimum of four (4) inches below the existing ground or pavement surface and backfilled with temporary asphalt concrete surfacing. No driveway access shall be blocked without the written authorization of the affected property owner.

D. Air and vacuum relief valves shall be provided at the high point in each section of elevated piping.

E. Pumped bypass systems shall be continuously monitored.

F. After the work necessitating bypassing is completed, flow shall be restored to normal, all equipment shall be removed from the sewer system, and all pipes or structures modified or damaged during the bypass operations shall be restored to their original condition.

G. Televising of main line and downstream sewer cleaning may be required at the Inspector's discretion and shall be done per the requirements set forth in Section 4-1.19 - Pipeline Cleaning, Testing and Televising.

4-1.06 SHORING, EXCAVATION SUPPORT AND PROTECTIVE SYSTEMS

GENERAL

THE REQUIREMENT

A. Competent Person

A Competent Person shall be designated by the Contractor for any job that requires any individuals to enter into a trench or other excavation regardless of depth. A Competent Person is an individual who has been specifically trained in, and is knowledgeable about, soils evaluation, the use of protective systems and the requirements of the applicable regulations regarding the safety of excavations. The Competent Person shall be responsible for identifying existing or predictable hazards in the surroundings or working area, and shall have the authority to stop the Contractor's operations, order individuals to evacuate the excavation and take measures to eliminate the hazards.

B. Excavations less than five (5) feet in depth

Protective systems are not required for excavations less than five (5) feet in depth unless the Contractor's designated Competent Person has evaluated the soil and trench and determined that there is an indication that a potential for cave-in of the trench or excavation exists.

C. Excavations greater than five (5) feet and less than twenty (20) feet in depth

Protective systems designed by a professional engineer registered by the State of California shall be required for all excavations greater than five (5) feet and less than twenty (20) feet in depth unless an Aluminum Hydraulic Shoring protective system is used in strict conformance with the system manufacturer's tabulated data approved and stamped by a registered professional engineer. Tunneling or undermining adjacent to any trench or excavation is strictly prohibited.

D. Excavations greater than twenty (20) feet in depth

A protective system designed by a professional engineer registered by the State of California shall be required for any trench or other excavation deeper than twenty (20) feet.

E. Soil Classification/Testing

Consideration of soil classification, as well as the depth of the trench or other excavations is necessary to determine the appropriate type of protective system to be used. All soil classification and testing shall comply with OSHA Regulations, 29 CFR Part 1926 Subpart P – Excavations.

F. Underground Utilities

Prior to any excavation, it is the Contractor's responsibility to determine the location of all utility installations including, without limitation, pipes, conductors and conduits for electricity, gas, water, telephone, cable TV, sewage, storm drainage that could be encountered during excavation. At least forty-eight (48) hours prior to commencing any excavation, the Contractor shall notify Underground Service Alert (USA) by calling 1-800-227-2600, or 811, in accordance with California state law. Regardless of whether utilities have been marked, the Contractor shall proceed with caution in areas of utility facilities and structures. The Contractor shall expose existing utilities by hand-excavation or by other methods acceptable to the utility owner when excavating within two (2) feet of any field markings of utility location.

G. Excavated Material

All stockpiled excavated or imported backfill material shall be stored at least two (2) feet away from the edge of any trench or other excavation when employees are working in the trench. At the discretion of the Competent Person, retaining devices may be used to prevent material from rolling or falling into the excavation.

H. Surcharge Loads

The excavation slope configuration and/or shoring system design shall include surcharge loads (e.g., excavation spoils, stockpiles, equipment, traffic and adjacent foundations).

I. Access/Egress

When personnel are working in trenches or other excavations of five (5) feet of depth or more; stairways, ladders, ramps, or other safe means of access/egress shall be located within a maximum of twenty-five (25) feet of lateral travel from each person in the excavation.

J. Stability of Adjacent Structures

Systems for support of structures adjacent to excavations are to be provided when the stability of such structures is threatened by excavation operations.

Sidewalks, pavement and other structures shall not be undermined unless an appropriate protective system is provided to protect from collapse.

K. Water Accumulation

Proper dewatering procedures as specified in Section 4-1.04 - Excavation Dewatering shall be used in excavations where water accumulates.

L. Inspections

The Competent Person designated by the Contractor shall conduct daily inspections of excavations, adjacent areas, dewatering and protective systems. Inspections shall be conducted prior to the start of work and as needed throughout the workday. If evidence of a hazardous situation is encountered by the Competent Person, work shall be stopped and all personnel evacuated from the excavation until remedial measures have been taken and the Competent Person has determined that it is safe to re-enter the excavation.

M. The Contractor shall be responsible for repairing or replacing existing utilities, pavement, structures or other improvements damaged as a result of failure to adequately support excavations.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.04 - Excavation Dewatering

B. Section 4-1.07 - Excavation, Bedding and Backfill

C. Section 4-1.01 - Safety

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. California Labor Code.

B. Occupational Safety and Health Administrative Code.

C. Cal/OSHA, State of California Administrative Code, Title 8; Industrial Relations, Chapter 4, Subchapter 4, Construction Safety Orders.

D. Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR Part 1926, Subpart P.

QUALITY ASSURANCE

A. Designs of protective systems for shoring or other excavation support systems shall be prepared by a Civil or Structural Engineer who is registered in the State of California.

DESIGN CRITERIA

A. Protective Systems

The Contractor shall provide adequate protective systems that will allow safe and expeditious construction of sewers and structures without movement or settlement of the ground and in a manner, which will prevent damage to, or movement of, adjacent structures, utilities, or other facilities, and prevent cave-ins and other potential hazards of excavations. Protective systems shall comply with applicable provisions of the State of California Administrative Code, Title 8; Industrial Relations, Chapter 4, Subchapter 4, Construction Safety Orders, and the federal Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR Part 1926 Subpart P – Excavations, and may include:

1. Sloping and/or benching;
2. Timber shoring;
3. Manufactured aluminum hydraulic shoring systems;
4. Shields and/or trench boxes;
5. Systems designed by a Registered Professional Engineer.

B. The excavation protective systems shall be designed and installed to support anticipated earth pressures, utility loads, equipment, applicable traffic and construction loads, and other surcharge loads in accordance with generally accepted professional engineering practice. The Contractor shall implement the recommendations of a geotechnical engineering report, if one is available. The design of protective systems shall include consideration of the effects of dewatering.

C. The lowest level of the protective systems shall extend to a depth below the main excavation adequate to prevent lateral and vertical movement of ground both inside and outside of excavation and excessive inflow of water.

D. The excavation protective systems shall provide the required free excavated space for workers and groundwater control systems and to accommodate the permanent structures to be constructed.

E. The excavation protective systems shall be designed to accommodate staged installation and removal as required to accommodate construction and backfill sequences.

F. Timber shoring, except lagging, shall be employed only for utilities and minor structures. No timber supporting members or lagging shall be left in place.

CONTRACTOR SUBMITTALS

A. The Contractor shall submit drawings and supporting calculations for excavation protective systems prepared and stamped by a civil or structural engineer registered in the State of California. The submittals shall include details, arrangements, and method of construction for the proposed systems including levels of struts and shores and permissible depth to which the excavation may be carried before supports are installed, and sequence for removal of shoring systems.

B. The Contractor shall submit a copy of its current annual OSHA Excavation Permit to the City of Richmond Permit Counter. No City of Richmond permits will be issued to a Contractor unless a current OSHA Excavation Permit is on file.

C. The Contractor shall designate a Competent Person who shall conduct daily or more frequent site inspections as appropriate. The designated Competent Person shall possess a current certification.

PRODUCTS

MATERIALS

All manufactured aluminum hydraulic shores and appurtenances, and timber and structural steel to be used for protective systems, whether new or used, shall be sound and free from defects that may impair their strength.

EXECUTION

INSTALLATION REQUIREMENTS

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. The Contractor shall install or construct protective systems in accordance with accepted shop drawings and in a manner that provides support of excavation sidewalls and meets the requirements of Part 1 of this Section.

C. No part of the excavation protective systems shall be placed or allowed to deflect within the limits of permanent structures.

D. Refer to OSHA Regulations, 29 CFR part 1926 Subpart P, for slope configurations and maximum

allowable slopes. Sloping and benching shall be done in accordance with the soil type determined. In the case that the soil type is unclear, the support system design shall be based on "Type C" soil with the following Cal/OSHA exceptions:

1. Excavation slope shall be less steep than the maximum allowable slope when there are signs of distress (See Cal/OSHA Article 6, Section 1541.1, Appendix B, Item 1541.1 (C) (3) (B)).
2. When surcharge loads (e.g., excavation spoils, stockpiles, equipment, traffic and adjacent foundations) are present, the Competent Person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope (See Cal/OSHA Article 6, Section 1541.1, Appendix B, Item 1541.1 (C)(3)(C)).

REMOVAL OF EXCAVATION SUPPORT SYSTEMS

A. Remove the shoring system in a manner that will not disturb or damage adjacent structures, construction, or utilities. Fill voids immediately with lean concrete or with approved backfill compacted to the relative compaction for the location specified in Section 4-1.07 - Excavation, Bedding and Backfill.

B. The Contractor shall repair damage to new or existing structures resulting from removal of excavation support systems.

4-1.07 EXCAVATION, BEDDING AND BACKFILL

GENERAL

THE REQUIREMENT

The Contractor shall provide all labor, materials, and equipment necessary to perform all excavation, bedding, backfill and grading operations required for construction of the work.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.03 - Clearing, Grubbing, Demolition, Abandonment, Removal, Disposal and Salvage

B. Section 4-1.06 - Shoring, Excavation Support and Protective Systems

C. Section 4-1.23 - Controlled Low Strength Material (CLSM)

D. Section 4-1.09 - Geotextile Fabric

E. Section 4-1.20 - Protection of Trees and Restoration of Landscaping

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM D 1556 Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D 1557 Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))
ASTM D 2419 Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregates
ASTM D 2487 Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 6938 Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D 4253 Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D 4254 Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

CONTRACTOR SUBMITTALS

Compaction testing of bedding and backfill materials shall be required for all main sewer extensions and laterals in public streets. Compaction testing of bedding and backfill for side sewer work on private property may be required at the discretion of the Inspector. The required compaction testing shall be conducted under the direction of a Civil or Geotechnical Engineer registered by the State of California. As a condition of City of Richmond's acceptance of complete project work, a Certification Report indicating that compaction results meet or exceed the requirements of the City of Richmond Standard Specifications shall be submitted by the engineer in responsible charge of the compaction testing. Compaction testing shall be completed prior to the acceptance televising of the sewer and installation of final paving.

QUALITY ASSURANCE

A. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content will be determined in accordance with ASTM D 1557. Where cohesionless, free draining soil material is required to be compacted to a percentage of relative density, the calculation of relative density will be determined in accordance with ASTM D 4253 and D 4254. Field density in-place tests will be performed in accordance with ASTM D 1556, ASTM D 6938, or by such other means acceptable to City of Richmond. At a minimum, compaction tests shall be conducted for each fifty (50) feet of trench and for each two (2) feet of trench depth, unless otherwise specified by the agency with jurisdiction for the roadway.

B. If a first test and a subsequent re-test of the bedding or backfill show non-compliance with the density required under this Section, the Contractor shall remove and re-compact the material represented by the test/retest as necessary to ensure compliance.

C. The Contractor shall provide access in the excavation for the soil compaction testing technician or Inspector. This shall include providing site-specific safety equipment and temporary shoring to enable compaction testing at each required level within the excavation. Should the Contractor have backfilled to an elevation above that required to be tested, he shall excavate the backfill down to the necessary level for testing and provide shoring at his cost. Subsequent backfilling shall also be at the Contractor's cost.

PRODUCTS

SUITABLE BEDDING AND BACKFILL MATERIAL

A. Bedding and backfill material shall be selected or processed clean, free from grass, roots, brush, other vegetation, debris, refuse or other deleterious material of any kind.

B. The following types of bedding and backfill materials are designated and defined as follows:
   1. Type I Bedding and Backfill Material (Class 2 Aggregate Base): Shall be newly quarried or recycled material (not mined alluvial material), and shall be certified by the quarry or recycler as complying with the provisions of Caltrans Specifications Section 26 (Class 2 Aggregate Base) for three-quarter (3/4) inch maximum grading.
   2. Coarse Bedding Material (Drain Rock/Foundation Rock): Shall be crushed stone or gravel (not mined alluvial material), with a minimum of ninety-five percent (95%) crushed particles per CTM 205, durable and free from slaking or decomposition under action of alternate wetting and drying with minimum Durability Index of 40 per CTM 229. The material shall meet the following gradation requirements:

Sieve Size	Percentage Passing
2-inch	100
1-1/2-inch	90-100
3/4-inch	5-30
3/8-inch	0-5
No. 200	0–2

3. Controlled Low Strength Material shall conform to the requirements of Section 4-1.23 - Controlled Low Strength Material (CLSM).

UNSUITABLE MATERIAL

A. Unsuitable materials for bedding and backfill shall include soils, which when classified under ASTM D 2487 fall in the classifications of PT, OH, CH, MH, or OL. In addition, any soil that cannot be sufficiently compacted to achieve the percentage of maximum density specified for the intended use shall be considered unsuitable.

B. Chemical testing for corrosivity shall be performed for all materials proposed for use as bedding and backfill for metallic or reinforced concrete pipe. The testing shall be in accordance with the requirements of CTM 417, CTM 422 and CTM 643. Bedding and backfill materials shall be considered unsuitable when the chloride concentration exceeds 500 ppm, sulfate concentration exceeds 1,500 ppm, resistivity is less than 2,000 ohm-cm or pH is less than 6.5. Testing shall be performed by a qualified laboratory approved by City of Richmond, and the data shall be submitted to the Inspector for acceptance prior to use of the material in the work.

C. Type III materials which are too wet to be compacted to specified compaction shall not be rejected solely because they are too wet for proper compaction. The Contractor may at its option, dry these materials in accordance with Paragraph 3.8.G of this section prior to compaction. Alternatively, the Contractor may remove the Type III materials and provide imported backfill material.

D. Backfill placed within six (6) inches of any structure or pipe shall be free of rocks or unbroken clods of earth larger than four (4) inches in any dimension.

E. All material that is determined to be unsuitable for use as bedding and backfill or that is in excess of the amount required shall be removed immediately and disposed of properly by the Contractor.

USE OF SUITABLE BEDDING AND BACKFILL MATERIAL

A. Backfill types shall be used in accordance with the following provisions:
   1. Pipe zone backfill (bedding, haunching and shading), as defined under paragraph 3.6 Bedding and Backfill herein, shall be Type I Bedding and Backfill Material (Class 2 Aggregate Base) unless otherwise specified on the plans.
   2. Trench zone backfill, as defined under paragraph 3.6 Bedding and Backfill herein, for pipelines in public and private streets and other paved areas shall be Type I Bedding and Backfill Material (Class 2 Aggregate Base).
   3. Trench zone backfill in future roadway or street rights-of-way or in off road locations (e.g., easements) may be Type III Bedding and Backfill Material (native trench soil) so long as specified compaction is achieved.
   4. Final Backfill as defined under "Pipe and Utility Trench Backfill" herein, for pipelines in public and private streets and other paved areas shall be Type I Bedding and Backfill Material (Class 2 Aggregate Base).
   5. Backfill around structures, vaults, and valve boxes shall be Type I Bedding and Backfill Material (Class 2 Aggregate Base).
   6. Backfill used to replace structure and pipeline trench over-excavation of wet or soft trench bottom conditions shall be Coarse Bedding and Backfill Material (Drain Rock/Foundation Rock) with a geotextile fabric envelope (minimum one-foot overlap) around the rock to prevent migration of fines.
   7. Controlled Low Strength Material may be used for bedding, pipe zone backfill and trench zone backfill whenever pre-approved in writing by City of Richmond or shown on the plans.
   8. Trenches in landscaped or cultivated areas shall have the top twelve (12) inches backfilled with topsoil.

FILTER FABRIC

Filter fabric shall be as specified in Section 4-1.09 - Geotextile Fabric.

TRENCH DAMS, AND PIPE ANCHORS

Trench Dams and Pipe Anchors shall be provided at the locations shown on the plans and shall be constructed as shown in the Standard Drawings as follows:

- Trench Dams: SS-16 of the Standard Drawings
- Pipe Anchors: SS-17 of the Standard Drawings

Trench dams shall be of the length and width dimensions shown in the detail, shall extend below finished grade as shown in the detail, and shall be constructed of controlled low strength material (CLSM) as specified in Section 4-1.23 - Controlled Low Strength Material (CLSM).

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Prior to any excavation and backfill work, the Contractor shall obtain and provide City of Richmond with copies or other evidence of acquisition thereof, all required permits for the work, including but not limited to:

County and/or City encroachment permits, City of Richmond permits, Cal/OSHA excavation permit, and Competent Person certification.

C. See Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration for saw-cutting requirements.

D. Material to be used for backfill shall be laid alongside of the trench and kept trimmed so as to cause as little inconvenience as possible to public travel and the normal use of adjacent properties. However, stockpiled material shall be kept a minimum of two feet from the edge of the trench and the face of the stockpile shall be sloped as required in Section 4-1.06 Shoring, Excavation Support and Protective Systems. Free access must be provided to all fire hydrants, water gates, meters, and private drives. Gutters or other drainage ways shall be kept clear unless other temporary provisions are made for maintaining drainage.

E. In advance of placing sewer pipe or structures, material within the area where such pipe or structures are to be placed, which in the opinion of the Inspector is unsuitable including, but not limited to vegetable matter, garbage, and junk piles, either on the surface or buried, shall be removed and disposed of in accordance with the provisions of Section 4-1.03 - Clearing, Grubbing, Demolition, Abandonment, Removal, Disposal and Salvage.

F. Water to control dust resulting from grading operations, excavation, backfill, and the passage of traffic through the work area shall be applied by means that will ensure a uniform application of water with no runoff.

G. The Contractor shall remove and dispose of all excess excavated material at a suitable preferred site(s). The Contractor shall obtain all necessary fill and grading permits and a written release from property owners upon completion of use of said sites.

STRUCTURE EXCAVATION

A. Except when specifically provided to the contrary, excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the work. The removal of these materials shall conform to the lines

and grades shown on the plans or as directed by the Inspector. Unless otherwise provided, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. The Contractor shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations, and all pumping, ditching, or other measures required for the removal or exclusion of water, including storm water, groundwater, and wastewater reaching the site of the work from any source so as to provide dry working conditions and to prevent damage to the work or adjoining property. Excavations shall be benched, sloped, shored or otherwise supported in a safe manner in accordance with Section 4-1.06 Shoring, Excavation Support and Protective Systems, applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

B. Excavation under structures, manholes, vaults and others: Except where otherwise specified for a particular structure or directed by the Inspector, excavation shall be carried to the grade of the bottom of the bedding. Where shown on the plans or directed by the Inspector, areas beneath structures shall be over-excavated. The exposed surface shall be scarified to a depth of six (6) inches, brought to optimum moisture content, and compacted to ninety-five percent (95%) Relative Compaction. Where over-excavation is directed by the Inspector to provide for the placement of foundation rock over wet or soft soils, scarification and re-compaction shall not be performed.

TRENCH EXCAVATION

A. Excavation for sewers shall be made only after pipe and other necessary materials are delivered on the site of the work. After such delivery, trench excavation shall proceed as rapidly as possible, and the pipe installed and the trench backfilled without undue delay. In public street areas, excavation and pipe installation shall be coordinated to the end that a minimum of interference with public traffic will result.

B. Refer to table below for required trench widths according to nominal pipe size.

Nominal Pipe Size	2"	4"	6"	8"	10"	12"	14"	15"	16"	18"	24"
Trench Width	18"	18"	24"	24"	30"	30"	36"	36"	36"	36"	42"

C. The pipe bedding shall be given a final trim, using a string line for establishing grade, such that each pipe section when first laid will be continually in contact with the bedding along the bottom of the pipe. The Contractor shall excavate bell holes at pipe joints.

D. For trenching in existing streets, excavation and pipe installation shall be coordinated so that no more than one hundred (100) linear feet of trench shall be open at any time. Backfilling operations shall closely follow pipe installation. In new subdivisions more than one hundred (100) feet of trench may be opened if allowed by the Inspector and if the excavation is properly shored, sloped or benched. All trenches shall be fully backfilled at the end of each day or, properly shored and covered by heavy steel plates adequately braced and capable of supporting HS-20 vehicle loads in those locations subject to traffic and with one and one-eighth (1-1/8) inch plywood in off road locations where it is impractical to backfill at the end of each day. Use of steel traffic plates is subject to the prior approval of the agency issuing the encroachment permit. Traffic plates shall be staked in place, with adjacent plates tack-welded together, and shall be provided with non-skid coating. Compacted cold mix asphalt shall be placed around the plate perimeter to provide a smooth transition from adjacent pavement.

E. Where the bottom of the trench becomes soft or is unstable due to groundwater and/or movement of construction equipment, the Contractor shall over-excavate unsuitable material to a minimum depth of nine (9) inches below the base elevation to establish a stable foundation for the bedding or to a depth as otherwise directed by the Inspector. Geotextile fabric shall be placed on the over-excavated trench bottom and staked to the trench walls, coarse bedding material in conformance with these specifications shall be placed on the fabric, and the fabric shall then be un-staked from the trench wall and wrapped

over the coarse bedding material forming a closed envelope with a minimum one (1) foot overlap at the top edges of the fabric.

F. Any over-excavation carried below the grade ordered, specified, or shown, shall be backfilled and compacted to the required grade with the specified material.

EMBANKMENT EXCAVATION

A. The relative compaction of the natural ground area upon which embankments are to be constructed, for a depth of not less than two (2) feet below finished grade, shall be not less than ninety percent (90%) Relative Compaction.

B. If finished grade is less than three (3) feet, above natural ground, the natural ground shall be excavated to a depth of not less than three (3) feet below finished grade and re-compacted to a relative compaction of not less than ninety percent (90%).

C. When embankments are to be made and compacted on hillsides, or where new fill is to be compacted against existing embankments, the slopes of the original hillside, old or new fill, shall be cut into a minimum of six (6) feet horizontally as the work is brought up in layers. Material thus cut out shall be re-compacted along with the new fill. Fill shall be compacted to a Relative Compaction of not less than ninety percent (90%).

EXCAVATION IN VICINITY OF TREES

Trees shall be protected from injury during excavation and backfilling operations as required in Section 4-1.20 - Protection of Trees and Restoration of Landscaping.

BEDDING AND BACKFILL

A. Except for required foundation material (in an envelope of geotextile fabric) coarse bedding material being placed in over-excavated areas, where water or soft ground is present, backfill shall not be placed until after all water is removed from the excavation.

B. Pipe zone bedding and backfill operations shall be performed in accordance with the following requirements:
   1. Type I Bedding and Backfill Material (Class 2 Aggregate Base) shall be placed and properly compacted in the pipe zone. The pipe zone is defined as that portion of the vertical trench cross-section lying between a plane four (4) to six (6) inches below the bottom surface of the pipe, i.e., the trench sub-grade, and a plane at a point twelve (12) inches above the top outside surface of the pipe. The sub-zones of the pipe zone are defined as follows:
      a. "Bedding is that portion of the Pipe Zone between the bottom of the trench or the top of required foundation material and the lowest point on the outside surface of the pipe barrel excepting bells;
      b. "Haunching" is that portion of the Pipe Zone between the top of the Bedding and the horizontal centerline of the pipe;
      c. "Shading" is that portion of the Pipe Zone between the top of the Haunching and a horizontal plane twelve (12) inches above the highest point on the outside surface of the pipe barrel excepting bells.
   2. Controlled Low Strength Material (CLSM) shall be provided in lieu of Type I Bedding and Backfill Material where indicated on the plans. Contractor shall provide a method to prevent pipe from floating during backfill. (The remaining portions of the trench shall be backfilled as specified elsewhere in this Section.)
   3. After compacting the bedding, the Contractor shall perform a final trim using a stringline for establishing grade, such that each pipe section when laid will be continually in contact with the bedding along the bottom of the pipe. The Contractor shall provide bell holes at each pipe joint.
   4. Backfill in trenches shall be placed uniformly on each side of the pipe to prevent displacement. The Contractor shall exercise care to prevent damage to the pipeline coating, cathodic bonds, or the pipe

itself during the installation and backfill operations. The Contractor shall hand shovel slice the bedding along the sides of the pipe in order to ensure filling any voids under the pipe haunches.

C. A colored detectable metallic foil core plastic tape, at least three (3) inches in width, shall be placed on top of the pipe zone backfill wherever sewers are installed. The tape shall have printed on it the words “Caution: Sewer Buried Below.” The warning tape shall be utilized for all pipes (mains and laterals).

D. After the pipe zone backfill has been placed as specified above, and after all excess water has completely drained from the trench, backfilling of the trench zone may proceed. The trench zone is defined as that portion of the trench excavation between the top of the Shading and the ground surface in unpaved areas, and the horizontal plane at lowest point of the pavement structural section in paved areas.

E. "Final Backfill" is that portion of the Trench Zone in paved areas between the top of the trench backfill and the lowest point of the pavement structural section.

F. Joint utility trench excavations shall conform to the requirements shown on SS-11 of the Standard Drawings.

PLACING AND SPREADING OF BACKFILL AND EMBANKMENT MATERIALS

A. Backfill materials shall be placed and spread evenly in layers. The backfill layers shall be evenly spread so that each layer shall not exceed eight (8) inches in un-compacted thickness. Backfill layers greater than eight (8) inches but no more than twenty-four (24) inches may be used after the Contractor demonstrates by compaction testing as specified in Section 3.8 below, that required compaction levels will be achieved.

B. During spreading, each layer shall be thoroughly mixed as necessary to promote uniformity of material in each layer. Pipe zone backfill materials shall be manually spread around the pipe so that when compacted, the pipe zone backfill will provide uniform bearing and side support.

C. Where the backfill material moisture content is below the optimum moisture content, water shall be added before or during spreading until the proper moisture content is within the range where the specified compaction can be achieved.

D. Where the backfill material moisture content is too high to permit the specified degree of compaction, the material shall be bladed, aerated or dried and/or mixed with dryer material until the moisture content is satisfactory.

E. Whenever selection is possible, embankment material having a sand equivalent value of less than ten (10) shall be deposited in the lower portions of embankments and no such material shall be placed within three (3) feet of planned finished grade.

F. When the embankment material consists of large rocky material, or hard lumps such as hardpan or cemented gravel which cannot be broken readily, such material shall be well distributed throughout the embankment, and sufficient earth or other fine material shall be placed around the large material as it is deposited so as to fill the interstices and produce a dense compact embankment, but in no case shall any material exceed twenty-four (24) inches in any dimension.

COMPACTION OF BACKFILL AND EMBANKMENT MATERIALS

A. Each layer of backfill material as defined herein, shall be mechanically compacted to the specified percentage of maximum density. Equipment that is consistently capable of achieving the required degree of compaction shall be used and each layer shall be compacted over its entire area while the material is at the required moisture content. Compaction at the top of the pipe zone shall be done using a plate compactor.

B. Flooding, ponding, or jetting shall not be used.

C. Equipment weighing more than ten thousand (10,000) pounds shall not be used within a horizontal distance equal to the depth of the trench. Hand operated power compaction equipment shall be used where use of heavier equipment is impractical or restricted due to weight limitations.

D. The following compaction requirements shall be in accordance with ASTM D 1557 except for free draining materials (i.e., Coarse Bedding Material/Drain Rock/Foundation Material), which shall be in accordance with ASTM D 4253 and D 4254 for cohesionless free draining type materials. Where other public agency, utility company or encroachment permit requirements govern, the highest compaction standards shall apply.

Location or Use of Fill	Percent (%) Relative Compaction
Pipe zone backfill including bedding and over excavated foundation zone.	90
Final backfill beneath paved areas or structures.	95
Trench backfill in unpaved easement or future street areas.	90
Trench Zone backfill.	90
Backfill under structures.	95
Backfill around structures under paved areas.	95
Backfill around structures in landscaped areas.	90
Embankment material	90

E. The Contractor shall maintain the indicated trench cross section at a minimum of twelve (12) inches above the top of the pipe (the top of the "Pipe Zone").

F. Embankments shall be constructed as recommended by the geotechnical engineer in compacted layers of uniform thickness.

G. At the time of compaction, the moisture content of embankment material shall be such that the relative compactions specified will be obtained and the embankment will be in a firm and stable condition. Embankment material which contains less than the required moisture content shall be watered and material which contains excessive moisture shall not be compacted until the material is dry enough to obtain the required compaction.

TEMPORARY PAVING

A minimum of two (2) inches of cold or hot mix temporary asphalt shall be placed in finished trenches and rolled to a smooth surface at the end of each day unless final paving can be completed or steel plates are used to cover trenches in paved streets. Traffic plates shall be subject to the requirements of Paragraph 3.3.D. The temporary asphalt shall be placed within one-quarter (1/4) inch of finished pavement grade.

4-1.08 EROSION CONTROL (VEGETATIVE)

GENERAL

THE REQUIREMENT

A. The Contractor shall provide erosion protection including fertilizing, seeding, and mulching for all disturbed areas that are not to be paved or otherwise treated, as specified, and other areas as shown on the plans.

B. Erosion Control (Vegetative) may be used as temporary erosion protection of landscaped areas as approved by City of Richmond. However, prior to final acceptance of landscaped areas Erosion Control (Vegetative) shall be replaced with the proper landscape material.

C. Erosion Control (Vegetative) shall be supplemented by straw bales, jute netting, and other similar erosion protection methods until the vegetative growth has been established.

D. An erosion control blanket shall be installed per manufacturer recommendations, in the following areas; non-landscaped areas, areas with slope gradients over 3:1, areas where mechanical compaction is not feasible, and areas parallel or perpendicular to drainage swales.

E. Erosion control measures shall be included as an element of the Contractor's Storm Water Pollution Prevention Plan (SWPPP).

PRODUCTS

MATERIALS

A. Fertilizer shall be a commercial, chemical type, uniform in composition, free-flowing, conforming to state and federal laws and suitable for application with equipment designed for that purpose. Fertilizer shall have a guaranteed analysis showing no less than eleven percent (11%) nitrogen, eight percent (8%) available phosphoric acid, and four percent (4%) water-soluble potash.

B. Seed shall be delivered in original unopened packages bearing an analysis of the contents. Seed shall be guaranteed ninety-five percent (95%) pure with a minimum germination rate of eighty percent (80%). Seed mix shall be equal parts by weight of fescue and perennial ryegrass or perennial ryegrass and barley. Other mixes such as those specified by Caltrans or the local agency having jurisdiction may be proposed by the Contractor and used if approved by City of Richmond.

C. Mulch shall be a fibrous, wood cellulose product produced for this purpose. It shall be dyed green and shall contain no growth or germination inhibiting substances, and shall be manufactured so that when thoroughly mixed with seed, fertilizer, and water, in the proportions specified it will form homogenous slurry which is capable of being sprayed.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Fertilizing, seeding, or mulching operations will not be permitted when wind velocities exceed fifteen (15) miles per hour or when the ground is frozen, unduly wet, or otherwise not in tillable conditions.

C. The ground to be seeded shall be reasonably free of large rocks, roots, and other material which will interfere with the work.

D. Fertilizer, seed, and mulch may be applied separately (Dry Method), or they may be mixed together with water and the homogeneous slurry applied by spraying (Hydraulic Method), except that all slopes steeper than three (3) units horizontal to one (1) unit vertical shall be stabilized by the hydraulic method.

3.2 DRY METHOD

A. The fertilizer shall be spread uniformly at the rate of eight hundred (800) pounds per acre (approximately 1 lb. per 55 square feet). The fertilizer shall be raked in and thoroughly mixed with the soil to a depth of approximately two (2) inches prior to the application of seed or mulch.

B. The seed shall be broadcast uniformly at the rate of sixty (60) lbs/acre (approximately 1 lb. per 730 sq.

ft). After the seed has been distributed it shall be incorporated into the soil by raking or by other approved methods.

C. Mulch shall be applied at the rate of one thousand five hundred (1,500) pounds (air dried weight) per acre (approximately 1 lb. per 30 sq. ft).

HYDRAULIC METHOD

The hydraulic method consists of the uniform application by spraying of a homogeneous mixture of water, seed, fertilizer, and mulch. The slurry shall be prepared by mixing the ingredients in the same proportions as specified above. The slurry shall have the proper consistency to adhere to the earth slopes without lumping or running. Mixing time of materials shall not exceed forty five (45) minutes from the time the seeds come into contact with the water in the mixer to the complete discharge of the slurry onto the slopes; otherwise the batch shall be recharged with seed. The mixture shall be applied using equipment containing a tank, having a built-in continuous agitation and recirculation system, and a discharge system that will allow application of the slurry to the slopes at a continuous and uniform rate. The application rates of the ingredients shall be the same as those specified for the Dry Method. The nozzle shall produce a spray that does not concentrate the slurry nor erode the soil.

3.4 WATERING

Upon completion of the erosion control seeding, the entire area shall be soaked to saturation by a fine spray. The new planting shall be kept watered by a sprinkling system on the site during dry weather or whenever necessary for proper establishment of the planting until final project acceptance. At no time shall the planting be allowed to dry out. Care shall be taken to avoid excessive washing or ponding on the surface. Any damage caused by excessive washing or ponding shall be repaired by the Contractor. The Contractor shall provide his own water supply.

3.5 MAINTENANCE PRIOR TO FINAL ACCEPTANCE

The Contractor shall maintain the planted areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the filling, leveling, and repairing of any washed or eroded areas, as may be necessary and sufficient watering to maintain the plant materials in a healthy condition. City of Richmond may require replanting of any areas in which the establishment of the vegetative ground cover does not appear to be developing adequately.

4-1.09 GEOTEXTILE FABRIC

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install geotextile fabric in accordance with the provisions of this Section.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM D 276	Test Methods for Identification of Fibers of Textiles
ASTM D 4354	Practice for Sampling of Geosynthetics for Testing
ASTM D 4491	Standard Test Methods for Water Permeability of Geotextiles
ASTM D 4533	Standard Test Methods for Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	Test Method for Determining Apparent Opening Size of a Geotextile

ASTM D 4833	Standard Test Methods for Index Puncture Resistance of Geomembranes and Related Products
ASTM D 4873	Guide for Identification, Storage and Handling of Geosynthetic Rolls and Samples
TxDOT 3099	Geotextile Asphalt Retention

PRODUCTS

GEOTEXTILE FABRIC FOR WRAPPING FOUNDATION ROCK

A. Geotextile fabric wrapped around the foundation rock material shall be a high modulus woven fabric. The fabric shall be inert to commonly encountered chemicals, rot-proof, and resistant to ultraviolet light exposures, insects, and rodents. The fabric shall meet the following physical requirements:

Property	Requirement	Test Method
Grab/Elongation, lbs./%	160 x 160 / 150 x 50	ASTM D 4632
Trapezoidal Tearing Strength, lbs.	60 x 60	ASTM D 4533
Apparent Opening Size	US Sieve <70	ASTM D 4751
Puncture, lbs.	95	ASTM D 4833
Permeability, Sec-1/gpm/ft.	1.4/110	ASTM D 4491

B. Geotextile fabric shall be as listed in the City of Richmond Approved Materials List.

GEOTEXTILE FABRIC FOR PAVING

A. Geotextile fabric for paving shall be a non-woven material consisting of at least eighty-five percent (85%) by weight of polyolefin, polyesters, or polyamides. The fabric shall be resistant to chemical attack, rot and mildew and shall have no tears or defects that will adversely alter its physical properties. The fabric shall be specifically designed for pavement application and be heat bonded on one side only to assist in preventing bleed through of tack coat and sticking of fibers to wheels of lay-down equipment. The fabric shall meet the following physical requirements:

Property	Requirement	Test Method
Tensile Strength, lbs.	80	ASTM D 4632
Elongation, percent	50	ASTM D 4632
Asphalt Retention, gal/sq. yd.	0.2	TxDOT 3099
Melting Point, degrees F	300	ASTM D 276
Surface Texture	Heat bonded on one side only	Visual inspection

Note: All numerical values shown above represent minimum average roll values. Test results from any sampled roll in a lot shall meet or exceed the minimum values shown. Lots shall be sampled in accordance with ASTM D 4354.

B. Geotextile paving fabric shall be as listed in the Approved Materials List.

TACK COAT

The tack coat used to bond the fabric to the base pavement shall be in accordance with the requirements of Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration, except that the use of cutbacks or emulsions that contain solvents shall not be allowed.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Geotextile fabric shall be provided in rolls wrapped with protective covering to protect the fabric from mud, dirt, dust, debris, ultraviolet radiation, and abrasion. The fabric shall be free of defects or flaws that significantly affect its physical properties. Each roll of fabric in the shipment shall be labeled in accordance with ASTM D 4873.

C. Geotextile fabric shall be handled and placed in accordance with the manufacturer's recommendations.

INSTALLATION OF GEOTEXTILE FABRIC FOR FOUNDATION ROCK

A. Geotextile fabric for foundation rock shall be installed as specified in the project plans and as specified in Section 4-1.07 - Excavation, Bedding and Backfill. The geotextile fabric shall be wrapped entirely around the rock with a minimum twelve (12) inch overlap. Punctures in the geotextile fabric shall be covered with a twelve (12) inch square minimum patch.

B. Geotextile fabric and foundation rock shall be provided beneath sanitary sewer manholes and structures where water or soft ground is present.

PAVEMENT SURFACE PREPARATION

The pavement surface shall be cleaned to remove all dirt, water, and oil from base pavement or aggregate base rock. Cracks one quarter (1/4) inch wide and wider shall be cleaned and filled with suitable bituminous material or by a method approved by City of Richmond and/or the local jurisdiction. Crack filling material shall be allowed to cure prior to geotextile placement. Where pavement is severely cracked, rutted, deformed, or otherwise distressed, a leveling course shall be placed as directed by City of Richmond and/or the local jurisdiction.

TACK COAT

A. Minimum air and pavement temperature shall be fifty degrees Fahrenheit (50°F) or higher for placement of asphalt and shall be sixty degrees Fahrenheit (60°F) or higher for placement of asphalt emulsion.

B. The sealant material shall be spread by means of a calibrated pressure distributor truck. The asphalt sealant shall be uniformly spray-applied to the prepared dry pavement surface at the rate of 0.20 to 0.30 gallons per square yard or as recommended by the geotextile manufacturer and approved by City of Richmond. When using emulsions, the application rate must be increased as directed by City of Richmond to offset water content of the emulsion. Some underlying surfaces may require a higher application rate. Within street intersections, on steep grades, or in other zones where vehicle speed changes are commonplace, the normal application rate shall be reduced about twenty percent (20%) as directed by City of Richmond but to no less than 0.20 gallons per square yard.

C. For paving grade asphalt cements, the distributor tank temperature shall not be less than two hundred eighty five degrees Fahrenheit (285°F) nor exceed three hundred twenty five degrees Fahrenheit (325°F) to avoid damage to the geotextile. For asphalt emulsions, the distributor tank temperatures shall be maintained between one hundred thirty degrees Fahrenheit (130°F) and one hundred sixty degrees Fahrenheit (160°F).

D. The target width of sealant application shall be geotextile width plus six (6) inches. The sealant shall be applied only as far as in advance of geotextile installation as is appropriate to insure a tacky surface at the time of geotextile placement. Fabric shall be placed the same day as the sealant. Traffic shall not be allowed on the sealant. Excess asphalt shall be cleaned from the road surface.

PLACEMENT OF GEOTEXTILE FABRIC FOR PAVING

A. The geotextile shall be placed into the sealant using mechanical or manual laydown equipment capable of providing a smooth installation with a minimum amount of wrinkling or folding prior to the sealant cooling and losing tackiness. When asphalt emulsions are used, the emulsion shall be allowed to cure properly, essentially with no moisture remaining prior to placing the geotextile and overlay. Wrinkles or folds in excess of one (1) inch shall be slit and laid flat. All transverse joints and slit folds or wrinkles shall be shingle-lapped in the direction of the paving operation. Brooming and/or pneumatic rolling will

be required to maximize geotextile contact with pavement surface. Additional hand-placed sealant material may be required at laps and repairs as determined by City of Richmond and/or the local jurisdiction.

B. All areas with fabric placed shall be paved the same day. No traffic except necessary construction equipment and emergency vehicles shall be allowed to drive on the fabric. Turning of the paver and other vehicles shall be done gradually and kept to a minimum to avoid movement and damage to the geotextile. Abrupt starts and stops shall also be avoided. Damaged geotextile shall be removed and replaced with the same type of geotextile, and the overlaps shall be shingle-lapped in the direction of paving. Overlaps shall not exceed six (6) inches.

PLACEMENT OF OVERLAY OR TRENCH PATCH

A. All areas in which fabric has been placed shall be paved during the same day. The temperature of the hot mix shall not exceed three hundred twenty five degrees Fahrenheit (325°F). Sealant bleeding through the geotextile shall be removed. Excess sealant can be removed by broadcasting hot mix or sand on the fabric. Excess sand or hot mix should be removed before beginning the paving operation. In the event of rainfall on the fabric prior to the placement of the asphalt overlay, the fabric must be allowed to dry completely before asphalt is placed. This will prevent the trapping of water (steam) under the hot asphalt that could induce cracking.

B. Asphalt concrete pavement shall be placed over the geotextile fabric to a minimum thickness of two and one half (2-1/2) inches or the thickness required by the local jurisdiction, whichever is greater in accordance with the requirements specified in Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration.

4-1.10 HORIZONTAL DIRECTIONAL DRILLING (HDD)

GENERAL

THE REQUIREMENT

A. The Contractor shall furnish and install sewer pipe, complete and in place, by the horizontal directional drilling (HDD) method. All work shall be performed as indicated on the plans and as required in these Specifications and shall be supervised by personnel experienced in HDD pipe installation. Note that HDD installation of sewers will only be allowed where the design slope is at least three percent (3%; S = 0.0300).

B. The HDD rig and tooling shall be of sufficient capacity to complete the pilot bore, reaming and pull-back of pipe.

C. The drilling fluid mixing and delivery system shall be of sufficient capacity to successfully complete the HDD work.

D. The Contractor shall provide all materials, labor, equipment and services necessary for bypass pumping and/or diversion of sewage flow (if required), installation of sewer pipe and testing of the completed pipe system.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.05 - Bypassing Wastewater

B. Section 4-1.06 - Shoring, Excavation Support and Protective Systems

C. Section 4-1.07 - Excavation, Bedding and Backfill

D. Section 4-1.19 - Pipeline Cleaning, Testing and Televising

E. Section 4-1.30 - Piping, General

F. Section 4-1.33 - Ductile Iron Pipe (DIP)

G. Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe

H. Section 4-1.35 - High Density Polyethylene (HDPE) Pipe

1.3 CONTRACTOR SUBMITTALS

A. The Contractor shall submit the following no later than fourteen (14) days prior to the planned date for commencement of work:
   1. Cut Sheets for field staking at twenty (20) foot intervals along the proposed centerline of the pipe alignment. No HDD work shall be started prior to City of Richmond's field check of the stakes.
   2. Site maps to scale indicating the locations proposed for pipe assembly work (e.g., butt-fusion welding), laydown areas, pipe and material storage areas, insertion and receiving pits, Pipe location monitoring grid, tanks, pumps, HDD rig and trailers.
   3. Technical data for pipe and fittings, and pipe joining, drilling, reaming, pulling and locating equipment.
   4. A proposed construction sequencing plan.
   5. Procedure for handling and disposal of drilling fluids and cuttings including the locations of disposal sites.
   6. Calculations of anticipated HDD installation loads demonstrating that the pipe and pipe fittings system is capable of withstanding the anticipated installation and operating loads with an appropriate factor of safety.
   7. Calculations of minimum penetration rates for all reaming passes.
   8. Contingency Plan for dealing with the potential for drilling fluids to surface (e.g., through hydrofractures).
   9. Material Safety Data Sheets (MSDS) for all drilling fluids, lubricants, and other products used for the HDD drilling and pipe installation work.
   10. A statement of the qualifications of the foreman, local operator and crew who will be responsible for HDD work. No Substitution of these personnel shall be made without the written acceptance of City of Richmond.

B. The Contractor shall submit the following installation information daily:
   1. Raw pilot hole data including all magnetic steering and surface monitoring readings.
   2. The pitch and three (3) dimensional (x, y, z) coordinates of the probe for every drill rod length or thirty (30) feet, whichever is shorter length. Coordinates shall be referenced to the drilling entry pit coordinate taken as the origin (0, 0, 0).
   3. A log of the maximum thrust, maximum torque, and maximum slurry flow during pull back at every drill rod length or thirty (30) feet whichever is shorter length.
   4. Records of any hydrofracture encountered or other problems and correction measures taken.

QUALITY ASSURANCE

A. The Contractor shall test and inspect the installed pipeline and shall conduct post-job television inspection in accordance with the requirements of Section 4-1.19 - Pipeline Cleaning, Testing and Televising.

B. All HDD work shall be done by a qualified Contractor with at least five (5) years' experience with HDD and a minimum of three (3) projects of similar diameter, depth, and length.

PRODUCTS

PIPE

The Contractor shall provide restrained-joint Ductile Iron Pipe as specified in Section 4-1.33, restrained-joint or thermo-fusion welded PVC Pipe as specified in Section 4-1.34, or thermo-fusion welded High Density Polyethylene Pipe as specified in Section 4-1.35.

HDD EQUIPMENT AND MATERIALS

A. The drill unit shall be a remote-steerable tunneling system that is designed and is capable of accurately drilling (true to line and grade as specified on the drawings) through the ground conditions identified in the geotechnical report and in bedrock and in mixed bedrock and soil face conditions. The drilling system shall utilize a high-pressure, low-volume, slurry-assisted, mechanical excavation technology capable of installing pipelines of the diameter shown on the plans.

B. The drilling slurry compound shall be totally inert.

C. The Contractor shall provide and use an electronic detection system that is capable of continuously locating the position of the drilling head to an accuracy of one percent (1%) of the depth in both the horizontal and vertical planes (e.g., within 0.1 feet when the drilling head is ten (10) feet deep), if the design slope of the sewer being installed by HDD is less that ten percent (10%; S = < 0.010 feet per foot). Where the design slope for the sewer being installed by HDD is equal to or greater than ten percent (10%), the electronic detection system shall be capable of continuously locating the drilling head to an accuracy of five percent (5%) of the depth in both the horizontal and vertical planes (e.g., within 0.5 feet when the drilling head is ten (10) feet deep).

D. All drilling equipment shall have a permanent, inherent alarm system capable of detecting an electrical current. The equipment shall be grounded and shall be equipped with an audible alarm to warn the operator when the drill head nears electrified cable.

E. All crews shall be provided with grounded safety mats, heavy gauge ground cables with connectors, hot boots and gloves.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. The Contractor shall protect all surface and subsurface site improvements, facilities, and utility pipelines, ducts and conduits from being damaged by the directional drilling operation.

PREPARATION

A. Cut Stakes shall be provided at twenty (20) foot intervals along centerline to provide for monitoring of the drilling head.

B. Easements shall be staked at fifty (50) foot intervals.

C. Potholing shall be required for marked utilities within ten (10) feet of centerline.

D. The Contractor shall walk the alignment to check for potential sources of interference that could affect the accuracy of the drilling head locating system. The Contractor shall properly calibrate the locating system prior to beginning and regularly during the HDD operation as required to achieve the accuracy specified in Subsection 2.2.C of this Section.

BYPASS PUMPING

The Contractor shall provide bypass pumping and/or diversion in accordance with the requirements of Section 4-1.05 - Bypassing Wastewater when required for acceptable completion of the pipe installation.

PIPE INSTALLATION

A. The Contractor shall locate, design, construct, properly brace or shore, dewater, maintain, and restore insertion and receiving pits. Insertion and receiving pits shall be a minimum of four (4") feet by six (6") feet in horizontal cross section and shall be shored in accordance with Section 4-1.06 - Shoring, Excavation Support and Protective Systems. Bracing shall be adequate to resist drilling and pull-back loads.

