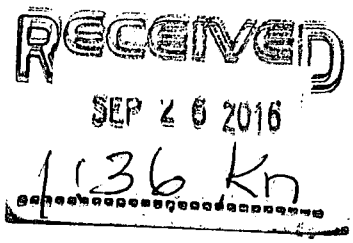
MAYOR JILL DABBS
CITY OF BRYANT

TELEPHONE 501-943-0999
FACSIMILE 501-943-0992

210 S.W. 3rd STREET
BRYANT, AR 72022



September 25, 2016

Mr. Miles Johnson
Enforcement Coordinator – Water Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: City of Bryant
LIS 16-057, AFIN 63-0005, Permit No. AR0034002
Corrective Action Plan

Dear Mr. Johnson:

In accordance with the requirements of the Consent Administrative Order (CAO) LIS No. 16-057 with the Arkansas Department of Environmental Quality dated on July 14, 2016, we submit herewith the Corrective Action Plan.

Should you have any questions regarding this correspondence plan please don't hesitate to contact Mr. Mark Grimmett, Public Works Director, at 501.943.0468.

Sincerely,

Jill Dabbs
Mayor

Enclosures: Corrective Action Plan
Standard Specifications for Design and Construction of Water and Sewer Lines
Standard Operating Procedures

Cc: Mark Grimmett, Public Works Director
Craig Johnson, Crist Engineers

THE CITY OF BRYANT, ARKANSAS

CORRECTIVE ACTION PLAN

LIS 16-057, AFIN 63-0065, NPDES PERMIT NO.: AR0034002

DATE: SEPTEMBER 25, 2016

PREPARED FOR:

City of Bryant
1019 S.W. 2nd Street
Bryant, Arkansas 72022
www.cityofbryant.com

PREPARED BY:

Crist Engineers, Inc.
205 Executive Court
Little Rock, Arkansas 72205

Crist Project No.: 1564

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SECTION 1

BACKGROUND

1.1 PURPOSE AND SCOPE

The City of Bryant entered into a Consent Administrative Order (CAO) LIS No. 16-057 with the Arkansas Department of Environmental Quality on July 14, 2016. Per the Order and Agreement section a comprehensive Corrective Action Plan with milestone schedule is required for submission on or before September 25, 2016.

1.2 BACKGROUND

The City of Bryant has endeavored to reduce wet weather and dry weather related SSO's by spending approximately $9.3 Million in equipment, engineering, and construction since 2008. **Table 1, Table 2, and Table 3** outline the cost and time table for the projects related to SSO reduction. Through these efforts and expenditures the City of Bryant has effectively reduced the SSO frequency and volume from 2008 to 2015. **Exhibit 1 – City of Bryant SSO Frequency and Volume** is included to demonstrate the reduction.

The City of Bryant has recently contracted with Crist Engineers and RJN Group to provide a Collection System Evaluation and Capacity Assurance Plan that will identify projects to mitigate sanitary sewer overflow as required for the Corrective Action Plan and is further described in Section 2.

Item No.	Begin	End	Description	Amount
1	1/2011	10/2014	SSES and Flow Monitoring	$303,778
2	1/2011	11/2011	WWTP Aeration System	$606,811
3	8/2012	8/2013	WWTP Improvements	$1,803,646
4	7/2012	5/2013	Basin 4, 5, & Stivers Subdivision Rehabilitation	$892,485
5	4/2013	2/2014	Manhole Rehabilitation	$593,125
6	8/2015	Ongoing	PS 25 and PS 5 Modifications	$2,343,540
7	9/2015	Ongoing	Sludge Removal	$292,352
8	1/2011	Ongoing	Engineering and Administration for All Projects	$1,093,000
			Current Total	**$7,928,737**

Table 1-1: Capital Project Cost for SSO Reduction

Item No.	Purchase Date	Description	Amount
1	9/2009	VACCON Vacuum Truck for I&I	$320,000
2	2010	Ques CCTV Van and Equipment	$192,230
3	2009	Hurco Smoke Test Equipment	$4,210
4	2012	Spartan Push CCTV	$2,500
4	6/2011	Portable Pumps for Pump Stations	$39,000
5	2014/2015	SCADA Upgrades for 35 Pump Stations	$264,360
		Current Total	**$822,300**

