Sewer System Management Plan

For

Burlingame Hills Sewer Maintenance District
Crystal Springs County Sanitation District
Devonshire County Sanitation District
Edgewood Sewer Maintenance District
Emerald Lake Heights Sewer Maintenance District
Fair Oaks Sewer Maintenance District
Harbor Industrial Sewer Maintenance District
Kensington Square Sewer Maintenance District
Oak Knoll Sewer Maintenance District
Scenic Heights County Sanitation District

By

County of San Mateo
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(Updated: July 31, 2009)

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Sewer System Management Plan (SSMP)

INTRODUCTION

In 2004, the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) indicated its intent to implement new regulations to uniformly monitor and regulate sanitary sewer overflows (SSOs) due to the growing emphasis on reducing SSOs.

On May 2, 2006, the State Water Resources Control Board (State Water Board) adopted the Statewide General Waste Discharge Requirements (WDR) for wastewater collection agencies. The WDR established monitoring and reporting requirements as well as Sewer System Management Plans (SSMP) requirements and timelines. 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 are required to comply with the WDR.

The SSMP has several elements and describes the activities each sewer/sanitation district will employ to manage their wastewater collection systems effectively.

SYSTEM OVERVIEW

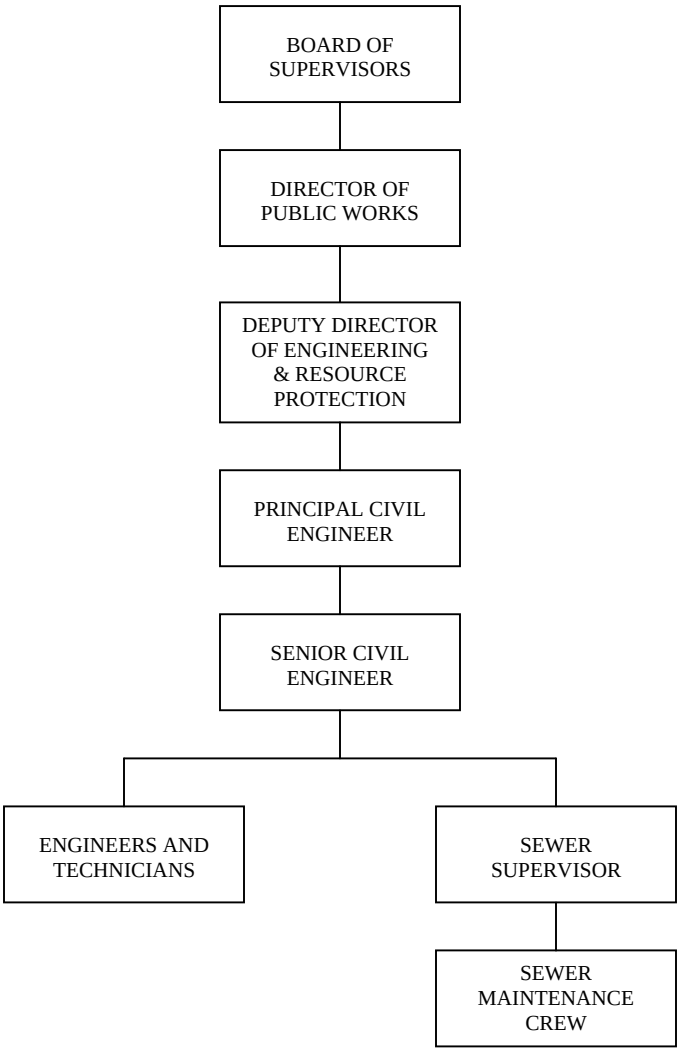
The San Mateo County Department of Public Works (County) operates and maintains ten (10) sanitary sewer districts (Districts) in the various areas of the county. The San Mateo County Board of Supervisors is the governing board for the Districts. There are approximately 150 miles of sewer mains, 4,300 manholes, and 11,000 service connections within the service areas. The Districts do not maintain sewer laterals. The property owners are responsible for sewer lateral construction, repair, replacement, and maintenance. Most of the Districts' collection systems are six-inch (6") vitrified clay pipe (VCP). As of 2006, the age of the collection systems ranges from 23 to 76 years old. The average age is 61 years old. The terrain of the Districts ranges from rural areas with dense vegetation, steep terrain, and easement lines, to urban type settings.

In 2004, the County implemented a Computerized Maintenance Management System (CMMS) for scheduling preventative maintenance work and tracking work performance. This system is also used to keep records of customer service requests and asset condition.

1. GOALS

- Manage, operate, and maintain the condition of the wastewater collection systems to provide reliable service
- Minimize infiltration and inflow
- Provide adequate capacity to convey peak flows
- Minimize the frequency of SSOs
- Mitigate the impact of SSOs

2. ORGANIZATION



Staff Roles

- Director of Public Works (650-599-1421) – Establishes policies; plans strategy; approves capital improvement projects; authorizes outside contractors to perform services; and serve as the public information officer.
- Deputy Director (650-599-1497) – Implements policies; delegates responsibility; and manages staff in the division.
- Principal Civil Engineer (650-599-1417) – Acts as the District Engineer (Legally Responsible Official); leads staff; allocates resources; approves developers' sewer plans; manages capital improvement projects; manages section budget; and coordinates development and implementation of SSMP.
- Senior Civil Engineer (650-599-1479) – Supervises and reviews work performed by engineers and technicians. Manages sewer operations and maintenance activities and sewer field staff.
- Engineers and Technicians (650-599-1443, 650-599-1434, 650-599-1473) – Prepare scheduled preventative maintenance work for the sewer maintenance crew; generate work orders for repairs and other services; maintain sewer data/records in CMMS; answer service request calls and relay information to sewer supervisor; review developers' sewer plans; evaluate sewer service charges and prepare report; and issue sewer inspection permits.
- Sewer Supervisor (650-363-4765) – Oversees the sewer maintenance crew; ensures that new and rehabilitated assets meet District standards; responds to service requests; investigates and files SSOs; trains sewer maintenance crew; and provides verbal reports to the office staff (engineers and technicians).
- Sewer Maintenance Crew (650-393-9132, 650-393-0512, 650-393-9193) – Perform preventive maintenance activities; and respond to emergencies repairs and SSOs (mobilize sewer cleaning equipment, by-pass pumping equipment, and portable generators).

Reporting Structure

The engineers, technicians, and sewer supervisor report to the Senior Civil Engineer, who reports to the District Engineer (Principal Civil Engineer). Office and field staff works closely together on a daily basis in response to sewer service calls and performance of scheduled and unscheduled maintenance work. They also meet on a regular basis (every three weeks) to discuss goals, work status, or problems and issues encountered in the field. These meetings are to encourage adequate communication among the groups and to ensure information is relayed and problems are addressed to provide better service to the customers and improve management of the Districts.

Responding to Service Calls

The District office is open Monday through Friday, 8:00 A.M. to 5:00 P.M. All service calls received during the business hours are directed to the office technicians and the information is recorded in CMMS with a Service Request Number assigned to the service call. The office technicians then relay the information to the sewer supervisor. Service calls received after business hours are directed to the County Communications Center, and the message is relayed to the designated on-call sewer worker. Sewer worker summons additional help as necessary.

The ability of the police, fire department, or citizen to talk to a live person 24 hours per day adds the positive benefits of human interaction and significantly reduces the possibility of a missed call or misunderstanding about the nature of a problem.

The sewer supervisor files a report on every SSO with the office technicians. Those that are extremely large, or need additional engineering analysis, are prepared by the engineers. All SSO reports are forwarded to the appropriate regulatory agencies.

3. OVERFLOW EMERGENCY RESPONSE PLAN

Overflow Response — The County has an Overflow Emergency Response Plan (Attachment A) for handling service calls and sewer overflows. The plan includes procedures for emergency response, spill recovery, overflow mitigation, cleanup, and rehabilitation of damaged dwellings and buildings. It also includes provisions for public notification, testing for contamination, and notification to regulators.

Overflow Reporting Policy — The County defines an overflow as any time raw sewage escapes from the sewer system onto public or private property. All overflows and backups are investigated to determine the cause and corrective actions needed to prevent future incidents. All overflows are documented in CMMS for record tracking. Overflows greater than or equal to 1,000 gallons or reaching any surface water or storm drain (Category 1 SSOs) are reported to the State Office of Emergency Services. All overflows are reported in the State Water Board's electronic reporting system and in the annual report to the Regional Water Board. In addition, all Category 1 SSOs are reported in the Regional Water Board's 2-hour/24-hour electronic reporting system with notification to the County's Environmental Health Services Division. The plan also includes reporting requirements to other regulatory agencies as may be appropriate.

The County implemented a root treatment program in 2001 in an effort to reduce overflows caused by roots.

4. FATS, OILS, AND GREASE (FOG) CONTROL PROGRAM

FOG has not been a major problem in the Districts, but it does contribute to the total overflows. The impact of FOG varies by District.

The County Ordinance (4.28.110) prohibits discharge of wastewater containing more than 300 mg/L of oil or grease of animal or vegetable origin into the collection system. Sewer lines that have FOG problems are flushed every 4-month with degreaser added to the water tank or at an alternate frequency as determined through preventative maintenance activities or emergency response. Assets in preventative maintenance groups can be shifted from one type of maintenance to another depending on the field condition and sewer crew assessment.

The County requires that new Food Service Establishments (FSEs) and existing FSEs being remodeled install grease traps or interceptors. Currently, the County does not perform regular inspections of FSE grease traps, grease interceptors, or other pre-treatment equipment.

The County developed an educational brochure that included a section on FOG, which describes the impact on sewer system when FOG is disposed down the sewer drain. The County plans to implement a FOG Control Program over the next few years to reduce overflows caused by FOG.

5. LEGAL AUTHORITY

The County provides sewer service to the properties within the ten districts through ordinance codes listed below:

Legal Authority	Ordinance Number	Ordinance Name	Adequate to Meet SSMP Requirements?
Public Sewers			
Ability to prevent illicit discharges into the wastewater collection system (GWDR – a)	4.28.030	General prohibitions	Yes
	4.28.040	Storm drainage and groundwater	
	4.28.050	Unpolluted water	
	4.28.060	Garbage grinders	
	4.28.070	Point of discharge	
	4.28.080	Holding tank waste	
	4.28.090	Radioactive wastes	
	4.28.100	Wastewater strength	
	4.28.110	Additional limitations	
	4.28.120	Specific user limitations	
	4.28.190	Mandatory wastewater discharge permits	
	4.28.360	Cease and desist orders	
	4.28.390	Termination of service	
Ability to require proper design and construction of new and rehabilitated sewers and connections (GWDR – b) (Regional Board – 2)	2.50.020	Special districts	Yes
	4.24.030	Opening or connection of sewers	
	4.24.070	Sewer inspection permit	
	4.24.080	Inspection procedure	
Ability to require proper installation, testing, and inspection of new and rehabilitated sewers (Regional Board – 3)	2.50.020	Special districts	Yes
	4.24.070	Sewer inspection permit	
	4.24.080	Inspection procedure	

Legal Authority	Ordinance Number	Ordinance Name	Adequate to Meet SSMP Requirements?
Ability to limit the discharge of fats, oils, and grease and other debris that may cause blockages (GWDR – d)	4.28.060	Garbage grinders	Yes
	4.28.110	Additional limitations	
Laterals			
Ability to control infiltration and inflow (I/I) from private service laterals (Regional Board – 1)	4.28.040	Storm drainage and groundwater	Yes
Provide clear support for Agency responsibility (upper and/or lower lateral) and policies (e.g. courtesy cleaning, repair, cleanout installation)	4.24.120	Overflow devices required	Yes
	4.24.130	Property owner responsibility	
	4.24.131	Emergency maintenance provided by districts	Yes
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the Agency (GWDR – c)	N/A (County doesn't own or maintain sewer laterals. See 4.24.130 for property owner responsibility)		
Satellite Collection Systems			
Ability to control infiltration and inflow (I/I) from satellite collection systems (Regional Board – 1)	Three-party agreement between Woodside, FOSMD, and Redwood City dated 8/7/2001 (page 10)		Yes
Enforcement			
Ability to enforce any violation of the Agency's sewer ordinances (GWDR – e)	4.24.132	Notification by district to owner	Yes
	4.28.340	Responsibility (for discharge)	
	4.28.360	Cease and desist orders (for discharge permits)	
Ability to disconnect user if fail to comply with established conditions of use	4.28.390	Termination of service	Yes
FOG Source Control			
Requirements for the installation of grease removal devices (GRD)	4.28.270	Pre-treatments	Not specific to GRD
Ability to set design standards for GRDs	County plans to implement a FOG Control Program in the future which will include legal authority		No
Ability to set maintenance requirements for GRDs			No
Ability to require application of best management practices			No
Ability to require record keeping and reporting of GRD maintenance and repair			No
Authority to inspect grease producing facilities	4.28.260	Inspection and sample	Not specific to GRD

Legal Authority	Ordinance Number	Ordinance Name	Adequate to Meet SSMP Requirements?
Other Requirements (Recommended but not required by GWDR)			
Define lateral ownership and maintenance responsibility	4.24.130	Property owner responsibility	N/A
Ability to deal effectively with private lateral problems (e.g. force property owner to correct failed/plugged private building sewer)	4.24.132 (d)	Notification by district to owner	N/A
Prohibit vandalism (tampering)	Not in ordinance		N/A

6. MEASURES AND ACTIVITIES (OPERATION AND MAINTENANCE PROGRAM)

a. COLLECTION SYSTEM MAP

The Districts' collection system maps were digitized into Computer Aided Drafting (CAD) and transferred to the Geographic Information System (GIS) mapping system, which is linked to the CMMS. Maps are updated when new sewer main installations from mainline extensions or capital improvements are accepted. Maps are also continually updated as new or corrected data is determined.

The district maps consist of the following sewer information:

Facility Type	Map Information
Manholes	• ID number • Location with reference to streets and addresses (latitude and longitude, or coordinates)
Pipes	• ID number • Location with reference to streets and addresses (latitude and longitude, or coordinates) • Size • Direction of flow • Length • Material type
Grinder Pumps	• ID number • Location with reference to streets and addresses (latitude and longitude, or coordinates)

b. RESOURCES AND BUDGET

The Districts' budget is prepared between February and April of a fiscal year for the following two fiscal years. The budget includes operations and maintenance, payments to downstream agencies for transporting and treating Districts' sewage, contract services, capital improvement program, and equipment upgrades.

In Spring/Summer of 2007, the County evaluated the sewer service rates for each district and increased rates in 8 of the 10 County maintained districts for the next 5 fiscal years. Sewer rates in Burlingame Hills Sewer Maintenance District were not increased due to a majority protest. Rates for the Crystal Springs County Sanitation District were adopted for the first year, which is insufficient to meet the financial obligation of this District. Both districts do not have adequate funding to support the recommended capital improvement program. Staff will work with homeowners in these 2 districts in the coming year to develop rate structures that will adequately support the financial requirements.

The County measures performance through annual and quarterly Outcome Based Management reporting.

c. PRIORITIZED PREVENTATIVE MAINTENANCE

Mainline Maintenance — The County's preventative maintenance activities consist of hand rodding, mechanical rodding, flushing, combination of rodding and flushing, and chemical root treatment. Office technicians use the CMMS program to generate preventative maintenance work orders in advance for the sewer crew. The County schedules mainline cleaning on the following cycles:

High Frequency	2-month or 4-month
Standard	12-month intervals
Low Frequency	24-month interval for newer systems (ESMD and ELHSMD Zone 2)

High frequency maintenance consists (2-month and 4-month) of mainlines with a history of blockages due to roots, grease, and debris.

Other Facilities — The County maintains 16 grinder pumps for residential dwellings in the Emerald Lake Heights Sewer Maintenance District. These pumps are inspected every 2 months and the data is stored in the County's CMMS program.

The County maintains a flow meter in the Crystal Spring County Sanitation District. The flow meter is verified twice a year to ensure the flow rate reading transmitted from the field to office is correct.

Capacity Studies — Developers are required to hire an independent engineer to conduct a hydraulic capacity study for residential developments on a case-by-case basis. The study examines whether or not the existing mainline capacity is sufficient to accommodate the

additional flow from the development. Commercial developments are also subject to the same requirements.

CMMS — The County uses the Hansen program to electronically store and retrieve data such as sewer main and manhole information, preventative maintenance schedule, work orders, service calls, and inspections. This program is linked with the County's GIS base mapping system through an interface.

d. SCHEDULED INSPECTIONS AND CONDITION ASSESSMENT

The County performs closed circuit television (CCTV) inspection whenever a sewer main experiences an overflow or backup. If it is determined that a repair is needed thru the CCTV inspection, a work order will be generated to repair the sewer main within 90 days. The sewer crew makes immediate repairs when a defect is severe and imposes immediate threat to the sewer mains functionality. The County plans to perform CCTV inspection every 6 years to evaluate the existing pipe condition and develop a long-term rehabilitation plan for sewer system repair, replacement, and rehabilitation. Pipe defects will be photographed and recorded in Hansen for analysis and comparison. The television inspection will be a continuous program.

Long-Term Rehabilitation — The long-term rehabilitation plan will inventory the Districts' pipe systems by age, size, and material. This plan will have three categories of repair: point repair, line repair, and pipe replacement. Lines selected for repair or replacement will generally be defects posing imminent service interruption. The low priority repairs include pipelines requiring frequent maintenance such as root intrusion, grease build-up and sags. A listing of projects scheduled for each year will be included in this plan. The plan will also be updated annually.