B. The Contractor shall employ a slurry-assisted, mechanical excavation process for the HDD operation. The drilling slurry compound shall maintain boring stability and provide lubrication to reduce frictional drag while the pipe is being installed. The Contractor shall employ a mobile vacuum spoils recovery vehicle or drilling fluid recycling system to remove drilling spoils from the access pits. The Contractor shall collect, transport, and properly dispose of drilling spoils away from the jobsite. Disposal of drilling spoils to sanitary, storm or other public or private drainage systems or waterways is strictly prohibited. The Contractor shall immediately clean up any leakage or spillage of drilling fluids.

C. Mechanical, pneumatic, or water-jetting methods are unacceptable due to the possibility of surface subsidence.

D. After a pilot bore has been completed, a reamer shall be installed at the termination pit and the bore shall be reamed, as many times as necessary, for proper insertion of the pipe, before the pipe is pulled back to the starting pit. The reamer shall be capable of discharging drilling slurry compound to facilitate the installation of the pipe into a stabilized and lubricated tunnel.

E. Prior to insertion of thermo-fusion welded PVC or HDPE pipe larger than six (6) inches in diameter, the Contractor shall properly remove all internal weld beads from the interior surface of the pipe.

F. During insertion, the pipe shall be supported on roller supports to isolate the pipe from the ground or pavement and avoid damage to the pipe.

G. During pull back operations, the maximum safe pulling load for the pipe shall not be exceeded.

H. Prior to making connection at each end of an installed reach of HDPE or PVC pipe, the Contractor shall allow a minimum of six (6) hours to elapse to allow pipe to relax from the tension resulting from pulling the pipe into and for the pipe to equalize with ambient ground temperature.

I. Upon completion of boring and pipe installation, the Contractor shall remove all spoils, debris and unsuitable material from the starting and termination pits. All pits shall be backfilled in accordance with the requirements of Section 4-1.07 - Excavation, Bedding and Backfill.

J. The installed pipeline shall be within six (6) inches horizontal and one (1) inch vertical of the alignment indicated in the Plans at all locations. In addition, for gravity sewers the pipeline shall be free-draining throughout.

K. The Contractor shall repair, replace or compensate the respective Owners for any damage to property including, but not limited to, utilities, pavements, landscaping and other improvements.

4-1.11 BORING AND JACKING (STEEL CASING)

GENERAL

THE REQUIREMENT

A. The Contractor shall furnish and install steel casings and sewer pipelines, complete and in place at the specified alignment and grade using horizontal boring and jacking methods. All work shall be performed as indicated on the plans and required in these Specifications, and shall be supervised by personnel experienced in the installation of pipe by boring and jacking methods.

B. The Contractor shall furnish all materials, labor, equipment and services necessary for bypass pumping, and or diversion of sewer flows, installation of casing and sewer pipes and testing of the completed system.

C. The Contractor shall be responsible for any settlement of overlying improvements, heaving of the surface, displacement of underground utilities and structures or other damage that results from the boring and jacking operations.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.04 – Excavation Dewatering

B. Section 4-1.06 - Shoring, Excavation Support and Protective Systems

C. Section 4-1.07 - Excavation, Bedding and Backfill

D. Section 4-1.19 – Pipeline Cleaning, Testing and Televising

E. Section 4-1.25 - Grout

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ANSI/AWS D1.1 Structural Welding Code Steel

B. Codes:

1. Cal/OSHA, State of California Administrative Code, Title 8, Industrial Relations, Chapter 4, Subchapter 20, Tunnel Safety Orders.
2. Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR Part 1926, Subpart S.

CONTRACTOR SUBMITTALS

A. Contractor shall submit the following a minimum of fourteen (14) days prior to the scheduled commencement of work:

1. Description of methods, procedures and equipment proposed for installation of the casing and carrier pipe, including methods used for checking the as-installed line-and-grade of the casing and the location of and procedures for muck disposal.
2. Casing installation schedules that address excavation, casing and carrier pipe installation and backfill operations.
3. Materials list and casing details including diameter, thickness, and class of steel, and fabrication drawings from the casing supplier.
4. Detailed locations, sizes and shoring design of all jacking and receiving pits.
5. Groundwater control methods, drawings, details and equipment information.
6. Procedures and methods for installation of the carrier pipe including pipe insulator details and spacing.

7. Grouting or sand placement equipment, procedures and proposed mixtures for grouting or filling the annular space between the casing and the carrier pipe.
8. Lists, catalog cuts and specifications for pipe insulators and end seals.
9. Site map to scale indicating locations and dimensions of jacking and receiving pits, pipe and material storage areas, cranes, trailers and other equipment.
10. Procedures for preventing uncontrolled loss of ground through the tunnel face and plan for closure of tunnel should uncontrolled loss of ground occur.
11. Boring and jacking personnel qualifications and welders certificates.
12. For bore and jack tunnel lengths greater than one hundred (100) linear feet, provide jacking force estimates and jacking pad (e.g., backstop) capacity calculations.

QUALITY ASSURANCE

A. All boring and jacking work shall be done by a qualified Contractor with at least five (5) years of boring and jacking experience including a minimum of three (3) projects of similar in diameter, depth and length to the work to be done.

B. The Contractor shall request a pre-construction meeting with the Inspector a minimum of one (1) day in advance of the start of boring operations.

C. The Contractor shall perform all work in the presence of the Inspector, unless the Inspector has granted prior approval to perform such work when absent.

D. All welding procedures used to fabricate steel casings shall be prequalified under the provisions of ANSI/AWS D1.1.

E. The Contractor shall check line-and-grade using surveying methods, or other methods approved by City of Richmond, from inside the casing at least every fifty (50) feet unless otherwise permitted by City of Richmond. The following tolerances apply to the installation of the casing pipe:
1. Horizontal (Line): 12 inches at the termination point.
2. Vertical (Grade): 3 inches high at the termination point. 6 inches low at the termination point.

If, at any time during the boring and jacking operation, it becomes apparent that installation may not meet these tolerances, the Contractor shall propose and implement a modification of operations so as to meet the tolerance criteria. If one or both of the tolerance criteria is exceeded at the completion of the casing installation, the Contractor shall install a new casing. Subject to the approval of City of Richmond, the Contractor may propose another method to correct the deficiency in line and or grade of the casing pipe. These methods may include modifying the insulator/skid assemblies, or revising the design of upstream or downstream portions of the job, if adequate grade is available.

F. All sewer pipe installed in bored and jacked casings shall be cleaned, tested and televised in accordance with Section 4-1.19 – Pipeline Cleaning, Testing and Televising of these Specifications.

SAFETY

The Contractor shall obtain an underground classification from the State of California, Department of Industrial Relations, Division of Occupational Safety and Health Administration (Cal/OSHA). The Contractor shall perform work in conformance with all applicable federal, state and local safety requirements.

PRODUCTS

STEEL CASING

A. The minimum interior diameter of metal castings shall be eight (8) inches greater than the maximum outside diameter of the sewer pipe barrel to be installed, not including bells.

B. Casings shall be welded steel pipe no less than the minimum diameter and thickness shown on the plans. The Contractor may propose a greater casing diameter or thickness for the method of work, loadings

involved, and site conditions, subject to the review and additional requirements of City of Richmond. Such increases of the casing diameter shall not interfere with existing utilities.

C. The steel casing pipe shall be furnished in accordance with Section 4-1.37 - Steel Pipe, unless shown otherwise. Casing section joints shall be butt welded, lap welded, or welded using butt straps in the field. If butt welded, each end of the casing shall be prepared by providing a one-quarter (1/4) inch by forty-five degree (45°) chamfer on the outside edges. Casings larger than thirty-six (36) inches in diameter shall have at least one grout coupling every eight (8) feet longitudinally along the casing for contact grouting the annular void outside the casing due to overcutting.

GROUT AND SILICA SAND

A. The annular space between the carrier pipe and the casing shall be filled with grout or silica sand. If grout is used, it shall be proportioned to flow and to completely fill all voids between the carrier pipe and the casing and shall conform to the requirements for abandonment grout of Section 4-1.25 - Grout.

B. Silica Sand shall be equivalent to that produced by Unimin Corporation; alternative sand mixtures proposed by the Contractor shall be submitted and are subject to approval by City of Richmond.

CARRIER PIPE INSULATORS

Pipe Insulators and pipe end seals shall be as listed in the Approved Materials List.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Prior to any boring and jacking work, the Contractor shall obtain and provide City of Richmond with copies of all required permits including, but not limited to, County and/or city encroachment permits.

C. Prior to starting any other work, the Contractor shall pothole all underground utilities and/or other facilities marked or suspected to be within ten (10) feet of the planned bore and jack alignment to determine the actual clear distance between each utility and/or other facility and the planned alignment.

D. The Contractor shall use boring and jacking equipment that is compatible with the ground conditions as described in the Geotechnical Report, if one is available, or the results of soils exploration conducted during construction.

JACKING AND RECEIVING PITS

A. The Contractor shall provide a working slab for the jacking pit to provide stable support for guide rails, thrust blocks, and other construction operations. The working slab shall not be connected to thrust blocks. The Contractor shall provide a minimum of two (2) layers of thirty (30) pound roofing felt placed between the working slab and thrust block.

B. The Contractor shall provide temporary fencing around all pit excavations. Provide traffic control around working areas and pits located within or adjacent to streets, roadways, freeways, driveways or parking lots in accordance with encroachment permit requirements, as appropriate.

C. After jacking equipment and excavated materials from the boring or jacking operations have been removed from the jacking and receiving pits, the Contractor shall prepare the bottom of the pits to receive the extensions of the carrier pipe, place and compact backfill materials, and restore the jacking and receiving pit sites in accordance with Section 4-1.07 - Excavation, Bedding and Backfill.

D. Provide dewatering wells or other methods of groundwater control in accordance with Section 4-1.04 - Excavation Dewatering.

E. Provide shoring systems for the boring, jacking and receiving pits in accordance with Section 4-1.06 - Shoring, Excavation and Support Protective Systems.

INSTALLATION OF STEEL CASING

Installation of the casing shall be in accordance with the plans and shop drawings, and shall be subject to the approval of the local agency having jurisdiction over the area containing the boring and jacking operations. The Contractor shall:

A. Provide adequate timber, structural steel and/or concrete jacking frame, thrust blocks, pipe cradles and/or guide rails to ensure accurate control of the boring alignment, and to provide uniform distribution of jacking force over the perimeter of the casing and the thrust block/soil interface. Adequate space shall be provided within the excavation, and in the length of the jacking frame, to permit the insertion of the casing sections. The jacking frame, thrust blocks and pipe cradles shall be adequately anchored or braced so as to maintain the orientation of the jacks in line with the axis of the casing.

B. Provide a steel jacking head fitted to the lead section of the casing in such a manner that it extends around the entire outer surface of the steel casing and projects at least eighteen (18) inches beyond the leading end of the casing. The jacking head shall not be more than one-half (1/2) inch greater in diameter than the outside diameter of the casing pipe. The head shall be securely anchored to prevent any wobble or alignment variation during the boring or jacking operations.

C. Provide a closed-face boring head capable of minimizing loss of ground if unstable soil conditions, such as raveling, squeezing, flowing, or running are anticipated.

D. Provide jacks and backstops of adequate capacity to push the casing through the soil with a minimum factor of safety of 2.0 or greater.

E. Place the casing pipe on cradles and/or guide rails, and direct it in the proper line and grade. Line up the jacking assembly in the direction and grade of the tunnel. Weld all casing joints completely prior to jacking.

F. Control the application of the jacking pressure and excavation of materials ahead of the casing as it advances to prevent the casing from becoming earthbound or from deviating from the required line and grade.

G. Carry out excavation entirely within the jacking head, not in advance of the head to minimize voids outside the casing. Coordinate the advance of the casing and boring rate to avoid overexcavation. Maintain a soil plug inside the jacking head and steel casing as required to minimize loss of ground. Restrict the excavation of the materials to the least clearance necessary to prevent binding in order to avoid loss of ground and consequent settlement or possible damage to overlying pavements, utilities or structures.

H. Remove excavated materials from the casing as the boring and jacking operation progresses. No accumulation of excavated materials within the casing shall be permitted.

I. Repair any surface or subsurface damage that occurs as a result of the boring and jacking operation.

INSTALLATION OF SEWER PIPE

A. The Contractor shall install the sewer pipe to the line and grade shown on the plans. Each individual pipe length or section shall be supported with pipe insulators/skids in accordance with the recommendations of both the pipe and insulator/skid manufacturers.

FILLING OF ANNULAR SPACE

A. The Contractor shall completely fill the annular space between the casing pipe and the carrier pipe with grout or silica sand, and shall furnish all grout, equipment, hoses, valves, and fittings necessary for the grouting operation. Grout shall be placed by concrete pump through a pipe or hose. The Contractor shall provide plugs or bulkheads at each end of the casing to contain the grout fill. The plugs or bulkheads shall be designed to withstand the anticipated grouting pressure and to prevent ground water intrusion into the casing. All necessary precautions shall be taken as instructed by the Inspector, to prevent uplift or floating of the pipe during grouting.

B. When using silica sand to fill the annular space around the carrier pipe, the carrier pipe shall be properly covered at both ends, allowing for a vent on one end and a threaded member at the other that will allow sand to flow into the pipe. Pumping of sand shall be complete when the sand has come out the other end and completely filled the annular space around the carrier pipe.

4-1.12 PIPE BURSTING

GENERAL

THE REQUIREMENT

A. The Contractor shall furnish and install sewer pipe, complete and in place, by the pipe bursting method. All work shall be performed as indicated on the plans and as required in these Specifications and shall be supervised by personnel experienced in installation of pipe using the pipe bursting technique. The Contractor shall provide all materials, labor, equipment, and services necessary for bypass pumping and/or diversion of sewage flows, installation of sewer pipe, and testing of completed pipe system.

B. The Contractor’s pipe bursting equipment shall be capable of bursting the host pipe and installing the new pipe as shown on the plans and specified herein.

C. The Contractor shall be responsible for repairing or replacing existing utilities, pavements, structures or other improvements damaged by the pipe bursting work.

D. If pipe bursting operation results in a partial or complete blockage of the public main sewer, the Contractor shall immediately notify City of Richmond's Inspector. In such a case, staff from the Richmond Municipal Sewer District, will be dispatched, and the Contractor will be billed for all City of Richmond's costs incurred to clear the blockage.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.05 - Bypassing Wastewater

B. Section 4-1.06 - Shoring, Excavation Support and Protective Systems

C. Section 4-1.07 - Excavation, Bedding and Backfill

D. Section 4-1.17 - Manholes and Rodding Inlets

E. Section 4-1.19 - Pipeline Cleaning, Testing and Televising

F. Section 4-1.30 - Piping, General

G. Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe

H. Section 4-1.35 - High Density Polyethylene (HDPE) Pipe

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM F 585 Practice for Insertion of Flexible Polyethylene Pipe into Existing Sewers

CONTRACTOR SUBMITTALS

A. For main sewer jobs, the Contractor shall submit the following items to City of Richmond for review prior to ordering pipe materials and/or commencement of work.

1. Pipe manufacturer's technical information; physical properties of pipe; joining/fusion method; dimensions of pipe and fittings; manufacturer's recommendation for handling; storage and repair of pipe and fittings; and certificate of compliance of the pipe and fittings with these Specifications.
2. Method of pipe bursting; type of bursting tool (e.g., pneumatic, static) and installation equipment; procedures for operating the equipment; copies of any technology licenses; and types of lubricant and Material Safety Data Sheets (MSDS).
3. Estimated pull load, jacking/winch, cable/tow rod capacity for static pipe bursting method.
4. Pneumatic hammer size and winch capacity.
5. Service connection restoration plan/installation schedule; shop drawings and written description of the entire construction sequence, procedures for bedding pipe and insertion/reception/lateral connection pits; plan to remove and dispose of old pipe (if necessary) and a contingency plan.
6. Contingency plans for the following: unforeseen obstructions causing burst stoppage, surface heave, damage to existing utilities and improvements, loss of return to line and grade, and sewer backup.
7. Sewer bypassing plans and procedures required under Section 4-1.05 - Bypassing Wastewater.
8. Site layout including: location/dimension of insertion and reception pits; pipe layout and joining work areas; storage and equipment layout areas; proposed modifications of manholes; and traffic control plans.
9. Reports from independent testing laboratory certifying that the pipe material including physical properties and dimensions meet the requirements of these Specifications.
10. Contractor's pipe bursting qualifications.
11. Data from potholing of existing utilities
12. Procedures for protection of existing utilities, structures and other improvements.

QUALITY ASSURANCE

A. Pipe bursting work shall be done by a qualified Contractor with at least five (5) years of pipe bursting experience including a minimum of three (3) projects of similar in pipe size and length to the work to be done.

B. The Contractor shall fully clean the sewer proposed for pipe bursting and shall call the City of Richmond Inspection Office at least one (1) business day in advance to arrange for an Inspector to be present for the pre-installation TV inspection.

C. The Contractor shall conduct a post-installation TV inspection for all pipe bursting projects. The installation shall not be accepted if any sag of more than 0.125 times the nominal pipe size (e.g., 1/2 inch for 4-inch diameter pipe) is evident in the post-installation TV inspection.

PRODUCTS

PIPE

The Contractor shall provide restrained-joint or thermo-fusion welded PVC pipe as specified in Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe, or thermo-fusion welded HDPE pipe (minimum SDR 17) as specified in Section 4-1.35 - High Density Polyethylene (HDPE) Pipe.

FIELD JOINTS AND COUPLINGS

Joints in HDPE pipe shall be butt-fusion welded prior to insertion in accordance with Section 4-1.35 - High Density Polyethylene (HDPE) Pipe. Electrofusion couplings shall be used on inaccessible locations. Electrofusion

couplings used to install fittings at insertion and/or receiving pits shall be Frialen Electrofusion Couplings, as manufactured by Friatec, Inc., or approved equals.

EXECUTION

GENERAL

Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

HANDLING OF PIPE

The Contractor shall exercise special care during the unloading, handling and storage of PVC and HDPE pipe to ensure that the pipe is not cut, gouged, scored or otherwise damaged. Any pipe which has cuts in the pipe wall exceeding ten percent (10%) of the wall thickness shall not be used and shall be removed from the site. The pipe shall be stored so that it is not deformed axially or circumferentially which may hinder pipe installation.

BYPASS PUMPING AND TEMPORARY SERVICE CONNECTIONS

The Contractor shall provide bypass pumping and/or diversion in accordance with the requirements of Section 4-1.05 - Bypassing Wastewater when required for acceptable completion of the pipe installation.

INSTALLATION OF PIPE

A. The Contractor shall conduct a pre-installation TV inspection for all pipe bursting projects. The Contractor shall call the City of Richmond Inspection Office at least one (1) business day in advance to arrange for an Inspector to be present for the pre-installation TV inspection. The Contractor shall fully clean the sewer proposed for pipe bursting prior to the arrival of the Inspector so that the TV inspection will reveal any deficiencies in the line (e.g., sags, offsets and/or repaired sections that could affect pipe bursting). Deficiencies shall be corrected prior to pipe bursting.

B. Prior to starting any other work, the Contractor shall pothole all underground utilities and/or other facilities marked or suspected to be within ten (10) feet of the planned pipe burst alignment to determine the actual clear distance between each utility and/or other facility and the existing pipeline.

C. The Contractor shall locate, design, construct, properly brace or shore, dewater, maintain, and restore insertion and receiving pits. Insertion and receiving pits shall be large enough to accommodate a minimum of two (2) hydraulic shoring jacks, a ladder for access/egress and adequate space for the work. Tunneling or undermining adjacent to any trench or excavation is prohibited. All work shall be shored in accordance with Section 4-1.06 - Shoring, Excavation Support and Protective Systems.

D. The Contractor shall fully expose the main sewer where a lateral is to be replaced to within four (4) feet of its point of connection to the main sewer, so that the point of connection can be inspected.

E. The insertion pit shall be large enough so that the pipe can be installed without exceeding the manufacturer’s recommendations for curvature of the pipe.

F. The Contractor shall insert the new pipe into the existing pipe in accordance with the requirements of ASTM F 585. Internal beads shall be removed for sewers eight (8) inches in diameter and larger.

G. The Contractor shall not drag the pipe over rocks or rough surfaces that may damage the pipe. An appropriate pulling head shall be attached to the end of the pipe and shall be used for pulling the pipe at all times. Pulling the pipe by a flanged end will not be allowed.

H. The pipe bursting machine shall be equipped with a direct-reading pulling force gauge acceptable to City of Richmond. The maximum pulling force that may be applied to any pipe shall be as follows:

HDPE-SDR 17 (DIPS) Nominal Pipe Size	Outside Diameter (inches)	Minimum Wall Thickness (inches)	Average Inside Diameter (inches)	Allowable Maximum Pulling Force (lbs)
4-inch	4.800	0.282	4.202	3,500
6-inch	6.900	0.406	6.039	7,500
8-inch	9.050	0.532	7.922	13,000
10-inch	11.100	0.653	9.726	20,000
12-inch	13.200	0.776	11.555	28,000

I. When the Contractor proposes to pull through bends greater than forty-five degrees (45°), the existing pipe shall be exposed to allow a minimum radius of two (2) feet at bends. Realigned pipe shall be properly bedded and backfilled in accordance with Section 4-1.07 - Excavation, Bedding and Backfill after bursting.

J. The pipe shall be pulled a minimum of two (2) feet beyond the planned connection to allow inspection of the condition of the pipe (e.g., for scarring or other damage).

K. Connections to existing pipes in insertion and receiving pits shall employ fittings or couplings listed in the City of Richmond Approved Materials List. Prior to making connection at each end of an installed reach of pipe with fittings or couplings, the Contractor shall allow a minimum of six (6) hours to elapse to allow pipe to relax from the tension resulting from pulling the pipe and for the pipe to equalize with ambient ground temperature.

L. Connections at manholes shall be in accordance with Section 4-1.17 - Manholes.

M. Upon completion of pipe installation, the Contractor shall remove all spoils, debris and unsuitable material from the insertion and receiving pits. All pits shall be backfilled in accordance with the requirements of Section 4-1.07 - Excavation, Bedding and Backfill.

4-1.13 CURED IN PLACE PIPE (CIPP)

GENERAL

THE REQUIREMENT

A. The Contractor shall furnish and install cured in place pipe (CIPP), as indicated on the plans and as required in these Specifications. Work shall be supervised by personnel experienced in installation of cured in place pipe. The Contractor shall furnish all materials, labor, equipment and services necessary for bypass pumping, and or diversion of sewer flows, pretreatment or disposal of process wastewater, installation of sewer pipe and testing of completed piping system.

B. The Contractor shall obtain a City of Richmond permit for all CIPP side sewer repair projects, one (1) business day prior to the start of work.

C. The Contractor shall obtain a City of Richmond Special Discharge Permit if it proposes to discharge CIPP process wastewater to the public sewer system. Process wastewater shall not be discharged to storm drains, gutters watercourses, swales, impoundments or onto the ground.

D. Side Sewers shall be thoroughly cleaned prior to calling for pre-installation TV inspection. Side sewers will be considered acceptable for CIPP repair if all of the following criteria are conclusively met at the pre-installation TV inspection:
   1. Pipe shall be free of debris and root intrusion, and thoroughly clean
   2. No sag (standing water) >1/2 inch

3. No joint offset > 1/4 inch

E. If the CIPP side sewer repair operation results in a partial or complete blockage of the public main sewer, the Contractor shall immediately notify City of Richmond's Inspector.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.19 – Pipeline Cleaning, Testing and Televising

QUALITY ASSURANCE

A. The Contractor shall clean and test the installed cured in place pipe in accordance with the requirements of Section 4-1.19 – Pipeline Cleaning, Testing and Televising.

B. For all side sewers proposed for CIPP repair, the Contractor shall conduct both pre-job and post-installation TV inspections using equipment that produces an image satisfactory to the City of Richmond Inspector. The Contractor shall call the City of Richmond Inspection Office at least one (1) business day in advance to arrange for an Inspector to be present for the pre-installation TV inspection. The installation shall not be accepted if any sag of more than 0.125 times the nominal pipe size (e.g., 1/2 inch for 4-inch diameter pipe) is evident in the post installation TV inspection.

C. Televising of the main line may be required at the discretion of the Inspector.

CONTRACTOR SUBMITTALS

A. Prior to installation of the line, design calculations shall be submitted to determine the minimum thickness of the liner to be installed. The pipe design shall have sufficient strength to support all dead loads, live loads and groundwater loads imposed.

B. Evidence of operator certification for the CIPP system proposed and a copy of the manufacturer’s system written procedures shall be submitted to City of Richmond prior to the start of work.

PART 2 -- PRODUCTS 2.1 GENERAL

Prior to starting work, an encroachment permit (if working in a public right-of-way), and all tools and materials needed for the job, including (but not limited to) CIPP wetting, insertion and curing equipment, pipe, fittings, couplings, shoring, gas detector, ladder, trench plates (if needed for street installations) or one and one-eighth (1-1/8) inch plywood (for off-road installations) shall be onsite.

PERMA-LINER AND MAXLINER

Perma-Liner and Maxliner System materials and products shall be provided as specified by the manufacturer’s list of materials and procedures. Contractor shall submit a copy of the materials list and applicable procedures to City of Richmond prior to the start of work.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Any deficient work identified during or after construction shall be properly repaired or replaced by open-cut or pipe bursting at the discretion of the City of Richmond Inspector.

C. The finished CIPP shall be continuous over the entire length of the service lateral connection at the mainline. The inner seal shall be free of dry spots, lifts and de-lamination.

PRELIMINARY CLEANING

Sewers shall be cleaned of all debris, roots and other materials that would block proper inversion of the cured-in-place-pipe, prior to the post-job TV inspection. All cleaning procedures shall be done as specified in Section 4-1.19 - Pipeline Cleaning, Testing and Televising.

LINING

A. During preparation, placement and curing, a CIPP system manufacturer-certified operator shall be on the jobsite in charge of the work and the Contractor shall strictly comply with the CIPP system manufacturer's written procedures.

B. The finished pipe must be such that when the resin cures, the total wall thickness will be a homogeneous and monolithic felt composite coated with PVC that will be chemically resistant to withstand internal exposure to domestic sewage.

4-1.14 ASPHALT CONCRETE PAVEMENT AND BASE RESTORATION

GENERAL

THE REQUIREMENT

The Contractor shall perform all work associated with Asphalt Concrete (AC) pavement and base restoration as specified herein and satisfying all the encroachment permit requirements of agencies having right-of-way jurisdiction, whichever is more stringent.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.09 - Geotextile Fabric

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:
ASTM D 1188 Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D 1557 Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))

ASTM D 2950 Test Method for Density of Bituminous Concrete in Place by Nuclear Methods

AASHTO T 209 Maximum Specific Gravity and Density of Bituminous Paving Mixtures

Caltrans Standard
Specification, Section 37 Bituminous Seals

Caltrans Standard
Specification, Section 39 Asphalt Concrete

Caltrans Standard
Specification, Section 59 Painting

Caltrans Standard
Specification, Section 84 Traffic Stripes and Pavement Markings

Caltrans Standard

Specification, Section 85 Pavement Markers

Caltrans Standard
Specification, Section 92 Asphalts

Caltrans Standard
Specification, Section 93 Liquid Asphalt

Caltrans Standard
Specification, Section 94 Asphaltic Emulsions

PRODUCTS

GENERAL

Without limiting the generality of other requirements of the plans, all work specified herein shall conform to or exceed the requirements of the local jurisdiction.

AGGREGATE BASE

Aggregate base shall be Type I backfill material as specified in Section 4-1.07 - Excavation, Bedding and Backfill.

PRIME COAT

Prime coat shall be Grade SC-70 liquid asphalt complying with the requirements of Caltrans Standard Specification, Section 93.

TACK COAT

Tack coat shall be emulsified asphalt Grade SS-1 or SS-1h, CSS-1 or CSS-1h diluted with one (1) part water to one (1) part emulsified asphalt. Emulsified asphalt shall comply with the requirements of Caltrans Standard Specification, Section 94.

ASPHALT

Asphalt shall be Grade AR-4000 complying with the requirements of Caltrans Standard Specification, Section 92.

ASPHALT-AGGREGATE COURSE MIXTURE

A. The job-mix formula for the asphalt-aggregate mixture shall be within the limits specified in Caltrans Standard Specifications, Section 39. Asphalt aggregate shall be Type A, one half inch (1/2") maximum, medium.

B. The asphalt-aggregate course mixture shall meet the Caltrans Standard Specifications, Section 39-2.02.

PAVEMENT MARKINGS, STRIPES, PAVEMENT MARKERS AND CURB PAINTING

A. Stripes and pavement marking replacement shall be thermoplastic material in accordance with Caltrans Standard Specifications, Section 84.

B. Pavement marker replacement shall be in accordance with Caltrans Standard Specifications, Section 85.

C. Paint for replaced curbs, where required for fire lanes, no parking zones, and other similar markings shall match existing color and be in accordance with Caltrans Standard Specifications, Section 59-6.

D. Pavement lane delineators shall match existing and shall be in accordance with Caltrans Standard Specifications requirements.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Pavement Restoration

Pavement cut for trenching and/or damages caused during the work must be restored with a cross section equal to that of the existing road, or a minimum of two and one-half (2-1/2) inches of asphalt over six (6) inches of aggregate base (whichever is greater). The limits of the pavement restoration must extend to competent existing pavement, and shall be "T-cut" with a minimum width equal to the trench width plus twelve (12) inches on each side of the trench. Where the edge of the "T-cut" is within twenty-four (24) inches of the edge of the existing paving, restoration in that area must extend to the edge of the road.

SUBGRADE PREPARATION

The subgrade shall be prepared as specified Section 4-1.07 - Excavation, Bedding and Backfill. The surface of the subgrade after compaction shall be hard, uniform, smooth, self-draining and true to grade and cross-section with roller.

PREPARATION OF EXISTING AC PAVEMENT

The edge of existing AC pavement shall be saw cut to provide a smooth joint for new pavement. The Contractor may saw cut or mechanically grind the pavement before excavating the trench to facilitate removal of pavement. After trench backfill and compaction the Contractor shall saw cut and remove a minimum of twelve (12) inches AC beyond any irregular or damaged pavement on each side of the trench before installation of the trench pavement patch.

AGGREGATE BASE

Aggregate base (AB) shall be provided where shown to the thickness required. The Contractor shall install aggregate base to match existing pavement AB thickness or a thickness of six (6) inches, whichever is greater. AB shall be delivered to the jobsite as uniform mixtures and each layer shall be spread in one (1) operation. Segregation shall be avoided and the base shall be free of pockets of coarse or fine material. Where the required thickness is six (6) inches or less, the base materials may be spread and compacted in one (1) layer. Where the required thickness is more than six (6) inches the base material shall be spread and compacted in two (2) or more layers of approximately equal thickness. The maximum compacted thickness of any single layer shall not exceed eight (8) inches. The compaction of each layer of aggregate base shall be not less than ninety-five percent (95%) of maximum density when measured in accordance with ASTM D 1557. The compacted surface of the finished aggregate shall be hard, uniform, smooth, self-draining and true to grade and cross-section.

PRIME COAT

Prior to placing pavement a prime coat shall be applied to the compacted base or subgrade at a rate between 0.30 and 0.50 gal/sq. yd.

TACK COAT

A tack coat shall be applied to existing paved surfaces where new asphalt concrete is to be placed on or against existing pavement. It shall also be applied to the contact surfaces of all pavement joints, curbs, gutters, manholes and the like immediately before the adjoining asphalt pavement is placed. Care shall be taken to prevent the application of tack coat material to surfaces that will not be in contact with the new asphalt concrete pavement. Tack coat shall be applied at the rate of 0.20 to 0.30 gal/sq. yd.

ASPHALT CONCRETE

A. At the time of compaction, the temperature of mixture shall not be lower than two hundred eighty-five degrees Fahrenheit (285°F) or higher than three hundred twenty-five degrees Fahrenheit (325°F), the lower limit to be approached in warm weather and the higher in cold weather.

B. Asphalt concrete shall not be placed when the atmospheric temperature is below fifty degrees Fahrenheit (50°F) or during unsuitable weather.

C. Asphalt concrete shall be spread and compacted in the number of layers and thicknesses specified in Caltrans Standard Specifications, Section 39-6.

D. The Contractor shall install asphalt concrete to match existing pavement AC thickness, to a thickness of two and one-half (2-1/2) inches or to the depth required by the local jurisdiction, whichever is greater.

E. The depositing, distributing and spreading of the asphalt concrete shall be accomplished in a single, continuous operation.

F. The mix shall be compacted using suitable compaction methods immediately after placing.

G. Upon completion, the final surface, pavement shall be true to grade and cross-section. The edge between new and existing pavements shall be flush. When a ten (10) foot long straightedge is laid on the finished surface parallel to the center of the roadway, the surface shall not vary from the edge of the straight edge more than one-eighth (1/8) inch except at intersections or changes of grade. In the transverse direction, the surface shall not vary from the edge of the straightedge more than one-quarter (1/4) inch.

H. The relative density after compaction shall be ninety-six percent (96%) of the density obtained by using AASHTO Test Method T 209. A properly calibrated nuclear asphalt testing device shall be used for determining the field density of compacted asphalt concrete in accordance with ASTM D 2950, or cores may be laboratory tested in accordance with ASTM D 1188. The Contractor shall supply certified test reports of the adequacy of compaction. The Contractor shall provide a minimum of one (1) compaction test per day and an additional compaction test for each five hundred (500) square feet completed.

I. The minimum pavement patch section for all locations shall be two and one-half (2-1/2) inches of AC over six (6) inches of AB.

PAVEMENT MARKINGS, STRIPES, PAVEMENT MARKERS AND CURB PAINTING

A. The Contractor shall restore all existing pavement markings, stripes and pavement markers to their original or better condition. Stripes and pavement marking replacement shall be installed in accordance with Caltrans Standard Specifications, Section 84 unless otherwise directed by City of Richmond.

B. Pavement marker replacement shall be installed in accordance with Caltrans Standard Specifications, Section 85 unless otherwise directed by City of Richmond.

C. Paint for replaced curbs, where required for fire lanes, no parking zones and other similar markings shall be installed in accordance with Caltrans Standard Specifications, Section 59-6 unless otherwise directed by City of Richmond.

SLURRY SEAL

A. For all locations that will not receive a full-width pavement overlay, a slurry seal shall be applied to match the surfaces of adjacent existing pavement and to cover the joint between the pavement patch and the existing pavement. Before placing slurry seal the pavement shall be cleaned by sweeping or other means necessary to remove all loose particles of paving, dirt and other extraneous material.

B. The slurry seal shall be mixed in accordance with the requirements of Caltrans Standard Specifications, Section 37-2.04 and the following provisions:

1. Mixing machines shall be equipped with a water pressure system and nozzle type spray bars to provide a rate of application of the fog spray. The mixing machine shall be adjusted to compensate for ambient temperature, surface texture, etc., and shall cover the entire surface without flowing or ponding.

C. The slurry mixture shall be uniformly spread by means of a controlled spreader box conforming to the requirements of Caltrans Standard Specifications, Section 37-2.05.

D. The slurry mix shall be placed in accordance with the requirements of Caltrans Standard Specification, Section 37-2.06 and the following provisions:

1. Slurry seal shall not be placed if the pavement or the air temperature is below fifty-five degrees Fahrenheit (55°F).

2. Slurry seal shall be feathered onto existing pavement to provide a smooth transition between new and existing pavements.

E. All existing and new manhole covers, valve boxes, vault covers and the like shall be temporarily covered during slurry sealing to prevent contact with these surfaces. The temporary coverings shall be removed after application of the slurry seal.

ASPHALT CONCRETE PAVEMENT OVERLAY

A. Pavement grinding shall be performed such that the new finished pavement grade accurately matches the grade of existing gutters and storm drain inlets and restores the existing street crown sloping.

B. Where indicated on the plans, the Contractor shall install geotextile paving fabric in accordance with Section 4-1.09 - Geotextile Fabric prior to placement of the pavement overlay.

C. Existing manhole covers, valve and survey monuments pots and vault lids shall be raised to the new pavement grade as required by each agency with jurisdiction over these appurtenances. The Contractor shall restore any utility structures and appurtenances that become damaged during grinding or overlay work including, but not limited to, raising castings to match new finished grades and repairing concrete collars. The Contractor shall coordinate work with those utility agencies that require repairs to be performed by their own forces.

D. Any joint between overlaid pavement and existing pavement shall be slurry sealed per SLURRY SEAL SECTION above, upon completion of the overlay work. Existing pavement markings shall be restored in accordance with the requirements per PAVEMENT MARKINGS, STRIPES, PAVEMENT MARKERS AND CURB PAINTING SECTION above.

E. Overlaid pavement shall be flush with the existing pavement grade at all joints with existing pavement and/or gutters.

4-1.15 CURBS, GUTTERS, SIDEWALKS AND DRIVEWAYS

GENERAL

THE REQUIREMENT

The Contractor shall furnish all labor, materials, and equipment necessary to construct as shown on the plans or restore curbs, gutters, sidewalks, and driveways removed, damaged or displaced.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.03 - Clearing, Grubbing, Demolition, Abandonment, Removal, Disposal, and Salvage

B. Section 4-1.07 - Excavation, Bedding and Backfill

C. Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration

D. Section 4-1.22 - Cast-in-Place Concrete

CONTRACTOR SUBMITTALS

A. Submit manufacturers' literature for all machines specifically designed for such work (i.e., machines to construct asphaltic concrete curbs).

B. Material submittals for concrete shall be in accordance with the requirements of Section 4-1.22 - Cast-in-Place Concrete. Submittals for AC shall be in accordance with Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration.

PRODUCTS

MATERIALS

Concrete shall conform to the requirements specified in Section 4-1.22 - Cast-In-Place Concrete. Asphaltic concrete shall conform to the requirements specified in Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Curbs, gutters, sidewalks and driveways shall be constructed by the conventional use of forms unless City of Richmond has favorably reviewed the Contractor's submittal proposing the use of a curb and gutter machine. Curb and gutter machines shall be specifically designed for such work, and the resulting products shall be equal to or better than would typically be obtained using forms. If the results are not satisfactory, then use of machines shall be discontinued.

SURFACE PREPARATION

A. Where any curb, gutter, sidewalk or driveway has been removed, damaged, or displaced, the same shall be replaced to the nearest construction joint to the same dimensions and finish as the original construction that was removed, damaged or displaced. Features to be demolished shall be saw cut at the limiting construction joints and all demolished curbs, gutters, sidewalks or driveways shall be removed and disposed of by the Contractor.

B. The subgrade shall be constructed and compacted true to line and grade, as required. All soft or unsuitable material shall be removed to a depth of not less than nine (9) inches below subgrade elevation and replaced with satisfactory material.

FORMS

Forms conforming to the dimensions of the curb, gutter, sidewalk or driveway shall be carefully set to line and grade and shall be securely staked in place. The forms and subgrade shall be watered immediately in advance of placing concrete. Forms shall be thoroughly cleaned each time they are used and shall be coated with light oil or other releasing agent of a type that will not discolor the concrete.

PLACEMENT

A. Concrete shall be thoroughly spaded away from the forms to eliminate rock pockets next to the forms. The concrete may be compacted by mechanical vibrators acceptable to City of Richmond. Tamping or vibrating shall continue until the mortar flushes to the surface and the coarse aggregate is below the concrete surface.

B. Expansion joints shall be located to match the expansion joints in the removed curb, gutter, sidewalk or driveway. Expansion joints shall be constructed vertical and at right angles to the centerline of the street. Joints shall be constructed at all radius points, driveways, alley entrances, and at adjoining structures.

C. C. Crack-control joints shall be constructed not more than fifteen (15) feet apart. Joints shall be made by the use of steel dividers, scoring or saw cutting to a depth of not less than one and one-half (1-1/2) inches and matching joints in adjacent sidewalks and/or driveways.

FINISH

The surface shall be finished with appropriate finishing tools to match adjacent existing finish. The front-face form shall not be removed before the concrete has taken the initial set and has sufficient strength to carry its own weight. Gutter forms and rear forms shall not be removed until the concrete has hardened sufficiently to prevent damage to the edges. Any portion of the curb, gutter, sidewalk or driveway that is damaged shall be replaced by the Contractor.

TESTING AND TOLERANCES

A. All surfaces shall be tested by laying a ten (10) foot long straightedge along the surface. Any deviation from the lines and grades indicated in the plans of more than one-quarter (1/4) inch in the ten (10) foot length shall be cause for rejection. Similarly, any section of the work that is deficient in depth shall be removed and replaced.

B. When required by the Inspector, gutters having a slope of 0.8 foot per one hundred (100) feet, or less, or gutters having unusual or special conditions that cast doubt on the capability of the gutter to drain, shall be water tested for proper drainage. Water testing shall consist of establishing flow in the length of gutter to be tested by supplying water from a hydrant, tank truck or other source. One (1) hour after the water source is removed, the gutter shall be visually inspected for evidence of ponding or improper shape. In the event water is found ponding in the gutter or on adjacent pavement to a depth of one-half (1/2) inch or greater, or on the adjacent asphalt pavement, the defect or defects shall be corrected by the Contractor.

4-1.16 LATERALS AND BUILDING SEWERS (SIDE SEWERS)

GENERAL

THE REQUIREMENT

The Contractor shall furnish all pipe, fittings, tools, materials and labor required to install and test sanitary sewer laterals, in accordance with the requirements of the Plans and Standard Specifications.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.05 - Bypassing Wastewater

B. Section 4-1.07 - Excavation, Bedding and Backfill

C. Section 4-1.23 - Controlled Low-Strength Material (CLSM)

D. Section 4-1.15 - Curbs, Gutters and Sidewalks

E. Section 4-1.19 - Pipeline Cleaning, Testing and Televising

F. Section 4-1.20 - Protection of Trees and Restoration of Landscaping

G. Section 4-1.30 - Piping, General

H. Section 4-1.32 - Vitrified Clay Pipe (VCP)

I. Section 4-1.33 - Ductile Iron Pipe (DIP)

J. Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe

K. Section 4-1.35 - High-Density Polyethylene (PVC) Pipe

L. Section 4-1.36- Cast Iron Soil Pipe (CIP)

PRODUCTS

GENERAL

A. Referenced pipe sizes are nominal pipe diameters. The minimum size for side sewers serving single-family dwellings shall be four (4) inches. The minimum size for side sewers serving all other properties shall be six (6) inches.

B. All side sewers materials shall be new, free from defects, and marked to identify manufacturer, material, class and other appropriate information.

PIPE, FITTINGS AND APPURTENANCES

A. Only pipe, fittings, couplings, appurtenances and other components listed in the Approved Materials List shall be used for side sewer construction or repair.

B. Warning tape shall be three (3) inch wide green plastic electronically detectable marking tape labeled "Buried Sewer Line Below," and installed above the pipe zone.

OVERFLOW PROTECTION DEVICES

Overflow Protection Devices (OPD) and utility boxes shall be as listed in the Approved Materials List and as shown on SS-9C of the Standard Drawings. Utility boxes over OPDs in areas subject to vehicular traffic shall be rated for H-20 traffic service. Utility boxes over OPDs shall be fitted with a grate lid and box extensions, if required to provide proper clearances.

EXECUTION

GENERAL

A. A cleanout shall be installed within two (2) feet of the building foundation, and:
   1. At intervals not to exceed one hundred (100) feet of laid pipe length;
   2. At bends where accumulated deflection from the last downstream cleanout equals or exceeds ninety degrees (90°).
   3. At any single bend greater than forty-five degrees (45°)
   4. At intervals along the side sewer system where the cumulative total of deflection from the point of connection to the main sewer or from another cleanout equals or exceeds ninety degrees (90°)

B. Excavation and backfill shall be in accordance with the requirements of Section 4-1.07 - Excavation, Bedding and Backfill.

C. To mark the location of side sewers, electronically detectable marking tape shall be installed one (1) foot below subgrade from the main sewer end of each side sewer to the connected building.

D. When performing work on side sewers, the Contractor shall bypass wastewater around the work area in accordance with the requirements of Section 4-1.05 - Bypassing Wastewater, or shall arrange with the Property Owner to temporarily shut down the side sewer. The Contractor shall ensure that no wastewater is discharged from side sewer to the excavation.

E. Minimum slopes shall be two percent (2%) for four (4) inch diameter sewer pipe, and one and one-tenth percent (1.1%) for six (6) inch sewer pipe. The slope of any portion of a side sewer shall not be less than one and one-tenth percent (1.1%) or greater than one hundred and fifty percent (150%). Wherever available slope is less than two percent (2%) or the length of the side sewer is greater than one hundred (100) feet, the side sewer shall be installed using an industrial-standard laser grade control system to confirm that the pipe is installed to the proper grade. Requirements for operation of the laser grade control system shall be as specified in Section 4-1.30 – Piping, General for main and trunk sewers.

F. When an existing building which is sewered by a septic tank is to be connected to the City of Richmond public sewer system, the new side sewer shall be installed in accordance with these Specifications. A cleanout and Overflow Protection Device shall be installed at the building. If the existing sewer from the building to the septic tank is of a material listed on the Approved Materials List, is a minimum of four (4) inches in diameter, passes a hydrostatic or low-pressure air test, and passes a television inspection, the existing sewer may be used as part of the new side sewer for the building.

G. Removal of septic tanks after installation of a new side sewer connection to the City of Richmond public sewer shall be in accordance with the requirements of the Contra Costa Environmental Health Division.

H. When a building connected to City of Richmond public sewer is to be demolished, an abandonment permit shall be obtained and the side sewer serving the building shall be temporarily disconnected and capped at the property or easement boundary.

I. Independent Systems - Unless otherwise permitted by the local building code jurisdiction, the requirements of the California Plumbing Code, Section 312.0 regarding “independent systems” as follows, shall be enforced:

J. “The drainage system of each new building and of new work installed in any existing building shall be separate and independent from that of any other building, and, when available, every building shall have an independent connection with a public or private sewer.

Exception: Where one building stands in the rear of another building on an interior lot, and no private sewer is available or can be constructed to the rear building through an adjoining court, yard, or driveway, the building drain from the front building may be extended to the rear building.

INSTALLATION

A. General

Side sewers (laterals and building sewers) shall be installed in accordance with the requirements of Section 4-1.30 - Piping, General and the specific Section of these Specifications for the particular pipeline material being used.

B. Lateral Sewer Location

Prior to installation of lateral sewers in subdivisions, the lot corner nearest the side sewer and the lateral sewer terminus shall both be staked and flagged in the field. Where curbs, gutters and/or sidewalks exist or are to be a part of an improvement, the location of each lateral sewer shall be permanently marked by imprinting an "S" (1-1/2" size) or by chiseling an "S" (4" size) in the concrete surface vertically above the lateral sewer pipe. The "S" shall be marked on the curb, gutter or on the sidewalk. It shall be the Contractor’s responsibility for providing the marking and for its accuracy.

C. Overflow Protection Devices

All Property Owners shall install and maintain an Overflow Protection Device (OPD) on any side sewer that is connected or is intended for connection to, the City of Richmond sewer system.

1. Side Sewer Installations or Alterations or Repairs

   No person shall install, alter or repair a side sewer that is connected, or is intended for connection to the City of Richmond sewer system without installing an OPD of the type and in the manner prescribed in these Specifications. Prior to installation of coupling when repairing side sewers a maximum spacing of 1/4" shall be left between the pipe ends to allow for proper installation of coupling. See SS-14 for side sewer repair details.

2. Maintenance Requirements

   OPDs shall be maintained so as to provide for their continuing function as designed. OPDs shall be accessible at all times and shall be kept free from any obstructions including, but not limited to, rocks, soil, vegetation, grass, trees, bushes, plants, landscaping, concrete, asphalt or other ground coverings that may impair the function of and accessibility to the devices.

3. Elevation Requirements

   OPDs shall be installed at an elevation that protects the property from damage. The Property Owner is responsible to either: 1) confirm that the backwater overflow prevention device is at the proper elevation; or 2) to obtain competent assistance from a licensed plumber or Contractor to confirm its proper elevation. If any subsequent modification of the property results in the OPD being at an improper elevation, the Property Owner or Contractor shall adjust the OPD to the proper elevation.