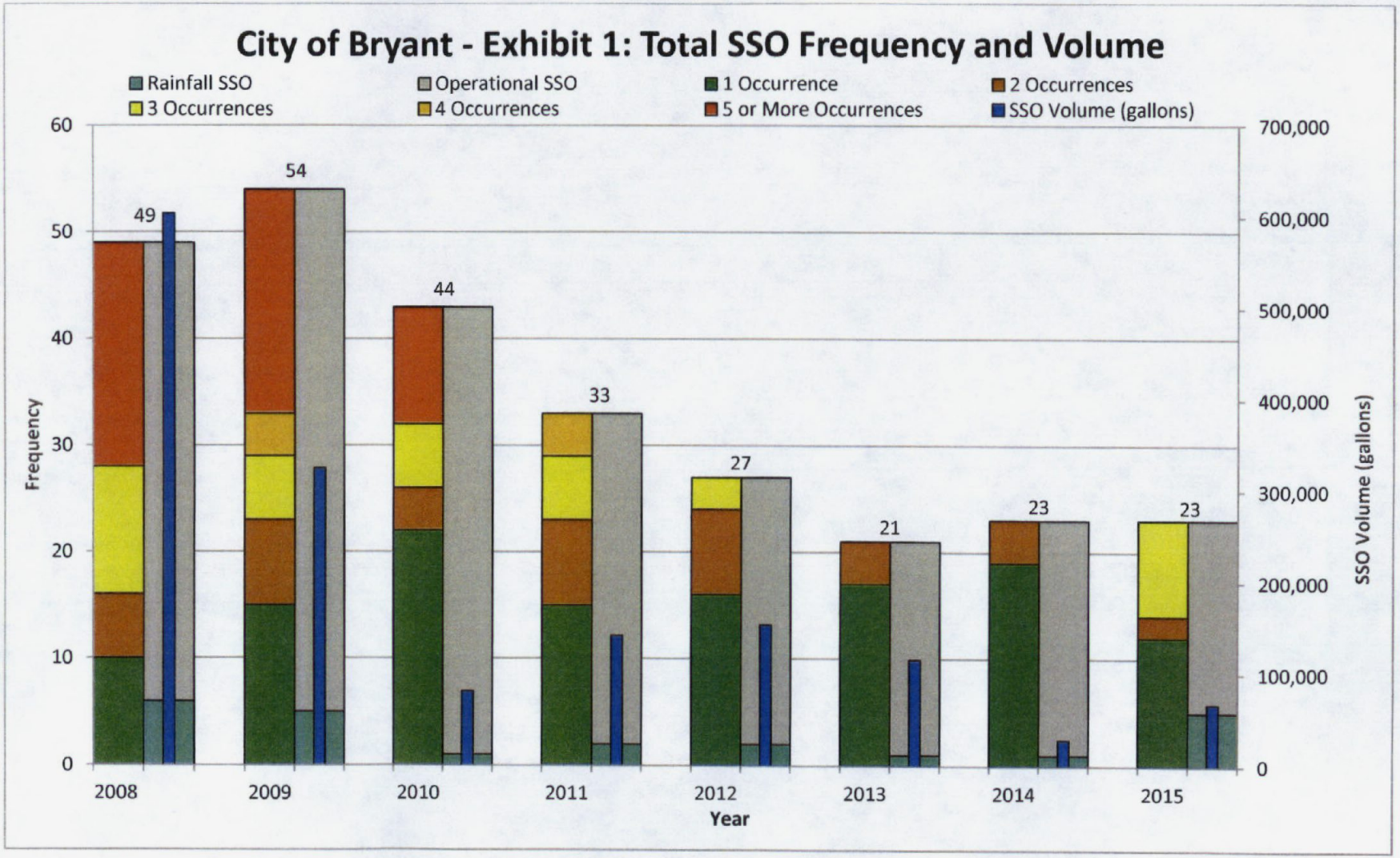
Table 1-2: Capital Equipment Cost for SSO Reduction

Item No.	Begin	End	Self-Performed Activities	Amount
1	7/2015	Ongoing	Smoke Testing - Basin 5 and Point Repairs	$30,500
2	2014	Ongoing	Physical Investigation of Possible I&I Sources (Basins 5/6)	$6,500
3	2014	Ongoing	Manhole Repairs	$6,500
4	2014	2014	Pipeline Analysis Flow Monitoring Study	$25,700
5	2016	Ongoing	ACT (Annual Contract) Sewer System Rehab	$300,000
6	2016	2017	System Evaluation and Capacity Assurance Plant	$222,784
			Current Total	**$591,984**

Table 1-3: Capital Cost for Self-Performed Activities for SSO Reduction

Further, in 2015 the City of Bryant commissioned Crist Engineers, Inc. to prepare Standard Specifications for Design and Construction of Water Lines and Sewer Lines. The City of Bryant began implementation of these standards for developers and the design of new construction the fourth quarter of 2015. A copy of the Standard Specification is included with this transmission.

In addition, the City of Bryant has developed standard operating procedures (S.O.P.'s) for public works activities, which include clearing stop-ups, containing manhole overflows, smoke testing, closed circuit television inspections, and fats, oil and grease interceptor inspections. This S.O.P. manual is attached to this submission for your reference.