Flow Monitoring — The County plans to utilize flow monitors and corresponding software to measure both dry and wet weather flow in various areas of the systems to determine inflow/infiltration. Outside contractors may be used to conduct flow-monitoring services.

Smoke Testing — The County plans to use smoke testing in excessive inflow/infiltration areas of the sewer systems to detect defects, cross connections, and unauthorized connections to the systems.

e. CONTINGENCY EQUIPMENT AND REPLACEMENT INVENTORIES

The County maintains its collection systems with a sewer supervisor and a crew of six. Equipment used for sewer system operations and maintenance and emergency response is listed below:

Equipment	Quantity
Operations and Maintenance	
Flusher Truck	2
Rodder	2
TV Van with TV Inspection System	1

Equipment	Quantity
and Camera	
Sewer Lateral Inspection Camera	1
Service Truck	1
Emergency Response Van	1
Dump Truck	1
Emergency Response	
2" Portable Gas Powered Pump	2
4" Portable Gas Powered Pump	1
6" Portable Gas Powered Pump	1
1,000 Watt Generator	1
2", 4", 6" Pump Suction Hose (16'-20' long)	one each
2" Discharge Hose (50' long)	22
4" Discharge Hose	400 ft
6" Discharge Hose	600 ft
4" – 6" Plug	2
4" – 16" Plug	1
8" – 12" Plug	2
8" – 24" Plug	1
10" Plug	1
12" – 18" Plug	2
12" – 32" Plug	1
20" – 40" Plug	1
Other	
Traffic Cones (10 in each truck)	80
Traffic Signs (2 in each truck)	16

Major equipment replacement is budgeted on a 12-year cycle. Other miscellaneous equipment is replaced on an as-needed basis. The County Vehicle and Equipment Services performs routine maintenance on sewer equipment. The sewer crew utilizes the VacCon and other necessary equipment for sewer repairs from the Road Maintenance Division. The County maintains an inventory of clay pipes and connectors for emergency repairs. The sewer crew relies on equipment and operators from the San Mateo County Road Division to assist with repair projects where mechanized equipment is required.

f. TRAINING

The County provides in-house safety training on a regular basis. Sewer operations, maintenance, and emergency response training are provided through mentoring of experienced personnel and participation in training opportunities offered by other agencies or training professionals. The County will be working on an ongoing training program to provide formal training in operating and maintaining the collection systems, as well as response to overflows and other emergencies.

g. OUTREACH TO PLUMBERS AND BUILDING CONTRACTORS

The County has prepared a flyer (Attachment B) to educate local plumbers and building contractors about the proper practices for preventing SSOs in private laterals. The flyer is available at the office front counter and is attached to the sewer inspection permits issued by the District.

7. DESIGN AND CONSTRUCTION STANDARDS (DESIGN AND PERFORMANCE PROVISIONS)

Standards for Installation, Rehabilitation and Repair

The Districts maintain up-to-date sewer design standards as shown in Attachment C. These standards are required to be utilized for both new installations and replacement of existing facilities. Standard details are available to contractors and citizens at a minimal fee and are updated as necessary.

Standard specifications and special provisions for sewer improvement projects are stored electronically on the network system.

Standards for Inspection and Testing of New and Rehabilitated Facilities

The sewer supervisor inspects new construction and repairs, and ensures that all construction meets the Districts' standards and codes. The Construction Section of the Public Works Department inspects all Districts' capital improvement projects. All sewers constructed by outside contractors are pressure cleaned, tested and video inspected before acceptance.

8. CAPACITY MANAGEMENT (SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN)

a. CAPACITY ASSESSMENT

Each District, except for the newly formed Edgewood Sewer Maintenance District, has a master plan prepared by Brown and Caldwell between 1999-2000. Hydraulic modeling was performed on major trunk sewers in the following Districts using 6" diameter pipe size and larger using a HYDRA model.

Burlingame Hills Sewer Maintenance District
Crystal Springs County Sanitation District
Devonshire County Sanitation District
Emerald Lake Heights Sewer Maintenance District
Fair Oaks Sewer Maintenance District
Oak Knoll Sewer Maintenance District
Scenic Heights County Sanitation District

The analysis used 14 temporary flow monitors, 4 temporary rain gauges, and the January 18, 1998 rainfall event to determine the base sanitary sewer flows and the effects of infiltration and inflow on the capacity of the collection system. This storm event was very similar to a 5-year design storm in terms of intensity, duration, and volume. A standard Manning's friction coefficient of 0.0135 was used for the analysis.

Based on the information provided by Brown and Caldwell, hydraulic models of Harbor Industrial and Kensington Square Sewer Maintenance Districts using HYDRA were not prepared due to their small size; however, a spreadsheet model was utilized to evaluate the capacities of these districts.

b. SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

The master plans evaluated the sewer collection systems and prioritized capital improvement projects for each District based on capacity, excessive maintenance requirements, and structural deficiencies.

The Districts have completed 11 of the 19 hydraulic deficient projects identified in the master plans. Six (6) of the remaining 8 projects are planned for replacement within the next 5 years. The other 2 projects are within the Burlingame Hills Sewer Maintenance District (BHSMD) and have not been programmed due to insufficient funding in this District. The County has submitted an application for a State Revolving Fund Loan to finance the capital improvement projects identified in the BHSMD master plan.

Sewer main lines that require excessive maintenance and have structural deficiencies were also identified in the master plans as capital improvement projects. These projects are planned for replacement within the next 5 to10 years. The Districts maintain a list of remaining capital improvement projects and estimated replacement year in the office. The remaining capital improvement projects in the Crystal Springs County Sanitation District have not been programmed for a particular fiscal year due insufficient funding in this District. The County is currently working with the homeowner association groups within the District to set a rate structure that can support the identified capital improvement projects.

The Fair Oaks Sewer Maintenance District is the only District that has a population of 10,000 or more. The County plans to perform a system evaluation for this District to update its sewer master plan in the next 5 years.

9. MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

The Districts prepare and submit an annual report to measure performance to the Regional Water Board. The report includes number of SSOs in a calendar year, volume distribution of SSOs, volume of SSOs contained and returned to the system, and cause of SSOs.

As part of the County's Outcome Based Management Program, the Districts report quarterly on the number of customers served by the Districts, percent of time spent on scheduled versus

unscheduled work, number of reportable SSOs, and number of customers rating services good or better. The Districts plan to include additional performance indicators such as average response time to a SSO, and backlog of repair and rehabilitation work.

Regular communication about preventative maintenance and emergency response activities between the field and office staff take place which is used to determine whether the prescribed preventative maintenance activities should be modified or performed at a different interval.

Office staff will be assigned to review the SSMP annually to update any changes in operations and maintenance protocols, infrastructure, organizational structure, and also check the effectiveness and identify potential areas for improvement. SSMP revisions will be reviewed and approved internally. Major changes to the SSMP will be approved by the Board of Supervisors.

10. SSMP AUDITS

The Districts plan to conduct an annual audit of the SSMP and submit to the Regional Water Board a report of such audit by March 15 of the following year. The audit shall contain information collected as part of Section 9 as well as the following:

- Progress made on development of SSMP elements, and if the Districts are on schedule in development of the SSMP. Provide justification on the delay if the Districts are behind schedule on development of the SSMP;
- How the Districts implemented SSMP elements in the past year;
- The effectiveness of implementing SSMP elements;
- A description of the additions (main line extensions) and improvements (repairs and capital improvements) made to the sanitary sewer collection system in the past reporting year; and
- A description of the additions (main line extensions) and improvements planned (repairs and capital improvements) for the upcoming reporting year with an estimated schedule for implementation.

11. COMMUNICATIONS PROGRAM (FOR STATE WDR ONLY)

Regulatory Requirements

The State Water Board requires the County to communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communications program shall provide the public the opportunity to provide input to the County as the program

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

The Regional Water Board does not require the County to develop a communication program for the SSMP.

Communication With the Public

The County maintains a website (http://www.co.sanmateo.ca.us/sewers) specifically for the sewer districts to inform the public of the policies, regulations, procedures, and services of the Districts. The website also serves as a communication channel to provide useful information to the public and ways for the public to contact staff for any issues concerning services provided. Some of the information posted on the website include: educational brochures, sewer rates, Districts' standard details and specifications, master plans, and a link to the County's sewer ordinance codes.

This SSMP has been published on the website. The public can review the SSMP and is encouraged to provide comments and feedback on any of the elements and their implementation.

The County also communicates with the public by distributing English and Spanish versions of sewer educational brochures to the residents, holding community meetings, mailing informational letters to property owners, and providing assistance over the phone.

Communication With Plumbers and Sewer Contractors

The County participated with Bay Area Clean Water Agencies (BACWA) in developing an outreach flyer for preventing SSOs for plumbers and sewer contractors. The flyer included information on construction standards and proper maintenance activities that can be practiced by contractors to prevent SSOs in private laterals.

Copies of the flyer are placed at the front counter of the County's Public Works and Building and Planning Departments. The flyers are also handed out to customers or contractors whenever a Sewer Inspection Permit is issued at the Public Works Department.

Communication With the Districts' Governing Board

The County of San Mateo Board of Supervisors, the governing board of the Districts, has been advised of the development of the SSMP. The Board of Supervisors adopted a resolution approving the SSMP development plan and schedule on October 16, 2007. It is anticipated that the final SSMP will be approved by the Board of Supervisors on August 25, 2009.

Communication With "Satellite" Agencies

The Town of Woodside is the only satellite system that discharges sewage into one of the Districts' sewer systems (Fair Oaks Sewer Maintenance District). There are other agencies neighboring the Districts boundaries that rely on the Districts' facilities to transport sewage emanating from portions of their collection systems.

District staff currently maintains constant contact with staff of other neighboring agencies. Both formal and informal meetings are being held regularly to discuss issues concerning the operation

and maintenance of each other's systems. Other agencies have incorporated the County's requirements into their construction documents when their projects affected the Districts' sewer facilities.

The County plans to develop and implement a communication program with its contributing agencies. The plan will establish a collaborative approach to communicate with the contributing agencies and work together to discuss issues, provide support, and improve the SSMP.

Attachment A

Overflow Emergency Response Plan

OVERFLOW EMERGENCY RESPONSE PLAN

For

Burlingame Hills Sewer Maintenance District
Crystal Springs County Sanitation District
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OVERFLOW EMERGENCY RESPONSE PLAN

I. PURPOSE

The purpose of this Overflow Emergency Response Plan is to ensure that any SSOs that occur within the ten (10) County maintained Sewer/Sanitation Districts (Districts) are immediately responded to and reported in a timely and effective manner to contain the spillage and prevent or minimize further damage or injury to the environment and the public health.

II. SANITARY SEWER OVERFLOW DEFINITION

A sanitary sewer overflow (SSO) is a spill, release, or unauthorized discharge of wastewater from a sanitary sewer collection system that is caused by a problem in or with the collection system.

1. **Category 1** – All discharges of sewage resulting from a failure in the Districts' sanitary sewer system that:
   a) Equal or exceed 1,000 gallons; or
   b) Result in a discharge to a drainage channel and/or surface water; or
   c) Discharge to a storm drain pipe that was not fully captured and returned to the sanitary sewer system.

2. **Category 2** – All other discharges of sewage resulting from a failure in the Districts' sanitary sewer system.

3. **Private Lateral Sewage Discharges** – Sewage discharges that are caused by blockages or other problems within a privately owned lateral. (The Districts do not maintain private laterals. Overflows from private lateral are not reported.)

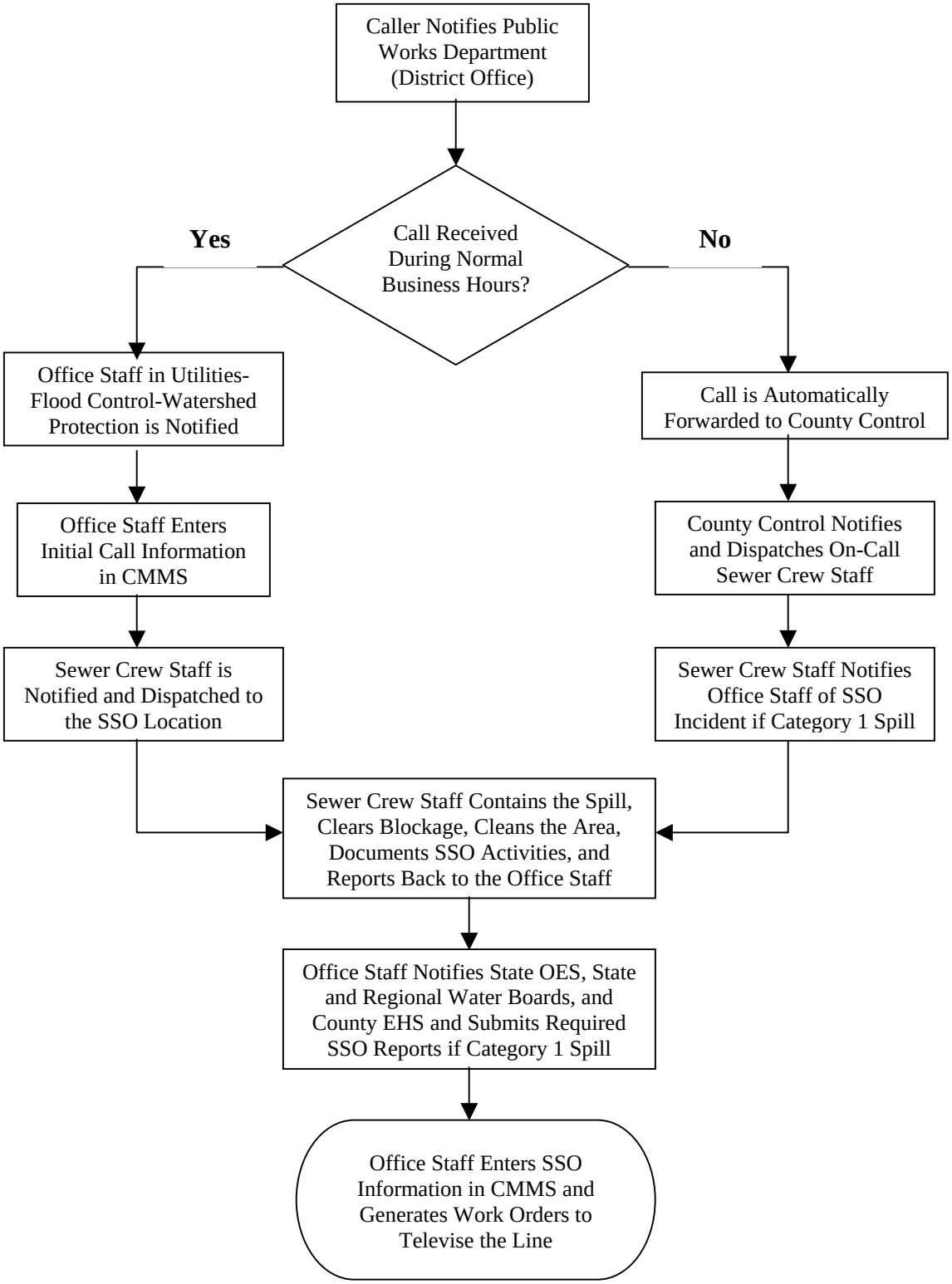
III. INCIDENT NOTIFICATION

1. Whenever a SSO is reported to the District office during normal business hours (Monday through Friday, 8:00 a.m. to 5:00 p.m.), the office staff dispatches a sewer crew staff member immediately to respond to the emergency. The incident is recorded in the Computerized Maintenance Management System (CMMS) with a Service Request Number assigned to the call.

2. All SSO calls received after business hours are directed to the County Communications Center (County Control). County Control then notifies the on-call sewer crew staff of the location and identifies information about the caller and the incident. The sewer crew supervisor reports all of the information pertaining to the SSO to the office staff during the next business day. The information is entered into CMMS by office staff.

3. The sewer crew staff arrives at the incident location with response vehicle and equipment (Appendix C) within 60 minutes after notification.

4. The following flow chart shows the notification sequence when a SSO occurs:



IV. OVERFLOW RESPONSE FIELD PROCEDURE

1. Wear personal protective equipment and follow all safety regulations.

2. Perform SSO investigation and assessment:
   a) Call for additional help if needed.
   b) Conduct quick estimate of the SSO volume using "**Appendix B – Volume Estimation Pictures and Tables for Overflowing Sewer Manholes**."
   c) Identify receiving water that may be impacted by SSO.
   d) Take photos of the incident and surrounding area.
   e) Contact office staff immediately to notify them whether the SSO is Category 1 or 2.

3. Provide adequate traffic control; and establish perimeters and control zones with cones, barricades, vehicles, or terrain for sewer crew's protection and public safety.
   a) If the County Health Officer determines that the SSO may affect the public health, a health officer will be dispatched to the site.
   b) The health officer will decide whether to post any warning signs at the site, and determine steps required to abate a health or environmental threat.
   c) Post "Sewage Contaminated Water" signs and block contaminated areas with yellow caution tape and barricades if SSO is reaching or has reached the waters of the state, and as deemed necessary by the Health Officer.