4. Installation extendable backwater overflow devices shall be determined by Inspector for the given field conditions

LANDSCAPE RESTORATION

The Contractor shall restore the area affected by its side sewer installation operations in accordance with the requirements of Section 4-1.15 - Curbs, Gutters, Sidewalks and Driveways, and Section 4-1.20 - Protection of Trees and Restoration of Landscaping.

3.4 TESTING AND TELEVISING

Laterals installed with main sewer extension jobs shall be tested as a part of the main sewer system in accordance with the requirements of Section 4-1.19 - Pipeline Cleaning, Testing and Televising. New building sewers and side sewer repairs shall be subject to low-pressure air or hydrostatic testing or television inspection at the discretion of the Inspector.

4-1.17 MANHOLES AND RODDING INLETS

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install manholes and rodding inlets, complete with cast-in-place or precast bases, pipe connections, barrel and cone components, preformed joint sealant, grade rings, frames, covers and other appurtenances shown on the Plans or specified in this Section.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.09 - Geotextile Fabric

C. Section 4-1.19 - Pipeline Cleaning, Testing and Televising

D. Section 4-1.22 - Cast in-Place Concrete

E. Section 4-1.25 - Grout

F. Section 4-1.26 - Miscellaneous Metal Work

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM C 150 Specification for Portland Cement

ASTM C 478 Specification for Precast Reinforced Manhole Sections

CONTRACTOR SUBMITTALS

The Contractor shall submit complete shop drawings for all precast manhole bases to City of Richmond, and shall receive favorable review prior to ordering the bases.

QUALITY ASSURANCE

After installation, the Contractor shall demonstrate that all manholes have been properly installed, level, with tight joints, at the correct elevations and orientations and that the backfilling has been carried out in accordance with the plans and these Specifications. Vacuum testing of manholes may be required at City of Richmond's sole discretion.

PRODUCTS

MATERIALS

A. Manhole bases may be either cast-in-place or precast. Channels and shelves shall conform to the requirements of the Standard Drawings (SS-1 thru SS-5). Manhole channels shall be shaped to form a smooth transition of uniform cross section from inlet pipes to the outlet pipe, both horizontally and vertically.

B. Precast Concrete Components: Only components listed in the Approved Materials List shall be used in the construction of manholes.

1. Precast manhole bases, and barrel and cone sections shall be manufactured by a process that will produce dense homogeneous reinforced concrete of high quality in conformance with ASTM C 478. Cement shall be Type V Portland Cement as specified in ASTM C 150.
2. Precast manhole components shall be designed to support vertical AASHTO H20 truck loading, plus the weight of soil above the cone section.
3. Pipe connections at precast bases shall be pipe bells of the size, material and class of inlet and outlet pipes, integrally cast into the base by the manufacturer.
4. The minimum wall thickness for barrel and cone sections (in inches) shall be calculated by dividing the nominal diameter of the barrel (in inches) by twelve (i.e., D/12).
5. Manhole throats shall be constructed of reinforced concrete grade rings.

C. Preformed plastic sealing gasket for sealing joints between the manhole base, barrel and cone sections shall be as listed in the Approved Materials List.

D. Non-shrink grout shall conform to the requirements of Section 4-1.25 - Grout.

E. Castings for manhole frames and covers shall conform to the requirements of Section 4-1.26 - Miscellaneous Metal Work.

F. Primer and sealant tape for sealing exterior joints between precast components shall be as listed in the Approved Materials List.

G. Concrete for cast-in-place manhole and rodding inlet components (bases and top blocks) shall conform to Section 4-1.22, Cast-in-Place Concrete.

TEMPORARY COVERS

Temporary covers for new construction or reconstruction of manholes shall be fabricated and approved by the engineer.

TEMPORARY PLUGS

Temporary plugs shall be of the mechanical expanding type, not pneumatic and shall be permanently marked in a manner acceptable to City of Richmond with the Contractor's identification or initials.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. An All-Weather Access Road as specified in this Section is required for access to all structures in off-road locations (e.g., easements).

INSTALLATION

A. Temporary Plugs

Mechanical expanding type temporary plugs shall be installed and removed as specified below in the presence of an Inspector. Plugs shall be secured by tethering with a one-quarter (1/4) inch nylon rope attached to the top of a wood Two (2) feet x four (4) feet of sufficient length to extend from the shelf to a point in the throat within six (6) inches of the underside of the cover.

1. When a manhole exists or a new manhole is constructed at the beginning of a new main extension, a temporary plug shall be installed at the inlet of the new pipe at the existing manhole or new manhole.
2. When a new main extension begins at an existing rodding inlet or stub, a temporary plug shall be installed on the outlet of the first manhole upstream from the beginning of the new main extension.

B. Cast-in-Place Manhole Bases (over existing sewers only):

1. Cast-in-place manhole bases shall be poured against undisturbed native soil, which has been excavated to the dimensions shown on the plans, (see SS-1 through SS-5 & SS 9A, B). If the excavation extends beyond the dimensions shown on the Standard Drawings, the Contractor shall construct forms and pour the base to the specified dimensions.
2. If water or soft ground is encountered at the bottom of the excavation, a minimum lift of nine (9) inches of coarse bedding material in a geotextile wrap shall be used as shown on SS-1A of the Standard Drawings.
3. A joint forming ring shall be used to form a level joint groove in the manhole base while the concrete is fresh to receive the first precast barrel section. The metal forming ring may be removed as soon as the concrete has set sufficiently to eliminate any slump in the joint groove.
4. Manhole channels shall be shaped to form a smooth transition from inlet pipes to the outlet pipe, both horizontally and vertically.

C. Precast Manhole Bases (on all new main sewer extensions):

1. Precast manhole bases shall be placed to the lines and grades shown on the plans as an integral part of the pipe laying operation on a minimum thickness of six (6) inches of Type I Bedding Material compacted to ninety-five percent (95%) relative compaction. Where soft ground or water is present, a minimum thickness of nine (9) inch of Coarse Bedding Material in a wrap of geotextile fabric, per the requirements of Section 4-1.09 - Geotextile Fabric, shall be placed below the course of Type I Bedding Material.
2. Inlet and outlet pipe connections at precast bases shall be pipe bells cast into the base by the manufacturer.

3. All precast concrete manholes shall be installed in strict conformance with the manufacturer's written instructions, on a well-compacted foundation, as specified in Section 4-1.07 – Excavation Bedding and Backfill.

D. Setting Precast Barrel and Cone Sections

All joint surfaces of precast manhole bases, barrel and cone sections shall be thoroughly cleaned and dried prior to setting, and shall be sealed with a preformed plastic sealing gasket listed in the Approved Materials List at each joint as follows:

1. Apply one (1) coat of primer to clean, dry joint surface (both tongue and groove) and allow the primer to dry. Remove the paper wrapper from one side of the gasket, retaining the outside paper in place to protect the gasket and assure against stretching. Place the plastic gasket strip in the joint, forming a continuous gasket around the entire circumference of the manhole joint. Remove the paper wrapper from the exposed side of the gasket and place the next manhole component.
2. Care shall be taken in the handling of barrel and cone sections after the plastic gasket has been affixed to avoid displacing the gasket or contaminating the joint or gasket with dirt or other foreign material. Any displaced or soiled gaskets shall be removed and replaced.
3. Care shall be taken to properly align the manhole section with the previously set section before it is lowered into position.
4. During cold or wet weather, the joint surfaces shall be heated with hot air until ice, frost, and moisture are removed and surface to be primed is dry and warm. Hot air shall also be passed over plastic gasket strips immediately prior to attaching them to joint surfaces and immediately prior to setting the section.

E. Manhole frames and covers shall not be set to final grade until the pavement has been completed, unless otherwise approved by City of Richmond. Precast concrete grade rings shall be installed as shown in the Standard Drawings. Paving around the manhole shall be in accordance with local jurisdiction requirements. Openings in manholes shall be protected from construction loads, debris and unauthorized entry.

F. When new piping is installed in existing structures, the Contractor shall accurately position core-drilled openings in the concrete as shown on the job plans and Standard Drawings or otherwise directed by the Inspector. Openings shall be of sufficient size to permit a final alignment of pipelines and fittings without deflection of any part and to allow adequate space for satisfactory placement of mechanical seals or packing with non-shrink grout where the pipe passes through the wall to ensure the resulting structure is watertight. Before placing the non-shrink grout, concrete surfaces shall be sandblasted, thoroughly cleaned of sand and any other foreign matter, and coated with epoxy bonding compound. After connection of the new inlet pipe, the Contractor shall rechannel the inside of the existing manhole base to provide a smooth flow channel to the new exit pipe.

G. The throat shall be constructed using appropriately sized reinforced concrete grade rings to bring the manhole cover to finished grade surface. No plastic sealing gaskets shall be used for jointing grade or extension rings.

H. Manhole top blocks shall be poured against forms constructed to the specified dimensions shown on SS-1A of the Standard Drawings.

I. All manholes located on slopes steeper than 3:1 (horizontal to vertical) in easement areas shall be constructed with a reinforced concrete, reinforced concrete masonry unit or interlocking masonry unit retaining walls and be installed around manhole rims and top blocks where required by the City of Richmond.

J. All manholes shall be tested in accordance with Section 4-1.19 - Pipeline Cleaning, Testing and Televising.

K. Temporary covers shall be used during construction until permanent frames and covers are installed.

RECONSTRUCTION OF EXISTING STRUCTURES

A. General

1. Reconstruction work on any particular structure shall be diligently prosecuted so as to be completed within three (3) calendar days after work is begun on that particular structure. The Contractor shall provide continuous access for City of Richmond maintenance forces to the structure at all times.
2. When removing existing structures, the Contractor shall take precautions to ensure that no foreign material enters the structure or the downstream system. Before any work is started, the base shall be covered with a plywood ("false bottom"), and then the false bottom shall be covered with a drop cloth of heavy canvas. The drop cloth and false bottom shall be kept in place during the work to catch debris, and upon completion, shall be removed with the collected debris. No debris shall enter the downstream system or be allowed to remain in the manhole.

B. Structure Adjustments and Repairs

All workmanship and materials for structure adjustments shall conform to the requirements of these Specifications. In the case of existing brick or cast-in-place concrete structures, repair or adjustments shall be accomplished with materials in kind or with precast elements as detailed on the job plans.

1. Existing structure precast elements, adjustment rings, frames, and covers removed for adjustments and/or repairs may be reinstalled only when such undamaged items are permitted by the Inspector for reuse.
2. Manhole adjustments shall be accomplished by one of the methods specified below or as detailed on the job plans.
    a. Upward adjustments of manholes to finish grade surface may be accomplished with reinforced concrete grade rings, formed concrete and/or a single cast iron extension ring when the adjusted manhole throat will not exceed twelve (12) inches in height. In no case shall multiple cast iron extension rings be used in adjustments. When adjustments are made that position the bottom of the cast iron manhole frame above the existing concrete top block, the top block shall be reconstructed in accordance with the requirements on SS-1 through SS-5 & SS-7A & SS-7B of the Standard Drawings.
    b. Whenever upward adjustment of manholes would result in a completed manhole throat section exceeding twelve (12) inches in height, the upper manhole section, including the top block and cone section, shall be removed and the adjustment shall be made by reconstructing the structure using manhole barrel and cone sections, grade rings and frames and covers in accordance with the requirements of these Specifications and SS-1 through SS-5 & SS-7A & SS-7B of the Standard Drawings.
    c. Downward adjustments of manholes shall be accomplished by removal of existing grade or extension rings and cone and barrel sections as required, and reconstructing the structure using manhole barrel and cone sections, grade rings and frames and covers in accordance with the requirements of these Specifications and SS-1 through SS-5 & SS-7A & SS-7B of the Standard Drawings.
3. Rodding inlet adjustments shall be accomplished by one of the methods specified below or as detailed on the job plans.
    a. Upward adjustments of rodding inlets shall be accomplished with formed concrete or cast iron extension rings where the extension will not exceed eight (8) inches, including any previous adjustments. When adjustments are made that position the bottom of the cast iron frame above the existing concrete top block, the top block shall be reconstructed in accordance with the requirements of these Specifications and SS-8A of the Standard Drawings.
    b. Upward adjustments of rodding inlets exceeding eight (8) inches shall be accomplished by removing the structure's frame, cover, and top block, and reconstructing the structure in accordance with the requirements of these Specifications and SS-8A of the Standard Drawings. Pipe used for such adjustments shall be as required for pipeline repair and shall be installed so as to extend the line and grade of the existing pipe.
    c. Downward adjustments of rodding inlets shall be accomplished by removal and reconstructions of the entire upper section of the structure including the top block.

4-1.18 ALL-WEATHER ACCESS ROADS

GENERAL

THE REQUIREMENT

All-weather roads shall be provided for permanent maintenance access to all sewer structures (i.e., manholes and rodding inlets). The Contractor shall construct these roads as shown on the Plans and specified in this Section.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.14 - Asphalt Concrete Pavement and Base Restoration

C. Section 4-1.22 - Cast in-Place Concrete

CONTRACTOR SUBMITTALS

A. Road Maintenance and Repair Agreement

An Access Road Maintenance Agreement shall be executed and recorded prior to City of Richmond's "Final Review for Construction" of job Plans. The agreement shall be in City of Richmond's standard form and shall require that the owners of properties served by sewers to be accessed from a particular road maintain that road in good repair at all times for routine and/or emergency access by City of Richmond maintenance vehicles.

PRODUCTS

MATERIALS

A. Type 1 Bedding and Backfill Material Aggregate Base shall be in accordance with the requirements of Section 4-1.07 - Excavation, Bedding and Backfill.

B. Asphalt Concrete shall be in accordance with Section 4-1.14 – Asphalt Concrete Pavement and Base Restoration.

C. Concrete shall be in accordance with the requirements of Section 4-1.22 - Cast in-Place Concrete.

EXECUTION

REQUIRED STRUCTURAL CROSS SECTION

A. The minimum structural cross section for all-weather access roads shall depend on the finished grade of roadway as follows:
   1. For finished grades less than ten percent (10%): the structural cross section of the road shall consist of a surface course having a minimum thickness of eleven (11) inches of Type 1 Bedding and Backfill Material (newly quarried crushed "Clayton Blue" or equal, not recycled material or mined alluvium), or equivalent section based on Caltrans "Gravel Equivalent Method", over competent native sub-base. Sub-base and Type 1 Bedding and Backfill Material shall be compacted to ninety-five percent (95%) relative compaction.
   2. For finished grades between ten percent (10%) and fifteen percent (15%): the structural cross section of the road shall consist of a surface course having a minimum thickness of two and one-half (2-1/2) inches of Asphalt Concrete (AC), over a minimum of nine (9) inches of Type 1 Bedding and Backfill Material (newly quarried crushed "Clayton Blue" or equal, not recycled material or mined alluvium), or equivalent based on Caltrans "Gravel Equivalent Method", or six (6) inches reinforced concrete (#4 @ 16" OC each way, or equivalent WWF), over a minimum of three (3) inches Type 1 Bedding

Material sub-base. Sub-base and Type 1 Bedding and Backfill Material shall be compacted to ninety five percent (95%) relative compaction.

3. For finished grades between fifteen percent (15%) and twenty percent (20%): the structural cross section of the road shall consist of a surface course of a minimum thickness of six (6) inches of reinforced concrete (#4 @ 16" OC each way, or equivalent WWF) over a minimum of three (3) inches Type 1 Bedding Material sub-base compacted to ninety five percent (95%) RC, grooved per Contra Costa County Fire Protection District Drawing. No. FPS-001-D3.
4. Grades exceeding twenty percent (20%) shall not be allowed.

REQUIRED GEOMETRY

A. Minimum geometric requirements for all-weather access roads shall be as follows:
   1. The minimum width of access roads shall be twelve (12) feet.
   2. The maximum cross slope of access roads shall be two percent (2%).
   3. The minimum radius at the centerline of access roads shall be twenty-eight (28) feet.
   4. Access roads shall either have access to a public road at each end, or shall have a turn-around.

DRAINAGE

Engineered drainage facilities to properly convey storm water runoff from the roadway surface and adjacent areas into storm drains or drainage ways shall be provided.

4-1.19 PIPELINE CLEANING, TESTING AND TELEVISING

GENERAL

THE REQUIREMENT

A. The Contractor shall furnish all labor, materials, tools, and equipment necessary to clean, perform acceptance testing, and provide for televising of completed sewer pipelines.

B. The Contractor shall notify the Inspector at least one (1) business day prior to any cleaning or testing work. All final testing and cleaning of sewer lines shall be done in the presence of the Inspector.

C. The Contractor shall complete cleaning and testing of sewer lines as required in this Section prior to requesting television inspection.

D. In new subdivisions or jobs involving potential conflicts with other new underground utilities, preliminary tests may be conducted at the discretion of the Contractor or Inspector at any time. The final test for acceptance will be made after the installation of all underground facilities, curb, gutter, lateral sewers and subbase, but prior to placing the final layer of paving.

E. If deficiencies are identified during testing, the Contractor shall re-test after the deficiencies have been corrected.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM C 969 Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines

ASTM C 1091-03a Test Method for Hydrostatic Infiltration Testing of Vitrified Clay Pipe Lines

AWWA C600-54T	Installation of Ductile-Iron Water Mains and Their Appurtenances
ASTM D 3034	Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM F 679	Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

PRODUCTS

MATERIAL REQUIREMENTS

Mandrels, temporary plugs, low-pressure testing equipment and all other necessary materials shall be provided by the Contractor, subject to the Inspector's approval. No materials shall be used which would be injurious to the public, personnel, adjacent improvements or the pipeline. Air test gauges shall be laboratory-calibrated test gauges and shall be recalibrated by a certified laboratory prior to the leakage test. Gauge shall be easy to read in no more than one (1) pound per square inch (psi) per increments and have a maximum full-scale range of five (5) psi.

EXECUTION 3.1 GENERAL

A. The Contractor shall clean pipelines by balling and flushing or Hydroflushing prior to deflection and pressure testing.

B. The Contractor shall perform deflection and pressure tests after submittal of compaction reports demonstrating compliance with the backfill compaction requirements included in Section 4-1.07 - Excavation, Bedding and Backfill, and before acceptance television inspections.

C. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

CLEANING

A. After all work on the pipeline installation has been completed to the satisfaction of City of Richmond, including all manhole channeling, the Contractor shall clean the pipe in the presence of the Inspector.

B. The Contractor shall clean all new main and trunk sewer installations, and such site collector and side sewer system installations deemed necessary by the Inspector, with a cleaning ball or device in accordance with the device manufacturer's instructions or recommendations and flushed. Hydroflush pressure must be maintained below two thousand (2,000) psi. Traps with screens in accordance with industry standards shall be used to trap debris. The Contractor shall remove all debris from the manhole prior to removing the trap.

C. Release of water during and/or after cleaning and testing has been completed, shall be performed in a manner approved by the Inspector. The Contractor shall be responsible for the proper disposal of water released.

D. The Contractor shall perform an additional cleaning of the pipeline after the installation of final paving, top block, frames and covers, and after all other required inspections, prior to acceptance, if required by the Inspector due to a reasonable determination that additional debris may have accumulated in the pipeline after initial cleaning.

DEFLECTION TESTING

PVC and HDPE pipe (8) eight inches in diameter or larger shall be tested for deflection, joint displacement, or other obstruction by passing a rigid mandrel through the pipe. Deflection shall be tested after submittal of daily compaction reports demonstrating compliance with, but prior to, permanent resurfacing. The mandrel shall be a full

circle, rigid, non-adjustable, an odd-numbered leg (9 leg minimum), approved by the Engineer as to design and manufacturer. Mandrel size shall meet the minimum requirements set forth in ASTM D 3034 and ASTM F 679. The circular cross section of the mandrel shall have a diameter of at least ninety five percent (95%) of the specified average inside diameter of the pipe and the minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe. Where obstructions and excessive deflection encountered by the mandrel, the Contractor shall remove, replace and retest the deficient section. Rerounding will not be allowed.

PIPELINE LEAKAGE TESTING

A. Repaired Pipelines shall be Re-Tested as Follows:
   1. For gravity sewers the Contractor shall conduct a low-pressure air test or a water pressure test. Sewers seventeen (17) inches or greater in diameter shall not be tested with air.
   2. For pressure sewers (force mains), the Contractor shall conduct an air-over-water pressure test at one hundred twenty percent (120%) of maximum design operating pressure, measured at the lowest point of the pipeline section being tested.

B. Air Pressure Test
   1. Each section of main sewer and its appurtenant connected laterals shall be tested between successive manholes by plugging and bracing all openings in the sewer lines. If any leaks are found, the air pressure shall be released, the leaks eliminated, and the test procedure started over again.
   2. Air tests shall be conducted in accordance with the following procedure and the details shown on SS-18 & SS-19 of the Standard Drawings. All necessary test equipment shall be in proper working order and tests shall be made in the presence of the Inspector. Test plugs shall be carefully placed at each end of the section of line to be tested. When all necessary test equipment is in place, a compressed air supply shall be attached to the air fitting on the test equipment and the air pressure within the line increased to four (4) pounds per square inch (psi). After the air supply is securely turned off or disconnected, there shall be a two (2) minute waiting period to allow stabilization of air within the sewer line before the actual test period begins. In no case shall the air pressure within the line be less than three and one- half (3-1/2) pounds per square inch at the beginning of the test period. The allowable air pressure loss shall not exceed one (1) pound per square inch. When testing sewers up to and including sixteen (16) inches in diameter, refer to SS-18 & SS-19 of the Standard Drawings for the length of the test period. When testing side sewers, or portions thereof, the test period shall be four (4) minutes and the allowable loss shall not exceed one (1) pound per square inch. After completion of a test, the air pressure shall be released slowly through the valve, which is incorporated in the test equipment. Air test plugs shall not be removed until the air pressure is no longer measurable.

C. New sewers larger than seventeen (17) inches in diameter shall be hydrostatically tested in accordance with the following procedure:
   1. After installation, all new trunk sewer pipelines shall be thoroughly cleaned prior to pressure testing. A section of trunk sewer shall be prepared for testing between two structures by plugging the inlet side of the discharge manhole and all openings in the upstream manhole except the discharge opening. All plugs shall be properly braced against the manhole wall to withstand the forces of the test in order to prevent loss in the event of a failure.
   2. A section of the trunk sewer prepared as above shall be tested by filling it with water to an elevation five (5) feet above the top of pipe at the upstream end of the test section, or five (5) feet above the existing groundwater elevation, whichever is greater. The water shall be introduced into the test section at least one (1) hour in advance of the test period and refilled as necessary prior to commencement of the test period to allow the pipe and joint material to become saturated. The loss in water may be determined by measuring the rate of fall of the water level, but the level shall not be allowed to fall more than one (1) foot below the specified head during the test period.
   3. For RCP, the pressure shall be maintained for not less than four (4) hours and the leakage rate shall not exceed two hundred (200) gallons per inch of diameter per mile of pipe for twenty-four (24) hours (ASTM C 969-02). For VCP, the pressure shall be maintained for not less than one (1) hour and the leakage rate shall not exceed two hundred (200) gallons per inch diameter per mile for twenty-four (24) hours (ASTM C 1091-03a). For DIP, the pressure shall be maintained for not less than one (1) hour and the leakage rate shall not exceed seventy (70) gallons per inch diameter per mile of pipe of twenty-four (24) hours (AWWA C600-54T).

D. When leakage exceeds the amount allowed by the specifications, the Contractor shall locate the leaks, submit a repair procedure for the Inspector's review, and make the necessary repairs.

TESTING OF MANHOLES

A. City of Richmond may require hydrostatic testing for leakage after installation and prior to backfilling. Prior to hydrostatic testing, all manholes shall be visually inspected. All defects shall be repaired by the Contractor, with non-shrink grout, to the satisfaction of the Inspector. All pipes entering the manhole shall be sealed at a point outside the manhole walls so as to include testing of the pipe/manhole joints. Safety lines shall be secured to all plugs utilized. The manhole shall be filled with water to a level two (2) inches below the top of the frame. After a period of at least one (1) hour to allow the water level to stabilize, the manhole shall be refilled and the water level shall be checked. The water level shall again be checked after a period of four (4) hours. If the water level drops by more than one (1) inch, the leakage shall be considered excessive, and the Contractor shall make necessary repairs and retest the manhole.

B. As an alternative to manhole hydrostatic testing, the Inspector may allow the use of vacuum testing. A vacuum of ten (10) inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test hood closed and the vacuum pump shut off. The manhole shall be deemed to have passed the test if the vacuum drop is less than one (1) inch of mercury during a one (1) minute test period.

TELEVISION INSPECTION

A. CCTV inspection shall be performed by the contractor upon substantial completion and prior to the end of a one year warranty period. The CCTV inspection shall be PACP compliant and compatible with COR database. The CCTV inspections shall be provided to COR in a digital format for review prior to acceptance.

B. The procedure outlined in items 1 through 11 below will be repeated until all deficiencies observed by television inspection have been corrected to the complete satisfaction of City of Richmond.
   1. The Contractor shall request television inspection once the following procedures have been completed:
      a. Sewer pipelines are installed, backfilled, and compacted.
      b. Structures are in place, all channeling is complete and pipelines are accessible from structures.
      c. All other underground facilities, utility piping, and conduits in the vicinity are installed.
      d. For street locations, placement of aggregate base has been completed.
      e. Pipelines to be inspected have been cleaned and flushed.
      f. Final pressure test has been completed.
      g. Mandrel testing is complete.
   2. After the above work is complete, the Contractor shall request the Inspector to have City of Richmond establish a date for television inspection.
   3. The Contractor for the project will be notified by phone as to the scheduled date of the television inspection, and shall arrange for water to be available the date of the inspection.
   4. If the jobsite will not be ready or accessible for the television inspection on the scheduled date, the Contractor shall notify the Inspector of the necessary cancellation at least twenty-four (24) hours in advance of the scheduled inspection to avoid being charged a cancellation fee.
      a. If the City of Richmond's television crew arrives at the jobsite and the work is not ready or accessible, the Contractor will be billed the cancellation fee payable to City of Richmond prior to the date of rescheduled television inspection.
      b. The Contractor shall reschedule inspection as outlined above.
   5. All CCTV inspections shall be at the contractors cost and incorporated into the contractor's proposal. The CCTV inspections shall be provided to COR in a digital format for review prior to acceptance.
   6. The entire job will be initially televised by City of Richmond. If no deficiencies are observed, the work will be considered satisfactory. If deficiencies are observed, a recording will be made and defects serious enough to require correction will be determined by the Inspector.
   7. Notification will be made in writing of any deficiencies revealed by the television inspection that will require repair. If corrective work is indicated and viewing of the recording is desired, the Contractor shall contact the Inspector to set a time for the viewing.

8. All corrective work shall be done, and shall be subject to approval by City of Richmond. City of Richmond reserves the right to require cleaning and additional leak testing of the repaired pipeline.
9. Those portions of the pipeline where deficiencies have been corrected must be re-televised. Payment of re-television inspection fees must be received by City of Richmond prior to the scheduled date of the television re-inspection.
10. All sewer stubs will be televised.
11. The following observations from television inspections will be considered defects requiring correction prior to paving:
    a. Low spot 0.125 x diameter of pipe or greater (e.g., 1 inch for 8-inch pipe).
    b. Joint separations (three-quarter (3/4) inch or greater opening between pipe sections).
    c. Cocked joints present in straight runs or on the inside of pipe curves.
    d. Chips in pipe ends.
    e. Cracked or damaged pipe.
    f. Offset joints.
    g. Infiltration.
    h. Debris or other foreign objects.
    i. Other obvious deficiencies.

C. Television inspection of the work and the correction of observed defects shall not relieve the Contractor of its responsibility for the one (1) year guarantee period. City of Richmond may inspect and/or televise portions of any projects during said guarantee period. This inspection may include a televising of the pipelines and the checking of the pipeline deflection in the case of plastic pipes.

4-1.20 PROTECTION OF TREES AND RESTORATION OF LANDSCAPING

GENERAL

THE REQUIREMENT

A. The Contractor shall protect trees and restore landscaping in accordance with the requirements of this Section.

B. The Contractor shall exercise due diligence and implement necessary precautions so as not to needlessly damage or destroy trees, shrubs or other landscaping including those within street rights-of-way and project limits. Removal or pruning of trees or shrubs shall occur only with prior approval of the Inspector and only in the presence of and under the supervision of a certified arborist acceptable to City of Richmond. If the Contractor damages any tree or shrub not specifically designated for removal on the plans, the Contractor shall replace or trim the damaged tree or shrub as directed by a certified arborist engaged by the Contractor and acceptable to City of Richmond. The Contractor shall obtain approval from the jurisdictional agency where required, and the owner of the trees and or shrubs prior to replacement or pruning.

C. The roots of trees or shrubs not specifically designated for removal on the plans shall be protected from damage by the Contractor's operations. If necessary for preservation of trees or shrubs, as determined by the arborist, the Contractor shall either hand dig or use an “air-spade” around roots in the drip zone. No tree roots over two (2) inches in diameter shall be cut without permission of the Inspector. Trees shall be supported during excavation, and no herbicides shall be used.

D. Existing growth on adjacent land and rights-of-way shall be preserved. Construction equipment shall not be operated in areas designated for preservation. If necessary for preservation of trees and shrubs, the Contractor shall install temporary protective fences, protective padding and/or staked straw bales around trunks of trees along the construction alignment to prevent damage by vehicles, equipment and material storage, pedestrian activity, and/or disposal of phytotoxic material.

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ANSI A 300 American National Standards Institute, Pruning Standards

ISA International Society of Arboriculture Tree Pruning Guidelines

CONTRACTOR SUBMITTALS

A list of the materials used, together with typical certificates of each material, shall be submitted to City of Richmond prior to the final acceptance of the job.

QUALITY ASSURANCE

A. The Contractor shall request inspection at least one (1) business day in advance of the time inspection is required. Inspection will be required on the following stages of the work:
   1. During preliminary grading, soil preparation and initial weeding.
   2. When trees are spotted for planting, but before planting holes have been excavated.
   3. When finish grading has been completed.
   4. When all specified work, except warranty work has been completed.
   5. Final inspection at the completion of the warranty period.

B. Plants shall be subject to inspection upon delivery to the site and at any time before or during progress of the work.

C. Rejected plants shall be identified in an obvious manner, removed from the site and replaced.

CLEANUP

During landscaping work and upon completion of planting operations, the site used for work or as a storage area by the Contractor shall be maintained in a neat and clean condition.

MAINTENANCE OF LANDSCAPING DURING WARRANTY PERIOD

A. The Contractor shall be responsible for protecting, watering and maintaining all planting and irrigation systems until the end of the warranty period.

B. Trees and shrubs shall be thoroughly soaked after planting and provided with additional water at intervals as necessary to provide for good health and growth of the planting.

PRODUCTS

GENERAL

All landscaping materials for soil conditioning, weed abatement, or planting shall be first-grade, commercial quality and shall have certificates indicating the source of material, analysis, quantity, or weight attached to each sack or container or provided with each delivery.

TOPSOIL

Topsoil shall be obtained from naturally drained areas and shall be fertile, friable loam suitable for plant growth, and be of uniform quality, free from stiff or lumpy clay, hard clods, hardpan, rocks, disintegrated debris, plants, roots, seeds, or any other materials that would be toxic or harmful to plant growth. Topsoil shall contain no harmful weeds or harmful weed seeds.

FERTILIZER AND ADDITIVES

Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon, and shall be applied at recommended rates.

MULCH

Mulching material shall be shredded bark, free of sticks, stones, clay or other foreign materials.

PLANT MATERIALS

A. All plants shall be symmetrical and shall conform to the size, age and condition as specified on the plant list. Plants shall be of sound health, vigorous, and free from plant disease and shall be well-branched, shall have full foliage when in leaf, and shall have a healthy well-developed normal root system. Cold storage plants will not be accepted.

B. Roots and root balls of all plants shall be adequately protected at all times from sun and/or drying winds.

C. Trees shall have straight trunks and all abrasions and cuts shall be completely callused over. In no case shall trees be topped before delivery.

STAKES

A. Stakes for supporting trees shall be two (2) inch diameter sound No. 2 redwood or lodge pole pine stakes.

B. Tree ties shall be approved by the Inspector prior to use.

EXECUTION

GENERAL

A. The Contractor shall provide protection to structures, pavements, adjacent properties and other facilities that are subject to damage during landscape work. Open excavations shall be provided with barricades and warning lights which conform to the requirements of governing authorities and the Cal/OSHA safety requirements from dusk to dawn each day and when needed for safety.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

REMOVAL OF TREES AND SHRUBS

A. The Inspector may authorize removal of tree and shrub branches that interfere with construction operations. When tree or shrub branches must be removed, the removal shall be done in a manner that does not injure the tree or shrub as directed by a certified arborist engaged by the Contractor and acceptable to City of Richmond. The trimming shall be completed in a manner that will preserve the symmetry of the tree or shrub presenting a balanced appearance. No stubs, splits or torn branches shall remain following the trimming. Clean cuts shall be made close to the trunk or a large branch.

B. The Contractor shall notify the Inspector a minimum of one (1) week in advance if a tree limb greater than three (3) inches in diameter needs to be removed and shall request authorization to remove the limb from the owner. Submitting a request to remove limbs does not guarantee approval. If approval is denied, the Contractor shall modify its operation in order to protect the limb.

C. Trees or shrubs designated for removal shall be felled in sections from the top down and removed in such a manner as not to injure standing trees, plants, structures or other improvements. Trees or shrubs to be removed shall be removed to a depth of eighteen (18) inches below existing minimum grade.

D. Trunks, stumps, dead or fallen limbs and branches, and roots of dead vegetation within the construction limits shall be removed from the jobsite.

E. The Contractor shall notify the Inspector prior to removal of any tree with a trunk diameter greater than six (6) inches at four and one-half (4-1/2) feet above its natural grade or any riparian tree with a trunk diameter of four (4) inches at four and one-half (4-1/2) feet above its natural grade or a multi-trunk riparian tree with a cross-sectional area of all trunks equal to a cross-section of a single stem of four (4) inches at four and one-half (4-1/2) feet above its natural grade. “Riparian Tree” is a tree within thirty (30) feet of the edge of a creek bank.

PRUNING AND MULCHING

A. Root Pruning
   1. No tree roots larger than two (2) inches in diameter shall be cut without the permission of the Inspector. A certified arborist engaged by the Contractor and acceptable to City of Richmond shall be present during trenching in root zones. If roots larger than two (2) inches in diameter are cut, the arborist may require some plant reduction. The arborist shall evaluate damaged trees and shrubs for stability, health, and aesthetic appearance. If reduction or removal is required, the Contractor shall notify the owner in writing and approval shall be secured prior to pruning or removal.
   2. All damaged roots regardless of size shall be pruned square and clean, in accordance with standard horticultural practice.

B. Pruning of Trees and Shrubs
   1. Pruning shall be done under the direction and in the presence of a certified arborist acceptable to City of Richmond and performed by tree workers who are competent in the area of tree trimming, maintenance, repairing and removal and familiar with equipment used in this work. The use of climbing spurs, spikes, or irons is prohibited in pruning operations on live trees. Pruning shall be done in accordance with the ISA “Pruning Guidelines” and ANSI A-300 Standards.
   2. All cuts shall be made close to the trunk without cutting into the branch collar so that closure can readily start under normal conditions. Clean cuts shall be made at all times. Heavy branches shall be notched from below to prevent splitting or peeling the bark. Cuts and wounds shall be treated with tree dressing where open wounds may attract insects that carry disease or allow fungus invasion. After use on a tree or shrub known to be diseased, tools shall be disinfected with methyl alcohol or seventy percent (70%) bleach solution after each cut and before use on another tree or shrub.
   3. No more than thirty-three percent (33%) of the total plant mass shall be reduced at a single operation. Where practical, avoid cutting back to small suckers. In reducing overall size, attention shall be given to achieving a symmetrical appearance. The top shall remain higher than the sides to maintain a natural appearance.

C. All dead wood or suckers and all broken or badly bruised branches shall be removed by thinning out and shortening branches. All cuts shall be made just above a healthy bud. Pruning shall be done with clean, sharp tools.

D. Plants shall be mulched after planting has been completed. A layer of mulch materials shall be spread on finished landscaping grade to a depth of two (2) inches. Mulching around isolated plants shall be six (6) inches greater in diameter than the planting hole.

REPLACEMENT OF DAMAGED TREES AND SHRUBS

A. If any tree or shrub is damaged by the Contractor's operations, the Contractor shall immediately notify the Inspector and the Owner of the tree or shrub. If, in the judgment of a certified arborist engaged by the contractor and acceptable to City of Richmond, the damage is such that replacement is necessary, the Contractor shall replace the tree or shrub. If possible, the replacement shall be of like size and variety as the tree or shrub damaged.

B. The size of replacement trees shall be no less than three (3) inches in diameter or less than six (6) feet in height contained in a 24" x 24" box. The size of replacement shrubs shall not be less than five (5) gallon

in size. Place topsoil around tree to allow root crown to remain at the original grade so that the root flares can be seen for at least several inches away from the trunk. The root crown shall remain dry and free of debris, such as lawn or ivy. Place an acidic, organic compost or mulch around the rooting area.

SOIL PREPARATION

A. The landscape work shall not begin until all other trades have repaired all areas of settlement, erosion, rutting, etc., and the soils have been re-established, re-compacted and refinished to finish grades.

B. Areas requiring grading by the landscaper including adjacent transition areas shall be uniformly level or sloping between finish elevations to within 0.10 ft. above or below required finish elevations.

C. The landscape work shall not proceed until roadways and irrigation systems are in place, and other construction operations are completed to a point where the landscape areas will not be disturbed. The subgrade shall be free of waste materials of any kind.

D. During grading, waste materials in the planting areas such as weeds, rocks (2 inches and larger), building materials, rubble, wires, cans, glass, lumber, sticks, etc., shall be removed from the site. Weeds shall be dug out by the roots.

E. Fertilizers, additives, seed, peat, etc. subject to moisture damage shall be kept in a weatherproof storage place in such a manner that they will be kept dry.

F. After removal of waste materials, the planting areas' subgrade shall be scarified and pulverized to a depth of no less than six (6) inches and all surface irregularities below the cover of topsoil removed.

G. Finish grading shall consist of:
1. Final contouring of the planting areas.
2. Placing four (4) inches of topsoil over all areas to be planted unless shown or specified otherwise.
3. Placing all soil additives and fertilizers.
4. Tilling of planting areas.
5. After tilling, bring areas to uniform grades by floating and/or hand raking.
6. Making minor adjustment of finish grades as directed by the Inspector.
7. Removing waste materials such as stones, roots, or other undesirable foreign material and raking, discing, dragging, and smoothing soil ready for planting.

H. Topsoil shall be uniformly distributed over all areas where required. Subgrade and topsoil shall be damp and free from frost.

I. Surface drainage shall be provided as shown by grading the surface to facilitate the natural run-off of water. Low spots and pockets shall be filled with topsoil and graded to drain properly.

J. Finish grade of all planting areas shall be one and one-half (1-1/2) inches below finish grades of adjacent pavement of any kind.

DELIVERY, STORAGE AND HANDLING OF PLANT MATERIALS

A. Plants shall not be pruned prior to delivery.

B. Plant material shall be planted on the day of delivery if possible. The Contractor shall protect the stock in a temporary nursery at the project site where it shall be protected from sun and drying winds and shall be shaded, kept moist, and protected with damp soil, moss or other acceptable material.

C. No plants shall be bound with wire or rope at any time so as to damage the bark or break branches.

D. Plants shall not be picked up or moved by stem or branches, but shall be lifted and handled from the bottom of the ball or the sides of the containers. Plants with balls cracked or broken before or during

planting operations will not be accepted and shall be immediately removed from the site and replaced.

TREE AND PLANT LOCATIONS

A. The Contractor shall locate and stake all tree and shrub locations and have the locations approved by the Property Owner before starting excavation of planting holes.

B. No trees shall be located closer than eighty-four (84) inches to sewers or sewer structures.

PLANTING HOLES

A. Planting holes shall be excavated circular pits centered on location stakes with vertical sides and flat or saucer shape bottom.

B. Holes for trees shall be at least two (2) feet greater in diameter than the specific diameter of ball or spread of roots, and at least six (6) inches below depth of ball or roots.

PREPARED BACKFILL

A. All soil for backfilling operations shall be prepared soil consisting of: one (1) part soil amendment, three (3) parts of topsoil. Commercial fertilizer shall be mixed with topsoil per manufacturer's printed recommendations.

B. Soil amendments shall be thoroughly mixed on the site before placement. Mixing of materials in pits will not be permitted.

ROCKS OR UNDERGROUND OBSTRUCTIONS

In the event that rock or underground obstructions are encountered in the excavation of plant pits, alternative locations shall be selected by the Property Owner.

SETTING PLANT MATERIALS

A. Prior to setting, all broken or frayed roots shall be properly cut off. Water shall be applied if necessary to provide ideal moisture for filling and for planting as specified herein.

B. Plants shall be set plumb and straight in the center of pits.

C. Planting soil around roots or root balls shall be compacted and watered. Muddy soil shall not be used for backfilling.

D. All plants shall be thoroughly watered immediately after planting.

E. Remove all tags and labels after final inspection.

STAKING

A. Staking of trees shall be done immediately after planting. Plants shall stand plumb after staking.

B. Trees less than two (2) inches in diameter shall be supported by two (2) stakes placed diametrically opposite at perimeter line of the root ball and to sufficient depth to hold the tree rigid. Trees shall be supported by guy wires in accordance with standard horticultural practice.

4-1.21 REINFORCEMENT STEEL

GENERAL

THE REQUIREMENT

The Contractor shall furnish, fabricate, and place all concrete reinforcement steel, welded wire fabric, couplers and concrete inserts for use in reinforced concrete.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.25 - Grout

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ACI 315	Detail and Detailing of Concrete Reinforcement
ACI 318	Building Code Requirements for Structural Concrete and Commentary
ASTM A 82	Specification for Steel Wire, Plain, for Concrete Reinforcement
ASTM A 185	Specification for Steel Welded Wire Reinforcement, Plain for Concrete
ASTM A 615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 775	Specification for Epoxy-Coated Reinforcing Steel Bars
CRSI MSP-1	Concrete Reinforcing Steel Institute Manual of Standard Practice

QUALITY ASSURANCE

If requested by City of Richmond, the Contractor shall provide samples from each heat of reinforcement steel delivered in a quantity adequate for testing.

PRODUCTS

GENERAL

Materials specified in this Section that may remain or leave residue on or within the concrete shall be classified as acceptable for potable water use by the U.S. Environmental Protection Agency.

REINFORCEMENT STEEL

A. Reinforcement Steel for all cast-in-place, reinforced concrete construction shall conform to the following requirements:
   1. Bar reinforcement shall conform to the requirements of ASTM A 615 for Grade 60 Billet Steel Reinforcement with supplementary requirement S-1, or as otherwise shown.
   2. Welded wire fabric reinforcement shall conform to the requirements of ASTM A 185 and the details shown; provided that welded wire fabric with longitudinal wire of W4 size wire and smaller shall be either furnished in flat sheets or in rolls with a core diameter of not less than ten (10) inches; and provided further that welded wire fabric with longitudinal wires larger than W4 size shall be furnished in flat sheets only.
   3. Spiral reinforcement shall be cold-drawn steel wire conforming to the requirements of ASTM A 82.

B. Accessories:
   1. Accessories shall include all necessary chairs, slab bolsters, concrete blocks, tie wires, dips, supports, spacers and other devices to position reinforcement during concrete placement. All bar supports shall meet the requirements of the CRSI Manual of Standard Practice, including special requirements for supporting epoxy-coated reinforcing bars. Wire bar supports shall be CRSI Class 1 for maximum

protection with a one-eighth (1/8) inch minimum thickness of plastic coating that extends at least one-half (1/2) inch from the concrete surface. Plastic shall be gray in color.

2. Concrete blocks (dobies), used to support and position reinforcement steel, shall have the same or higher compressive strength as specified for the concrete in which it is located. Wire ties shall be embedded in concrete block bar supports.

C. Epoxy coating for reinforcing and accessories, where indicated, shall conform to ASTM A 775.

MECHANICAL COUPLERS

If the Contractor proposes the use of mechanical couplers, it shall submit product data for City of Richmond approval.

EPOXY GROUT

Epoxy for grouting reinforcing bars shall be specifically formulated for such application, for the moisture condition, application temperature and orientation of the hole to be filled. Epoxy grout shall meet the requirements specified in Section 4-1.25 - Grout.

EXECUTION

GENERAL

A. All reinforcement-steel, welded wire fabric and other appurtenances shall be fabricated and placed in accordance with the requirements specified herein. Welded splices or mechanical couplers shall not be used unless approved by City of Richmond. Reinforcement shall not be straightened or re-bent.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

FABRICATION

A. Reinforcement steel shall be accurately formed, and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318. Stirrups and tie bars shall be bent around a pin having a diameter not less than one (1) inch for No. 3 bars, two (2) inches for No. 4 bars and No. 5 bars. Bars shall be bent cold. The Contractor shall fabricate reinforcement bars for structures in accordance with bending diagrams, placing lists and placing drawings.

B. Fabricating Tolerances: Bars used for concrete reinforcement shall meet the following requirements for fabricating tolerances:

1. Cut or sheared length: 1 inch
2. Depth of truss bars: +0, -1/2 inch
3. Stirrups, ties, and spirals: 1/2 inch
4. All other bends: 1 inch

PLACING

A. Reinforcement steel shall be accurately positioned and shall be supported and wired together to prevent displacement, using annealed-iron wire ties or suitable clips at intersections. Concrete, plastic, metal supports, spacers, or metal hangers shall support all reinforcement steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used, in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous. All concrete blocks used to support reinforcement steel shall be tied to the steel with wire ties that are embedded in the blocks. For concrete over form work, the Contractor shall furnish concrete, metal, plastic or other acceptable bar chairs and spacers.

B. Limitations on the use of bar support materials shall be as follows:

1. Concrete dobies are permitted at all locations, except where architectural finish is required.
2. Wire bar supports are permitted only at slabs over dry areas and exterior wall surfaces.
3. Plastic bar supports are permitted at all locations, except on grade.
4. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage.

C. Bars additional to those shown that may be found necessary or desirable for the purpose of securing reinforcement in position shall be provided by the Contractor.

D. Unless otherwise specified, reinforcement placing tolerances shall be within the limits specified in Section 7.5 of ACI 318.

E. Bars may be moved as necessary to avoid interference with other reinforcement steel, conduits, or embedded items. If bars are moved more than one (1) bar diameter or enough to exceed the specified tolerances, the resulting arrangement of bars shall be as acceptable to City of Richmond.

F. Welded wire fabric reinforcement placed over horizontal forms shall be supported on slab bolsters. Slab bolsters shall be spaced not more than thirty (30) inches on centers, shall extend continuously across the entire width of the reinforcement mat, and shall support the reinforcement mat in the plane indicated.

G. Welded wire fabric placed over the ground shall be supported on wired concrete blocks (dobies) spaced not more than three (3) feet on centers in any direction. The practice of placing welded wire fabric on the ground and hooking into place in the freshly placed concrete shall not be used.

H. Epoxy-coated reinforcing bars shall be stored, transported, and placed in such a manner as to avoid chipping of the epoxy coating. Non-abrasive slings made of nylon and similar materials shall be used. Specially coated bar supports shall be used. All chips or cracks in the epoxy coating shall be repaired with a compatible epoxy repair material prior to placing concrete.

I. Accessories supporting reinforcing bars shall be spaced such that there is no deflection of the accessory from the weight of the supported bars. When used to space the reinforcing bars from wall forms, the forms and bars shall be located so that there is no deflection of the accessory when the forms are tightened into position.

SPACING OF BARS

A. The clear distance between parallel bars not including bundled bars (except in columns and between multiple layers of bars in beams) shall not be less than the nominal diameter of the bars, not less than one and one-half (1-1/2) times the maximum size of the coarse aggregate, nor less than one (1) inch. The clear distance between bars shall also apply to the distance between a contact splice and adjacent splices or bars.

SPLICING

A. Reinforcement bar splices shall only be used at locations shown. When it is necessary to splice reinforcement at points other than where shown, the character of the splice shall be as acceptable to City of Richmond.