City of Bryant - Exhibit 1: Total SSO Frequency and Volume
Rainfall SSO
Operational SSO
1 Occurrence
2 Occurrences
3 Occurrences
4 Occurrences
5 or More Occurrences
SSO Volume (gallons)
Frequency
SSO Volume (gallons)
Year
0
10
20
30
40
50
60
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
49
54
44
33
27
21
23
23
2008
2009
2010
2011
2012
2013
2014
2015

SECTION 2

PLANNED CORRECTIVE ACTIONS

2.1 CURRENT STATUS

The City of Bryant has initiated a project with Crist Engineers and the RJN Group to perform an evaluation of the citywide sanitary sewer system. The scope of the project includes assessing the condition of selected sewer gravity lines (approximately 480,000 linear feet) by performing flow monitoring to determine the amount of wet weather and dry weather flows and build and calibrate a hydraulic model to assess the system under both dry and wet weather conditions. The hydraulic model of the citywide sewer system will include all gravity sanitary sewer lines within the system as well as select major pump stations and force mains. A hydraulic modeling report with capacity upgrades and alternatives analysis will be provided. Ultimately, a Capital Improvement Plan will be outlined to incorporate projects over a period time. An evaluation of the current sewer rate structure with funding alternatives will be considered.

2.2 FLOW MONITORING

The Engineer will review the available electronic mapping, the operational information for the collection system, and the proposed collection system network to identify key temporary flow meter locations. The Engineer shall prepare and present to the City a flow metering plan that describes the final temporary flow metering, equipment installation requirements (i.e. manhole access, traffic control, notification to landowners, assistance from the City staff, etc.), equipment maintenance requirements, data recording frequency, and termination and removal of the equipment following completion of the monitoring period.

Seven temporary flow meters will be maintained over the sixty (60) day monitoring period. Maintenance shall be carried out on a regular basis and includes calibration of the recording equipment, downloading of recorded data, onsite analysis of the data to ensure proper meter function, cleaning of the sensor, and replacement of any defective equipment. It is assumed that adequate weather conditions will be observed during the monitoring period so that dry weather and wet weather conditions that include at least three (3) storm events of different rainfall intensities are observed.

2.3 RAINFALL MONITORING

Four (4) rain gauge sites will be selected to obtain rainfall data during the monitoring period. The rain gauges will continuously record rainfall conditions during the monitoring period. Each rain gauge will also be inspected regularly and coincide with flow meter inspection.

2.4 HYDRAULIC MODEL

Utilizing the City's GIS database, as-built information available, and GPS survey performed as part of this project, a hydraulic model will be developed. Select 8-inch and all 10–inch diameter and larger sewer lines in the collection system will be input into the model based on the GPS survey data. All 6 and 8-inch diameter sewer lines will be input into the model based on the GIS database, as-built data available and City elevation contour data. Based on record drawings and design pump curves provided by the City, major lift stations will be input into the hydraulic model.

The model will be calibrated by adjusting various parameters in the model until the model flows match the depth, velocity, and flow recorded by the flow meters. Where the model data cannot be adjusted within acceptable parameters to match monitored conditions, field investigations may be performed to evaluate actual system performance.

2.5 SYSTEM EVALUATION CAPACITY ASSURANCE PLAN

The System Evaluation Capacity Assurance Plan (SECAP) will be developed that will include discussion of specific topic area including supporting information and exhibits: Executive Summary, System Description, Methodology, Flow Development and Analysis, Hydraulic Model Development, Model Assumptions, Model Calibration, Capacity Analysis, Inflow and Infiltration Reduction, Recommended Capital Improvements, Schedule of Improvements. The Schedule of Improvements will further outline recommendations of capital project needs to abate sanitary sewer overflows.