4. Contain SSO by employing any of the following or other site specific methods for containing the SSO:
   a) Plug nearby catch basin outlets using air plugs or cover catch basin inlets and storm drains using rubber mats.
   b) Contain the SSO by letting sewage collect in a natural low area and recover sewage after relieving blockage.
   c) Use sandbags or absorbent material around the overflow to collect the sewage and preventing it from spreading.
   d) Divert the SSO by building dikes or berms to redirect flow back to the sewer system.
   e) Divert the SSO by pumping around an overflow and attempting to return it to the sewer system.

5. Relieve and Correct the Cause of SSO
   a) Relieve the blockage or cause of the SSO and assess the material to determine the cause of the SSO.
   b) If unable to relieve the blockage, request immediate assistance from additional staff and appropriate equipment.
   c) If still unable to clear the blockage, request immediate assistance with the establishment of bypass pumping and CCTV support to determine the problem.

6. Notify office staff of the estimated volume of SSO and the expected time for completing the cleanup.

7. Cleanup and Disinfection
   a) Collect solid and liquid materials for proper disposal.
   b) Flush the area with water and direct the water to flow into the sewer system.
   c) If chlorinated water is used as a disinfectant during cleanup, the water should be contained and returned to the sewer system.
   d) Conduct cleanup of impacted storm drain in compliance with the storm water NPDES permit. NPDES permit allows only rainwater to be discharged into the storm drain system.
   e) If a SSO is on private property and is caused by a blockage in the District's maintained sewer system, follow the procedures described in "**V. OVERFLOWS IN HOMES AND BUSINESSESS**" of this section.

8. Sampling and Lab Tests (when required by the County Health Officer for Category 1 SSOs)
   a) Provide initial sampling of the receiving waters upstream and downstream of SSO.
   b) Re-sample the receiving waters and compare against initial samples to ensure the SSO contamination, if detectable, has been mitigated.
   c) Additional sampling and testing may be required by the Health Officer.

V. OVERFLOWS IN HOMES AND BUSINESSESS

San Mateo County Ordinance Code, Title 4, Sanitation and Health, Section 4.24.120:
Building laterals or pipes or piping which serve fixtures which are located below the level of the top of the nearest upgrade manhole of the main sewer shall be protected from the back flow of sewage by the installation of an appropriate number of district approved overflow devices. As additional protection, a gate valve of the type approved by the district, may also be installed on the building lateral.

San Mateo County Ordinance Code, Title 4, Sanitation and Health, Section 4.24.130:
The district shall not be responsible for damages to the interior of a house or structure or for the costs of cleanup which results from a sewer stoppage where an overflow or backflow valve as required by Section 4.24.120 has not been installed and properly maintained.

The following procedure applies only for situations where an overflow on private property is caused by a mainline blockage and the property has been identified as not needing a backflow prevention device. See the above County Ordinance Codes.

A. Private Property Cleanup

1. If the SSO has reached any private property structures, the sewer crew staff shall coordinate with the office staff to contact a professional cleaning company. For SSOs that occurred after normal business hours, the sewer crew staff shall contact a cleaning company directly and notify the office staff of the incident on the following working day.

2. When calling a cleaning company, it is important to state that the situation is a "**Water Emergency**". This will prevent the billing for the cleanup being sent to the homeowner. Below is a list of professional cleaning companies.

ServiceMaster Disaster Restoration (24-Hours) 2731 Fair Oaks Ave, Redwood City, CA 94063	650-299-9080
Emergency Service Restoration, Inc. (24-Hours)	800-577-7537

3. Office staff shall inform the cleaning company that an original invoice is required to process the payment.

B. Private Property Damage Claims

1. If there is property damage (ruined carpet/padding, hardwood floors, etc.) caused by a mainline blockage, the sewer crew staff shall do the following:
   a) Verify that the damage is associated to the current incident
   b) Take pictures of the damaged property
   c) Notify office staff of the situation

   Note: County staff should not pre-judge the cause of a spill or admit liability prior to an investigation of the incident. Actions until this point should be abatement, alleviation, and reduction of the emergency.

2. The office staff shall notify County Claims Administrator (Keith Hilligas, 510-351-1600) of the incident and actions needed to be taken to repair and restore the site to its previous condition.

3. County Claims Administrator will work with the homeowner in submitting a damage claim for reimbursement.

VI. OVERFLOW DOCUMENTATION

A. Initial Documentation

Office staff enters the following SSO information in CMMS:

1. Type of problem
2. Call date and time
3. Caller name, phone number, and comments
4. Location of incident
5. District name
6. Time sewer crew staff dispatched
7. Name of sewer crew staff dispatched
8. Name of office staff received the call

B. Field Documentation

Sewer crew staff fills out a SSO Reporting Form (Appendix A) and submits it to the office staff. The following information is recorded on the form:

1. Date and location of SSO
2. Time SSO notified
3. Time sewer crew staff arrived at the SSO location
4. Time SSO cleared
5. Time response completed (cleanup)
6. Estimated total volume of SSO
7. Estimated volume contained and returned the sewer system
8. Estimated volume released to the environment
9. Estimated volume that may have reached any receiving water and name of that receiving water
10. Final SSO destination
11. Cause of SSO
12. Pipe size and material
13. Brief description of mitigation measures
14. Names of sewer crew members that responded to the SSO

C. Office Documentation

1. Sewer crew staff brings the completed SSO Reporting Form to the office and reviews the form with office staff to finalize the information recorded on the form.

2. Office staff uses the information on the SSO Reporting Form to submit data to the regulatory agencies as required.

3. Office staff incorporates SSO Reporting Form information into CMMS for record keeping and trend tracking.

VII. POST-RESPONSE ACTIVITIES

Conduct a SSO post incident investigation to identify necessary corrective actions. Follow-up actions may include:

1. Clean and assess pipe to assure that pipe size is adequate.

2. Televise the pipe to determine if defects exist.

3. Adjust preventative maintenance schedule to increase maintenance frequency or type of preventative maintenance.

4. Replace/rehabilitate/repair sewer pipe or sections of sewer pipe if determined to be an

appropriate course of action.

5. If a SSO is caused by lack of capacity during wet weather conditions, document the storm event and conduct analysis of the system to determine point source mitigation relief or upgrade needs.

6. Recommend new equipment needs for future SSO response.

VIII. OVERFLOW REPORTING

Note: Contact information for all agencies is listed under "IX. PHONE DIRECTORY"

A. California Office of Emergency Services (State OES)

1. The State OES must be notified by telephone immediately when a Category 1 SSO occurs.

2. Once the State OES is notified, an OES Control Number will be provided for record and proof of report compliance.

3. The OES Control Number will be used to complete the "Notification Details" field of the State SSO Report in the California Integrated Water Quality System (CIWQS).

B. California State Water Resources Control Board (State Water Board)

1. Whenever an event shown below occurs, the State Water Board must be notified by completing an electronic report on the CIWQS website, as required by the Statewide General Waste Discharge Requirements (WDR) for Sanitary Sewer Systems Order No. 2006-0003 and Amendment Order No. WQ 2008-0002-EXEC adopted by the State Water Board on February 20, 2008.

SSO Type	Reporting Timeframe
Category 1	• **Initial Report** must be submitted as soon as possible, no later than 3 business days after becoming aware of SSO. • **Final Certified Report** must be submitted within 15 calendar days of the conclusion of SSO response and remediation.
Category 2	Must be reported within 30 days after the end of the calendar month in which the SSO occurs.

2. Monthly Reports must be submitted within 30 days after the end of each calendar month, even if there are no SSOs.

C. San Francisco Bay Regional Water Quality Control Board (Regional Water

Board)

1. The Regional Water Board must be notified within 2 hours of the District becoming aware of a Category 1 SSO.

2. Notify the Regional Water Board through their web based reporting program for 2/24-hour notification/certification (http://www.wbers.net). Filing a report on the web based reporting program fulfills both the 2-hour notification and the 24-hour certification (required by WDR). A full report must also be filed in CIWQS within 3 business days in accordance with the WDR.

3. If internet access is not available, leave a voicemail on the Regional Water Board's "Sewer Spill Line" at (510) 622-2369. The message needs to include a description of SSO and OES control number, and to state that the County Health Officer has been notified.

4. Annual SSO Report is required to be submitted to the Regional Water Board by March 15 of each year.

D. San Mateo County Environmental Health Services (County EHS)

The office staff shall notify the County EHS of all Category 1 SSOs. An Environmental Health Officer may be dispatched to determine the extent of health danger and any impact on the environment. It is the health officer's responsibility to determine what further health prevention steps, including the posting of health warning signs, are required for abatement of the SSO

1. County EHS will be automatically notified of the SSO once the Regional Water Board's web based 2-hour report is submitted by the District. This meets the requirements of notifying County EHS.

2. If the web based report for the Regional Water Board cannot be filed within 2 hours, notify Greg Smith of County EHS at (650) 372-6279 and leave a voicemail with a description of the SSO.

3. For SSOs that will have substantial impact on surface water, call County EHS **ASAP** to report the SSO.
    a) During business hours (Monday through Thursday, 7:00 a.m. to 6:00 p.m.), call County EHS front desk at (650) 372-6200. They can direct your call to either Greg Smith or to the District Inspector if Greg Smith is unavailable.
    b) After business hours and on Friday, Saturday or Sunday, call County Communications (Fire Dispatch) at (650) 363-4963. Inform them of the SSO and ask them to page the Environmental Health On-Call Inspector.
    c) Upon consulting County EHS, public areas affected by the SSO may be closed and sampling of the affected waters may be required to test for Total Coliform, E. coli, and Enterococcus.

E. Other State Agencies

Agencies listed below may need to be notified, as necessary:

1. California Department of Fish and Game
2. California Highway Patrol (must be notified for spills occurred on highways in the State)

F. Local Agencies

1. Water Districts
   Contact local water agencies whenever a SSO threatens to impact the drinking water storage or supplies.

2. County Office of Emergency Services
   San Mateo County Office of Emergency Services can assist agencies in notification and response coordination. In some cases, they may advise those completing financial assistance applications to support a cleanup operation.

3. Law Enforcement
   Contact the local police department for incorporated areas and the Sheriff's Department for unincorporated areas of San Mateo County for assistance. In an emergency, dial 9-1-1 for assistance.

G. Neighborhoods

1. Local residents should be notified of the SSO whenever the situation endangers the health of a neighborhood or its environment.

2. If a resident inquires about cleanup from private property structure damage caused by a SSO, refer to "**V. OVERFLOWS IN HOMES AND BUSINESSESS",** of this plan.

3. If the District is not responsible for cleanup of a spill, the property owner may choose to file a claim against the County. Claim forms can be obtained from the Clerk of the Board of Supervisors' office.

IX. PHONE DIRECTORY

A. Districts Staff

Name	Work Number	Personal Cell
Ann Stillman, Deputy Director	(650) 599-1497	(650) 222-0930
Mark Chow, Acting Principal Civil Engineer	(650) 599-1489	(650) 380-6962
Julie Young, Senior Civil Engineer	(650) 599-1479	(650) 515-6458
Pedro Oliva, Sewer Crew Supervisor	(650) 363-4765	(510) 415-1113
Crew Members:		
Dan VerLinden	(650) 393-9132	(650) 743-1044
George Godoy		(916) 213-2770
James Pruitt		(650) 754-3013
Jose Robles	(650) 393-0512	(650) 868-0336
Luis Gutierrez		(650) 291-1474
Vernon Jones Jr.	(650) 393-9193	(209) 513-1973

B. State of California

California Office of Emergency Services • 24-hour toll free for caller in California • Office main line OES Coastal Region Office 1300 Clay Street, Suite 408, Oakland, CA 94612	 (800) 852-7550 (916) 845-8911 (510) 286-0895
San Francisco Bay Regional Water Quality Control Board • 24-hour voicemail • Fax • Office main line • Michael Chee (San Mateo County Contact) mchee@waterboards.ca.gov 1515 Clay St. Suite 1400, Oakland, CA 94612	 (510) 622-5633 (510) 622-2460 (510) 622-2300 (510) 622-2333
Department of Fish and Game Central Coast Region (Region 3) 7329 Silverado Trail, Napa, CA 94558	(707) 944-5500
California Highway Patrol Redwood City Office 355 Convention Way, Redwood City, CA 94063	(650) 369-6261

C. San Mateo County Offices

County Department of Public Works – Sewer Section	(650) 363-4100
County Environmental Health Services	(650) 363-4305
County Risk Management	(650) 363-4611
County Office of Emergency Services	(650) 363-4790
County Sheriff's Office	(650) 599-1536
County Communications Center	(650) 363-4961
County Operator (24 Hours)	(650) 363-4000
Local Police or Fire Services	9-1-1

D. Local Water Agencies

Sewer District	Water Provider	Phone Number
Burlingame Hills SMD	City of Burlingame	(650) 558-7210
Crystal Springs CSD	California Water Service Company	(650) 343-7698
Devonshire CSD	California Water Service Company	(650) 343-7698
Edgewood SMD	City of Redwood City	(650) 780-7464
Emerald Lake SMD	City of Redwood City	(650) 780-7464
Fair Oaks SMD	California Water Service Company City of Redwood City	(650) 367-6800 (650) 780-7464
Harbor Industrial SMD	Mid-Peninsula Water District	(650) 591-8941
Kensington Square SMD	City of Redwood City	(650) 780-7464
Oak Knoll SMD	City of Redwood City	(650) 780-7464
Scenic Heights CSD	City of Redwood City	(650) 780-7464

X. SSO VOLUME CALCULATIONS AND ESTIMATES

The following are some methods of determining the volume of SSO in gallons.

1. Rectangular Area

If the SSO is settled in a rectangular area, the formula for calculating the volume is:

Gallons Spilled (Volume) = Length (ft) x Width (ft) x Depth (ft) x 7.48 gal/ft^3

Example 1: Calculate a SSO with dimensions of 100 ft by 100 ft and one-half foot deep.

Volume of SSO = 100' x 100' x 0.5' x 7.48 = 37,400 Gallons

2. Circular Area

If the SSO is settled in a circular area, the formula for calculating the volume is:

Gallons Spilled (Volume) = Length (ft) x Width (ft) x Depth (ft) x 7.48gal/ft^3 x 0.785

Example 2: Calculate a SSO with a circular surface area similar to Example #1.

Volume of SSO = 100' x 100' x 0.5' x 7.48 x 0.785 = 26,180 Gallons

3. Upstream Connections

If you are dealing with an ongoing SSO where the sewage is not contained by the terrain, you can estimate the volume of SSO entering the storm drain by multiplying the average sewer flow rate per household per hour and the duration of the SSO in hours, then multiply the number of connections on the receiving line.

Estimate: Average sewer flow rate per household in a hour = 10 gallons/hour

Example 3: You have a line with 6 houses connected to the sewer main and the manhole has been overflowing for 24 hours. Calculate the total amount of SSO.

Volume of SSO = 10 gallons per hour x 24 hours x 6 houses = 1,440 Gallons

Example 4: Calculate the volume of SSO for 3 hours in Example #3 using 200 gallons per day per household.

Volume of SSO = (200 gallons per day x 3 hours x 6 houses) / 24 hours = 150 Gallons

4. Overflowing Manhole

If a manhole is overflowing, the spill volume can be estimated using one of the following references in Appendix B:

a) Reference Sheet for Estimating Sewer Spills from Overflowing Sewer Manholes
b) Table A: Estimated SSO Flow Out Of M/H With Cover In Place
c) Table B: Estimated SSO Flow Out Of M/H With Cover Removed
d) Table C: Estimated SSO Flow Out of M/H Pick Hole

Appendix A

Sanitary Sewer Overflow Reporting Form

Latitude: _____ SSO Event ID: _____ SR No.: _____

Longitude: _____ Certification ID: _____ Flushing WO No.: _____

Map Page No.: _____ OES Control No.: _____ CCTV WO No.: _____

SSO Reporting Form

To be filled out for all SSO's

Contact Pedro Oliva: 510-415-1113 or Ann Stillman: 650-222-0930/650-776-5796 if SSO is Category 1.
OES: 800-852-7550, San Mateo County Environmental Health Services: 363-4305

If **ANY** of the 3 following questions below is answered yes, this is a Category 1 SSO, all other SSO's are Category 2.