B. Splices of Reinforcement:
1. The length of lap for reinforcement bars, unless otherwise shown, shall be in accordance with ACI 318.
2. Laps of welded wire fabric shall be in accordance with ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one (1) tie for each two (2) running feet. Wires shall be staggered and tied in such a manner that they cannot slip.
3. Splices in column spiral reinforcement, when necessary, shall be made by a lap of one and one-half (1-1/2) turns.

3.6 CLEANING AND PROTECTION

A. Reinforcement steel shall be protected at all times from conditions conducive to corrosion until concrete is placed around it.

B. The surfaces of all reinforcement steel and other metal work to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale, rust, grout, mortar and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcement shall be re-inspected and, if necessary, re-cleaned.

EMBEDMENT OF DRILLED, REINFORCING-STEEL DOWELS

A. Hole Preparation:
   1. The hole diameter shall be as recommended by the epoxy manufacturer but shall be no larger than one-quarter (1/4) inch greater than the diameter of the outer surface of the reinforcing bar deformations.
   2. The depth of the hole shall be as recommended by the epoxy manufacturer to fully develop the bar but shall not be less than twelve (12) bar diameters, unless noted otherwise.
   3. The hole shall be drilled by methods that do not interfere with the proper bonding of epoxy.
   4. Existing reinforcing steel in the vicinity of proposed holes shall be located prior to drilling. The location of holes to be drilled shall be adjusted to avoid drilling through or nicking any existing reinforcing bars.
   5. The hole shall be blown clean with clean, dry compressed air to remove all dust and loose particles.

B. Epoxy shall be injected into the hole through a tube placed to the bottom of the hole. The tube shall be withdrawn as epoxy is placed but kept immersed to prevent formation of air pockets. The hole shall be filled to a depth that ensures that excess material will be expelled from the hole during dowel placement.

C. Dowels shall be coated with epoxy and twisted during insertion into the partially filled hole so as to guarantee full wetting of the bar surface with epoxy. The bar shall be inserted slowly enough to avoid developing air pockets.

SAFETY

A. No employee shall be permitted to work above vertically protruding reinforcing steel until the steel has been so protected that the employee cannot fall or be impaled on the steel.

B. Employees working more than six (6) feet above any adjacent working surface placing and tying reinforcing steel in walls, piers, columns, etc., shall be provided with and required to use a safety belt or other device affording equivalent protection for the hazard of falls from elevated surfaces.

C. Reinforcing steel for walls, piers, columns, and similar vertical structures shall be guyed and supported to prevent collapse.

D. Wire mesh rolls shall be secured at each end to prevent dangerous recoiling action.

4-1.22 CAST-IN-PLACE CONCRETE

GENERAL

THE REQUIREMENT

The Contractor shall furnish materials, form, mix, place, cure, repair, finish and do all other work required to produce finished concrete in accordance with the provisions of this section.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.21 - Reinforcement Steel

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ACI 301	Specifications for Structural Concrete for Buildings
ACI 347	Guide to Formwork for Concrete
ASTM C 33	Specification for Concrete Aggregates
ASTM C 94	Specification for Ready-Mixed Concrete
ASTM C 150	Specification for Portland Cement
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete
ASTM C 309	Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 494	Specification for Chemical Admixtures for Concrete
ASTM C 618	Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

CONTRACTOR SUBMITTALS

A. When the Contractor proposes to use a mix design not listed in the City of Richmond Approved Materials List, the proposed mix design including the proportions and gradations of all materials proposed shall be submitted to City of Richmond and shall receive favorable review prior to use. Mix designs shall be tested by an independent testing laboratory for properties specified in this section, and the results shall be submitted with the proposed concrete mix designs.

B. Where ready-mix concrete is used, the Contractor shall furnish certified delivery tickets at the time of delivery of each load of concrete. Each ticket shall show the state certified equipment used for measuring, and the total quantities, by weight, of cement, sand, each class of aggregate, admixtures, and the amounts of water in the aggregate, added at the batching plant, and the amount allowed to be added at the site for the specific design mix. In addition, each certificate shall state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to the time when the batch was dispatched, when it left the plant, when it arrived at the job, when unloading began, and when unloading was finished.

C. When a water-reducing admixture is proposed, the Contractor shall furnish mix designs for concrete both with and without the admixture.

D. The Contractor shall submit shop bending diagrams, placing lists, and drawings of all reinforcement steel.

PRODUCTS

REINFORCEMENT STEEL

Reinforcement Steel shall satisfy the requirements specified in Section 4-1.21 - Reinforcement Steel.

CONCRETE MATERIALS

A. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one (1) brand of cement shall be used.

B. All materials furnished for the work shall comply with the requirements of Sections 201, 203, and 204 of ACI 301, as applicable.

C. Materials for concrete shall conform to the following requirements:
   1. Cement shall be standard brand Portland cement conforming to ASTM C 150 for Type II or Type V.
   2. Clean potable or recycled water free from objectionable quantities of silty organic matter, alkali, salts and other impurities shall be used.

3. Aggregates shall be obtained from pits acceptable to City of Richmond, shall be non-reactive, and shall conform to ASTM C 33. Lightweight sand for fine aggregate shall not be permitted.
4. Ready-mix concrete shall conform to the requirements of ASTM C 94.
5. Air-entraining agent shall meet the requirements of ASTM C 260.
6. Fly Ash shall meet the requirements of ASTM C 168.
7. Admixtures may be added at the Contractor's option to control the set, effect water reduction, and increase workability. The use of an admixture shall be subject to acceptance by City of Richmond. Concrete shall not contain more than one water reducing admixture. Water reducing admixture shall conform to ASTM C 494, Type A or Type D.
8. Calcium chloride shall not be used in concrete. 2.3 CURING MATERIALS
9. Materials for curing concrete shall conform to ASTM C 309. Curing compounds shall be white pigmented and resin based. Sodium silicate compounds shall not be used. Concrete curing compound shall be MB-429 as manufactured by Master Builders; Spartan Cote Cure-Seal Hardener by the Burke Company; Super Rez Seal by Euclid Chemical Company; or equal.

CONCRETE DESIGN REQUIREMENTS

A. General
1. Concrete shall be composed of cement, admixtures, aggregates and water. These materials shall be of the qualities specified. The mix shall be designed to produce a concrete capable of being deposited to obtain maximum density and minimum shrinkage and where deposited in forms to have good consolidation properties and maximum smoothness of surface.
2. The Contractor is cautioned that the limiting parameters specified below are NOT a mix design. Additional cement or water reducing agent may be required to achieve workability demanded by the Contractor's construction methods.

B. Concrete shall meet the requirements in the following tabulation:

Minimum 28-Day Compressive Strength (psi)	4,000
Maximum Size Aggregate (inches)	1
Minimum Cement per cu yd. (sacks*)	6.0
Slump Range	2" to 4"
Maximum W/C Ratio (by weight)	0.45

*Note: One sack of cement equals 94 lbs.

MEASUREMENT OF CEMENT AND AGGREGATE

The amount of cement and of each separate size of aggregate entering into each batch of concrete shall be determined by direct weighing equipment acceptable to City of Richmond.

MEASUREMENT OF WATER

The quantity of water entering the mixer shall be measured by a suitable water meter or other measuring device acceptable to City of Richmond and capable of measuring the water in variable amounts within a tolerance of one percent (1%).

READY-MIXED CONCRETE

A. Ready-mixed concrete shall be delivered to the site of the work, and discharge shall be completed within one (1) hour after the addition of the cement to the aggregates or before the drum has been revolved two hundred and fifty (250) revolutions, whichever occurs first. In hot weather, or under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is eighty-five degrees Fahrenheit (85°F) or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed forty-five (45) minutes.

B. Truck mixers shall be equipped with electrically-actuated counters by which the number of revolutions of

the drum or blades may be readily verified. The counter shall be of the resettable, recording type, and shall be mounted in the driver's cab. The counters shall be actuated at the time of starting mixers at mixing speeds.

C. Each batch of concrete shall be mixed in a truck mixer for not less than seventy (70) revolutions of the drum or blades at the rate of rotation designated by the manufacturer of equipment. Additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolution of mixing.

D. Each batch of ready-mixed concrete delivered at the jobsite shall be accompanied by a certified delivery ticket furnished to City of Richmond's Inspector.

E. The use of non-agitating equipment for transporting ready-mixed concrete will not be permitted only if the pour can be made with continuous placement and within thirty (30) minutes of batching at the plant. The quality and quantity of materials used in ready-mixed concrete and in batch aggregates shall be subject to continuous inspection at the batching plant by City of Richmond.

EXECUTION

GENERAL

Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

FORMWORK REQUIREMENTS

A. Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. The Contractor shall assume full responsibility for the adequate design of all forms, and any forms that are unsafe or inadequate in any respect shall promptly be removed from the jobsite and replaced. The design and inspection of concrete forms, false work, and shoring shall comply with applicable local, state and federal regulations. All design, construction, maintenance, preparation, and removal of forms shall be in accordance with ACI 347 and the requirements specified herein.

B. All vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is called for on the plans.

C. Forms may be reused only if in good condition and acceptable to City of Richmond.

REINFORCEMENT REQUIREMENTS

A. All reinforcement steel and appurtenances shall be fabricated, and placed in accordance with Section 4-1.21 - Reinforcement Steel.

B. Reinforcement shall not be straightened or re-bent. Bars with kinks or bends not shown shall not be used. All bars shall be bent cold.

C. Reinforcement steel shall be accurately positioned as shown, and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used, in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous. All concrete blocks used to support reinforcement steel shall be tied to the steel with wire ties that are embedded in the blocks.

D. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage.

E. Reinforcement steel shall at all times be protected from conditions conducive to corrosion until concrete is

placed around it.

PROPORTIONING AND MIXING

A. Proportioning of the concrete mix shall conform to the requirements of Chapter 3 of ACI 301.

B. Mixing of concrete shall conform to the requirements of Chapter 7 of ACI 301.

C. Retempering of concrete that has partially hardened shall not be permitted.

PREPARATION OF SURFACES FOR CONCRETING

A. Earth surfaces shall be thoroughly wetted by sprinkling, prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, and debris at the time of placing concrete.

B. All water entering the space to be filled with concrete shall be cut off or diverted prior to placement of concrete. No concrete shall be deposited underwater nor shall the Contractor allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete.

HANDLING, TRANSPORTING AND PLACING

A. Placing of concrete shall conform to the applicable requirements of Chapter 8 of ACI 301 and the requirements of this Section. No aluminum materials shall be used in conveying any concrete.

B. Concrete shall be conveyed from the mixer to place of deposit by methods that prevent separation or loss of material.

C. No concrete shall be placed when the ambient temperature exceeds one hundred five degrees Fahrenheit (105°F).

CONSOLIDATION

As concrete is placed in the forms or in excavations, it shall be thoroughly settled, tamped and compacted, throughout the entire depth, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement using mechanical vibrators. Vibrators shall be high speed power vibrators (8,000 to 10,000 rpm).

FINISHING CONCRETE SURFACES

A. Finished surfaces shall be free from fins, bulges, ridges, offsets, honeycombing, or roughness of any kind, and shall present a finished, smooth, continuous hard surface, and shall be plumb, level or conform to the design alignment, profiles, and dimensions shown on the plans.

B. No treatment is required after form removal except for curing, repair of defective concrete, and treatment of surface defects.

C. Surface holes larger than two (2) inch in diameter or deeper than three (3) inch are defined as surface defects in basins and exposed walls.

CURING

A. All concrete shall be cured for no less than seven (7) days after placing, in accordance with the methods

indicated below:

Surface to be Cured	Method
Unstripped forms	1
Encasement concrete, thrust blocks, manhole bases and top blocks	2
All other concrete surfaces	3

B. Method 1: Outside of wooden forms shall be wetted immediately after concrete has been placed and shall be kept wet with water until removal. If steel forms are used the exposed concrete surfaces shall be kept continuously wet until the forms are removed. If forms are removed within seven (7) days of placing the concrete, curing shall be continued in accordance with Method 3.

C. Method 2: The surface shall be covered with moist earth for no less than four (4) hours or more than twenty-four (24) hours after the concrete is placed. Earthwork operations that may damage the concrete shall not begin until at least seven (7) days after placement of concrete. Stacking of manhole components on cast-in-place bases shall not commence until the next working business day after the base has been placed.

D. Method 3: The surface shall be sprayed with a liquid curing compound applied in accordance with the manufacturer's printed instructions. Curing compound shall be applied as soon as the concrete has hardened enough to prevent marring on unformed surfaces and within one (1) hour after removal of forms. Repairs to formed surfaces shall be made within the one (1) hour period.

TREATMENT OF SURFACE DEFECTS

All repairs shall be built up and shaped in such a manner that the completed work will conform to the requirements of this section, using approved methods which will not disturb the bond, cause sagging or cause horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.

CARE AND REPAIR OF CONCRETE

The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress or any other cause until final acceptance by City of Richmond.

Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the plans, shall be satisfactorily removed and replaced with acceptable concrete.

4-1.23 CONTROLLED LOW-STRENGTH MATERIAL (CLSM)

GENERAL

THE REQUIREMENTS

The Contractor shall furnish all materials for Controlled Low Strength Material (CLSM) in accordance with the provisions of this Section.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.25 - Grout

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM C 33	Specification for Concrete Aggregates
ASTM C 39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Specifications for Ready-mixed Concrete
ASTM C 150	Specification for Portland Cement
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete
ASTM C 494	Specification for Chemical Admixtures for Concrete
ASTM C 618	Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Filler in Portland Cement Concrete

CONTRACTOR SUBMITTALS

When the Contractor proposes to use a mix design not listed in the City of Richmond Approved Materials List, the proposed mix design including the proportions and gradations of all materials proposed shall be submitted to City of Richmond and shall receive favorable review prior to use. Mix designs shall be tested by an independent testing laboratory for properties specified in this Section, and the results shall be submitted with the proposed CLSM mix designs.

QUALITY ASSURANCE

City of Richmond Inspectors will take samples of CLSM from time to time to ensure compliance with the requirements of this Section.

PRODUCTS

MATERIALS

A. CLSM shall be a mixture of cement (one (1) sack per cubic yard minimum; two (2) sacks per cubic yard maximum), pozzolan, fly ash, coarse and fine aggregate, admixtures, and water batched by a ready mix concrete plant and delivered to the work by means of standard transit mixing trucks. The mixture shall produce a material which may be excavated by hand. The minimum twenty-eight (28) day compressive strength shall be fifty (50) psi and the maximum twenty-eight (28) day compressive strength shall be no greater than one hundred fifty (150) psi in accordance with ASTM C 39.

B. Cement shall be Type II in accordance with the requirements of ASTM C 150.

C. Pozzolan and/or fly ash may be added to improve the flowability and shall be Type F in accordance with the requirements of ASTM C 618.

D. Coarse aggregate shall consist of a well-graded mixture of crushed rock, or sand with a maximum size aggregate of three-eighth (3/8) inch. One hundred percent (100%) shall pass the one-half (1/2) inch sieve. Not more than thirty percent (30%) shall be retained by the three-eighth (3/8) inch sieve and not more than twelve percent (12%) shall pass the number two hundred (200) sieve. All material shall be free from organic matter and meet the requirements of ASTM C 33.

E. Clean potable or recycled water free from objectionable quantities of silty organic matter, alkali salts and other impurities shall be used.

ADMIXTURES

A. An air entraining admixture may be added to improve the workability and shall be in accordance with the requirements of ASTM C 260. The entrained air content shall be a minimum of eight percent (8%) and a maximum of twenty percent (20%) as required by the Contractor to meet the uses specified herein.

B. A water reducing agent may be added in accordance with the requirements of ASTM C 494 to improve workability.

EXECUTION

GENERAL

Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

PREPARING FOR PLACEMENT

The subgrade and compacted fill and/or trench to receive CLSM shall be complete and acceptable in accordance with Section 4-1.07 – Excavation, Bedding and Backfill.

MIXING AND DELIVERING

CLSM shall be batched by a ready mix batching plant acceptable to City of Richmond, and shall be delivered in standard transit mix trucks.

PLACEMENT

A. Use of CLSM in the pipe zone may cause flotation or displacement of the pipe during installation of the CLSM. The Contractor shall take necessary precautions to prevent flotation and ensure that the pipe is installed according to the alignment and grade shown on the plans.

B. CLSM shall be placed by means of tailgate discharge, conveyor belts, concrete pumps, or other means acceptable to City of Richmond.

C. A vibrator may be used to ensure that all voids, crevices, and pockets are filled with CLSM. Care shall be taken to avoid over-consolidation of the material separating the large and fine aggregate.

D. Where new CLSM must be placed against existing CLSM, the placement shall be clean of all loose and foreign material. The surface of existing CLSM shall be soaked a minimum of one (1) hour before placement of fresh CLSM. No standing water will be allowed before starting placement of fresh CLSM.

E. When placing CLSM for trench dams, the Contractor shall ensure that no voids exist around the pipe barrel and that the CLSM completely fills the trench width, including keyways, for the full depth required, as shown.

F. When using CLSM as abandonment grout, the Contractor shall contain CLSM in sewer pipelines and structures to be abandoned using bulkheads.

FINISHING CLSM

The finished surface of CLSM shall be smooth and to the grade shown on the plans or as directed by City of Richmond.

PROTECTION

CLSM shall be protected from running water, rain, freezing, or other conditions that could damage the material until cure is complete.

TRENCH BACKFILL

No equipment, traffic, or backfill shall be allowed on the CLSM until the surface of the CLSM is able to withstand a twenty (20) psi load without displacement or damage. If necessary, the Contractor shall provide steel trench

plates that span the trench, as specified in Section 4-1.07 – Excavation, Bedding and Backfill, until the CLSM has reached the required strength.

4-1.24 PRECAST CONCRETE BOXES AND VAULTS

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install precast boxes and vaults as shown on the plans, including appurtenances necessary for a complete installation.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.22 - Cast-in-Place Concrete

B. Section 4-1.25 - Grout

CONTRACTOR SUBMITTALS

The Contractor shall submit shop drawings for all precast concrete items not included in the City of Richmond Approved Materials List. Submitted drawings shall show all dimensions, location and type of embedded items, lifting inserts, and details of reinforcement and joints.

QUALITY ASSURANCE

A. Tests on component materials and for compressive strength of concrete will be performed as specified herein.

B. Test methods and criteria for evaluation and acceptance of concrete shall be as specified in Section 4-1.22 – Cast-In-Place Concrete.

PRODUCTS

MANUFACTURED ITEMS

A. Precast boxes and vaults shall be as listed in the City of Richmond Approved Materials List, or approved equals.

B. Concrete used for manufactured vaults shall have a minimum twenty-eight (28) day compressive strength of three thousand (3,000) psi.

C. Boxes or vaults to be installed in areas subject to vehicular traffic shall be designed for HS-20 loads.

PREFORMED JOINT SEALANT

Preformed joint sealant shall be as listed in the City of Richmond Approved Materials List, or approved equal.

NON-SHRINK GROUT

Non-shrink grout shall be as specified in Section 4-1.25 - Grout.

EXECUTION

GENERAL

Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

INSTALLATION

A. All precast items shall be installed in accordance with the manufacturer's recommendations. All joints shall be sealed by the use of preformed sealant so as to be watertight. All precast boxes and vaults shall be set on a minimum foundation of six (6) inches of Type I Bedding Material compacted to ninety-five percent (95%) relative compaction.

B. Connections to precast boxes and vaults shall be made by one of the following:
   1. Casting sections of pipe into the item.
   2. Core drilling or casting pipe chases into the items. Where core drilled holes or cast-in pipe chases are used; the annular space between the core-drilled hole or chase and the connecting pipe shall be filled with non-shrink grout or sealed using an approved resilient connector, skirt or reducing coupling, unless otherwise specified on the plans. All such connections shall be watertight.

4-1.25 GROUT

GENERAL

THE REQUIREMENT

A. The Contractor shall furnish grout and shall form, mix, place, cure, repair, finish and do all other work as required to produce finished grout in accordance with the provisions of this Section.

B. The following types of grout are covered in this Section:
   1. Non-Shrink Grout: shall be used wherever grout is shown on the plans or required by these Specifications, unless another type is specifically referenced.
   2. Epoxy Grout
   3. Grout for Topping and Concrete Fill
   4. Abandonment Grout

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.22 - Cast-in-Place Concrete

B. Section 4-1.23 - Controlled Low-Strength Material (CLSM)

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in or 50-mm Cube Specimens)

ASTM C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM C 827 Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures

ASTM C1107 Standard Specification for Packaged dry, Hydraulic Cement Grout (Non-shrink)

CONTRACTOR SUBMITTALS

City of Richmond may require that the Contractor submit certified test results verifying that grout meets the compressive strength, shrinkage, and expansion requirements specified herein; and manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of grout used in the work.

QUALITY ASSURANCE

A. Field Tests:

Compression test specimens may be taken by the Inspector at any time during construction to ensure continued compliance with these Specifications. The specimens will be made by the Inspector.

1. Compression tests and fabrication of specimens for non-shrink grout will be performed as specified in ASTM C 109.
2. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B.

PRODUCTS

CEMENT GROUT

A. Cement grout shall be composed of one (1) part cement, three (3) parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white Portland cement shall be blended with regular cement as needed. The minimum required compressive strength at twenty-eight (28) days shall be four thousand (4,000) psi.

B. Component materials for cement grout materials shall be as specified in Section 4-1.22 – Cast-in-Place Concrete.

PREPACKAGED GROUTS

A. Non-Shrink Grout:

1. Non-shrink grout shall be inorganic, non-gas liberating, nonmetallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout shall be as recommended by the manufacturer for the particular application.
2. Non-shrink grouts shall have a minimum twenty eight (28) day compressive strength of five thousand (5,000) psi; shall have no shrinkage (0.0%) and a maximum of four percent (4%) expansion in the plastic state when tested in accordance with ASTM C 827; and shall have no shrinkage (0.0%) and a maximum of point two percent (0.2%) expansion in the hardened state when tested in accordance with ASTM C1107.
3. Non-shrink grout shall be used for the repair of all holes and defects in concrete members which are water bearing or in contact with soil or other fill material, grouting under all equipment base plates, and at all locations where grout is specified in the plans; except for those applications where epoxy grout, grout for topping and concrete fill, and abandonment grout is specified herein.

B. Epoxy Grout:

1. Epoxy grout shall be a pourable, non-shrink, one hundred percent (100%) solids system. The epoxy grout system shall have three (3) components: resin, hardener, and specially blended aggregate, all pre-measured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.
2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.

3. The mixed epoxy grout system shall have a minimum working life of forty- five (45) minutes at seventy-five degrees Fahrenheit (75°F).
4. The epoxy grout shall develop a compressive strength of five thousand (5,000) psi in twenty four (24) hours and ten thousand (10,000) psi in seven (7) days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (0.0%) and a maximum four percent (4%) expansion when tested in accordance with ASTM C 827.

GROUT FOR TOPPING AND CONCRETE FILL

A. Grout for topping of slabs and building up surfaces of tank, channel and basin bottoms shall be composed of cement, fine aggregate, coarse aggregate, water, and admixtures proportioned and mixed as specified herein. All component materials and procedures specified for concrete in Section 4-1.22 - Cast-in¬Place Concrete, shall apply except as noted otherwise herein.

B. Topping grout and concrete fill shall contain a minimum of six (6) sacks (564 pounds) of cement per cubic yard with a maximum water-cement ratio of 0.45.

C. Coarse aggregate shall be graded as follows:

U.S. Standard Sieve Size	Percent by Weight Passing
1/2"	100
3/8"	90-100
No. 4	20-55
No. 8	5-30
No. 16	0-10
No. 30	0

D. Final mix design shall be as determined by trial mix design under supervision of an approved testing laboratory.

E. Strength: Minimum compressive strength of topping grout and concrete fill at the end of twenty-eight (28) days shall be three thousand (3,000) psi.

ABANDONMENT GROUT

Refer to Section 4-1.23 - Controlled Low-Strength Material (CLSM) for abandonment grout requirements.

CURING MATERIALS

Curing materials shall be as specified in Section 4-1.22 - Cast-in-Place Concrete for cement grout and as recommended by the manufacturer of prepackaged grouts.

CONSISTENCY

A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency shall be such that the grout is plastic and moldable but will not flow. Where dry pack is called for on the plans, it shall mean a grout of that consistency; the type of grout to be used shall be as specified herein for the particular application.

B. The slump of grout for topping and concrete fill shall be adjusted to match placement and finishing conditions but shall not exceed four (4) inches.

MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

EXECUTION

GENERAL

A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 4-1.22 - Cast-in-Place Concrete. The finish of the grout surface shall match that of the adjacent concrete.

B. Base concrete shall have attained its design strength before grout is placed, unless otherwise authorized by City of Richmond.

C. Grout at the consistency necessary for the particular application shall be placed in such a manner so as to completely fill the space to be grouted.

D. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

GROUTING PROCEDURES

A. Prepackaged Grouts: All mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

B. Grout for topping or concrete fill:
   1. All finish work shall be completed prior to placement of topping or concrete fill. The base slab shall be given a roughened textured surface by sandblasting or hydroblasting, exposing the aggregates, to ensure bonding to the base slab.
   2. The minimum thickness of grout topping and concrete fill shall be one (1) inch. Where the finished surface of concrete fill is to form an intersecting angle of less than forty-five degrees (45°) with the concrete surface it is to be placed against, a key shall be formed in the concrete surface at the intersection point. The key shall be a minimum of three (3) inches wide by one (1) inch deep.
   3. The base slab shall be thoroughly cleaned and wetted prior to placing topping and fill. No topping concrete shall be placed until the slab is free from standing pools or ponds of water. A thin coat of Type II cement shall be broomed into the surface of the slab just before topping of fill placement. The topping and fill shall be compacted by rolling or tamping, brought to established grade, and floated.
   4. Topping grout placed on sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement.
   5. The surface shall be tested with a straight edge to detect high and low spots which shall be immediately eliminated. When the topping and fill has hardened sufficiently, it shall be steel troweled to a smooth surface free from pinholes and other imperfections. An approved type of mechanical trowel may be used as an assist in this operation, but the last pass over the surface shall be by hand-troweling. During finishing, no water, dry cement or mixture of dry cement and sand shall be applied to the surface.

C. Abandonment Grout
   1. Placing of Material
      a) Batching, mixing, and placing may be started if the weather conditions are favorable and when the air temperature is thirty four degrees Fahrenheit (34°F) and rising. At the time of placement, the abandonment grout must have a temperature of at least forty degrees Fahrenheit (40°F). Mixing and placing shall stop when the air temperature is thirty eight degrees Fahrenheit (38°F) or less and falling.
      b) The Contractor shall contain abandonment grout in sewer pipelines and structures to be abandoned using bulkheads.

4-1.26 MISCELLANEOUS METAL WORK

GENERAL

THE REQUIREMENT

The Contractor shall provide miscellaneous metalwork and appurtenances, complete, in accordance with the plans and these Specifications.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.27 - Protective Coating and Painting

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM A 36	Carbon Structural Steel
ASTM A 48	Specification for Gray Iron Castings
ASTM A 123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 307	Carbon Steel Bolts and Studs, 60,000 psi Tensile
ANSI/AWS D1.1	Structural Welding Code – Steel
AWS	American Welding Society Standards

PRODUCTS

GENERAL

A. Standard: Structural steel shapes, plates, bars (excluding reinforcement steel covered in Section 4-1.22 - Cast-In-Place Concrete) shall conform to the requirements of ASTM A 36.

B. Corrosion Protection: Fabricated steel shall be coated in accordance with Section 4-1.27 - Protective Coating and Painting or shall be hot dip galvanized as indicated on the plans.

C. Stainless Steel: Unless otherwise indicated, stainless steel metalwork and bolts shall be of Type 316 stainless steel and shall not be galvanized.

BOLTS AND ANCHORS

A. Standard Service Bolts (Not Buried or Submerged): Bolts, anchor bolts and cap screws shall be in accordance with the requirements of ASTM A 307 Grade A or B, or threaded parts of ASTM A 36.

B. Length of Bolts: The length of all bolts shall be such that after joints are made up, each bolt shall extend through the entire nut, but in no case more than one-half (1/2) inch beyond the nut.

C. Adhesive Anchors: Unless otherwise indicated, all drilled, concrete or masonry anchors shall be adhesive anchors. No substitutions will be considered unless accompanied with ICBO report verifying strength and material equivalency.
   1. Epoxy adhesive anchors are required for drilled anchors where exposed to weather, in submerged, wet, splash, overhead and corrosive conditions, and for anchoring handrails, pumps, mechanical equipment and reinforcing bars. Epoxy systems shall be per the Approved Materials List. Threaded rods shall be Type 316 stainless steel. Holes are to be clean and dry prior to the application of epoxy.
   2. Unless otherwise shown, glass capsule, polyester resin adhesive anchors will be permitted in locations not specified above and shall be per the Approved Materials List. Threaded rod shall be galvanized steel.

D. Expanding-Type Anchors: Expanding-type anchors if indicated or permitted shall be steel expansion type

per the Approved Materials List. Lead caulking anchors will not be permitted. Size shall be as shown. Non-embedded buried or submerged anchors shall be Type 316 stainless steel.

E. Lubricant: Non-seize lubricant shall be applied to the threads of all stainless steel bolts prior to installation.

CASTINGS

A. Steel castings shall contain no less than point six percent (0.6%) of manganese and not less than point two percent (0.2%) of silicon.

B. All castings shall be sound and free from shrinkage crack, blow holes and other defects. All fins and burnt sand shall be removed. Excessive porosity and spongy surfaces will constitute causes for rejection. City of Richmond shall be final judge as to whether the defects present are sufficient to cause rejection.

C. No welding or patching of defects in castings will be permitted unless authorized by the Inspector. Any such welding or patching done without the Inspector's consent shall be cause for rejection.

D. All castings shall be true to the form and dimensions shown on the Standard Drawings. After inspection and prior to shipping, all machined surfaces shall be coated with a blue rust inhibitive lacquer, or other material which can be easily removed, unless otherwise specified.

E. Castings shall not be more than seven and one-half percent (7-1/2%) overweight.

CAST IRON FRAME AND COVERS

A. Castings for manhole frames and covers shall be non-rocking and shall conform to the requirements of ASTM A 48, Class 30. Cast iron covers and frames shall be heavy traffic type with a minimum weight and diameter as shown in the Drawings. Frame and cover shall be designed for H-20 traffic loading. Each item in a set of frames and covers shall be supplied by the same Manufacturer. The manhole covers shall have sealed pick holes.

B. Refer to SS-3 & SS-4 of the Standard Drawings for manhole cover requirements. Covers for public sewer manholes shall be marked "City of Richmond." Covers for manholes in private site collector systems shall be marked "Sanitary Sewer."

C. The cover and its seat in the frame shall be machined so that the cover will sit evenly and firmly in the frame. Cast iron frames and covers shall be dipped or painted with asphalt.

FILLETS

A. Steel, gray iron, malleable iron and bronze castings shall be provided with continuous fillets in all inside angles. The radius of curvature of the exposed surface of a fillet shall define the size of the fillet.

B. The size of fillets shall not be less than one-half (1/2) of the thickness of the thinnest adjoined member nor less than one-half (1/2) inch.

MATCH MARKING

Connecting parts assembled in the shop for the purpose of alignment in the field shall be match marked.

EXECUTION

GENERAL

Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

FABRICATION AND INSTALLATION REQUIREMENTS

Except as otherwise indicated, the fabrication and erection of structural steel shall conform to the requirements of the American Institute of Steel Construction "Manual of Steel Construction," current edition.

WELDING

A. All welding shall be by the metal-arc method or gas-shielded arc method as described in the American Welding Society's (AWS) "Welding Handbook" as supplemented by other pertinent standards of the AWS. Qualification of welders shall be in accordance with the AWS Standards.

B. In assembly and during welding, the component parts shall be adequately clamped, supported and restrained to minimize distortion and for control of dimensions. Welded reinforcement shall be as indicated by the AWS Standards. Upon completion of welding, all weld splatter, flux, slag and burrs left by attachments shall be removed. Welds shall be repaired to produce a workmanlike appearance, with uniform weld contours and dimensions. All sharp corners of material which are to be painted or coated shall be ground to a minimum one-thirty second (1/32) inch chamfer.

C. Welding electrodes shall be uniformly and heavily coated (not washed) and shall be of such nature that the coating will not chip or peel while being used with the maximum amperage specified by the manufacturer.

GALVANIZING

All structural steel plates' shapes, bars and fabricated assemblies to be galvanized shall be thoroughly cleaned of rust and scale, and galvanized in accordance with the requirements of ASTM A 123. Bolts, anchor bolts, nuts and similar threaded fasteners, after being properly cleaned, shall be galvanized in accordance with the requirements of ASTM A 153. Field repairs to galvanizing shall be made using approved coating according to the Approved Materials List.

DRILLED ANCHORS

Drilled anchors and reinforcing bars shall be installed in strict accordance with the manufacturer's instructions. Holes shall be roughened with a brush on a power drill, cleaned and dried. Expanding anchors if permitted shall not be installed until the concrete has reached the required twenty-eight (28) day compressive strength. Adhesive anchors shall not be loaded until the adhesive has reached its indicated strength in accordance with the manufacturer's instructions.

CUTTING WITH TORCH

A. The use of a cutting torch is permissible if the metal being cut is not carrying stress during the operation.

B. When cutting with a torch, cuts shall be true to line with a maximum deviation of one-eighth (1/8) inch. All burned edges shall be finished by grinding or chipping.

C. The use of the cutting torch will be permitted on ends that form compression connections providing a minimum of one-quarter (1/4) inch of metal is left to be removed by machining.

4-1.27 PROTECTIVE COATING AND PAINTING

GENERAL

THE REQUIREMENT

A. The Contractor shall apply protective coatings, complete and in place, where indicated on the plans, or as directed by the Inspector, in accordance with the requirements of this Section.

B. The Contractor or its subcontractor who applies the protective coatings shall possess a valid license from the California Contractor's State License Board as required for performance of the painting and coating

work.

CONTRACTOR SUBMITTALS

The Contractor shall submit the following information at least thirty (30) days prior to commencement of protective coating work:

A. Coating Materials List: Showing the manufacturer and the name of the product. The list shall be submitted prior to or at the time of submittal of samples.

B. Paint Manufacturer's Information: For each coating system product to be used, the following data:
   1. Paint manufacturer's data sheet, including statements on the suitability of the material for the intended use.
   2. Technical and performance information that demonstrates compliance with the system performance and material requirements.
   3. Paint manufacturer's instructions and recommendations on surface preparation and application.
   4. Colors available for each product (where applicable). Color charts that identify each color the Contractor is proposing shall be submitted. City of Richmond will select the color to be used during the submittal process.
   5. Compatibility of shop and field applied coatings (where applicable).
   6. Material Safety Data Sheet for each product to be used.

C. Samples of all paint, finishes, and other coating materials shall be submitted on eight and one-half (8-1/2) inch by eleven (11) inch sheet metal. Each sheet shall be completely coated over its entire surface with one protective coating material, type, and color.

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

The following referenced surface preparation Specifications of the Steel Structures Painting Council shall form a part of this specification:

SSPC SP1 Solvent Cleaning: Removal of oil, grease, soil, salts, and other soluble contaminants by cleaning with solvent, vapor, alkali, emulsion or steam.

SSPC SP2 Hand Tool Cleaning: Removal of loose rust, loose mill scale, loose paint and other loose detrimental foreign matter, by hand chipping, scraping, sanding and wire brushing.

SSPC SP3 Power Tool Cleaning: Removal of loose rust, loose mill scale, loose paint and other loose detrimental foreign matter, by power tool chipping, descaling, sanding, wire brushing and grinding.

SSPC SP5 White Metal Blast Cleaning: Removal of all visible rust, oil, grease, soil, dust, mill scale, paint, oxides, corrosion products and foreign matter by blast cleaning.

SSPC SP6 Commercial Blast Cleaning: Removal of all visible oil, grease, soil, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except that staining shall be limited to no more than thirty-three percent (33%) of each square inch of surface area.

SSPC SP7 Brush-Off Blast Cleaning: Removal of all visible oil, grease, soil, dust, loose mill scale, loose rust and loose paint.

SSPC SP10 Near-White Blast Cleaning: Removal of all visible oil, grease, soil, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter, except that staining shall be limited to no more than five percent (5%) of each square inch of surface area.

SSPC-SP13 Surface Preparation of Concrete, Abrasive Blast Cleaning Method: Removal of all visible oil, grease, soil, dust, mill scale, paint, oxides, corrosion products and foreign matter by blast cleaning.

QUALITY ASSURANCE

A. The Contractor shall prepare surfaces and apply coatings in strict accordance with the requirements and

intent of the Specifications. All materials furnished and all work accomplished shall be subject to inspection by City of Richmond. The Contractor shall provide access and allow for adequate time to perform all inspections.

B. Quality assurance procedures and practices shall be used to monitor all phases of surface preparation, application and inspection throughout the duration of the project. Procedures or practices not specifically defined herein may be used provided they meet recognized and acceptable professional standards and are approved by City of Richmond.

PRODUCTS

GENERAL

A. The Contractor shall use suitable coating materials as recommended by the manufacturer. Materials shall comply with Volatile Organic Compound (VOC) limits applicable at the site.

B. Coating materials shall be sealed in containers clearly labeled to indicate the designated name, formula or specification number, batch number, color, date of manufacture and name of manufacturer, all of which shall be plainly legible at the time of use.

COATING SYSTEMS FOR EXPOSED STEEL PIPE

A. Zinc/Epoxy/Polyurethane System: The zinc primer shall be an aromatic urethane that contains at least eighty-three percent (83%) of metallic zinc by weight in the dried film, and is recommended by the coating manufacturer as a primer for this system. The intermediate coat shall be a high-build two-component epoxy with a solids content of at least sixty-nine percent (69%) by volume. Finish coats shall be a two-component aliphatic acrylic or polyester polyurethane coating material that provides superior color and gloss retention, resistance to chemical fumes and severe weathering. Finish coat shall have a minimum solids content of seventy- three percent (73%) by volume.
   1. Prime coat (minimum dry film thickness = 3 mils): Tnemec Series 90-97 Tneme-Zinc, Amercoat 68HS, Carbozinc 859, or equal.

   3. Intermediate coat (minimum dry film thickness = 4 mils): Tnemec Series N69 Polyamidoamine Epoxy, Amerlock 400, Carboguard 890 or equal.
   4. Finish coats (one or more, minimum dry film thickness = 3 mils): Tnemec Series 1075 Endurashield, Ameron Amershield, Carbothane 134 HG or equal.
   5. Total system minimum dry film thickness = 10 mils.
   6. Intermediate coat shall be applied in excess of four (4) mils minimum dry film thickness or in more than one (1) coat as necessary to completely cover the organic zinc primer and prevent application bubbling of the polyurethane finish coat.
   7. More than one finish coat shall be applied as necessary to produce a finish with uniform color and texture. If the organic zinc primer is used as a pre-construction or shop applied primer, all damaged and uncoated areas shall be spot abrasive blasted and coated after construction using the indicated material.

EXECUTION

GENERAL

Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

STORAGE, MIXING AND THINNING OF MATERIALS

A. Manufacturer's Recommendations: Unless otherwise indicated, the coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protecting its coating materials, for preparation of surfaces for coating and for all other procedures relative to coating shall be

strictly observed.

B. All protective coating materials shall be used within the manufacturer's recommended shelf life.

C. Storage and Mixing: Coating materials shall be stored under the conditions recommended by the Material Safety Data Sheets, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Coatings of different manufacturers shall not be mixed together. It is required for the MSDS to be on the application site during use.

METAL SURFACE PREPARATION (UNGALVANIZED)

A. The minimum abrasive blasting surface preparation shall be as indicated in the coating manufacturer's printed recommendations for the intended service.

B. Workmanship for metal surface preparation shall be in conformance with the current SSPC Standards and this Section. Blast cleaned surfaces shall match the standard samples available from the National Association of Corrosion Engineers (NACE), NACE Standard TM-01-70 - Visual Standard for Surfaces of New Steel Airblast Cleaned with Sand Abrasive and TM-01-75 - Visual Standard for Surfaces of New Steel Centrifugally Blast Cleaned with Steel Grit.

C. All oil, grease, welding fluxes, and other surface contaminants shall be removed by solvent cleaning per SSPC SP1 - Solvent Cleaning prior to blast cleaning.

D. All sharp edges shall be rounded or chamfered and all burrs, surface defects and weld splatter shall be ground smooth prior to blast cleaning.

E. The type and size of abrasive shall be selected to produce a surface profile that meets the coating manufacturer's recommendation for the particular coating and service conditions. Abrasives for submerged and severe service coating systems shall be clean, hard, sharp cutting crushed slag. Automated blasting systems shall not be used for surfaces that will be in submerged service. Metal shot or grit shall not be used for surfaces that will be in submerged service, even if subsequent abrasive blasting is planned to be one with hard, sharp cutting crushed slag.

F. The abrasive shall not be reused unless an automated blasting system is used for surfaces that will be in non-submerged service. For automated blasting systems, clean oil-free abrasives shall be maintained. The abrasive mix shall include at least fifty percent (50%) grit.

G. The Contractor shall comply with the applicable federal, state and local air pollution control regulations for blast cleaning.

H. Compressed air for air blast cleaning shall be supplied at adequate pressure from well-maintained compressors equipped with oil and moisture separators that remove at least ninety-five percent (95%) of the contaminants.

I. Surfaces shall be cleaned of all dust and residual particles of the cleaning operation by dry air blast cleaning, vacuuming, or another approved method prior to painting.

J. Enclosed areas and other areas where dust settling is a problem shall be vacuum cleaned and wiped with a tack cloth.

K. Damaged or defective coating shall be removed by the blast cleaning to meet the clean surface requirements before recoating.

L. If the required abrasive blast cleaning will damage adjacent work, the area to be cleaned is less than one hundred (100) square feet, and the coated surface will not be submerged in service, then SSPC SP2 or SSPC SP3 is to be used.

M. Shop applied coatings of unknown composition shall be completely removed before the indicated coatings are applied. Valves, castings, ductile or cast iron pipe, and fabricated pipe or equipment shall be examined for the presence of shop-applied temporary coatings. Temporary coatings shall be completely removed by solvent cleaning per SSPC SP1 before the abrasive blast cleaning work has been started.

N. Shop primed equipment shall be solvent cleaned in the field before finish coats are applied.

SURFACE PREPARATION FOR GALVANIZED FERROUS METAL

A. Unless noted otherwise, galvanized ferrous metal shall be alkaline cleaned per SSPC SP1 to remove oil, grease, and other contaminants detrimental to adhesion of the protective coating system to be used, followed by brush off blast cleaning per SSPC SP7.

B. Pretreatment coatings of surfaces shall be in accordance with the printed recommendations of the coating manufacturer.

SURFACE PREPARATION OF FERROUS SURFACES WITH EXISTING COATINGS

A. General: All grease, oil, heavy chalk, dirt, or other contaminants shall be removed by solvent or detergent cleaning prior to abrasive blast cleaning. The generic type of the existing coatings shall be determined by laboratory testing.

B. The Contractor shall provide the degree of cleaning indicated in the coating system schedule for the entire surface to be coated. If the degree of cleaning is not indicated in the schedule, deteriorated coatings shall be removed by abrasive blast cleaning to SSPC SP6. Areas of tightly adhering coatings shall be cleaned to SSPC SP7, with the remaining thickness of existing coating not to exceed three (3) mils.

C. If coatings to be applied are not compatible with existing coatings, the Contractor shall apply intermediate coatings per the paint manufacturer's recommendation for the indicated coating system or shall completely remove the existing coating prior to abrasive blast cleaning. A small trial application shall be conducted for compatibility prior to painting large areas.

D. Coatings of unknown composition shall be completely removed prior to application of new coatings.

E. Where indicated or where site conditions do not permit dry abrasive blasting due to dust or air pollution considerations, water abrasive blasting or wet abrasive blasting may be used. In both methods, paint-compatible corrosion inhibitors shall be used, and coating application shall begin as soon as the surfaces are dry. Water abrasive blasting shall be done using high pressure water with sand injection. In both methods, the equipment used shall be commercially produced equipment with a successful service record. Wet blasting methods shall not be used for submerged and severe service coating systems unless indicated.

PREPARATION FOR COATING

A. All surfaces to receive protective coatings shall be cleaned as indicated prior to application of coatings. The Contractor shall examine all surfaces to be coated, and shall correct all surface defects before application of any coating material. All marred or abraded spots on shop-primed and on factory-finished surfaces shall receive touch-up restoration prior to any coating application. Surfaces to be coated shall be dry and free of visible dust.

B. Surfaces that are not to receive protective coatings shall be protected during surface preparation, cleaning, and coating operations.

C. All hardware, lighting fixtures, switch plates, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not to be painted shall be removed, masked or otherwise protected. Drop cloths shall be provided to prevent coating materials from falling on or marring adjacent surfaces. The working parts of all mechanical and electrical equipment shall be protected from damage during surface

preparation and coating operations. Openings in motors shall be masked to prevent entry of coating or other materials.

D. Care shall be exercised not to damage adjacent work during blast cleaning operations. Spray painting shall be conducted under carefully controlled conditions. The Contractor shall be fully responsible for and shall promptly repair any and all damage to adjacent work or adjoining property occurring from blast cleaning or coating operations.

E. Cleaning and coating shall be coordinated so that dust and other contaminants from the cleaning process will not fall on wet, newly coated surfaces.

APPLICATION OF COATING

A. Coating shall be done in a workmanlike manner so as to produce an even film of uniform thickness. Edges, corners, crevices, and joints shall receive special attention to insure thorough cleaning and adequate thickness of coating material. The finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks, and variations in color, texture, and finish. The finish coat application shall be so complete that the addition of another coat would not substantially change the color or texture of the finished work.

B. All damage to surfaces resulting from the work shall be cleaned, repaired, and refinished to its original condition.

4-1.28 INDIVIDUAL LOT PUMPING SYSTEMS

GENERAL

THE REQUIREMENT

A. Design and construction of private individual lot pumping systems shall be in conformance with applicable Cal/OSHA regulations, electrical, plumbing, and building codes, and the requirements of this Section.

B. Pumping systems for single residential units may be either simplex (single pump) or duplex (two pumps). Systems to serve multiple residential units or nonresidential uses service shall be duplex systems (two pumps).

C. Flow Rates: Pumping systems shall produce a velocity in the pressure sewer (force main) of three (3) to five (5) feet per second when pumping against the non-surcharged head at sump Low Water Level (LWL).

1. Connection to House Plumbing

   Systems connected to the house plumbing shall employ grinder pumps that discharge at a maximum flow rate of thirty (30) gallons per minute (gpm).

2. Connection to Side Sewer Systems connected to side sewers shall discharge at a maximum flow rate of fifty (50) gpm.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.29 – Multiple-User Low Pressure Sewer Systems

C. Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe

D. Section 4-1.35 - High-Density Polyethylene (HDPE) Pipe

CONTRACTOR SUBMITTALS

A. The Contractor shall submit a complete Individual Lot Pumping System Application including manufacturer's Specifications for pumps, electrical controllers, sumps, and alarms to City of Richmond and receive favorable review prior to purchasing any pumping system components, or commencing construction work.

B. The Contractor shall submit a copy of the electrical permit signed off as approved by the local building code enforcement agency to the Inspector prior to startup testing of the pumping system.

QUALITY ASSURANCE

A. Leakage Test: After closing the isolation valve at the pump station, the pump discharge pressure sewer shall be filled with water and pressurized with compressed air to the required test pressure cited on the approved City of Richmond pump curve data sheet at its point of connection to the gravity sewer system (air-over-water). The pressure shall be allowed to stabilize for a period of five (5) minutes immediately preceding a ten (10) minute test period. To pass the test, there shall be no pressure drop during the test period.

B. Electrical Permit and Inspection: The Property Owner or the Contractor shall obtain an electrical construction permit for the electrical control and alarm work from the local building code enforcement agency, and shall show evidence of favorable inspection of the system prior to functional testing of the pumping system.

