

# City of Auburn

## *Topic: 2016 SSMP Update*

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COPIES:

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## 1 Background

In May 2006, the California State Water Resources Control Board (SWRCB) adopted Order No. 2006-0003-DWQ – Statewide General Waste Discharge Requirements for Sanitary Sewer Systems. The Order applies to all public collection system agencies California that own or operate a collection system containing a mile or more of pipe or sewer lines, which convey untreated wastewater to a publicly owned treatment facility. The Order requires each agency to prepare a Sewer System Management Plan (SSMP).

The City of Auburn (City) has completed all 11 elements of the SSMP as listed in the original Order. The purpose of this document is to show the “effectiveness of the SSMP and the Enrollee’s compliance with the SSMP requirements” and “identification of any deficiencies in the SSMP and steps to correct them”.

The City’s compliance and performance for each SSMP element are shown in the following sections.

## 2 Goals and WDR Compliance

The City's SSMP goals and goal statuses are listed in Table 2-1 below.

TABLE 2-1. SSMP GOALS FOR EACH ELEMENT AND TARGET SCORES

SSMP Goals for Each Element	Notes and Items to be Completed	Status
<b>1. Goals</b>		
1. Update established SSMP goals	1. Completed with this table. <i>Updated as needed.</i>	<b>Complete</b>
<b>2. Organization</b>		
1. Establish a SSMP organizational chart with assigned roles and descriptions of responsibilities. 2. Identify chain of communication for reporting SSOs. 3. Include current contact information. 4. Include web site where SSMP is located (if applicable).	1. These tasks have been completed. <i>Updated on an as-needed basis.</i>	<b>Complete</b>
<b>3. Legal Authority</b>		
1. Define legal authority in sewer ordinances, service agreements, and other legally binding prodecures.	1. Add legal authority to limit flows to the sewer system from connected sources (laterals and satellite systems). 2. Add legal authority to ban new connections. <i>Contained in Title XV: Land Usage.</i> 3. Add legal authority to limit discharge of roots, fats, oils, grease. 4. Specify who owns and maintains which parts of private service laterals.	<b>Complete</b>  <b>Complete</b>  <b>Complete</b>  <b>Complete</b>
<b>4. Operations and Maintenance Program</b>		
1. Maintain an up-to-date map of the collection system.	1. An electronic map is kept up-to-date in the City's CMMS system.	<b>Complete (Ongoing)</b>

SSMP Goals for Each Element	Notes and Items to be Completed	Status
2. Describe and maintain proactive preventative maintenance program (CMMS) 3. Maintain list of contractors performing routine maintenance on sewer system and description of service provided. 4. Identify and prioritize corrective and preventative maintenance activities (Rehabilitation and Replacement Plan) 5. <u>Staff Assessment Program</u> : Review and identify any deficiencies in staffing requirements (such as trainings, skill sets, etc.) required to comply with SSS WDRs. 6. <u>Contingency Planning</u> : Identify most critical collection system assets and operating procedures. Develop “hot spot” list. 7. <u>O&amp;M and Sewer System Replacement Funding</u> : Include budgets for routine sewer O&M, including CIP and revenue sources.	2. Maintenance is ongoing and tracked by work orders. 3. Task completed. <i>Updated as needed.</i> 4. Task completed. <i>Updated periodically in CMMS.</i> 5. Latest staff review (2016) has not identified any staffing deficiencies or further requirements. 6. Task completed. <i>Updated as needed.</i> 7. Task completed. <i>Updated on an ongoing basis.</i>	<b>Complete (Ongoing)</b>  <b>Complete</b>  <b>Complete (ongoing)</b>  <b>Complete (ongoing annually)</b>  <b>Complete</b>  <b>Complete (Ongoing)</b>
<b>5. Design and Performance Provisions</b>		
1. Develop design and construction standards and specs for the installation of new sewers and for rehabilitation and repair of existing sewers. 2. Develop standards and procedures for inspection and testing for new, repaired and rehabilitated sewers, pumps and other appurtenances.	1. Task completed. 2. Task completed. See Appendix C.	<b>Complete</b>  <b>Complete</b>
<b>6. Overflow Emergency Response Plan</b>		
1. Develop and implement a plan to respond to SSOs. 2. Establish and maintain internal and external SSO notification procedures that include regulators and the general public. 3. Provide written SSO response procedure to investigate and assess, contain, correct cause, estimate volume, cleanup, sample receiving waters if necessary, incident documentation and notification and reporting requirements.	1. Task complete. 2. Task complete. 3. Task complete.	<b>Complete</b>  <b>Complete</b>  <b>Complete</b>

SSMP Goals for Each Element	Notes and Items to be Completed	Status
4. Procedures to address emergency operations, such as traffic and crowd control, etc.	4. Task complete.	<b>Complete</b>
5. Train employees on SSO response procedures and SSO monitoring and reporting program.	5. <i>Requires documentation.</i>	<b>In Progress</b>
6. Perform risk and threat analysis to identify highest risks and threats posed by sewer system failures. Include expected consequences of each identified failure. Include procedures, strategies, etc. to minimize risks.	6. Task complete. <i>Updated as needed.</i>	<b>Complete</b>
<b>7. Fats, Oils, and Grease (FOG) Control Program</b>		
<p><i>The City has provided justification for why a FOG program requiring all of the following elements is not needed. However, the majority of these elements are already in place.</i></p>		
1. Public outreach	1. Task complete. <i>Updated on an ongoing basis.</i>	<b>Complete</b>
2. Plan and schedule for disposal of FOG generated within the sewer service area.	2. Task complete. Disposal information is listed on the Healthy Auburn Waters, LiveSewerSmart, and City of Auburn public outreach web sites.	<b>Complete</b>
3. Legal authority to prohibit discharges into the collection system that could contribute to SSOs and blockages.	3. Task complete.	<b>Complete</b>
4. Establish requirements to install grease removal devices, design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements.	4. The City coordinates these requirements with the Placer County Environmental Health Department.	<b>N/A</b>
5. Establish authority to inspect grease producing facilities, enforcement authority. Include required staffing levels.	5. The City coordinates these requirements with the Placer County Environmental Health Department.	<b>N/A</b>
6. Identify sections of the sewer system subject to grease blockages and establish a cleaning maintenance schedule for each section.	6. The City coordinates these requirements with the Placer County Environmental Health Department.	<b>Complete (ongoing)</b>
7. Develop and implement source control measures for all known sources of grease and fats that may be discharged to the sewer system.	7. The City coordinates these requirements with the Placer County Environmental Health Department.	<b>N/A</b>

SSMP Goals for Each Element	Notes and Items to be Completed	Status
<b>8. System Evaluation and Capacity Assurance Plan</b>		
<ol style="list-style-type: none"> <li>Evaluate portions of the collection system experiencing SSOs due to hydraulic deficiency.</li> <li>Establish design criteria if not developed in the Design and Performance Provisions section.</li> <li>Establish a short- and long-term capital improvement program to address identified hydraulic deficiencies.</li> <li>Include schedule of completion for capital improvements plan.</li> <li>Include budget for capital improvements. Identify costs, revenues, and revenue sources.</li> </ol>	<ol style="list-style-type: none"> <li>Task complete. See Section 9 of this report.</li> <li>Established in Design and Performance Provisions section.</li> <li>Task complete. <i>Updated periodically.</i></li> <li>Task complete. <i>Updated periodically.</i></li> <li>Task complete. <i>Updated periodically.</i></li> </ol>	<p><b>Complete</b></p> <p><b>N/A</b></p> <p><b>Complete</b></p> <p><b>Complete</b></p> <p><b>Complete</b></p>
<b>9. Performance Targets and Program Modifications</b>		
<ol style="list-style-type: none"> <li>Identify performance targets and illustrate SSO trends including SSO frequencies and volumes.</li> <li>Collect and maintain appropriate records and information to establish and prioritize performance targets.</li> <li>Link each performance target with the appropriate SSMP element(s).</li> <li>Monitor effectiveness and success of each SSMP element meeting each performance target developed.</li> <li>Update program elements, as appropriate, to achieve performance targets.</li> <li>Maintain SSMP Change Log that includes list of modifications and changes to the SSMP (include date and staff responsible for change).</li> </ol>	<ol style="list-style-type: none"> <li>Task complete. <i>Updated periodically.</i></li> <li>Continuously updated.</li> <li>Task complete.</li> <li><i>Updated periodically.</i></li> <li><i>Updated as needed.</i></li> <li><i>Updated as needed.</i></li> </ol>	<p><b>Complete</b></p> <p><b>Continuously updated</b></p> <p><b>Complete</b></p> <p><b>Complete (ongoing)</b></p> <p><b>Complete</b></p> <p><b>Complete</b></p>
<b>10. SSMP Program Audits</b>		
<ol style="list-style-type: none"> <li>Conduct periodic internal audits appropriate to the size of the system and the number of SSOs. Every two years, prepare and attach report of audit results to SSMP.</li> </ol>	<ol style="list-style-type: none"> <li>Task complete with the adoption of this SSMP update. <i>To be updated every two years.</i></li> </ol>	<p><b>Complete (updated every two years)</b></p>

SSMP Goals for Each Element	Notes and Items to be Completed	Status
<b>11. Communication Program</b>		
1. Communicate on an on-going basis with the public regarding the development, implementation, and performance of its sanitary sewer system.	1. Task complete. <i>Updated on an ongoing basis.</i>	<b>Complete (ongoing)</b>
2. Provide the public with the opportunity to provide input to the Agency as the SSMP program is developed and implemented.	2. Task complete. <i>Ongoing.</i>	<b>Complete (ongoing)</b>
3. Permitted agencies with satellite systems must create a plan for communication on an annual basis with datellite systems that are tributary to the Permittee's sanitary sewer collection system.	3. <i>Not applicable.</i>	<b>N/A</b>

### 3 Organization

The following organizational chart shows the key personnel for sewer collection system management, operations, and maintenance as of January 2017.



Table 3-1 below shows the same key personnel and includes descriptions of roles and contact information for each person (e-mail addresses and phone numbers).

**TABLE 3-1. CITY OF AUBURN SSMP ORGANIZATIONAL ROLES AND RESPONSIBILITIES AS OF 2016**

<b>Roles and Responsibilities</b>	<b>Name</b>	<b>E-mail Address</b>	<b>Phone Number</b>
<b><u>City Council:</u></b>	William Kirby	<a href="mailto:bkirby@auburn.ca.gov">bkirby@auburn.ca.gov</a>	(530) 823-4211 x 383
Establish policy.	Matt Spokely	<a href="mailto:mspokely@auburn.ca.gov">mspokely@auburn.ca.gov</a>	(530) 823-4211 x 381
	Daniel Berlant	<a href="mailto:dberlant@auburn.ca.gov">dberlant@auburn.ca.gov</a>	(530) 823-4211 x 380
	Cheryl Maki	<a href="mailto:cmaki@auburn.ca.gov">cmaki@auburn.ca.gov</a>	(530) 823-4211 x 382
	Bridget Powers	<a href="mailto:bpowers@auburn.ca.gov">bpowers@auburn.ca.gov</a>	(530) 823-4211 x 384
<b><u>City Manager</u></b>			(530) 823-4211 x 192
Appointed by the City Council and is the chief administrative officer of the City of Auburn. Oversees operations and services and enforces the laws and policies as adopted by the City Council.			
<b><u>Director of Planning and Public Works:</u></b>	Bernie Schroeder <i>(Legally Responsible Official)</i>	<a href="mailto:bschroeder@auburn.ca.gov">bschroeder@auburn.ca.gov</a>	(530) 823-4211 x 144
Plans, directs, and reviews the activities, operations and programs of the Public Works Department, including those related to the sewer system. Oversees the sewer system and performs system analyses, special studies, and manages capital improvement projects to ensure public works department compliance with federal, state, and local environmental regulations. Coordinates and confers with operation and maintenance division, consultants, and contractors on utility services and complex capital improvement projects. Prepares reports on sanitary sewer system and communicates utility services to the public, commissions, and city council. Plan, coordinate, supervise, and participate in the performance of professional engineering activities of a complex nature involving engineering planning and design, construction project management. Manages city utility maps and record drawings. Legally Responsible Official (LRO) for the SSMP.			
<b><u>City Engineer:</u></b>	Edgar Medina	<a href="mailto:emedina@auburn.ca.gov">emedina@auburn.ca.gov</a>	(530) 823-4211 x 142
Assists the LRO with planning, reviews of the activities, operations, and programs of the Public Works Department, including those related to the sewer system. Assists in the delivery of capital improvements projects to ensure public works department compliance with federal, state, and local environmental regulations. Coordinates and confers with operation and maintenance division, consultants, and contractors on utility services and complex capital improvements projects. Assists with the preparation of reports on sanitary sewer system and communicates utility services to the public, commissions, and city council. Plans, coordinates, supervises, and participates in the performance of professional engineering activities of a complex nature involving engineering planning and design, construction project management. Manages city utility maps and record drawings.			
<b><u>Wastewater Treatment Plant Manager:</u></b>	Greg Wiltfong	<a href="mailto:Gregory.Wiltfong@CH2M.com">Gregory.Wiltfong@CH2M.com</a>	(530) 889-0624
Oversees the City's collection system operations and maintenance. Also responsible for managing the wastewater treatment plant operations and maintenance.			
<b><u>Collections Supervisor:</u></b>	Gary Thompson <i>(registered Data Submitter)</i>	<a href="mailto:Gary.Thompson@CH2M.com">Gary.Thompson@CH2M.com</a>	(530) 889-0624
Plans, coordinates, and supervises all aspects of the operations and maintenance for sewer systems. Identifies sewer repairs and rehabilitation to notify City's Public Works Director.			

**TABLE 3-1. CITY OF AUBURN SSMP ORGANIZATIONAL ROLES AND RESPONSIBILITIES AS OF 2016 (CONT.)**

<b>Roles and Responsibilities</b>	<b>Name</b>	<b>E-mail Address</b>	<b>Phone Number</b>
<p><b><u>Collections Operators:</u></b></p> <p>Jonathon Connelly            (registered Data Submitter)</p> <p>To lead a crew in the performance of duties related to sewer system operation and maintenance; and to perform semi-skilled and skilled work related to maintenance, repair and operation of sewer systems. Operates power equipment including hydraulic cleaning truck, root saw and closed circuit television system.</p>	Jonathon Connelly	<a href="mailto:Jonathon.Connelly@CH2M.com">Jonathon.Connelly@CH2M.com</a>	(530) 889-0624
<p><b><u>Engineering Technician:</u></b></p> <p>Russell Koch</p> <p>Reviews and approves work orders. Provides inspection and construction management of sewer repair projects. Prioritizes repair and rehabilitation projects.</p>	Russell Koch	<a href="mailto:rkoch@auburn.ca.gov">rkoch@auburn.ca.gov</a>	(530) 823-4211 x 130
<p><b><u>Capital Projects Manager:</u></b></p> <p>Chris Bressi</p> <p>Performs construction management. Reviews, prioritizes, and inspects repairs to the City's collection system. Responds to sewer spills and pump station emergencies. Inspects lift station construction.</p>	Chris Bressi	<a href="mailto:cbressi@nexgenum.com">cbressi@nexgenum.com</a>	(530) 823-4211 x 130

## 4 Legal Authority

The following goals for creating legal authority for the SSMP have already been established in the City's Municipal Code. Specific sections of the Municipal Code that fulfill each goal are listed.

1. Add legal authority to limit flows to the sewer system from connected sources (laterals and satellite systems).  
*Title V: Public Works, Chapter 52: Sewers*  
 § 52.063 IMPROPER MAINTENANCE OR USE OF CONNECTED SEWERS.
2. Add legal authority to ban new connections.  
*Title XV: Land Usage, Chapter 150: Building Code and Regulations*  
 § 150.015 DENIAL; GROUNDS.
3. Add legal authority to limit discharge of roots, fats, oils, grease.  
*Title V: Public Works, Chapter 52: Sewers*  
 § 52.065 PROHIBITED WASTE DISCHARGES.
4. Specify who owns and maintains which parts of private service laterals.  
*Title V: Public Works, Chapter 52: Sewers*  
 § 52.054 DEFINITIONS.  
 § 52.063 IMPROPER MAINTENANCE OR USE OF CONNECTED SEWERS.

## 5 Operation and Maintenance Program

A summary of the operation and maintenance program for the City’s wastewater collection system is included in Appendix A.

### 5.1 CONTRACTORS USED FOR ROUTINE MAINTENANCE

A list of contractors performing routine maintenance on the sewer system is provided in Table 5-1 below.

TABLE 5-1. CITY OF AUBURN HISTORICALLY USED CONTRACTORS

Contractor Name	Address	Phone Number	Owner
Civil Engineering Construction	P.O. Box 1669 Loomis, CA 95650	(916) 652-9884	Michael Hogan
Gabe Mendez Inc.	9390 Ridge Road Newcastle, CA 95658	(916) 663-3372	Vince Mendez

These contractors provide the following services related to the City’s sewer system on an as-needed basis:

- Excavate, backfill
- Repair pipes
- Replace pipes
- Remove blockages from pipes
- Dispose of debris
- Clean up spills
- Associated road repairs

### 5.2 STAFFING REQUIREMENTS

As of the writing of this report (January 2017), there have been no additions to City staff for the operation and maintenance of the wastewater collection system since the last update. Therefore, there are no staff deficiencies that need to be filled to comply with the SSS WDRs.

### 5.3 O&M AND SEWER SYSTEM REPLACEMENT FUNDING

The fiscal year 2016/17 capital and operation budget for sewer systems is included in Appendix B.

## 6 Design and Performance Provisions

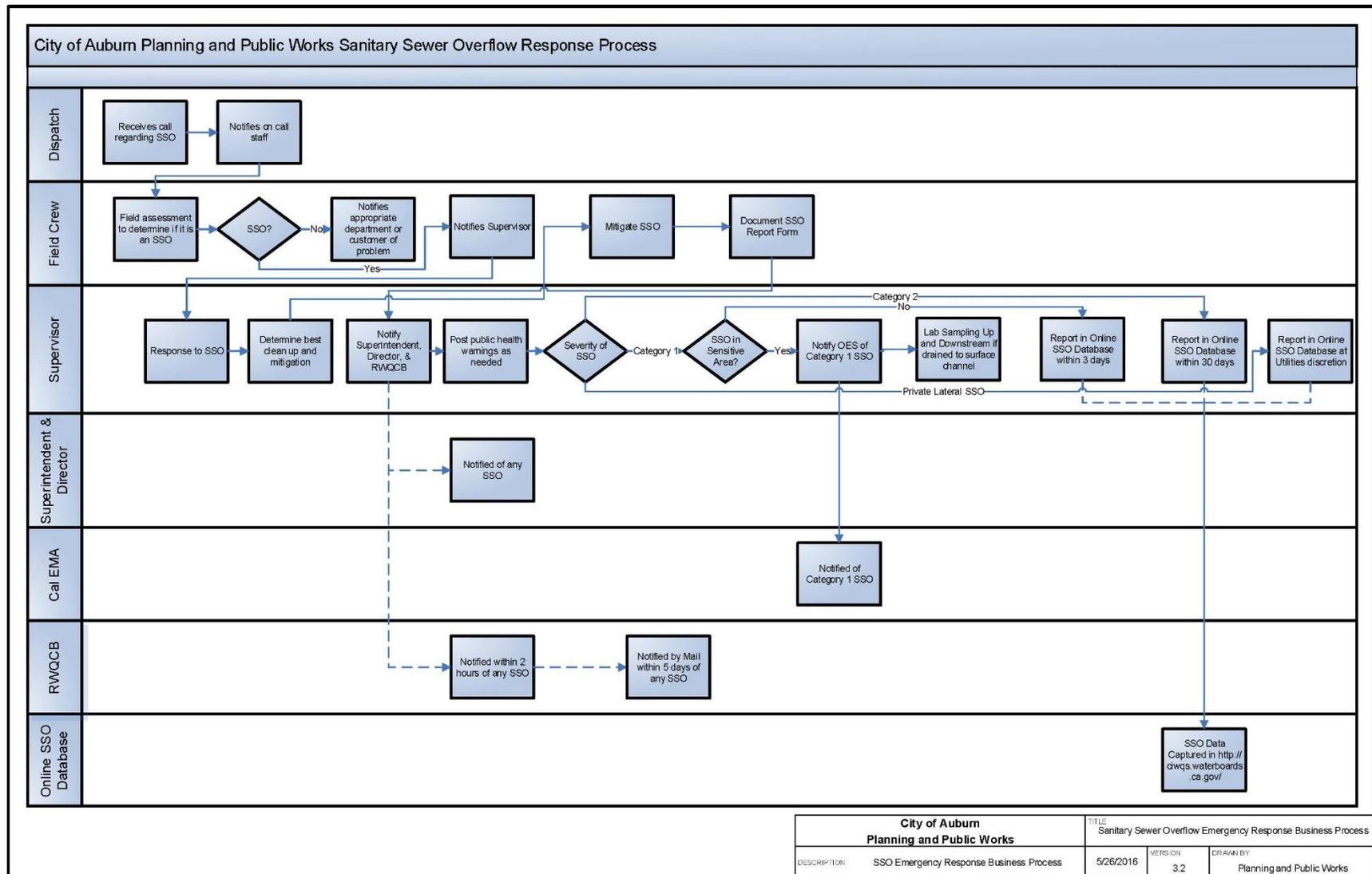
The design and performance provisions for the City’s sewer system are included in Appendix C.

## 7 Overflow Emergency Response Plan

The chain of communication for reporting sanitary sewer overflows (SSOs) is shown in Figure 7-1 below.

Table 7-1 shows contact names and phone numbers for the chain of communication in the event of an SSO.

Appendix D contains detailed procedures to follow when an SSO occurs.



**FIGURE 7-1. SSO RESPONSE PROCESS**

**TABLE 7-1. CHAIN OF COMMUNICATION FOR REPORTING SSOS**

Step	Contact Name	Title/Role	Phone Number
1a	<b>During Business Hours:</b> WWTP Operators	WWTP Operators	(530) 889-0624
1b	<b>After Business Hours and Weekends:</b> Police Dispatch – contacts whoever is on call at the WWTP	Police Dispatch	(530) 823-4222
2	Field Crew	Field Crew	N/A (contacted by WWTP staff)
3	Gary Thompson / Chris Bressi	Supervisor	(530) 392-0393 / (916) 296-7980
4	Bernie Schroeder	Director and LRO	(530) 823-4211 x 144
5	California Office of Emergency Services	California Office of Emergency Services	(916) 845-8510
	Placer County Department of Environmental Health	Placer County Department of Environmental Health	(530) 745-2300
6	Gil Vazquez	SWRCB – SSO Program Permit/Reporting Information	(916) 322-1400
7	Enter into CIWQS ( <a href="http://ciwqs.waterboards.ca.gov/">http://ciwqs.waterboards.ca.gov/</a> )		

## 8 FOG Control Program

The City of Auburn (City) has incorporated several elements of a fats, oils, & grease (FOG) program, but has not implemented a full-scale FOG program as outlined in the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (SSS WDRs). This section outlines the FOG program elements the City has already established and provides justification as to why the City does not need to create a larger FOG program.

### 8.1 FOG PROGRAM ELEMENTS

The SSS WDRs specify that the following elements be incorporated, as appropriate, into a FOG control program:

1. **Public education outreach**
2. **Plan and schedule for disposal of FOG generated in the sewer service area**
3. **Legal authority to prohibit FOG discharges and to implement measures to prevent SSOs and blockages caused by FOG**

4. Requirements to install grease removal devices and design standards, maintenance, BMP, record keeping and reporting requirements for these devices
5. Authority to inspect grease-producing facilities and enforce violations
6. **Identification of sewer sections subject to FOG blockages and establishment of regular cleaning of these sections**
7. Development of source control measures for FOG sources

The City has completed the elements in bold, which are described in more detail in the sections below.

### 8.1.1 Public Outreach

In December 2007, the City began the Healthy Auburn Waters (HAW) public outreach campaign. The goal of the project is to teach people how to properly dispose of pesticides, fuels, hazardous wastes, and cooking fats. A website ([www.healthyauburnwaters.org](http://www.healthyauburnwaters.org)) kicked off the campaign and has been part of the core of the project, along with informational flyers, fat trapper bags, and public informational events. The City also offers free pick-up of residential FOG.

Figures 8-1 and 8-2 show the Fats, Oils & Grease information pages for City residents and businesses, respectively, on the HAW website.

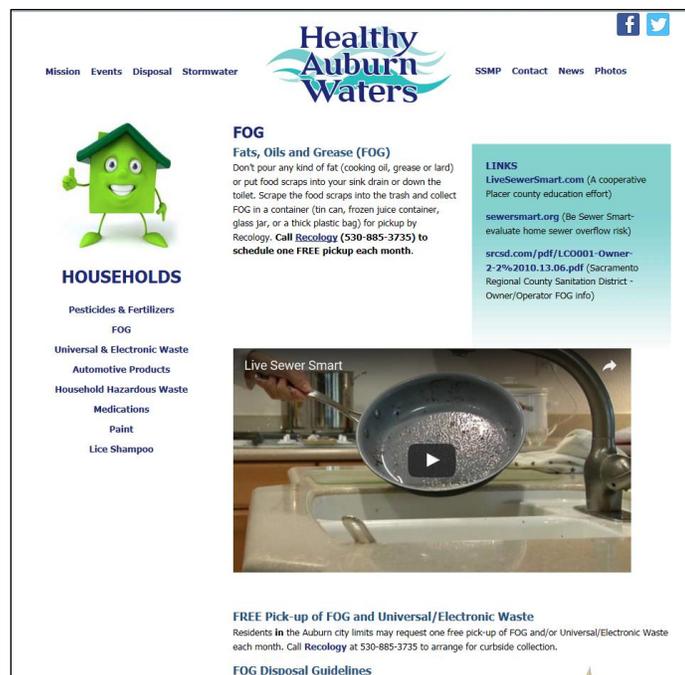


FIGURE 8-1. HEALTHY AUBURN WATERS WEB SITE – FOG OUTREACH FOR CITY RESIDENTS

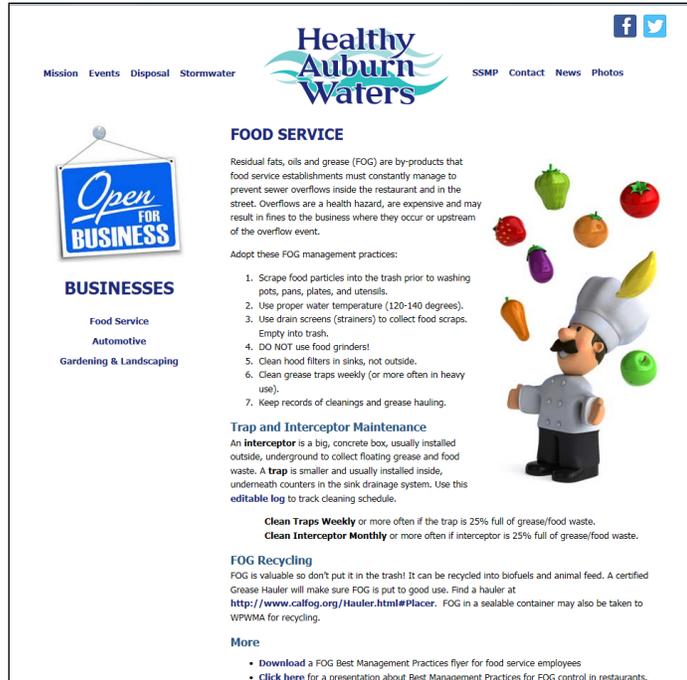


FIGURE 8-2. HEALTHY AUBURN WATERS WEB SITE – FOG OUTREACH FOR BUSINESSES

In collaboration with the Cities of Lincoln and Roseville and Placer County, the LiveSewerSmart web site was created with a focus on disposal of FOG and other common household waste (<http://www.livesewersmart.com/>). The figures below show screen shots of the web site. LiveSewerSmart is updated regularly.

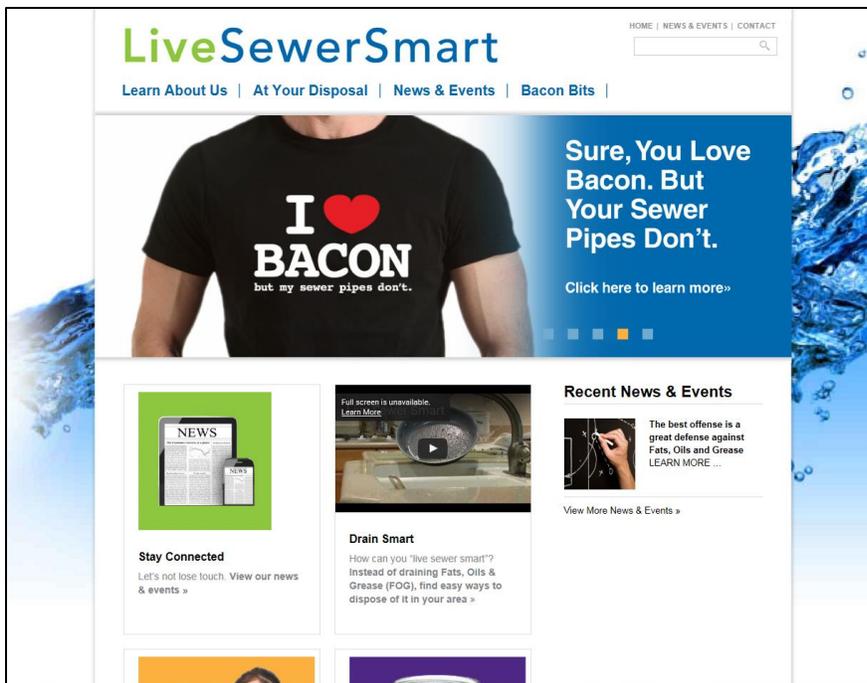


FIGURE 8-3. LIVESEWERSMART WEB SITE



FIGURE 8-4. LIVESEWERSMART WEB SITE

### 8.1.2 Disposal of FOG Generated Within Service Area

The HAW web site lists several options available for residents and businesses to dispose of FOG:

1. To request curbside pick-up of FOG once a month, residents need to call Recology at (530) 885-3735 to arrange an appointment day.
2. Residents and businesses generating over 7 quarts of FOG in a month may take the FOG to the Western Placer Waste Management Authority (WPWMA; 3195 Athens Avenue, Lincoln, CA) for free disposal.
3. Placer County residents not within the city limits may take FOG to one of the following locations:
  - a. **Recology Auburn Placer Transfer Station** (12305 Shale Ridge Road, Auburn, CA; Phone: (530) 885-3735)
  - b. **WPWMA Household Hazardous Waste Facility** (3195 Athens Avenue, Lincoln, CA; Phone: (916) 645-5230 ext. 4)

### 8.1.3 Legal Authority

The following selections from the City's Municipal Code give the City legal authority to (1) prohibit the discharge of any substance (including FOG) into the sewer system that could cause blockages and subsequently SSOs and (2) prohibit the discharge of any type of lard, fat, or oil which would have "adverse effects" on the sewer system.