1) Was the SSO greater than 1,000 Gallons? YES / NO
2) Did the SSO reach drainage channel or surface waters? YES / NO
3) Did the SSO discharge into a stormdrain that was not captured and returned to the sewer? YES / NO

Location of SSO (Address): _____

BHSMD CSCSD DCSD ESMD ELHSMD FOSMD HISMD KSSMD OKSMD SHCSD

(Circle District in which SSO occurred)

Date: _____/_____/_____

SSO originally reported by: _____

Time notified: _____:_____ *AM / PM* (**SSO start time**)

Time arrived: _____:_____ *AM / PM*

Time SSO cleared: _____:_____ *AM / PM* (**SSO end time**)

Time response completed: _____:_____ *AM / PM*

SSO duration: _____ minutes = Time SSO cleared – Time notified (1 hour = 60 minutes)

Estimated rate of SSO: _____ gallons per minute (see sample SSO pictures)

Estimated volume of SSO: _____ gallons (rate x duration)

SSO volume returned to system: _____ gallons SSO volume contained: _____ gallons

Weather condition at time of SSO: *SUNNY / RAINING / WET / DRY / OTHER:* _____

Source of SSO: *MANHOLE / CLEANOUT / PIPE / PUMP / BUILDING / OTHER*: _____

Overflowing manhole number(s) _____

Main line size: ____", Main line material: *VCP / PVC / HDPE / RCP / OTHER:* _____

Cause of SSO: *DEBRIS / EXCESSIVE FLOW / GREASE / ROOTS / PUMP FAILURE / OPERATOR ERROR / PIPE FAILURE / VANDALISM / OTHER:* _____

Blockage was _____ *FEET / RODS* from MH # _____ (between MH # _____ and MH # _____)

Final Destination of SSO: *STREET / GUTTER / STORM DRAIN / BUILDING / PAVED SURFACE / UNPAVED SURFACE / SURFACE WATER / OTHER:* _____

Description of terrain surrounding spill: _____

Were health warnings posted? YES / NO

Were water quality samples taken? YES / NO

SSO Reporting Form (Continues)

Name of impacted beach: _____

Name of impacted waters: _____

Describe the actions taken to contain the spill and to stop the SSO:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

SSO Responder(s): _____

SSO Report Completed by: _____ Date: _____

SSO Report Reviewed by: _____ Date: _____

FOR OFFICE USE

Notification Details (Category 1 Only)

OES Control Number: _____

OES Notified Date: _____ Time: _____ *AM / PM*

Environmental Health Notified Date: _____ Time: _____ *AM / PM*

CIWQS Database

Draft Report Submitted by: _____ Date: _____

Report Finalized by: _____ Date: _____

Report Certified by: _____ Date: _____

Appendix B

Volume Estimation Pictures and Tables for Overflowing Sewer Manholes

Flow Estimation Pictures

Attachment D - Sample Templates for SSO Volume Estimation

TABLE 'A'

ESTIMATED SSO FLOW OUT OF M/H WITH COVER IN PLACE

24" COVER

Height of spout above M/H rim **H** in inches	S S O FLOW **Q** in gpm	in MGD	Min. Sewer size in which these flows are possible
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	
9	529	0.761	

36" COVER

Height of spout above M/H rim **H** in inches	S S O FLOW **Q** in gpm	in MGD	Min. Sewer size in which these flows are possible
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	

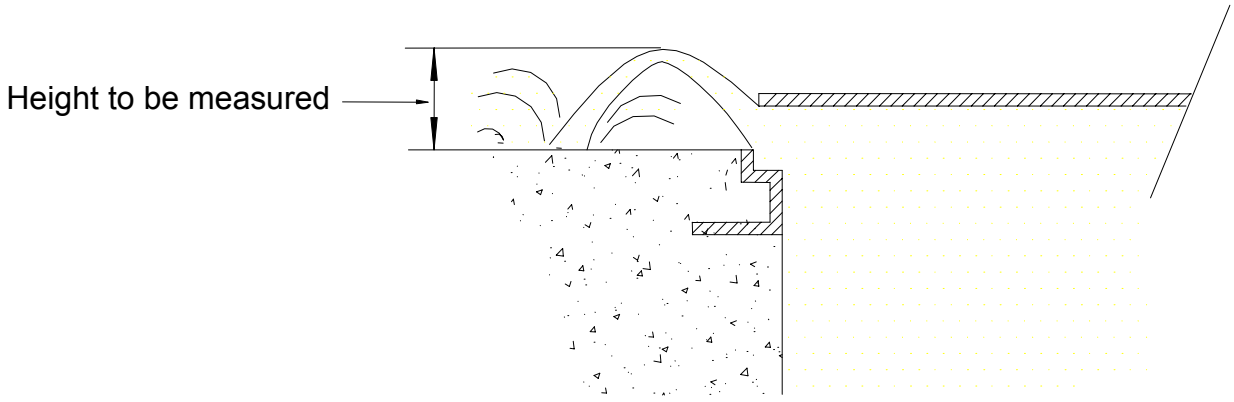
Disclaimer:
This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

The formula used to develop Table A measures the maximum height of the water coming out of the maintenance hole above the rim. The formula was taken from hydraulics and its application by A.H. Gibson (Constable & Co. Limited).

Example Overflow Estimation:

The maintenance hole cover is unseated and slightly elevated on a 24" casting. The maximum height of the discharge above the rim is 5 ¼ inches. According to Table A, these conditions would yield an SSO of 185 gallons per minute.

FLOW OUT OF M/H WITH COVER IN PLACE



This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

Collection System Collaborative Benchmarking Group
Best Practices for Sanitary Sewer Overflow (SSO) Prevention and Response Plan

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TABLE 'B'

ESTIMATED SSO FLOW OUT OF M/H WITH COVER REMOVED

24" FRAME

Water Height above M/H frame **H** in inches	S S O FLOW **Q** in gpm	in MGD	Min. Sewer size in which these flows are possible
1/8	28	0.04	
1/4	62	0.09	
3/8	111	0.16	
1/2	160	0.23	
5/8	215	0.31	6"
3/4	354	0.51	8"
7/8	569	0.82	10"
1	799	1.15	12"
1 1/8	1,035	1.49	
1 1/4	1,340	1.93	15"
1 3/8	1,660	2.39	
1 1/2	1,986	2.86	
1 5/8	2,396	3.45	18"
1 3/4	2,799	4.03	
1 7/8	3,132	4.51	
2	3,444	4.96	21"
2 1/8	3,750	5.4	
2 1/4	3,986	5.74	
2 3/8	4,215	6.07	
2 1/2	4,437	6.39	
2 5/8	4,569	6.58	24"
2 3/4	4,687	6.75	
2 7/8	4,799	6.91	
3	4,910	7.07	

36" FRAME

Water Height above M/H frame **H** in inches	S S O FLOW **Q** in gpm	in MGD	Min. Sewer size in which these flows are possible
1/8	49	0.07	
1/4	111	0.16	
3/8	187	0.27	6"
1/2	271	0.39	
5/8	361	0.52	8"
3/4	458	0.66	
7/8	556	0.8	10"
1	660	0.95	12"
1 1/8	1,035	1.49	
1 1/4	1,486	2.14	15"
1 3/8	1,951	2.81	
1 1/2	2,424	3.49	18"
1 5/8	2,903	4.18	
1 3/4	3,382	4.87	
1 7/8	3,917	5.64	21"
2	4,458	6.42	
2 1/8	5,000	7.2	24"
2 1/4	5,556	8	
2 3/8	6,118	8.81	
2 1/2	6,764	9.74	
2 5/8	7,403	10.66	
2 3/4	7,972	11.48	30"
2 7/8	8,521	12.27	
3	9,062	13.05	
3 1/8	9,604	13.83	
3 1/4	10,139	14.6	
3 3/8	10,625	15.3	36"
3 1/2	11,097	15.98	
3 5/8	11,569	16.66	
3 3/4	12,035	17.33	
3 7/8	12,486	17.98	
4	12,861	18.52	
4 1/8	13,076	18.83	
4 1/4	13,285	19.13	
4 3/8	13,486	19.42	

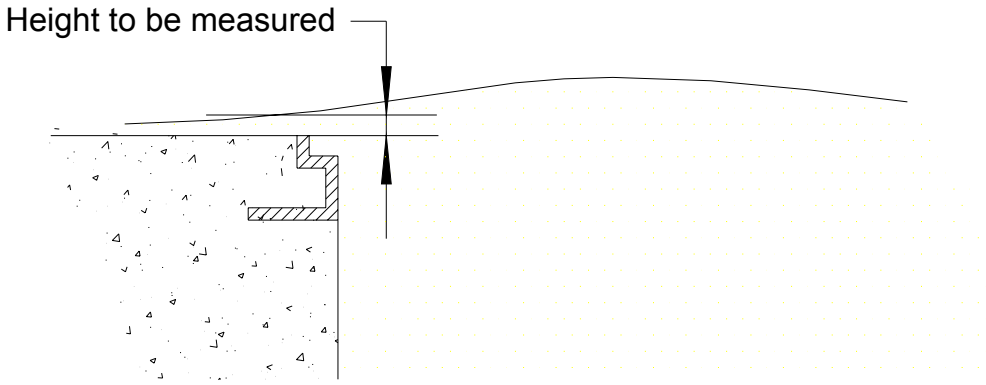
Disclaimer:
This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

The formula used to develop Table B for estimating SSO's out of maintenance holes without covers is based on discharge over curved weir -- bell mouth spillways for 2" to 12" diameter pipes. The formula was taken from hydraulics and its application by A.H. Gibson (Constable & Co. Limited).

Example Overflow Estimation:

The maintenance hole cover is off and the flow coming out of a 36" frame maintenance hole at one inch (1") height will be approximately 660 gallons per minute.

FLOW OUT OF M/H WITH COVER REMOVED (TABLE "B")



This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

TABLE 'C'

ESTIMATED SSO FLOW OUT OF M/H PICK HOLE

Height of spout above M/H cover **H** 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 M/H cover **H** 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	← Unrestrained M/H cover will start to lift
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	

Note: This chart is based on a 7/8 inch diameter pick hole

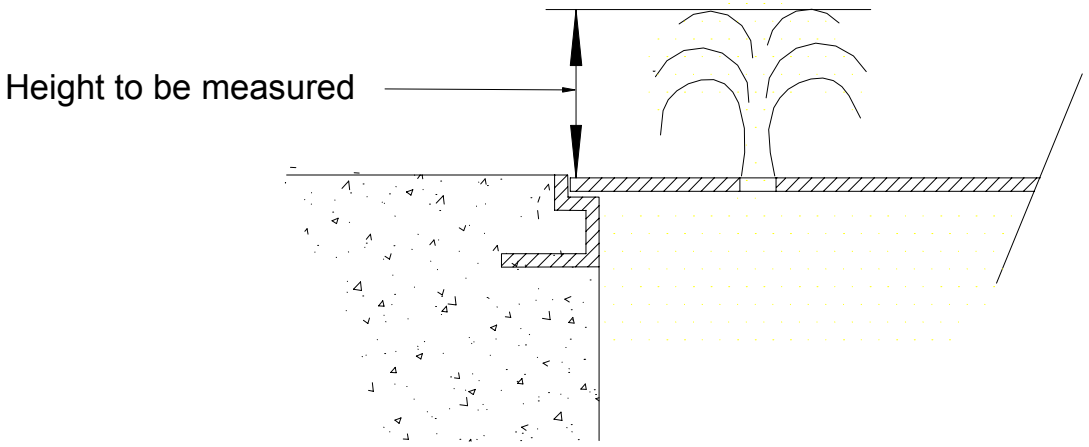
Disclaimer: This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

The formula used to develop Table C is Q=CcVA, where Q is equal to the quantity of the flow in gallons per minute, Cc is equal to the coefficient of contraction (.63), V is equal to the velocity of the overflow, and A is equal to the area of the pick hole.[2] If all units are in feet, the quantity will be calculated in cubic feet per second, which when multiplied by 448.8 will give the answer in gallons per minute. (One cubic foot per second is equal to 448.8 gallons per minute, hence this conversion method).

Example Overflow Estimation:

The maintenance hole cover is in place and the height of water coming out of the pick hole seven-eighths of an inch in diameter (7/8") is 3 inches (3"). This will produce an SSO flow of approximately 4.7 gallons per minute.

FLOW OUT OF VENT OR PICK HOLE (TABLE "C")



This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

[2] Velocity for the purposes of this formula is calculated by using the formula h = v squared / 2G, where h is equal to the height of the overflow, v is equal to velocity, and G is equal to the acceleration of gravity.

Appendix C

Overflow Response Contingency Equipment

Equipment		Quantity
Operations and Maintenance		
	Flusher Truck	2
	Rodder	2
	TV Van with TV Inspection System and Camera	1
	Sewer Lateral Inspection Camera	1
	Service Truck	1
	Dump Truck	1
Emergency Response		
	2” Portable Gas Powered Pump - New	2
	4” Portable Gas Powered Pump	1
	6” Portable Gas Powered Pump	1
	2”, 4”, 6” Pump Suction Hose (16’-20’ long)	one each
	2” Discharge Hose (50’ long)	22
	4” Discharge Hose	400 ft
	6” Discharge Hose	600 ft
	4” – 6” Plug	2
	4” – 16” Plug	1
	8” – 12” Plug	2
	8” – 24” Plug	1
	10” Plug	1
	12” – 18” Plug	2
	12” – 32” Plug	1
	20” – 40” Plug	1
Others		
	Traffic Cones (10 in each truck)	80
	Traffic Signs (2 in each truck)	16

Attachment B

Plumbers and Sewer Contractors Outreach Flyer

Plumbers & Sewer Contractors:
Your Actions Can Prevent Sanitary Sewer Overflows!

What Are Sanitary Sewer Overflows or SSOs?

SSOs discharge untreated or partially treated human and industrial waste, debris, and disease-causing organisms from the sanitary sewer onto the ground near and into homes and potentially into creeks, rivers, lakes or streams.

What Are the Impacts of SSOs?

SSOs may result in property damage, environmental damage and/or potential liability to you or your company. Allowing sewage to discharge to a gutter, storm drain or waterway may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up efforts and regulatory penalties.

How Can You Prevent SSOs?
and avoid associated penalties & fines

When clearing plugged sewer laterals:

- ☑ Whenever possible, remove root balls, grease blockages and any other debris; don't push debris from the lateral to the sewer main.
- ☑ If you can't prevent a root ball or other debris from entering the sewer main when working in our service area, **please call us** at (650) 363-4100, so we can work with you (free of charge) to remove the root ball from the sewer main to prevent blockages further downstream.
- ☑ Use plenty of water to flush lines.
- ☑ Take all appropriate action and be cautious when opening manholes. Hazardous sewer gases from manholes are odorless, undetectable and can be deadly. Please note that discharge into a publicly owned manhole requires a permit. Please contact us at (650) 363-4100, for an application.

When constructing sewer laterals:

- ☑ Contact us at (650) 363-4100 for permits and appropriate construction details and specifications.
- ☑ Check your work area. Gravel, backfill material and test plugs can become lodged in the sewer line and cause blockages. Make sure no debris is left in the sewer line before you backfill.
- ☑ Avoid offset joints – offset joints make sewer lines vulnerable to root intrusion & grease accumulation, cause debris hang-ups and make lines harder to clean. Properly bed your joints and don't hammer tap.

Who Do I Call to Avoid an SSO?

Help us help you…

If you require our free assistance to help clear root balls, grease blockages and other debris from a main sewer line to prevent an SSO, please call us at:

(650) 363-4100

County Maintained Districts

Burlingame Hills Sewer Maintenance District
Crystal Springs County Sanitation District
Devonshire County Sanitation District
Edgewood Sewer Maintenance District
Emerald Lake Heights Sewer Maintenance District
Fair Oaks Sewer Maintenance District
Harbor Industrial Sewer Maintenance District
Kensington Square Sewer Maintenance District
Oak Knoll Sewer Maintenance District
Scenic Heights County Sanitation District

(District service area map can be viewed by accessing the County website at: www.co.sanmateo.ca.us/sewers)

Office Location:

County of San Mateo
Department of Public Works
555 County Center, 5th Floor
Redwood City, CA 94063
Tel: (650) 363-4100
Fax: (650) 361-8220

Bay Area Clean Water Agencies
A Joint Powers Public Agency

BAPPG

COUNTY OF SAN MATEO FOUNDED 1856

Attachment C

Sanitary Sewer Standard Details and Specifications

County of San Mateo

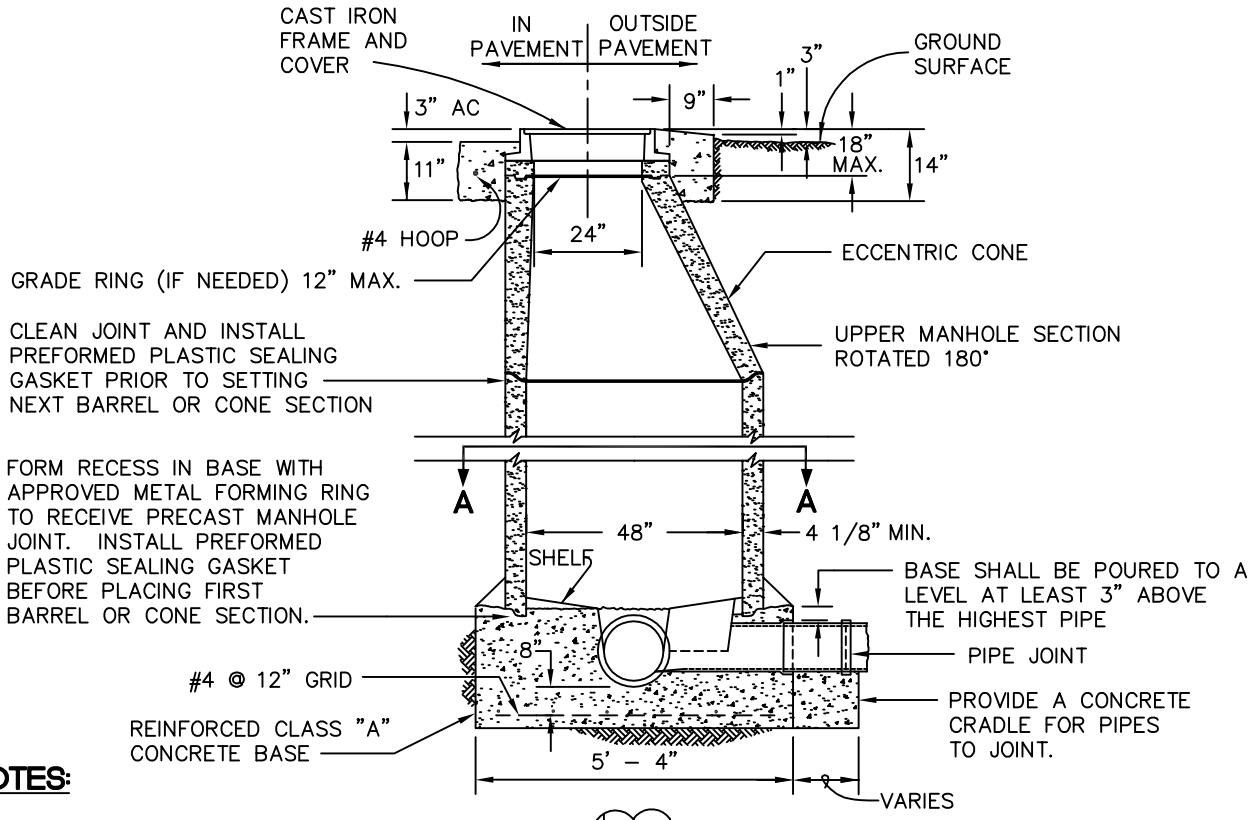
Sanitary Sewer Standard Details and Specifications