C. Functional Test: When the pumping system installation is complete and favorable inspection of the electrical work has been obtained, the Contractor shall call for functional testing of the system. The Contractor shall arrange for a supply of water for use in the functional testing. The Inspector will witness the Contractor's operation of the system during the functional test, which shall include running through more than one (1) normal automatic pumping cycle; hand (manual) switching of pumps; alternation of pumps in duplex systems; activation, silencing and resetting of alarms (visual and audible); and activation of all other switches and system features.

PRODUCTS

GENERAL

All equipment and accessories shall be standard manufactured items and shall be specifically manufactured for sewage use by a company regularly engaged in the manufacture and assembly of pumping system components.

PUMPS

A. Pump systems not listed as "pre-approved" in the Approved Materials List are subject to review by City of Richmond. Such pumps shall be approved for residential sewage service by a Nationally Recognized Testing Entity (NRTE) such as Underwriters Laboratories (UL Listed) and/or CSA, and shall carry a certification label for this use, and shall be one of the types described below:

1. Submersible, centrifugal, non-clog pumps: Impeller shall be a non-clog type and shall be capable of passing a two (2) inch sphere. The pump discharge shall be at least two (2) inches in diameter.
2. Submersible, centrifugal or positive displacement grinder pumps: The grinder pump shall be constructed of long-lasting, low maintenance material that is capable of reducing all components in normal domestic sewage (including "foreign objects", such as paper, wood, plastic, glass, rubber, etc.) to finely divided particles which will pass freely through the passages of the pump, force main, and fittings. The pump discharge shall match the manufacturer's recommended discharge size, but shall be at least one and one-quarter (1-1/4) inches in diameter.

B. For duplex systems (two pumps), an alternator shall be provided to automatically alternate between the pumps on each operating cycle so that each pump is assured of near-equal operating time. For duplex systems, the High Water Alarm (HWA) shall be activated in the event that the lead (first) pump is unable

to maintain proper level and the lag (second) pump is called to run.

PUMP SUMPS

A. The pump sump shall include integral anti-flotation flanges, and shall be fabricated from one of the following materials:
   1. Asphalt-coated steel (minimum three-sixteenth (3/16) inch plate), with interior and exterior surfaces protected with a minimum of 0.10-inch thick corrosion barrier acceptable to City of Richmond.
   3. Filament wound fiberglass, minimum one-quarter (1/4) inch wall thickness with tank interior surface protected with a minimum of 0.10-inch thick, resin-rich corrosion barrier.
   4. Reinforced concrete pipe or manhole barrel sections with a corrosion barrier of PVC "T-lock" or other material or coating acceptable to City of Richmond.
   5. High density polyethylene (HDPE).
   6. A City of Richmond-approved alternative.

B. The sump shall have a four (4) inch minimum inlet and an outlet at least the size of the pump discharge. The invert of the inlet shall be at least six (6) inches above the High Water Alarm (HWA) set-point elevation.

C. The pump sump cover shall be epoxy coated steel plate (one-half (1/2) inch minimum thickness), heavy cast iron or the pump system manufacturer's standard molded plastic, and shall be designed to support reasonably anticipated dead and live loads, including impact (HS-20 required for traffic areas).

MOTORS

A. Motors for column-type pumps shall be a drip-proof vertical type, totally enclosed, weather protected, and shall conform to the standards of NEMA.

B. Only explosion proof pump and motor assemblies approved by an NRTE and listed as explosion proof for Class 1, Division 1, Groups C and D locations shall be used in non-residential applications.

C. Pumps constructed with separate thermal overload protection and moisture sensing seal failure probes shall have these devices connected to sensors and to an alarm in the control panel according to the manufacturers' recommendations.

MOTOR LEVEL CONTROLS AND PANELS

A. The pump's level controls shall employ either: 1) a ball and rod mechanical float switch mounted above the cover; 2) a weighted mechanical-type float switch sealed within a polypropylene shell with a neoprene-covered cable; or a City of Richmond approved alternate.

B. Each pump level control switch shall be wired directly and independently to terminals in the control panel.

C. Each pump and the level control/alarm system shall be on separate electrical circuit breakers.

D. The following level control switches shall be provided:
   1. A "High Water Alarm (HWA)" switch set to alarm a minimum of six (6) inches below the invert elevation of the gravity inlet sewer and to start the "lag" pump in a duplex system.
   2. A "Pump On" (High Water Level (HWL)) switch set to start the single pump in a simplex system or the "lead" pump in a duplex system at a reasonable elevation below the HWA.
   3. A "Pump Off" (Low Water Level (LWL)) switch set to turn off the pump(s) at a reasonable elevation above the LWA. The distance between the HWL and LWL shall be great enough to allow the pump to run for at least thirty (30) seconds during each pump cycle.
   4. An optional "Low Water Alarm" (LWA) switch set to alarm at an elevation above the pump suction inlet and wired to a redundant pump shut off.

INTRINSICALLY SAFE CIRCUITS

Level control and alarm system circuit wiring connected to level switches in the tank shall be listed as intrinsically safe by an NRTE. The circuits shall reduce the power to the pilot devices and alarms to a value incapable of releasing sufficient thermal or electrical energy to ignite an explosive environment. Separate conduits for the control and motor power wiring shall be run between the sump and the control panel. Both conduits shall be provided with seals to prevent sewer gases from migrating to the control panel.

EXECUTION

GENERAL

A. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

B. Installation of pumping system components shall conform to the manufacturer recommendations.

C. A standard clean out with an Overflow Protection Device shall be installed between the served building and the sump inlet.

PUMP SUMP

A. Ballast consisting of material specified in Section 4-1.22-Cast In-Place Concrete, or Section 4-1.23 - Controlled Low-Strength Material (CLSM), and weighing at least one and one-half (1-1/2) times the calculated buoyant force on the sump assuming the groundwater surface is one (1) foot below finish grade shall be provided. The required minimum volume of ballast material will be cited on the approved City of Richmond pump curve data sheet.

B. The top of the cover shall be at least three (3) inches above the surrounding ground surface in non-traffic areas. The sump cover shall be securely attached to the pump sump with stainless steel bolts, and all joints between the component parts and openings shall be sealed with gas tight gaskets.

C. The sump shall be vented to atmosphere, either: 1) to the building drain-waste-roof vent; or 2) through an integral vent in the cover.

CONTROL PANEL, ALARM SYSTEM AND ELECTRICAL WORK

A. The Control Panel shall be mounted outside the pump sump on a post or building wall, or inside the served building. The panel shall have a NEMA 1 classification when mounted inside a building or a minimum NEMA 3R classification when mounted outside the building.

B. The Alarm Panel, or a remote alarm indicator, shall be mounted within the building that is served by the pump and shall provide a visible pilot light and audible alarm with silencer to alert the building occupants to alarm events. The alarm system shall be on a separate electrical circuit from pump motor power. When activated by a high water or low water condition, the alarm system shall remain latched until manually acknowledged and cleared.

C. Electrical work shall conform to the technical and permitting requirements of the local building code enforcement agency.

DISCHARGE LINE

A. The pressure portion of the discharge line, including the isolation valve, check valve and mechanical couplings shall be the same size as the pump discharge line. The valves and discharge line connecting the isolation valve, check valve, cleanout and mechanical couplings inside the sump shall be DWV brass, copper or galvanized steel pipe (Schedule 40), or a City of Richmond approved alternate material. The isolation valve shall be operable from grade and shall be placed in a utility box if outside the sump.

B. The portion of the pressure discharge line between the sump and its connection to the private gravity side sewer shall be PVC conforming to the requirements of Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe; or High Density Polyethylene (SDR 11) conforming to the requirements of Section 4-1.35 - High Density Polyethylene (HDPE) Pipe; and shall meet depth and bedding requirements for side sewers as specified in Section 4-1.07 - Excavation, Bedding and Backfill. All bends shall be special extra-long radius (Rmin = 9 inches).

C. A standard tee or wye branch with cleanout shall be placed where the discharge line connects to the private gravity side sewer.

D. Installation of a high water passive overflow pipe is optional. If installed, the pipe shall extend to a sanitary sewer main. A Clean Check valve as listed in the Approved Materials List shall be installed in the passive overflow line.

4-1.29 MULTIPLE-USER LOW PRESSURE SEWER SYSTEMS

GENERAL

THE REQUIREMENT

The Contractor shall furnish all pipe, manholes, flushing inlets, valves, fittings, other appurtenances, tools, materials, and labor required to install and test multiple-user low-pressure sewer systems (MULPSS), in accordance with the requirements of the Plans and this Section.

A. Extension of MULPSS shall be subject to the same rules, requirements and procedures as apply to extensions of the public gravity main sewers.

B. Individual lot pumping systems (ILPS) connected to MULPSS shall conform to the requirements specified in Section 4-1.28 of these Specifications, and in addition shall:
   1. Utilize “grinder” pumps with nearly vertical pump curves (semi-positive displacement type pumps) discharging at less than twenty (20) gallons per minute;
   2. Incorporate a redundant curb stop (isolation valve) and check valve at each connection to a MULPSS, in addition to the isolation and check valves installed at the ILPS;
   3. Connections to the MULPSS shall be at a manhole.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.07 - Excavation, Bedding and Backfill

B. Section 4-1.17 - Manholes & Rodding Inlets

C. Section 4-1.28 - Individual Lot Pumping Systems

D. Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe

E. Section 4-1.35 - High-Density Polyethylene (HDPE) Pipe

CONTRACTOR SUBMITTALS

A. The Contractor shall submit complete shop drawings for all precast manhole components to City of Richmond, and shall receive favorable review prior to ordering the components.

B. The Contractor shall submit catalog cuts and/or shop drawings for any proposed MULPSS components not listed in the Approved Materials List.

QUALITY ASSURANCE

Leakage Test: After closing the isolation valves at each individual lot connection and fitting the lowest flushing inlet with a liquid filled pressure gauge having a full-scale reading of one hundred sixty (160) psi, the multi-user low-pressure sewer shall be filled with water and pressurized with compressed air at its high point until the pressure gauge reads one hundred (100) psi (air-over-water). The pressure shall be allowed to stabilize for a period of at least five (5) minutes immediately preceding a minimum fifteen (15) minute test period. There shall be no pressure drop during the test period.

PRODUCTS

GENERAL

All equipment and accessories shall be standard manufactured items and shall be specifically manufactured for sewage use by a company regularly engaged in the manufacture and assembly of pumping system components.

PIPES AND FITTINGS

A. Casing pipe and fittings shall be C900 PVC (DR-14) of the size indicated on the Plans, conforming to the requirements of Section 4-1.34 of these Specifications.

B. Pressure sewer pipe shall be HDPE (SDR 11) of the size indicated on the Plans, conforming to the requirements of Section 4-1.35 of these Specifications.

C. Brass pipe and threaded fittings shall be one (1) inch diameter Schedule 40 NPS.

VALVES

A. Isolation Valves shall be true union ball valves of the size indicated on the Plans, fabricated from PVC rated for one hundred fifty (150 psi) service at seventy five degrees Fahrenheit (75°F) as listed in the Approved Materials List, or equal.

B. Check Valves shall be true union flap check valves of the size indicated on the Plans, fabricated from PVC rated for one hundred fifty (150 psi) service at seventy five degrees Fahrenheit (75°F) as listed in the Approved Materials List, or equal.

C. Combination Isolation/Check Valves shall be a combination true union ball valve and flap check valve of the size indicated on the Plans, fabricated from PVC rated for one hundred fifty (150 psi) service at seventy five degrees Fahrenheit (75°F) as listed in the Approved Materials List, or equal.

D. Bronze ball valves shall be one (1) inch diameter, FIPT x FIPT, rated for a maximum working pressure of six hundred (600 psi) WOG (water, oil, gas), having chromium plated balls and PTFE (Teflon) seats.

MANHOLE COMPONENTS

A. Precast manhole components shall be as listed on the Approved Materials List.

B. Standard manhole frames and covers shall be as listed on the Approved Materials List.

TRACER WIRE AND TERMINAL BOARDS

A. Tracer wire shall be TW #10 copper.

B. Terminal Boards for tracer wires shall be fabricated from three-eighths (3/8) inch HDPE sheet and three-sixteenths (3/16) inch diameter brass machine screws, washers and knurled nuts.

FLUSHING NOZZLE COMPONENTS

A. Pressure gauges shall be glycerine-filled having stainless steel cases, brass internal components, one quarter (1/4) inch NPT inlets and two (2) inch diameter dials having maximum range of three hundred (300) psi and five (5) psi graduations, Grainger Stock Number 5WZ52, or equal.

B. Pressure relief valves shall have bronze bodies, stainless steel ball valves, one (1) inch MNPT inlet ports, three-quarters (3/4) inch right angle FNPT outlet ports, adjustable outlet pressure from zero (0) to four hundred (400) psi and maximum outlet flow of forty (40) gpm; Dayton Model Number 3YB67, or equal.

EXECUTION

GENERAL

A. Casing pipes and structures (manholes and flushing inlets) for MULPSS shall be installed in accordance with the requirements of these Specifications pertaining to installation of gravity sewers, except where otherwise required in this Section.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

INSTALLATION OF PRESSURE SEWER MAIN

A. After installing the casing pipe and manhole bases, pull HDPE pressure main sewer pipe of the size indicated on the Plans into the casing.

B. The Contractor may pull more than one reach of adjacent HDPE pressure sewer main pipe of the same size through intermediate manholes.

PLUMBING AT MANHOLES

A. Plumbing for pressure main sewers and laterals shall be configured and firmly attached to galvanized metal struts as shown on the Plans.

B. At most, four (4) private pressure lateral sewers shall be connected to the public pressure main sewer at each manhole. Connection tees shall be located as near to the center of the manhole as is practical to provide adequate space for initial assembly and disassembly/assembly for future maintenance.

TRACER WIRE

A. Pull tracer wire into pipe casing when installing the HDPE pressure main sewer in the casing.

B. Terminate the tracer wires on a terminal board at each manhole. Test each tracer wire for continuity after installation.

4-1.30 PIPING, GENERAL

GENERAL

THE REQUIREMENT

A. Pipe materials and installation procedures shall be in accordance with the pipe manufacturer's recommendations unless otherwise specified in this Section, or in the specific Section of these Specifications for the particular pipeline material being used.

B. A current list of pipe, fittings and joint materials specifically approved by City of Richmond as

conforming to these Specifications and allowed for use in sewer pipeline installations within City of Richmond boundaries, referred to as the "Approved Materials List," is on file and copies are available at City of Richmond's office. Pipe, appurtenances and accessories not appearing on the Approved Material List shall not be used without prior written approval of City of Richmond.

C. Pipe sizes cited in these Specifications refer to the nominal diameter of the pipe in whole inches.

D. For a particular sewer installation, pipe and manufactured fittings connecting pipe between structures shall be of one and only one manufacturer's brand and of the same type, quality, class and size.

E. Joining of pipe dissimilar size should be joined using an eccentric sheer band coupler and matching the inverts of the pipes to be connected.

F. Where field cuts are required, the Contractor shall use tools and/or equipment recommended by the pipe manufacturer. No hammer and chisel cuts will be permitted.

G. All pipe and fittings delivered to the jobsite shall be marked by the manufacturer with such inventory and identification (Brand Name, Pipe Type, Strength Class, Batch Lot, Lengths, etc.) as to be properly identified in the field as meeting the requirements of these Specifications.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.06 - Shoring, Excavation Support and Protective Systems

B. Section 4-1.07 - Excavation, Bedding and Backfill

C. Section 4-1.19 - Pipeline Cleaning, Testing and Televising

D. Section 4-1.27 - Protective Coating and Painting

E. Section 4-1.31 - Reinforced Concrete Pipe (RCP)

F. Section 4-1.32 - Vitrified Clay Pipe (VCP)

G. Section 4-1.33 - Ductile Iron Pipe (DIP)

H. Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe

I. Section 4-1.35 - High-Density Polyethylene (HDPE) Pipe

J. Section 4-1.36- Cast Iron Soil Pipe (CIP)

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:
ANSI/ASME B1.20. Pipe Threads, General Purpose (inch)
ANSI/AWS D1.1 Structural Welding Code

B. Codes:
Cal/OSHA Construction Safety Orders

QUALITY ASSURANCE

A. Pipe shall be subject to inspection at the place of manufacture. During the manufacture of the pipe, City of Richmond shall be given access to all areas where manufacturing is in progress and shall be permitted to make all inspections necessary to confirm compliance with these Specifications.

B. Except where otherwise specified, all materials used in the manufacture of the pipe shall be tested in accordance with the applicable specifications and standards. The manufacturer shall perform all tests at its own cost.

C. All installed pipe shall be cleaned, tested and televised in accordance with Section 4-1.19 – Pipeline Cleaning, Testing and Televising of these Specifications.

MANUFACTURER'S SERVICE REPRESENTATIVE

Where the assistance of a manufacturer's service representative is required, in order to obtain compliance for pipe joints, supports, or special connections, the Contractor shall arrange for such assistance.

MATERIAL DELIVERY, STORAGE AND PROTECTION

All piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged condition, and stored off the ground. All pipe and appurtenances shall be protected from damage by sunlight, moisture, corrosive materials, equipment and other sources. All defective or damaged pipe or appurtenances shall be removed from the jobsite and replaced with new materials.

PRODUCTS

GENERAL

A. Pipes, fittings, and appurtenances shall be furnished in accordance with the requirements of the applicable Section of these Specifications for the particular pipeline material being used.

B. Application of pipe coatings shall be in accordance with the requirements of the applicable Section of these Specifications for the particular pipeline material being used and Section 4-1.27 - Protective Coating and Painting.

BANDED COUPLINGS

Where banded couplings are used for joining of new pipe or repair of existing pipelines, only couplings listed in the Approved Materials List shall be allowed.

EXECUTION

GENERAL

Sewer pipelines shall be constructed to the alignment and grade shown on the plans, and in compliance with the specified requirements of this Section and of the specific Section of these Specifications for the particular pipeline material being used.

SEWER INSTALLATION

A. Sewer pipelines shall have a minimum wall-to-wall horizontal clearance of three (3) feet and a minimum vertical clearance of twelve (12) inches from all other improvements and utilities unless otherwise shown on the plans as being allowed by City of Richmond under Special Approval.

B. Where sewer pipelines are to be installed in the vicinity of potable water pipelines, wall-to-wall sewer-to-water pipeline separation shall be in conformance with the minimum requirements shown on SS-13 of the Standard Drawings. Sewer pipeline installation in the area labeled "Special Permission," will not be allowed unless specifically approved in writing by the water utility.

C. Pipe cover for sewer pipelines shall be in conformance with the requirements showed in the Standard Drawings, unless otherwise shown on the plans as being allowed by City of Richmond under a Special Approval.

D. For main sewers and trunk sewers, the grade line shall be established by setting cut stakes and obtaining

City of Richmond approval for cut sheets. During pipe installation, the Contractor shall continuously utilize an industrial-standard laser grade control system to confirm that the pipe is installed to the design grade, subject to the following requirements:

1. The Contractor shall provide a properly calibrated laser instrument and an operator who is qualified and trained in the operation of the particular laser instrument being used. The operator shall adhere to the provisions of the CalOSHA Construction Safety Orders regarding the use of laser equipment.
2. Laser control points shall be established bench marks or construction cut stakes identified on the City of Richmond approved cut sheets.
3. Laser must contain a direct grade reading screen, which will allow the Inspector to verify the grade at all times.

E. Pipe shall not be laid when the Inspector determines that the condition of the trench is unsuitable.

F. If the sewer is to be laid in an area that is to be filled, and the cover prior to filling is less than the required minimum cover specified pipe material and type, the pipe shall not be laid until the area has been properly filled and compacted to a level at least equal to required minimum cover above the proposed pipe, unless otherwise authorized by the Inspector.

G. If field conditions in areas that are potentially unstable or subject to settlement warrant, the Inspector may require that the Contractor substitute a different pipe material/type for the pipe shown on the plans.

H. Pipe, fittings and appurtenances shall be carefully handled and protected against damage, impact shocks, and free fall. Pipe shall be stored in a manner which will protect it from damage at the trench site or elsewhere. The Contractor shall inspect each pipe and fitting prior to installation to determine that only undamaged material is installed.

I. Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance and shall be kept clean at all times thereafter.

J. Sewer pipelines shall be laid upgrade from the point of connection to the existing sewer with the bell end at the upgrade end of each pipe length.

K. Layout of curves should not be allowed except by special variance from COR.

L. Non-marring slings shall be used for lowering each length of pipe into the trench (chains shall not be used). The pipe shall be laid on properly compacted bedding material as specified in Section 4-1.07 - Excavation, Bedding and Backfill. No blocking will be permitted and the pipe shall have full bearing for its entire length between bell holes excavated in said bedding material to prevent point loading at the bells or couplings and to allow for unobstructed assembly of all joints. Excavation shall be made as needed outside the normal trench section at field joints to permit adequate access to the joints for field connection operations and for application of coating on field joints. After jointing is completed, bell holes shall be backfilled with properly compacted bedding material, taking care not to damage, move, or lift the pipe from its bedding support.

M. Where it becomes necessary to modify the design pipe alignment to resolve conflicts with unforeseen obstructions or other causes, the Contractor shall propose a revised alignment to the Inspector who may allow installation per the revised alignment or may require that the revision be submitted to the Engineer for consideration. Such revision may be made by the deflection of joints, by the use of fittings or by forced bending of the pipe if permitted, however, in no case shall the deflection in the pipe or at any joint exceed the maximum deflection recommended by the pipe manufacturer.

N. Sewer pipes, branches, stubs, or other open ends which are not to be immediately connected, shall be plugged or capped.

O. The Contractor shall take all necessary precautions to prevent excavated or other foreign material from getting into the pipe during the laying operations. At all times when laying operations are not in progress and at the close of the day's work, the openings of all pipe and specials, whether in the trench or in

storage, shall be protected with suitable bulkheads to prevent unauthorized access by persons, animals, water, or any undesirable substance.

P. The Contractor shall prevent the pipe from floating during and after its installation.

CONNECTIONS TO EXISTING SEWERS

A. Existing sewers are shown on the plans at the locations where new sewers are to be connected. It is the responsibility of the Contractor to determine the exact location and depth of the existing sewers prior to the installation of any sewer pipe. New pipe shall be plugged with mechanical plugs until further connection is necessary.

B. Connection of new main and/or trunk sewers to existing lines up to and including forty eight (48) inches in diameter shall be made at existing manholes or by constructing a new manhole over the point of connection, or by removing an existing rodding inlet or plug and extending new pipe of the same diameter, material and class from the point of connection.
   1. Where the connection is to be made into an existing manhole, the Contractor shall make the connection by core-drilling through the manhole shelf to the existing channel, installing the new pipe, finishing a new channel within the manhole and repairing any damage to the structure.
   2. Where the connection is to be made by constructing a new manhole on an existing sewer, the manhole and new connection shall conform to the details shown in SS-1 through SS-2 & SS-5A & 5B of the Standard Drawings. The existing sewer shall be kept intact until immediately before the cleaning and flushing operation for the new sewer is to begin.
   3. Where the connection is to be made at a removed rodding inlet or plug, the existing piping shall be cut square and ends properly prepared for the connection shown and an air test fitting shall be installed at the connection of new and existing pipelines.
   4. All new pipe shall be plugged with an approved mechanical plug or brick/mortar until the line is completed and ready for testing.

C. Side Sewer Connections to Main Sewers:
   1. Side sewer connections shall be made with fittings or adapters recommended by the manufacturer for use with the particular pipe and as listed on the Approved Materials List.
   2. Side sewers equal in size to the main sewer shall be connected by installing a wye branch or tee fitting.
   3. Connection and side sewer details shall conform to the requirements shown ON SS-16D of the Standard Drawings.
   4. Side sewer or lateral connections to new or existing manholes shall be as detailed on SS-1 through SS-2, SS-5A, SS-5B & SS-6B of the Standard Drawings.
   5. Side sewer connections where wyes, tees or laterals were not installed during main sewer construction, shall be made by installing a tap listed in the Approved Materials List, installing a main sewer repair spool (replacement pipe section) as specified in Subsection 3.5 below including a Section 4-1.30 – Piping, General new wye branch or tee fitting, or by core drilling through the barrel of an existing manhole at the top of the shelf or crown of mainline pipe. Installation of taps shall comply with the following requirements:
      a. Only pre-qualified Contractors shall be permitted to install tap and saddle connections on VCP, CIP, DIP, or RCP.
      b. Before commencing excavation for tap installation, the Contractor shall have sufficient Type I bedding and backfill material at the site to properly re-bed the main and lateral sewers, and backfill the excavation.
      c. The excavation for the tapping work shall be a minimum of two (2) feet in width, give enough length for work space, without under-cut sides and shall be properly shored in conformance with Section 4-1.06 - Shoring, Excavation Support and Protective Systems. A minimum clearance of three (3) inches below, six (6) inches on each side and twelve (12) inches each way along the main from the point of connection shall be provided for tap installation.
   6. If the main sewer is damaged during excavation for or during installation of the tap, the Contractor shall install a main sewer repair spool (replacement pipe section) as specified in Subsection 3.5 below including a new wye branch or tee fitting.
   7. The outer surface of the main in this exposed area shall be thoroughly cleaned prior to tapping.

REPAIRS TO EXISTING SIDE SEWERS AND MAINS

A. Repairs to main sewers and trunk sewers sixteen (16) inches or less in diameter shall be made using pipe and fittings specified in Section 4-1.33 - Ductile Iron Pipe (DIP), or Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe.

B. Repairs to side sewers shall conform to the requirements shown in SS-14 of the Standard Drawings, and shall be made using pipe and fittings specified in:
   1. Section 4-1.33 - Ductile Iron Pipe (DIP);
   2. Section 4-1.34 - Polyvinyl Chloride (PVC) Pipe;
   3. Section 4-1.35 - High-Density Polyethylene (HDPE) Pipe; or
   2. Section 4-1.36 - Cast Iron Soil Pipe (CIP).

C. When repair of a damaged section of pipe is required within eighteen (18) inches of a pipe joint, the replacement section shall extend to and include the joint.

D. Where repair couplings are permitted, only couplings listed in the Approved Materials List shall be used.

E. The Inspector may require replacement of broken, damaged or improper pipe or fittings discovered during sewer repair or replacement work.

REPAIRS TO NEW SEWER MAINS

A. If damage to the new main sewer pipe is identified during inspection, testing or televising, the Contractor shall repair the damage or replace the pipe as instructed by the Inspector. When repair of a damaged section of pipe is required within eighteen (18) inches of a pipe joint, the replacement section shall be extended to include the joint. Repair procedures shall comply with the following:

   1. VCP and DIP SEWER MAINS – Manufacturer's recommended couplings shall be used. The damaged pipe shall be removed by squarely cutting out the damaged section. The replacement pipe shall be squarely cut approximately one-half (1/2) inch shorter than the missing section. The repair couplings shall be placed onto the pipe ends, the replacement assembly inserted into the gap, the repair couplings moved to be centered over each new joint, and the fasteners or bands tightened as required. The Contractor shall re-bed the pipe and backfill the excavation with properly compacted bedding and backfill material in accordance with Section 4-1.07 - Excavation, Bedding and Backfill.

   2. PVC SEWER MAINS - PVC double bell repair couplings shall be used. The damaged pipe shall be removed by squarely cutting out the damaged section, and the remaining ends shall be beveled. The replacement pipe shall be a minimum of three (3) feet in length and shall be squarely cut approximately one-half (1/2) inch shorter than the missing section, and its ends shall be beveled. Reference lines indicating the spigot stab distance required for centering the repair coupling shall be clearly marked on all cut ends. The repair couplings shall be placed onto the pipe ends, the replacement assembly inserted into the gap, the repair couplings moved to be centered over each new joint. The Contractor shall re-bed the pipe and backfill the excavation with properly compacted bedding and backfill material in accordance with Section 4-1.07 - Excavation, Bedding and Backfill.

WARNING TAPE INSTALLATION

See Section 4-1.07 - Excavation, Bedding and Backfill for warning tape requirements.

4-1.31 REINFORCED CONCRETE SEWER PIPE

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install reinforced concrete sewer pipe and all appurtenances as specified, complete and in place, as shown on the plans, as specified in this Section and in Section 4-1.30 Piping, General.

RELATED WORK SPECIFIED ELSEWHERE

Section 4-1.30 – Piping, General

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM C 76	Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
ASTM C 150	Specification for Portland Cement
AWWA C 302	Reinforced Concrete Pressure Pipe, Non-cylinder Type, for Water and Other Liquids

CONTRACTOR SUBMITTALS

A. Certificates guaranteeing that the pipe furnished hereunder is in compliance with the requirements of these Specifications and the referenced standards.

B. Quality control records as required herein.

C. Detailed fabrication including pipe designs, special pipe, dimensions, weights, joint details, laying diagrams and a fabrication schedule. Drawings shall indicate, at relative scale, concrete covers, reinforcement placements, joint assembly design, the design pipe size, D-load, cement type, concrete strength and areas, and types and placements of reinforcement.

D. Three-edge bearing test results. Results shall indicate the City of Richmond assigned project number, agency and operator performing the test, date, pipe size and specified D-load and ultimate test load applied. The ultimate test load applied shall not exceed one hundred ten percent (110%) of the specified D-load.

E. Fabrication plant joint leakage testing results.

QUALITY ASSURANCE

A. For concrete pipes of thirty (30) inches inside diameter and larger, each pipe joint shall be inspected by the Contractor from the inside of the installed piece of pipe before backfilling and before the next piece of pipe is connected. The inspection shall include the checking of proper joint gaps and gasket placement, and damaged or chipped joints. The Contractor shall verify the deflection at each joint by comparing the width of gaps at the top and bottom and each side of each joint. Gaps exceeding manufacturer's maximum/minimum allowable limits and/or with potentially rolled or pinched gaskets shall be corrected before the next piece of pipe is installed. If a pipe section, which has previously been installed, is moved or dislodged in the process of installing the next pipe section, those pipe joints which have been previously checked and which may have been affected by the moving or dislodging shall be rechecked. In addition, at the completion of each pipe installation day, the Contractor shall again inspect the inside of the pipeline installed that day for potential problems that may have developed since the individual joint inspections. The Contractor shall correct all excessive gaps and potential problems that may affect the passing of the leakage test before any more pipes are installed.

B. The Inspector may participate in any or all of the alignment checks or interior pipe inspections. The City

of Richmond's inspection, if implemented, will be for general compliance only and will not relieve the Contractor from being fully responsible for the overall installation quality including the proper alignment, grades, and the passing of the specified leakage test. The Contractor shall provide all necessary access and safety equipment that will assure a safe work area and facilitate the inspection process for the Inspector.

C. City of Richmond reserves the right to reject the repairing of pipe joints needed to pass the specified leakage test. Such repairs may be allowed only at the Inspector's discretion, and may require the installation of exterior concrete collars designed for leakage and settlement in addition to interior repairs, or other approved equivalent repair methods to ensure the integrity of the pipeline for the full design life. Repair of chipped joints, if approved by City of Richmond, shall be made after the passing of the specified leakage test, as approved by City of Richmond.

D. Except as modified in this Section, all materials used in the manufacture or installation of the pipe shall be tested in accordance with the requirements of the referenced standards.

E. Submittals and testing shall be done in compliance with Section 4-1.30 – Piping, General of these Specifications.

PRODUCTS

PIPE MATERIALS

A. All pipe sizes refer to the nominal inside diameter of pipe (including any pipe linings) and no pipe, except where specified herein, shall be more than three-eighth (3/8) inch smaller than the nominal size designated. All pipe, joints incorporated into the pipe, and manufactured fittings connecting pipe between structures shall be fabricated by one and only one manufacturer and be of the same type, quality, class, and size unless otherwise specified or shown. Jointing of pipe dissimilar in size and/or material shall be accomplished at structures. All field cut pipe shall be accomplished by methods and equipment recommended by the pipe manufacturer. No hammer and chisel cuts will be permitted. All pipe and fittings delivered to the jobsite shall be properly marked by the manufacturer with, at a minimum, the manufacturer's name, piece number, pipe diameter, class (or D-load) and date of manufacture. All elliptically reinforced pipe shall also be marked with a "field top" designation.

B. Reinforced Concrete Sewer Pipe with Flared or Flush Bell and Spigot Joint: All Reinforced Concrete, hereinafter referred to as R.C., pipe and fittings shall conform to the requirements of ASTM C 76 and as modified herein:

1. Materials shall comply with the appropriate ASTM designation under which the subject pipe is to be manufactured, modified as specified hereunder:
    a. Cement used in the manufacture of R.C. pipe shall be TYPE II in conformance with ASTM C 150.
    b. No admixtures shall be introduced to concrete mixes.
    c. Rubber for gaskets shall be neoprene and shall comply with the requirements of AWWA C 302.
    d. Aggregates used shall consist of granitic, calcareous or combinations.
2. Design shall comply with appropriate ASTM designation under which the subject pipe is to be manufactured and as modified herein.
    a. In no case shall pipe be less than that specified under ASTM C 76 provisions for CLASS III, Walls "B" or "C". Wall "A" shall not be acceptable.
    b. Total concrete cover of reinforcement at the inner wall, (clearance of steel surface to inner wall surface), nominal one and one-half (1-1/2) inches, regardless of pipe diameter size or type and placement configuration of reinforcement. Minimum concrete cover at the outer wall shall not be less than one (1) inch.
    c. Joint design for thirty (30) inch diameter and larger pipe shall be reinforced concrete bell and spigot incorporating a fully-retained, double rubber gasketed joint with a one-half (1/2) inch diameter Schedule 40 PVC testing tube extending from the inside of the pipe into the annular space between the two gaskets. A removable plastic screw-in plug shall be provided to protect the tube opening. Position of the testing tube shall be at the springline of the pipe.

d. Reinforced concrete pipe for tunneled installations shall be double spigot type with Type 316 stainless steel joint band. The minimum thickness of the Type 316 stainless steel joint band shall be one-half (1/2) inch unless a greater thickness is required by the Contractor for the tunnel and jacking operation.

3. PVC lined reinforced concrete pipe shall be manufactured by the vertically cast process, utilizing stationary inner and outer forms. Vertically cast pipe shall be wet cast, vibrated, steam cured, and shall remain in the forms for a minimum of six (6) hours. Pipe manufactured by the "Dry Cast" method is unacceptable. Fabrication of centrifugally spun and vertically cast pipe shall be in accordance with AWWA C 302 and as modified herein:
   a. Form oils or release agents shall not contain any material or substances that would penetrate or otherwise retard concrete set at the formed surface.
   b. The steel forms shall be placed horizontally in a machine capable of spinning the forms at speeds that will produce concrete meeting or exceeding the concrete strengths required under the appropriate ASTM standard for the subject pipe specified.
4. Pipe fabrication plant and field hydrostatic joint leakage testing shall be in accordance with the following minimum criteria:
   a. All pipes shall be subject to a D-load test by the manufacturer. Three-edge bearing test loads shall be applied to the extent that no greater than a 0.01-inch crack is produced in tested pipe sections. Applied test loading may be terminated without producing a 0.01-inch maximum crack if or when such loading has reached one hundred ten percent (110%) of that required for and relative to the specified D-load for the subject pipe. City of Richmond may select at random and test as specified in ANSI/AWWA C 302. The cost of the pipe and the tests shall be borne by the Contractor. Pipe will be acceptable under the test requirements specified herein when all test specimens conform to the test requirements, the manufacturer will be allowed to retest two (2) additional specimens for each specimen that failed, and the pipe shall be acceptable only when all of the retest specimens meet the strength requirements.
   b. Fabrication plant joint leakage testing shall be performed in accordance with AWWA C 302. The pipe test pressure shall be a minimum head of twenty five (25) feet.
   c. Field hydrostatic joint leakage testing shall be performed by the Contractor installing the pipe, after the pipe is in place in accordance with the requirements of Section 4-1.19 - Pipeline Cleaning, Testing and Televising.
5. Pipe minimum and maximum lengths, except where required otherwise shall be in accordance with AWWA C 302.

C. The quality of materials, the process of manufacture, and the finished pipe shall be subject to inspection and approval by City of Richmond or its assignee. Pipe shall be substantially free of fractures and internal surface roughness. The ends of the pipe shall be normal to the walls and centerline of the pipe, within the limits of variations given in ASTM C 76. Pipe shall be subject to rejection for failure to conform to any of the specification requirements. City of Richmond's decision regarding rejection of the pipe shall be final and the rejected pipe shall be immediately removed from the jobsite and replaced at the Contractor's cost. Individual sections of pipe may be rejected for any of the following defects:
   1. Fractures or cracks passing through the wall, except for a single end crack that does not exceed the depth of the joint.
   2. Defects that indicate proportioning, mixing, and molding not in compliance with ASTM C 76.
   3. Spigot and/or bell surface and/or dimensional irregularities which may impede assembling the joint or affect leak tightness.
   4. Surface defects indicating honeycomb, rock pockets or open texture.
   5. Damaged or cracked ends where such damage would prevent making a satisfactory joint.
   6. Any continuous crack having a surface width of 0.01 inch or more and extending for a length of twelve (12) inches or more, regardless of position in the wall of the pipe.

EXECUTION

GENERAL

A. Sewer pipelines shall be constructed in compliance with the requirements of this Section and of Section 4-1.30 – Piping, General.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

PIPE INSTALLATION

A. Reinforced concrete pipe shall be installed in accordance with the Manufacturer's recommendations and the additional requirements of this Section.

B. Bell holes shall be excavated at each joint to provide full-length barrel support of the pipe and to prevent point loading at the bells or couplings.

C. Pipe bedding or trench subgrade beneath the pipe shall be compacted and graded to provide a uniform and continuous support beneath the pipe at all points between the bell holes or pipe joints.

D. Unless otherwise required, all pipes shall be laid straight between changes in alignment and at uniform grade between changes in grade. Where lined reinforced concrete pipe is specified, it shall be installed with the unlined area of the pipe circumference centered on the invert. For pipes with elliptical reinforcement, the pipe shall be placed with the minor axis of the reinforcement in a vertical position.

E. For standard beveled pipes where it is necessary to defect the pipe joint to achieve the required line or grade, the amount of joint "pull" shall not exceed the pipe manufacturer's recommendation. Pipes installed in straight lines or grades shall have a uniform end gap all around the pipe joint.

PIPE DEFLECTION

Horizontal Curves shall be installed in straight pipe segments and joint deflections or fittings by special variance from COR. Minimum curvature radius requirements for RCP pipe are shown on the table below. All designs of curvilinear sewers are subject to approval by City of Richmond.

Reinforced Concrete Pipe (RCP)		
Allowable Deflection Per Joint	Segment Length	Minimum Radius
1.2 Degree Joint Deflection	8'0"	400 ft.

JOINTS

A. Care shall be taken to avoid dragging the spigot on the ground or allowing it to be damaged by contact with gravel, crushed stone, or other hard objects.

B. Joint mating surfaces shall be cleaned immediately prior to jointing.

C. After the subgrade has been prepared as specified, the rubber gaskets shall be placed in the groove(s) on the spigot ring, and the spigot end of the pipe then centered into the bell of the adjoining pipe and pushed into position. Care shall be taken to avoid twisting or cutting the gasket(s) when jointing the pipe. The inside surface of the bell, the gasket groove(s) and the gasket(s) shall be lubricated immediately prior to jointing with a compound recommended by the manufacturer which will facilitate the telescoping of the joint.

D. After the pipe joint is made, the Contractor shall check proper gasket(s) placement with a feeler gauge supplied by the pipe manufacturer for such testing. Where joint placement is found to be improper, the tested pipe section shall be first removed, the gasket(s) checked for defects due to manufacturing error, a new gasket(s) installed if necessary, the pipe re-laid and the gasket(s) placement rechecked.

TRENCH LOAD

Trench load calculations and design shall reflect the following minimum criteria:

A. Maximum trench width of twenty four (24) inches greater that the outside diametric dimension (O.D.) of the pipe barrel not including bells and a backfill density relative to that anticipated but in all cases not less than one hundred twenty (120) pounds per cubic foot.

B. A dead load factor not greater that one and nine-tenths (1.9) for bedding shown and specified on SS-10 and SS-11 of the Standard Drawings.

C. Live load and impact factors relative to that anticipated but in all cases not less than that produced by using AASHO HS-20 load criteria and a one and one-half (1.5) impact factor.

D. A safety factor of not less than one and one-half (1.5).

4-1.32 VITRIFIED CLAY PIPE (VCP)

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install vitrified clay pipe and all appurtenances as specified, complete and in place, as shown on the plans, as specified in this Section and in Section 4-1.30 Piping, General.

RELATED WORK SPECIFIED ELSEWHERE

Section 4-1.30 – Piping, General

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM C 12	Practice for Installing Vitrified Clay Pipe Lines
ASTM C 301	Test Methods for Vitrified Clay Pipe
ASTM C 700	Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated

CONTRACTOR SUBMITTALS

The Contractor shall furnish a certified affidavit of compliance for all pipe and other products or materials furnished under this Section, as specified in the referenced standards.

QUALITY ASSURANCE

A. All pipes shall be subject to a hydrostatic pressure test and a three (3) edge bearing test at the manufacturer's plant.

B. All pipe and fittings shall be true, circular, and concentric with the barrel of the pipe, on a plane at right angles to the longitudinal axis of the pipe. At no point shall the thickness of the pipe spigot be less in thickness than the shell of the main body of the pipe. Socket ends shall be square with the longitudinal axis and shall be true, circular and concentric with the barrel of the pipe.

C. All pipe and fittings shall have smooth interiors and shall be free from injurious cracks, checks, blisters, broken extremities or other imperfections.

D. Pipe shall be subject to rejection for failure to conform to any specification requirement. City of Richmond’s decision regarding rejection of the pipe shall be final and the rejected pipe shall be immediately removed from the jobsite and replaced at the Contractor’s cost. Individual sections of pipe may be rejected for any of the following defects:

1. A single crack in the pipe or fitting extending through the entire thickness, regardless of the length of such crack; a single crack which extends through one-fifth (1/5) of the barrel thickness and is over two (2) inches long. Any surface firing crack that is more than 1/32 inch wide at its widest point.
2. Lumps, blisters, pits, or flakes on the interior surface of a pipe or fitting.
3. When spigot or bell of the pipe varies from a true circle more than three percent (3%) of its nominal diameter.
4. Any piece broken from the spigot end that extends through the barrel.
5. Tramp clays, grog, or other foreign matter fused to the exterior or interior surface of the pipe or fittings.

E. Except as modified in this Section, all materials used in the manufacture or installation of the pipe shall be tested in accordance with the requirements of the referenced standards.

F. Submittals and testing shall be done in compliance with Section 4-1.30 – Piping, General of these Specifications.

PRODUCTS

PIPE AND FITTINGS

Clay pipe and fittings shall be extra strength, glazed, unless otherwise shown, and shall conform to the requirements of ASTM C 700.

JOINTS

Joints in vitrified clay pipe shall be made up using a factory-made bell and spigot compression joint, or a coupling listed in the Approved Materials List.

EXECUTION

GENERAL

A. Sewer pipelines shall be constructed in compliance with the requirements of this Section and of Section 4-1.30 – Piping, General.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

INSTALLATION OF VCP

A. Installation of pipe shall be in accordance with ASTM C 12. Pipe laying shall proceed upgrade with spigot ends pointing in direction of flow. After a section of pipe has been lowered into the prepared trench, supported along the full length of the pipe section, and immediately before joining the pipe, the ends of the pipe to be joined shall be cleaned and the rubber gasket lubricated, all in accordance with the pipe manufacturer's written instructions. Assembly of the pipe length shall be in accordance with the recommendations of the manufacturer. All special tools and appliances required for joining the pipe shall be provided by the Contractor. When cutting or machining of the pipe is necessary, only tools and methods recommended in writing by the pipe manufacturer and approved by City of Richmond shall be employed.

B. All necessary precautions shall be taken to prevent uplift or floating of the pipe prior to the completion of the backfilling operation. The Contractor shall assume full responsibility for any damage due to this cause and shall restore and replace the pipe to its specified condition and grade if it is displaced due to floating.

PIPE DEFLECTION

Horizontal Curves shall be installed in straight pipe segments and joint deflections or fittings by special variance from COR. Minimum curvature radius requirements for VCP pipe are shown on the table below. All designs of curvilinear sewers are subject to approval by City of Richmond.

VCP					
Max. Allowed Deflection (Degrees)	Equation for Minimum Radius (L= Pipe Length)	r (feet) Minimum Radius of Curvature, For Pipe Length (L) of: 4'	6'	8'	10'
2.4	r = 24.0(L)	96	144	192	~
1.8	r = 32.0(L)	128	192	256	320
1.2	r = 48.0(L)	192	288	384	480
0.9	r = 64.0(L)	256	384	512	640

MANHOLES

VCP entering and leaving manholes or other structures shall have two (2) standard joints within three (3) feet of the manhole base. One (1) joint shall be incorporated in the manhole base or installed immediately adjacent to the manhole base and there shall not be less than twelve (12) inches between the two (2) joints.

4-1.33 DUCTILE IRON PIPE (DIP)

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install ductile iron pipe (DIP) and all appurtenances as specified, complete and in place, as shown on the plans, as specified in this Section and in Section 4-1.30 Piping, General.

RELATED WORK SPECIFIED ELSEWHERE

Section 4-1.30 – Piping, General.

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ANSI/AWWA C110/A21.10 Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in. for Water and Other Liquids

ANSI/AWWA C111/A21.11 Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings

ANSI/AWWA C115/A21.15 Flanged Ductile-Iron and Gray-Iron Pipe with Threaded Flanges

ANSI/AWWA C150/A21.50 Thickness Design of Ductile-Iron Pipe

ANSI/AWWA C151/A21.51 Ductile-Iron Pipe, Centrifugally Cast

ANSI/AWWA C153/A21.53 Ductile-Iron Compact Fittings, 3 in. through 12 in. for Water and Other Liquids

AWWA C600 Installation of Ductile-Iron Water Mains and Their Appurtenances

QUALITY ASSURANCE

A. Except as modified in this Section, all materials used in the manufacture or installation of the pipe shall be tested in accordance with the requirements of the referenced standards.

B. Submittals and testing shall be done in compliance with Section 4-1.30 – Piping, General of these Specifications.

PRODUCTS

GENERAL

A. Ductile-iron pipe shall conform to the latest revision of ANSI/AWWA C150/A21.50 subject to the following supplemental requirements. The pipe shall be furnished complete with rubber gaskets, and all special fittings shall be provided as shown on the plans.

B. Bell and spigot joints are to be used for all underground applications. As an alternative to bell and spigot joints the use of mechanical and flanged joints will be permitted for above ground applications only.

PIPE

Ductile iron pipe shall be of the diameter indicated at a minimum class 52, and shall be manufactured with standard bell and spigot joints in accordance with the latest revision of ANSI/AWWA C151/A21.51.

LINING AND COATING

Pipe shall have standard asphaltic coating on the exterior and be epoxy lined on the interior with Protecto 401TM ceramic epoxy lining as manufactured by U.S. Pipe, or approved equal.

FITTINGS

A. Fittings shall be ductile iron at a minimum of class 52. Fittings shall conform to the latest revision of either ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53. Fittings and accessories shall be furnished with either Push-on or Mechanical Type Joints in accordance with ANSI/AWWA C111/A21.11.

B. Ductile-iron pipe and fittings shall be furnished with mechanical joints, push-on joints, flanged joints, and/or restrained joints, as required. Bolted joints shall not be used for underground installations.
   1. Mechanical and push-on bell and spigot joints shall conform to ANSI/AWWA C111/ A21.11, and be furnished complete with all necessary accessories.
   2. Flanged joints shall conform to ANSI/AWWA C115/A21.15.
   3. Restrained joints shall be per the Approved Materials List.

EXECUTION

GENERAL

A. Sewer pipelines shall be constructed in compliance with the requirements of this Section and of Section 4-1.30 – Piping, General.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

INSTALLATION OF PIPE

All pipe shall be installed in accordance with ANSI/AWWA C600.

RUBBER-GASKETED JOINTS

Immediately before jointing pipe, the bell end of the pipe shall be thoroughly cleaned, and a clean rubber gasket, lubricated with an approved vegetable-based lubricant, shall be placed in the bell groove. The spigot end of the pipe shall be carefully cleaned and lubricated with a vegetable-based lubricant. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and pushed into its proper position. Tilting of the pipe to insert the spigot into the bell will not be permitted.