SECTION 3

MILESTONE SCHEDULE

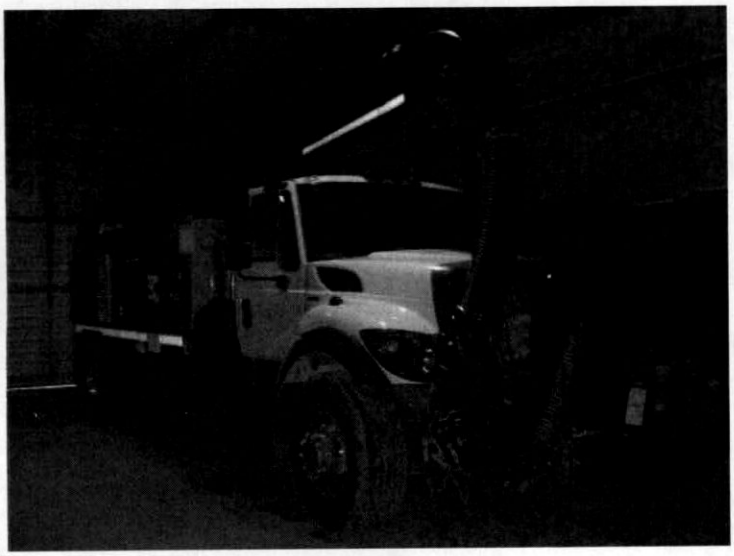
3.1 SCHEDULE

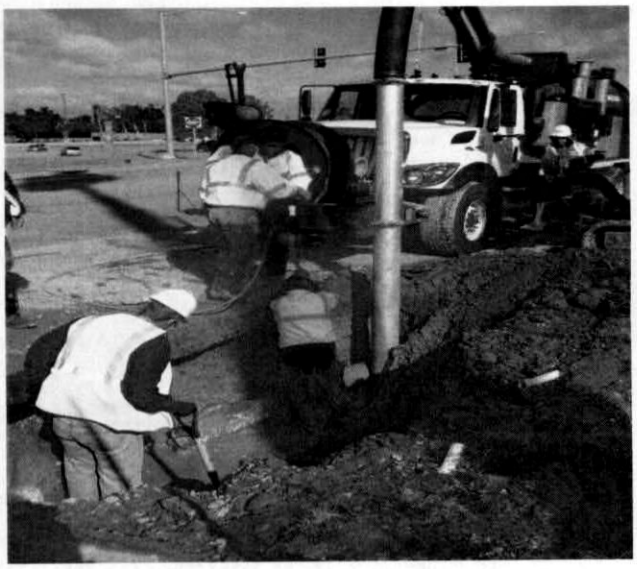
As previously indicated, compliance with the CAO requirements will be a staged implementation plan that will incorporate capital projects that will require funding sources through sewer rate increases or other available sources, such as sales tax. At the completion of the SECAP, which will be submitted to ADEQ for review, a capital improvement plan will establish a time line of projects.

Item No.	Corrective Action Description	Target Completion Date
1	Flow Monitoring and Rainfall Monitoring	December 31, 2016
2	Hydraulic Model	August 30, 2017
3	System Evaluation and Capacity Assurance (SECAP) Plan	September 29, 2017
4	Capital Improvement Plan and Schedule of Improvements	December 30, 2017

Table 3-1: Schedule

CITY OF BRYANT WASTEWATER COLLECTION DEPARTMENT STANDARD OPERATING PROCEDURES (S.O.P's)





Optimizing Operation, Maintenance, and Rehabilitation of Sanitary Sewer Collection Systems DAY-TO-DAY STANDARD OPERATING PROCEDURES City of Bryant Arkansas

This appendix contains standard operation procedures (SOPs) for routine day-to-day collection system operation and maintenance activities.