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

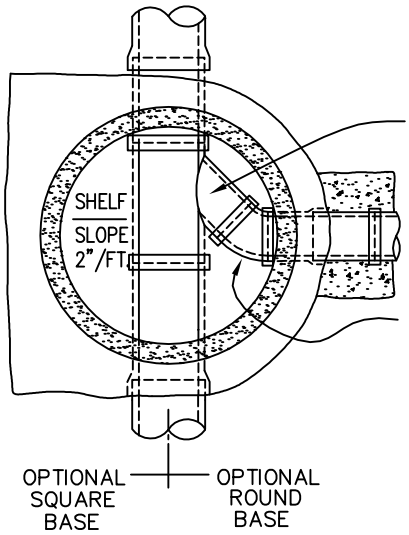
DRAWN BY: D.P.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: 7/97



NOTES:

1. ALL STEEL TO BE 3" CLEAR.
2. LAY PIPE THRU M.H. WHEN POSSIBLE.
3. M.H. SHELF SHALL BE MORTARED TO A SLOPE OF 2"/FT.
4. THERE SHALL BE NO STEPS IN THE MANHOLE.
5. PREFORMED PLASTIC SEALING GASKET SHALL BE "RAM–NEK" OR APPROVED EQUAL.
6. IN THE EVENT PVC OR ABS PIPES ARE APPROVED, STANDARD WATER STOPS SHALL BE INCORPORATED INTO THE MANHOLE BASE.
7. OTHER APPLICABLE DETAIL: C–2
8. MANHOLE THROAT LOCATION TO BE OPPOSITE THE LARGEST SHELF AREA OR AS DIRECTED BY THE ENGINEER



SECTION A-A

SANITARY SEWER MANHOLE DETAIL

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

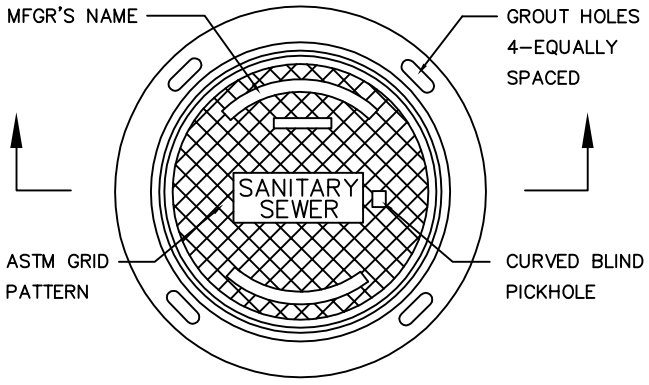
REDWOOD CITY
CALIFORNIA

DRAWN BY: M.L.
CHECK BY: R.O.
APPROVED BY: N.R.C.

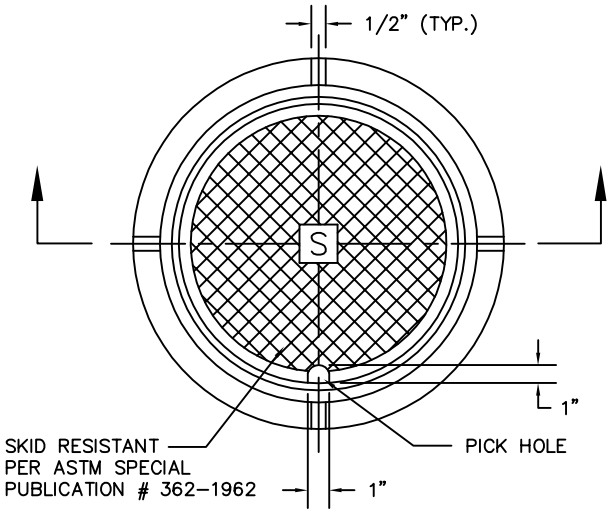
SCALE: NONE
DATE: 6/95
REVISED:

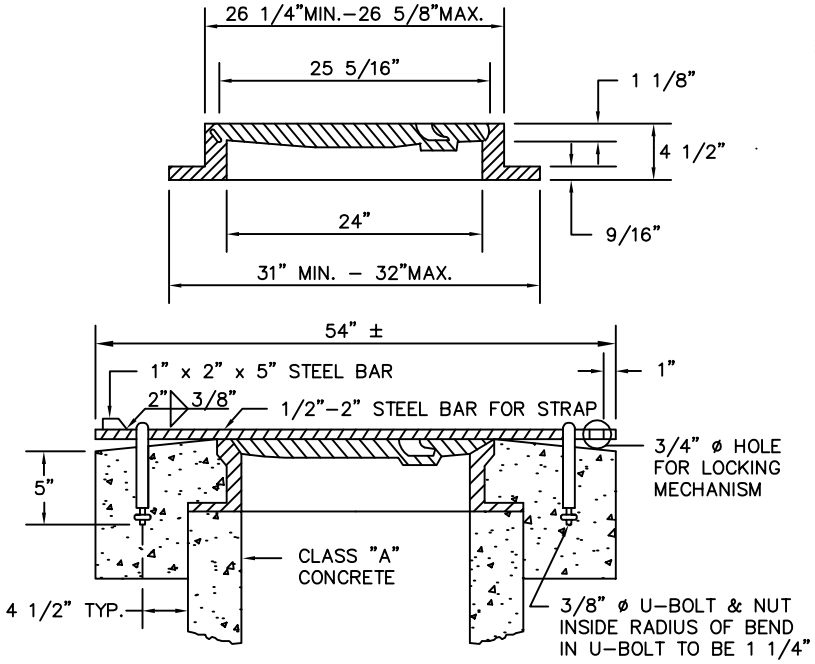
GENERAL NOTE:

FRAME AND COVER SHALL MEET OR EXCEED THE REQUIREMENTS OF AASHTO H-20 LOADING.



* ALL MATERIALS USED SHALL CONFORM TO ASTM SPEC. A-159-70T-G3000 OR U.S. GOV'T SPEC. QQ1-653

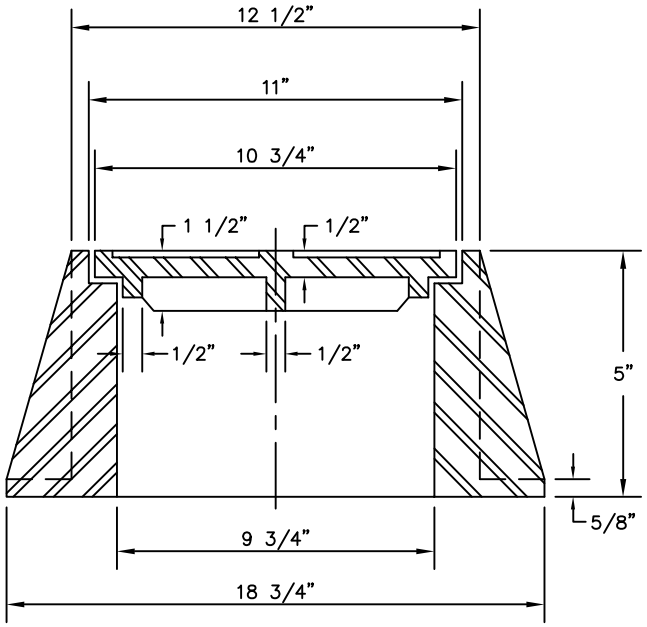




* MANHOLE STRAP TO BE USED IN OFF ROAD AREA WHERE SPECIFIED BY THE ENGINEER

* U-BOLTS, NUT & STRAP SHALL BE HOT DIP GALVANIZED AFTER FABRICATION

* ALL MATERIALS USED SHALL CONFORM TO ASTM SPEC. A-159-64T-G3000 OR U.S. GOV'T SPEC. QQ1-653



SECTION

SANITARY SEWER MANHOLE COVER, FRAME AND STRAP DETAIL

SECTION

SANITARY SEWER FLUSHING INLET COVER

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

DRAWN BY: N.M.
CHECK BY: A.M.S.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 8/06
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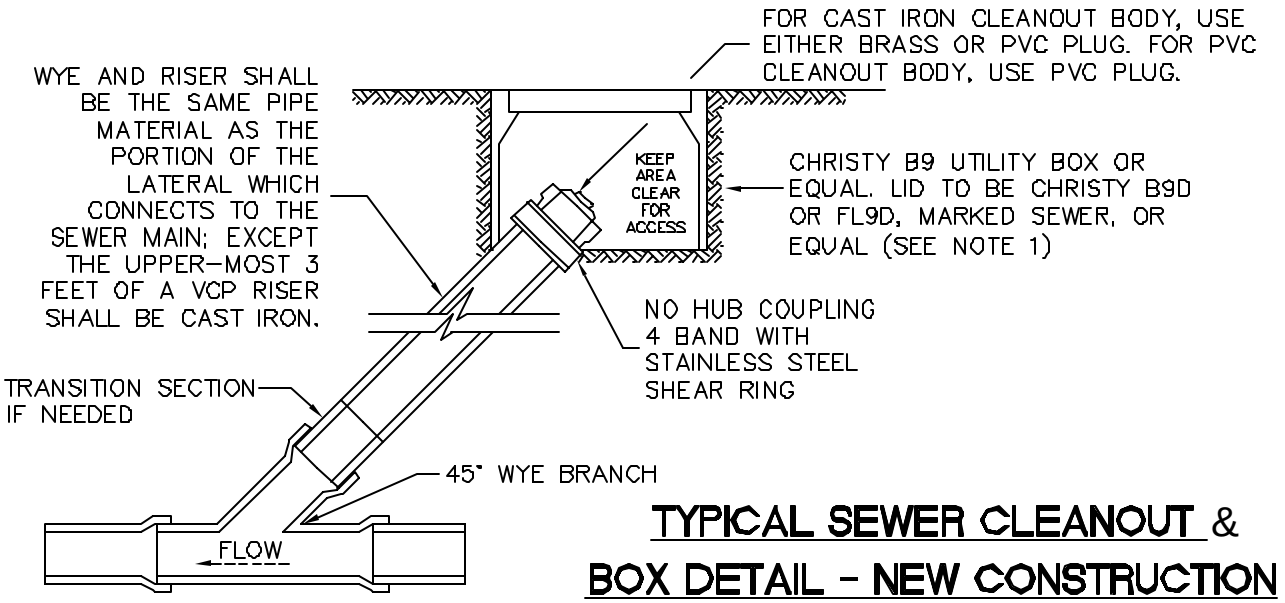
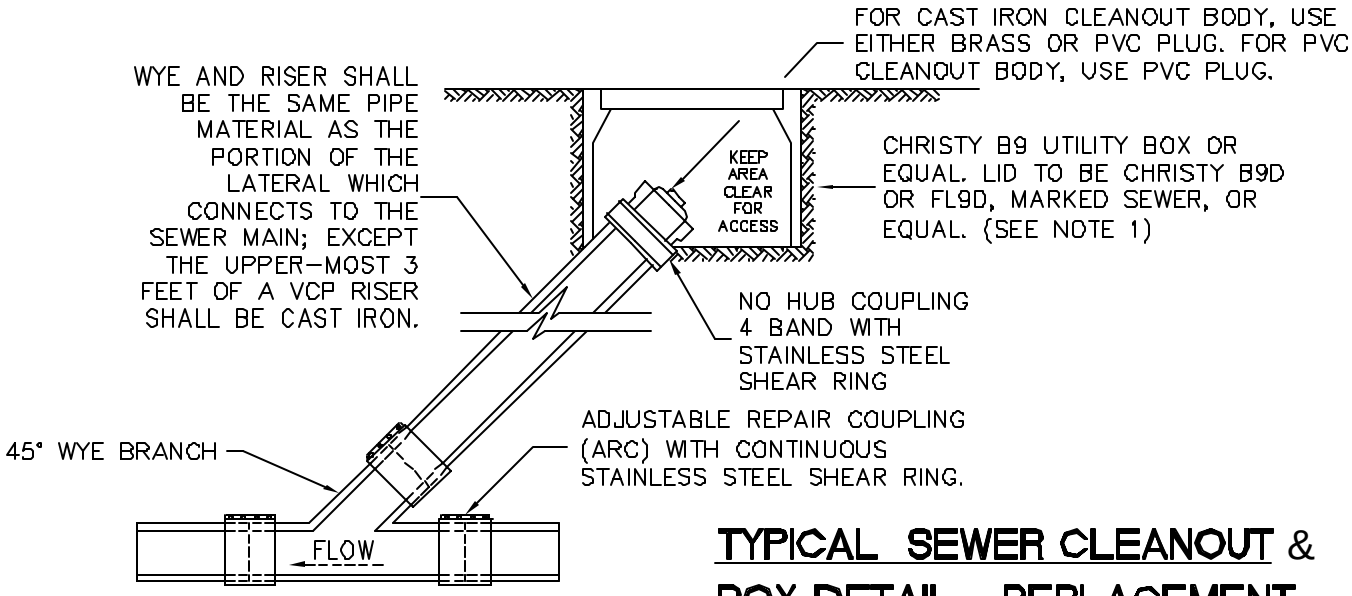


TYPICAL SEWER CLEANOUT & BOX DETAIL - NEW CONSTRUCTION



TYPICAL SEWER CLEANOUT & BOX DETAIL - REPLACEMENT

NOTES:

1. WHEN BOX IS SUBJECT TO TRAFFIC LOADING, PROVIDE CAST IRON LID.
2. BOX TO BE PLACED SUCH THAT CLEANOUT CAP CAN BE EASILY REMOVED, SEE ILLUSTRATION.
3. PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING LATERAL FROM THE PROPERTY STRUCTURE TO DISTRICT MAIN. DISTRICT PROVIDES COURTESY SERVICE FROM DISTRICT STANDARD PROPERTY LINE CLEANOUT TO THE MAIN.
4. SDR-26 WYE, RISER, CLEANOUT BODY AND CAP CAN BE USED ONLY WHEN LATERAL FROM PROPERTY LINE TO MAIN LINE IS REPLACED WITH SDR-26.
5. WHEN ENTIRE LATERAL IS REPLACED, LATERAL FROM PROPERTY LINE CLEANOUT TO MAIN LINE SHALL HAVE A 14-1-UF GUAGE MINIMUM SINGLE CONDUCTOR TRACER WIRE TAPED TO THE ENTIRE LENGTH OF THE PIPE.

CONSTRUCTION OF A STANDARD CLEANOUT REQUIRES MULTIPLE INSPECTIONS BY DISTRICT PERSONEL:
1. FIRST INSPECTION - TO INSPECT WYE AND RISER, WYE AND RISER MUST BE EXPOSED.
2. SECOND INSPECTION - TO INSPECT PLACEMENT OF BOX, LID AND LOCATION OF CLEANOUT WITHIN BOX .