4-1.34 POLYVINYL CHLORIDE (PVC) PIPE

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install PVC pipe and all appurtenances as specified, complete and in place, as shown on the plans, as specified in this Section and in Section 4-1.30 Piping, General.

RELATED WORK SPECIFIED ELSEWHERE

Section 4-1.30 – Piping, General.

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

AWWA C900-07 Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm through 300 mm), for Water Transmission and Distribution

AWWA C905-08 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution

ASTM D 1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

ASTM D 2241 Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR-Series)

ASTM D 2321 Practice for Underground Installation of Thermoplastic Sewer Pipe for Sewers and Other Gravity-Flow Applications

ASTM D 3034 Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer

Pipe and Fittings

ASTM F 477 Standard Specification for Elastomeric Seals (Gaskets) for

Joining Plastic Pipe

ASTM F 1674 Test Method for Joint Restraint Products

QUALITY ASSURANCE

A. Except as modified in this Section, all materials used in the manufacture or installation of the pipe shall be tested in accordance with the requirements of the referenced standards.

B. Submittals and testing shall be done in compliance with Section 4-1.30 – Piping, General of these Specifications.

PRODUCTS

GENERAL

All PVC pipe shall be continuously and permanently marked with the manufacturer's name, pipe size and pressure rating in psi.

PIPE

A. All PVC pipe shall be joined by compression, solvent-welded, thermo-fusion welded or mechanical restrained joints as shown on the Plans.

B. Polyvinyl chloride pipe (PVC) shall conform to the requirements of ASTM D 3034, SDR 26, or AWWA C900 or C905, Class 100, 150, 165, 200, 253, or 305. Material for PVC pipe shall conform to the requirements of ASTM D 1784 for Class 12454-B or 12454-C as defined therein.

C. Flexible rubber rings for compression type joints for PVC pipe and fittings shall conform to the requirements of ASTM F 477.

D. All sun-faded pipe or pipe with noticeable surface defects will be rejected and shall be replaced by the Contractor.

COUPLINGS AND FITTINGS

A. Couplings shall be as listed in the Approved Materials List.

B. All fittings for PVC pipe shall conform to the requirements of ASTM D 2241. The ring groove and gasket ring shall be compatible with PVC pipe ends.

C. The strength class of fittings shall be no less than the strength class of any adjoining pipe.

D. PVC fittings shall, at a minimum, conform to the requirements of ASTM D 3034 as they apply to type SDR 26 PVC Sewer Pipe using an Elastomeric Gasket Joint in a bell and spigot assembly system. Rubber sealing gaskets shall meet the requirements of ASTM F 477.

E. All PVC pipe entering or leaving a concrete structure shall have a rubber sealing gasket, as supplied by the pipe manufacturer, firmly seated perpendicular to the pipe axis, around the pipe banded and cast into the structure base or near the structure wall center as a water stop. Said water stop may also consist of a manhole coupling with rubber sealing rings cast into the structure base.

RESTRAINED JOINTS FOR C900 PVC PIPE

All restrained joints used in sanitary sewer applications shall meet or exceed the requirements of ASTM F 1674. All restrained joints shall be per the Approved Materials List.

EXECUTION

GENERAL

A. Sewer pipelines shall be constructed in compliance with the requirements of this Section and of Section 4-1.30 - Piping, General.

B. Work shall meet the specified requirements of these Specifications unless the requirements of the local agency having jurisdiction are greater, in which case the greater requirements shall govern.

INSTALLATION

PVC pipe shall be installed in accordance with the requirements of ASTM D 2321; as specified herein and shown on the plans.

3.3 HORIZONTAL CURVES

Horizontal curves shall be installed in straight pipe segments by special variance from COR, each a minimum of five feet in length and joint deflections or fittings in accordance with the requirements or with forced bends where the radius of the curve exceeds the minimums specified in the table below:

SDR 26 PVC Pipe (Forced Bends)				
Pipe Diameter	4"	6"	8"	10"
Minimum Radius	135’	200’	260’	322’

FIELD JOINTING

A. Each pipe compression type joint shall be joined with a lock-in rubber ring and a ring groove that is designed to resist displacement during pipe insertion.

B. The ring and the ring seat inside the bell shall be wiped clean before the gasket is inserted. A thin film of lubricant shall be applied to the exposed surface of the ring and to the outside of the clean pipe end. Lubricant other than that furnished with the pipe shall not be used.

C. Joints shall not be deflected either vertically or horizontally in excess of the printed recommendations of the pipe manufacturer.

4-1.35 HIGH DENSITY POLYETHYLENE (HDPE) PIPE

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install high-density polyethylene pipe (HDPE) and all appurtenances as specified, complete in place, as shown on the plans, as specified in this Section and in Section 4-1.30 Piping, General. The HDPE pipe and fittings specified herein shall be used only in association with pipe-bursting methods and directional drilling construction methods unless otherwise approved by City of Richmond.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.10 - Horizontal Directional Drilling

B. Section 4-1.12 - Pipe Bursting

C. Section 4-1.30 - Piping, General

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM D 638 Test Method for Tensile Properties of Plastics
ASTM D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics
ASTM D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
ASTM D 1238 Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D 1248 Specification for Polyethylene Plastics Molding and Extrusion Materials
ASTM D 1505 Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D 1525 Test Method for Vicat Softening Temperature of Plastics
ASTM D 1693 Test Method for Environmental Stress-Cracking of Ethylene Plastics
ASTM D 2240 Test Method for Rubber Property - Durometer Hardness
ASTM D 2837 Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
ASTM D 3350 Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM F 585 Practice for Insertion of Flexible Polyethylene Pipe into Existing Sewers
ASTM F 714 Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
PLASTICS PIPE Renewing Sewers with Polyolefin Pipe Industry (PPI)

QUALITY ASSURANCE

A. Except as modified in this Section, all materials used in the manufacture or installation of the pipe shall be tested in accordance with the requirements of the referenced standards.

B. Submittals and testing shall be done in compliance with Section 4-1.30 - Piping, General of these Specifications.

PRODUCTS

GENERAL

Referenced pipe sizes are nominal pipe diameters.

PIPING MATERIALS

A. Pipe and fittings shall be high density, high molecular weight polyethylene with a cell classification of 345434D, as defined in ASTM D 3350 and shall be colored white or light gray. In addition, the material shall be listed by the Plastic Pipe Institute with a designation of PE 3408 and shall be classified as a Type III, Class C, Category 5, Grade P34 material, as defined in ASTM D 1248.

B. Fittings shall be of the same material and class as the pipe. Identification of pipe and fittings shall be in accordance with ASTM D 3350. Pipe and fittings shall be made from virgin material. No rework compound, except that obtained from the manufacturers own production of the same formulation, shall be used. Pipe and fittings shall be homogeneous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

C. Dimensions of pipe and fittings shall be in accordance with ASTM F 714. Pipe and fittings shall be at minimum SDR 17 with cast iron/ ductile iron outside diameter and have a minimum pressure rating of one hundred (100) psi at seventy three and four-tenth degrees Fahrenheit (73.4°F).

D. The physical properties of the pipe and fittings material shall be as follows:

PROPERTY	TEST METHOD	VALUE
Density	ASTM D 1505	0.955 gm/cc
Melt Index	ASTM D 1238	0.14 gm/10 min
Environmental Stress-Cracking Resistance [a]	ASTM D 1693	> 5,000 hr > 800 hr
Tensile Strength, Yield [b]	ASTM D 638	3,200 psi
Elongation at Break [c]	ASTM D 638	> 750 percent
Vicat Softening Temperature	ASTM D 1525	257º F
Brittleness Temperature	ASTM D 746	< -180º F
Flexural Modulus	ASTM D 3350	125,000 psi

Modulus of Elasticity	ASTM D 638	105,000 psi
Hardness	ASTM D 2240	65 Shore D
Coefficient of Linear Thermal Expansion [d]	ASTM D 696	$8.3x10^{-5}$ in/in/°F $1.2x10^{-4}$ in/in/°F
Long Term Strength [e]	ASTM D 2837	1,600 psi 800 psi

a - Condition A, B & C @ 0°F; Compressed Ring @ 50°F
b - Type IV specimen
c - Type IV specimen
d - Molded specimen; Extruded pipe
e - @ 73°F; @ 140°F

JOINTS

A. Joints in HDPE pipe shall be made using thermal butt-fusion welding equipment designed for the specific purpose of permanently connecting HDPE pipes. This equipment shall be capable of squarely facing the pipe ends to be joined, properly heating each pipe end to the temperature range specified by the pipe manufacturer, and applying and sustaining the appropriate pressure, as recommended by the pipe manufacturer. Test joints may be requested at the Inspector's discretion to ensure the quality of the joints.

B. For main sewer installation, the butt-fusion welding machine shall be outfitted with a measuring and recording unit that documents the conditions existing during the fusion of each individual weld. A printout that includes the date and time each joint was made, the joint number, the initials of the machine operator, the platen temperature at the time of mating, the pressure during the heating cycle, the time period for the heating cycle, the pressure during the soak cycle, and the time period of the soak cycle shall be machine-generated and delivered to City of Richmond at the end of each work shift. The recording unit shall be a DataLogger, as manufactured by McElroy Manufacturing, Inc., or approved equal.

C. Fusion equipment shall be operated by technicians who have been certified by a major gas public utility such as Pacific Gas and Electric or Southern California-Edison for operation of such equipment. A copy of the technician's certification shall be provided to City of Richmond prior to the start of the work. Furthermore, all technicians performing butt-fusion welding on this project shall have a minimum of two (2) years' experience operating the same equipment used hereon.

D. Butt-fusion welding equipment shall be as follows, or approved equal:
   1. McElroy No. 412 Hydraulic Fusion Machine, McElroy Manufacturing, Tulsa, Oklahoma.
   2. Proweld Field 12 (315)-R, Asahi/America, Malden, Massachusetts.

FITTINGS

A. The Contractor shall provide fabricated fittings where required. Fabricated fittings shall be of the same material as, and shall have a minimum pressure rating equal to, the pipeline material. If the fitting is in-line with the pipeline (i.e., a flange adapter), then the I.D. of the fitting shall be the same as the pipe. If the fitting is off-line (i.e., a tee), then the fitting shall have an I.D. in accordance with the plans. Unless otherwise required, all fittings shall be butt-fusion welded or flanged.

B. Terminations to pipe or fittings made of other pipe materials shall be made by using flanges. Flanges shall

consist of flange adapters butt-fusion welded to the HDPE pipe end, ductile iron back-up rings with a pressure rating of at least one-hundred and fifty (150) pounds per square inch (psi), Type 316 stainless steel bolts, nuts and washers, and one eighth (1/8) inch thick, black-reinforced rubber gaskets. In no case shall threaded fittings or adapters be used to connect HDPE materials.

EXECUTION

GENERAL

A. Sewer pipelines shall be constructed in compliance with the requirements of this Section and of Section 4-1.30 – Piping, General.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

HANDLING AND STORAGE

A. The Contractor shall inspect each pipe and fitting prior to butt-fusion welding and again prior to installation. Any damaged pipe or fittings shall be replaced by the Contractor.

B. Prior to butt-fusion welding or installation, each pipe or fitting shall be thoroughly cleaned and shall be kept clean. The material used to clean the pipe and fittings shall be as recommended by the pipe manufacturer.

BUTT-FUSION WELDING

A. Butt-fusion welds shall be performed in accordance with manufacturer's instructions. The butt-fusion welding procedures are summarized below:
   1. Clean each pipe end with a clean cotton cloth to remove dirt, oil, grease and other foreign materials.
   2. Square (face) the mating surfaces of each of the pipes to be fused.
   3. Bring the two (2) pipe ends together and adjust the pipe locations to ensure proper alignment.
   4. Verify that the surface temperature of the heater plate is between three hundred seventy five degrees Fahrenheit (375°F) to four hundred degrees Fahrenheit (400°F) and then clean the heater surface with a clean cotton cloth.
   5. Insert the heater plate between the pipe ends, bring the ends into firm contact with the heater plate without applying pressure and achieve a proper melt pattern.
   6. After achieving the proper melt bead, remove the heater plate and quickly examine the pipe ends for complete melt.
   7. Once complete melt has been accomplished, rapidly bring the pipe ends together and apply pressure as recommended by the pipe manufacturer.
   8. Hold the pressure constant and at the proper level throughout the cooling period, for the minimum time period recommended by the pipe manufacturer or as necessary to achieve proper cooling.

B. For main sewer installations, the Contractor shall mark each joint with the individual joint number, corresponding to the joint identification number appearing on the printout of the data logger attached to the butt-fusion welding machine. The printout shall be attached to the pipe near the joint for collection by City of Richmond.

C. For main sewer installations, the Contractor shall remove the internal melt bead from the welded joint. Bead removal shall be accomplished in a manner that does not score or gouge the pipe.

INSTALLATION

A. The Contractor shall insert and retrieve the pipe through properly prepared insertion and receiving pits, in accordance with the requirements of ASTM F 585.

B. All pipe bursting and directional drilling procedures that require the use of HDPE pipe, shall be executed as listed in Section 4-1.10 - Horizontal Directional Drilling and Section 4-1.12 - Pipe Bursting.

C. For side sewer installations, a maximum of ten (10) joints per one hundred foot (100) length of laid pipe shall be achieved, unless all joints are de-beaded.

PIPE DEFLECTION

Horizontal curves shall be installed by forced bending of the pipe by special variance from COR. Minimum curvature radius requirements for HDPE pipe are shown on the table below. All designs of curvilinear sewers are subject to approval by City of Richmond.

HDPE	
Pipe DR	Minimum Curve Radius
≤ 9	20 times pipe O.D.
> 9 - 13.5	25 times pipe O.D.
> 13.5- 21	27 times pipe O.D.
> 21	30 times pipe O.D.
Fitting or flange present in bend	100 times pipe O.D.

FIELD COUPLINGS

A. Fittings/joints that are to be assembled after pipe bursting or directional drilling has been completed shall be butt fused where accessible. Electrofusion couplings listed in the Approved Materials List shall be used on inaccessible locations.

B. Saddles used for taps shall be per the Approved Materials List.

4-1.36 CAST IRON SOIL PIPE

GENERAL

THE REQUIREMENT

The Contractor shall furnish and install cast iron soil pipe and all appurtenances as specified, complete and in place, as shown on the plans, as specified in this Section and in Section 4-1.30 Piping, General.

RELATED WORK SPECIFIED ELSEWHERE

A. Section 4-1.30 – Piping, General.

REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM A 74 Standard specifications for Hub and Spigot Cast Iron Soil Pipe and Fittings

CISPI 301 Hubless Cast Iron Soil Pipe and Fitting for Sanitary and Storm Drain, Waster and Vent Piping Applications

QUALITY ASSURANCE

A. Except as modified in this Section, all materials used in the manufacture or installation of the pipe shall be tested in accordance with the requirements of the referenced standards.

B. Submittals and testing shall be done in compliance with Section 4-1.30 - Piping, General of these Specifications.

PRODUCTS

PIPE AND FITTINGS

A. All hub and spigot cast iron pipes (CIP) shall conform to the requirements of ASTM A 74 as it applies to single hub, extra heavy and service weight pipe.

B. Service weight, Class SV, pipe shall be the normal requirement of CIP installations; however, the Inspector may require use of extra heavy, Class XH, pipe or ductile iron pipe under special conditions.

C. CIP may be installed without the use of foundation bedding material where such trench bottom provides solid bearing for the full length of the pipe. The Inspector may require foundation bedding material where conditions warrant.

D. Cast Iron "Hubless" pipe and fittings shall conform to the requirements of the Cast Iron Soil Pipe Institute, (CISPI), "Standard No. 301."

EXECUTION

GENERAL

A. Sewer pipelines shall be constructed in compliance with the requirements of this Section and of Section 4-1.30 - Piping, General.

B. Work shall meet or exceed the requirements of these Specifications unless applicable requirements of an agency having jurisdiction (including the terms and conditions of an encroachment permit issued by a city or county) are greater, in which case the greater requirements shall govern.

C. Cast Iron Soil Pipe shall not be used in food service or grease interceptor applications.

COUPLINGS

A. Hubless pipe shall be installed in accordance with CISPI Pamphlet No. 100 using only four (4) banded couplings or approved equals per the Approved Materials List.

B. The use of a properly calibrated torque wrench set to sixty (60) foot-pounds for jointing shall be mandatory.

SECTION 5 - SANITARY SEWER STANDARD DRAWINGS

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SECTION 6 - APPROVED MATERIALS LIST

6-1.01 BEDDING AND BACKFILL MATERIALS

Material Type(s): Bedding Type, Backfill

Description:

TYPE	MATERIAL DESCRIPTION
CLSM	• Controlled Low Strength Material
Coarse	• Drain or Foundation Rock • Crushed stone or gravel (not mined alluvial material) • Minimum of 95% crushed particles • Durability Index of 40
Type 1	• Class 2 Aggregate Base • Newly quarried or recycled material (not mined alluvial material) • Three-quarter (3/4) inch maximum grading
Type 3	• Free of vegetable matter, debris and refuse, concrete, stones or clods larger than four (4) inches
Type 3 Select	• Particles must not exceed three-quarter (3/4) inch in diameter • Free of vegetable matter, debris and refuse, concrete, stones or clods larger than four (4) inches

6-1.02 GEOTEXTILE FABRIC

Material Type(s): Geotextile fabric

Description: Geotextile fabric for paving and wrapping foundation rock.

	Manufacturer	Product
FABRIC FOR WRAPPING FOUNDATION ROCK	Mirafi	600X
	US Fabrics	US 315
	Webtec	HD
	Carthdage Mills	FX-66
	Amoco	2006
	Propex	300 ST
	SKAP	W315
	Thrace/Linq	GTF 300
FABRIC FOR PAVING	Mirafi	Mirapave 400
	US Fabrics	US 90P
	Webtec	OL
	Carthdage Mills	FX-38 OL
	Amoco	4599 Petromat
	Propex	381
	SKAP	GC 130
	Thrace/Linq	130 EX

6-1.03 CAST IRON FITTINGS



Combination Wye and (1/8) Bend



1/8 Bend



Long Sweep Quarter Bend



P Trap



Reducer



Reducing Combination



San Tee



1/16 Bend



Two Way Combination (Clean Out Only)



Wye



Twin Cleanout

Note: Other fittings may be accepted under special use approval. Contact the District Inspector for such circumstances. All fittings to be four inch (4") or larger.

6-1.04 CAST METAL PRODUCTS

Material Type(s): Manhole frames, Covers, Rodding Inlets, Adjustment Rings

Manufacturer: Cast Metal Products such as Manhole Frames, Covers, Rodding Inlets and Adjustment Rings can be obtained from but are not limited to the following approved manufacturers:

1. D&L Foundry and Supply
   Phone Number: (707) 557-4525

2. South Bay Foundry
   Phone Number: (209) 367-1940

6-1.05 COUPLINGS

Material Type(s): Banded Rubber Couplings

Description: For repairs, alterations and house sewers with connections of dissimilar materials. Banded rubber couplings shall have four (4) clamps and metal shear bands.

Manufacturer: Manufacturers included but are not limited to:

1. Fernco®
2. Mission®
3. Husky®

Note: Check with Inspector prior to purchase of material to ensure proper coupling is selected for the different pipe types encountered.



Mission® Band Seal



Joints® Calder Coupling



Fernco® Proflex Coupling



Fernco® Stainless Steel Shear Rings
(60 in-lb)



Anaco No Hub (60 in lb)
(For House Only)



Fernco® Strong Back RC Couplings
(60 in-lb)



Fernco® 5000 Series RC Couplings
(60 in-lb)

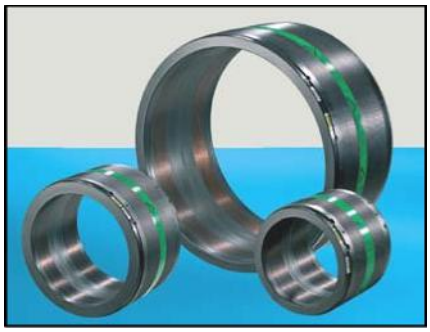


Fernco® No-Hub Couplings
Silver (60 in-lb), Yellow & Green (80 in-lb)
(For Houses Only)



Mission® Adjustable Repair Coupling

6-1.06 HIGH DENSITY POLYETHYLENE COUPLINGS



Friatec® Frialen
Electrofusion Coupling

6-1.07 HOUSE SEWERS: 4" AND 6"

Material Type(s): Pipe

Description: Pipe material for house sewers in four (4) and six (6) inch in diameter.

1. PVC Solid Wall–SDR 26
   (Bell & Spigot Joints)

2. Vitrified Clay Pipe (VCP)
   (Bell & Spigot Joints)
   (Plain Ended Joints)

3. HDPE SDR 17 Gray (Ductile Iron Pipe O.D.)
   (Butt Thermal Fused Joints)
   (Pipe Bursting or Directional Drilling only or at Inspector's discretion)

Note: HDPE SDR 17 shall be purchased in longest length practicable in order to achieve the minimum amount of pipe joints during construction. A maximum of ten (10) joints per one hundred foot (100) length of laid pipe shall be achieved, unless all joints are de-beaded.

6-1.08 OVERFLOW PROTECTION DEVICES

Material Type(s): Overflow Protection Devices (OPD)

Description: Overflow protection devices prevent sewage from entering homes and businesses and reroute the spill outside the building.

Manufacturer:

	MANUFACTURER	PRODUCT NAME
Extendable Backwater Valve	Mainline Backflow Products	Adapt-a-valve Inspection Chamber with Test-Eze Gate Feature
	Rector Seal	Clean Check Backwater Valve
"Mushroom"	Genplex	Kelly Backwater Device (No-Hub & IPS)
Sewer Popper™	Stephens Corp	Sewer PopperTM Model S62-304
Relief Cap	Unlimited Home Solutions LLC (www.unlimitedhomesolutions.com)	Sewer Relief Cap

Extendable Backwater Valves



ABS



PVC



"Mushroom" OPD



Sewer PopperTM OPD



Sewer Relief Cap

6-1.09 MAIN SEWERS: LESS THAN 18”

Material Type(s): Pipe

Description: Pipe material for sewers less than eighteen (18) inches in diameter.

1. PVC Solid Wall–SDR 26 (Bell & Spigot Joints)
2. Ductile Iron CL52 (Bell & Spigot Joints)
3. PVC Solid Wall C900 or C905 (Bell & Spigot Joints)
4. HDPE SR 17 Gray (Ductile Iron Pipe Size O.D.) (Butt Fused Joints, de-beaded)
5. Vitrified Clay (Bell & Spigot Joints)

Note: Special approval may be granted by City of Richmond for other materials as necessary for the specific application. Material shall be purchased in longest length practicable in order to achieve the minimum number of pipe joints.

6-1.10 JOINT RESTRAINT SYSTEMS

	MANUFACTURER	JOINT RESTRAINT SYSTEM
DIP	American Ductile Iron Pipe	“Lok-Fast” Restrained Joint
	U.S. Pipe	“TR FLEX” Restrained Joint
	U.S. Pipe	“Field-Lok 350 Gaskets”
PVC	BullDog Restraint System	BullDog PVC Pressure Pipe Integrated Joint Restraint System
	Certain Teed	Certa-Lok restrained joint system

6-1.11 PIPE FITTINGS: LESS THAN 18” SEWERS

Material Type(s): Pipe fittings

Description: Pipe fittings for pipelines that are less than eighteen (18) inches in diameter.

PIPE MATERIAL	FITTING
DIP	Wye, Tee, 11 1/4 ° Fitting, Mechanical Fittings
PVC Solid	Wye, Tee, Closure Coupling
	Saddle Tee, 3° Fitting, 11 1/4 ° Fitting
	90° Sweep Elbow
VCP	Wye, Tee

MANUFACTURER	FLEXIBLE FITTING	MAXIMUM ALLOWABLE FITTING DEFLECTION
Plastic Trends	SDR 26 Gasketed Sewer Fitting	4°
CertainTeed	Cast Iron O.D.	5°
	Iron Pipe Size O.D.	5°



90º Sweep Elbow for pressure side sewers



Saddle Tee Fitting



Wye, Tee Fitting



SDR 26 Heavy Wall Gasketed Sewer Fitting

6-1.12 TAPS

Material Type(s): Taps

Description: Tap materials for the corresponding type of main line sewer.

PIPE MATERIAL	MAINLINE TAP
ACP	• Fowler Saddle
CIP, DIP	• Fowler Saddle • Sealtite Type "S" Saddle with four (4) band coupling
HDPE	• Thermal-Fused Saddle
Insituform Liner	• PVC Saddle with Rubber Gasket and two (2) stainless steel straps
PVC	• Sealtite Type "S" Saddle with four (4) band coupling • PVC Saddle with Rubber Gasket and two (2) stainless steel straps
VCP	• Fowler Saddle • Sealtite Type "S" Saddle with four (4) band coupling
	•

Note: PVC taps may be done by any General Engineering ("A") Contractor registered with City of Richmond. All other taps must be done by either Tap-Tite Company or RotoRooter.



Fowler Saddle



HDPE Saddle



PVC Saddle

6-1.13 READY-MIX DESIGNS

Material Type(s): Concrete mix

Manufacturer:

1. Central Concrete Supply
   Phone Number: (408) 404-1030

MIX DESIGNATION	MIX DESIGN #
Controlled Low Strength Material	F35138AA
Cast-in-place Concrete	1EF115Q1
	163115C1

2. Cemex
   Phone Number: (650) 333-5357

MIX DESIGNATION	MIX DESIGN #
Controlled Low Strength Material	4212893
Cast-in-place Concrete	4212798

6-1.14 PRECAST PRODUCTS

Material Type(s): Precast Products such as Manhole Bases, Barrels, Cones, Grade Rings, Paving Rings, Adjustment Rings, Gaskets, Top Slabs, Grease Interceptors, Sampling Boxes and Sand-Oil Interceptors can be obtained from the following approved manufacturers.

Manufacturer:

1. Central Precast (US Concrete Precast Group) Phone Number: (925) 960-8740

2. Jensen Precast
   Phone Number: (707) 429-5500

3. Cook Concrete Products
   Phone Number: (530) 243-2562

6-1.15 CONCRETE CURING COMPOUNDS

Material Type(s): Concrete curing compounds

Description: Curing compounds shall be white pigmented and resin based.

MANUFACTURER	COMPOUND
Master Builders	MB-429
Burke Company	Spartan Cote Cure-Seal Hardener
Euclid Chemical Company	Super Rez Seal

Note: Sodium silicate compounds shall not be used.

6-1.16 REINFORCED CONCRETE UTILITY BOXES

Material Type(s): Utility boxes for traffic and non-traffic areas

	ITEM DESCRIPTION	PRODUCT
Traffic Area	12" x 12" Drain Box	Christy® V12 Box
	10-3/8" I.D. x 12" Valve Box	Christy® or Jensen® G5 Traffic Valve
	Cast Iron Grate (3/8" Max Spacing) H/20 Loading	Christy® V12-71W Welded Grate
Non-Traffic Area	8" I.D. x 12" Valve Box	Christy® or Jensen® F8 Box
	8-1/2" I.D. x 11-3/4" Drain Box	Christy® V1 Drain Box
	10-5/8" I.D. x 17-1/4" Drain Box	Christy® V9 Drain Box
	Cast Iron Grate 3/4" Max Spacing	Christy® V1-71C Grate and V9-71C Grate



Christy® V12 Box



Christy® G5 Box



Christy® F8 Box



Christy® V12-71W Welded Grate



Christy® K-6004 Grate (Special Order)



Christy® V1-71C Grate

6-1.17 PUMP SYSTEMS

Material Type(s): Pre-Approved Pump Systems, Pipe

Description:

VENDOR	SYSTEM	PIPE MATERIAL
E-One	D-Series, W-Series, I-Series and G-Series	HDPE (SDR 11) or PVC (Sch 40 or 80)
Liberty	2448- Series, Pro370 Series, Pro380 Series	HDPE (SDR 11) or PVC (Sch 40 or 80)
Aqua Pro Pump Systems	E-Series, EDP Series, ESP-Series, SG-Series, DG-Series	HDPE (SDR 11) or PVC (Sch 40 or 80)

Note: Complete packages are required for Pre-Approved Pump Systems. This includes a pump, alarm panel, isolation and check valves, sump and sump extensions (as required). Individual parts of Pump System are not pre-approved by City of Richmond. Models include but are not limited to the ones below, contact City of Richmond for special approval of all others.



E-One® Model D-H071



Liberty® 2448 Series



E-One® Model Gator Grinder



Liberty® Pro370-Series
(2” discharge system,
Required Access Riser)



Liberty® Pro380 Series
(2” discharge system,
Required Access Riser)



Aqua Pro SG-1182-2

6-1.18 GREASE TRAPS

(Referred to in the UPC as Hydromechanical Grease Interceptors) Material Type(s):

Grease Traps

Description: Grease traps for trash enclosures with a 4” connector

Manufacturers:

1. Zurn
   Phone Number: (805) 238-7100
2. Jay R. Smith Manufacturing Co. Phone Number: (334) 277-8520
3. Schier Products
   Phone Number: 1-800-827-7119
4. Dormont
   Phone Number: 1-800-376-6668

MANUFACTURER	PRODUCT
Zurn	Z1165, Z1170, Z1172, GT2700 Grease Interceptors
Jay R. Smith Manufacturing Company	8000-8100 Series
Schier	PATG-2025, PATG-2420
Dormont	WD Series PDI Certified Grease Interceptor



Jay R. Smith
800-8100 Series



Dormont
WD Series



Zurn
Z1170



Schier Products Trapper II*
PATG-2025 or PATG-2420
*Designed for indoor use only

Note: Models without a standard 4” connector shall be upgraded to 4”.

6-1.19 MISCELLANEOUS APPROVED MATERIALS

	MANUFACTURER	PRODUCT
D.E. Separation Tanks	Pentair Pool Products	Product # 60 SEP
	Hayward Pool Products	Model # C9002 SEP
Epoxy Adhesive Anchors	Sika	FI System with Sikadur® Injection Gel Epoxy
	Hilti	HIT HY150 Adhesive Anchors
	BASF	Concresive® 1420 Gel Epoxy Adhesive
	BASF	Concresive® Paste LPL
Expanding - Type Anchors	ITW	Red Head®, Trubolt Wedge Anchor
	Hilti	Kwik-Bolt 3 Expansion Anchor
Galvanizing Field Repairs	Carboline®	Galvanox
Glass Capsule Polyester Resin Adhesive Anchors	Hilti	HVU Adhesive Capsule
HubSettTM	Rector Seal®	HubSettTM
Manhole Sealing Products	J-K Polysource®	External Joint Wrap M-860
	Henry®	Rubr-Nek External Joint Wrap
	ConSeal®	CS-50 Liquid Butyl Primer
	ConSeal®	CS-101 Butyl Sealant for Precast Structures
	Henry®	RAM-NEK Joint Sealant
Transition Cements	Weld-On®	ABS to PVC Transition Cement
	Oatey®	ABS to PVC Transition Green Solvent Cement
Waterstops	Newby	Rubber Water Stop Ring

6-1.20 MISCELLANEOUS APPROVED MATERIALS

Anchors



Trubolt Wedge Anchor



HVU Adhesive Capsule



HIT HY150 Adhesive Anchor

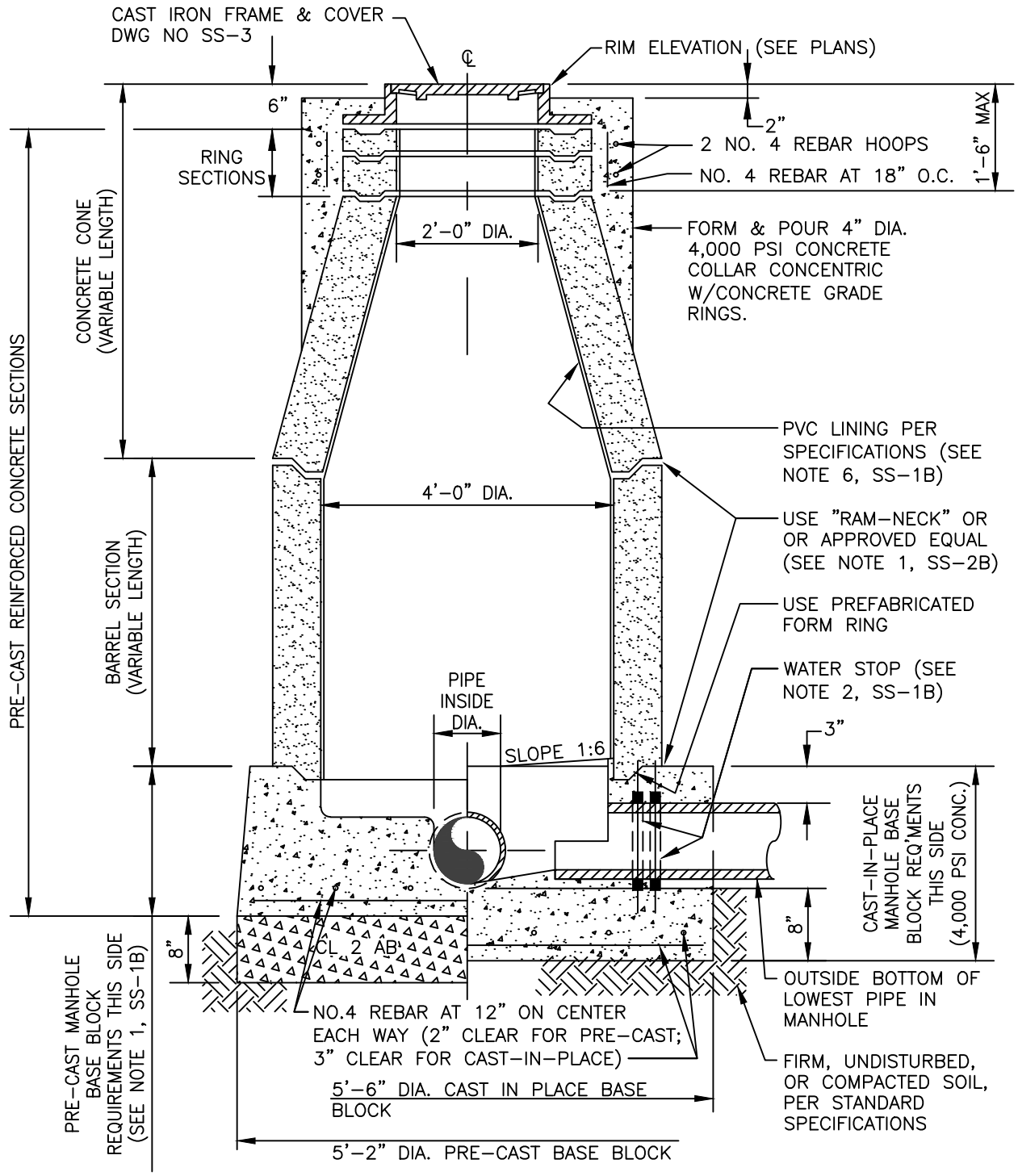
Miscellaneous



Waterstop Rings



HubSettTM



ELEVATION

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REGISTERED PROFESSIONAL ENGINEER
YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT

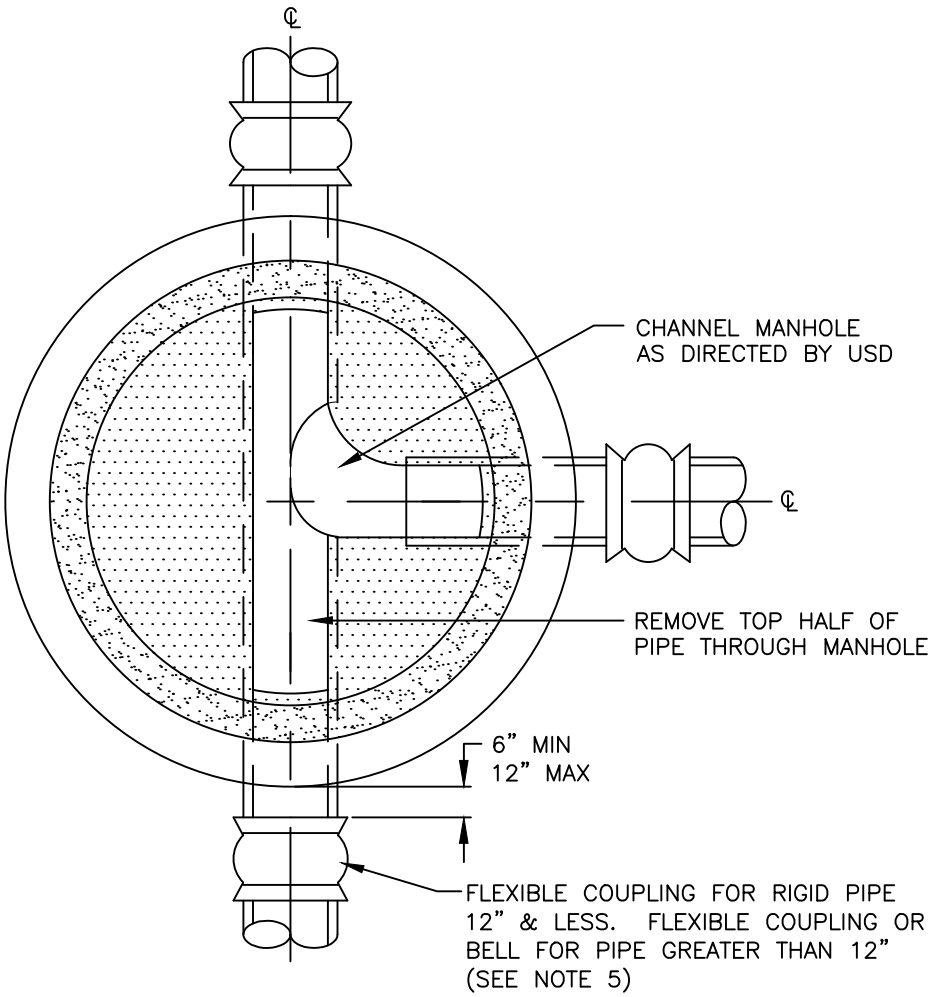
STANDARD PLANS

APPROVED BY:

YADER BERMUDEZ PUBLIC WORKS DIRECTOR

STANDARD MANHOLE DETAIL

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PLAN

NOTES:

1. PRECAST MANHOLE BASE BLOCKS SHALL ONLY BE USED AFTER PRIOR APPROVAL HAS BEEN RECEIVED FROM CITY FOR EACH LOCATION TO BE USED.

2. FLEXIBLE PIPE ONLY – AN APPROVED WATER STOP, SUCH AS TWO O–RINGS OR A BANDED RUBBER COUPLING, SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE AND CENTERED UNDER THE MANHOLE WALL AS SHOWN.

3. INSTALL "RAM–NECK" OR APPROVED EQUAL BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS TO MAKE A FLEXIBLE WATER–TIGHT JOINT. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON THE INSIDE OF MANHOLE.

4. CEMENT MORTAR SHALL BE USED BETWEEN ALL GRADE RINGS.

5. FLEXIBLE COUPLING NOT REQUIRED FOR FLEXIBLE PIPE OR IF MANHOLE IS INSTALLED OVER EXISTING SANITARY SEWER.

6. PVC LINE STANDARD MANHOLES WHERE REQUIRED BY THE ENGINEER.

REGISTERED PROFESSIONAL ENGINEER
YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT

STANDARD PLANS

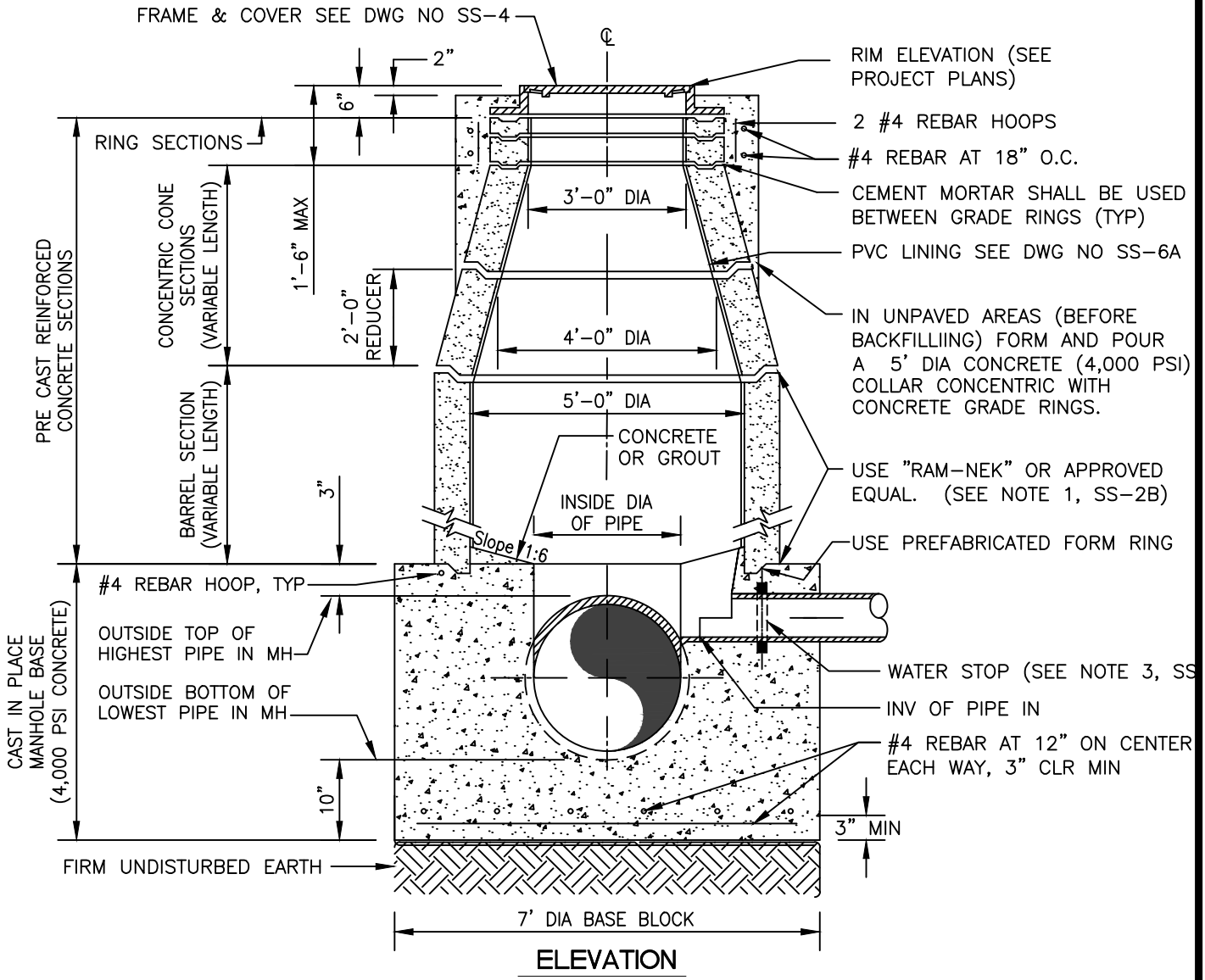
APPROVED BY:

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STANDARD MANHOLE DETAIL

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CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT

STANDARD PLANS

REGISTERED PROFESSIONAL ENGINEER
YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

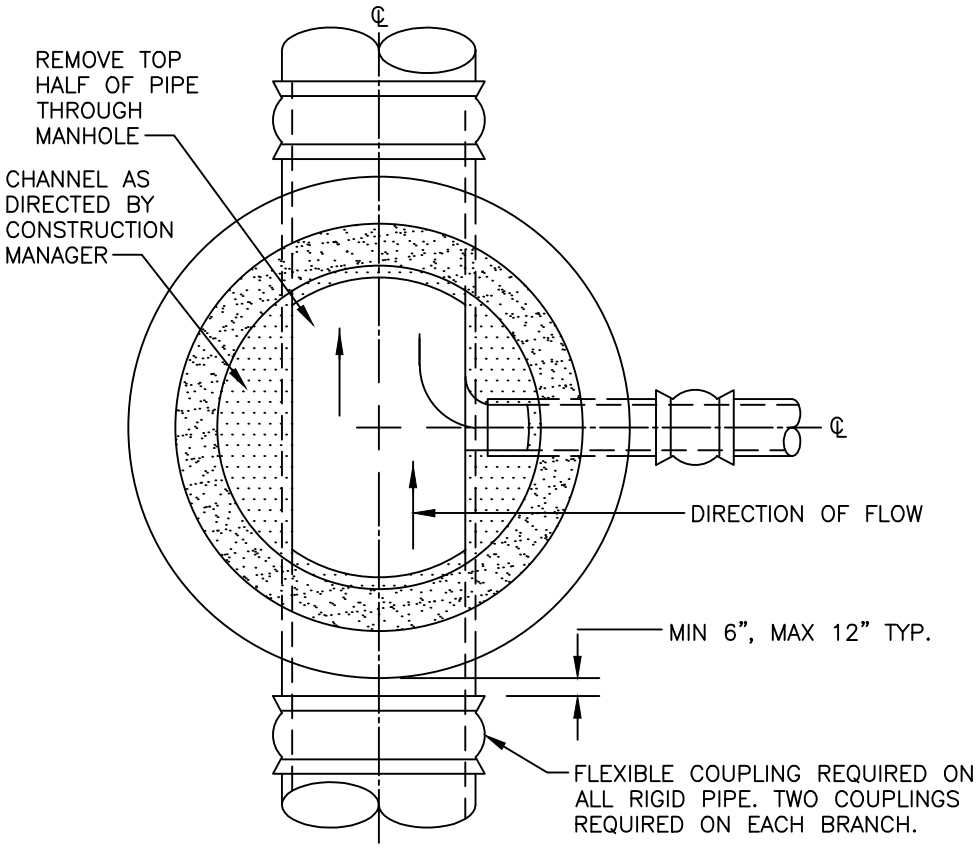
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TRUNK MANHOLE DETAIL

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PLAN

NOTES:

1. INSTALL "RAM–NEK" OR APPROVED EQUAL BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS TO MAKE A FLEXIBLE WATER–TIGHT JOINT. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON THE INSIDE OF MANHOLE.

2. FLEXIBLE COUPLING NOT REQUIRED FOR FLEXIBLE PIPE OR IF MANHOLE IS INSTALLED OVER EXISTING SANITARY SEWER.

3. FLEXIBLE PIPE ONLY – AN APPROVED WATER STOP, SUCH AS A BANDED RUBBER COUPLING, SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE AND CENTERED UNDER THE MANHOLE WALL AS SHOWN.

4. CEMENT MORTAR SHALL BE USED BETWEEN ALL GRADE RINGS.

5. ONLY CAST–IN–PLACE CONCRETE BASES SHALL BE USED.

REGISTERED PROFESSIONAL ENGINEER
YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT

STANDARD PLANS

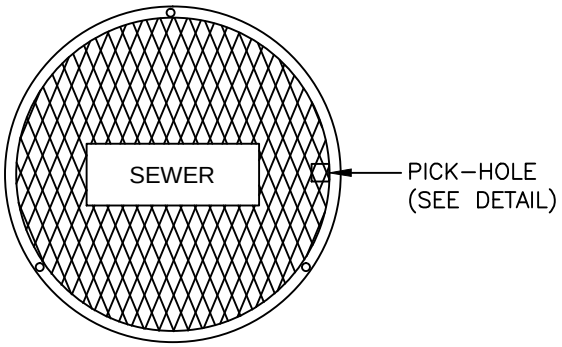
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YADER BERMUDEZ PUBLIC WORKS DIRECTOR

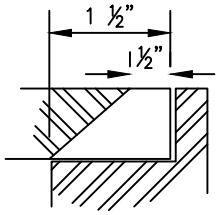
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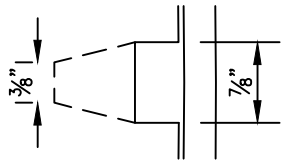
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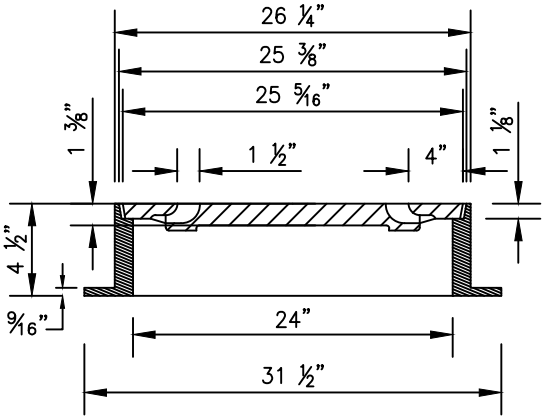


ELEVATION SECTION



PLAN SECTION

PICK HOLE DETAIL



ELEVATION SECTION

NOTES:

1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO CITY APPROVAL.
2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER ASTM A–48.
3. RAISED LETTERS ¼" HIGH TO BE CAST IN CENTER OF MANHOLE COVER.
4. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.
5. MANHOLE FRAME AND COVER SHALL BE AS MANUFACTURED BY SOUTH BAY FOUNDRY, OR APPROVED EQUAL.
6. FRAME AND COVER BEARING SURFACES SHALL BE MACHINED TO ASSURE CLOSE, QUIET FIT.