#### CITY'S MUNICIPAL CODE, TITLE V: PUBLIC WORKS: CHAPTER 52:

##### § 52.065 PROHIBITED WASTE DISCHARGES.

- (B) No person shall discharge or cause to be discharged to a public sewer which directly or indirectly connects to the city's sewerage systems the following wastes:
- (4) Any solid or viscous substance of a size or in such quantity that they may cause obstructions to the flow in the sewer or be detrimental to proper wastewater treatment plant operations;
  - (11) Any dispersed biodegradable oil or fat, such as lard, tallow or vegetable oil, in excessive concentrations that would tend to cause adverse effects on the sewerage system;

### 8.1.4 Identification and Maintenance of FOG Hot Spots

The City maintains a computer maintenance management system (CMMS) which is used to track hot spots and schedule preventative maintenance activities based on a variety of parameters (such as pipe age and material, etc.). Table 8-1 below shows miles of pipe maintained by year from 2009 to 2015. Maintenance activities include hydrocleaning, CCTV inspection, repair, root sawing, and responding to callouts.

TABLE 8-1. SUMMARY OF SEWER MAINTENANCE BY YEAR (A)

Year	Miles of Pipe Maintained
2009	56.4
2010	41.6
2011	57.8
2012	55.2
2013	59
2014	59.8
2015	60.1
2016	59.8

(a) From the City's CMMS.

## 8.2 JUSTIFICATION FOR EXISTING FOG PROGRAM

### 8.2.1 FOG-Related Sanitary Sewer Overflows (SSOs)

Since beginning SSO tracking in the California Integrated Water Quality System (CIWQS) online database in 2007, the City has experienced 64 SSOs.

Of these 64 SSOs, only 3 were related to FOG build-up, with all occurring in 2009 or prior. *No FOG-related spills have occurred since 2009.*

Table 8-2 below shows a summary of SSOs that occurred from 2007 to 2016. FOG-related spills are only 4.5% of all SSOs in the City's system.

TABLE 8-2. SUMMARY OF SANITARY SEWER OVERFLOWS (2007 - 2016)

Cause of Spill	# of Spills	% of Spills
Root Intrusion	38	57.6
Pipe Structural Problem/Failure	8	12.1
Grease Deposition (FOG)	3	4.5
Vandalism	3	4.5
Debris	3	4.5
Rainfall Exceeded Design	2	3.0
Miscellaneous (each occurred once) (a)	9	13.6
<b>Total</b>	<b>66</b>	<b>100%</b>

(b) Screwdriver lodged from a service connection built up with rags, construction repair upstream, flow exceeded capacity, heavy rainfall causing I&I, PCWA water main break, pump station failure due to power outage, roots, mortar, and broken PVC pipe, screwdriver pulled through pump and damaged discharge line, unknown-CCTV inspection found no cause.

The low frequency of FOG-related SSOs within the City’s sewer system indicate that FOG issues are minimized by the City’s existing FOG program.

### **8.3 CONCLUSION**

Based on the minimal number of work orders and SSOs related to FOG within the past several years and the fact that the number of FOG-related SSOs are decreasing, it can be concluded that the City does not require a more comprehensive FOG program.

## **9 System Evaluation and Capacity Assurance Plan (SECAP)**

### **9.1 BACKGROUND**

As part of the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (SSS WDRs), the City of Auburn (City) must complete a System Evaluation and Capacity Assurance Plan (SECAP). The SECAP typically includes the following elements:

- Evaluation of portions of sewer system experiencing or contributing to sanitary sewer overflows (SSOs) because of hydraulic deficiencies.
- Develop appropriate design storm or wet weather event to analyze sewer system at peak flow conditions.
- Develop short- and long-term capacity enhancement measures to address identified hydraulic deficiencies. Develop Capital Improvement Plan (CIP).
- Devise a schedule for completion of the CIP.
- Include a budget for the CIP.

This section is intended to fulfill the SECAP requirements and contains the following sections:

- Existing Wastewater Collection System Components
- Evaluation
- Capital Improvement Plan, Budget, and 5-Year Schedule (see Appendix B)

### **9.2 EXISTING WASTEWATER COLLECTION SYSTEM COMPONENTS**

#### **9.2.1 Pipes**

The City-owned wastewater collection system serves residences and businesses within the City Limits. The City limits contain over 85 miles of wastewater collection lines and about 1,500 manholes. Ten lift stations are also owned and operated by the City and are described in more detail in the next section.



## 9.2.2 Lift Stations

The City owns and operates 10 lift stations and the WWTP lift station. Table 9-1 below provides a summary of lift station information.

In the past 5 years, the City has completed reliability upgrades to 4 out of 10 pump stations. These upgrades included dedicated emergency generators, improved alarms, and new pumps. Each year, the City plans to complete upgrades to at least one pump station, depending on age and condition.

TABLE 9-1. LIFT STATION SUMMARY

Lift Station	Address	Pump Type	Force Main Diameter (in)	Emergency Generator	Odor Control
Monticello	601 Maidu	Flygt, 3.5 hp, 40 gpm	4	Generac	N/A
Vista de Valle	13085 Manzanita Way	Peabody Barnes, 15 hp, 200 gpm	4	N/A	N/A
Maidu	903 Auburn-Folsom Road	Peabody Barnes, 30 hp, 720 gpm	6	Kohler	N/A
Lower Vintage	10700 Sunrise Ridge Circle	Flygt, 205 hp, 577 gpm	6	Kohler	N/A
Southridge	1150 Humbug Way	---	4	---	N/A
Canyon Court	570 Canyon Way	Flygt, 23 hp	4	Kohler	N/A
Indian Hills	12050 Mont Vista Drive	Peabody Barnes, 11.3 hp, 180 gpm	4	Winco	N/A
Auburn Oaks	1540 Foxridge Circle	ABS, 25 hp, 200 gpm	4	Generac	N/A
Falcons Point	500 Blackstone	Flygt, 35 hp, 200 gpm	3	Kohler	N/A
Fawn Creek	929 Fawn Creek Trail	Peabody Barnes, 75 hp, 300 gpm	4	Generac	Bioxide

## 9.2.3 Evaluation

A review of the City's sanitary sewer overflows (SSOs) since 2007 (when reporting in CIWQS), shows that the City had 4 overflows in the time period from 2007 to 2015 related to capacity. The first, in March of 2008, was unrelated to a storm event.

The February 2014 and March 2011 storms are evaluated in the sections below to determine their relative magnitude and frequency of occurrence and appropriateness as wet weather events for the SECAP hydraulic evaluation.

Rainfall data for the evaluation was downloaded from a rain gauge operated by the US Bureau of Reclamation near the American River on the Auburn Dam Ridge (ADR). The data was obtained from the California Data Exchange Center (CDEC), operated by the California Department of Water Resources (<http://cdec.water.ca.gov/>). Statistical development of the DDF curves shown below was completed by the Hydrology group within the Flood Management Division of the California Department of Water Resources.

### **March 2011 Storm Event**

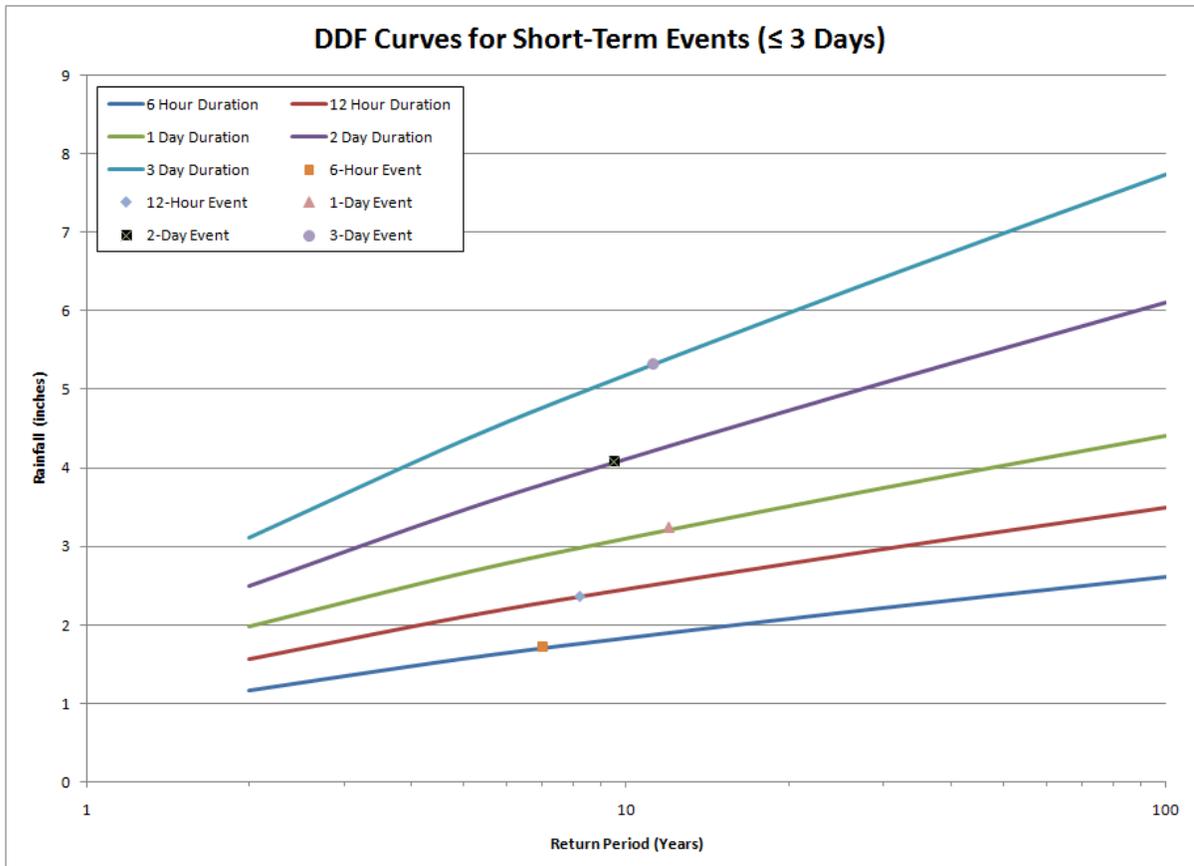
In late March 2011, the City and surrounding northern California communities experienced about a two week duration of back to back storms with periods of intense rainfall. The City received 12.3 inches of rain over a 15-day period, including one day of 3.24 inches of rain. While no sanitary sewer overflows were observed or reported, the City did experience sustained elevated inflow and infiltration (I&I) into the WWTP. The tertiary plant was operated for several days at its peak hydraulic capacity of around 6 mgd.

Two depth-duration-frequency (DDF) curves are shown in Figures 9-2 and 9-3. Figure 9-2 shows the curves for short-term storm events (of 3 days or less) and Figure 9-3 shows the curves for longer-term storm events (4 to 15 days). DDF curves are developed from statistical analysis of local precipitation records. They serve to classify storms of different durations by return period (probability of the frequency of occurrence) so storms from different years, but of the same duration, can be compared directly. For Auburn, storms with long return periods (> 5 years) and longer term duration (several days) produce significant inflow and infiltration into the WWTP.

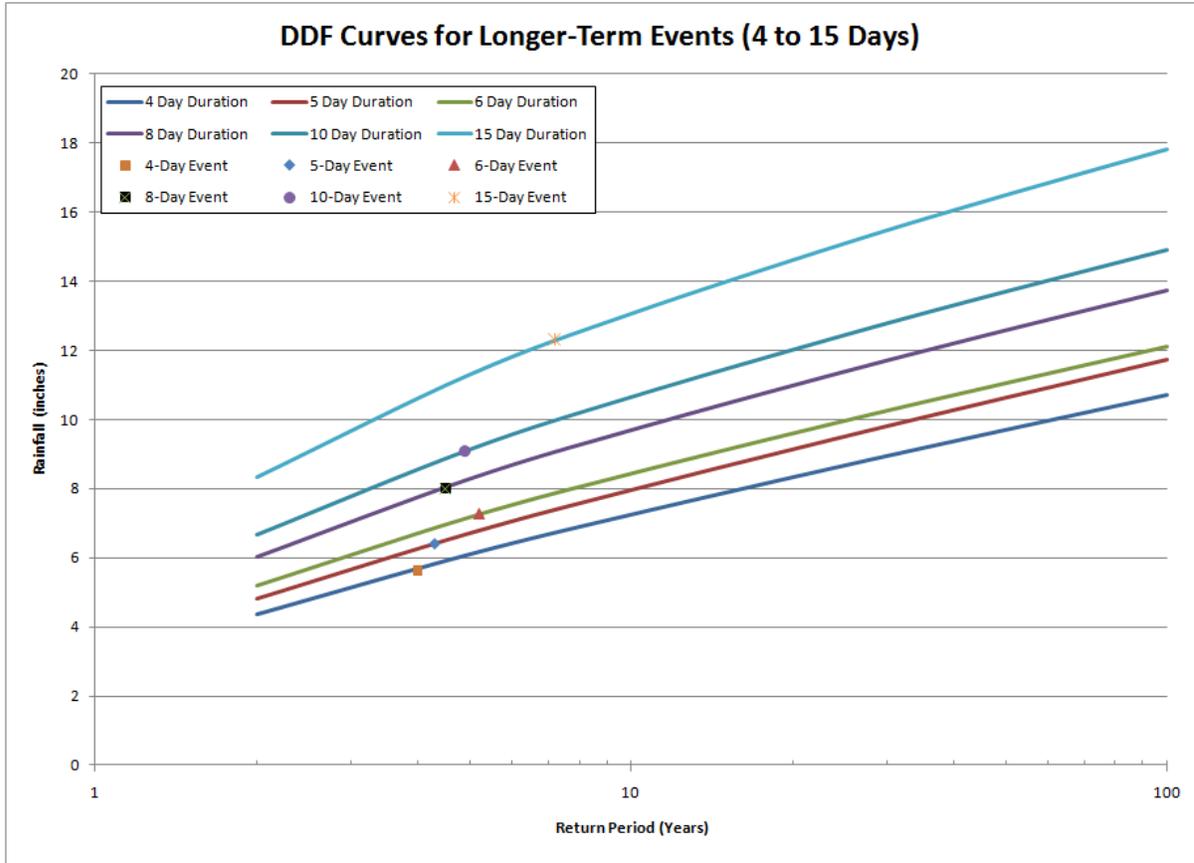
The curves below suggest that the return periods of the storm events of March 2011 ranged from 4 to 12 years depending on the duration selected. The largest return period of 12 years was for a 1-day duration storm event (when it rained 3.24 inches). The entire 2 week period of storms would represent about a 7-year return frequency.

Neighboring municipalities and communities, such as the South Placer Municipal Utility District (SPMUD) and Placer County, have been utilizing a 6-hour, 10-year design storm for hydraulic analyses of their sewer systems. Rather than establishing a design storm, the 1-day, 12-year storm in March 2011 was used in evaluation of the City's hydraulic capacity. This storm is considered conservative because of the saturated conditions prior to and subsequent to the storm and is consistent with the level of storm event used by neighboring communities.

As mentioned previously, no SSOs were observed or reported during this time period, even during the 12-year return period event.



**FIGURE 9-2. SHORT-TERM STORM EVENTS (3 DAYS OR LESS) – EVALUATION OF MARCH 2011 STORMS**



**FIGURE 9-3. LONG-TERM STORM EVENTS (4 TO 15 DAYS) – EVALUATION OF MARCH 2011 STORMS**

### February 2014 Storm Event

In February 2014, the City experienced a period of intense rainfall, with 5.56 inches falling within a 24-hour period. This storm event caused one overflow of approximately 300 gallons in the City’s sewer system.

Figure 9-4 below shows a depth-duration-frequency (DDF) chart for the ADR rain gauge. It also shows the return periods for both 1 and 2 day durations for the February 2014 storm event.



**FIGURE 9-4. DDF CURVES FOR ADR RAIN GAUGE WITH FEBRUARY 2014 STORM EVENT**

As shown in Figure 9-4, for a 24 hour period, the February 2014 storm event had a return period of over 100 years.

**Conclusion**

The data from these storm events suggests that for a 10-year return period storm event, the City’s sewer system has enough hydraulic capacity within the pipes and lift stations to avoid SSOs. A storm event of over a 100 year return period was needed before an SSO occurred, presumably from a capacity issue. Therefore, further evaluation is not required at this time since capacity during a 10-year return period storm event (the standard return period for many communities in the Central Valley) appears more than adequate. This evaluation will be updated as more large storms occur and as the system ages.

## 10 Monitoring, Measurement, and Program Modifications

### 10.1 PERFORMANCE STANDARDS

The City, in coordination with CH2M Hill/OMI, has developed the following performance targets (see Table 10-1) for sewer system maintenance. These performance targets have been established to help achieve and maintain the City’s goal of minimizing/eliminating sanitary sewer overflows (SSOs) in mains and lift stations throughout the City.

TABLE 10-1. SANITARY SEWER MAINTENANCE PERFORMANCE TARGETS

Activity	Monthly City Contract (feet)	Yearly City Contract (feet)	Yearly City Goal (feet)
Hydrocleaning	17,000	204,000	214,713
Root Sawing	2,000	24,000	24,000
Televising/CCTV	1,700	20,400	26,464

The City utilizes a Computer Maintenance Management System (CMMS) and its GIS system for tracking inspections, repairs, and preventative maintenance activities. The data used in this section was taken from the CMMS database.

The following table (Table 10-2) shows actual performance from 2009 through 2016 as well as totals and averages per year of each activity.

TABLE 10-2. ACTUAL PERFORMANCE PER YEAR BY ACTIVITY

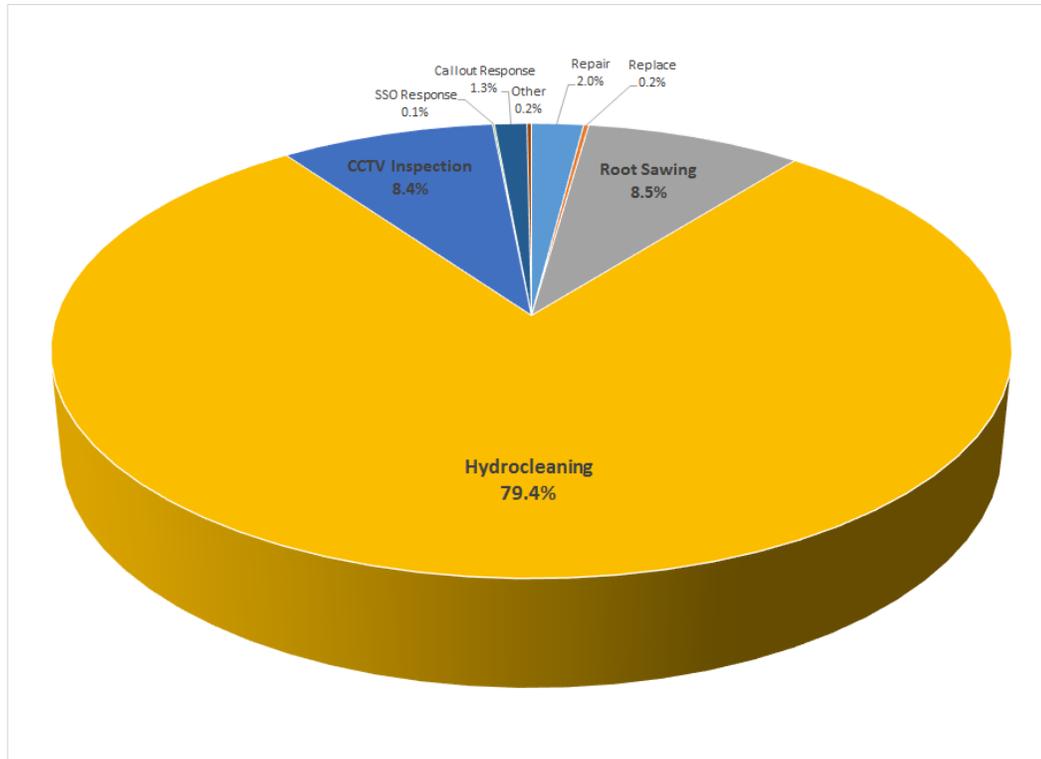
Year	Activity			
	Hydrocleaning (feet)	Root Sawing (feet)	Televising/CCTV (feet)	Other Activities (a) (feet)
2009	252,089	22,065	22,889	561
2010	185,828	15,155	18,411	0
2011	235,644	27,231	26,005	16,374
2012	216,041	27,138	31,670	16,477
2013	253,384	27,231	21,237	9,448
2014	251,422	25,212	26,391	12,465
2015	247,549	23,811	27,864	18,113
2016	246,586	31,716	22,910	14,342
<b>TOTAL</b>	<b>1,888,543</b>	<b>199,559</b>	<b>197,377</b>	<b>87,780</b>
<b>AVERAGE</b>	<b>236,068</b>	<b>24,945</b>	<b>24,672</b>	<b>10,973</b>

(a) Replacement, repair, chemical treatment, callout response, dye test, road clearing, inspection, unknown, CCTV for USA marking, and SSO response.

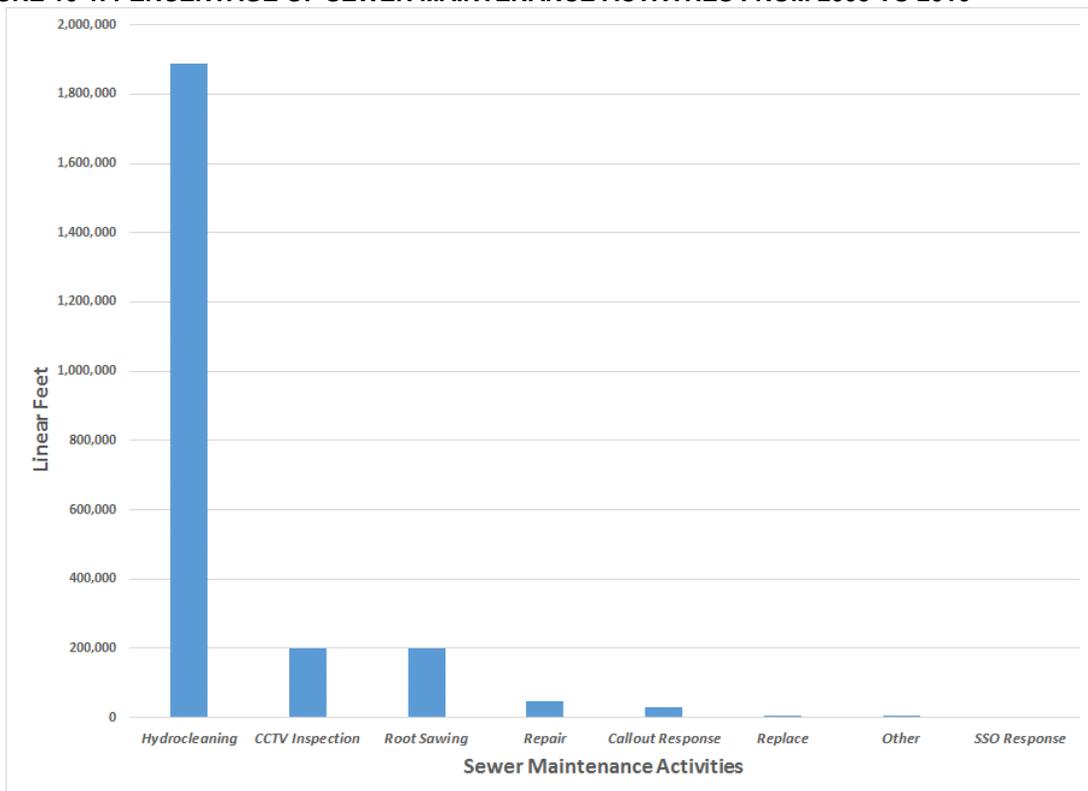
On average and in most years, the City has met or exceeded the established performance targets listed in Table 10-1.

Figure 10-1 below shows percentages of maintenance activities for 2009 to 2016.

Figure 10-2 shows totals for maintenance activities by linear feet.



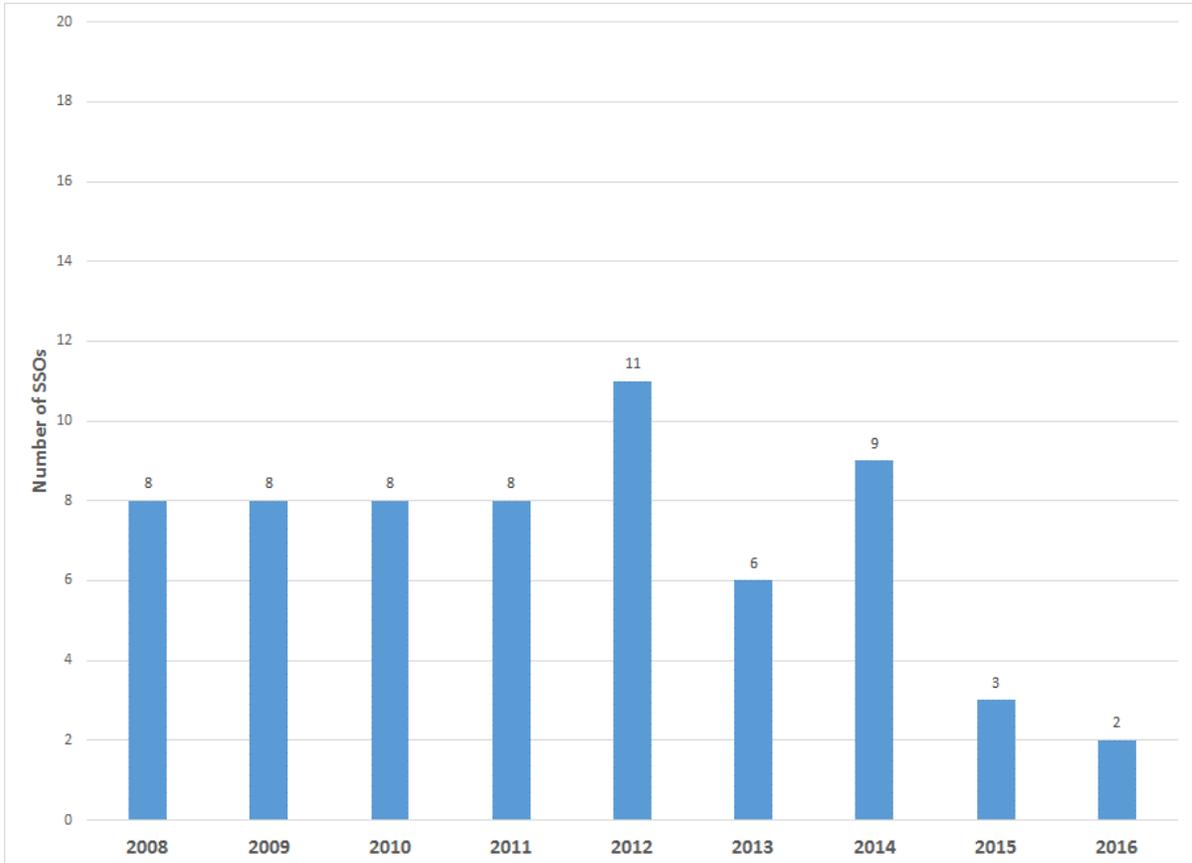
**FIGURE 10-1. PERCENTAGE OF SEWER MAINTENANCE ACTIVITIES FROM 2009 TO 2016**



**FIGURE 10-2. SEWER MAINTENANCE ACTIVITIES FROM 2009 THROUGH 2016 BY LINEAR FEET**

## 10.2 SANITARY SEWER OVERFLOWS

Figure 10-3 below shows total numbers of SSOs from 2008 through 2016. The general trend is downward.



**FIGURE 10-3. TOTAL NUMBER OF SSOS FROM 2008-2016**

Figure 10-4 shows the causes of these overflows from 2007 to 2016. Root intrusion is the main cause of SSOs. As shown in the previous section, the City’s maintenance activities focus on hydrocleaning, CCTV, and root sawing. These activities target the main causes of overflows, helping to develop the downward trend of SSOs.

Based on the small and decreasing number of SSOs in the City’s sewer system, it can be assumed that the City’s SSMP is effective.