SAN MATEO COUNTY DEPARTMENT
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REDWOOD CITY
CALIFORNIA

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SCALE: NONE
DATE: 6/95
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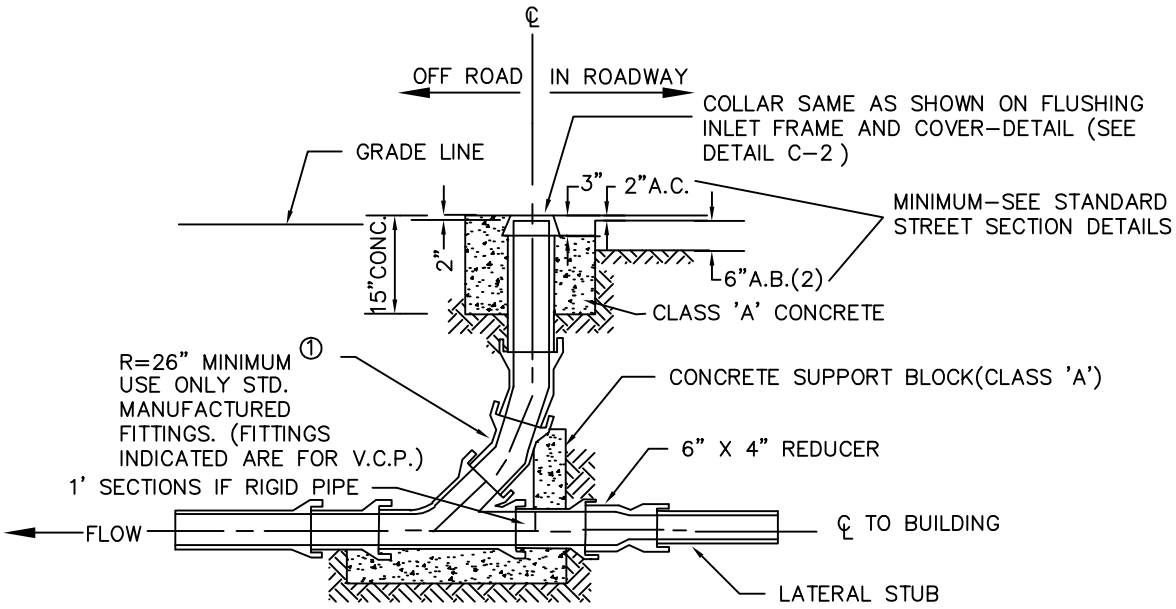
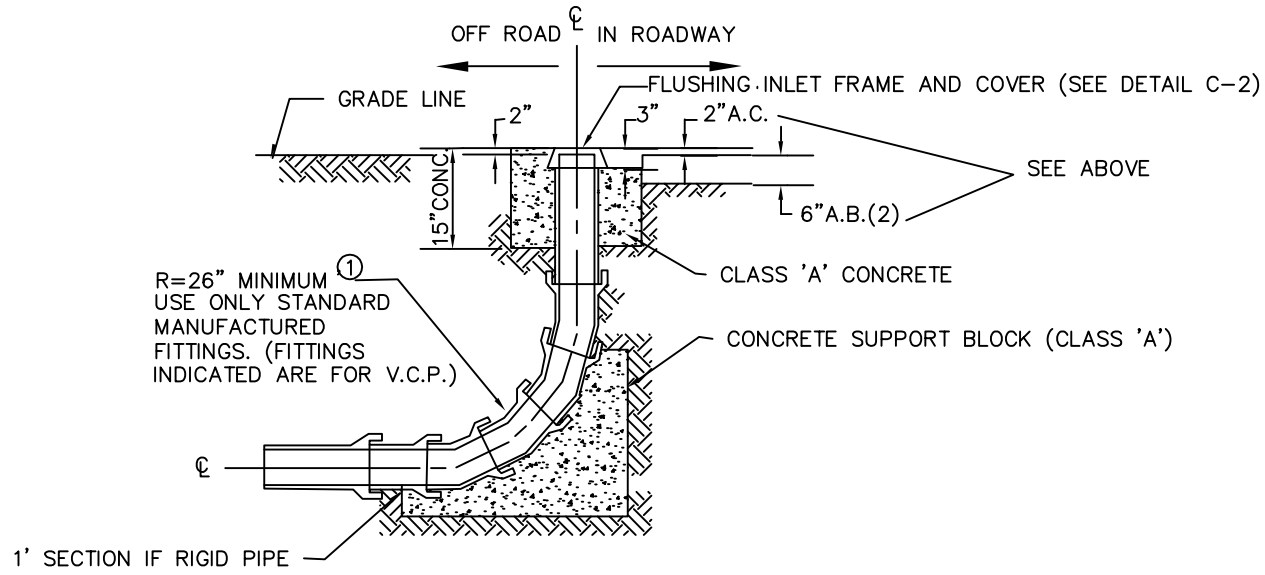


FLUSHING INLET WITH LATERAL STUB



NOTE: ① FOR P.V.C. PIPE, LARGE 90° MANUFACTURED SWEEPS MAY BE USED IF R=36" OR GREATER

FLUSHING INLET

SANITARY SEWER FLUSHING INLET DETAIL

SAN MATEO COUNTY DEPARTMENT
OF
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REDWOOD CITY
CALIFORNIA

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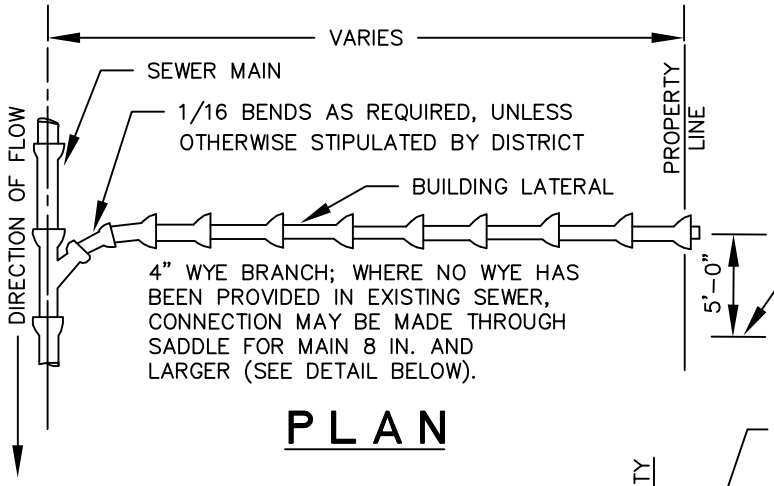
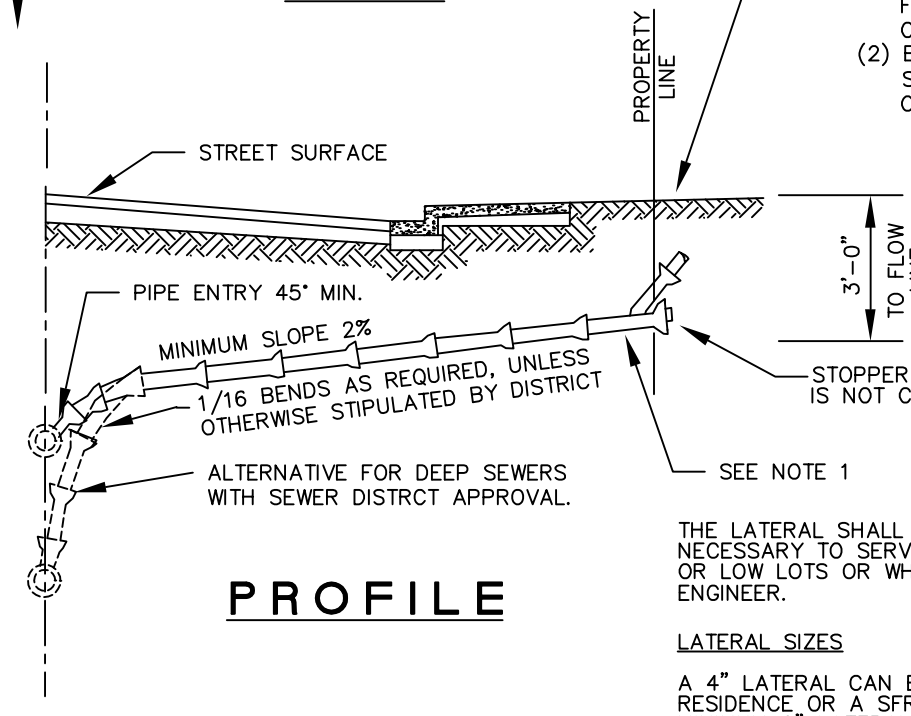


ON NEW CONSTRUCTION–LATERAL TO BE PLACED 5' ABOVE LOWER LOT LINE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE WYE LATERAL AND PROPERTY LINE CLEAN OUT SHALL BE OF THE SAME MATERIAL

PLAN



NOTE: (1) SEE DETAIL SHEET NO. C–3 FOR SAN MATEO COUNTY STANDARD CLEANOUT DETAIL.
(2) BEDDING AND BACKFILL MATERIAL SEE DETAILS C–6 (TYPE A OR B) OR C–7

STOPPER OR PLUG (IF BUILDING LATERAL IS NOT CONNECTED AT THE SAME TIME)

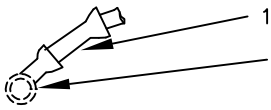
PROFILE

THE LATERAL SHALL BE LOWER WHERE NECESSARY TO SERVE EXISTING PLUMBING OR LOW LOTS OR WHEN DIRECTED BY THE ENGINEER.

LATERAL SIZES

A 4" LATERAL CAN BE USED FOR A SINGLE FAMILY RESIDENCE OR A SFR WITH A SECOND UNIT. A MINIMUM 6" LATERAL SHALL BE USED FOR ALL OTHER DEVELOPMENTS.

METHOD OF ATTACHING LATERAL TO EXISTING SEWER WHERE NO WYE HAS BEEN PROVIDED



1. EXISTING MAIN ≤ 8": FOR MEANS BY WHICH CONNECTION IS TO BE MADE TO MAIN LINE SEE DETAIL C–8.
2. EXISTING MAIN 10"–18": CONNECTION BY MEANS OF AN APPROVED SADDLE "TEE"
3. EXISTING MAIN >18": CONNECTION SHALL BE AT A MANHOLE UNLESS OTHERWISE APPROVED BY THE SEWER DISTRICT.

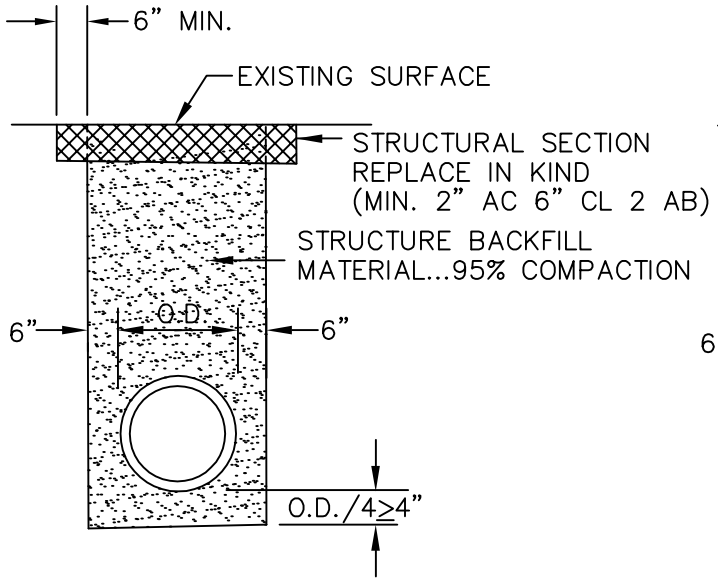
SEWER LATERAL DETAIL

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

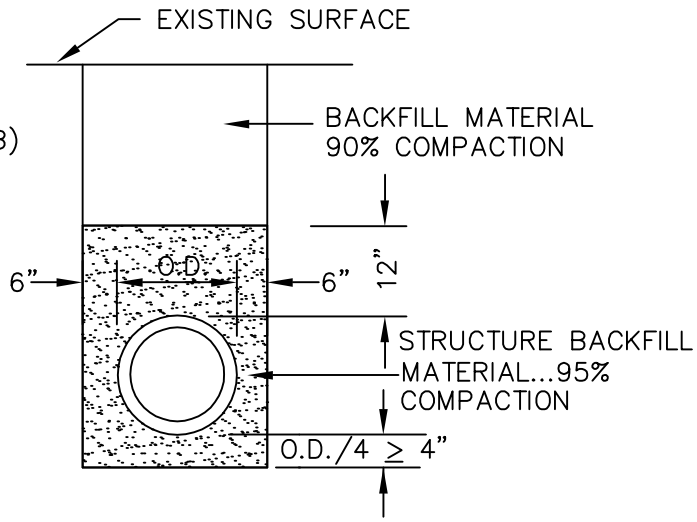
REDWOOD CITY
CALIFORNIA

DRAWN BY: N.M.A.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: 7/97



TYPE A (IN ROADWAY)



TYPE B (OUTSIDE ROADWAY)

1. STRUCTURE BACKFILL MATERIAL....MATERIAL WITH SAND EQUIVALENT NOT LESS THAN 20 AND SIEVE GRADATION BY WEIGHT AS FOLLOWS:

SIEVE SIZE	% PASSING SIEVE
3"	100
No. 4	35–100
No. 30	20–100

2. BACKFILL MATERIAL.... MATERIAL FROM EXCAVATION, FREE FROM STONES OR LUMPS EXCEEDING 3 INCHES GREATEST DIMENSION, ORGANIC MATTER, OR OTHER UNSATISFACTORY MATERIAL

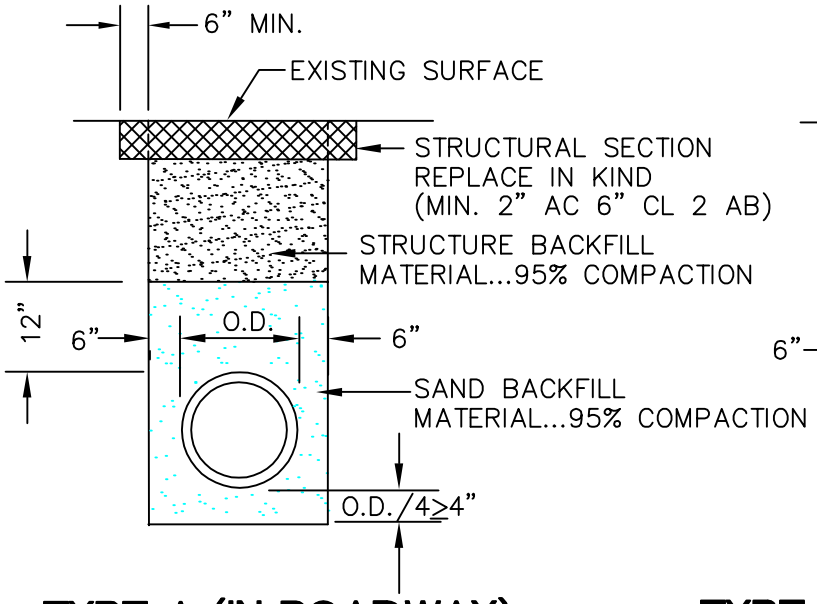
STANDARD TRENCH BACKFILL AND BEDDING DETAIL FOR VITRIFIED CLAY AND DUCTILE IRON SEWER PIPE

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

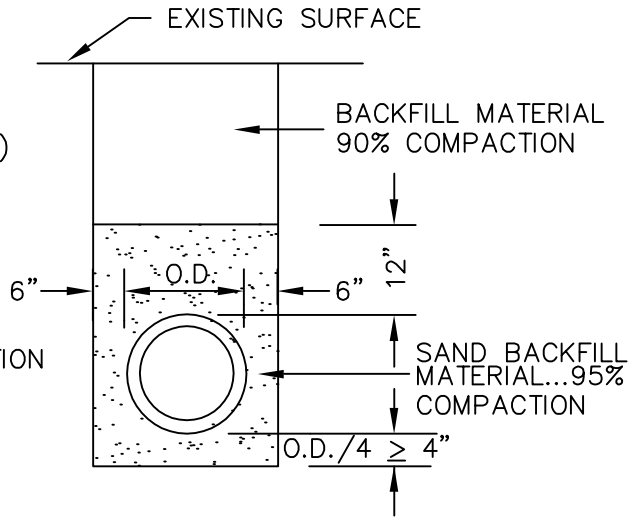
REDWOOD CITY
CALIFORNIA

DRAWN BY: N.M.A.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: 7/97



TYPE A (IN ROADWAY)



TYPE B (OUTSIDE ROADWAY)

NOTES:

1. SAND.... MATERIAL FREE FROM ORGANIC MATTER AND CLAY WITH A SIEVE GRADATION BY WEIGHT AS FOLLOWS:

SIEVE SIZE	% PASSING SIEVE
No. 4	100
No. 200	0–5

2. STRUCTURE BACKFILL MATERIAL.... MATERIAL WITH SAND EQUIVALENT NOT LESS THAN 20 AND SIEVE GRADATION BY WEIGHT AS FOLLOWS:

SIEVE SIZE	% PASSING SIEVE
3"	100
No. 4	35–100
No. 30	20–100

3. BACKFILL MATERIAL.... MATERIAL FROM EXCAVATION, FREE FROM STONES OR LUMPS EXCEEDING 3 INCHES GREATEST DIMENSION, ORGANIC MATTER, OR OTHER UNSATISFACTORY MATERIAL.

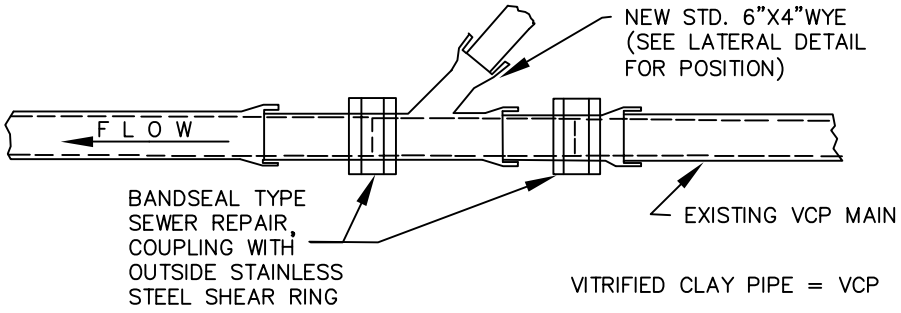
STANDARD TRENCH BACKFILL AND BEDDING DETAIL FOR PVC SEWER PIPE

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

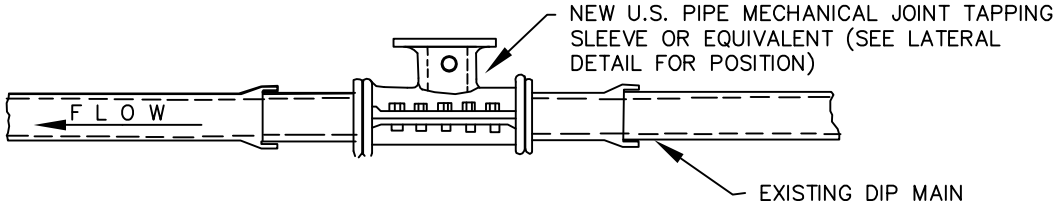
DRAWN BY: N.M.A.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: _____



NOTE: (1) THE NEWLY INSTALLED WYE SHALL BE OF THE SAME MATERIAL AS THE EXISTING MAIN.