APPENDIX-A- INSTALL RELAY OR ABANDONMENTOF WASTEWATER GRAVITY MAIN

APPENDIX-A-1- PERSONAL SAFETY EQUIPMENT

APPENDIX-A-2- JOB SITE SAFETY EQUIPMENT

APPENDIX-A-3- CONSTRUCTION EQUIPMENT

APPENDIX A-4- EROSION CONTROL

APPENDIX A-5-CONSTRUCTION MATERIALS

APPENDIX A-6- REFERENCE MATERIALS

APPENDIX A-7- MAJOR TASK AND WORK STEPS FOR INSTALLING RELAYING REPAIRING OR ABANDONING WASTEWATER GRAVITY MAIN

APPENDIX-B-1- PARALLEL LAY OR CROSSING OF WATER LINES

APPENDIX-C-1CREEK CROSSING

APPENDIX-D-1- ARIAL OR BRIDGE CROSSING

APPENDIX-E- INSTALL RELAY OR REPAIR HOUSE CONNECTION

APPENDIX-E-1- PERSONAL SAFETY

APPENDIX-E-2- JOB SITE SAFETY

APPENDIX-E-3- CONSTRUCTION EQUIPMENT

APPENDIX-E-4- CONSTRUCTION MATERIALS

APPENDIX-E-5- REFERENCE MATERIALS

APPENDIX-E-6-METHOD

APPENDIX-E-7- CUT SIDEWALK DRIVEWAY OR CURB AND GUTTER

APPENDIX-E-8- BREAK OR CUT ASPHALT/CONCRETE STREET

APPENDIX-F- INSTALL WASTEWATER CLEAN-OUT

APPENDIX-F-1 OBJECTIVE

APPENDIX-F-2- PERSONAL SAFETY EQUIPMENT

APPENDIX-F-3- JOB SITE SAFETY EQUIPMENT

APPENDIX-F-4 CONSTRUCTION EQUIPMENT

APPENDIX-F-5- CONSTRUCTION MATERIALS

APPENDIX-F-6- REFERENCE MATERIALS

APPENDIX-F-7- MAJOR TASK AND WORK STEPS FOR INSTALLING A CLEANOUT

APPENDIX-G- INSTALLING WASTEWATER MANHOLES

APPENDIX-G-1- OBJECTIVE

APPENDIX-G-2- PERSONAL SAFETY EQUIPMENT

APPENDIX-G-3- JOBSITE SAFETY EQUIPMENT

APPENDIX-G-4- CONSTRUCTION EQUIPMENT

APPENDIX-G-5- CONSTRUCTION MATERIALS

APPENDIX-G-6- REFERENCE MATERIALS

APPENDIX-G-7-TASK AND WORK STEPS FOR INSTALLING WASTEWATER MANHOLES

APPENDIX-H- REPAIR OF WASTEWATER MANHOLE

APPENDIX-H-1- OBJECTIVE

APPENDIX-H-2-PERSONAL SAFETY EQUIPMENT

APPENDIX-H-3- JOB SITE SAFETY EQUIPMENT

APPENDIX-H-4- CONSTRUCTION EQUIPMENT

APPENDIX-H-5- EROSION CONTROLS

APPENDIX-H-6- CONSTRUCTION MATERIALS

APPENDIX-H-7- REFERENCE MATERIALS

APPENDIX-H-8- MAJOR TASK AND WORK STEPS FOR REPAIRING A WASTEWATER MAN HOLE

APPENDIX-I- REHABILITATION RELAY REPAIR,OR ABANDONMENT OF WASTEWATER FORCE MAIN

APPENDIX-I-1- OBJECTIVE

APPENDIX-I-2- PERSONAL SAFETY EQUIPMENT

APPENDIX-I-3- JOBSITE SAFETY EQUIPMENT

APPENDIX-I-4- CONSTRUCTION EQUIPMENT

APPENDIX-I-5- EROSION CONTROLS

APPENDIX-I-6- CONSTRUCTION MATERIALS

APPENDIX-I-7- RERERENCE MATERIALS

APPENDIX-I-8- MAJOR TASK AND WORK STEPS FOR REHABILITATION RELAY REPAIR OR ABONDONMENT OF A WASTEWATER FORCE MAIN

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APPENDIX-J-2- PERSONAL SAFETY EQUIPMENT

APPENDIX-J-3- JOB SITE SAFETY EQUIPMENT

APPENDIX-J-4- CONSTRUCTION EQUIPMENT

APPENDIX-J-5- CONSTRUCTION MATERIALS

APPENDIX-J-6- MAJOR TASK AND WORK STEPS FOR UNBLOCKING OR CLEARING A WASTEWATER STOP UP OR CONTAINING A MANHOLE OVER FLOW

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APPENDIX-K-3- JOB SITE SAFETY EQUIPMENT

APPENDIX-K-4- CONSTRUCTION EQUIPMENT

APPENDIX-K-5- CONSTRUCTION MATERIALS

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APPENDIX-K-7- INSPECTION

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APPENDIX-M-1- OBJECTIVE

APPENDIX-M-2- PERSONAL SAFETY EQUIPMENT

APPENDIX-M-3- JOB SITE SAFETY EQUIPMENT

APPENDIX-M-4- INSPECTIONS

APPENDIX-M-5- CCTV OPERATIONS

APPENDIX-N- (FOG) OR FATS OILS AND GREASE "25%" RULE

APPENDIX-N-1- OBJECTIVE

APPENDIX-N-2-PERSONAL SAFETY EQUIPMENT

APPENDIX-N-3-JOB SITE SAFETY EQUIPMENT

APPENDIX-N-4- METHOD

APPENDIX-N-5- TOOLS AND EQUIPMENT

APPENDIX-N-6- PREPARATION

APPENDIX-N-7- PROCEDURES FOR CHECKING GREASE AND SOLIDS ACCUMULATIONS IN A GREASE TRAP

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Day-to-Day Standard Operating Procedures

A INSTALL, RELAY, REPAIR, OR ABANDONMENT OF WASTEWATER GRAVITY MAIN

Objective: This Maintenance activity is performed to install, relay, repair or abandon wastewater gravity mains whose integrity has been compromised due to cracks, breaks, collapses due to soil movement, impact, and root intrusion contact with other structures, temperatures, corrosion due to hydrogen sulfide, improper laying or repair, and combinations of any of the above.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEAN-UP AFTER WORK IS COMPLETED TO ENSURE SAFETY.

A-1 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work and/or Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

A-2 Job Site Safety Equipment:

Ladder (Extra Heavy Duty Industrial with IA Duty Rating), Safety Harness, Safety Rope, Gas Detector, Traffic Wand, Traffic Control Devices such as Flags, Flag Stands, Cones Barricades, and Arrowboard, Mesh Safety Fencing, Shoring and/or Trench Box

A-3 Construction Equipment:

Backhoe, Jackhammer, Shovels, Hydrant Wrench, Water Pump, Suction and Discharge Hoses, Chop Saw, Wrenches, Tamper, Air Compressor, , Surveyor's Level, String Line, Batter Board, Pipe Beveller, Rasp, Small Hand Tools, Chain, Sling. Air Plugs or Wing Plugs, Steel Plates, Generator with GFCI, Flood Lights, Hand Lights, Drop Lights with Heavy Duty Bulb U.A. Rated Explosion Proof, and Lift Truck.

A-4 Erosion Controls:

Sand Bag, Filter Dike and/or Silt Fence.

A-5 Construction Materials:

Approved Pipe (appropriate to type of pipe in ground), Rubber Adapters and Stainless Steel Clamps (appropriate to type of material in ground), Retainers and Sleeves, Brick or Concrete Support Blocks, Cement as Required, Select Backfill Materials (flexible base, gem sand, crushed rock, washed rock or two sack flowable fill), 9 mil Polywrap, Poly Tape, Clean Rags, and Cold Mix.

A-6 Reference Materials:

Maps, As-Builts, Profiles, and Aperture Cards.