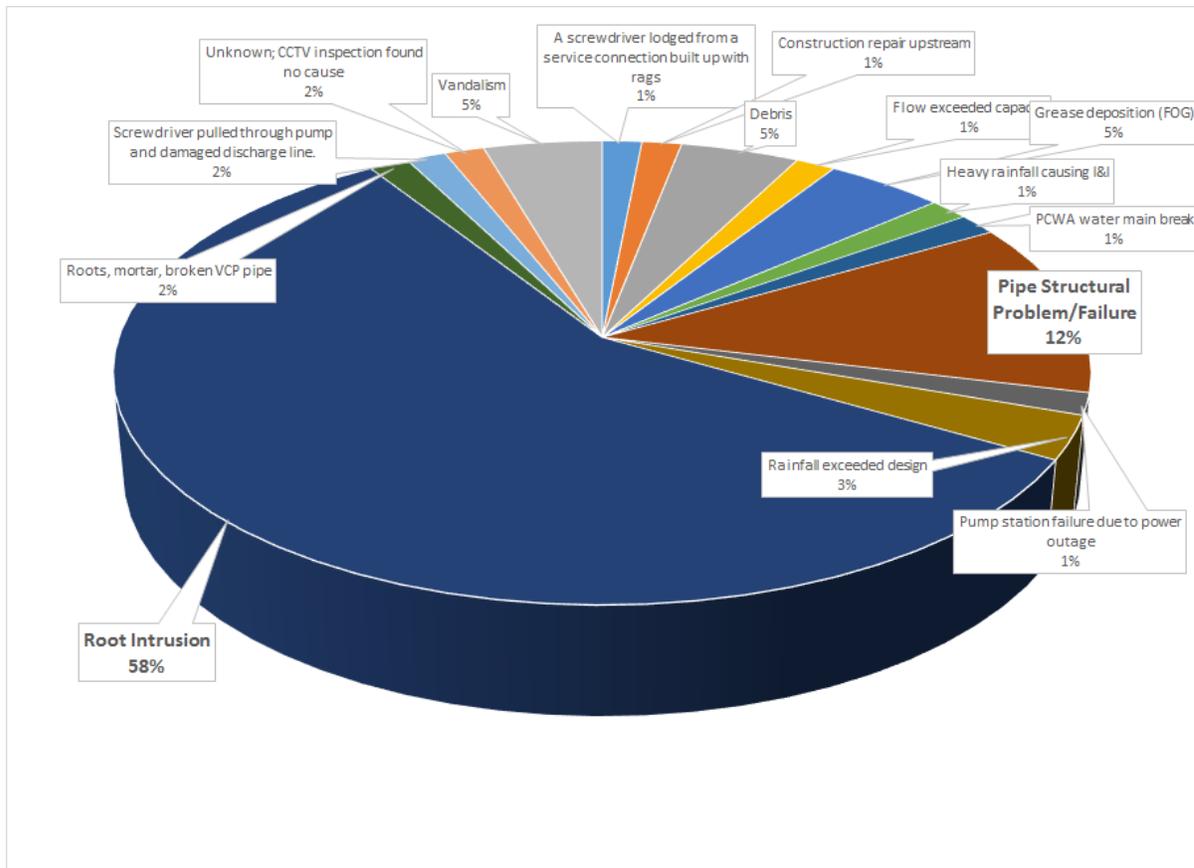


FIGURE 10-4. CAUSES OF SSOS FROM 2007 THROUGH 2016

## 11 SSMP Program Audits

Program audits occur every two years and consist of the evaluation shown in Section 10. The CMMS database helps to track and direct maintenance activities to maximize the program’s effectiveness.

## 12 Communication Program

Communication Program activities include the following:

- Communicate with stakeholders through regular updates to City staff and council
- Public works newsletters and outreach websites on SSMP for the public

When implementing the SSMP, the City has created public outreach campaigns known as Healthy Auburn Waters (HAW) and LiveSewerSmart (<http://www.livesewersmart.com/>). The HAW web site includes a link to the latest SSMP audit (<http://www.healthyauburnwaters.org/sewer-system-management-plan>). Both web sites aim to educate the public on safe disposal of the following substances:



- Chemicals
- Poisons
- Water Softener Backwash
- Pesticides and Herbicides
- Cleaners
- Pharmaceutical waste
- Cooking fats, oils and grease (FOG)
- Motor oil and fuel

The web sites are updated regularly and communication with the public is ongoing.

Appendix A

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## **Operation and Maintenance Program Summary**

# City of Auburn SSMP Implementation

## *Topic: Overview of Operations & Maintenance Program*

PREPARED FOR: Bernie Schroeder/City of Auburn

PREPARED BY: Dan Rich/NEXGEN

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COPIES:

DATE: Updated: June 24, 2016

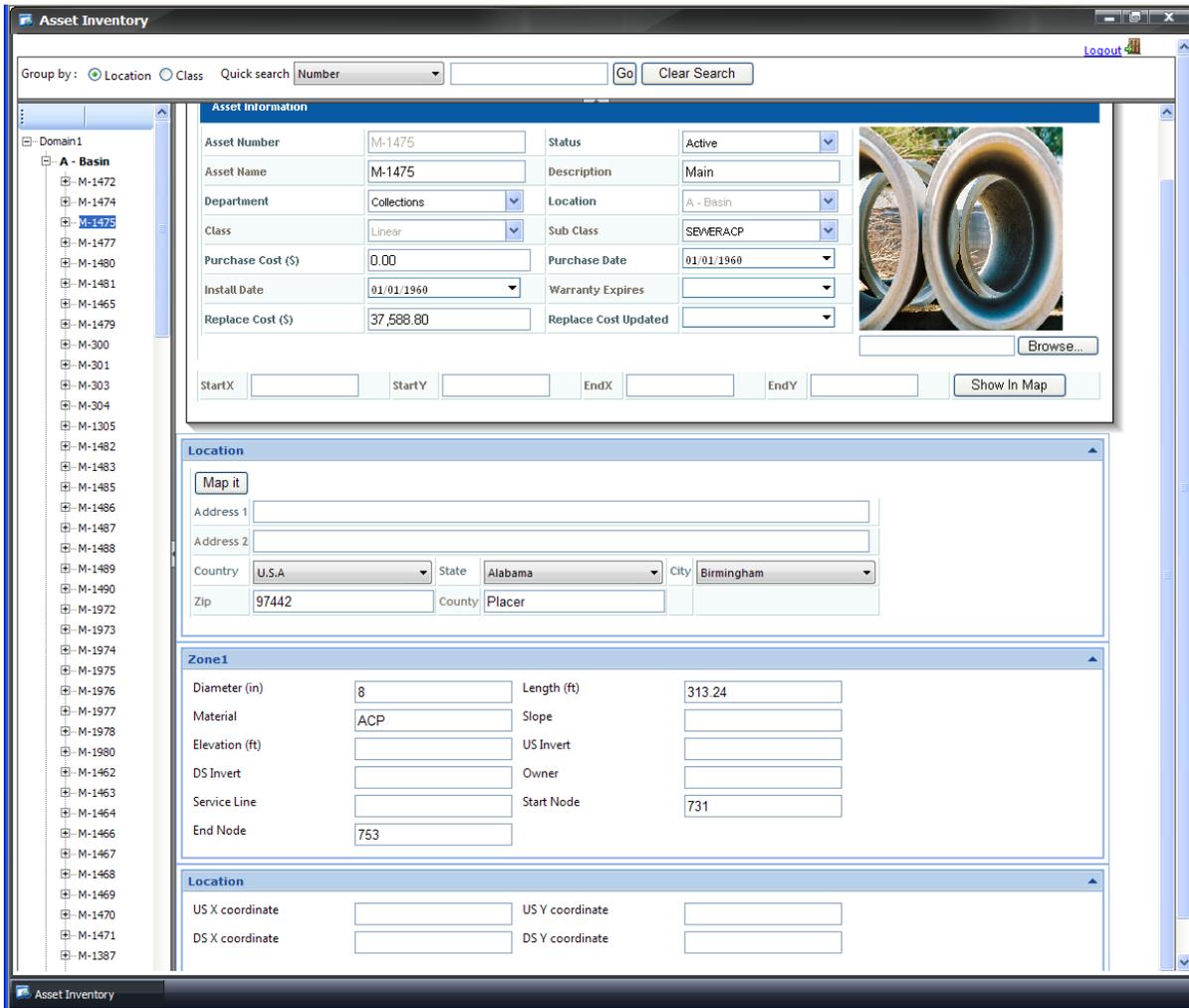
## O&M Implementation

### 1 Computer Maintenance Management System

All of the City's collection system assets including sewers and maintenance holes are documented in a computer maintenance management system (CMMS). They are sorted and rolled up by sewer shed basins. Figure 1 presents an example of the details that are captured in the CMMS for asset inventory.

Using the CMMS, the City has established a formal Operations and Maintenance (O&M) program with routine preventive maintenance program on the higher risk assets. The City utilizes the CMMS to manage the O&M program which complies with the state's Sewer System Management Plan (SSMP) requirements.

FIGURE 1. CITY'S COLLECTION SYSTEM ASSETS ARE MANAGED IN A CMMS



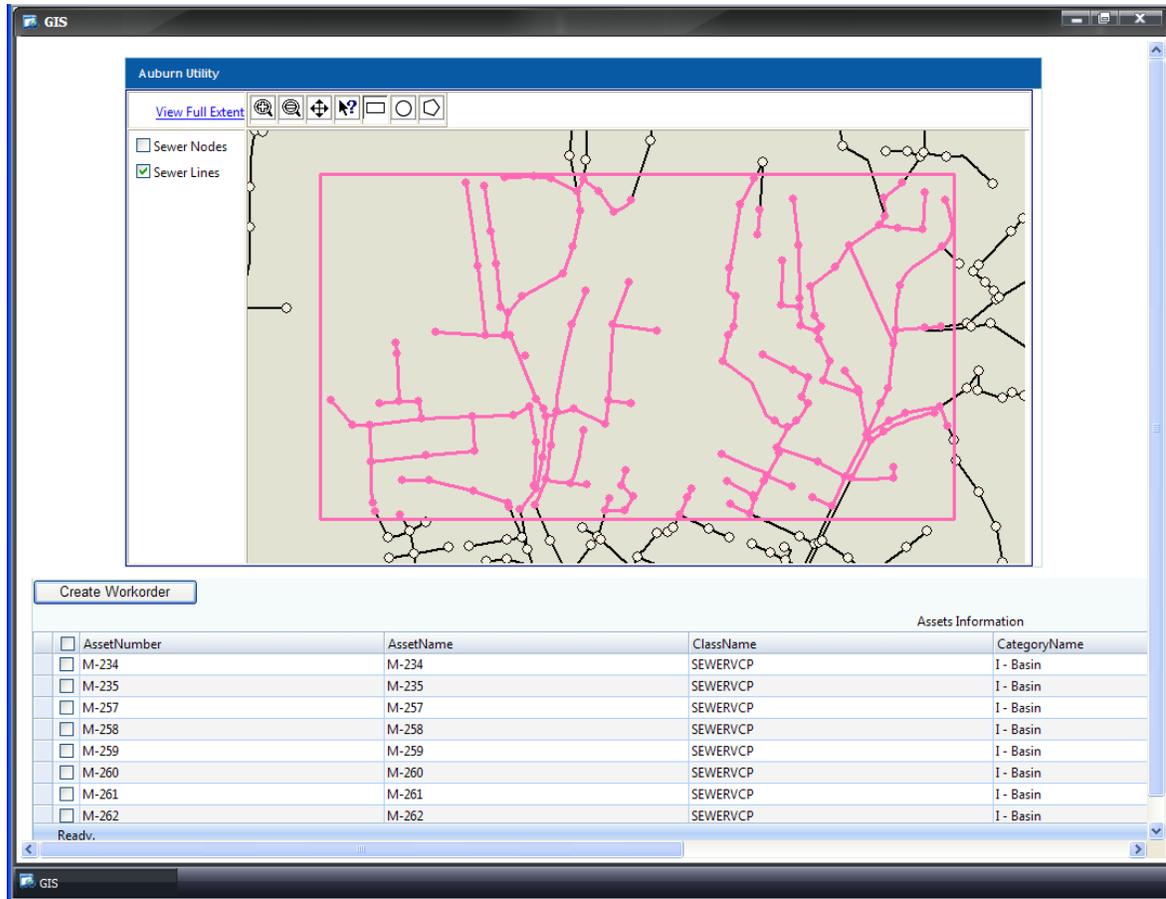
## 2 Migration of the City's Historical Work Orders to CMMS

The City has kept track of historical Work Orders (WO) from 12/9/99 to the present. There were 2 sets of data, historical WO from 12/9/99 to 2/13/03, which identified the dates, street and priority. The records did not identify WO types and causes for the WO. A separate set of historical WO data from 3/24/04 to present has identified dates, sewer lines, priority, street and memo. Some of the memo fields identified WO types and causes. Where possible, the WO types and causes were interpreted based on the memo field. There seems to be some missing data from February 2003 and March 2004. Therefore, historical work orders from 3/24/2004 to the present have been migrated into the City's new CMMS. Since 2007, new work orders have been entered into the CMMS, creating a real-time database.

### 3 Integration of GIS with CMMS

The City’s Geographical Information System (GIS) is integrated with the CMMS. Users can access the asset inventory through the GIS map or asset inventory tree in the CMMS. Figure 2 shows a sample of GIS map in the CMMS. Users can query asset information or create work orders from the GIS map. The City’s GIS is maintained by City staff.

FIGURE 2. CITY’S GIS IS INTEGRATED WITH THE CMMS



### 4 Application of Asset Management Principles to Preventive Maintenance Program – Risk Assessment

The City prioritized its assets based on risk from a risk rating system that accounts for impact and probability. The purpose of the risk assessment is to prioritize Preventative Maintenance (PM) activities. The City rated groups of assets by the impact of asset failure from a rating system of 1- 5 as presented in Table 3.

**TABLE 3. ASSET IMPACT INDEX RATINGS**

Asset Impact Index	Social/Service	Environment/Regulatory	Economic/Financial
1	No operation and service interruptions.	No impact on environment and regulatory compliance.	No economic and financial impact.
2	Minimal operation interruptions but no service interruptions to customers.	Minor impact on environment and no violation of regulatory compliance.	Trivial loss of economic and financial revenue from productions or service interruptions.
3	Routine operation interruptions and minor service interruptions to customers.	Moderate impact on environment and minor violation of regulatory compliance.	Evident loss of economic and financial revenue from productions or service interruptions.
4	Major operation interruptions, service interruptions and potential public safety.	Major impact on environment and violation of regulatory compliance with fines.	Significant loss of economic and financial revenue from productions or service interruptions.
5	Extended operations interruptions, service interruptions to large number of customers and public safety.	Catastrophic environmental impact and violation of regulatory compliance with significant fines.	Extreme loss of revenue from productions or service interruptions.

The City rated groups of assets by the probability of asset failure from a rating system of 1- 5 as presented in Table 4.

**TABLE 4. ASSET PROBABILITY INDEX RATINGS**

Asset Probability Index (API)	Probability of Failure
1	Very low probability of failure.
2	Low probability of failure.
3	Intermediate probability of failure.
4	High probability of failure.
5	Very high probability of failure.

The Asset Risk Index (ARI) was calculated based on Asset Impact Index multiplied by Asset Probability Index. ARI scores ranged from 1- 25. Depending on the asset risk index scores, different asset management strategies may apply as presented in Table 5.

**TABLE 5. ASSET MANAGEMENT STRATEGIES**

Risk	Strategy
1. High impact & high probability	Replace assets to reduce probability of failure if possible. If not possible, monitor closely.
2. High impact & low probability	Monitor closely through inspections & condition assessment to minimize probability of failure.
3. Low impact & high probability	Utilize Business Case Evaluation (BCE) to determine assets have exceeded its economic lifecycle. If risk cost is high, BCE will recommend replacement.
4. Low impact & low probability	Run to failure.

## 5 Document and Optimize Preventive Maintenance Program

The City’s preventive maintenance program is organized by months. In some months, only specific sewer lines are to be cleaned depending on if they are assigned odd or even years. The City is currently maintaining the sewers based on the preventive maintenance schedule as presented in Table 6. Work order tracking provides a reliable means for updating and optimizing the PM program.

**TABLE 6. CITY’S PREVENTIVE MAINTENANCE PROGRAM FOR SEWERS**

Month	Annually	Odd Years	Even Years
Jan	M-127, M-128, M-129, M-130, M-135, M-166, M-167, M-168, M-169, M-212, M-372, M-373, P-920, P-921, M-923, M-924, M-927, M-928, M-929, M-930, M-931, M-933, M-934, M-935, M-936, M-937, M-938, M-939, M-940, M-942, M-943, M-944, M-988, M-991, M-992, M-993, M-1104, M-1105, M-1106, M-1109, M-1110, M-1113, M-1114, M-1116, M-1117, M-1121, M-1123, M-1124, M-1125, M-1128, M-1129, M-1130, M-1131, M-1132, M-1133, M-1134, M-922, M-1962, M-126, P-370, M-1968, M-1100, M-1108, M-2057, M-131	M-51, M-52, M-78, M-79, M-80, M-81, M-82, M-83, M-84, M-85, M-86, M-87, M-88, M-91, M-698, M-714, M-715, M-717, M-718, M-733, M-749, M-750, M-752, M-753, M-754, M-798, M-799, M-804, M-805, M-806, M-807, M-808, M-809, M-810, M-1837, M-1838, M-1839, M-1840, M-1874, M-1875	M-311, M, 312, M-313, M-314, M-315, M-316, M-317, M-1565, M-1567, M-1568, M-1569, M-1570, M-1571, M-1572, M-1573, M-1574, M-1578, M-1621, M-1624M-1625, M-1626, M-1770, M-1771, M-1772, M-1773, M-1774, M-1818, M-1819, M-1820, M-1821, M-1822, M-1823, M-1824
Feb	M-774, M-104, M-1547, M-1548, M-1549, M-1550, M-1959, M-863, M-1207, M-1208, M-1165, M-1169, M-376, M-1261, M-933, M-1413, M-1717, M-1718, M-1287, M-198, M-1363, M-1364, M-1365, M-1366, M-1367, M-197, M-1509, M-1514, M-1515, M-1507, M-413, M-1511, M-1512, M-1513, M-193, M-194, M-1508 M-1510, M-1833, M-204, M-205, M-1516, M-1503, M-1504, M-1505, M-200, M-201, M-202, M-1501, M-1517, M-1834, M-436, M-1412, M-1419, M-1414, M-1415, M-1407, M-1420, M-1418, M-1382, M-1383, M-1403, M-1404, M-1405, M-1409, M-176, M-175, M-1413, M-1421, M-1421, M-		

Month	Annually	Odd Years	Even Years
	1304, M-1488, M-1489, M-304, M-1305, M-1487, M-1479, M-1480, M-1483, M-1484, M-1486, M-300, M-301, M-303, M-1490, M-1478, M-195, M-412, M-438, M-447		
Mar	M-199, M-217, M-218, M-219, M-220, M-221, M-222, M-223, M-377, M-414, M-1023, M-1026, M-1027, M-1028, M-1029, M-1030, M-1031, M-1032, M-1034, M-1038, M-1042, M-1043, M-1091, M-1093, M-1094, M-1095, M-1096, M-1097, M-1098, M-1099, M-1102, M-1103, M-1110, M-1114, M-1115, M-1494, M-1495, M-1496, M-1520, M-1521, M-1522, M-1523, M-1525, M-1526, M-1527, M-1528, M-1529, M-1530, M-1531, M-1532, M-1533, M-1534, M-1535, M-1536, M-1827, M-1828, M-1033, M-1024, M-1089, M-1092	M-30, M-32, M-33, M-34, M-35, M-36, M-1340, M-1341, M-1942, M-1943, M-1944, M-1945, M-1946, M-1947, M-1948, M-1949, M-1950, M-31, M-2043	M-111, M-112, M-140, M-141, M-142, M-143, M-144, M-145, M-146, M-147, M-148, M-153, M-154, M-428, M-874, M-875, M-876, M-877, M-878, M-879, M-880, M-882, M-883, M-884, M-885, M-886, M-892, M-905, M-1955, M-1957, M-1880, M-1881, M-1882, M-1883, M-1884, M-1885, M-1886, M-1887, M-1888, M-139
Apr	M-203, M-206, M-357, M-360, M-363, M-364, M-410, M-435, M-964, M-965, M-966, M-968, M-969, M-970, M-972, M-973, M-974, M-975, M-976, M-977, M-978, M-979, M-980, M-981, M-984, M-985, M-996, M-997, M-1002, M-1492, M-1493, M-1496, M-1498, M-1500, M-1502, M-1537, M-1538, M-1539, M-1540, M-1542, M-1543, M-1544, M-1545, M-1850, M-1851, M-1855, M-1856, M-1857, M-1859, M-1547, M-967	M-247, M-249, M-250, M-251, M-252, M-522, M-530, M-531, M-532, M-533, M-534, M-535, M-536, M-537, M-538, M-540, M-720, M-722, M-723, M-724, M-1214, M-1215, M-1216, M-1219, M-1227, M-1228, M-1229, M-1230, M-1231, M-1233, M-1244	M-59, M-60, M-100, M-101, M-102, M-104, M-156, M-415, M-416, M-417, M-418, M-426, M-427, M-755, M-756, M-757, M-758, M-759, M-760, M-761, M-788, M-789, M-790, M-791, M-792, M-793, M-794, M-795, M-906
May	M-863, M-774, M-65M-1547, M-1548, M-1549, M-1550, M-1959, M-1717, M-1718, M-1207, M-1208, M-1265, M-1266, M-1413, M-1165, M-1169, M-376, M-1261, M-933, M-1214, M-1219, M-249, M-1287, M-1136, M-731, M-738, M-739, M-746, M-2050, M-1250, M-1234, M-1236, M-255, M-305, M-1220, M-1221, M-1222, M-1223, M-1224, M-1225, M-1226, M-1241, M-1247, M-265, M-306, M-333, M-429, M-431, M-432, M-1255, M-1882, M-1252, M-2026, M-2031, M-1232, M-1237, M-1238, M-1239, M-1240, M-1860, M-244, M-278, M-279, M-280, M-281, M-282, M-283, M-284, M-285, M-286, M-287, M-288, M-289, M-1204, M-1206, M-1209, M-1253M-1254, M-1256, M-1267, M-1268, M-1203, M-2042, M-1902, M-1903, M-1904, M-1905, M-1906, M-1907, M-1908, M-1909, M-1910, M-1912, M-1913, M-1914, M-1915, M-1916, M-1917, M-1919, M-1920, M-1922, M-1923, M-1924, M-1925, M-1926		
Jun	M-155, M-157, M-165, M-166, M-170, M-184, M-185, M-186, M-187, M-214, M-216, M-224, M-225, M-227, M-228, M-		

Month	Annually	Odd Years	Even Years
	229, M-232, M-258, M-259, M-267, M-291, M-346, M-347, M-348, M-349, M-350, M-379, M-380, M-381, M-382, M-383, M-394, M-395, M-907, M-909, M-912, M-913, M-915, M-946, M-948, M-957, M-1009, M-1011, M-1040, M-1042, M-1045, M-1047, M-1048, M-1049, M-1050, M-1057, M-1058, M-1060, M-1066, M-1067, M-1068, M-1071, M-1072, M-1073, M-1081, M-1082, M-1085, M-1086, M-1087, M-1177, M-1178, M-1179, M-1180, M-1181, M-1183, M-1184, M-1185, M-1187, M-1188, M-1190, M-1191, M-1192, M-1270, M-1970, M-1039, M-215		
Jul	M-1814, M-1815, M-1811, M-1812, M-1813, M-1628, M-1629, M-1781, M-1782, M-1810, M-321, M-329	M-324, M-1551, M-1552, M-1553, M-1554, M-1555, M-1556, M-1558, M-1560, M-1562, M-1563, M-1564, M-1577, M-1579, M-1580, M-1605, M-1606, M-1607, M-1608, M-1614, M-1615, M-1616, M-1617, M-1618, M-1619, M-1620, M-1621, M-1622, M-1630, M-1732, M-1751, M-1752, M-1753, M-1754, M-1756, M-1757, M-1758, M-1759, M-1765, M-1769, M-1770, M-1775, M-1777, M-1778, M-1779, M-1816, M-1817, M-1831, M-2051, M-1559, M-1391, M-1389, M-1392, M-1396, M-1397, M-1398, M-1399, M-1400, M-1401, M-1407, M-1408, M-1410, M-1460, M-1461, M-1463, M-1387, M-1388, M-1394, M-1395	M-1760, M-1575, M-1576, M-1761, M-1762, M-1557, M-1763, M-1764, M-1592, M-1594, M-1595, M-1599, M-1600, M-1582, M-1583, M-1584, M-1588, M-1589, M-1590, M-1593, M-1596, M-1597, M-1598, M-1604, M-1602, M-1601, M-1739, M-1738, M-1742, M-1741, M-1646, M-1648, M-1797, M-1800, M-1647, M-1665, M-1790, M-1791, M-1792, M-1796, M-1798, M-1585, M-1799, M-1807, M-1808, M-1650, M-1803, M-1653, M-1789, M-1801, M-1802, M-1804, M-1805, M-1806, M-317, M-367, M-368, M-972, M-1567, M-1826, M-1829, M-1830, M-967
Aug	M-38, M-39, M-40, M-42, M-43, M-44, M-67, M-68, M-73, M-74, M-541, M-543, M-544, M-545, M-546, M-547, M-548, M-549, M-721, M-725, M-727, M-731, M-732, M-735, M-736, M-737, M-738, M-739, M-740, M-742, M-745, M-746, M-774, M-775, M-776, M-777, M-778, M-781, M-782, M-785, M-1842, M-1843, M-741, M-728, M-730, M-774, M-104, M-1547, M-1548, M-1549, M-1550, M-1959, M-863, M-1207, M-1208, M-1165, M-1169, M-376, M-1261, M-933, M-1413, M-1717, M-1718, M-1287		
Sep	M-107, M-93, M-848, M-850, M-856, M-105, M-106, M-420, M-421, M-797, M-800, M-802, M-803, M-845, M-846, M-847, M-851, M-852, M-854, M-90, M-94, M-801, M-91, M-1145, M-207, M-208, M-209, M-210, M-238, M-237, M-211, M-		



Month	Annually	Odd Years	Even Years
	1153, M-1158, M-1160, M-1162, M-1155, M-1156, M-1152, M-1137, M-1142, M-1143, M-1146, M-1147, M-1148, M-1149, M-1150, M-1154, M-2013, M-1163, M-1164, M-1139, M-275, M-290, M-291, M-337, M-338, M-346, M-347, M-348, M-349, M-1171, M-1172, M-1174, M-1176, M-1178, M-1179, M-1180, M-1182, M-1183, M-1184, M-1185, M-1187, M-1269, M-1270, M-236, M-41, M-58, M-62, M-63, M-65, M-66, M-73, M-74, M-75, M-76, M-77, M-726, M-747, M-763, M-764, M-765, M-766, M-767, M-768, M-769, M-770, M-2040, M-64		
Oct	M-108, M-109, M-113, M-114, M-115, M-116, M-117, M-118, M-138, M-149, M-150, M-151, M-152, M-188, M-189, M-190, M-191, M-230, M-231, M-233, M-235, M-257, M-260, M-261, M-262, M-263, M-264, M-378, M-817, M-818, M-820, M-821, M-827, M-830, M-832, M-835, M-836, M-837, M-839, M-840, M-841, M-842, M-843, M-858, M-860, M-861, M-862, M-863, M-865, M-869, M-887, M-891, M-893, M-894, M-895, M-896, M-899, M-900, M-994, M-999, M-1000, M-1001, M-1003, M-1004, M-1005, M-1006, M-1008, M-1010, M-1012, M-1016, M-1018, M-1019, M-1022, M-1051, M-1053, M-1054, M-1055, M-1062, M-1063, M-1064, M-1065, M-1869, M-1956, M-864, M-1425, M-2011, M-2033, M-2027, M-2039, M-268, M-269, M-273, M-274, M-290, M-337, M-338, M-1176, M-1202, M-1269,		
Nov	M-260, M-261, M-262, M-263, M-264, M-293, M-294, M-295, M-296, M-297, M-298, M-308, M-310, M-345, M-346, M-351, M-354, M-355, M-356, M-482, M-483, M-484, M-485, M-486, M-487, M-490, M-491, M-492, M-493, M-494, M-495, M-496, M-497, M-498, M-499, M-500, M-501, M-502, M-503, M-505, M-506, M-509, M-510, M-1180, M-1193, M-1194, M-1195, M-1196, M-1197, M-1198, M-1199, M-1200, M-1201, M-1272, M-1273, M-1275, M-1276, M-1277, M-1278, M-1279, M-1280, M-1282, M-1284, M-1285, M-1286, M-1287, M-1288, M-1289, M-1290, M-1291, M-1294, M-1295, M-1296, M-1297, M-1300, M-1878, M-1879, M-309, M-774, M-104, M-1547, M-1548, M-1549, M-1550, M-1959, M-863, M-1207, M-1208, M-1165, M-1169, M-376, M-1261, M-933, M-1413, M-1717, M-1718, M-1287		
Dec	M-10, M-11, M-12, M-13, M-14, M-15, M-45, M-47, M-48, M-322, M-323, M-325, M-		



Month	Annually	Odd Years	Even Years
	330, M-331, M-375, M-523, M-524, M-525, M-526, M-527, M-539, M-550, M-551, M-552, M-553, M-554, M-555, M-556, M-557, M-558, M-559, M-560, M-561, M-1306, M-1307, M-1346, M-1347, M-1348, M-1349, M-1350, M-1351, M-1352, M-1353, M-1354, M-1355, M-1356, M-1357, M-1358, M-1359, M-1360, M-1586, M-1632, M-1635, M-1636, M-1637, M-1639, M-1640, M-1641, M-1642, M-1666, M-1667, M-1668, M-1670, M-1671, M-1699, M-1700, M-1701, M-1702, M-1703, M-1704, M-1708, M-1709, M-1710, M-1711, M-1712, M-1713, M-1714, M-1716, M-1717, M-1718, M-1719, M-1720, M-1721, M-1722, M-1723, M-1724, M-1725, M-1730, M-1731, M-1734, M-1735, M-1736, M-1737, M-1743, M-1744, M-1745, M-1746, M-1747, M-1748, M-1749, M-1814, M-1863, M-1894, M-1895, M-1896, M-1939, M-1706, M-1990, M-1989, M-2045, M-1633, M-2047, M-2046		

The City's PM program has been established in the CMMS and reminders and work orders for PM activities are automatically generated when they are due. Figure 3 presents a sample screen of the City's PM program in the CMMS software.