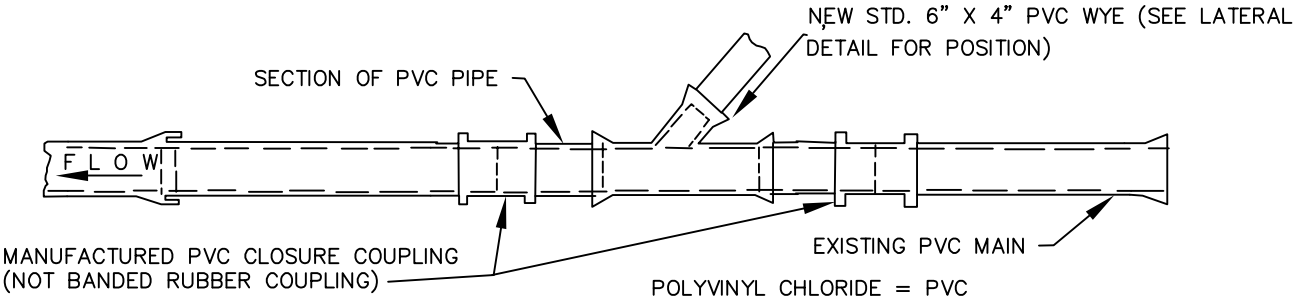
PLAN
VITRIFIED CLAY



NOTES: HORIZONTAL PIPE ENTRY ANGLE WILL BE 90 ^{0}, INSTEAD OF 45 ^{0}
(SEE LATERAL DETAIL, PLAN VIEW)

VERTICAL PIPE ENTRY ANGLE SHALL BE 45 ^{0} MINIMUM (SEE LATERAL DETAIL PROFILE VIEW)

PLAN
DUCTILE IRON PIPE



NOTE: ALL PVC, PIPE AND FITTINGS SHALL BE SDR 35 35 AND SHALL HAVE RUBBER GASKETED JOINTS. SOLVENT WELDED JOINTS SHALL NOT BE ALLOWED.

PLAN
POLYVINYL CHLORIDE PIPE

LATERAL CONNECTION INSTALLATION DETAIL ON EXISTING PIPE

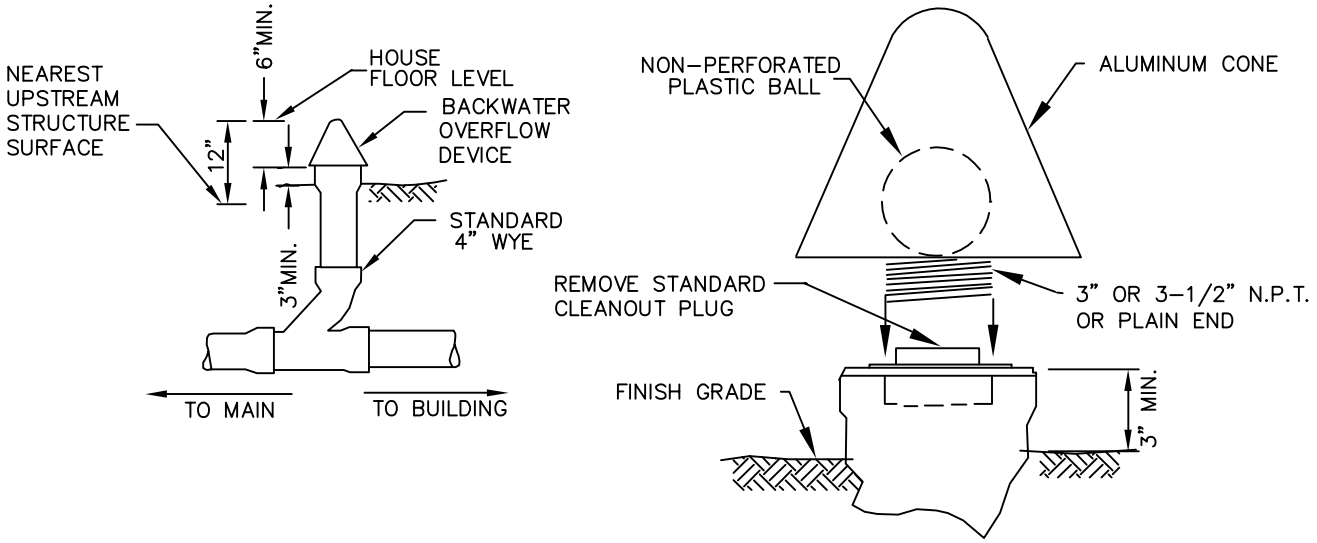
NOTE: LATERAL CONNECTION INSTALLATION ON NEWLY INSTALLED PIPE WILL BE AS DIRECTED BY THE DEPARTMENT OF PUBLIC WORKS.

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

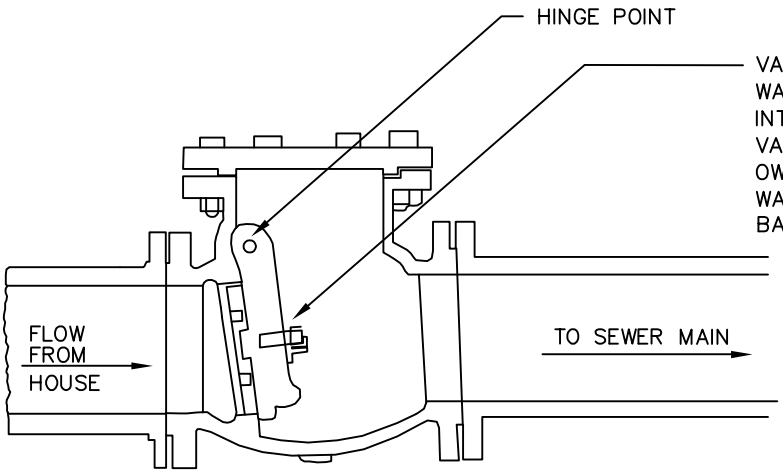
DRAWN BY: N.M.A.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: _____



OVERFLOW DEVICE

NOTE: LOCATION OF DEVICE TO APPROVAL OF DISTRICT AND BUILDING DEPARTMENT PRIOR TO INSTALLATION



NOTE: LOCATION OF DEVICE TO APPROVAL OF DISTRICT AND BUILDING DEPARTMENT PRIOR TO INSTALLATION

BACKFLOW DEVICE

OVERFLOW AND BACKFLOW DEVICE DETAIL

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

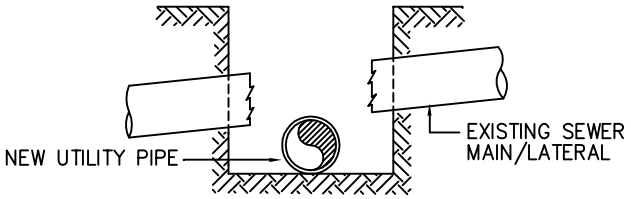
REDWOOD CITY
CALIFORNIA

DRAWN BY: M.L.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: _____

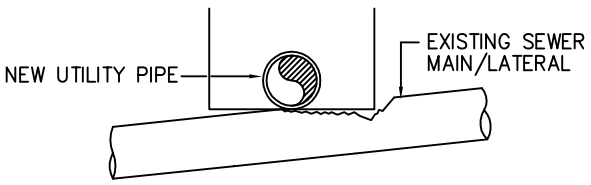
NOTICE:

CALL SANITARY DISTRICT (363–4765 OR 363–4100) BEFORE MAKING ANY SEWER REPAIRS. ALL REPAIRS MUST BE DONE IN THE PRESENCE OF A DISTRICT INSPECTOR.



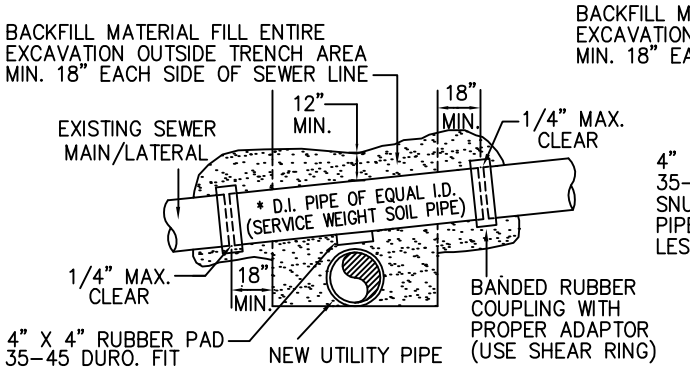
SIMPLE SEWER MAIN/LATERAL BREAK
(NO CONFLICT IN GRADE)

BREAK



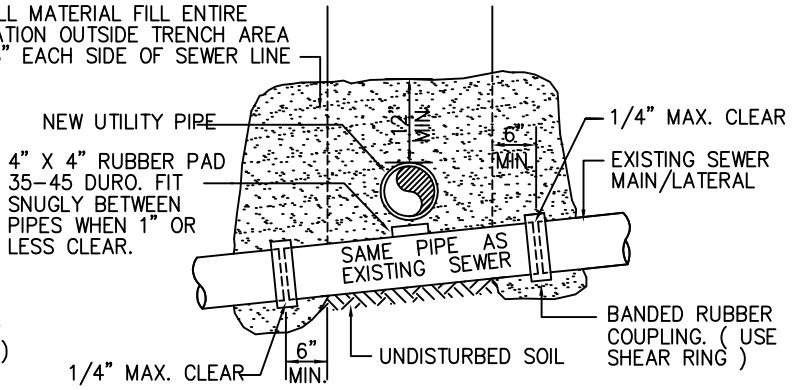
SIMPLE SEWER MAIN/LATERAL BREAK
(NO CONFLICT IN GRADE)

BREAK



REPAIR

* D.I. = DUCTILE IRON



REPAIR

PROCEDURE:

1. NOTIFY SANITARY DISTRICT (363–4765 OR 363–4100)
2. TRIM SEWER PIPE TO A CLEAN CUT UNDAMAGED END, A MINIMUM OF 18" INTO TRENCH WALL. CUT PIECE OF NEW DUCTILE IRON PIPE (D.I.P.) OF EQUAL DIAMETER TO FIT SPACE BETWEEN TRIMMED ENDS WITH A MAXIMUM CLEARANCE OF 1/4 INCH AT EACH END. ALIGN PIPES AT UPSTREAM END AND SLIDE COUPLING DOWNSTREAM, CENTERING IT OVER THE JOINT, TIGHTEN COUPLING BANDS. WHEN O.D. OF PIPES ARE WITHIN 1" OF EACH OTHER, THERE SHALL BE A 4"X4" PAD OF 35–45 DUROMETER RUBBER PLACED SNUGLY BETWEEN THE PIPES.
3. CONCRETE ENCASEMENT SHALL BE REQUIRED IN THE EVENT THE ADJACENT SOIL IS DISTURBED. LIMITS SHALL BE DETERMINED BY THE DISTRICT.

PROCEDURE:

1. NOTIFY SANITARY DISTRICT (363–4765 OR 363–4100)
2. REPAIR SHALL BE MADE AS SHOWN ABOVE WHEN CLEARANCE BETWEEN SEWER PIPE AND UTILITY PIPE IS 6" OR MORE, REPAIR MAY BE MADE WITH THE SAME TYPE OF PIPE AS THE EXISTING SEWER. WHEN O.D. OF PIPES ARE WITHIN 1" OF EACH OTHER, THERE SHALL BE A 4" X 4" PAD OF 35–45 DUROMETER RUBBER PLACED SNUGLY BETWEEN THE PIPES.
3. IF EXISTING SEWER PIPE IS PVC OR ABS, USE MANUFACTURED COUPLINGS AND NOT BANDED RUBBER COUPLINGS.
4. CONCRETE ENCASEMENT SHALL BE REQUIRED IN THE EVENT THE ADJACENT SOIL IS DISTURBED. LIMITS SHALL BE DETERMINED BY THE DISTRICT.

STANDARD DRAWING
VITRIFIED CLAY AND DUCTILE IRON SEWER PIPE
PIPE CROSSING REPAIR

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

DRAWN BY: M.L.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: _____

NOTICE:

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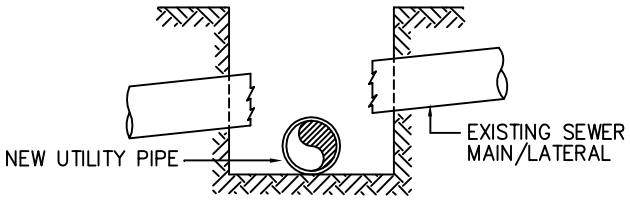
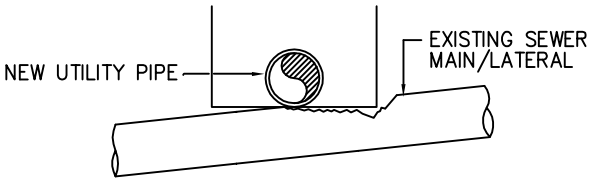


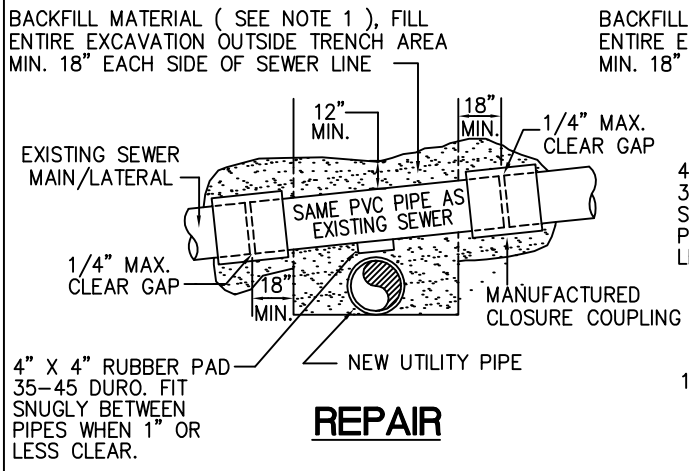
SIMPLE SEWER MAIN/LATERAL BREAK
(NO CONFLICT IN GRADE)

BREAK

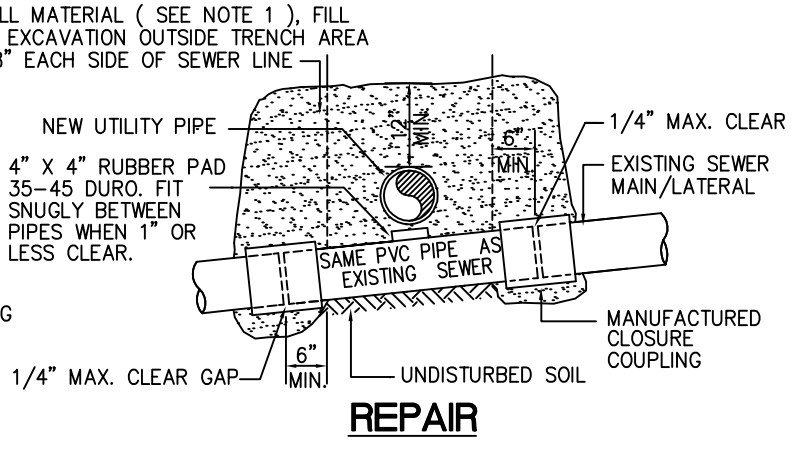


SIMPLE SEWER MAIN/LATERAL BREAK
(NO CONFLICT IN GRADE)

BREAK



REPAIR



REPAIR

NOTES:

1. BACKFILL MATERIAL SHALL BE SAND AS SPECIFIED IN STANDARD TRENCH BACKFILL AND BEDDING DETAIL FOR P.V.C. SEWER PIPE (C–7) OR OTHER MATERIAL APPROVED EQUAL BY THE SEWER DIVISION.
2. THE USE OF BANDED RUBBER COUPLINGS IS PROHIBITED.

PROCEDURE:

1. NOTIFY SANITARY DISTRICT (363–4765 OR 363–4100)
2. TRIM SEWER MAIN/LATERAL TO A CLEAN–CUT, UNDAMAGED END, A MINIMUM OF 18" INTO TRENCH WALL. INSTALL NEW PVC PIPE WITH MANUFACTURED CLOSURE COUPLINGS (IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS).
3. WHEN OUTSIDE DIAMETER OF THE CROSSING PIPES ARE WITHIN 1" OF EACH OTHER, THERE SHALL BE A 4" X 4" PAD OF 35–45 DUROMETER RUBBER PLACED SNUGLY BETWEEN THE PIPES.

PROCEDURE:

1. NOTIFY SANITARY DISTRICT (363–4765 OR 363–4100)
2. WHEN O.D. OF PIPES ARE WITHIN 1" OF EACH OTHER, THERE SHALL BE A 4" X 4" PAD OF 35–45 DUROMETER RUBBER PLACED SNUGLY BETWEEN THE PIPES.