A-7 Major tasks and work steps for installing, relaying, repairing or abandoning wastewater gravity mains:

1. Coordinate with Camera Crew to televise line in question, using a transponder to pinpoint breaks or sags in the line.

2. Analyze the job site. If possible, have all necessary transition pieces on hand at the job site. Set up traffic control following the Transportation Criteria Manual, on Traffic Control and erosion control per City of Bryant Standard Specifications, The Supervisor or person in charge of the work site will visually inspect site and insure that documentation is made to record pre-existing conditions. Documentation should consist of written field notes and photographs with the location, date, and name of the person documenting the site listed on the back of the photographs. Larger jobs may require use of a video camera to document pre-existing conditions. If it is noted that the street is under construction or is new, report this fact and field conditions to Division Technical Support staff by radio or telephone for assistance or possible special billing. Care should be taken to avoid working in the drip line or root system of protected trees. Notify property owners should be contacted to advise them of your plans and measures taken to protect trees.

3. Make a One Call Request and secure a Permit if necessary.

4. Before any work begins, it is mandatory for each crew member in the work zone to properly wear and maintain all assigned personal safety equipment required for safe job performance. This procedure will be strictly enforced on all jobs at all times.

5. In wastewater ditches, it is essential that you ensure that the atmosphere is regularly checked, using gas detectors to ensure the crew's safety. Before entering a confined space, consult the Water and Wastewater Utility Standard Operating Procedure, which establishes guidelines for working in a Confined Space.

6. If necessary, set up a pump around to provide a clean, dry area for the repair work.

7. Break or cut asphalt/concrete street.

a. The person in charge will make decision to cut rather than break the street; however, cutting is the preferred construction method. Crew should wear safety glasses and hearing protection during the operation as well as (APR) respirator and full face shield when using an abrasive saw.

b. Cut asphalt/concrete with an asphalt spade with jackhammer, chop saw or hoe ram.

Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately after underground utility lines are located.

8. Cut sidewalk, driveway, or curb and gutter.
a. Isolate area to be removed.
b. Cut concrete with a jackhammer, chop saw or hoe ram.
Normally, excavation should not proceed until utilities are located and clearance given.

9. The Supervisor is responsible for providing Superintendent with a list of all regularly scheduled wastewater work to be performed, which will be done on a monthly basis, with updates as needed.

However, if due to an emergency, your crew will be working in a creek bed; MS-4 should be notified before beginning work. Insure that appropriate erosion controls and possible spill confinement measures are taken.

10. Dig hole to expose main. Care should be taken to prevent additional damage to areas outside the trench line.

a. If there is low risk of damaging underground utilities, preferred method is to use backhoe; and/or by hand with shovel, if not.

b. Dig down to flowline. If bedding is contaminated or too wet, then dig down at least 18 inches below damaged or broken pipe or until stable material is found, and remove all unsuitable materials.

11. On trenches 5 feet deep or greater, OSHA regulations require a trench safety system. Follow the manufacturer's Tabulated Data Sheet for shoring chosen as the trench safety system appropriate to the type of soil conditions prevalent on the job undertaken. This data sheet should be kept with the trench shoring equipment at all times. As an alternate method, sloping may be used following OSHA guidelines. Trench shoring or sloping should be used if there is any question about the safety of the trench, regardless of trench depth. A ladder is required in any trench 4 feet deep or greater, with additional ladders placed every 25 feet. The ladder should be a minimum height of 3 feet higher than the existing embankment. Insure that lighting is adequate to safely perform the necessary work.

12. If ground water is encountered, set up pump and dewater trench as necessary.

13. Establish a method of maintaining proper grade by any of the following method:

a. Batter board and String line: Set up a batter board (a 2 inch by 4 inch straight edge that will extend across the ditch). Set a string at the same elevation above the flowline at both points. Pull the string as tightly as possible. Check the string with a 2 foot level from the bottom of the string to insure that flow is in right direction. Then take a grade pole with a shelving and mark pole at a predetermined point from the flowline. Then mark the grade pole for the thickness of the pipe, and finally mark the grade pole 6 inches above the bottom of the pipe mark (for bedding depth).

b. Laser: The laser is set up in essentially the same manner as the batter board and string line. It shoots grade from flow line to flow line after you dial in the percent.

c Surveyor's Level or Transit: Take the difference in elevation of the flow line, between starting and ending points, and divide this by the distance to get the feet of rise per foot--always working from the low point.

14. Before any extensive repairs are made to a wastewater line, consult the Wastewater Collection Superintendent before making decision about what and how repairs should proceed. Possible types of repairs that may be made are as follows:

a. For pipe that has deteriorated or is in poor condition, remove the existing pipe, starting downstream and staying on the downhill side. Work uphill to the high point. Work from the first good bell on the low side to the first good spigot on the high side. If there are very poor pipe conditions, lay new section(s) from manhole to manhole, starting at the lowest manhole and working to the highest manhole with bell ends pointing uphill.

b. Other types of repairs that can be made to pipe which has not deteriorated badly are: slip lining existing pipe, Insituform repairs, pipe bursting, micro tunneling, or actual reconstruction of the wastewater main.