FIGURE 3. CITY'S PREVENTIVE MAINTENANCE PROGRAM AUTOMATICALLY GENERATED FROM CMMS

The image shows two overlapping windows from a CMMS interface. The top window is titled 'Preventative Maintenance' and contains a form with the following fields:

- Scheduled
- PM Number: 00001
- PM Name: Jan Annual
- Description: (empty text area)
- WO Type: Hydrocleaning
- Main Task: -Select a Task-
- Department: Collections
- Crew: Hydro Cleaning Crew
- Lead Worker: -Select a Lead-
- Project: -Select a Project-
- Comments: (empty text area)
- WO Comments: (empty text area)
- Interrupt Service
- ShutDown
- Lockout
- Safety

The bottom window is titled 'Preventative Maintenance Details' and features a tabbed interface with 'Assets' selected. It contains a table with the following data:

Asset Number	Asset Name	Class	Location	Department	UnderWarranty
* Please click here to add new row...					
M-127	M-127	SEWERVCP	G - Basin	Collections	<input type="checkbox"/>
M-128	M-128	SEWERVCP	G - Basin	Collections	<input type="checkbox"/>
M-129	M-129	SEWERVCP	G - Basin	Collections	<input type="checkbox"/>
M-130	M-130	SEWERVCP	G - Basin	Collections	<input type="checkbox"/>
M-135	M-135	SEWERVCP	G - Basin	Collections	<input type="checkbox"/>
M-166	M-166	SEWERVCP	I - Basin	Collections	<input type="checkbox"/>
M-167	M-167	SEWERVCP	T - Basin	Collections	<input type="checkbox"/>

The bottom window also shows a status bar with 'Ready.' and 'Loaded 45 of 45'.

## 6 CCTV Schedule

The City works with CH2M Hill/OMI to complete systematic hydrocleaning, root sawing, and CCTVing throughout the sewer system.

The City actively uses CCTV inspection to monitor the condition of its sewer lines, identify problem areas, identify locations in need of repairs, and to determine the effectiveness of the cleaning/root sawing program.

After cleaning or repairing the sewer lines as necessary, the City uses CCTV inspection to confirm the adequacy or the cleaning/root removal and the competency of any repair or replacement operations.

The City's yearly goal is to CCTV 26,464 feet of pipe (approximately 5 miles) each year.

Appendix B

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**2016-2017 Capital and Operation Budget for Sewer  
Systems and 5 Year Schedule**

**City of Auburn**  
**Fiscal Year 2016-17 Proposed Budget**  
**Sewer Enterprise Fund (Fund 11)**  
**Capital Expenditure Detail**

<b>Capital Expenditures</b>	<b>ACTUAL 2014-15</b>	<b>REVISED BUDGET 2015-16</b>	<b>PROPOSED BUDGET 2016-17</b>
63702 - WWTP Upgrade / UV Project	150	-	-
63856 - Auburn Ravine Sampling	7,183	10,200	10,000
63895 - Lift Station Repairs	32,699	20,800	15,000
63899 - Emergency Sewer Repair Projects	946,174	728,000	350,000
63890 - BIOASSY Testing WWTP	-	-	5,000
63901 - Sewer Map Updates	-	10,000	10,000
63903 - WWTP - Repairs / Projects	18,919	52,000	10,000
63913 - Gunite Ditch - WWTP	-	10,500	10,500
63914 - NPDES Permit Renewal	85,724	30,000	200,000
64004 - SSMP Upgrades	-	10,000	10,000
64006 - Oxidation Ditch	504,644	2,200,000	4,500,000
64007 - Aeration Improvements	13,136	10,000	-
64008 - Contract Operations RFP	2,000	-	-
64009 - Source Control Program	3,078	25,000	-
64010 - I&I Reduction Program	-	15,000	-
64011 - Monticello Lift Station Upgrade	1,702	550,000	-
64012 - Vista Del Val Lift Station	-	-	250,000
65000 - Regional Sewer Project / Outreach	427	3,600,000	530,000
65001 - Back Flow Preventer Device	-	5,000	-
65007 - Groundwater Study	10,781	-	-
65602 - Utility Billing Software	-	75,000	100,000
65603 - Collection System Software	-	50,000	-
65604 - NPDES - 2015 Permit	5,487	100,000	-
65605 - Tractor / Mower	-	50,000	70,000
65606 - WWTP Pond Improvements	-	50,000	-
67012 - Monticello Lift Station	47,372	-	-
67013 - Auburn Oaks Lift Station	884	-	-
67023 - Diamond Ridge Lift Station	-	75,000	75,000
67024 - Pond 1B Lift Station	-	-	-
67025 - Southridge Lift Station	-	20,000	-
63054 - Groundwater Monitoring Wells	95	100,000	-
64014 - Nevada Street Sewer Project	-	-	200,000
<i>Total:</i>	<u>1,680,455</u>	<u>7,796,500</u>	<u>6,345,500</u>

# COA - CIP FY17 - FY22 Program



Project Number	Code	Program Summary	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18/22	Notes	
City of Auburn CIP FY18 to FY22			FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18-22		
2	GREEN	ACTIVE	Airport Program	\$425,000	\$179,341	\$495,659	\$1,037,500	\$617,500	\$312,500	\$69,000	\$277,500	\$2,314,000.00	
3	BLUE	ANNUAL	Sewer Program	\$6,345,500	\$0	\$6,345,500	\$7,722,000	\$1,705,000	\$813,000	\$815,200	\$817,000	\$11,872,200.00	
4	BLACK	PROGRAM	Transportation Program	\$2,896,500	\$255,254	\$2,641,246	\$1,515,000	\$1,455,000	\$1,455,000	\$1,455,000	\$1,455,000	\$7,335,000.00	
5			Transit Program	\$177,703	\$14,888	\$162,816	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000.00	
6			General Facilities Program	\$284,000	\$168,731	\$115,269	\$105,000	\$32,500	\$68,000	\$30,000	\$0	\$235,500.00	
7			Public Safety Facilities Program	\$120,800	\$177,608	-\$56,808	\$81,000	\$166,000	\$31,000	\$50,000	\$0	\$328,000.00	
8			<b>Sum Total of ALL PROGRAMS</b>	<b>\$10,249,503</b>	<b>\$795,821</b>	<b>\$9,703,682</b>	<b>\$10,470,500</b>	<b>\$3,986,000</b>	<b>\$2,689,500</b>	<b>\$2,429,200</b>	<b>\$2,559,500</b>	<b>\$22,134,700</b>	
10	Proj. No.	Finance Code	Airport Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18 - 22	
11		02-510-63153	Airport Layout Plan w/ Narrative Report	\$215,000.00	\$109,293.49	\$105,707						\$0.00	
12		02-510-63317	Bill Clark Environmental and Deconstruction		\$49,953.00	-\$49,953	\$50,000					\$50,000.00	
13		02-510-50303	Machinery & Equipment	\$25,000.00	\$447.44	\$24,553	\$15,000	\$15,000	\$15,000	\$1,500	\$15,000	\$61,500.00	
14		02-510-50800	Computer Equipment	\$5,000.00	\$0.00	\$5,000	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$12,500.00	
15		02-510-63090	Building & Facility Improvements	\$10,000.00	\$0.00	\$10,000	\$25,000	\$10,000	\$10,000	\$10,000	\$10,000	\$65,000.00	
16		02-510-63021	Demolition of Old Hangar Structures (Denham)	\$10,000.00	\$5,443.75	\$4,556	\$25,000					\$25,000.00	
17		02-510-63042	AWOS/AIP-04	\$15,000.00	\$0.00	\$15,000						\$0.00	
18		02-510-63048	East End Hangar Project	\$25,000.00	\$0.00	\$25,000						\$0.00	
19		02-510-63091	East End Sanitary Sewer Project (Denham) - Design	-	-	-	\$25,000					\$25,000.00	
20		02-510-63154	Airport Parking Lot Improvements	\$60,000.00	\$0.00	\$60,000						\$0.00	
21		02-510-63306	Security Camera Upgrades	\$50,000.00	\$0.00	\$50,000						\$0.00	
22		02-510-63308	Airport Monument Sign (Staff)	\$10,000.00	\$0.00	\$10,000						\$0.00	
23		02-510-63156	Airport Taxiway Lighting Rehabilitation	\$0.00	\$2,880.81	-\$2,881						\$0.00	
24		02-510-63309	E. Hangar Motorized Gate	\$0.00	\$11,322.76	-\$11,323						\$0.00	
25			Pollution Abatement Facility	\$0.00		\$15,000						\$0.00	
26			Pavement Maintenance Rehabilitation - Apron Area	\$0.00		\$30,000						\$0.00	
27			Runway LED Lighting Rehabilitation	\$0.00		\$205,000						\$0.00	
28			Design/Engineer New Helicopter Parking Area				\$75,000					\$75,000.00	
29			Construct New Helicopter Parking Area				\$620,000					\$620,000.00	
30			Design - Solar Shade Structure - Tie Down Area				\$10,000					\$10,000.00	
31			Construct - Solar Shade Structure - Tie Down Area				\$190,000					\$190,000.00	
32			Pavement Maintenance Program					\$590,000				\$590,000.00	
33			Construct Perimeter Fencing (Phase 2)						\$285,000			\$285,000.00	
34			Design/Engineer East End Airfield Access/Run Up Imp.							\$55,000		\$55,000.00	
35			Construct East End Airfield Access/Run Up Improvements								\$250,000	\$250,000.00	
36			<b>Sum Total of AIRPORT PROJECTS</b>	<b>\$425,000</b>	<b>\$179,341</b>	<b>\$495,659</b>	<b>\$1,037,500</b>	<b>\$617,500</b>	<b>\$312,500</b>	<b>\$69,000</b>	<b>\$277,500</b>	<b>\$2,314,000</b>	
38	Proj. No.	Finance Code	Sewer Collection Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18-22	
39	SC-02	11-410-63856	Auburn Ravine Stream Sampling	\$10,000.00		\$10,000	\$10,000	\$10,000	\$10,000	\$10,200	\$10,000	\$50,200.00	
40	SC-03	11-410-65603	Collection System Computer Software Upgrades	\$0.00			\$35,000	\$10,000	\$10,000	\$10,000	\$10,000	\$75,000.00	
41	SC-09	11-410-63895	Lift Station Repairs/Upgrades	\$15,000.00		\$15,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$100,000.00	
42	SC-08	11-410-64010	I & I Reduction Program	\$0.00			\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000.00	
43	SC-12	11-410-63901	Sewer Map Updates	\$10,000.00		\$10,000	\$25,000	\$10,000	\$10,000	\$10,000	\$10,000	\$65,000.00	
44	SC-15	11-410-64004	SSMP Updates	\$10,000.00		\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000.00	
45	SC-06	11-410-63899	Emergency Sewer Repairs	\$350,000.00		\$350,000	\$550,000	\$550,000	\$550,000	\$550,000	\$550,000	\$2,750,000.00	
46	SC-13	11-410-64009	Source Control Program				\$20,000	\$20,000	\$25,000	\$25,000	\$25,000	\$115,000.00	
47	SC-23	11-410-63890	BIOASSY Repairs	\$5,000.00		\$5,000						\$0.00	
48	SC-22	11-410-65602	Utility Billing Software	\$100,000.00		\$100,000						\$0.00	
49	SC-21	11-410-64014	Nevada Street Sewer Project - Part of Transportation project	\$200,000.00		\$200,000						\$0.00	
50	SC-14	11-410-67025	Southridge Lift Station				\$300,000					\$300,000.00	
51	SC-20	11-410-64012	Vista de Val Lift Station	\$250,000.00	\$0.00	\$250,000	\$350,000					\$350,000.00	
52	SC-07		Hydro Jet Unit				\$30,000					\$30,000.00	
53	SC-04	11-410-67023	Diamond Ridge Lift Station	\$75,000.00		\$75,000	\$20,000					\$20,000.00	
54	SC-10		Maidu Lift Station				\$150,000	\$600,000				\$750,000.00	
55			<b>Subtotal of COLLECTION SYSTEM PROJECTS</b>	<b>\$1,025,000</b>	<b>\$0</b>	<b>\$1,025,000</b>	<b>\$1,535,000</b>	<b>\$1,245,000</b>	<b>\$650,000</b>	<b>\$650,200</b>	<b>\$650,000</b>	<b>\$4,730,200</b>	

Project Number	Code	Program Summary	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18/22	Notes	
56													
57	Proj. No.	Finance Code	WWTP Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY13-17	
58	SP-05	11-410-64006	NPDES - Oxidation Ditch Secondary Treatment Process	\$4,500,000.00		\$4,500,000	\$6,000,000					\$6,000,000.00	
59	SP-07	11-410-63914	NPDES - Report of Waste Discharge Permit	\$200,000.00		\$200,000						\$0.00	
60	SP-03	11-410-63913	Gunite Ditch - WWTP	\$10,500.00		\$10,500	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000.00	
61	SP-12	11-410-63903	WWTP Repair/Upgrades	\$10,000.00		\$10,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$250,000.00	
62	SP-10	11-410-65605	Tractor/Mower	\$70,000.00		\$70,000						\$0.00	
63	SP-09	11-410-67024	Pond 1B Lift Station				\$30,000	\$300,000				\$330,000.00	
64			<b>Subtotal of WWTP PROJECTS</b>	<b>\$4,790,500</b>	<b>\$0</b>	<b>\$4,790,500</b>	<b>\$6,090,000</b>	<b>\$360,000</b>	<b>\$60,000</b>	<b>\$60,000</b>	<b>\$60,000</b>	<b>\$6,630,000</b>	
65													
66	Proj. No.	Finance Code	General Sewer Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY13-17	
67	SG-01		Computer Equipment				\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000.00	
68	SG-02		Machinery & Equipment				\$42,000	\$45,000	\$48,000	\$50,000	\$52,000	\$237,000.00	
69	SG-03	11-410-65604	NPDES - Permit Compliance				\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$250,000.00	
70	SG-05	11-410-65000	Regional Sewer Project	\$530,000.00		\$530,000						\$0.00	
71			<b>Subtotal of GENERAL SEWER PROJECTS</b>	<b>\$530,000</b>	<b>\$0</b>	<b>\$530,000</b>	<b>\$97,000</b>	<b>\$100,000</b>	<b>\$103,000</b>	<b>\$105,000</b>	<b>\$107,000</b>	<b>\$512,000</b>	
72			<b>SUM TOTAL SEWER PROGRAMS</b>	<b>\$6,345,500</b>	<b>\$0</b>	<b>\$6,345,500</b>	<b>\$7,722,000</b>	<b>\$1,705,000</b>	<b>\$813,000</b>	<b>\$815,200</b>	<b>\$817,000</b>	<b>\$11,872,200</b>	
73													
74	Proj. No.	Finance Code	Transportation Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18 - 22	
75	TP-02		ADA Transition Plan	\$0.00		\$0						\$0.00	
76	TP-09	26-320-63160	Nevada Street Pedestrian & Bicycle Facilities	\$2,500,000.00	\$13,712.98	\$2,486,287						\$0.00	
77		26-320-50303	Machinery & Equipment	\$45,000.00	\$0.00	\$45,000						\$0.00	
78	TP-03	26-320-63503	FY17 - Annual Street Overlay Project	\$0.00	\$24,844.10	-\$24,844						\$0.00	
79		26-320-63503	FY18 - Annual Street Overlay Project				\$1,100,000					\$1,100,000.00	
80		26-320-63503	FY19 - Annual Street Overlay Project					\$1,100,000				\$1,100,000.00	
81		26-320-63503	FY20 - Annual Street Overlay Project						\$1,100,000			\$1,100,000.00	
82		26-320-63503	FY21 - Annual Street Overlay Project							\$1,100,000		\$1,100,000.00	
83		26-320-63503	FY22 - Annual Street Overlay Project								\$1,100,000	\$1,100,000.00	
84		26-320-63502	FY17 - Annual Street Surface Maintenance	\$189,000.00	\$150,758.54	\$38,241						\$0.00	
85		26-320-63502	FY18 - Annual Street Surface Maintenance				\$150,000					\$150,000.00	
86		26-320-63502	FY19 - Annual Street Surface Maintenance					\$150,000				\$150,000.00	
87		26-320-63502	FY20 - Annual Street Surface Maintenance						\$150,000			\$150,000.00	
88		26-320-63502	FY21 - Annual Street Surface Maintenance							\$150,000		\$150,000.00	
89		26-320-63502	FY22 - Annual Street Surface Maintenance								\$150,000	\$150,000.00	
90			Annual Crackfilling Maintenance				\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$250,000.00	
91	TP-04	26-320-63510	City Pavement Marking Project	\$20,000.00	\$0.00	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$100,000.00	
92	TP-06	26-320-63299	Emergency Repairs - Storm Drain	\$25,000.00	\$3,744.00	\$21,256	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000.00	
93	TP-11	26-320-63011	Paving Project - Public Works Department	\$75,000.00	\$37,683.94	\$37,316	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$375,000.00	
94		26-320-63016	Sidewalk Repairs - Commercial	\$2,500.00	\$8,065.00	-\$5,565	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000.00	
95		26-320-63501	Sidewalk Repairs - Residential	\$15,000.00	\$14,104.00	\$896	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000.00	
96	TP-05	26-320-65012	Storm Drain Channel - Downtown	\$10,000.00	\$0.00	\$10,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000.00	
97	TP-14		Vegetation & Tree Removal				\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000.00	
98	TP-15	26-320-67021	Wafinding Project	\$15,000.00	\$2,341.36	\$12,659						\$0.00	
99	TP-08	26-320-63515	Multi Modal Rail Platform Extension				\$60,000					\$60,000.00	
100			<b>Subtotal of TRANSPORTATION PROJECTS</b>	<b>\$2,896,500</b>	<b>\$255,254</b>	<b>\$2,641,246</b>	<b>\$1,515,000</b>	<b>\$1,455,000</b>	<b>\$1,455,000</b>	<b>\$1,455,000</b>	<b>\$1,455,000</b>	<b>\$7,335,000</b>	
101													
102	Proj. No.	Finance Code	Transit Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18 - 22	
103	TS-01	27-530-63161	Transit - Bus Stop Facilities	\$2,063.00	\$10,374.00	-\$8,311	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000.00	Ramps at ARD Park Transit Stop.
104		27-530-5030	Machinery & Equipment	\$1,000.00	\$433.50	\$567						\$0.00	
105		27-530-63162	Transit On Board Cameras	\$8,747.00	\$0.00	\$8,747						\$0.00	CALOES Funds, Bus 99 & New
106		27-530-66022	Security Lighting	\$5,893.00	\$4,080.00	\$1,813						\$0.00	Project is Complete.
107	TS-5	27-530-50302	Vehicles	\$160,000.00	\$0.00	\$160,000						\$0.00	
108			<b>Subtotal of TRANSIT PROJECTS</b>	<b>\$177,703</b>	<b>\$14,888</b>	<b>\$162,816</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$50,000</b>	
109													

Project Number	Code	Program Summary	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18/22	Notes	
110	Proj. No.	Finance Code	General Facilities Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18 - 22	
111		45-231-50301	Capital Projects - Buildings (City Hall)	\$30,000.00	\$21,243.70	\$8,756.30						\$0.00	
112		45-231-50303	Machinery & Equipment - Building Maintenance	\$5,000.00	\$4,090.88	\$909.12						\$0.00	
113		45-231-63601	City Hall Painting	\$0.00	\$4,509.77	-\$4,509.77						\$0.00	
114		45-231-65001	Backflow Prevention	\$500.00	\$57.95	\$442.05						\$0.00	
115	FS-19	45-231-65023	Old City Hall Renovations	\$30,000.00	\$0.00	\$30,000.00						\$0.00	
116		45-231-65600	EV Charging Station	\$35,000.00	\$0.00	\$35,000.00						\$0.00	
117		45-231-65607	Lewis Street Park Restroom	\$0.00	\$96,514.12	-\$96,514.12						\$0.00	
118		45-231-65601	Old Town Restroom Remodel	\$16,000.00	\$23,222.29	-\$7,222.29						\$0.00	
119		45-231-66019	Corp Yard Flooring	\$5,000.00	\$0.00	\$5,000.00						\$0.00	
120	FS-40	45-231-66024	Carnegie Library ADA Improvements	\$20,000.00	\$0.00	\$20,000.00						\$0.00	
121			Machinery & Equipment - Corporation Yard	\$5,500.00	\$125.00	\$5,375.00						\$0.00	
122	FS-42		Vehicle - Trailer King	\$40,000.00	\$0.00	\$40,000.00						\$0.00	
123			Vehicle - Corporation Yard Shop Truck	\$65,000.00	\$0.00	\$65,000.00						\$0.00	
124	FS-44		Crackfill Material - Carport	\$3,500.00	\$0.00	\$3,500.00						\$0.00	
125	FS-41		Sign Shop Building - Re-Roof	\$28,500.00	\$18,967.30	\$9,532.70						\$0.00	
126	FS-25		Corporation Yard HVAC Replacement/Repair				\$10,000					\$10,000.00	
127	FS-20		City Hall HVAC Replacement/Repair				\$60,000					\$60,000.00	
128	FS-22		City Hall Roof Replacement/Repair				\$35,000					\$35,000.00	
129	FS-17		City Hall ADA Improvements					\$5,000				\$5,000.00	
130	FS-14		Carnegie Library Floor Replacement/Repair					\$10,000				\$10,000.00	
131	FS-18		City Hall Energy Efficiency Upgrades					\$5,000				\$5,000.00	
132	FS-21		City Hall Parking Lot Resurfacing					\$12,500				\$12,500.00	
133	FS-26		Corporation Yard Wash Rack Upgrade						\$60,000			\$60,000.00	
134	FS-24		Corporation Yard Exterior Paint						\$8,000			\$8,000.00	
135	FS-10		Auburn School Park Preserve LED Light Upgrade							\$20,000		\$20,000.00	
136	FS-13		Auburn/Conheim Station Transit Shelters Rplmnt/Repair							\$10,000		\$10,000.00	
137												\$0.00	
138												\$0.00	
139												\$0.00	
140												\$0.00	
141			<b>Sum Total of GENERAL FACILITIES PROJECTS</b>	<b>\$284,000</b>	<b>\$168,731</b>	<b>\$115,268.99</b>	<b>\$105,000</b>	<b>\$32,500</b>	<b>\$68,000</b>	<b>\$30,000</b>	<b>\$0</b>	<b>\$235,500</b>	
142													
143	Proj. No.	Finance Code	Public Safety Facilities Projects	FY16/17 Approved Budget	FY16/17 YTD Expenses	FY16/17 Budget Deficit/Available	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total Cost FY18 - 22	
144			APD Roof Replacement/Repair	\$23,344.57	\$66,282.70	-\$42,938						\$0.00	
145			Martin Park Fire Station Roof Replacement Project	\$23,344.57	\$37,214.10	-\$13,870						\$0.00	
146			Gietzen Fire Station Improvements	\$74,110.86	\$74,110.86	\$0						\$0.00	
147	FS-03		APD Exterior Repair & Painting				\$36,000					\$36,000.00	
148	FS-04		APD Floor Replacement/Repair				\$25,000					\$25,000.00	
149	FS-08		APD Locker Room Upgrade/Repair				\$10,000					\$10,000.00	
150	FS-28		Gietzen Fire Station Bay Doors Replacement/Repair - 1 Door				\$10,000					\$10,000.00	
151	FS-06		APD HVAC Replacement/Repair					\$10,000				\$10,000.00	
152	FS-34		Maidu Fire Station HVAC Replacement/Repair					\$6,000				\$6,000.00	
153	FS-36		Martin Park Fire Station Parking Lot Resurfacing					\$150,000				\$150,000.00	
154	FS-07		APD Interior Painting						\$5,000			\$5,000.00	
155	FS-35		Martin Park Fire Station Floor Replacement/Repair						\$10,000			\$10,000.00	
156	FS-01		APD Covered Parking Lot						\$10,000			\$10,000.00	
157	FS-05		APD Front Stairwell Upgrade						\$6,000			\$6,000.00	
158	FS-37		Martin Park Fire Station Upgrade (EOC & Training)							\$20,000		\$20,000.00	
159	FS-27		Fire Public Education Trailer Storage/Cover							\$10,000		\$10,000.00	
160	FS-31		Gietzen Fire Station Parking Lot Resurfacing							\$20,000		\$20,000.00	
161												\$0.00	
162												\$0.00	
163												\$0.00	
164												\$0.00	
165			<b>Sum Total of PUBLIC SAFETY FACILITIES PROJECTS</b>	<b>\$120,800</b>	<b>\$177,608</b>	<b>-\$56,808</b>	<b>\$81,000</b>	<b>\$166,000</b>	<b>\$31,000</b>	<b>\$50,000</b>	<b>\$0</b>	<b>\$328,000</b>	

Appendix C

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## **Sewer System Design and Performance Provisions**

## **SANITARY SEWERAGE**

### **§ 158.265 PROVISION OF SANITARY SEWERS.**

The subdivider shall make adequate provision for the disposal of all sanitary wastes which will originate within the proposed subdivision by connection to the sanitary sewer system of the city or any other public sewer system as approved by the City Engineer. If the subdivider, by the submission of a report by a registered civil engineer specializing in sanitary engineering, can establish to the satisfaction of the City Engineer that it is in the public interests, sewage collection and disposal may be accomplished through the use of septic tanks or a community sewage treatment plant constructed by the subdivider and operated by the city.

(1973 Code, § 9-3.1810) (Ord. 770, eff. 3-24-1982)

### **§ 158.266 STANDARDS FOR THE DESIGN OF SEPTIC TANKS AND LEACHING FIELDS.**

When septic tanks and leaching fields are approved, the installations shall meet the minimum requirements specified by the Environmental Health Department of the County and the City Engineer.

(1973 Code, § 9-3.1815) (Ord. 770, eff. 3-24-1982)

### **§ 158.267 STREET SEWER MAINS AND HOUSE SEWER CONNECTIONS.**

Street sewer mains and house sewer lines shall be constructed in accordance with the standard specifications and shall be designed to meet the following minimum standards.

(A) *Capacity.* House sewer and connecting lines shall be designed to carry the flow from the contributing area assuming that each single family unit will contribute 400 gallons of sanitary waste each 24 hours and providing for a peak load of twice the average flow. No street sewer main shall be smaller than 8 inches in diameter.

(B) *Grades.* A minimum grade of 0.005% shall be maintained for all sewers constructed in subdivisions, unless otherwise approved by the City Engineer.

(C) *Manholes.* Manholes shall be provided at all changes in grade and at all changes in direction, but in no case shall be spaced further apart than 400 feet center to center, except in situations which justify or require variations from this requirement. Drop manholes shall be provided where the inlet is more than 2 feet above the invert of the manhole.

(D) *Materials for sewer mains and house sewers.* Sewer mains and house sewers in industrial subdivisions shall be constructed of Class I asbestos cement sewer pipe or vitrified clay pipe, unless otherwise approved by the City Engineer.

(E) *House sewers.* The subdivider, unless otherwise approved by the City Engineer, shall install a wye branch in the sewer main for each lot in the subdivision, and a 4-inch connection house sewer shall be constructed from the street main to the property line for each lot. House sewers shall be constructed of asbestos cement pipe or vitrified clay pipe. The location of all house sewers should be clearly marked by the letter "S" at least 3 inches in height, marked in the curb face. Cleanouts shall be constructed at the property line of all sewer laterals.

(F) *Computations.* The City Engineer may require the submission of computations to indicate compliance with the standards set forth in this section.

(G) *Cost of connections to existing sewer mains.* The cost of constructing sewer mains to connect the subdivision sewer mains to the existing city sewer mains shall be borne by the subdivider.

(H) *Sewers along curves.* Sanitary sewers may be installed on horizontal and vertical curves which conform to the curves of the street with the approval of the City Engineer. Manholes for such curves shall be installed at locations approved by the City Engineer.

(1973 Code, § 9-3.1820) (Ord. 770, eff. 3-24-1982)



## POLICY MEMO

January 25, 1999

### RE: LIFT STATION STANDARDS INCLUDING ODOR CONTROL

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The design and equipment guidelines to be considered in a set of lift station standards are now as follows:

1. Adopt the Black & Veatch lift station reliability standards for all lift stations. A copy of that report has been provided to the City.
2. Standardize lift stations for the following:
  - a) Control of pumps, preferably using a pressure transducer for level control
  - b) Type of pumps, i.e., Flygt submersible pumps
  - c) Control panels that allow direct readout of water depth, runtime hours of pumps and number of pumping cycles
  - d) Have redundant control system where floats are a backup and a pressure transducer provides normal level control. This allows for easy adjustment of on and off set points
3. Select a standard float control support rack of non corrosive material such as stainless steel, fiberglass, PVC, etc. with a noncorrodible compressive fitting to allow adjustment of the float heights.
4. Require lift stations to be coated for corrosion protection.
5. Require that all covers, lids and ancillary materials shall be of aluminum or stainless steel.
6. The overall intent is to standardize to the extent possible for future ease of O&M, station reliability and fail-safety and longevity.
7. Consider pulling submersible pumps every 5 years and replacing seals to maximize pump life and not wait until seals fail.
8. All lift stations either need standby power or 24 hours storage with provision for connection to a portable generator. Existing stations may need retrofitting in some cases.
9. All lift stations must be provided a potable water service line with a certified backflow prevention device.
10. Lift Station Odor Control Design Guidelines

All lift station designs must specifically address issues of odor potential and mitigation measures. Odor potential is a function of the wastewater temperature and composition as well as its detention time in the wet well and forcemain both during initial flows and design flows. Ideally total detention times should not exceed a few hours at all flow rates. Mitigation measures include:

a. Design

- i. Parallel forcemains could be sized to allow detention times to stay within reasonable ranges and velocities as flows increase.
- ii. Wet wells could be designed with sloped bottoms to allow for increasing usable wet well volume as flow increases so detention times are not excessive in early years and pump cycling is kept reasonable.
- iii. Buildings over wet wells can be a confined space hazard and should be avoided where possible otherwise confined space issues must be addressed in the design.

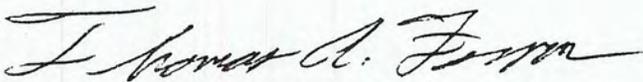
b. Design

The actual choice has to be made on a case by case basis. Not all lift stations need odor control measures but the following are options that can be considered.

- i. Air scrubbers: in order of cost-effectiveness, biofilters, oxidants (including Persnickety), activated carbon. Based on experience quoted in the literature, biofilters seem to be able to remove the widest range of odors and has usually the lowest life cycle cost.
- ii. Addition of oxidants to wet well: permanganate, peroxide, nitrate, hypochlorite.
- iii. Addition of chelating agents: ferrous and ferric chloride.
- iv. Air injection into forcemains and lift stations.

Please let me know if you wish to discuss these at a meeting. An action plan would then need to be prepared to convert these guidelines into an actual lift stations standards manual.