STANDARD DRAWING

POLYVINYL CHLORIDE (PVC) SEWER PIPE

PIPE CROSSING REPAIR

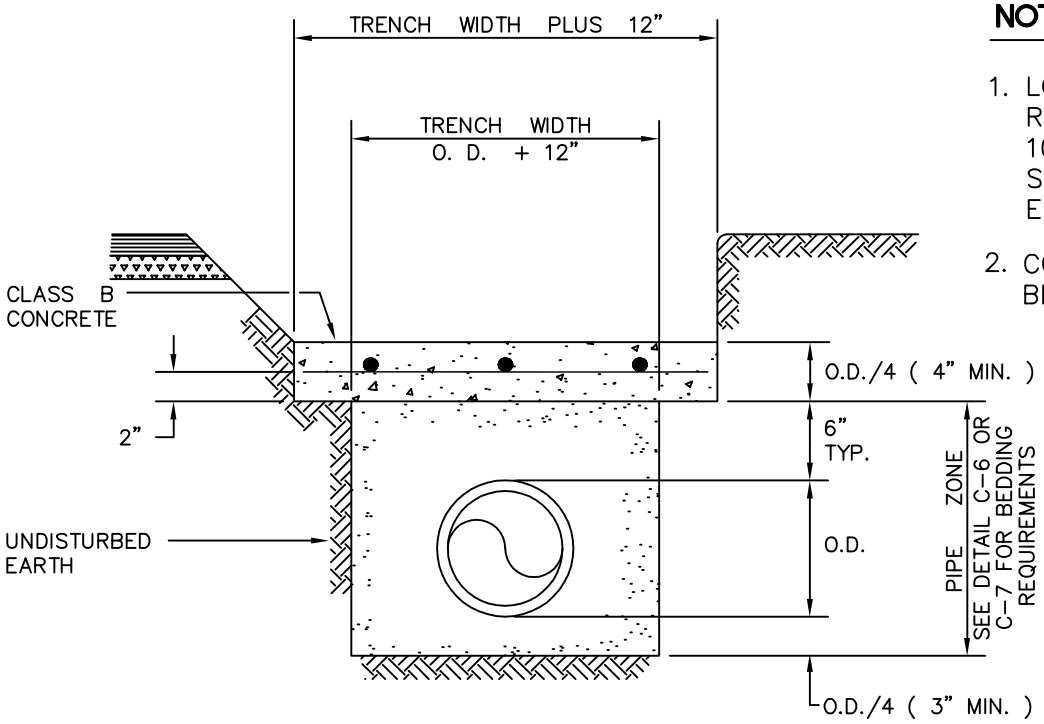
C–11

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

DRAWN BY: M.L.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: _____

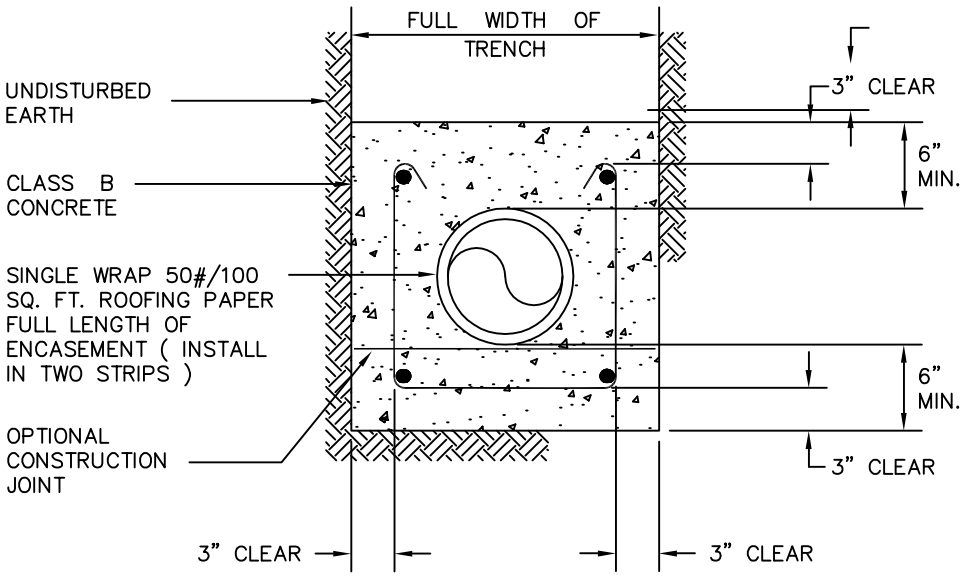


NOTE:

1. LONGITUDINAL TRENCH SLAB REINFORCING: #4 BARS AT 10" O.C. TRANSVERSE TRENCH SLAB REINFORCING: 1–#4 EVERY 20" OF SLAB LENGTH.
2. CONCRETE CAPS SHALL NOT BE USED OVER PLASTIC PIPE.

REINFORCED CONCRETE CAP

NON - PLASTIC PIPE ONLY



NOTE:

1. LONGITUDINAL REINFORCING: 4–#4 BARS AS SHOWN. STIRRUP REINFORCING: 1–#4 BAR EVERY 24" OF CONCRETE ENCASEMENT LENGTH.
2. PLASTIC PIPE SHALL NOT BE ENCASED.

CONCRETE ENCASEMENT

NON - PLASTIC PIPE ONLY

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

DRAWN BY: N.M.A.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: _____

SAN MATEO COUNTY SEWER AND SANITATION DISTRICTS STANDARD SPECIFICATIONS

GENERAL NOTES

1. ALL REFERENCES TO "DISTRICT" IN THESE GENERAL NOTES SHALL MEAN THE APPROPRIATE COUNTY SEWER OR SANITATION DISTRICT.

2. THE APPROVAL OF THESE PLANS BY THE DISTRICT SHALL BE INTERPRETED TO MEAN THAT THE SANITARY SEWER DESIGN SHOWN ON THESE PLANS MEETS THE DISTRICT'S STANDARDS. THE DISTRICT'S APPROVAL IN NO WAY GUARANTEES ANY OTHER ASPECT OF THIS PLAN OR ITS ACCURACY RELATIVE TO ACTUAL FIELD CONDITIONS.

3. THE CONTRACTOR SHALL CONTACT THE DISTRICT AT 363-4765 OR 363-4100 TWO (2) WOKING DAYS IN ADVANCE OF BEGINNING ANY SANITARY SEWER WORK. THE CONTRACTOR SHALL THEREAFTER KEEP THE INSPECTOR FOR THE DISTRICT INFORMED OF HIS SCHEDULE FOR SANITARY SEWER WORK.

4. ALL SANITARY SEWER WORK CONSTRUCTED WITHOUT INSPECTION BY THE DISTRICT SHALL BE REMOVED AND RECONSTRUCTED WITH INSPECTION.

5. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT FORTY-EIGHT (48) HOURS IN ADVANCE OF BEGINNING ANY WORK.

6. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL UTILITIES BEFORE BEGINNING ANY EXCAVATING.

7. THE CONTRACTOR SHALL OBTAIN ANY AND ALL PERMITS REQUIRED BY THE COUNTY OR CITY BEFORE BEGINNING ANY SANITARY SEWER WORK.

8. UPON THE COMPLETION OF CONSTRUCTION A COMPLETE SET OF REPRODUCIBLE "AS-CONSTRUCTED" PLANS SHALL BE PROVIDED TO THE DISTRICT.

9. SANITARY SEWER SERVICE SHALL BE MAINTAINED AT ALL TIMES. THE CONTRACTOR SHALL USE WHATEVER MEANS ARE NECESSARY (E.G. PUMPS, ETC.) TO MAINTAIN THIS SERVICE DURING CONSTRUCTION.

10. PRIOR TO COMMENCING ANY SANITARY SEWER WORK IN OFF-SITE EASEMENTS THE CONTRACTOR SHALL PROVIDE THE DISTRICT WITH ADEQUATE EVIDENCE THAT ALL AFFECTED PROPERTY OWNERS (AND TENANTS WHERE APPLICABLE) WERE NOTIFIED WELL IN ADVANCE OF THE DATE WORK IN THESE EASEMENTS WAS TO BEGIN AND THAT THEY HAVE UPDATED THAT NOTICE IN A TIMELY MANNER WHEN THOSE DATES HAVE CHANGED.

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

DRAWN BY: N.M.A.
CHECK BY: R.O.
APPROVED BY: N.R.C.

SCALE: NONE
DATE: 6/95
REVISED: 4/97

SAN MATEO COUNTY SEWER AND SANITATION DISTRICTS STANDARD SPECIFICATIONS

PIPE AND FITTINGS

POLYVINYL CHLORIDE PIPE (PVC)

1. ALL PIPE AND FITTINGS SHALL CONFORM TO ASTM SPECIFICATIONS D3034, SDR 35.

2. ALL JOINTS SHALL BE A BELL AND SPIGOT ASSEMBLY WITH ELASTOMERIC SEALING GASKETS. SEALING GASKETS SHALL MEET THE REQUIREMENTS OF ASTM SPECIFICATION D1869. SOLVENT CEMENT JOINTS ARE NOT PERMITTED.

3. ALL PIPE ENTERING OR LEAVING A CONCRETE STRUCTURE SHALL HAVE A RUBBER WATERSTOP GASKET ATTACHED TO IT. THE WATERSTOP GASKET SHALL CONFORM TO THE PIPE MANUFACTURER'S SPECIFICATIONS. THE WATERSTOP GASKET SHALL BE SEATED FIRMLY AROUND THE PIPE EXTERIOR AND BE CAST INTO THE CONCRETE STRUCTURE.

4. ALL PIPE JOINTS SHALL BE MADE USING MANUFACTURED PVC COUPLINGS. BAND TYPE COMPRESSION COUPLINGS ARE NOT PERMITTED.

DUCTILE IRON PIPE (DIP)

1. ALL PIPE SHALL BE THICKNESS CLASS 50 (FOUR INCH PIPE SHALL BE THICKNESS CLASS 51) IN ACCORDANCE WITH ANSI SPECIFICATIONS A21.51. FITTINGS SHALL BE IN ACCORDANCE WITH ANSI SPECIFICATION A21.10.

2. JOINTS SHALL BE PUSH–ON TYPE OR MECHANICAL JOINT TYPE IN ACCORDANCE WITH ANSI SPECIFICATION A21.11. RUBBER GASKETS FOR PUSH–ON JOINTS SHALL BE IN ACCORDANCE WITH ANSI SPECIFICATIONS HEREIN.

3. PIPE AND FITTINGS SHALL HAVE A BITUMINOUS COATING OUTSIDE IN ACCORDANCE WITH ASTM SPECIFICATION A746–86, UNLESS OTHERWISE SPECIFIED HEREIN.

4. PIPE AND FITTINGS SHALL HAVE A 1/16" (ONE–SIXTEENTH INCH) CEMENT–MORTAR LINING WITH AN ASPHALTIC SEAL COAT.

VITRIFIED CLAY PIPE (VCP)

1. PIPE AND FITTINGS SHALL BE EXTRA STRENGTH, UNGLAZED, BELL AND SPIGOT, CONFORMING TO THE LATEST REVISION OF ASTM SPECIFICATION C700.

2. JOINTS SHALL BE A BELL AND SPIGOT ASSEMBLY WITH FACTORY INSTALLED FLEXIBLE COMPRESSSION TYPE GASKETS MADE OF PLASTICIZED POLYVINYL OR POLYURETHANE CONFORMING TO THE LATEST REVISION OF ASTM SPECIFICATIONS C425. BAND TYPE COUPLINGS ARE NOT ALLOW.

SAN MATEO COUNTY DEPARTMENT
OF
PUBLIC WORKS

REDWOOD CITY
CALIFORNIA

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SCALE: NONE
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REVISED: _____

SAN MATEO COUNTY SEWER AND SANITATION DISTRICTS
STANDARD SPECIFICATIONS

TESTING REQUIREMENTS

1. ALL REFERENCES TO "DISTRICT" IN THESE TESTING REQUIREMENTS SHALL MEAN THE APPROPRIATE COUNTY SEWER OR SANITATION DISTRICT.

2. ALL REQUIRED CLEANING AND TESTING OF SANITARY SEWER MAINS AND LATERALS SHALL BE PERFORMED IN THE PRESENCE OF A REPRESENTATIVE OF THE DISTRICT.

3. ALL SANITARY SEWER MAINS BEING CONSTRUCTED SHALL BE CLEANED BY MEANS OF A HIGH SPEED JET RODDER PRIOR TO TESTING. VCP AND DIP SHALL BE TESTED FOR OBSTRUCTION BY BALL ROLLING.

4. ALL SANITARY SEWER MAINS BEING CONSTRUCTED SHALL PASS A LOW PRESSURE AIR TEST. EACH SECTION OF MAIN SHALL BE TESTED BETWEEN SUCCESSIVE MANHOLES. THE LOW PRESSURE AIR TEST SHALL BE CONDUCTED IN THE FOLLOWING MANNER.

   A COMPRESSED AIR SUPPLY SHALL BE ATTACHED TO AN AIR FITTING ON THE MAIN 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 BEFORE THE ACTUAL TEST PERIOD BEGINS TO ALLOW STABILIZATION OF AIR WITHIN THE MAIN.

   IN NO CASE SHALL THE AIR PRESSURE WITHIN THE LINE BE LESS THAN 3.5 PSI AT THE BEGINNING OF THE TEST PERIOD. REFER TO THE CHART WHICH FOLLOWS FOR THE LENGTH OF THE TEST PERIOD. THE MINIMUM LENGTH OF TEST IS TWO (2) MINUTES). THE ALLOWABLE AIR PRESSURE LOSS DURING THE TEST PERIOD SHALL BE 1.0 PSI. A WRITTEN RECORD OF THE TEST SHALL BE SUBMITTED TO THE DISTRICT BY THE CONTRACTOR.

NOMINAL PIPE SIZE (inches)	LENGTH OF LINE (feet)	LENGTH OF TEST (minutes)
4	ALL	2
6	0 – 300	2
6	300 – 370	2 1/2
6	370 AND GREATER	3
8	0 – 170	2
8	170 – 210	2 1/2
8	210 – 250	3
8	250 – 290	3 1/2
8	290 AND GREATER	3 3/4
10	0 – 110	2
10	110 – 165	3
10	165 – 215	4
10	215 AND GREATER	4 3/4

5. A TELEVISION INSPECTION SHALL BE MADE OF ALL SANITARY SEWER MAINS BEING CONSTRUCTED. IMMEDIATELY PRIOR TO TELEVISING THE SEWER, AN AMOUNT OF WATER ACCEPTABLE TO THE DISTRICT'S REPRESENTATIVE SHALL BE INTRODUCED INTO THE SEWER MAIN BEING INSPECTED.

   A VIDEO TAPE IN VHS FORMAT AT SP, OR EQUIVALENT, SPEED SHALL BE MADE OF THE INSPECTION AND DELIVERED ALONG WITH A TYPED LOG OF THE INSPECTION TO THE DISTRICT (SAN MATEO COUNTY DEPARTMENT OF PUBLIC WORKS) FOR REVIEW AND ACCEPTANCE.

   SUBMITTED VIDEO TAPES SHALL INCLUDE A CONTINUOUS ON-SCREEN DISPLAY WHICH CONTAINS, AS A MINIMUM, THE DATE OF THE FILMING, IDENTIFICATION OF THE LINE AND SEGMENT (REACH) OF THE LINE BEING VIEWED, AND A READOUT, IN FEET, SHOWING THE DISTANCE TO THE ENTRY POINT.

   IF, IN THE OPINION OF THE DISTRICT, THE SUBMITTED VIDEO TAPES ARE OF POOR QUALITY, THE DISTRICT MAY REJECT THE VIDEO TAPES AND REQUIRE THE VIDEO INSPECTION TO BE REPEATED AND NEW VIDEO TAPES SUBMITTED TO THE DISTRICT FOR REVIEW AND ACCEPTANCE. ALL VIDEO TAPES SHALL BECOME THE PROPERTY OF THE DISTRICT.

6. DEFLECTION TESTING OF POLYVINYL CHLORIDE (PVC) SEWER MAINS SHALL BE PERFORMED AFTER THE PLACEMENT OF ALL TRENCH BACKFILL. PIPE DEFLECTION SHALL BE TESTED BY PULLING BY HAND A GO/NO-GO MANDREL THROUGH THE INSTALLED SECTIONS OF SEWER MAIN.

   THE MANDREL USED SHALL HAVE A MINIMUM LENGTH EQUAL TO ITS DIAMETER. THE MANDREL SHALL BE CONSTRUCTED WITH A MINIMUM OF NINE (9) RIBS FABRICATED PARALLEL TO ITS LONGITUDINAL AXIS. BOTH THE DESIGN OF THE MANDREL AND THE FABRICATED MANDREL ITSELF SHALL BE INSPECTED AND APPROVED BY THE DISTRICT WELL IN ADVANCE OF THE DEFLECTION TEST.

   THE MANDREL DIAMETER SHALL BE 95% OF THE PIPE'S AVERAGE INSIDE DIAMETER AS DEFINED BY ASTM SPECIFICATION D3034, AND AS DETAILED IN THE FOLLOWING TABLE:

NOMINAL PIPE SIZE (inches)	AVERAGE INSIDE DIAMETER (inches)	MINIMUM MANDREL DIAMETER (inches)
6	5.893	5.598
8	7.891	7.497
10	9.864	9.371

NOTE: AVERAGE INSIDE DIAMETER = AVERAGE OUTSIDE DIAMETER – 2(1.06)T; WHERE T = MINIMUM WALL THICKNESS AS DEFINED BY ASTM SPECIFICATION D3034.