REGISTERED PROFESSIONAL ENGINEER
YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

CITY OF RICHMOND ENGINEERING SERVICES DEPARTMENT

STANDARD PLANS

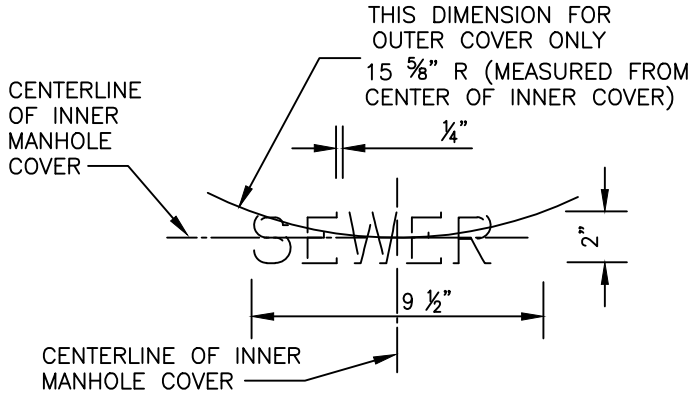
APPROVED BY:

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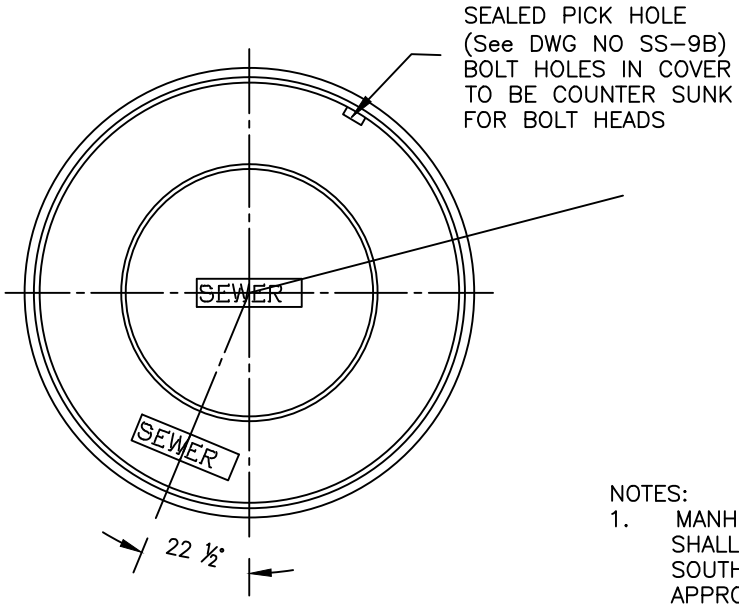
24" DIA MANHOLE FRAME AND COVER DETAIL

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
REVISED:			1 OF 1	SS-3

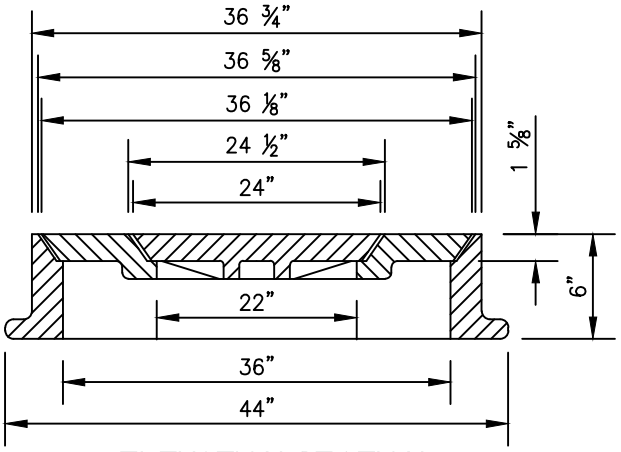
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LETTERING DETAIL



PLAN SECTION



ELEVATION SECTION

NOTES:

1. MANHOLE FRAME AND COVER SHALL BE AS MANUFACTURED BY SOUTH BAY FOUNDRY, OR APPROVED EQUAL.
2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER ASTM A-48.
3. RAISED LETTERS 1/4" HIGH TO BE CAST IN CENTER OF MANHOLE COVER.
4. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO APPROVAL.
5. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVERS SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

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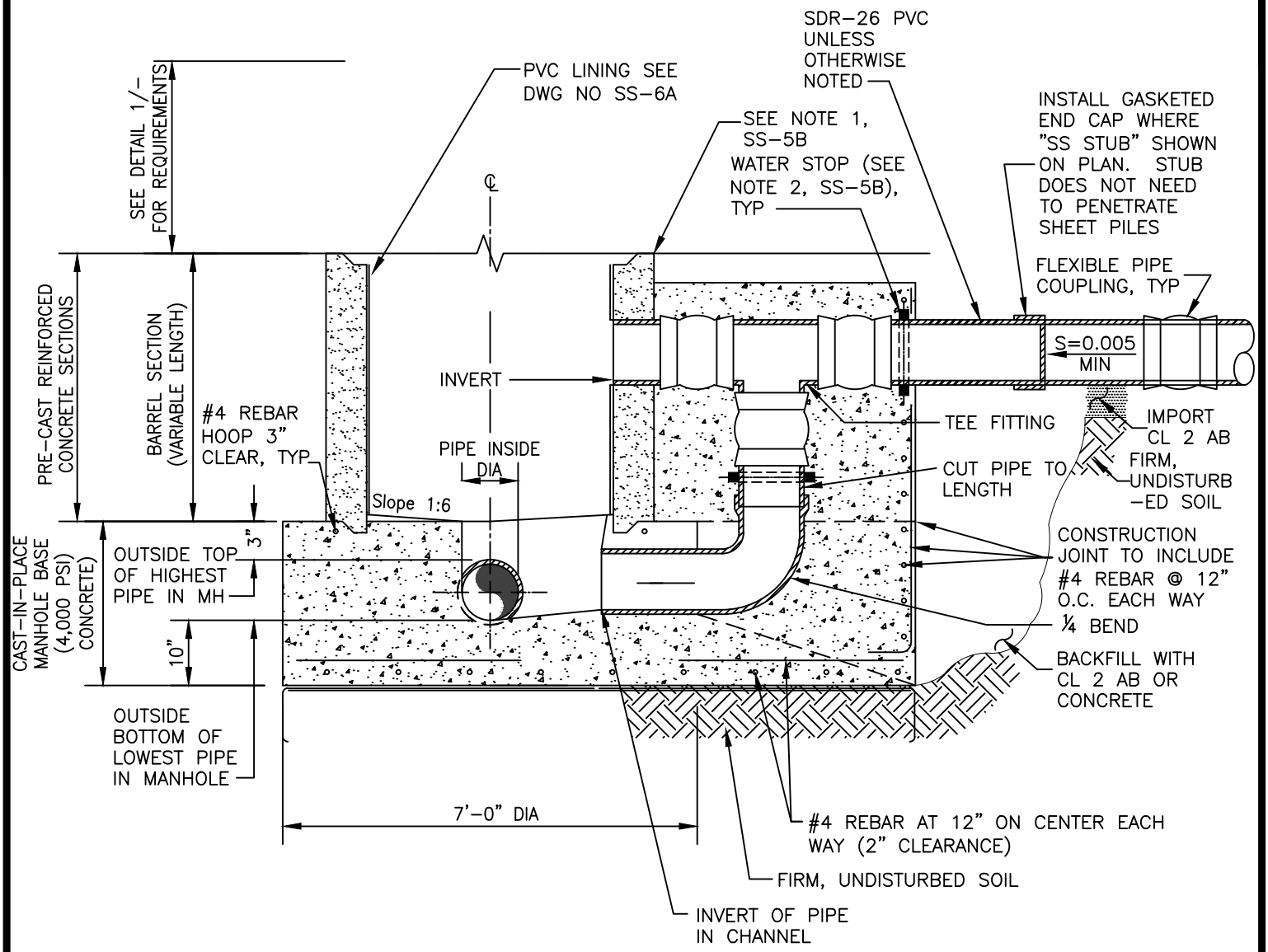
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36" DIA MANHOLE FRAME AND COVER DETAIL

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
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ELEVATION

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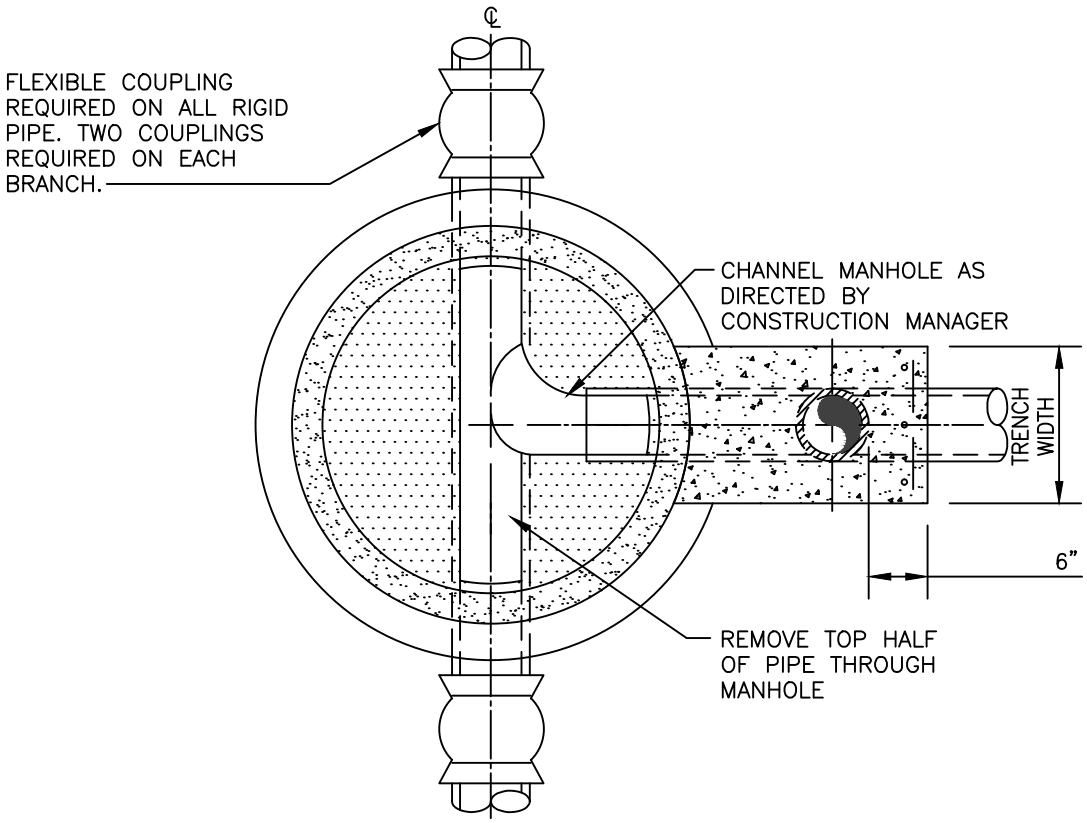
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DROP MANHOLE DETAIL

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
REVISED:			1 OF 2	SS-5A



PLAN

NOTES:

1. INSTALL "RAM–NEK" OR APPROVED EQUAL BETWEEN EACH JOINT OF THE CONE AND BARREL SECTIONS. AFTER JOINT IS MADE, TRIM JOINT SMOOTH ON THE INSIDE OF MANHOLE.
2. FLEXIBLE PIPE ONLY – AN APPROVED WATER STOP, SUCH AS A BANDED RUBBER COUPLING, SHALL BE INSTALLED ON ALL FLEXIBLE PIPE ENTERING OR LEAVING A MANHOLE, AND CENTERED UNDER THE MANHOLE WALL AS SHOWN.
3. CEMENT MORTAR SHALL BE USED BETWEEN ALL GRADE RINGS.
4. FLEXIBLE COUPLING NOT REQUIRED FOR FLEXIBLE PIPE OR IF MANHOLE IS INSTALLED OVER EXISTING SANITARY SEWER.
5. ONLY CAST–IN–PLACE CONCRETE BASES SHALL BE USED.

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YADER BERMUDEZ
No. C 040523
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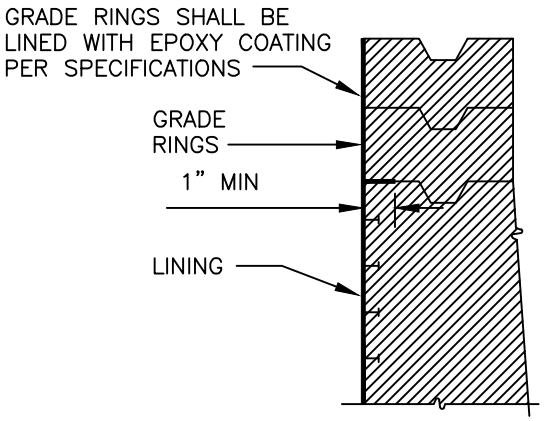
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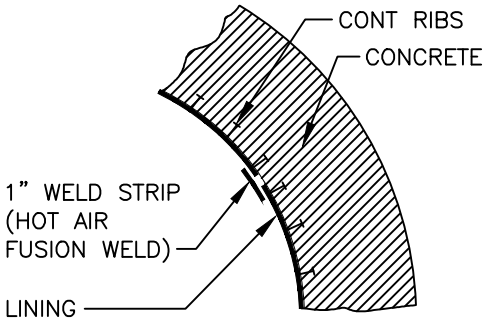
DROP MANHOLE DETAIL

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
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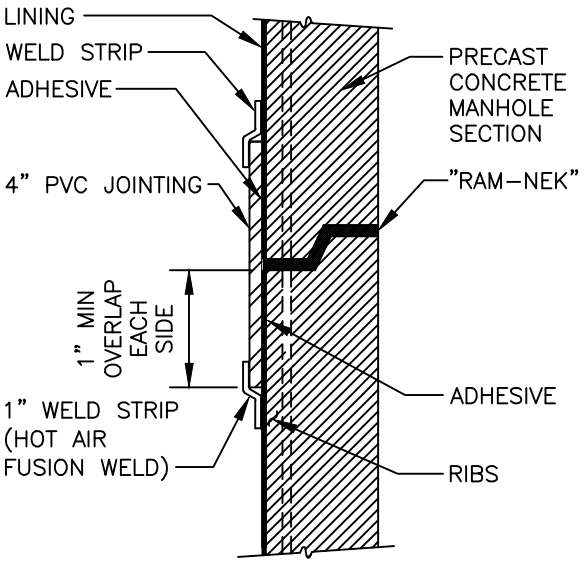
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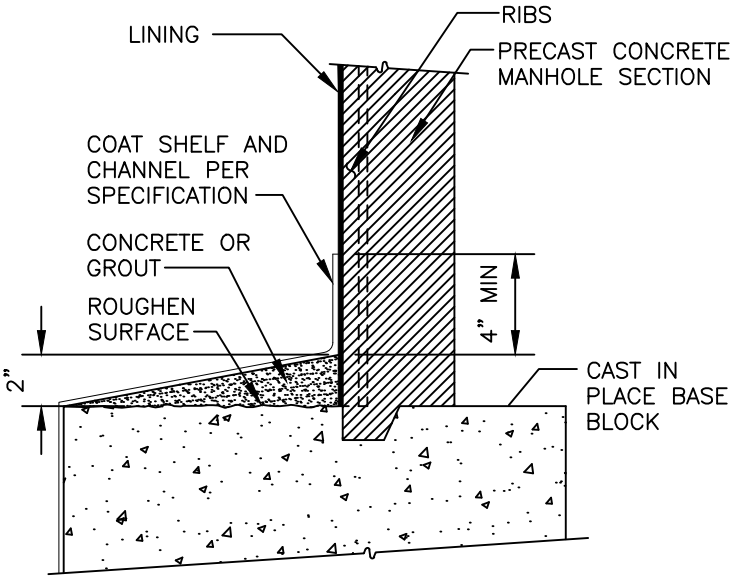
AT GRADE RINGS



VERTICAL JOINT STRIP



PRECAST MANHOLE JOINT



AT MANHOLE BASE

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STANDARD PLANS

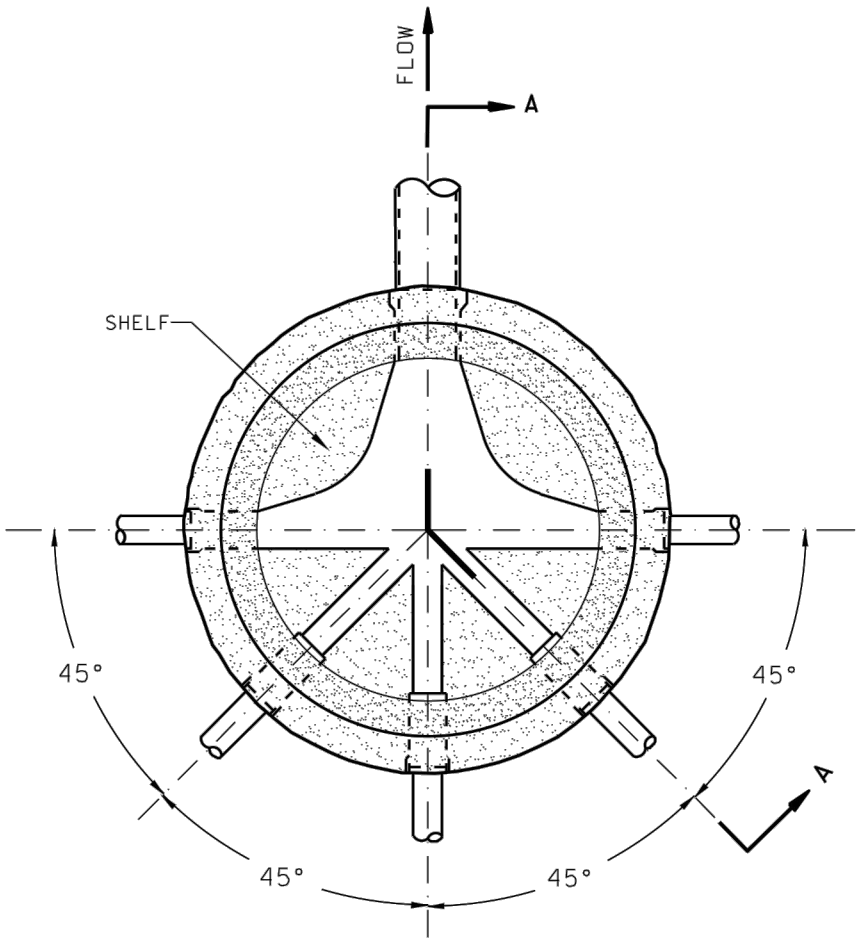
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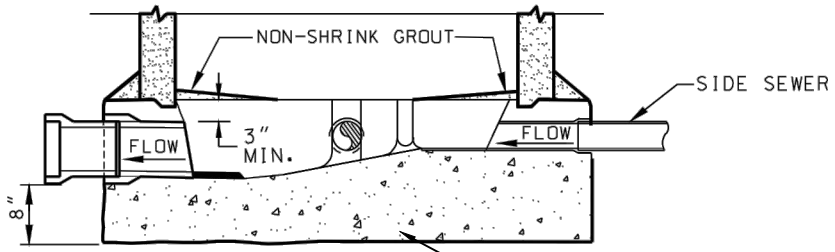
PVC LINING FOR MANHOLES

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
REVISED:			1 OF 3	SS-6A

FOR LINES TERMINATING IN A CUL-DE-SAC



PLAN



SEE SS-1A FOR MANHOLE BASE, BEDDING & FOUNDATION DETAILS.

NOTES:

1. NO LATERAL CONNECTIONS SHALL BE MADE IN DOWNSTREAM HALF OF MANHOLE.
2. MAXIMUM NUMBER OF SIDE SEWERS ALLOWED = 5.
3. TOP OF SIDE SEWERS SHALL BE NO LOWER THAN TOP OF OUTLET PIPE.
4. SEE SS-6C FOR REQUIRED JOINT LOCATIONS.

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STANDARD PLANS

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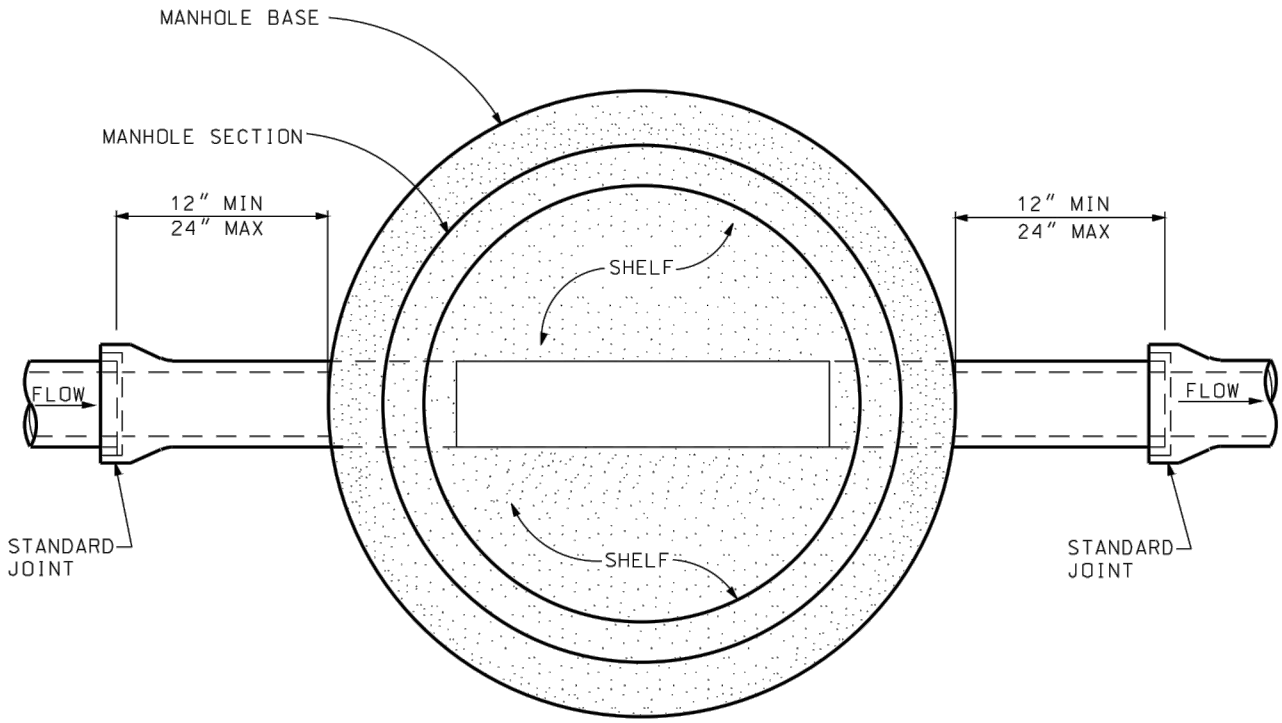
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SPECIAL BASE DETAIL - CUL-DE-SAC

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PIPE JOINT REQUIREMENTS WHERE PIPE IS LAID THROUGH MANHOLE



NOTE:

1. JOINT LOCATIONS APPLICABLE TO ALL INCOMING AND OUTGOING PIPELINES, EXCEPT THAT THE 24" MAXIMUM DIMENSION SHALL NOT APPLY TO PVC PIPE LAID THROUGH A MANHOLE.

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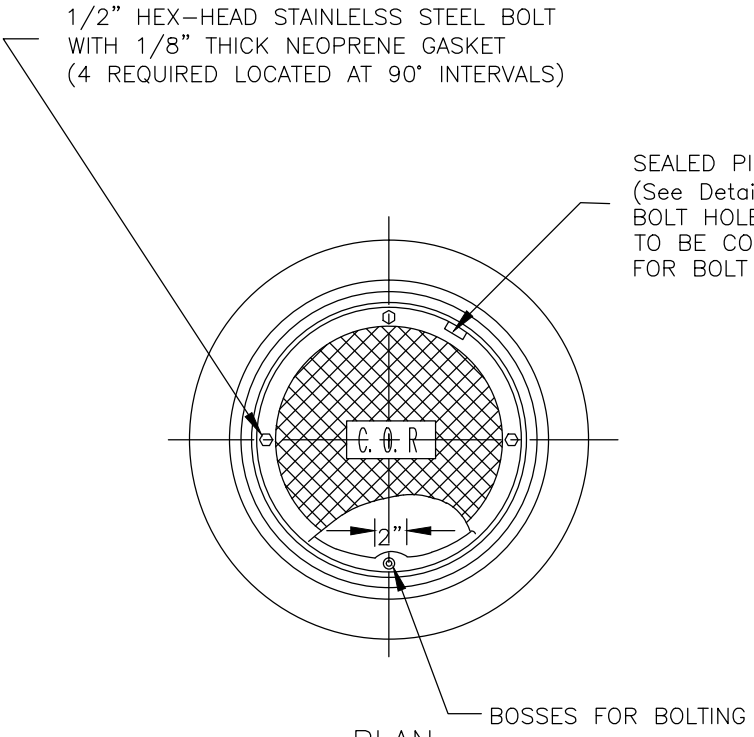
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PIPE JOINT REQUIREMENTS WHERE PIPE IS LAID THROUGH MANHOLE

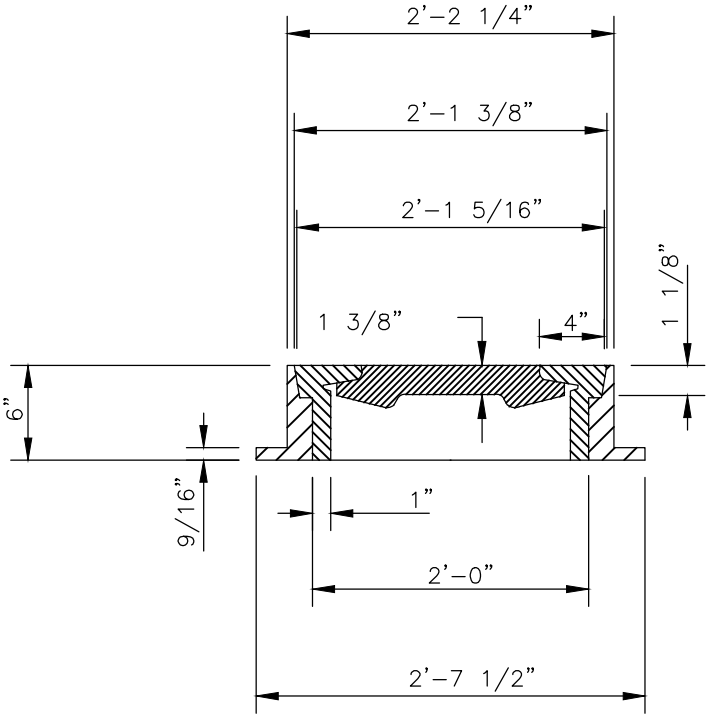
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PLAN

SCALE: NTS



ELEVATION SECTION

SCALE: NTS

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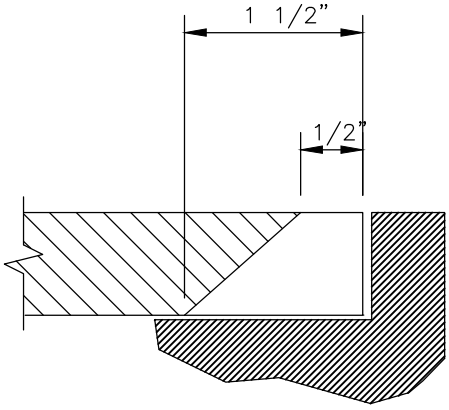
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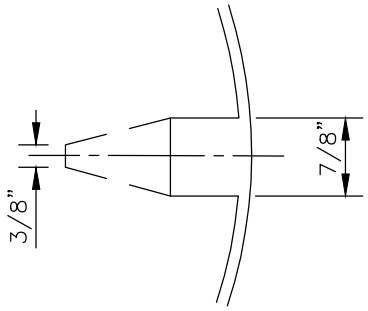
BOLT DOWN MANHOLE

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
REVISED:			1 OF 2	SS-7A

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ELEVATION
SCALE: NTS



PLAN

PICK HOLE DETAIL
SCALE: NTS

NOTES:

1.MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO C.O.R. APPROVAL.

2.CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 MINIMUM AS PER A.S.T.M. A-48.

3.WHEN VENT HOLES ARE SPECIFIED FOR THE BOLT-DOWN MANHOLE COVER ON PLANS, THEY SHALL BE DESIGNED AND SPACED AS SHOWN ON STANDARD MANHOLE COVER DETAIL SHEET NO. 6.

4.BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

REGISTERED PROFESSIONAL ENGINEER
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STANDARD PLANS

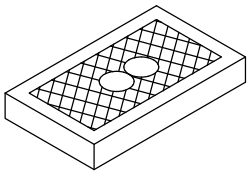
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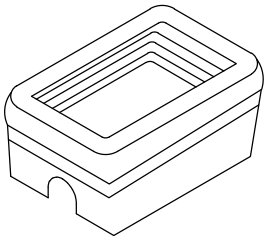
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BOLT DOWN MANHOLE

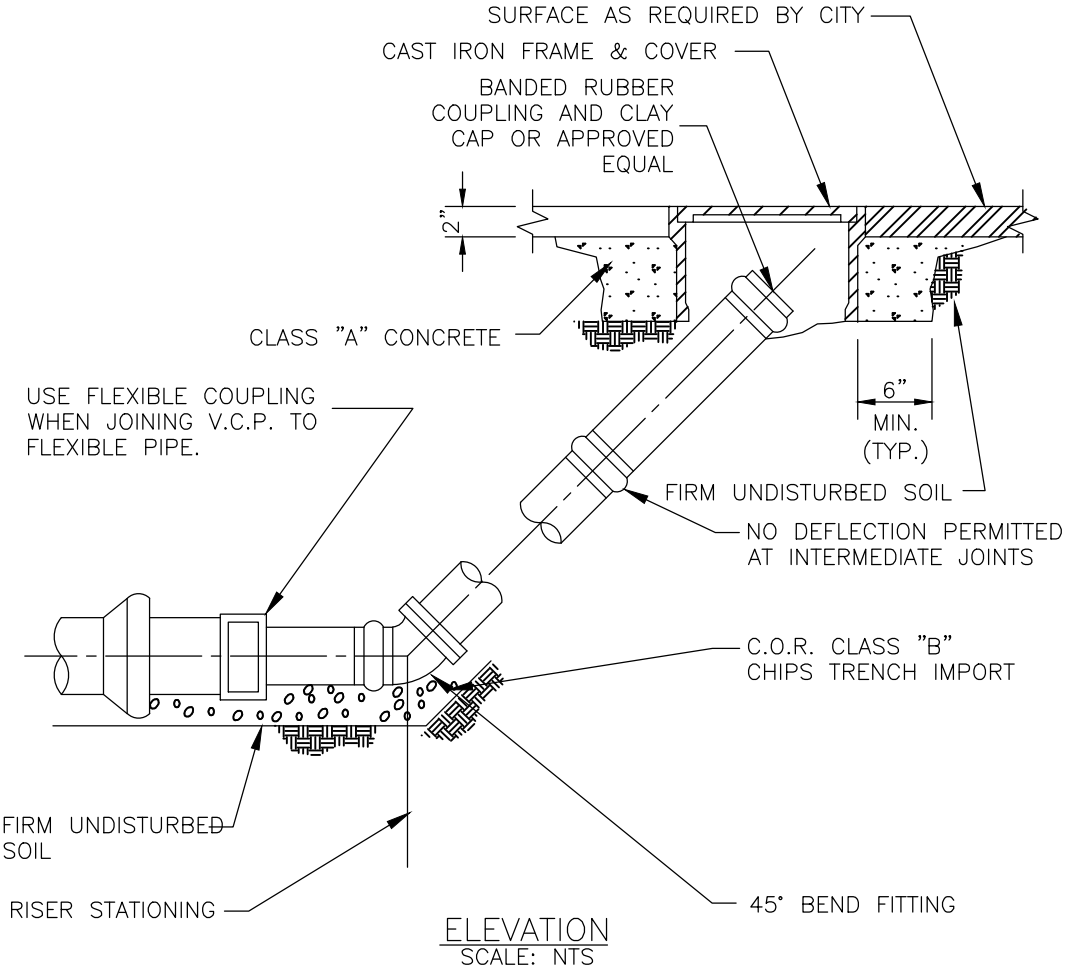
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CAST IRON COVER



ELEVATION
SCALE: NTS

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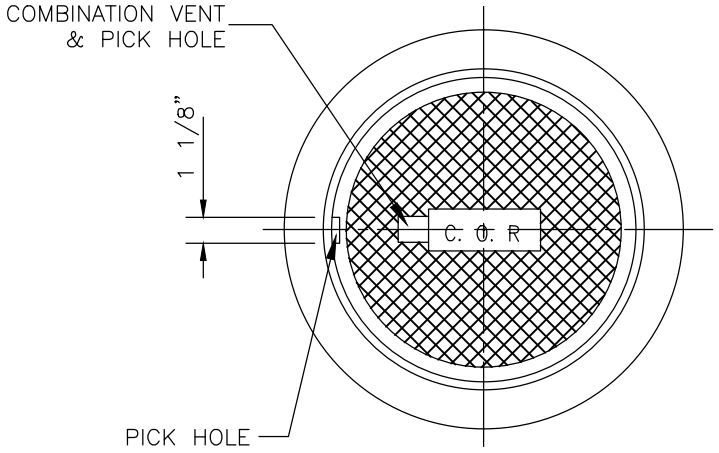
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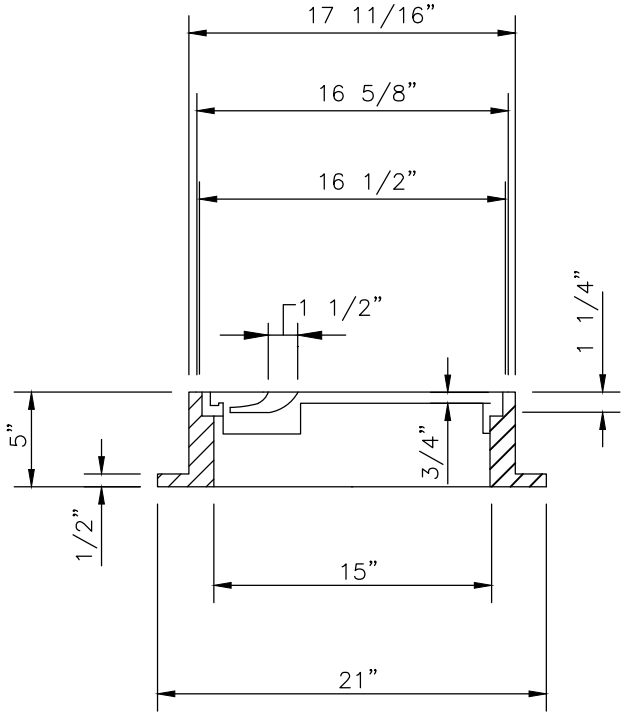
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RISER DETAIL

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
REVISED:			1 OF 2	SS-8A



PLAN
SCALE: NTS



ELEVATION SECTION
SCALE: NTS

NOTES:

1. MINOR MODIFICATIONS IN ABOVE DIMENSIONS AND MANUFACTURING CONFIGURATIONS ARE PERMISSIBLE SUBJECT TO "C.O.R." APPROVAL.

2. CAST IRON FOR FRAME AND COVER SHALL BE CLASS 30 AS PER A.S.T.M. A-48.

3. BEFORE LEAVING THE FOUNDRY, THE FRAME AND COVER SHALL BE PAINTED OR DIPPED IN ASPHALT PAINT.

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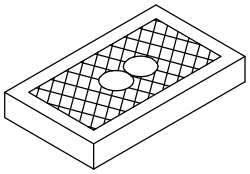
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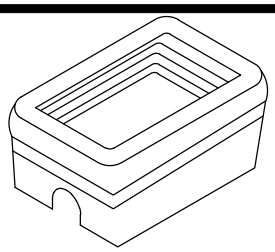
RISER FRAME & COVER

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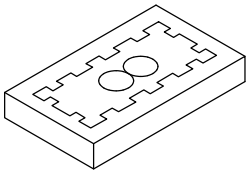
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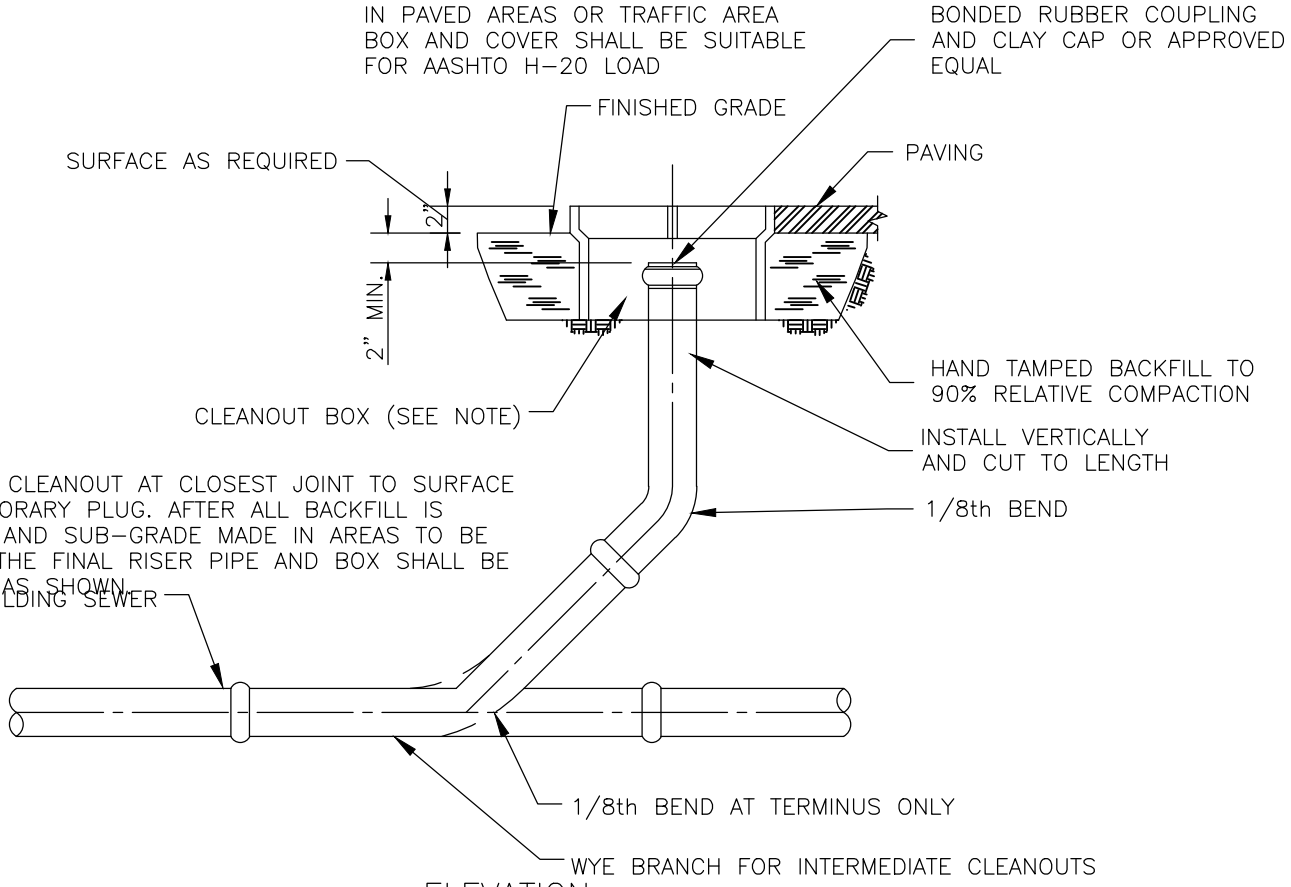
CAST IRON COVER



CONCRETE BOX



CONCRETE COVER



ELEVATION

SCALE: NTS

NOTE:

1. A RECTANGULAR BOX AS SHOWN ABOVE SHALL BE USED FOR CLEANOUTS THAT ARE CAPPED USING A BANDED RUBBER COUPLING.

2. CIRCULAR BOXES ARE PERMITTED FOR CLEANOUTS THAT ARE CAPPED WITH A SCREW TYPE CAP OR THE APPROVED TOP OPENING CAPS. TYPE AND MANUFACTURE SUBJECT TO APPROVAL.

3. CIRCULAR BOXES INSTALLED IN SIDEWALK AREAS SHALL HAVE A SOLID COVER WITHOUT HOLES.

4. APPROVED RECTANGULAR BOXES ARE: A)CHRISTY CONCRETE PRODUCTS 83 BOX WITH A 83D CONCRETE LID OR 83C METAL LID OR B)BROOKS PRODUCTS INC. NO. 3 METER BOX WITH A NO. 3 HEAVY DUTY CONCRETE LID OR A NO. 3 CAST IRON TRAFFIC LID OR AN APPROVED EQUAL.

5. CONCRETE LIDS ARE ACCEPTABLE FOR USE IN NON-VEHICULAR TRAFFIC AREAS, WHILE METAL LIDS MUST BE USED ELSEWHERE.

6. ALL CLEANOUT BOX LIDS SHALL BE MARKED WITH A LETTER "S" OR THE WORD "SEWER".

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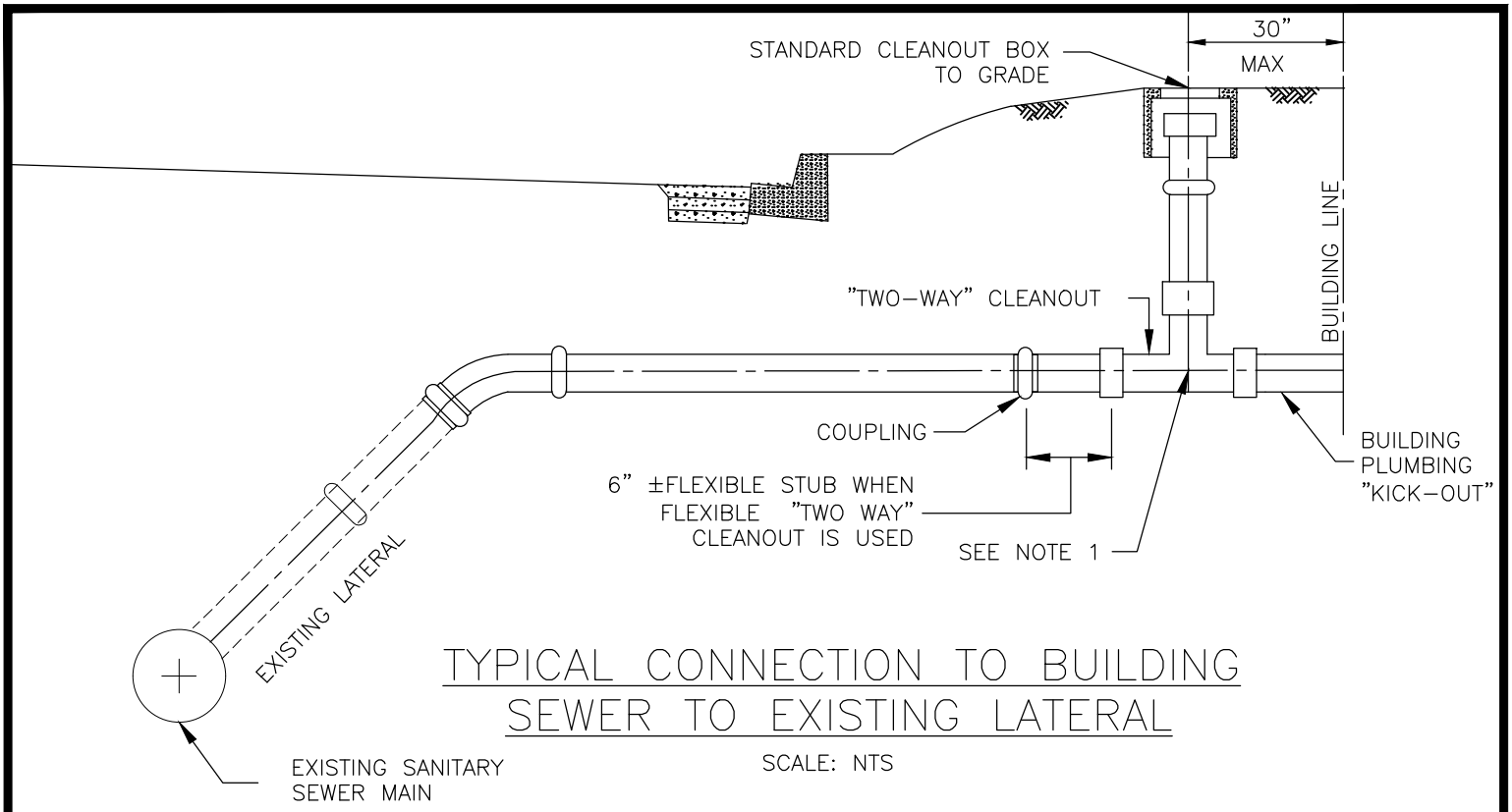
APPROVED BY:

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CLEANOUT DETAIL TO GRADE WITH WYE CONNECTION

DATE:	DRAWN:	CHECK:	SHEET NO.	DRAWING NO.
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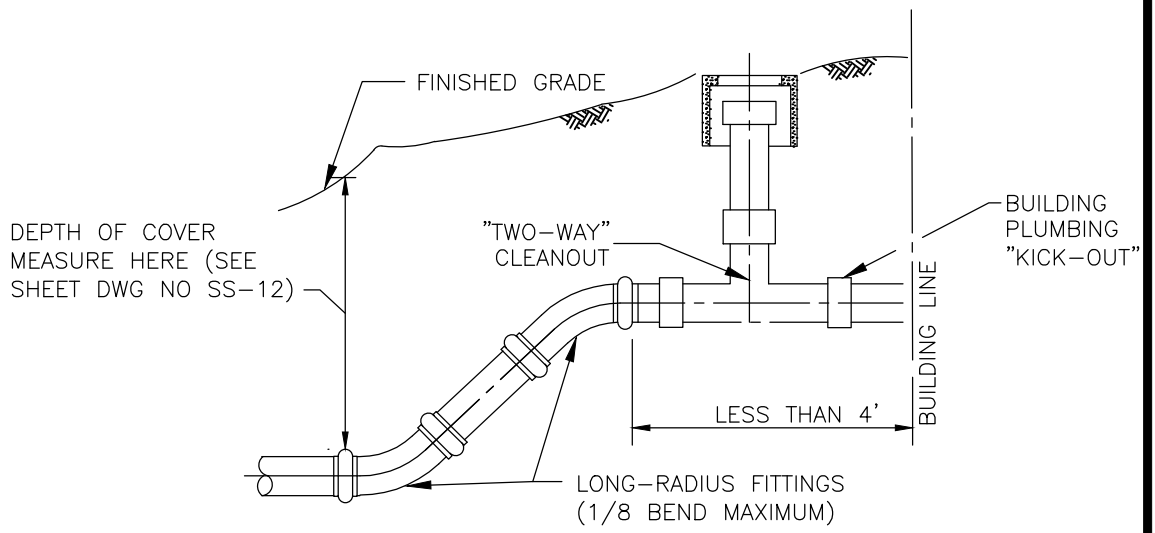
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TYPICAL CONNECTION TO BUILDING SEWER TO EXISTING LATERAL

SCALE: NTS

NOTES:
1. IF BUILDING PLUMBING IS LARGER THAN 4 INCHES IN DIAMETER USE A STANDARD 6 INCH WYE IN PLACE OF TWO-WAY FITTIING.