Sincerely,



Thomas A. Fossum, P.E.  
Director of Public Works/City Engineer

TAF/mb

cc: B.Schroeder, Engineering Division Manager  
C.Bressi, Construction Inspector  
T.Ho, Associate Civil Engineer  
Engineering Technician  
J.Mueller, OMI

# City of Auburn

## Sewage Pump Station Design Guidelines

The following lists the current design guidelines for new or retrofitted sewage pump stations within the City of Auburn:

### General

1. Design calculations, signed by a Professional Engineer, must be submitted to the City for review and shall contain the following computations:
  - a. Capacity at peak flow
  - b. System head - tabulated and plotted on pump performance curve
  - c. Cycle time - including starts per hour for peak flow and average flow conditions
  - d. Buoyancy calculations
  - e. Storage volume - show volume of storage available in the even of a power outage

The City Engineer shall approve the final design.

2. Design, along with supporting sewage flow and hydraulic calculations, shall be stamped and signed by a profession civil engineer licensed in the State of California and submitted to the City for approval. All electrical drawings shall be stamped and signed by a professional electrical engineer licensed in the State of California.
3. Design the pump station to serve the entire tributary at build-out densities conforming to the General Plan, and in accordance with City peaking standards and I/I allowances.
4. The pump station shall sit on a plot at least 40 feet by 40 feet square. This plot should be at least 150 feet away from any area designated for public use or recreation and 100 feet away from the nearest home or business. The City will consider locations closer than this with a vegetative barrier on a case-by-case basis. The area inside the fence line shall be filled in with gravel to a depth sufficient to allow for vehicle access and sufficient drainage during rain events.
5. Pump stations shall have a 6-foot high security fence.
6. The pump station shall consist of a minimum of two submersible centrifugal sewage pumps, guide rails, wet well access, discharge seal and elbow, motor control center, starters, liquid level control system and all hardware necessary to make a complete working system. Supply and warranty shall be through a single company.
7. The pumps shall be electric, submersible, centrifugal non-clogging units capable of passing a 3-inch sphere. Pump and motor shall be suitable for continuous operation at full name plate load while the motor is completely submerged, partially submerged or totally non-submerged. All electrical equipment/panels will be above ground.

8. The level control systems, telemetry and generator and all associated equipment shall be of a brand, type and configuration acceptable to the City.

### **Pump and Wet Well**

9. Submersible pumps, minimum of two, each sized to handle peak flow with one standby pump. Pumps shall be equipped with three phase 480-volt electric motors. Deviation from this standard shall be at the City Engineer's approval.
10. The pumps shall be in the manufacturer's preferred operating range. This range shall be indicated on the selected pump curve.
11. Provide two complete rebuild kits for the pumps.
12. The removal system shall be stainless steel pipe guide rail pump removal system. Cable guide pump removal systems will not be considered.
13. The pump removal system shall be stainless steel chain suspended from a stainless steel hook located in the opening of the hatch. The chain shall be attached to the pump with a stainless steel shackle. There shall be one chain for each pump.
14. The minimum acceptable pump operating range shall be 3 feet. This range shall fall entirely below the well influent line. The engineer shall demonstrate that the pump system will not exceed the maximum rated motor starts per hour.
15. Access panels shall have an internal grate, which prevents accidental falls while the main lid is open. Three complete sets of O&M manuals and keys shall be provided for the pumps and all keyed panels.
16. Wet Well hatches shall be H-20 rated.
17. The pit access panel shall be a minimum of 2-½ feet square. This pit should drain into the pump station.
18. The wet well influent line shall be equipped with a stainless steel influent baffle.
19. All hardware and other basic mechanical parts (not including piping and valves) internal to the wet well and valve vault shall be 316 stainless steel, including the level transducer/float hanger, anchor bolts, cable grip systems etc.
20. All hardware in wet well, chains, cables and slide rails shall be 316 stainless steel.
21. All piping internal to the wet well shall be coated with coal tar epoxy.
22. The anchoring system shall be Hilti HIT HY 150, or equal, epoxy in place anchor bolts. Expansion anchors shall not be used.
23. Provide restrained flexible couplings on all outlet piping within 2 feet of the station wall.

24. Each pump shall be furnished with a discharge connection system, which shall permit removal and installation of a pump without the need for the operator to enter the wet well.

### **Valve Vault**

25. All valves shall be enclosed in an external valve vault.
26. Check valves shall be ball check valves.
27. Isolation valves shall be Clow plug valves with square operating nut.
28. Parallel to the pipeline, all flanges must be at least one foot from the vault walls. All flanges are to be minimum one foot from the floor of the vault. Perpendicular to the pipeline all valve bodies or flanges to be no less than 18 inches from the vault walls.
29. Pipe supports shall be hot dip galvanized.
30. The valve vault shall drain to the pump station wet well. When gravity drainage is used, a "P" trap shall protect the vault. When gravity drainage is not possible the valve vault shall incorporate a sump pump discharging to the wet well. Sump pump or gravity drainage line shall extend below the water level in the wet well and be equipped with a Tideflex all-rubber check valve, Red Valve Co., or equal.
31. The minimum inside height of the vault shall be 4 feet.
32. Plug valves shall be accessible for operation through the hatch or shall be equipped with a valve stem riser to the surface.
33. Provide an operating wrench for the valves.
34. All hardware and other basic mechanical parts (not including piping and valves) internal to the valve vault shall be 316 stainless steel, including float hangers, anchor bolts, cable grip systems, etc.
35. The anchoring system shall be Hilti HIT HY 150, or equal, epoxy in place anchor bolts.
36. All piping internal to the valve vault shall be coated with coal tar epoxy.

### **Force Main**

37. The force main shall be sized for a minimum of two feet per second flow with the pump station operating at minimum flow. All force mains shall be ductile iron pipe. Force mains shall have concrete thrust blocks as required at all bends. All fittings shall be mechanical joints. Air release valve locations and sizes shall be as required by the City. Sewer force mains must be marked by tape to identify the pipe as a sewer force main in order to prevent accidental water service taps.

38. Force Main Design: Force mains shall be designed in accordance with the following requirements:

Velocity Limits

- a. Re-suspension initial velocity of a minimum of 3.5 ft/s.
  - b. Minimum velocity shall be 2 ft/s.
  - c. Maximum velocity shall be 10 ft/s.
39. When required, air release valves shall be Golden Anderson Figure 935 Sewage Air Release valve.

**Basic Electrical**

40. All electrical enclosures, except the explosion proof enclosure, shall be stainless steel.
41. All conduit exiting the wet well or valve vault shall be PVC coated (both inside and outside) galvanized rigid steel conduit.
42. Minimum conduit size shall be one inch.
43. No conduit shall be more than one half full of conductor(s).
44. Separate electrical conduits shall be installed for each pump. A separate conduit shall be supplied for the level control float. A separate conduit shall be supplied for the level transducer. The level transducer conduit shall run directly to the control panel. All other conduits shall exit the wet well and run directly to an explosion proof enclosure.
45. The explosion proof enclosure shall be located in a below grade vault. The enclosure shall be manufactured by the Appleton Corp. model AJBEW and shall be epoxy coated and equipped with quad lead bolts.
46. The explosion proof enclosure vault shall drain to the wet well.
47. The explosion proof enclosure shall be equipped with an explosion proof space heater to prevent condensation.
48. All wires entering and exiting the enclosure shall land on terminal strips.
49. Intrinsically safe wiring shall be in a separate zone in the explosion proof enclosure.
50. All conduit seal-offs shall be located just below the control panel.
51. All hardware, unistrut, anchor bolts etc. shall be 316 stainless steel.
52. The anchoring system shall be Hilti HIT HY 150, or equal.

**Motor Control Panel**

53. Building architecture shall be per the requirements of the City. For pump station with pumps in excess of 120 hp, motor starters, motor control centers, and miscellaneous electric controls shall be housed in a building. Pump control panels for stations below 120 hp shall be pedestal mounted in a NEMA 4 enclosure.
54. The engine generator transfer switch shall be included in the control panel. The transfer switch shall be an ASCO Series 7000 automatic transfer switch with exercise clock.
55. Pump stations may require flow monitoring. The City Engineer may determine that for other operational reasons, a pump station may require flow monitoring. If required the flow meter shall be a magnetic type flow meter. The meter shall be placed in a separate vault; the vault shall drain to the wet well. The meter shall be explosion proof and submersible. The flow signal shall be reported to the WWTP. The flow meter transmitter shall be included in the control panel enclosure.
56. The control panel and all other electrical enclosures shall be mounted on stainless steel feet or stainless steel unistrut; all hardware and other basic electrical parts shall be 316 stainless steel.
57. The level transducer and the high level float shall be attached to a stainless steel chain dedicated for this purpose.
58. The control panel will communicate by radio or phone to the WWTP or as determined by the City Engineer.
59. Programming is required at the WWTP to incorporate the new pump station into the telemetry system.

**Controls**

60. Pump stations shall have telemetry installed to monitor power failure and generator status, wet well levels and alarm conditions, pump failure, seal failure, hour meter readings, and other sensing points as required by the City. At the discretion of the City Engineer, telemetry shall be capable of turning pumps on and off, acknowledging and resetting alarms, and resetting starters.
61. Level controller shall be ultrasonic type
62. Level sensing equipment shall be a transducer type capable of measuring depth over the full range of expected and unexpected pumping conditions.
63. NEMA weatherproof outdoor enclosures shall be provided for controls. Electric service shall be provided by underground conduit to the utility pedestal.

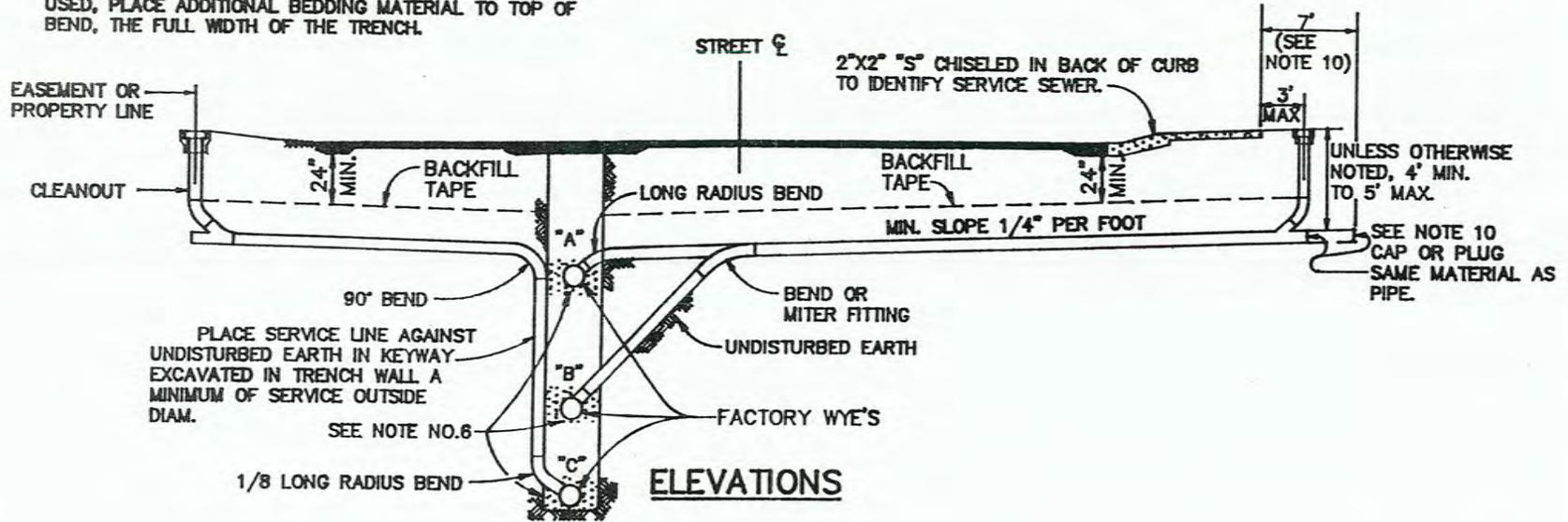
## Engine Generator and Transfer Switch

64. All pump stations are required to be equipped with a standby diesel-powered engine generator sized or equipped as follows:
- a. Sized to run both pumps at the same time; one pump may delay start.
  - b. The standby generator shall be commissioned in accordance with NFPA 110 Standards. Provide factory test, startup by a supplier authorized by the manufacturer, and on-site testing of the system.
  - c. The generator shall be housed in a CMU building. Quiet site soundproofing shall be provided to reduce noise to 70 dB at a distance of 7 meters for diesel powered generators. The soundproofing shall meet the City and the State of California noise limit requirements.
  - d. The entire standby generator set shall be warranted for a period of five years from the date of commissioning.
  - e. Generator shall be supplied with all auxiliary systems necessary for operation (i.e. batteries, battery charger, block heater, etc.).
  - f. The generator set shall operate at 1800 rpm and at a voltage of: 460 volts AC, three phase, four wire, 60 hertz. Voltage regulation shall be plus or minus 1.0 percent for any constant load between no load and rated load. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.
  - g. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.25 percent. An electronic governor system shall provide automatic isochronous frequency regulation.
  - h. The generator set shall be provided with a mounted main line circuit breaker, sized to carry the rated output current of the generator set on a continuous basis.
  - i. The standby power system shall include an automatic transfer switch. Transfer switch shall be rated for 100 percent of full load. This switch shall be provided with indicators for all phases of operation and be equipped with a fully programmable timer for exercising the equipment. The switch must be selectable for load or no load. The switch shall be configured with in-phase transition or neutral delay.
  - j. The generator shall be load tested at 100 percent full load on site for a period of four hours using resistive load banks. Notify the City inspector prior to test and provide certification letter from the manufacturer.
  - k. Three complete sets of O&M manuals and keys shall be provided for the generator and the automatic transfer switch.

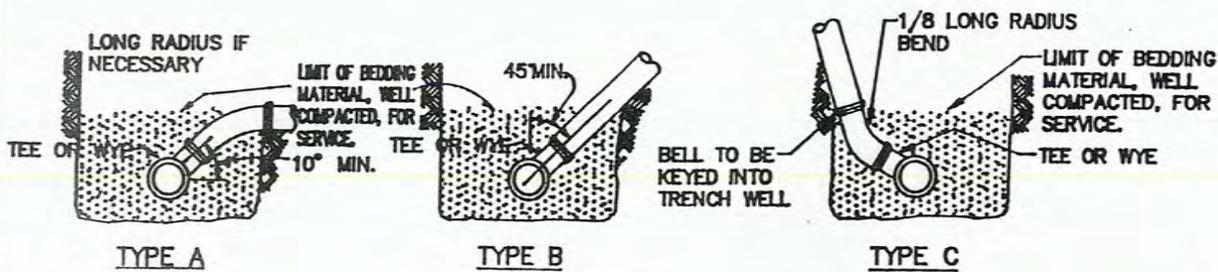
- l. The generator control system must include a programmable control device to allow automatic start-up and test functions. Test functions can be programmed for daily, weekly or monthly testing (this will be in the transfer switch). Connections for remote monitoring of function and failure must be provided.
- m. Pump stations are required to have continuous standby power. Generators shall be diesel powered with 100 gallons minimum fuel storage capacity or 24-hour operating time, whichever is greater. Fuel storage shall be accomplished by the use of corrosion-resistant double wall sub-base fuel tank only, no underground storage will be allowed. The fuel tank shall also be equipped with a low fuel level alarm. The fuel tank shall have secondary containment basin. A leak detection device shall be provided in the interstitial space for sensing fuel leakage. The device contact shall be connected to the generator control panel terminals for telemetry.
- n. The generator manufacturer shall provide a 60-month comprehensive warranty to include parts and labor. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- o. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical replacement parts at the local service organization, and in service vehicles. The service organization shall be on call 24 hours per day, 365 days per year.
- p. Transfer switches shall be in NEMA-4 enclosure
- q. The transfer switches shall be configured to switch back when power is restored to the station.
- r. A generator ground grid shall be provided. The ground grid design shall be in accordance with the National Electric Code (NEC) and subject to City approval.
- s. The equipment supplier shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. The training program shall be not less than 4 hours in duration. Training date shall be coordinated with the facility owner.
- t. The generator shall be mounted on seismic spring isolators.

**GENERAL NOTES:**

1. ALL SERVICE LINES SHALL BE 4" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
2. SERVICES SHALL HAVE SAME BEDDING AND BACKFILL AS LATERAL SEWER.
3. CONTRACTOR SHALL USE THE MOST APPROPRIATE TYPE CONNECTION (A,B OR C) FOR THE PARTICULAR SITUATION ENCOUNTERED.
4. SERVICE SEWER SHALL HAVE MINIMUM 4'-0" COVER AT PROPERTY LINE WHENEVER LATERAL DEPTH AND SERVICE SEWER SLOPE OF 1/4" PER FOOT (MINIMUM) PERMIT. SEE NOTE 10.
5. WHEN THE LATERAL SEWER DEPTH IS SUCH THAT MINIMUM COVER AT PROPERTY LINE CANNOT BE MET, THE MINIMUM SLOPE OF 1/4" PER FOOT SHALL GOVERN THE COVER.
6. PLACE CONCRETE 12" WIDE UNDER THE TEE BRANCH, THE FITTING, AND UNSUPPORTED PIPE. WHEN BEDDING MATERIAL IS USED, PLACE ADDITIONAL BEDDING MATERIAL TO TOP OF BEND, THE FULL WIDTH OF THE TRENCH.
7. MIN. SPECIFIED COVER AT THE PROPERTY LINE SHALL BE MEASURED FROM EXISTING GROUND SURFACE OR EDGE OF ADJACENT ROADWAY, WHICHEVER IS LOWER.
8. A SPECIFIC ELEVATION AT THE PROPERTY LINE, WHEN SHOWN ON THE PLANS OR DESIGNATED BY THE ENGINEER, SHALL GOVERN.
9. MITER FITTING SHALL BE MAX. 45°.
10. MINIMUM DEPTH OF COVER TO BE INCREASED TO 4'-8" WHERE WATER MAIN IS TO BE INSTALLED AT BACK OF SIDEWALK AS PART OF THE SUBDIVISION IMPROVEMENTS. IN SUCH CASES, SERVICE IS TO BE EXTENDED TO A MINIMUM OF 7' BACK OF SIDEWALK; CLEANOUT TO GRADE TO REMAIN WITHIN 3" OF BACK OF SIDEWALK.

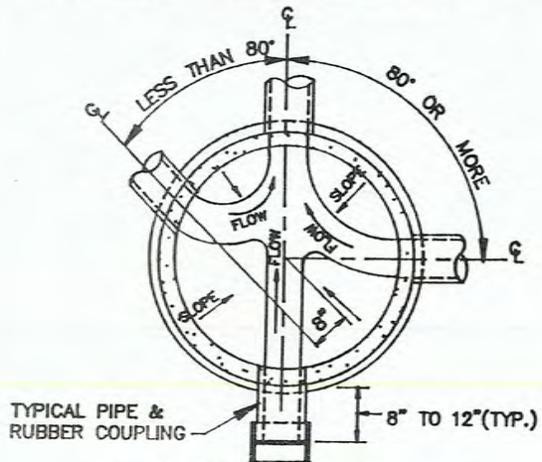
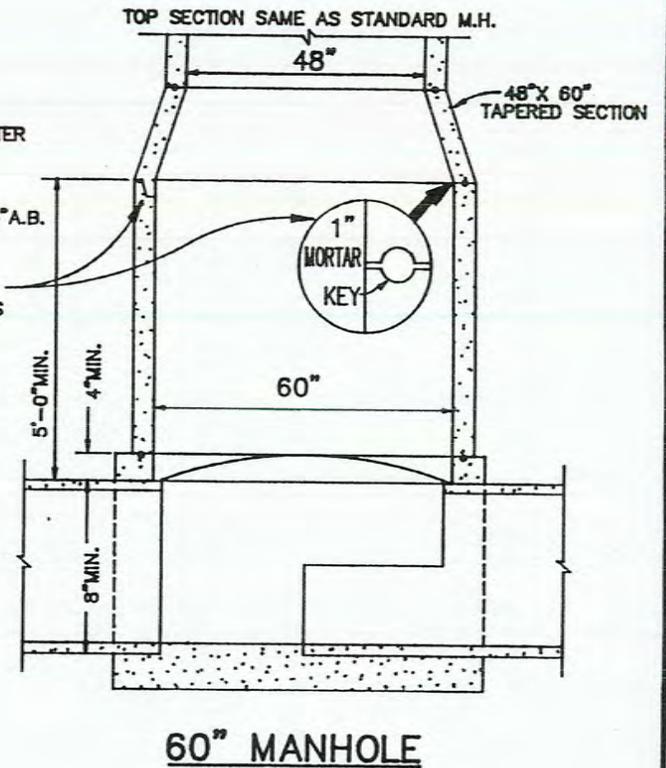
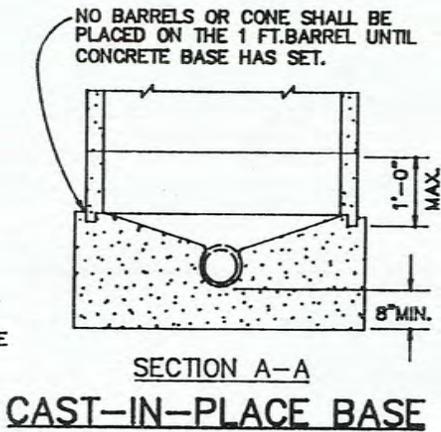
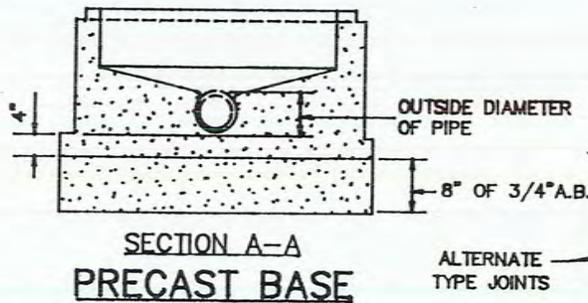
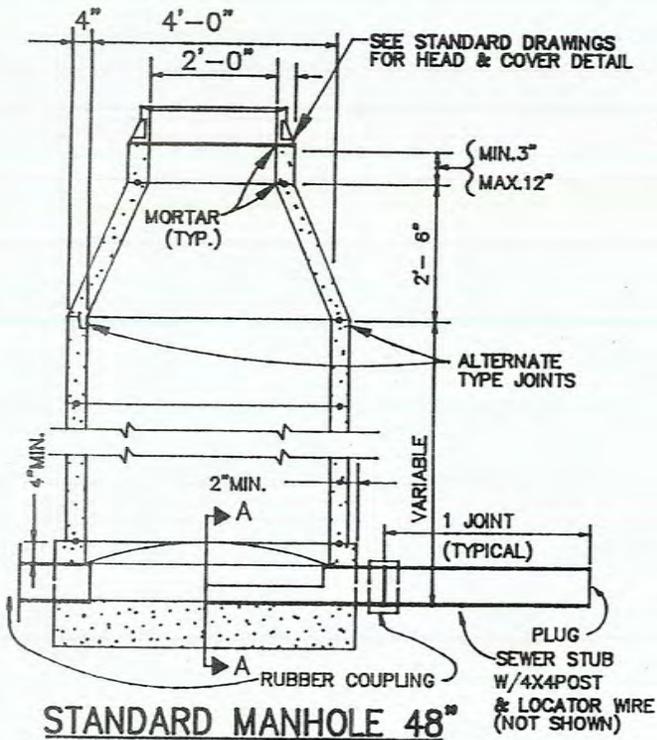


**ELEVATIONS**



**CONNECTION DETAILS**

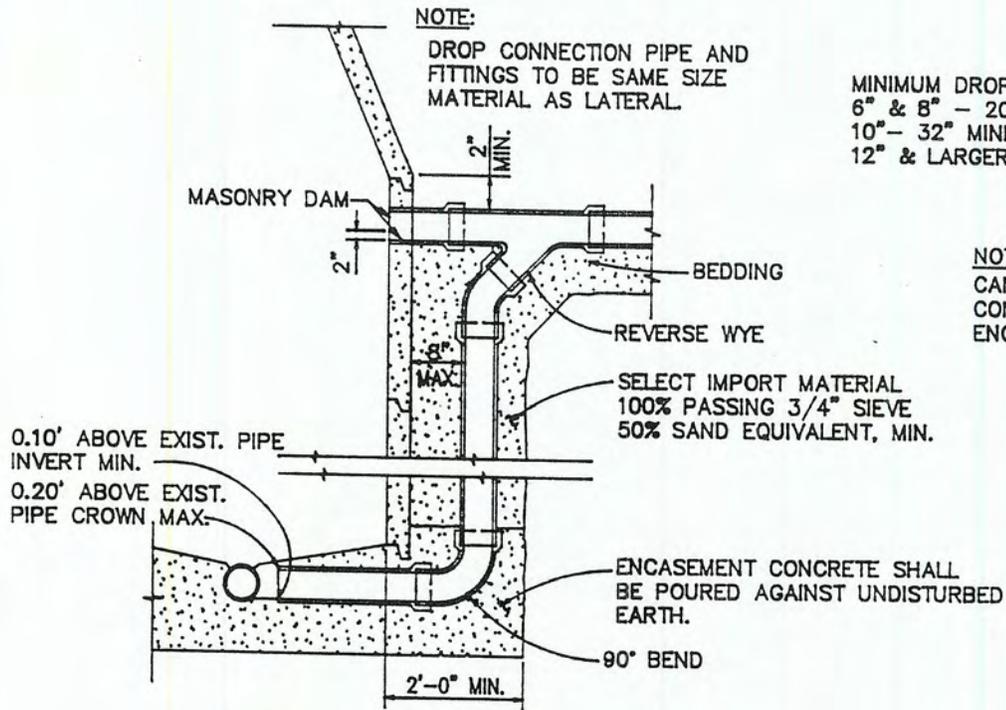
CITY OF AUBURN PUBLIC WORKS DEPARTMENT	
<b>SERVICE SEWERS</b>	
DATE: JANUARY 1993	SS-2
CITY ENGINEER _____	



**PLAN VIEW OF MANHOLE  
SHOWING INTERSECTING SEWERS**

CITY OF AUBURN PUBLIC WORKS DEPARTMENT	
<b>STANDARD PRECAST SEWER MANHOLE</b>	
DATE: JANUARY 1993	
CITY ENGINEER _____	
SS-4	





**OUTSIDE DROP CONNECTION**  
10" DIAMETER & LARGER

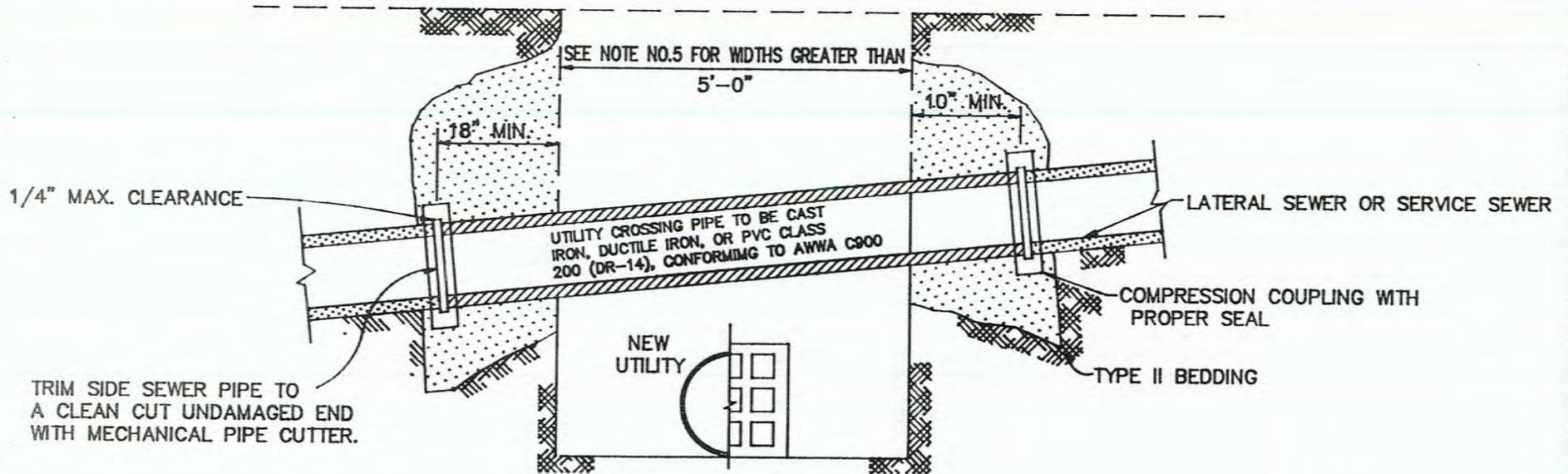
CITY OF AUBURN  
PUBLIC WORKS DEPARTMENT

**OUTSIDE DROP CONNECTION**

DATE: JANUARY 1993

CITY ENGINEER \_\_\_\_\_

SS-6



**NOTES:**

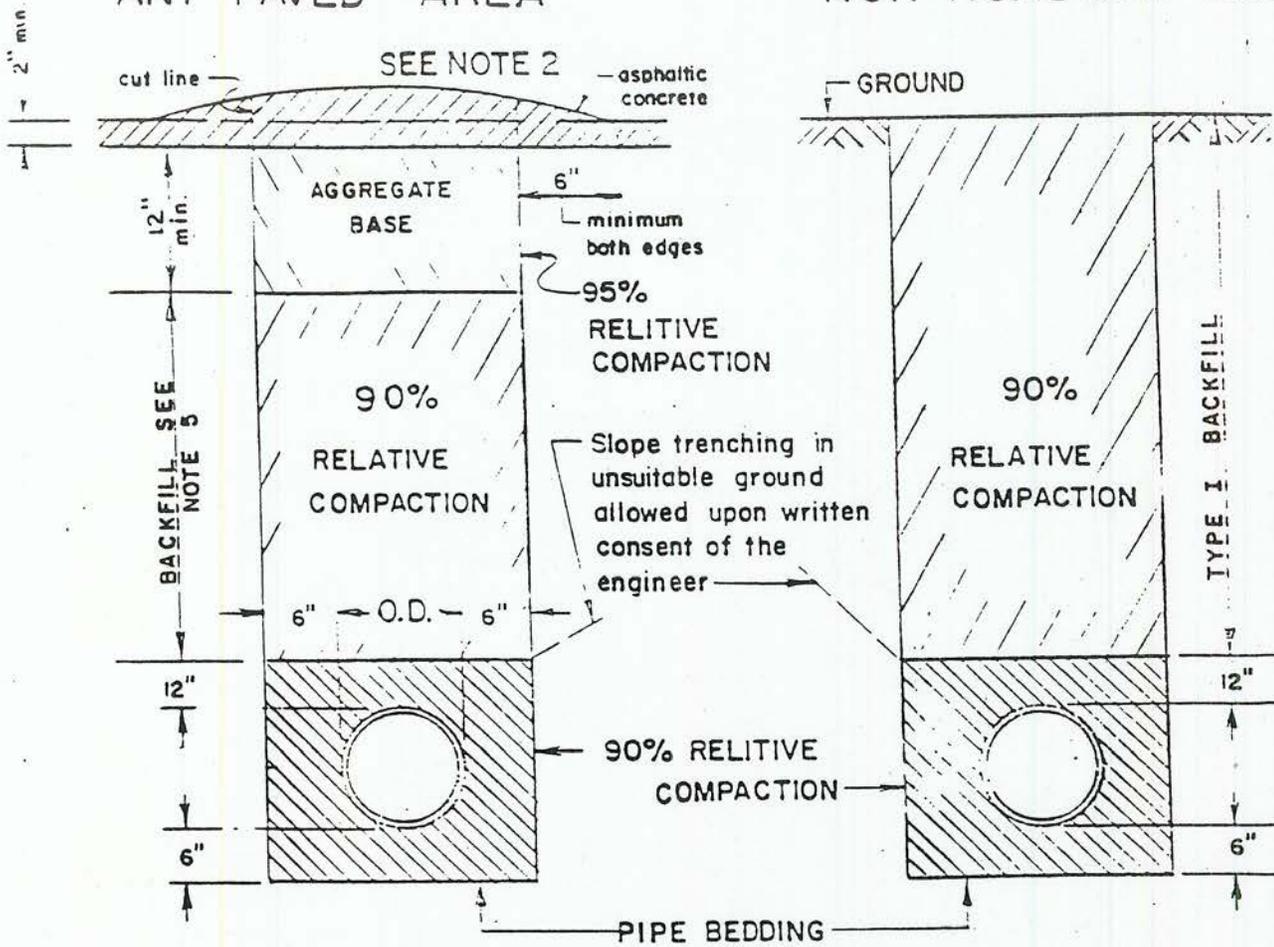
1. INSIDE DIAMETER OF UTILITY CROSSING PIPE TO BE THE SAME AS THE PIPE TO WHICH IT CONNECTS.
2. THIS DETAIL SHALL APPLY WHENEVER THE LATERAL OR SERVICE SEWER IS CUT OR DAMAGED.
3. THIS DETAIL IS APPLICABLE WHENEVER CONSTRUCTION PASSES BENEATH THE LATERAL OR SERVICE SEWER.
4. ALTERATION OF SEWER GRADES WILL BE PERMITTED ONLY AFTER WRITTEN PERMISSION HAS BEEN RECEIVED FROM THE CITY ENGINEER.
5. WHENEVER THE SPAN, WHETHER CAUSED BY TRENCH WIDTH OR CROSSING ANGLE OF THE UTILITY CROSSING PIPE EXCEEDS 5'-0", PLACE TYPE II BEDDING TO 6" ABOVE THE PIPE AND 18" EACH SIDE OF ITS CENTER LINE.