15. If existing material in place is found to be different than planned upon, insure you get appropriate couplings for the material in place.

16. Remove all unstable material and the old pipe. Optimizing Operation, Maintenance, and Rehabilitation of Sanitary Sewer Collection Systems

17. Rebed the ditch to proper grade using one of the methods in number 13 above listed.

18. Make sure the flowlines match when installing the first joint of pipe. If using a rubber coupling, ensure it is supported with a concrete cradle. The cradle should extend 3 inches beyond the width of the coupling. Insure there is no loose material under the concrete cradle as this should sit on a stabilized portion of the ditch (this may or may not sit on bedding material).

19. When existing services are encountered, if possible install a new main size by 6 inch gasketed "Tee". If it is not possible to install a "Tee", then a main size by 6 inch saddle with stainless steel straps may be used in emergency situations only.

CAUTION: Insure that hole in the pipe has been cut to proper dimensions prior to installing tap saddle. The hole should be centered in the direction and grade of the existing service.

Check to insure that the main pipe is properly aligned and does not have any obstructions or jagged edges, using a rasp or grinding tool to remove obstructions or jagged edges. Make sure that the locator ring or shoulder is properly fitted inside the cut opening. Insure that all clamps have been properly installed and tightened. After the "Tee" or tap saddle has been properly installed, reconnect the service to the main, insuring that the gasket has been properly installed.

20 Finish laying all pipe. During pipe installation insure that no joints are glued and that all gaskets are properly placed in the bell end, except when dealing with a pressurized system or when PVC Schedule 40 pipe is used. Bed and blind pipe. If possible before backfilling pipe, televise line to insure all sags have been eliminated and that offset is correct. If scheduling of Camera Crew will not allow pipe to be televised before backfilling is complete, schedule this activity as soon as possible.

21. During activities to install, relay or repair wastewater gravity flow mains, if it is determined that the line needs to be abandoned; the following should be done:

a. Set up a smoke test for the section to be abandoned to verify that no live or improperly abandoned service connections exist.

b. Abandon wastewater gravity flow main by plugging upstream end of the main at the manhole invert(s) or at the end of the main, using concrete, mortar and bricks.

c. Plug the downstream end of the main at the manhole invert(s) or at the end of the main, using concrete, mortar and bricks.

22. If it is determined that it is necessary to abandon a manhole, the following should be done:

a. Remove the ring and cover. The manhole needs to be lowered to a minimum of 36 inches below existing street or ground surface.

b. Plug the invert on both sides with brick and mortar, placing brick 12 inches into the pipe.

c. If the manhole to be abandoned is located in the street or is susceptible to being "washed out", fill it with flowable fill.

d. If the manhole to be abandoned is located in any other area than those listed in "c" above, fill it with sand or gravel and cap it with 12 inches of concrete.

23. Backfill pipe according to City of Bryant Standard Specifications. This should be done carefully to prevent damage to the newly placed pipe.

a. Backfill pipe with gem sand, sand or washed rock in uniform lifts a minimum of 6 inches under the pipe to 12 inches or a maximum of 18 inches over the top of the pipe, depending on the depth of the pipe. On temporary repairs, do not use sand bedding material.

b. Lay polywrap or filter fabric over gravel or washed rock to prevent migration of backfill and possible trench failure.

24. Backfill any trench/subgrade located in right of way with select material, using the City of Bryant Detailed Specification for Construction Methods and Materials and Acceptance of Existing System, "Cuts in Public Rights of Way" in uniform layers not exceeding 6 inches in depth and tamping each layer in accordance with specifications (95% compaction is required).

a. Flexible base placed should be equal to existing material in place or a minimum of 10 inches,

whichever is greater. It should be compacted in 6 inch lifts in accordance with specifications

(100% compaction is required) and should be placed to within 2 inches of the existing surface.

b. Apply temporary paving (cold mix) and compact to existing grade.

25. Remove spoil, insuring that all contaminated spoils are handled in an appropriate manner and hauled to an approved site for proper disposal. Clean up work site and remove erosion controls if possible. Always insure that work site is properly cleaned before removing any erosion controls. If backfill is behind the curb or in an easement, all areas to receive vegetation should be compacted in 6 inch lifts to 95% compaction, to within 4 inches from finished grade. This can be accomplished by using a jumping jack, air tamper, or other approved equipment. Dress the area for vegetation and restore to original condition per stipulations of the General Permit. Maintain erosion controls in place until such time as vegetation has adequately covered disturbed area. Then remove them per City of Bryant Standard Specifications.

26. Remove traffic control devices following the Transportation Criteria Manual, on Traffic Control.

27. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel. Place doorhanger with information regarding work done, supervisor's name, and telephone number for any questions customer may have. If work is done after hours, write your name and telephone number in the appropriate space on the doorhanger as the person responsible for the work done. Also place the name and telephone number of the day zone supervisor so the customer can contact them if they have urgent needs or questions regarding the work done. Never place notice in customer's mailbox and use caution when entering private property at night.