TYPICAL CONNECTION TO BUILDING SEWER FOR SHALLOW BUILDING PLUMBING "KICK-OUT"

SCALE: NTS

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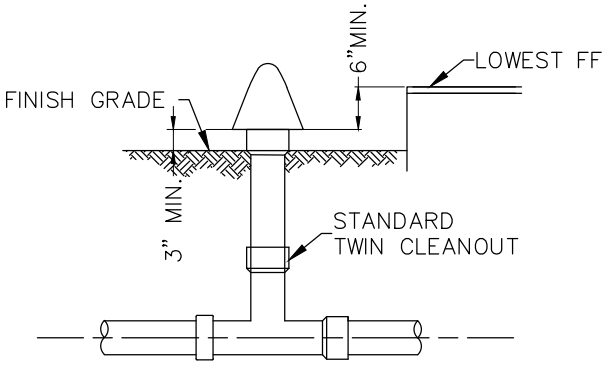
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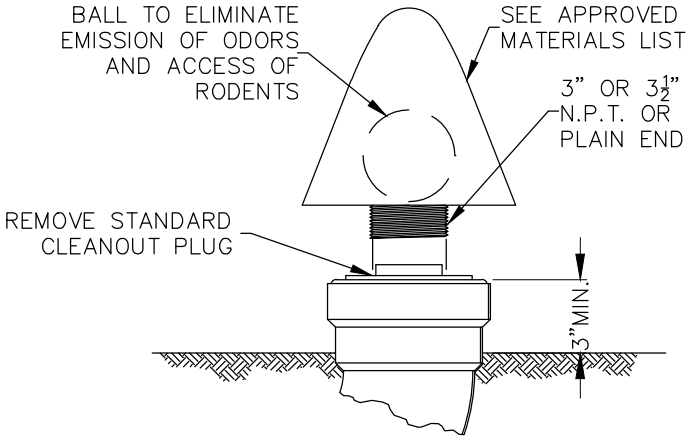
BUILDING SEWER LATERAL DETAILS WITH TWO-WAY CLEANOUT

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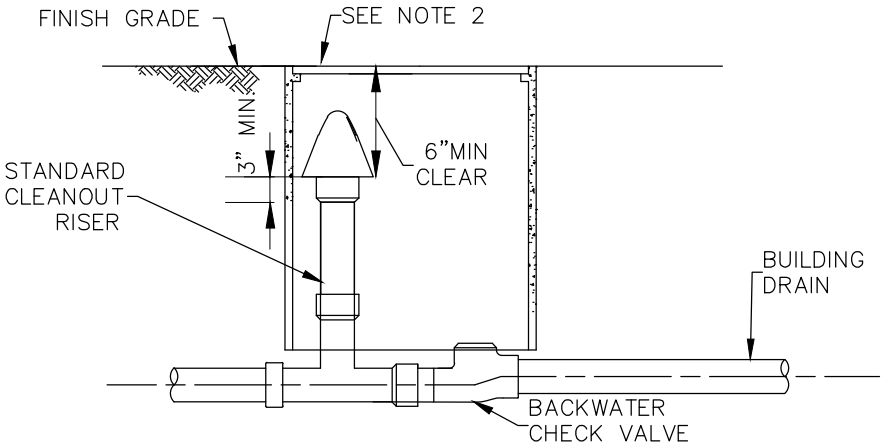
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OVERFLOW SYSTEM



BACKWATER OVERFLOW DEVICE



BACKWATER CHECK VALVE & SHUTOFF SYSTEM

MINIMUM REQUIREMENTS

1. AN OVERFLOW PROTECTION DEVICE PER APPROVED MATERIALS LIST IS REQUIRED ON ALL SIDE SEWERS. SPECIFIC LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND THE PROPERTY OWNER.

2. SEE APPROVED MATERIALS LIST FOR TRAFFIC AND NON-TRAFFIC AREA PRECAST UTILITY BOXES AND GRATED LIDS.

3. THE OVERFLOW SYSTEM, AS DETAILED HEREON, IS REQUIRED AND SHALL BE INSTALLED ON ALL NEW SIDE SEWER CONNECTIONS. REPAIRS AND ALTERATIONS ON EXISTING SIDE SEWERS, WHERE SEWAGE CAN, WITHOUT SERIOUS PROPERTY DAMAGE, OVERFLOW ON THE AREA ADJACENT TO SUCH SYSTEM INSTALLATION. A GATE VALVE NEXT TO THE BACKWATER CHECK VALVE IS OPTIONAL BUT SHOULD BE CONSIDERED FOR ADDITIONAL PROTECTION. WHEN AN EXISTING SIDE SEWER IS BEING REPAIRED OR ALTERED AND THE ABOVE CONDITION IS FOUND TO EXIST, AN OVERFLOW SYSTEM SHALL BE INSTALLED ON THE SIDE SEWER AS PART OF THE WORK.

4. A BACKWATER CHECK VALVE AND SHUTOFF SYSTEM AS DETAIL HEREON IS REQUIRED AND SHALL BE INSTALLED PER SECTION 4 AND 6 OF THE STANDARD SPECIFICATIONS.

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YADER BERMUDEZ
No. C 040523
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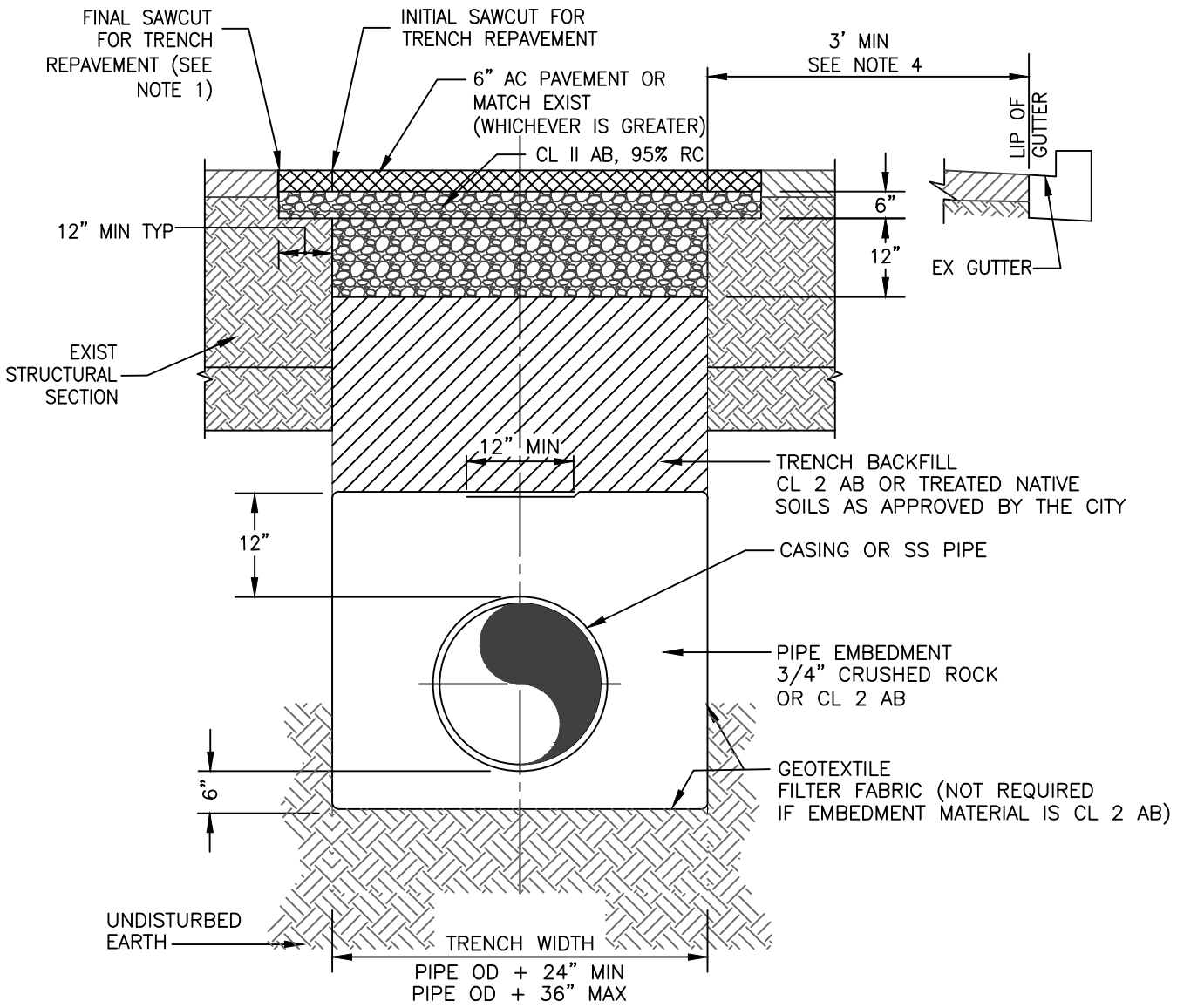
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OVERFLOW PROTECTION DEVICE FOR LATERALS

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NOTES:

1. CONTRACTOR SHALL SAWCUT PAVEMENT IN TWO STEPS. INITIAL SAWCUT SHALL BE AT PLANNED TRENCH WIDTH. FINAL SAWCUT SHALL BE A MINIMUM OF 12" OUTSIDE OF TRENCH EDGE. IF TRENCH SIDES RAVEL DURING CONSTRUCTION, THE FINAL SAWCUT SHALL BE 12" BEYOND THE FINAL EDGE OF TRENCH.

2. AS AN ALTERNATIVE, THE EXISTING EXISTING ASPHALT CONCRETE OUTSIDE THE TRENCH LINE MAY BE GROUND TO A MINIMUM DEPTH OF 0.20' TO A NEAT STRAIGHT LINE AT LEAST 1.0' OUTSIDE THE TRENCH LINE. THE EXISTING ASPHALT CONCRETE AT THE TRENCH LINE SHALL BE CUT THROUGH THE FULL DEPTH OF THE EXISTING ASPHALT CONCRETE TO A NEAT STRAIGHT LINE. ANY PAVEMENT EDGES, INCLUDING GROUND EDGES, DAMAGED DURING CONSTRUCTION SHALL BE RE-CUT OR RE-GROUND TO NEAT LINES PRIOR TO PAVING.

3. THE EXISTING PAVEMENT THICKNESS IN SAN PABLO AVENUE MAY BE APPROXIMATELY 12" THICK.

4. IF THE EDGE OF THE PAVEMENT TRENCH IS 3' OR LESS TO THE LIP OF GUTTER, ALL EXISTING ASPHALT SHALL BE REMOVED AND REPLACED TO MATCH EXISTING THICKNESS BUT NO LESS THAN 6".

5. PAINT BINDER (TACK COAT) SHALL BE APPLIED TO ALL VERTICAL SURFACES IN ACCORDANCE WITH THE LATEST EDITION OF CALTRANS STANDARD SPECIFICATIONS.

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No. C 040523
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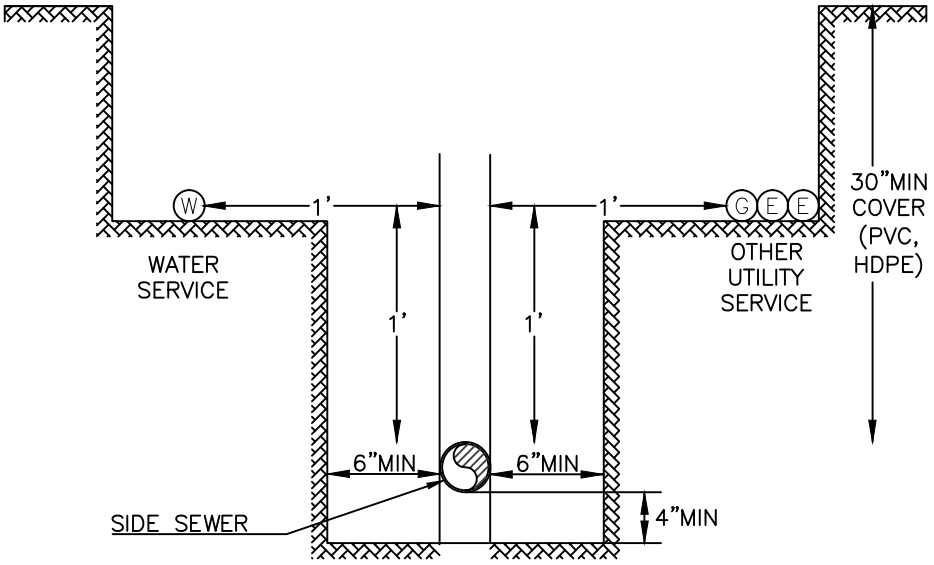
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TRENCH SECTION DETAIL

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SECTION

SCALE: NTS

NOTES:

1. PIPE BEDDING AND BACKFILL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 4–1.07.
2. REFER TO SS–12 OF THE STANDARD DRAWINGS FOR PIPE COVER REQUIREMENTS.
3. THESE ARE MINIMUM REQUIREMENTS. CONTRACTOR SHALL CONTACT UTILITY AGENCY TO CONFIRM REQUIRED SEPARATION REQUIREMENTS.

REGISTERED PROFESSIONAL ENGINEER
YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

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JOINT UTILITY TRENCH SEPARATION DETAIL

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SIZE	MATERIAL	TYPE AND MINIMUM CLASS	MIN.- MAX. COVER IN FT.	
BUILDING SEWERS				
4"-6"	VC	-	2.5	30
4"-6"	CI	SOIL PIPE	1.5	30
4"-6"	DI	CLASS 52	1	30
4"-6"	ABS	SCHEDULE 40	2.5	24
4"-6"	PVC	SDR 26	2.5	24
4"-6"	HDPE	SDR 17	2.5	24
LATERAL SEWERS				
4"	VC	-	5	30
6"	VC	-	5	20
4"-6"	CI	SOIL PIPE	1.5	30
4"-6"	DI	CLASS 52	1	30
4"-6"	ABS	SCHEDULE 40	5	24
4"-6"	PVC	SDR 26	5	24
4"-6"	C900	DR 25	5	24
4"-6"	C900	DR 18	4	24
4"-6"	C900	DR 14	3	24
4"-6"	HDPE	SDR 17	5	24
MAIN SEWERS UNDER ROAD WAY				
8"	VC	-	6	30
10"	VC	-	6	15
8"-10"	DI	CLASS 52	1	35
8"-10"	PVC	SDR 26	5	24
8"-10"	C900	DR 25	5	24
8"-10"	C900	DR 18	4	24
8"-10"	C900	DR 14	3	24
8"-10"	HDPE	SDR 17	5	24
MAIN SEWER NOT UNDER ROAD WAY				
8"-10"	DI	CLASS 52	1	30
8"-10"	C900	DR 14	3	24
SMALL TRUNK SEWERS				
12"	VC	-	6	18
15"	VC	-	6	25
12"	DI	CLASS 52	1	30
14"	DI	CLASS 52	1	30
16"	DI	CLASS 52	1	30
12"-15"	PVC	SDR 26	6	24
14"-24"	C905	DR 51	6	24
14"-24"	C905	DR 41	6	24
14"-24"	C905	DR 32.5	6	24
14"-24"	C905	DR 25	6	24
14"-24"	C905	DR 21	6	24
14"-24"	C905	DR 18	6	24

PIPE COVER LIMITATION TABLE

NOTES:
1. PIPE SPECIFICATIONS SEE SECTION 4-1.30

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YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

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STANDARD BEDDING AND COVER REQUIREMENTS FOR GRAVITY SEWER INSTALLATIONS

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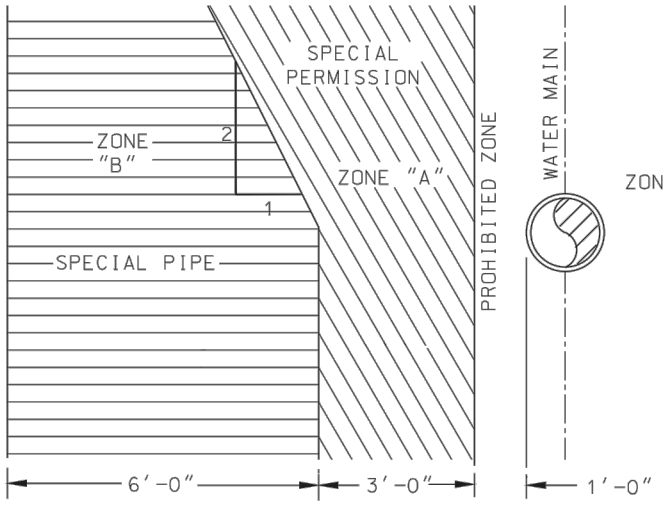
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(REFERENCE: CALIFORNIA DOHS GUIDANCE MEMO NO. 2003-02)

ZONE "A": SEWER LINES NOT PERMITTED WITHOUT APPROVAL OF WATER AGENCY

ZONE "B": PERMITTED MATERIALS
- -VC PIPE WITH COMPRESSION JOINTS
- -PVC PIPE WITH RUBBER RING JOINTS (ATSM 3034)
- -CI OR DI PIPE WITH COMP. JOINTS
- -RC PRESSURE PIPE WITH COMP. JOINTS
- -HDPE PIPE WITH FUSION WELDED JOINTS (AWWA C906-99)
- -SPIRALLY-REINFORCED HDPE PIPE WITH GASKETED JOINTS (ASTM F-984)

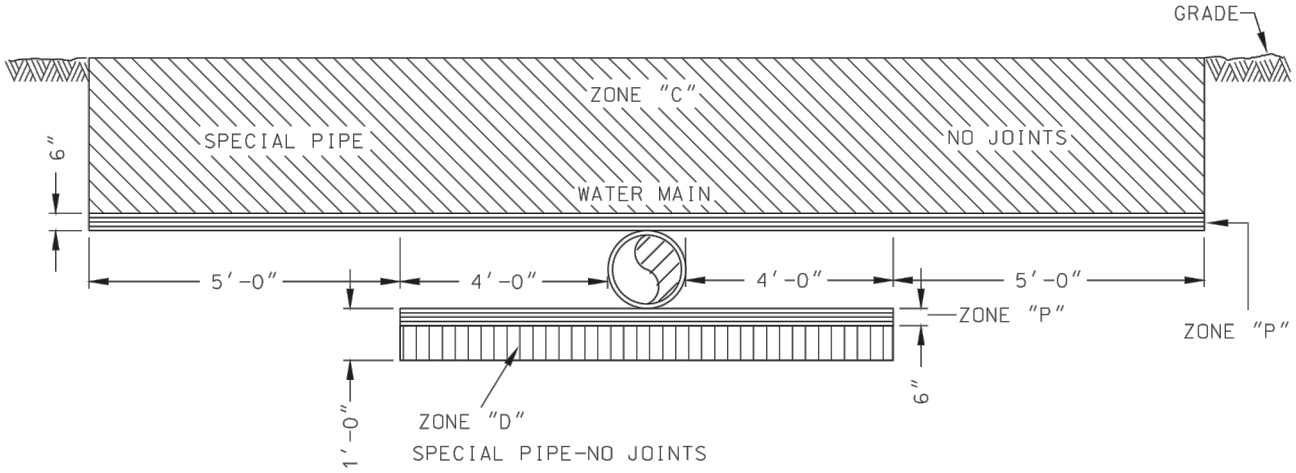
ZONE "C": PERMITTED MATERIALS
- -DI PIPE WITH HOT DIP BITUMINOUS COATING
- -C-900 PVC (DR 14). CONTINUOUS SECTION CENTERED OVER PIPE BEING CROSSED
- -RC PRESSURE PIPE. CONTINUOUS SECTION CENTERED OVER PIPE BEING CROSSED
- -ANY SEWER PIPE WITHIN A CONTINUOUS SLEEVE
- -HDPE PIPE WITH FUSION WELDED JOINTS (AWWA C906-99)



PARALLEL CONSTRUCTION

ZONE "D": PERMITTED MATERIALS
- -DI PIPE WITH HOT DIP BITUMINOUS COATING AND MECHANICAL JOINTS
- -HDPE PIPE WITH FUSION-WELDED JOINTS (AWWA C906-99)
- -C-900 PVC (DR 14) CONTINUOUS SECTION CENTERED OVER PIPE BEING CROSSED
- -RC PRESSURE PIPE CONTINUOUS SECTION CENTERED OVER PIPE BEING CROSSED
- -ANY SEWER PIPE WITHIN A CONTINUOUS SLEEVE

ZONE "P": NOT PERMITTED



CROSSING

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YADER BERMUDEZ
No. C 040523
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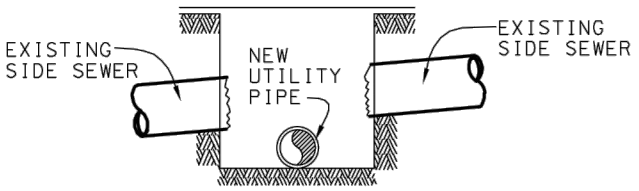
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CRITERIA FOR THE SEPARATION OF WATER MAIN AND GRAVITY SANITARY SEWERS

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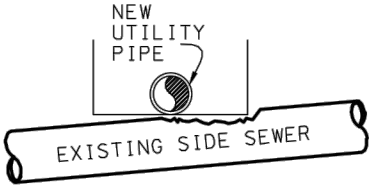
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SIDE SEWER BREAK NO CONFLICT IN GRADE

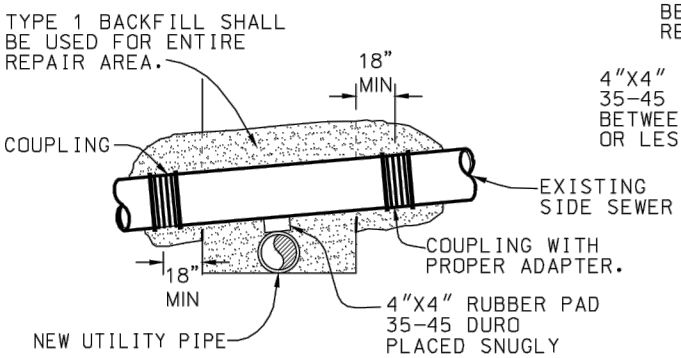


BREAK

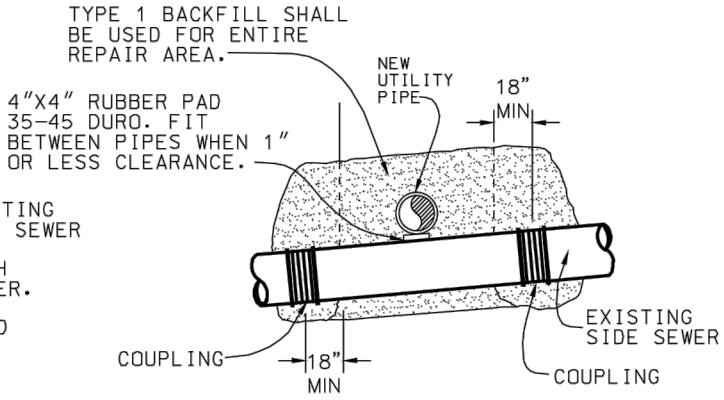
SIDE SEWER BREAK NO CONFLICT IN GRADE



BREAK



REPAIR

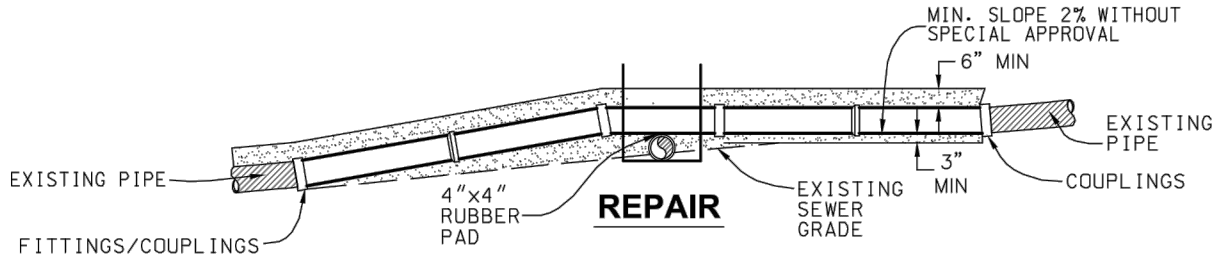


REPAIR

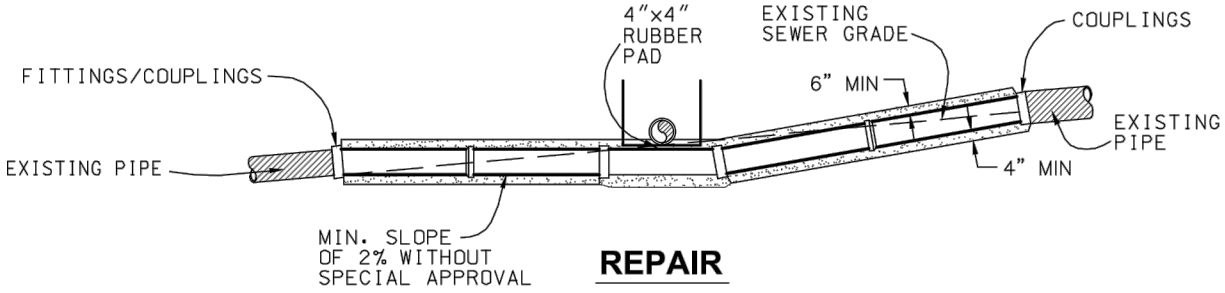
NOTES: 1. REFER TO SECTION 4-1.16 LATERALS AND BUILDING SEWERS FOR SIDE SEWER DETAILS.

2. ALL EXCAVATIONS FOR REPAIRS SHALL BE EQUAL TO THE REQUIRED TRENCH WIDTH PLUS 18" ON EACH SIDE.

SIDE SEWER WITH CONFLICT IN GRADE



REPAIR



REPAIR

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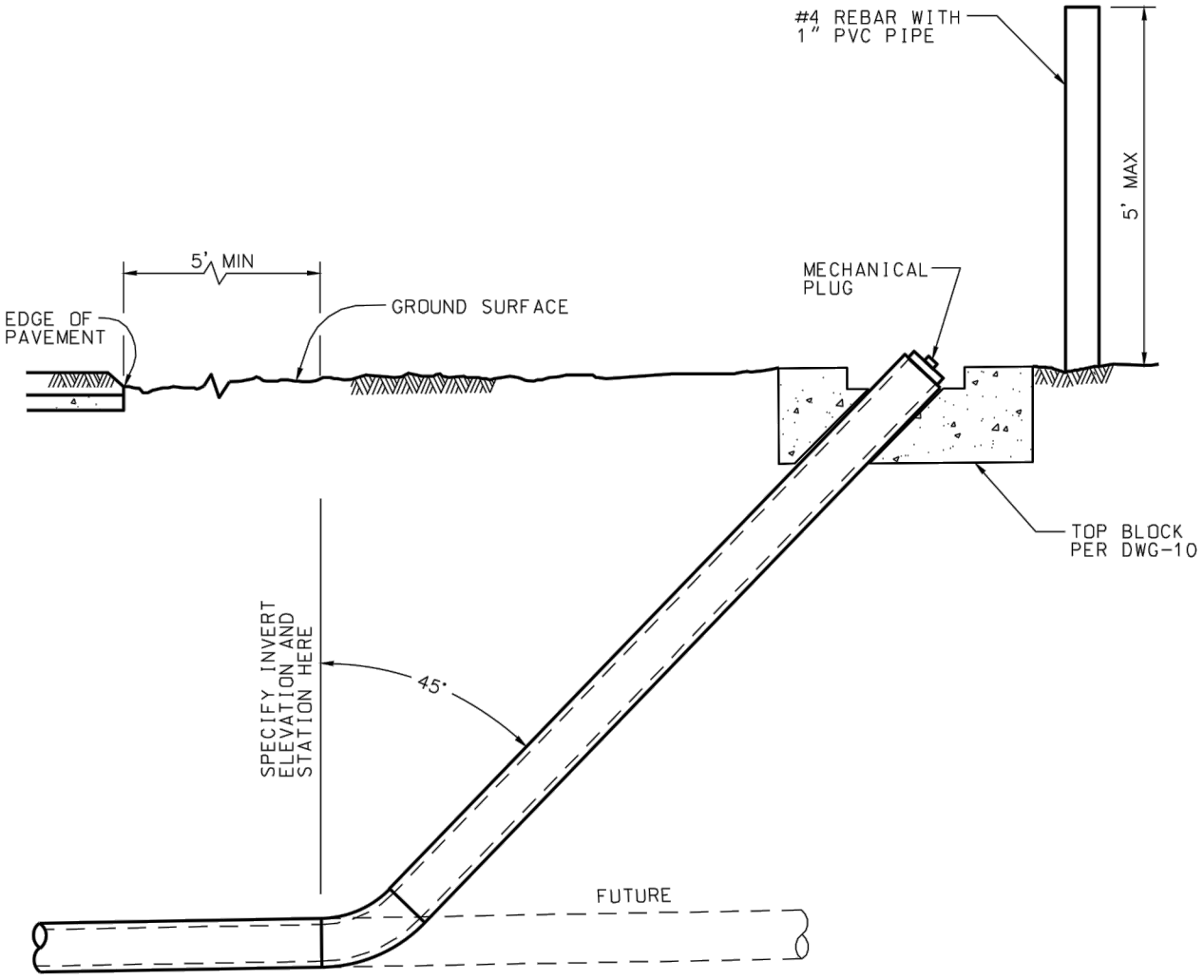
SIDE SEWER REPAIRS

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TEMPORARY ACCESS STRUCTURE

(FOR CLEANING AND TESTING OF SANITARY SEWER MAINS TO BE EXTENDED IN THE FUTURE)



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YADER BERMUDEZ
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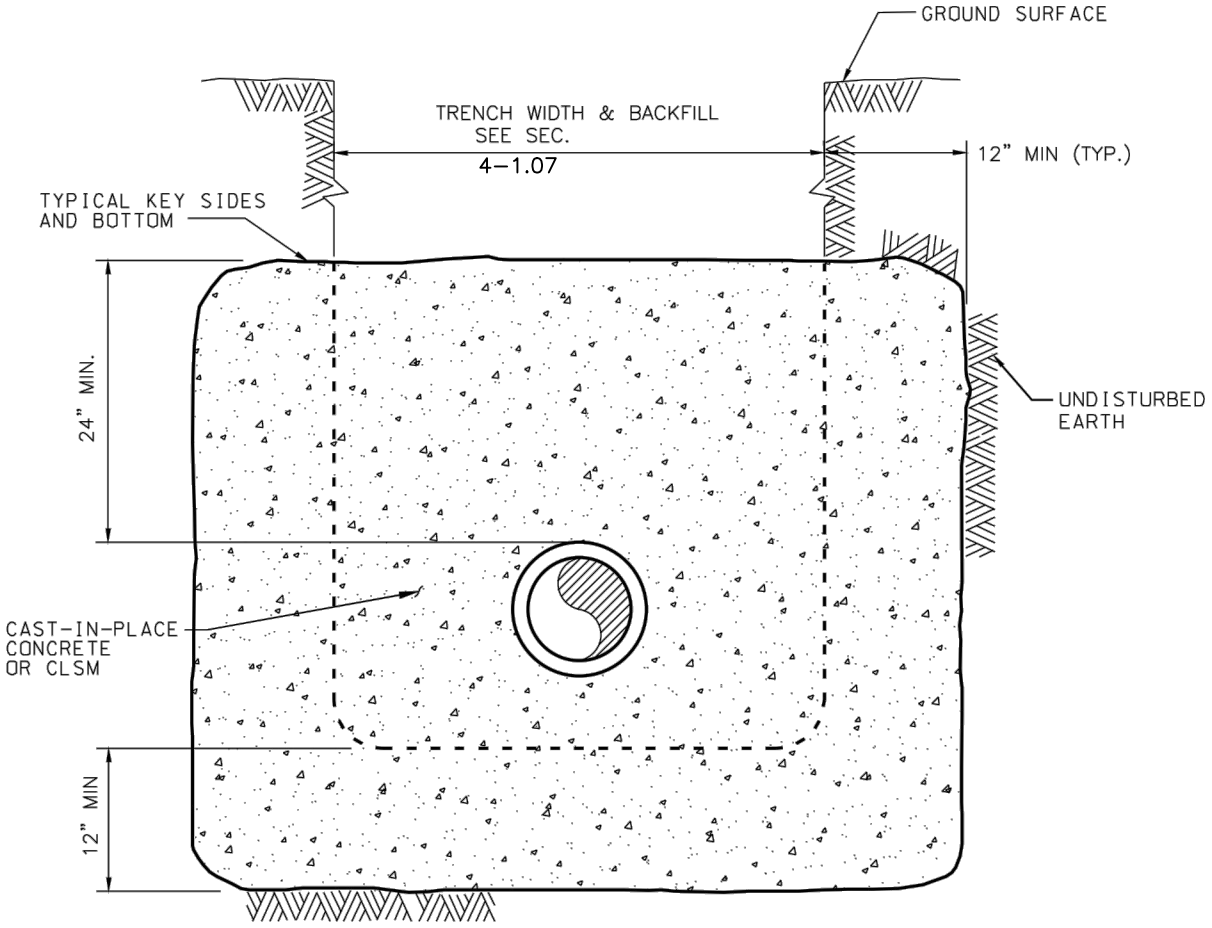
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TRENCH DAMS

LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER



SECTION

NOTES:

1. SEE SECTION 4-1.22 FOR CAST-IN-PLACE COINCRETE & CLSM REQUIREMENTS.
2. TRENCH DAM TO HAVE 12" MIN. THICKNESS (ALONG TRENCH).

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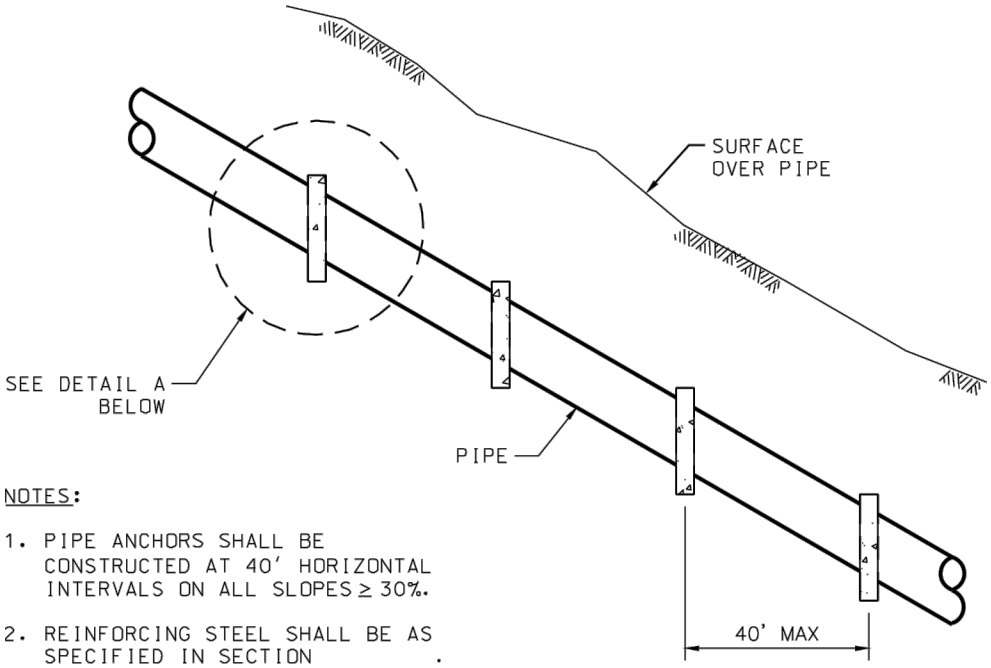
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TRENCH DAMS

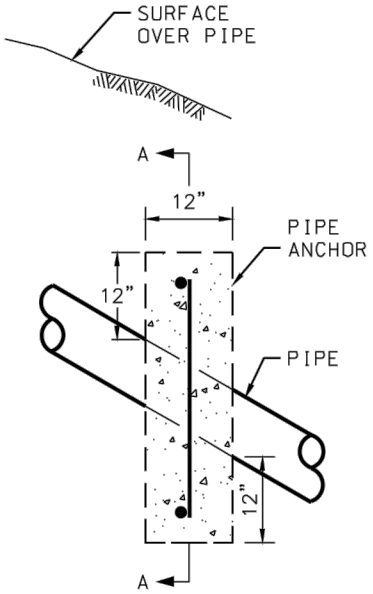
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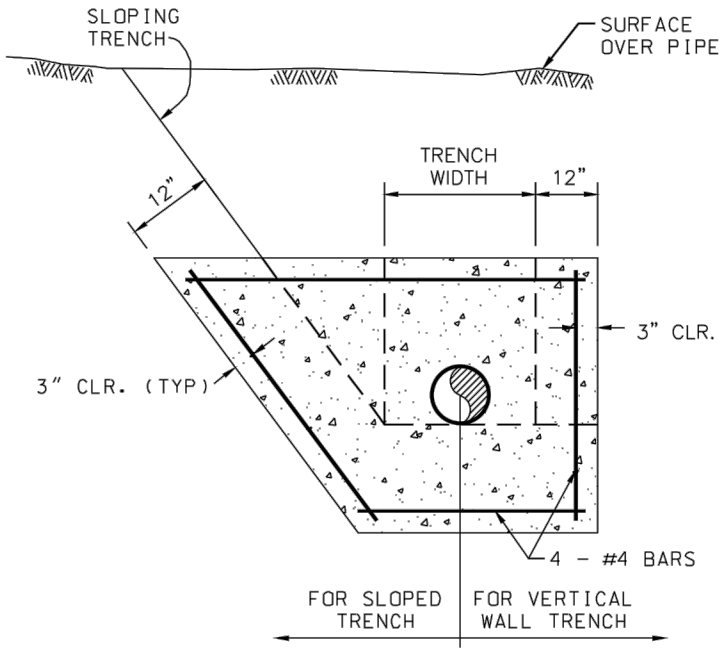


NOTES:

1. PIPE ANCHORS SHALL BE CONSTRUCTED AT 40' HORIZONTAL INTERVALS ON ALL SLOPES ≥ 30%.
2. REINFORCING STEEL SHALL BE AS SPECIFIED IN SECTION 4-1.21 .
3. ANCHORS SHALL BE CAST-IN-PLACE CONCRETE PER SECTION 4-1.22 .



DETAIL A



SECTION A-A

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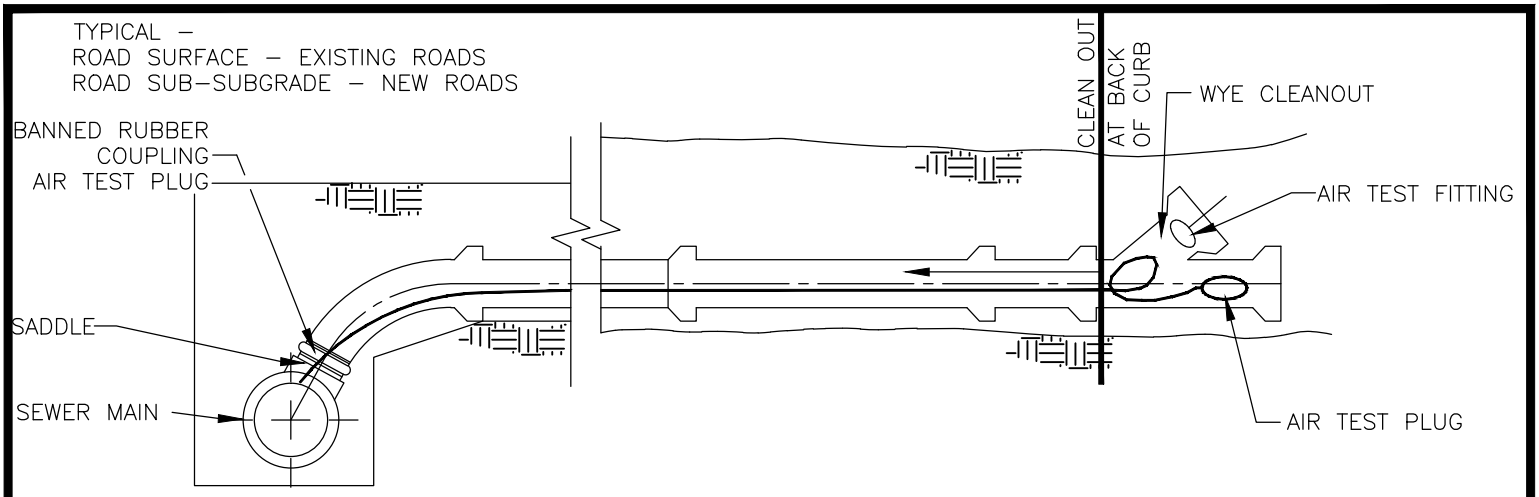
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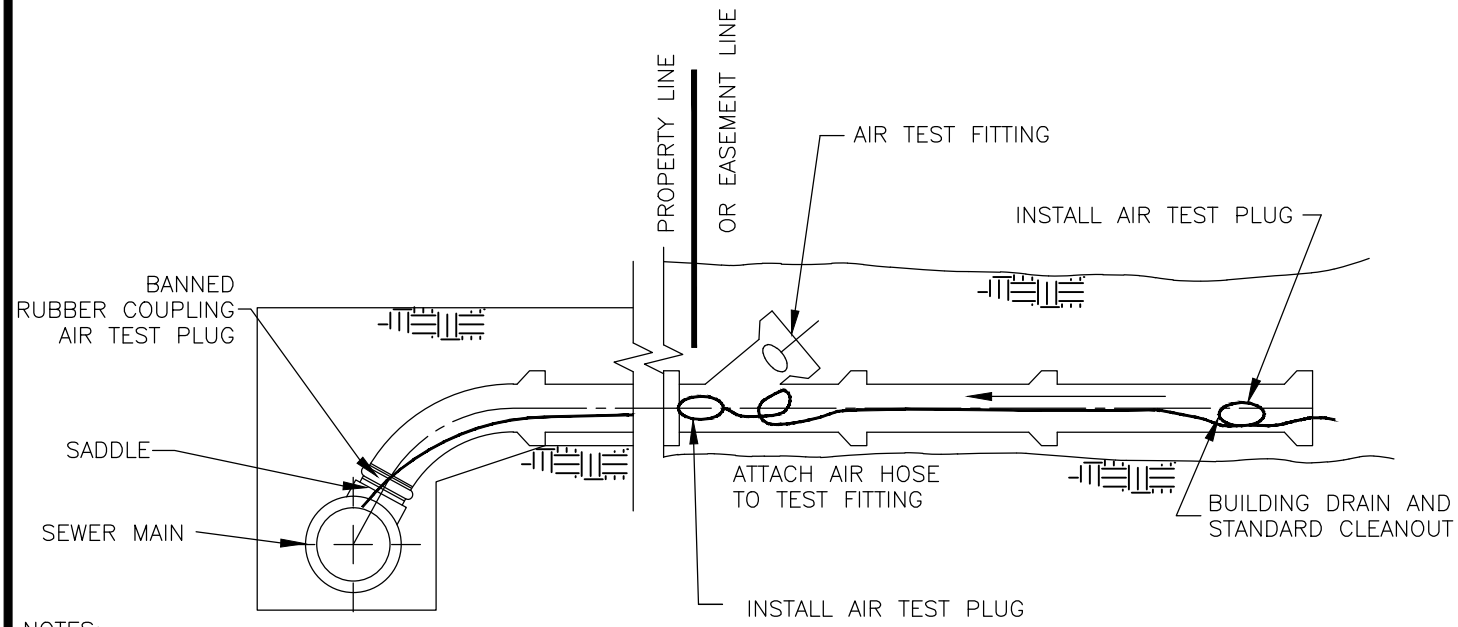
PIPE ANCHOR DETAIL

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LATERAL SEWER TEST
SCALE: NTS

NOTES:
1. LAY PIPE FROM SADDLE TO PROPERTY LINE, INSERTING HOSE INSIDE AS IT IS BEING LAID TO THE WYE BRANCH AT CURB CLEANOUT. INSTALL TEST EQUIPMENT AND PRESSURIZE LINE IN ACCORDANCE WITH STANDARD SPECIFICATIONS. IF TEST IS SATISFACTORY REMOVE PLUGS AND CONTINUE PIPE LAYING.



NOTES:

1. INSTALL TEST PLUGS AND TEST FITTINGS AS SHOWN AND PRESSURIZE LINE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AFTER APPROVAL TEST EQUIPMENT MAY BE REMOVED AND CONNECTION SHALL BE MADE.

HOUSE SEWER TEST
SCALE: NTS

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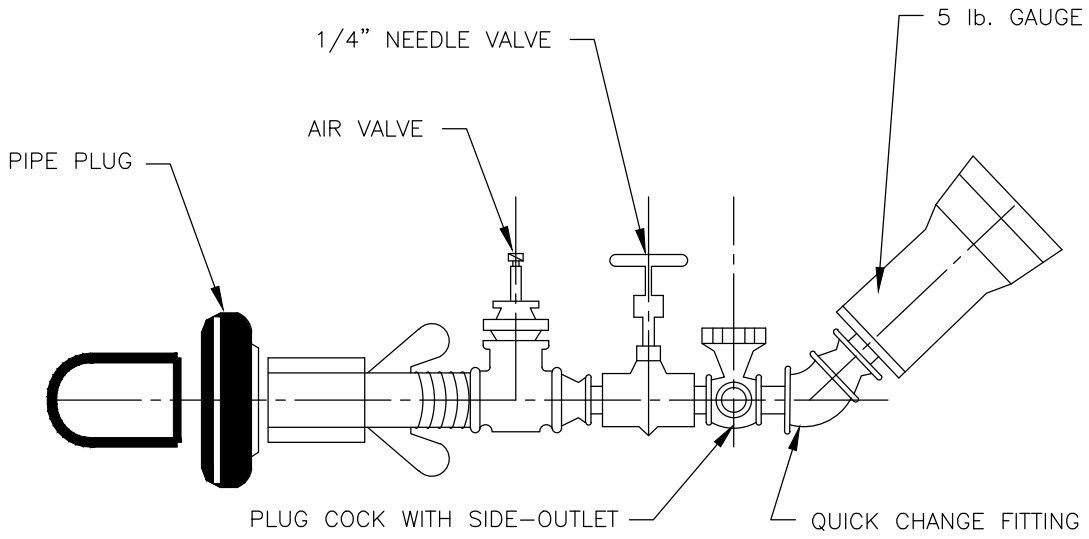
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BUILDING SEWER AIR TEST DETAIL

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AIR TEST FITTING

SCALE: NTS

NOTES:

1. FITTING SHOWN ABOVE CONSISTS OF THE MINIMUM HARDWARE REQUIRED AND SUGGESTS A RECOMMENDED CONFIGURATION ONLY.

DIAMETER OF PIPE (INCHES)	LENGTH OF LINE (FEET)	LENGTH OF TEST (MINUTES)
4	ALL	4
6	ALL	4
8	ALL	4
10	0 TO 215	4
10	215 AND GREATER	5
12	0 TO 155	4
12	155 TO 190	5
12	190 AND GREATER	6
15 & 16	0 TO 120	5
15 & 16	120 TO 165	7
15 & 16	165 AND GREATER	8

AIR TEST CHART

NOTES:

1. ALL TEST TO BE PERFORMED @ 4PSI USING A 5LB GAGE.

2. ALL PIPE GREATER THAN 16 INCHES IN DIAMTER SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH PROVISIONS CONTAINED IN SECTION 4–1.19

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YADER BERMUDEZ
No. C 040523
CIVIL
STATE OF CALIFORNIA

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BUILDING SEWER AIR TEST DETAIL

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