CITY OF AUBURN PUBLIC WORKS DEPARTMENT	
<b>UTILITY CROSSING WITH SEWER</b>	
DATE: JANUARY 1993	
CITY ENGINEER _____	SS-7

# ROADWAY AREAS

ANY PAVED AREA

NON-ROADWAY AREAS



CITY OF AUBURN			
STANDARD DETAILS			
TRENCH BACKFILL and RESURFACING			
DRAWN BY		W. MAY	
DATE	M. J. CLARK	PLAN NO.	PLATE
APRIL 1977	CITY ENGINEER	FOUR	NO. 23

1. The depth of surfacing and base as shown are required minimums. If the original structural section is thicker, it shall be replaced in kind.
2. Trenches paralleling a street within the roadway area shall be resurfaced using an approved spreader box, and the edges shall be neatly raked and sealed with asphalt emulsion.
3. On trenches traversing a street within the roadway area, the edges shall be neatly raked and sealed with asphalt emulsion.
4. Material for Type 1 backfill may be obtained from the excavation, and shall be free from stones, lumps, broken concrete, or bituminous surfacing exceeding 4 inches in greatest dimension, vegetable matter, or other unsatisfactory material. The material shall contain sufficient fines to insure that voids will be filled and that specified compaction requirements will be met. When material from the excavation is unsuitable for use as backfill, it shall be disposed of and suitable material furnished.
5. Pipe bedding shall be required on all pipes except reinforced concrete pipe.
6. Pipe bedding shall be sand or native material with a minimum S.E. of 30 and all material passing the 3/4" sieve.
7. In instances where a water, gas, electric, telephone, sewer, etc., lateral or service is being installed in an existing street at an isolated location, the backfill shall be aggregate base or aggregate subbase and shall be compacted to the required relative compaction. In all other instances Type 1 backfill may be used.

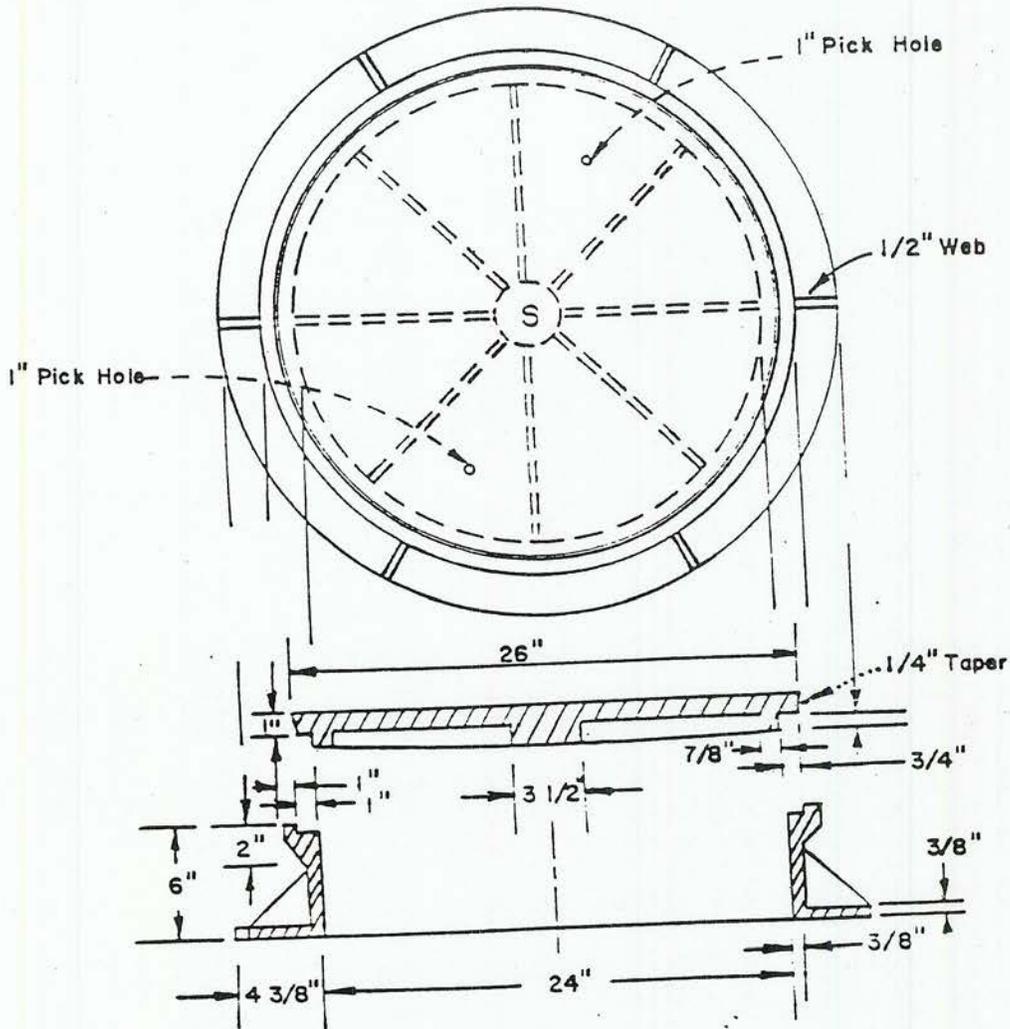
# CITY OF AUBURN

## STANDARD DETAILS

### TRENCH BACKFILL AND RESURFACE

DRAWN BY \_\_\_\_\_ W. MAY

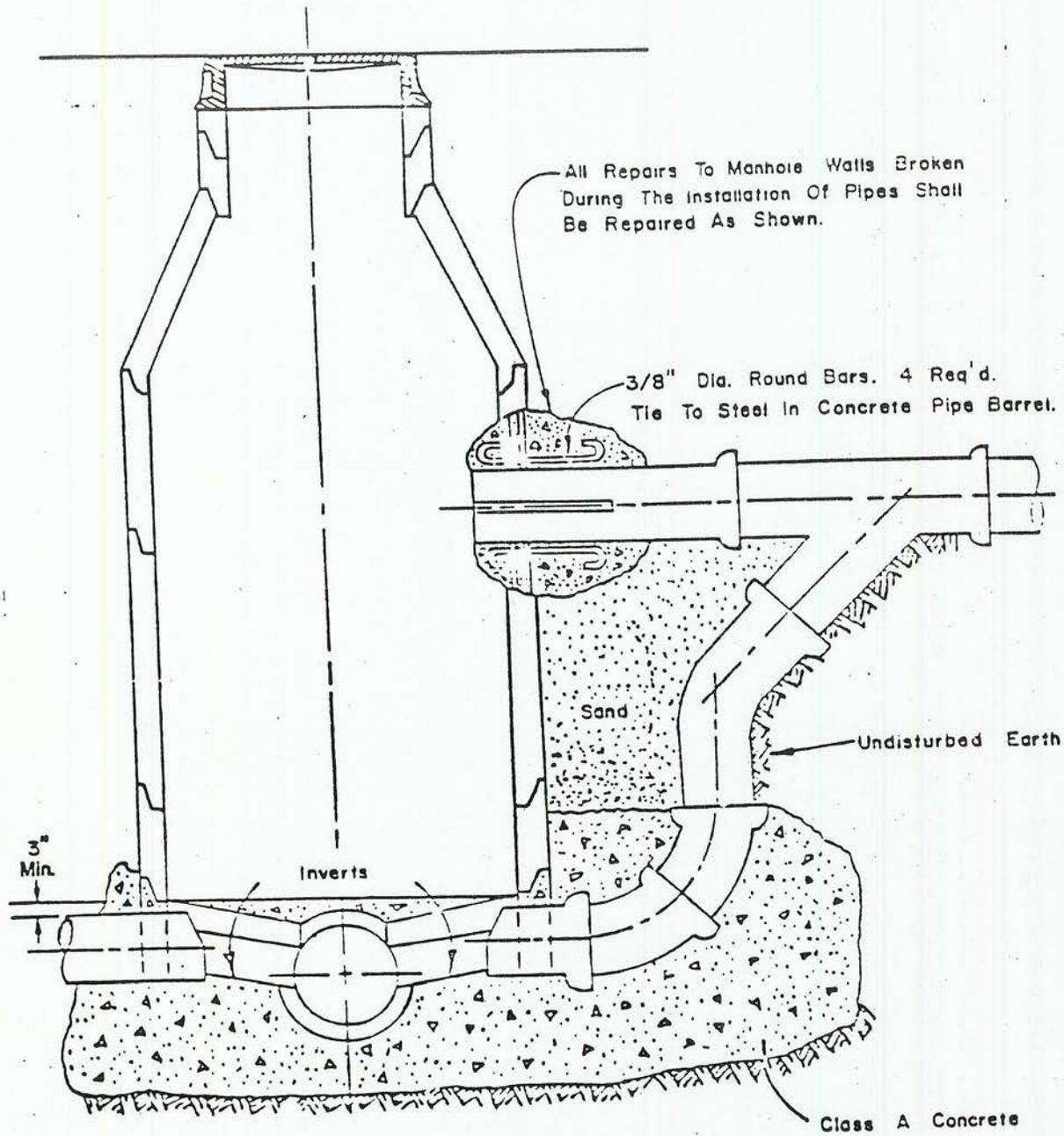
DATE	M. J. CLARK	PLAN NO.	SHEET 2
APRIL 1977	CITY ENGINEER	FOUR	OF 2



Notes:

1. Cast Iron Frame & Cover Shall Be Milled To insure Full Bearing
2. Combined Weight of Frame & Cover Shall Be At Least 269 Lbs. Minimum
3. Similar To Pinkerton Foundry A107 P1090

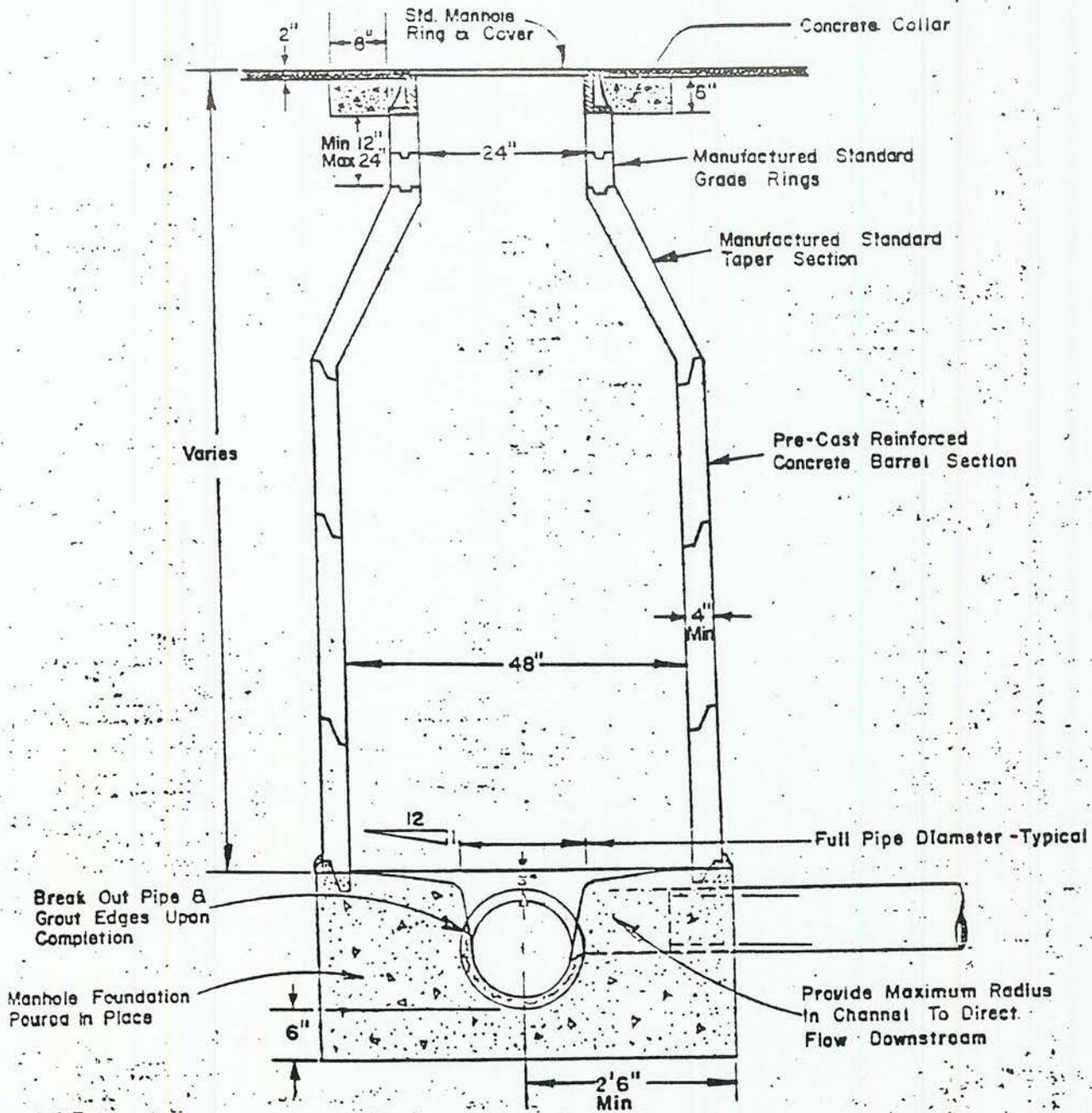
<b>CITY OF AUBURN</b> DEPARTMENT OF PUBLIC WORKS		
<b>STANDARD DETAILS</b> <u>TYPE "A" MANHOLE FRAME &amp; COVER</u> <u>SANITARY &amp; STORM LINE STRUCTURES</u>		
Date	_____ Director of Public Works	Scale 1" = 10"
		<b>PLATE NO. 24</b>

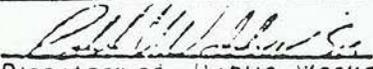


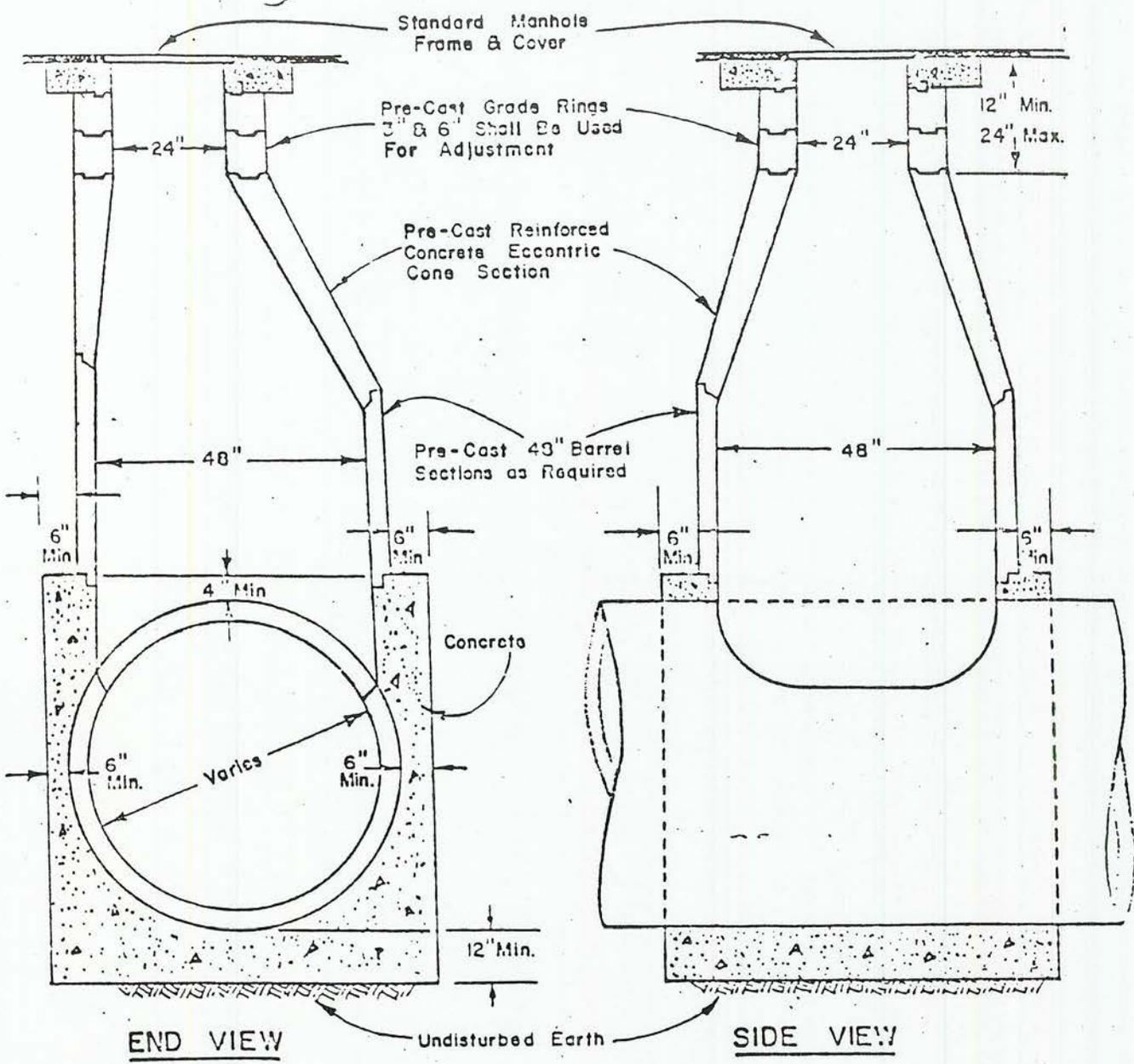
Notes:

- 1 Broken Pipe Edges Shall Be Grouted Smooth.
- 2 For Manhole Details See Sheet NO.

<b>CITY OF AUBURN</b>			
DEPARTMENT		OF PUBLIC WORKS	
<b>STANDARD DETAILS</b>			
<b>TYPICAL DROP SECTION</b>			
Date		Scale	None
	Director of Public Works		<b>PLATE NO. 25</b>



<b>CITY OF AUBURN</b>		
DEPARTMENT OF PUBLIC WORKS		
<i>STANDARD DETAILS</i>		
<u>STANDARD CONCENTRIC MANHOLE</u>		
Date 8-11-67	 Director of Public Works	Scale 1" = 2'
		PLATE NO. 25



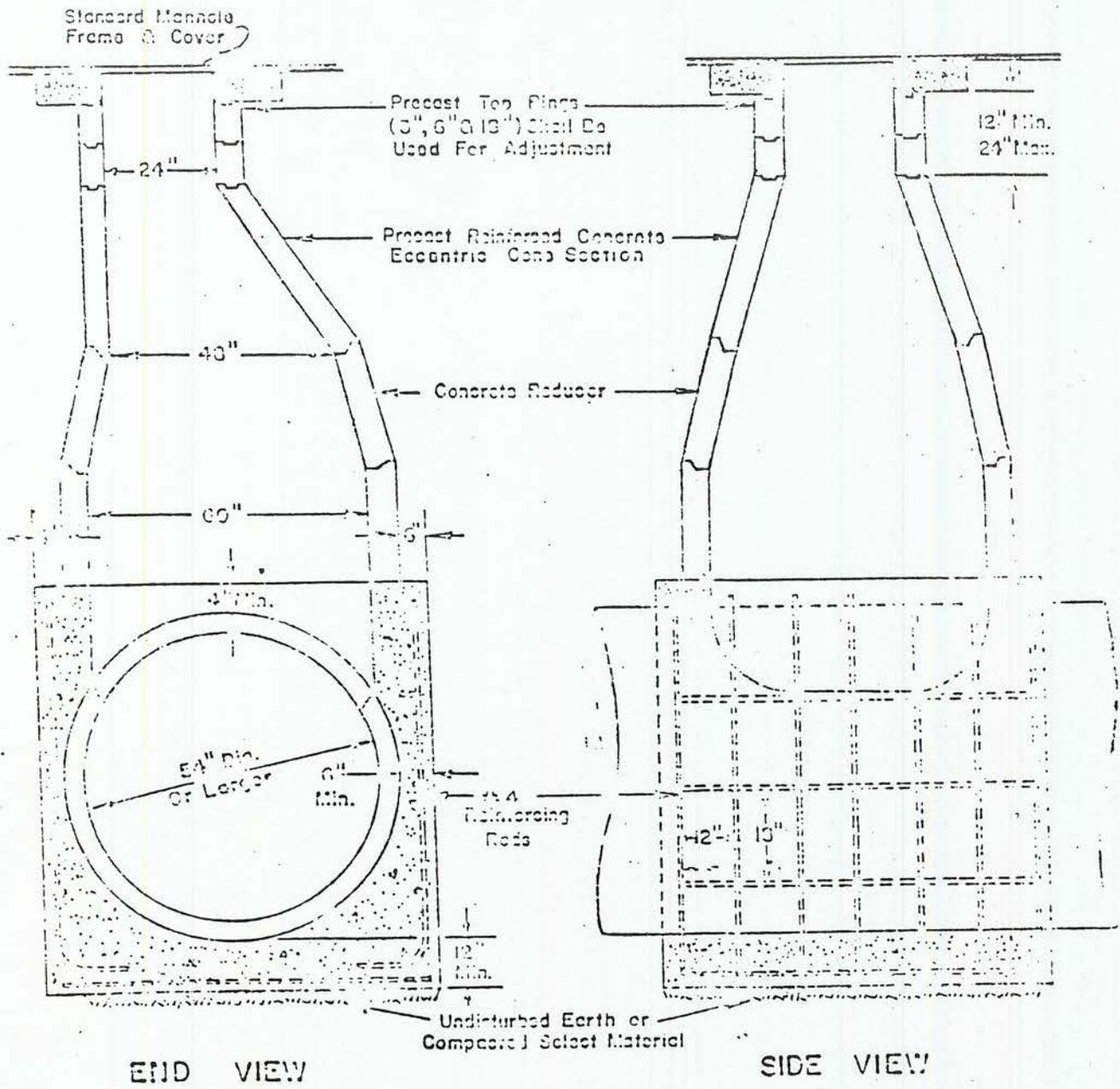
END VIEW

SIDE VIEW

Notes:

- 1. All Broken Pipe Shall Be Grouted Smooth.

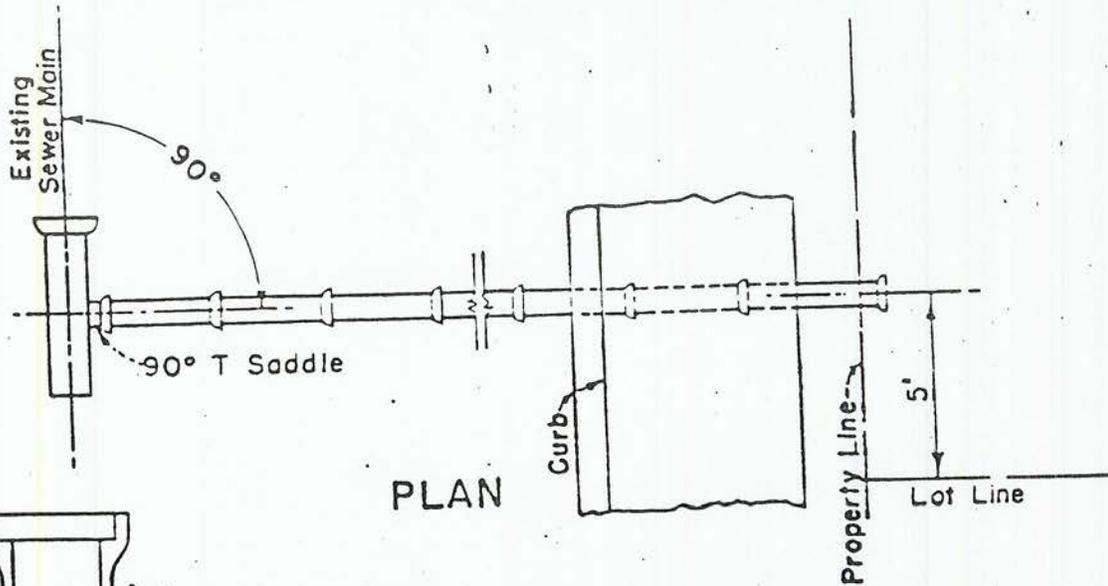
<b>CITY OF AUBURN</b>		
DEPARTMENT OF PUBLIC WORKS		
<i>STANDARD DETAILS</i>		
<u>TYPE II ECCENTRIC MANHOLE</u>		
<u>36" TO 48" PIPE</u>		
Date	Scale	<b>PLATE</b>
_____	None	<b>NO. 27</b>
Director of Public Works		



Notes:

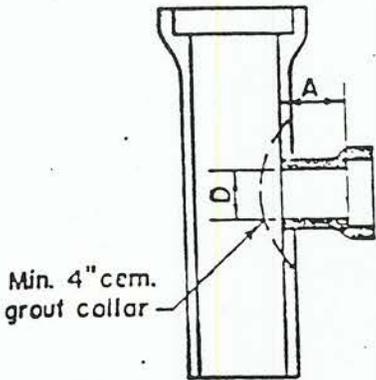
1. Broken Pipe Edges Shall Be Grouted Smooth.
2. Reinforcing Steel Required Where Sides Are Not Placed Against Undisturbed Earth.

<b>CITY OF AUBURN</b> DEPARTMENT OF PUBLIC WORKS		
<b>STANDARD DETAILS</b> <b>TYPE IV ECCENTRIC MANHOLE</b> <b>54" PIPE OR LARGER</b>		
Date	Director of Public Works	Scale 1" = 3'
		<b>PLATE NO. 28</b>



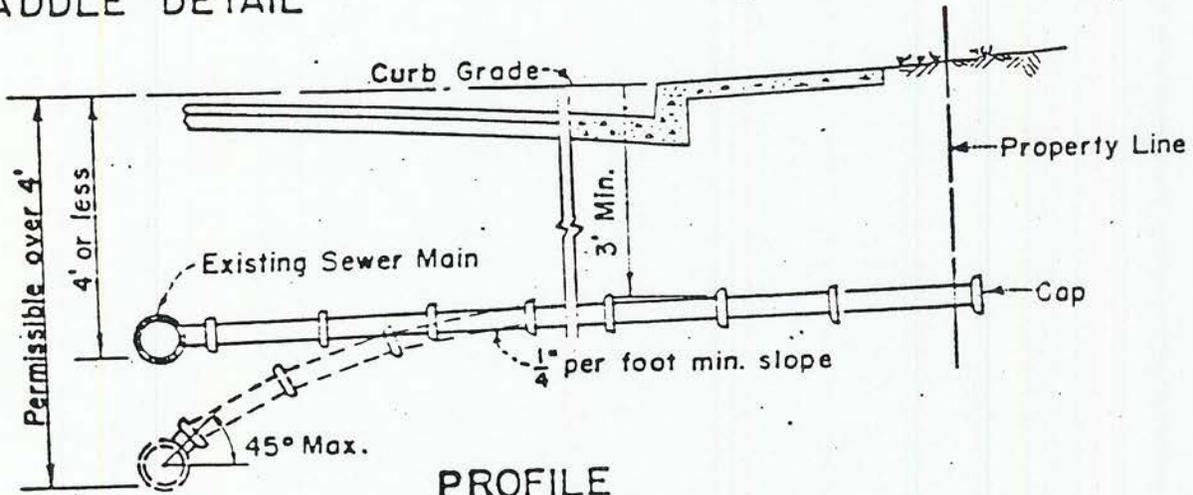
PLAN

**Note:**  
 Diam. of T saddle shall be 2" less than the diam. of the existing sewer main. When laterals are the same size as the existing sewer main, section of main at point of connection shall be removed and replaced with standard branch fitting.



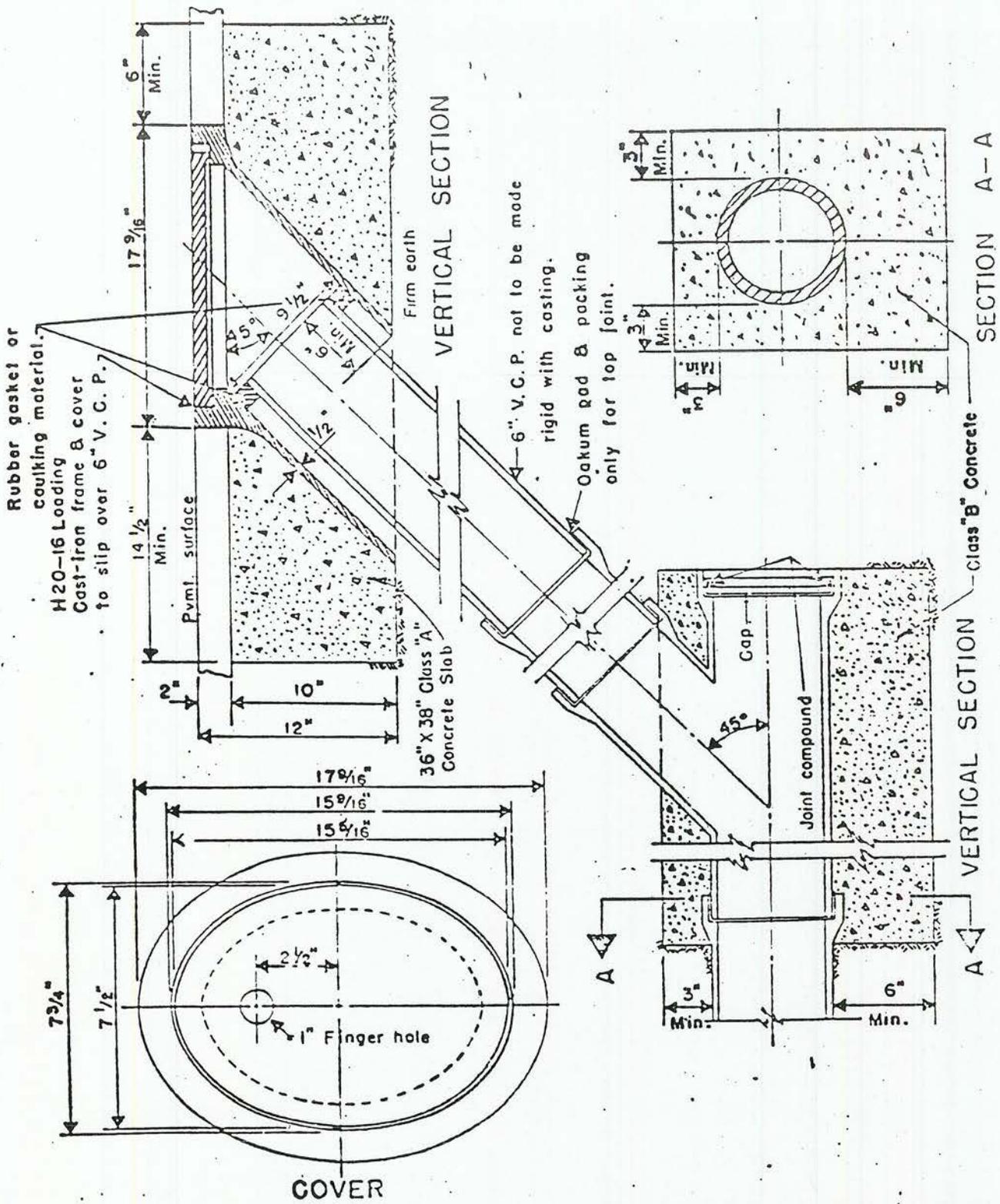
Diameter D	A
4"	2 1/2"
6"	3"
8"	6"

SADDLE DETAIL

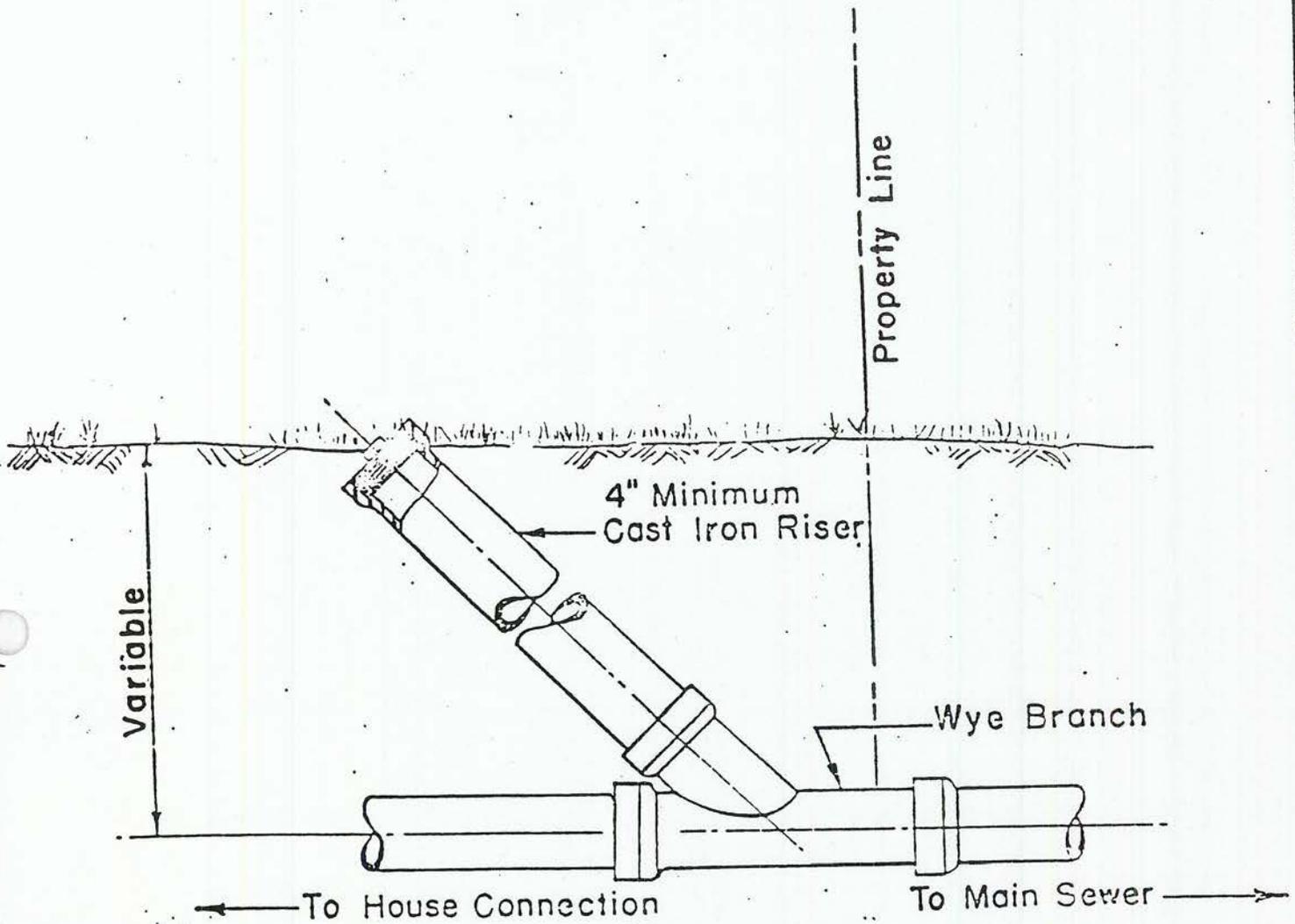


PROFILE

CITY OF AUBURN			
STANDARD DETAILS			
LATERAL TO EXISTING MAIN SEWER			
DATE		PLAN NO.	PLATE NO. 29



CITY OF AUBURN			
STANDARD DETAILS			
STANDARD 6" SEWER CLEANOUT			
DATE		PLAN NO.	PLATE NO. 30



CITY OF AUBURN

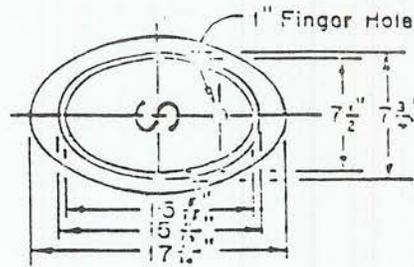
STANDARD DETAILS

SEWER LATERAL CLEANOUT

DATE

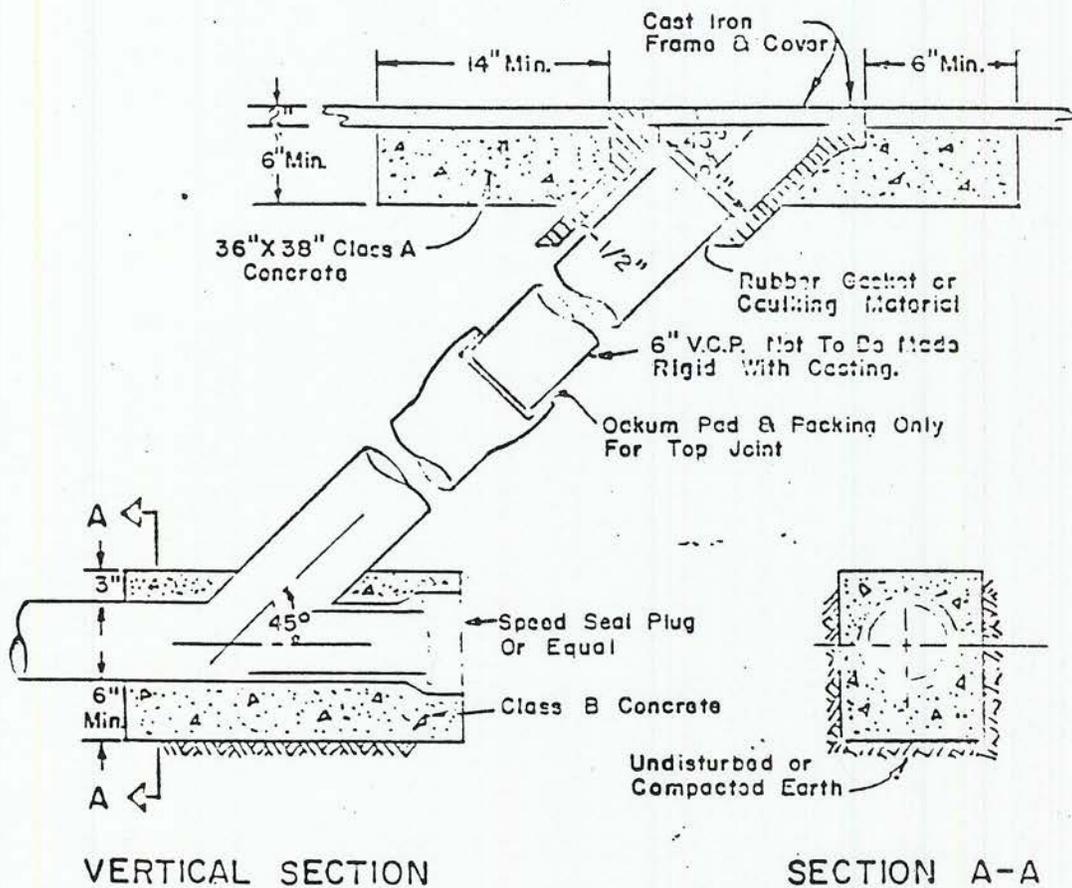
PLAN NO.

PLATE  
NO. 31



**FRAME & COVER**

See Notes 1, 2 & 3



**VERTICAL SECTION**

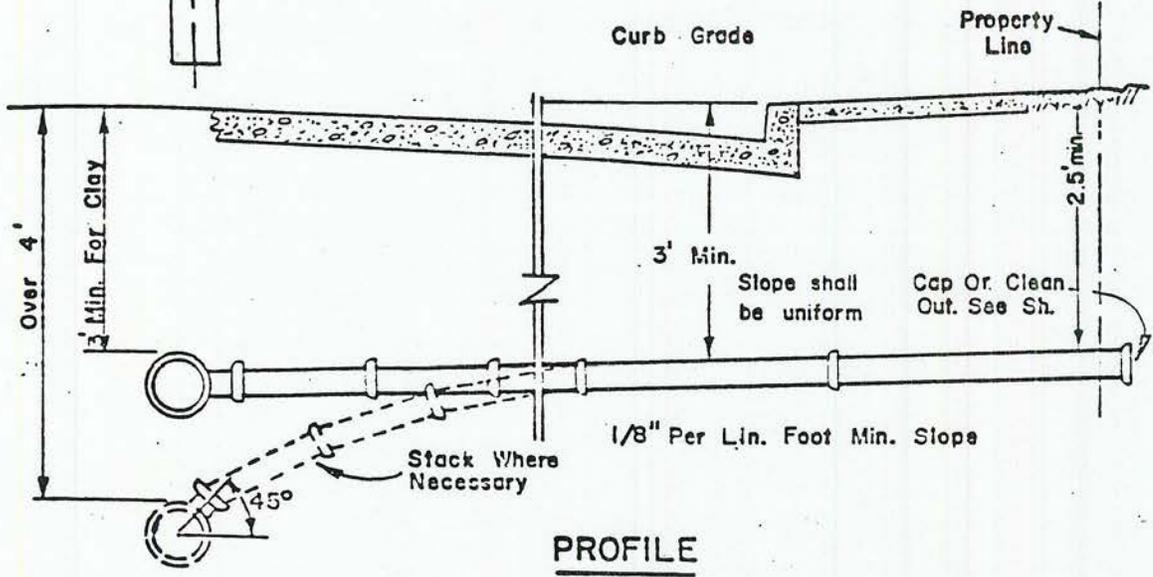
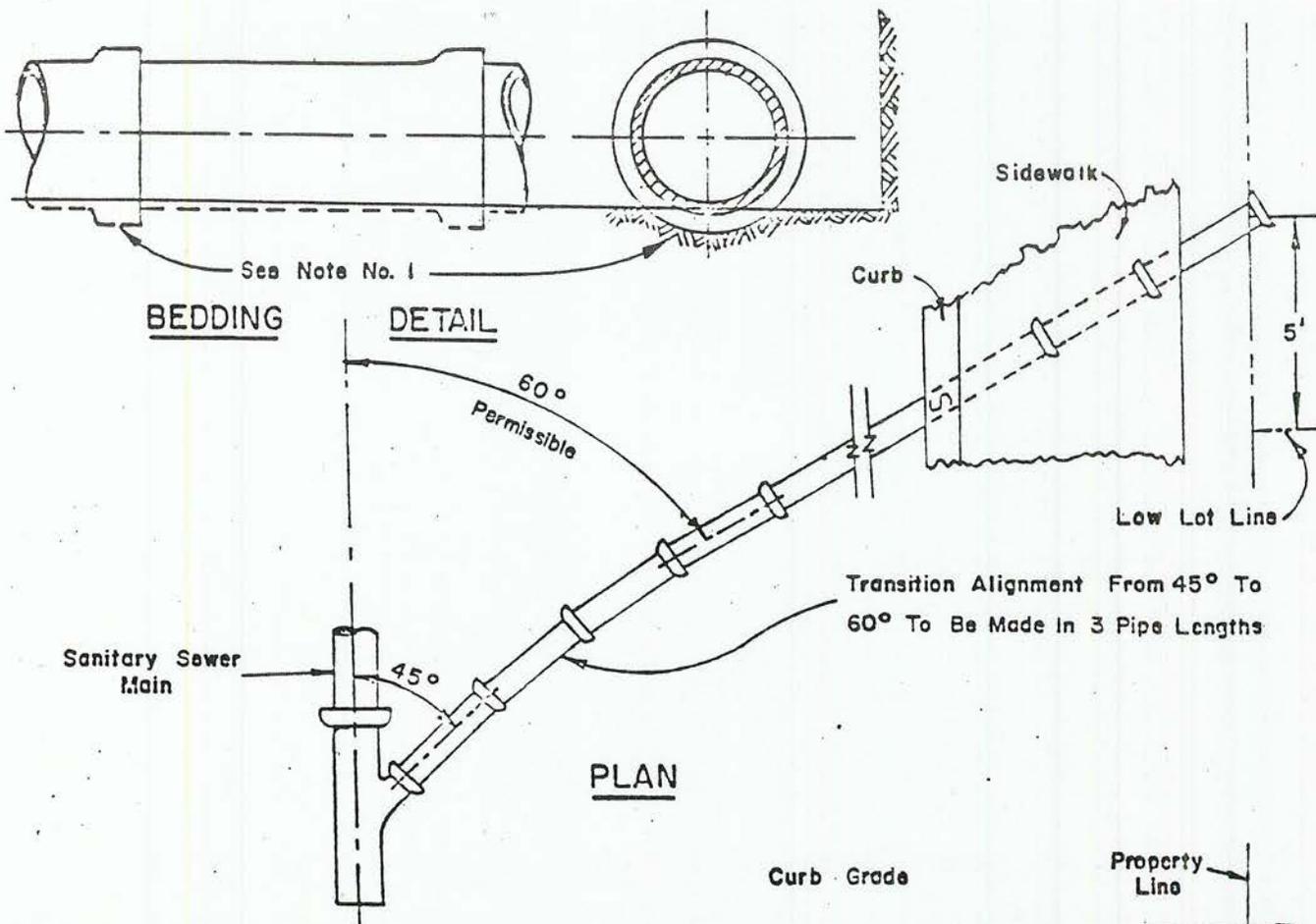
**SECTION A-A**

**Notes:**

1. Empire Foundry #30 or Equal.
2. Cover & Frame Shall Be Tough Gray Iron Casting Conforming To Latest A.S.T.M. Requirements.
3. Cover Shall Be Ground or Otherwise Finished So That It Will Fit Its Frame Without Rocking.

<b>CITY OF AUBURN</b>		
<b>DEPARTMENT OF PUBLIC WORKS</b>		
<b>STANDARD DETAILS</b>		
<b><u>45° FLUSHING INLET</u></b>		
Date	Scale	None
Director of Public Works		

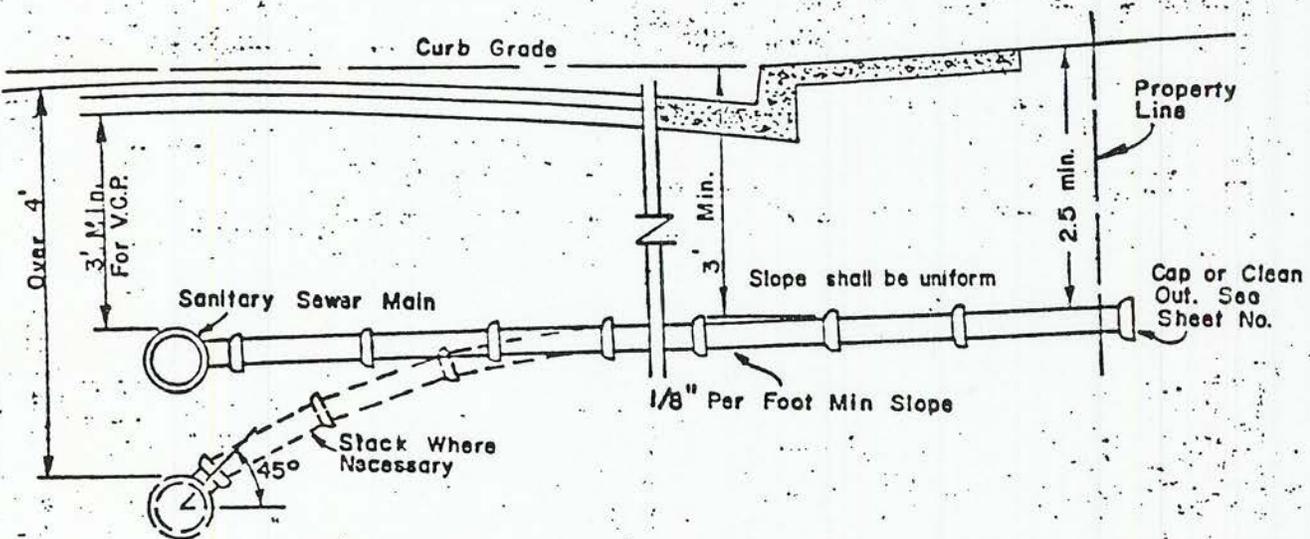
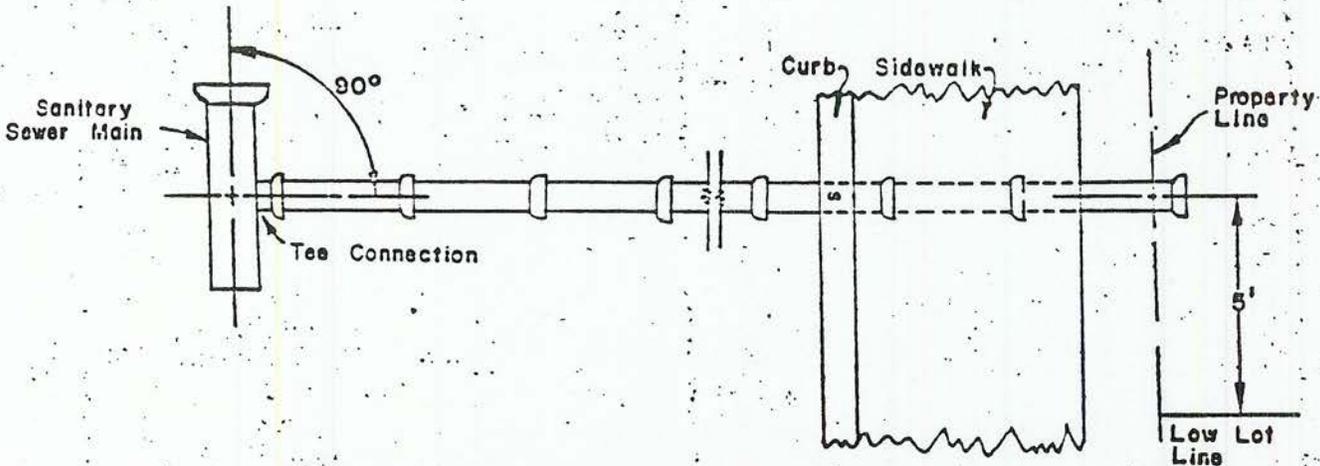
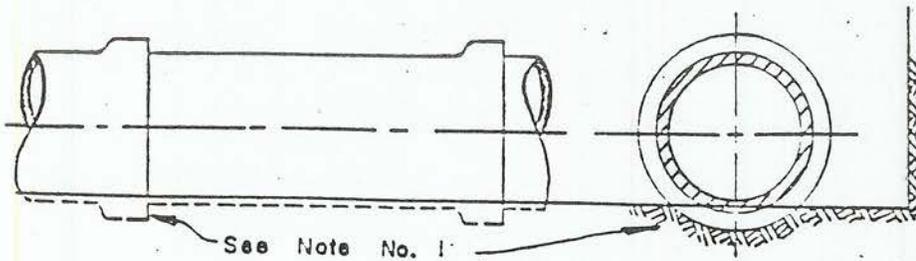
**PLATE  
NO. 32**



**Notes:**

1. Full Length Of Barrel Shall Be Supported On Firm Granular Material
2. Ball Holes Shall Be Provided

<b>CITY OF AUBURN</b>			
DEPARTMENT OF PUBLIC WORKS			
<b>STANDARD DETAILS</b>			
<b>"Y" LATERAL CONNECTION</b>			
<b>TO SANITARY SEWER MAIN</b>			
Date		Scale:	None
		Director of Public Works	<b>PLATE NO. 33</b>

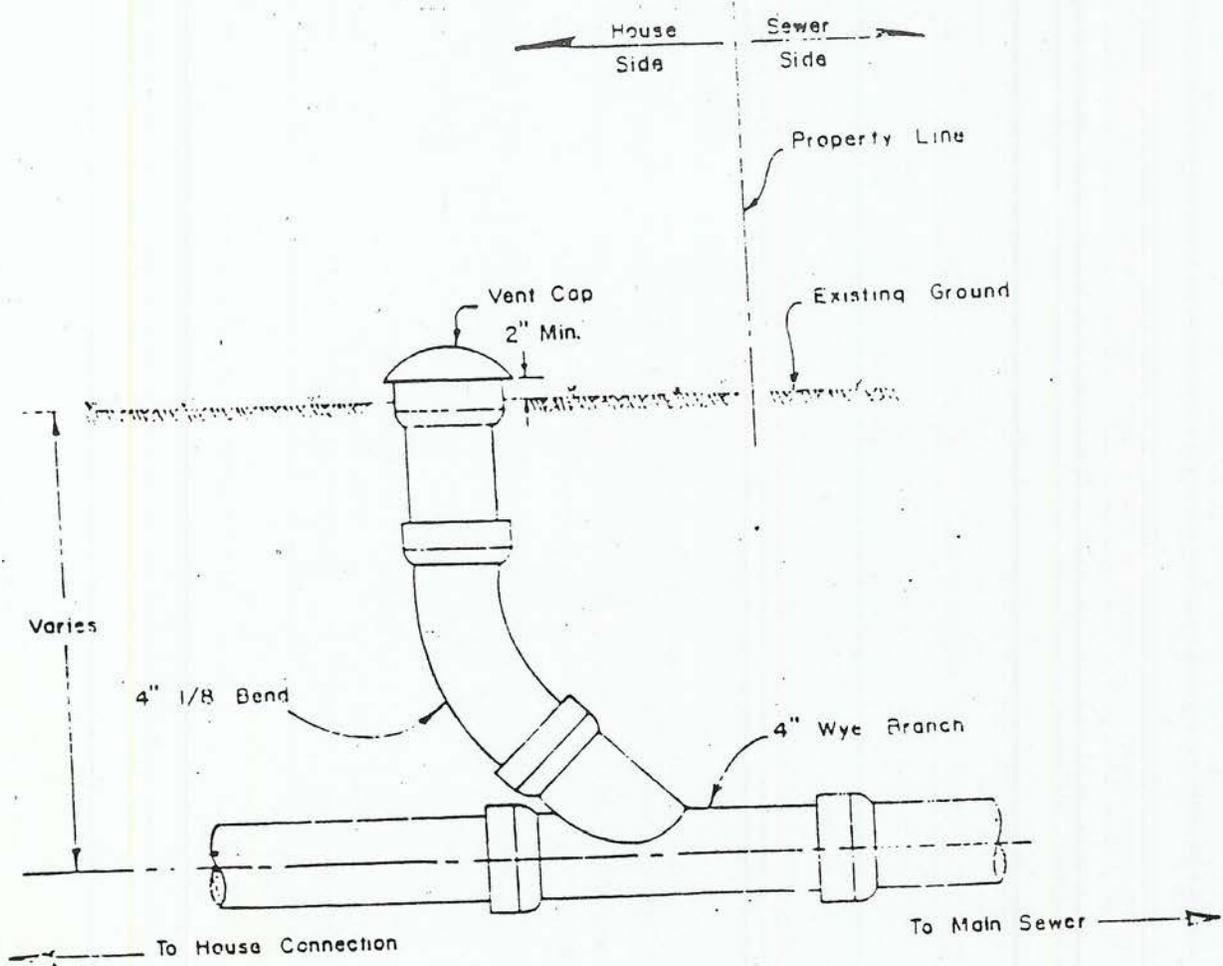


Notes:

1. Full Length of Barrel Shall Be Fully Supported On Compacted Fine Granular Material.
2. Bell Holes Shall Be Provided.

<b>CITY OF AUBURN</b>			
DEPARTMENT		OF PUBLIC WORKS	
<i>STANDARD DETAILS</i>			
<i>"T" LATERAL CONNECTION</i>			
<i>TO SANITARY SEWER MAIN</i>			
Date		Scale	None
	Director of Public Works		<b>PLATE NO. 34</b>

*1947*



SIDE ELEVATION

<b>CITY OF AUBURN</b>		
DEPARTMENT OF PUBLIC WORKS		
<i>STANDARD DETAILS</i>		
<i>SANITARY SEWER LATERAL</i>		
<i>PROPERTY LINE CLEANOUT</i>		
Date	Scale	<b>PLATE NO. 35</b>
Greater of 1/8 inch or 1/16 inch	North	

SECTION 69  
OVERSIDE DRAINS

The Standard Specifications are incorporated herein by this reference.

SECTION 70.  
MISCELLANEOUS FACILITIES

The Standard Specifications are incorporated herein by this reference.

SECTION 71  
SEWERS

The Standard Specifications are incorporated herein by the following references:

71-1.01 Description  
Thru  
71-1.02D Acrylonitrile-Butadiene-Styrene Composite  
Sewer Pipe

71-1.02D(1)

POLYVINYL CHLORIDE SEWER PIPE - Polyvinyl Chloride Sewer Pipe may be allowed only upon approval by the Engineer. When permitted only 6" (inch) or 8" (inch) pipe will be allowed.

Polyvinyl Chloride Sewer Pipe shall conform to the requirements of ASTM D 3034, SDR 35 pipe.

All services and cleanout bends shall be long sweep.

The Standard Specifications are incorporated herein by the following references:

71-1.02E Asbestos-Cement Sewer Pipe  
thru  
71-1.020 Concrete

71-1.03 EXCAVATION AND BACKFILL - Excavation and backfill for all sewers shall conform to the provisions of Section 19-3.01A, "Utility Excavation" and Section 19-3.06A, "Utility Bedding and Initial Backfill".

71-1.03A TRENCH WIDTHS - The minimum trench width shall be the outside diameter of the pipe plus 8 inches on each side.

71-1.04 EXISTING MANHOLES - The Standard Specifications are incorporated herein by this reference.

71-1.05 PIPE LAYING - Pipe shall be protected during handling against impact shocks and free fall.

When the new facilities interfere with the existing flow of sewage, the Contractor shall provide satisfactory bypass facilities at his expense.

The pipe shall be laid without break upgrade from structure to structure, with bell end upgrade for bell and spigot pipe, unless otherwise permitted by the Engineer.

All joints shall be cleaned and then sealed with the type of materials specified or required by the local municipality, utility, or owner. In the absence of such requirements the pipe shall be jointed with materials recommended by the pipe manufacturer for the purposes intended, and approved by the Engineer, in order to obtain a watertight joint against leakage and infiltration under all conditions of expansion, contraction, and settlement.

Liquid-types of sealing materials shall be retained by molds or runners until congealed. Liquid materials shall be poured into the joint space in a continuous operation and agitated until the joint is completely filled.

Voids occurring in the outer and inner annular sealing material shall be filled with the same type of material and the inside of the joint finished smooth. Sealing materials shall be sufficiently protected from the aid and sun to prevent deterioration.

Whenever the work ceases for any reason, the end of the pipe shall be securely closed with a tight fitting plug or cover.

Whenever existing pipes are to be cut or abandoned, the open end of said pipes shall be securely closed by a tight fitting plug or wall of concrete not less than 0.5-foot thick, or by a tight brick wall 0.67-foot thick with cement mortar joints.

Where ground water occurs, the bottom of the trench shall be kept entirely free of water during the pipe laying, filling the joints, and as long thereafter as directed by the Engineer.

All joints shall be carefully cleaned on the inside. Stoppers for pipes and branches left unconnected shall be made of the same material as the pipe or of resilient joint material conforming to Section 71-1.02J, "Resilient Joint Material". After placing the stopper, it shall be covered with a layer of sealant. The sealant shall be sufficiently fluid to insure free flow around the stopper.

The pipe shall be laid in conformity to the prescribed line and grade, with grade bars set and each pipe length checked to grade lines. Three consecutive points shown on the same rate of slope shall be used in common, in order to detect any variation from a straight grade. In case any such discrepancy exists, the work shall be stopped and immediately corrected by the Contractor to the satisfaction of the Engineer. In addition, a string line shall be used either in the bottom or top of the trench or by methods approved by the Engineer to insure a straight alignment of pipe between manholes.

Pipe shall be laid continuously upgrade with the bell of the pipe forward. Each length of pipe shall be laid on a firm bed and shall have a true bearing for the entire length between bell holes. No wedging or blocking up of the pipe will be permitted. Both bell and spigot and inside of pipe shall be clean before the joint is made and care shall be taken that nothing but the joint-making material enters the joints. Each section of pipe shall be laid true to line and grade in such a manner as to form a watertight, concentric joint with the adjoining pipe.

When for any reason pipe laying is discontinued for an hour or more, the open end of all lines shall be closed with a close fitting stopper.

All pipe jointing shall be of an approved type and shall be in accordance with accepted best practice and/or recommendations of the manufacturer and as approved by the Engineer. Chipped or cracked pipes shall be rejected.

71-1.05A

CONNECTIONS TO EXISTING SYSTEMS - No new sewer line shall be connected to an existing sewer system until the new sewer lines are balled, flushed and satisfactorily tested in accordance with Section 71-1.08 of these General Specifications unless, due to construction problems, it is necessary that such connection be made during construction. Should a construction connection be necessary a plug shall be placed at the connection to prevent water or debris from entering the existing sewer system. The plug shall remain in place until construction is complete.

All debris and testing water shall be removed from the system prior to its entrance into the existing system. Should this not be possible removal shall be at the nearest clean-out facility of the existing system.

71-1.05B BORING AND JACKING - Where specified or permitted the sewer pipe shall be placed in a conductor pipe, which shall have been previously placed under a roadway, railroad, or other obstruction by boring and jacking. The equipment and method of operation shall be approved by the Engineer before proceeding with the work.

Excavation for the boring operation shall be the minimum necessary to satisfactorily complete the work. Bracing and shoring shall be adequate to protect workmen and any adjacent structures or roadbed.

Unless expressly specified otherwise, the Contractor may elect to either jack reinforced concrete pipe directly or place it in a conductor, in conformance with the following specifications.

71-1.05C INSTALLATION OF CONDUCTOR - The conductor shall closely follow the boring operation. The bored hole shall not be more than 0.1 foot larger in diameter than the outside diameter of the conductor. Guide rails shall be accurately set to line and grade to insure installation of the conductor within allowable limits. Conductor diameter shall be sufficient to allow adjustment of line and grade of the sanitary sewer pipe to meet allowable tolerances and to allow sand to be placed between the conductor and sewer pipe. Tunnel liner ribs shall have a minimum of 3 inches clearance from the sanitary pipe.

71-1.05D PLACING SEWER PIPE IN CONDUCTOR - If necessary to establish correct line and grade, cement mortar shall be placed on the invert of the conductor. Sewer pipe, of which any part of the joint is larger in diameter than the barrel of the pipe, shall be strapped to 2 redwood skids with steel straps. The redwood skids shall be near the center of each pipe section and shall be large enough to prevent any part of the joint from bearing on the conductor.

Sewer pipe with joint not larger than the pipe barrel shall be laid into place on 2 redwood skids which have been securely fastened to the invert of the conductor or strapped to the barrel of the pipe. In lieu of redwood skids, pipe with joints smaller than the pipe barrel shall be placed on a cement mortar bed which has been shaped to hold the pipe on correct line and grade. Pipe section shall be joined outside the conductor and then slid into place. The space between the sewer pipe and conductor shall be completely filled with clean dry sand blown into place, or sand which has been sluiced into place. The method of placing sand shall be subject to the Engineer's approval.

71-1.05E BACKPACKING OF VOIDS - Whenever in the opinion of the Engineer, the nature of the soil indicates the likelihood of ground loss which would result in a greater space between the outer surface of the conductor or RCP than herein allowed, the Contractor shall take immediate steps to prevent such occurrences by installing a jacking head extending at least 18 inches from the leading edge of the conduit. The jacking head shall cover the upper two-thirds of the conduit and project not more than 1/2 inch beyond the conduit's outer surface. Excavation shall not be made in advance of this jacking head.

Voids greater than allowable shall be filled with sand, soil cement, or grout as directed by the Engineer. Where voids are suspected, the Engineer may direct the Contractor to drill the conduit, to pressure inject grout to refusal and then to repair the drilled hole. Grouting pressure shall not exceed 50 PSI at the nozzle.

When tunnel liner is used as the conductor, the space between the outer earth and the tunnel liner shall be pressure grouted to fill all voids. Grout shall consist of 1 part Portland Cement to 3 parts clean sand; by volume, injected at a pressure as directed by the Engineer.

71-1.05F TOLERANCES - Extreme care shall be exercised by the Contractor to maintain line and grade during jacking operations. Maximum deviation from stated line and grade of tunnel liner or conductor pipe shall be such that the sanitary sewer pipe can be adjusted a sufficient amount within the conductor pipe or tunnel liner to achieve the line and grade shown on the plans. This adjustment shall be made to all pipe deviating from line and grade and not merely to the sections of pipe nearest the end of the conductor or tunnel liner.

Directly jacked R.C.P. will be allowed a maximum deviation of 0.25 feet per 100 feet from intended line and grade unless more stringent tolerances are shown on the plans or indicated by the Engineer.

- 71-1.06 PIPE REINFORCEMENT & CRADLES - The Standard Specifications are incorporated herein by this reference.
- 71-1.06A BRACING AND SHORING - As required by the "Trench Construction Safety Orders" of the California State Industrial Accident Commission, bracing and shoring shall be installed in trenches to insure the safety of workmen and to protect and facilitate the work.  
The excavation shall be supported so that it will be safe and that the ground alongside the excavation will not slide or settle and all existing improvements, either on public or private property, will be fully protected from damage.  
All supports shall be removed after construction is completed, unless otherwise directed by the Engineer, and shall be withdrawn in a manner that will prevent the caving of the sides of the excavation. All openings caused by the removal of supports shall be filled with suitable material properly compacted.
- 71-1.07 SEWER STRUCTURES - The Standard Specifications are incorporated herein by this reference.
- 71-1.07A MANHOLES - Manholes shall be watertight structures constructed by placing precast concrete sections on a poured concrete base. Poured-in place manholes shall not be used unless specifically called for in the Special Provisions.
- 71-1.07B The poured concrete base shall be made of Class "A" concrete with 1-1/2 inch maximum size aggregate.  
All manholes shall be constructed on a non-yielding firm bed. When water is encountered or in the opinion of the Engineer existing conditions are such that the excavated ground at the base of the manhole is not firm, a minimum of 6 inches of crushed rock will be required prior to manhole base construction. The first manhole ring shall be placed before the poured concrete base has set.

- 71-1.07C All precast manhole barrels and cones shall conform to ASTM Specification C-478.  
All precast sections shall be joined together with pre-formed plastic gaskets.  
Pre-formed plastic gaskets shall be equal to "Ram-Nek" and shall comply with the requirements of Federal Specification SS-S-00210 "Sealing Compound, Pre-formed Plastic for Pipe Joints", Type I, Rope Form.
- 71-1.07D Where sewer lines pass through manholes, the pipe shall be laid continuously as a whole pipe. After the manhole base and precast sections have been placed and sufficient time has elapsed to allow all concrete and grout to set, the top half of the pipe within the manhole shall be carefully cut off and the sides mortared, as shown in the Land Development Manual. All channels so formed shall be checked with a template and shall form a smooth flowing channel at all flow depths.  
To provide flexibility for pipes entering and leaving a manhole, standard couplings shall be placed within the walls of the concrete base. Another standard coupling shall be placed on the pipe within 1-1/2 feet of the outside of the concrete base. The couplings are to be inspected and approved prior to backfilling.  
Lift holes shall be packed and sealed with Ram-Nek or Kent-Seal gasket material or equal. All joints and lift holes must be grouted on the outside of the manhole before backfilling.
- 71-1.07E Temporary covers of 3/8 inch steel plate of sufficient size to adequately cover the opening shall be placed on the cone until the pavement is completed. Suitable locating ribs shall be welded to the underside of the cover to hold it in place during the grading and paving operations.
- 71-1.07F The throat of the manhole shall be made of precast concrete rings of the proper inside diameter. The minimum depth of throat permitted shall be one 3 inch ring between the cone and the frame. The maximum depth permitted shall be 12 inches between the cone and frame.
- 71-1.07G Manhole frame and covers shall conform to Plates 89 & 90 of the Standard Drawings. When adjusting the manhole frame and covers to grade, the frame shall be wired to a straight edge of sufficient length to span the excavation, and the throat completed to the proper level. Whenever

the space between the bottom of the frame and top of a ring is less than 3 inches, the void may be filled with concrete, poured against a suitable form on the inside of the structure.

In snow areas the grade of the manhole cover shall be 1/2 to 1 inch below pavement grade.

When the manhole is in the shoulder area a paved taper shall be extended 25 feet on each side of the manhole to meet the existing pavement.

71-1.07H When adjusting an existing manhole to grade and the total depth of the throat from the top of the frame to the bottom of the throat exceeds 24 inches, the upper portion of the manhole shall be removed to the first fullsize manhole section. The upper portion shall then be reconstructed as outlined above in Paragraph F and G.

71-1.07I Before any work is started on adjusting or repairing a manhole, the channels in the base shall be covered with strips of wood and the entire base covered with a heavy piece of canvas. This cover shall be kept in place during all work. Upon completion of the work the wood strips and the canvas shall be removed from the manhole allowing no debris to fall or remain in the manhole.

71-1.07J Any new structure to be placed or existing structure to be adjusted shall be temporarily covered with a heavy steel plate below the grading plane before subsequent layers are placed thereon. After completion of paving the structure shall be raised to grade.

71-1.08 TESTING SEWERS - All sewers shall be tested by the Contractor and observed by the Engineer for obstructions and leakage as provided for in Section 71-1.08 of the General Specifications.

Testing of the sewer lines for obstructions and leakage shall take place after the acceptance of the subgrade and before the placing of any layer thereon. If required by the Engineer additional testing may be required after paving.

Testing of manholes shall take place after the manholes have been set to grade and are complete in place.

In addition to testing as required in Section 71-1.08 of the General Specifications the following will be required for Polyvinyl Chloride (PVC) sewer pipe only:

After balling and blushing and prior to acceptance of the project by the County, the Contractor shall pull a deflection gage or mandrel through each section of pipe. The gage shall be designed to resist movement through the pipe when a deflection of 3 percent of the nominal diameter of the pipe is reached.

71-1.08A

TESTS FOR OBSTRUCTIONS - All sewer lines shall be cleaned by balling and flushing. The ball shall be controlled by a tag line or rope, or sewer rods, and permitted to move slowly through the sewer. The ball shall be of the inflatable grooved type and inflated to have a snug fit in the pipe.

Any obstructions or irregularities shall be removed or repaired by the Contractor. All testing, cleaning, and repairing shall be done to the satisfaction of the Engineer. The Contractor shall provide all necessary materials and utilities for the tests and shall dispose of all waste, including water.

71-1.08B

TESTS FOR LEAKAGE - After laying, backfilling, and compacting, all sewers shall be tested for leakage. The program of testing must fit the conditions as mutually determined by the Engineer and the Contractor. The Contractor shall furnish all labor, tools, and equipment necessary to make the tests and to perform any work incidental thereto. The Contractor shall take all necessary precautions to prevent any joints from drawing while the pipelines or their appurtenances are being tested. He shall correct any excess leakage and repair any damage to the pipe and its appurtenances or to any structures indicated by or resulting from the following tests:

(1) AIR TEST FOR LEAKAGE - The Contractor shall test all sewers by means of the air test specified herein unless otherwise directed by the Engineer. Length of line tested at one time shall be limited to the length between adjacent manholes.

Air test procedures shall be as follows:

Pressurize the test section to 3.5 PSI and hold above 3.0 PSI for not less than five minutes. Add air if necessary to keep the pressure above 3.0 PSI. At the end of this five minute saturation period, note the pressure (must be 3.0 PSI min.) and begin the time period. If the pressure drops 0.5 PSI in less than the time given in the following table the section of pipe shall not have passed the test.

<u>LATERAL SIZE</u>	<u>MINIMUM TIME IN SECONDS</u>
4	122
6	184
8	245
10	306
12	367
15	460

For larger diameter pipe, use the following formula:  
Minimum time in seconds = 370 x pipe diameter in feet. When the prevailing ground water is above the sewer being tested, air pressure shall be increased 0.43 PSI for each foot the water table is above the flow of the sewer. If the time for the pressure to drop 0.5 PSI is 125 percent or less of the time given in the table, the line shall immediately be repressurized to 3.0 PSI and the test repeated.

For 8 inch and smaller pipe only, if, during the 5 minute saturation period, pressure drops less than 0.5 PSI after the initial pressurization and air is not added, the section undergoing the test shall have passed.

If the test is not passed, the leak shall be found and repaired to the satisfaction of the Engineer.

Building sewers shall be considered part of the lateral to which they are connected and no adjustment of test shall be allowed to compensate for the smaller diameter of the building sewers.

The pressure gauge used shall be supplied by the Contractor, shall have a minimum division of 0.10 PSI, and shall have an accuracy of 0.05 PSI. Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six month intervals or when requested by the Engineer. In addition, the Engineer may compare the Contractor's gauge with County owned gauge at any time.

(2) HYDROSTATIC TEST - The hydrostatic test may be used in lieu of the air test only when shown on the plans and/or allowed in the special provisions.

All sections of sewer shall be tested by inserting stoppers in the lower end of the sewer, the inlet sewer of the upper manhole, and any side sewers at intervening manholes, and filling the pipe and manholes with water to a point in the upper manhole not less than 5 feet above the invert of the pipe or prevailing ground water elevation, whichever is higher. The maximum length of section tested shall be 1,000 feet.

The line shall be filled approximately 4 hours prior to testing. It shall be tested for at least 2 hours, maintaining the head specified above by measured additions of water. The sum of these additions shall be the leakage for the test period.

Maximum allowable head of water above any portion of sewer being tested shall be 15 feet. Where the difference in elevation between successive manholes exceeds 15 feet, a test tee shall be installed between manholes, and testing shall be carried on between the tee and the manhole.

The allowable leakage shall not exceed 0.066 gallon per minute per inch diameter, per 1,000 feet of main line sewer being tested. This is equivalent to 500 gallons per day, per inch diameter, per mile.

Where the actual leakage in a section tested exceeds the allowable, the Contractor shall remedy it before the sewer is accepted. If the leakage is less than allowable and leaks are observed, such leaks shall be repaired.

71-1.08C FORCE MAINS - Each section of pipe to be tested shall be slowly filled with water and all air expelled from the pipe. After the pipe has been filled, it shall be allowed to set for a period of not less than 24 hours. The pipe shall then be refilled to the original water level and subjected to a pressure of not less than 100 pounds per square inch or the service pressure plus 50 pounds, whichever is greater, for a period of two hours.

All exposed joints, bends, angles, and fittings shall be closely examined during the test. Any part of the line which proves to be defective shall be replaced and the line retested.

The maximum allowable leakage shall not exceed 30 gallons per 24 hours per mile of pipe per inch of nominal diameter.

71-1.08D MANHOLES - Manholes shall be tested for leakage by the following procedure:

All inlet and outlet pipes shall be plugged and the manhole filled with water to the top of the reducing cone section. The water should be introduced into the test section at least four hours in advance of the official test period to allow the manhole and joint material to become saturated. The manhole shall then be refilled to the original water level. At the beginning of the test, the elevation of the water surface in the manhole shall be carefully measured from a point on the manhole rim. After a period of four hours, the water elevation shall be measured from the same point on the manhole rim and the loss of water during the test period determined.

The maximum allowable leakage shall be determined from the following chart:

MH DEPTH	ALLOWABLE DROP PER TIME
Less than 4 feet	1" / 30 min.
4 to 6 feet	1" / 20 min.
Greater than 6 feet	1" / 15 min.

Where the actual leakage in a manhole exceeds the maximum allowable, the Contractor shall discover the cause, remedy it, and retest the manhole before the manhole is accepted. If the leakage is less than allowable and leaks are observed, such leaks shall be repaired.

- 71-1.09 TRENCH RESURFACING - Trenches shall be restored in accordance with Section 19-3.06A(5) of these General Specifications and Plate #32 of the Land Development Manual.
- 71-1.09A CLEAN UP - During the progress of the work, the Contractor shall keep the entire job site in a clean and orderly condition. Excess or unsuitable backfill material, broken pipe, or other waste material shall be removed from the job site. Spillage resulting from hauling operations along or across existing streets or roads shall be removed immediately by the Contractor. All gutters and roadside ditches shall be kept clean and free from obstructions. Any deviation from this practice shall have prior approval from the Engineer.
- 71-1.10 MEASUREMENT - Sewer work performed under Section 71, "Sewers", will be designated in the contract item by size, type, gauge, quality, or whatever information is necessary for identification.
- The lengths of the various types of sewer pipe to be paid for by the linear foot will be the slope length designated by the Engineer. Pipe placed in excess of the length designated will not be paid for, unless pipes are cut to fit a structure. When pipes are cut to fit a structure, the quantity to be paid for will be the length of pipe placed before cutting, measured in 2 foot increments.
- Pipe bends, wyes, tees and other branches will be measured by the linear foot for the sizes of pipe involved. Bends will be measured along centerlines. Wyes, tees and other branches will be measured along centerlines to the point of intersections. The capped portion of a wye or tee placed for future connections will not be measured for payment.
- House services shall be measured as long, short, double, single, or combinations thereof depending upon the location of the sewer line in relation to the centerline of the street or easement.

The quantities of aggregate base and asphalt concrete for trench resurfacing shall be the actual quantities placed within the limits as directed by the Engineer.

Quantities of brick or precast concrete pipe manholes, lampholes, terminal cleanout structures, and pipe chimneys will be determined as units from actual count, except new frames and covers shall be paid for as a contract item.

New frames and covers required by the plans will be measured as miscellaneous iron and steel by the pound as provided in Section 55, "Steel Structures", except when frames and covers are measured and paid for as units. A frame and cover together will be considered as a single unit.

The quantity of concrete for cradles, pipe reinforcement, and pipe support walls to be paid for will be measured in accordance with the dimensions shown on the drawing by the Engineer.

Manholes may be divided into two items:

- (1) The complete manhole through the cone and including the temporary cover specified in Section 71-1.15E.
- (2) Providing and placing adjusting rings and manhole frame and cover.

71-1.11.

PAYMENT - Items of work, measured as provided in Section 71-1.18, "Measurement", will be paid for at the contract prices per linear foot for the various sizes and types of sewer pipe; the contract unit prices for brick or precast concrete pipe sewer manholes, lampholes, terminal cleanout structures, and pipe chimneys; the contract price per pound for miscellaneous iron and steel for frames and covers; or the contract unit price for frames and covers; the contract price paid for the class of concrete (concrete cradles, pipe reinforcement, and pipe support walls); the contract price for house services; the contract unit price paid for trench resurfacing.

The price paid per lineal foot shall include compensation for excavation, backfill, aggregate base and asphalt concrete, (unless they are specified as separate items), bar reinforcing steel and concrete other than required for concrete cradles, pipe reinforcement and pipe support walls and miscellaneous iron and steel other than frames and covers will be considered as included in the contract prices paid for the various items of sewer work and no additional compensation will be allowed therefor.

Full compensation for structure excavation; structure backfill; bar reinforcing steel and concrete other than required for concrete cradles, pipe reinforcement and pipe support walls; and miscellaneous iron and steel other than frames and covers; will be considered as included in the contract prices paid for the various items of sewer work and no separate payments will be made therefor.

Steps for manholes will be considered as a part of the manhole and no additional compensation will be allowed therefor.

Full compensation for all tunneling and jacking of pipe, capping open ends of pipe, joining of pipe to other pipe or structure, utility support and protective work operations required to accommodate or safeguard public traffic, testing the sewer line, furnishing and disposing of water used for testing and all other incidental work and material required to construct the sewer system shall be considered as included in the prices paid for the various contract items of sewer work and no additional compensation will be allowed therefor.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing sewers, complete in place, as shown on the plans, and as specified in these Specifications and the Special Provisions, and as directed by the Engineer.

## SECTION 72

### SLOPE PROTECTION

The Standard Specifications are incorporated herein by this reference.

## SECTION 73

### CONCRETE CURBS AND SIDEWALKS

The Standard Specifications are incorporated herein by this reference.

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**Standard Operating Procedures for SSOs**

## **Policy of Actions for Handling Sewage Backups on Private Property**

**Background:** The City receives several calls each year from citizens complaining or reporting damage to private property resulting from some sewage backups.

**Policy:** Incoming phone calls should be handled in the following manner:

1. When the City of Auburn is notified of a sewer backup, the caller should be nicely informed that the City of Auburn has a procedure for handling this type of problem and then refers the individual to Ch2M/OMI located at the Auburn Wastewater Plant office. The City employee taking the in-coming call should not try to handle the problem, make any commitments or comments other than to express concern and empathy and have the person call OMI.
2. When a Ch2M/OMI employee receives the citizen's call, Ch2M/OMI should follow the set procedure as follows:
3. Before starting to speak to the individual calling, you must remember that you are likely dealing with a person who is experiencing an unpleasant situation and they will likely be irritated, demanding, and likely irrational. It is incumbent that your attitude be such that you do not further complicate the problem. Listen carefully to the caller and express empathy for their problem but do not admit fault or make any commitments other than what is in the procedure list.
4. The Ch2M/OMI employee receiving the incoming call shall attempt to secure vital information from the caller such as: name, address, day-time phone number, evening phone number, message phone number, location of property where backup or damage has occurred, extent of damage, steps the citizen has taken to avoid further damage from occurring, etc. This information shall be recorded on a Client Response Form (CRF).
5. The Ch2M/OMI employee receiving the incoming call shall inquire what the caller feels is the cause of the problem. This may sound like a simple question. However, it is important to get the caller's perspective on the situation. The bottom line here is to try to determine if there was something the City of Auburn or Ch2M Hill/OMI did that caused or contributed to the problem. Remember, you are not trying to solve the caller's problem or accept or deny blame, but rather to have interaction with the caller and gather information.
6. The Ch2M/OMI employee shall inform the caller that there is a set procedure for Ch2M/OMI to follow and that the caller has just taken the first step. The second step is to have a Ch2M/OMI representative inspect the main line, which collects flow from the owner's property.
7. The Ch2M/OMI employee receiving the incoming call shall forward a completed CRF to the Ch2M/OMI representative who will be doing the main line inspection.

8. The Ch2M Hill/OMI representative doing the inspection should attempt to make contact with the citizen and schedule a time to make an inspection. The OMI representative shall ask the caller what times are available for an on-site inspection. Do not commit Ch2M/OMI staff to a particular time if other emergencies are occupying all available Ch2M Hill/OMI representatives.
9. At the site the Ch2M/OMI representative should have the same attitude as given in paragraph #3. Try to determine what caused the backup or damage, and what can be done to alleviate the problem. If the main line is flowing freely, the Ch2M/OMI will contact the caller and inform that person that the problem is not occurring in the City main line and it would be the responsibility of the owner to contact a plumber of their choosing to clear the blockage. If the main line is observed with a blockage or surcharged, Ch2M/OMI will work to clear the obstruction and return the system to free flowing condition. The owner will be informed when the blockage is removed and the completed CRF will be filed with the Lead Collections Operator (LCO). The LCO will log in the CRF and file a copy with the Project Manager (PM).
10. All sewage backup problems are obviously not the same and must be evaluated on a case by case basis. After obtaining as much information as possible and inspecting the premises, the OMI representative should give a copy of the "Sewer Backup Handling Procedure" to the owner. All questions regarding the Sewer Backup Handling Procedures and/or the incident should be directed to the City of Auburn.
11. Following all sewage backup calls, Ch2M/OMI will submit to the City of Auburn a copy of the CRF documenting the incident. Ch2M/OMI will make itself available to the city to answer any specific questions regarding the backup. Ch2M/OMI will not discuss with the owner any city policies related to compensation.

### **PHONE NUMBERS**

Ch2M/OMI AWWTP	(530) 889-0624
After hours pager	(530) 381-0038



## **STANDARD OPERATING PROCEDURE**

### **SSO Callout**

**SUBJECT:** Receiving collection line complaints

**SPECIFIC:** Reporting, assigning personnel and investigation

**PURPOSE:** To assure prompt and proper investigation of the problem with as much information as possible.

#### **PROCEDURE:**

- (1) Review and be familiar with the City's administrative directive of "Sewage Backup Policy", "Sewage Backup Handling Procedures" and "SSO Reporting". All topics are located in the white notebook, at the AWWTP control office and the collection office
- (2) When receiving a complaint of a possible collection problem fill out the OMI Client Response Form (CRF). This form is located in the white notebook, in the office, at AWWTP labeled "OMI Collections/Client Response Forms.
- (3) Every incident needs to be treated as a possible problem with the collections system, and investigated ASAP by an Ch2M/OMI employee. The investigation may require assistance due to traffic control and or location of the city sewer main lines. The importance of a quick response can not be over emphasized. If there is a spill the Plant Manager or Lead Collection Operator needs to be advised immediately.
- (4) If there is property damage from a sewage backup, the PM, or LCO needs to be advised immediately. When a property owner feels that it is the city's problem for the damage caused from the sewage backup, they are to be given a copy of the "Sewer Backup Handling Procedures" Ch2M/OMI will not discuss, with the owner, any city policies related to compensation.
- (5) If there is a concern that the property owner may have or they perceive that there is a damage claim against the city, an immediate phone call is to be made to the City of Auburn (Bernie Schroeder) with all details.
- (6) Following all sewage backup calls, The LCO will file a copy with the PM and Ch2M Hill/OMI Compliance Team for review prior to sending it .to the City of Auburn. Ch2M/OMI will submit to the finished report to the City of Auburn a copy of the CRF documenting the details of the incident.
- (7) If this is a Category 1 sewage spill additional notification and documentation is required. See the SOP on SSO Reporting.

## Reporting SSO – SOP

(Revised 1/1/2016)

1. With in 2 hours of confirming there is an SSO and what category the spill is under you must call:
  - a. **California Emergency Agency** (Calema) formally none as **Office of Emergency** (OES) at 1-800-852-7550. Give assessment and category of the spill (see categories on page 2), Calema will issue a control number; this will be needed for **RWQCB** and applied to all SSO documents.
  - b. You're following call to **RWQCB** at 916-464-4835. If no answer, leave a message regarding SSO category along with **OES** control number in addition with all details of the SSO.
  - c. If the SSO is a Category 1 and reached a waterway all above calls along with calls to **Health Department** at (530) 745-2300 and **Department of Fish & Game** at (916)358-1310.
2. Prepare a memo for the City of Auburn with the category and assessment of the SSO. Email a copy of the letter for review to OMI Compliance and Review Team @ OMI\_CNR. After OMI Compliance and Review team approve memo; attach a copy of the client response form to the letter and deliver to City Hall ASAP. The City of Auburn must respond to the RWQCB with in 5 working days of the SSO.
3. With in 3 days; file a SSO report to the CWIQS web site with all the SSO information. Record the CWIQS ID number and save the new SSO file. Notify City of Auburn personnel certification that they have a SSO report waiting for certification.
4. Enter all data regarding the SSO to Nexgen Asset Management Program.

## **Spill Category**

**Category 1:** 1000 gallons or more; or if any amount of SSO that has reached a storm drain and or waterway (samples must be taken).

**Category 2:** Less than 1000 gallons and SSO contained to land.

## **Required Lab Test for Category 1**

**Gather 1 sample and perform test from up stream of the SSO and 1 downstream.**

- Total Coliform (fecal outside 6 hr. time)
- PH
- EC
- Ammonia
- CL2
- DO
- NTU