28. If there are any changes in the location of this line or the type of material used, send marked up as-builts or profile to Technical Support staff so it can be sent to Maps and Records,

29. Fill out a Job Completion Report, Status Report, and if needed a Property Damage Report and/or Special Billing Report and other related, required documentation completely and in a timely manner. If a customer, plumber or third party is being special billed for this work, it is important that the proper notification is made to Dispatch so that Law Department is notified. Insure that reports for these charges reflect all actual time, equipment and materials so charges are accurate.

30. If permanent repairs were made by Public Works, upon receipt of the Fixed Priced Payment

Order the Superintendent will insure that the work site is checked before payment approval is made. If there are any problems with the work done or with the way the site was left, Public Works should be notified in writing so that any unacceptable work can be rectified before payment for the job is approved.

31. When installing, relaying, or repairing a wastewater main, there are certain incidental activities pertaining to wastewater construction or repair that may be regulated by Arkansas Natural Resource Conservation Commission or other entities. These activities have been subdivided and succinctly described so that you are familiar with the most common of these. For any specific problems you may encounter with any of the following, get with Division Technical Support staff for assistance.

B-1 PARALLEL LAY OR CROSSING OF WATER LINES

When installing a wastewater line parallel to, or crossing a water line, you must insure that at a minimum, 150 psi pressure rated pipe is used. The pipe must be centered to allow a separation of 10 feet on either side of the existing water line. Additionally, pressure rated fittings must be used on both ends of the pressure rated pipe. These fittings may consist of a coated, solid sleeve with a transition gasket or other approved products from the Utility's Standard Products List for wastewater.

For wastewater mains that cannot be installed with a separation of a minimum of 10 feet from the existing water line, pressure rated pipe and fittings must be used.

Preferred construction method is to maintain a separation of a minimum of 10 feet from the existing water line for all new wastewater installation. Exceptions from this norm should be discussed with Utility Engineering staff.

C-1 CREEK CROSSING

When installing a wastewater line, if it is necessary to cross a creekbed; the preferred construction method is to use lined Ductile Iron pipe. If this is not available, use SDR-21. In any event, either type of pipe used should be encased in concrete. Depending on field conditions, special backfill and trench/cap encasement may be required. Consult with Utility Engineering staff.

D- 1 AERIAL OR BRIDGE CROSSING

When installing a wastewater line that will be suspended aerially, the preferred construction method is to use Yellowmine (U.V. resistant) Pipe or Ductile Iron Pipe (with restrained joints). An appropriate support structure equal to or better than existing should be designed for this work, depending on existing site conditions. For assistance with design or installation of these lines, consult with Division Technical Support staff.

INSTALL, RELAY, OR REPAIR OF HOUSE CONNECTION

E

Objective: This Maintenance activity is performed to install, relay or repair a wastewater house connection whose integrity has been compromised due to cracks, breaks, collapses due to soil movement, impact, root intrusion, contact with other structures, temperatures, corrosion due to hydrogen sulfide, improper laying or repair, and combinations of any of the above. This task may be performed because of problems with an existing house connection or because it was inadvertently forgotten during construction.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD

HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP
AFTER WORK IS COMPLETED TO ENSURE SAFETY.

E-1 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work and/or Rubber Boots, Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

E-2 Job Site Safety Equipment:

Ladder (Extra Heavy Duty Industrial with IA Duty Rating), Safety Harness, Safety Rope, Gas Detector, Traffic Wand, Traffic Control Devices such as Flags, Flag Stands, Cones Barricades, and Arrowboard, Mesh Safety Fencing, Shoring and/or Trench Box.

E-3 Construction Equipment:

Equipment: Backhoe, Jackhammer, Shovels, Hydrant Wrench, Water Pump, Suction and Discharge Hoses, Quickie Saw, Wrenches, Tamper, AirCompressor, Laser, Surveyor's Level, String Line, Batter Board, Transit, Philadelphia Rod (Grade Rod), Pipe Burster, Pipe Beveler, Rasp, Small Hand Tools, Chain, Sling, Jute, Air Plugs or Wing Plugs, Steel Plates, Generator with GFCI, Flood Lights, Hand Lights, Drop Lights with Heavy Duty Bulb U.A. Rated Explosion Proof, and Lift Truck. Erosion Controls: Sand Bag, Filter Dike and/or Silt Fence.

E-4 Construction Materials:

Tees, Wyes, Caps, Approved Pipe (appropriate to type of pipe in ground), Rubber Adapters and Stainless Steel Clamps (appropriate to type of material in ground), Retainers and Sleeves, Brick or Concrete Support Blocks, Cement as Required, Select Backfill Materials (flexible base, gem sand, crushed rock, washed rock or two sack flowable fill), 9 mil Polywrap, Poly Tape, Clean Rags, and Cold Mix.

E-5 Reference Materials:

Quads, As-Builts, Profiles, and Aperture Cards.

Optimizing Operation, Maintenance, and Rehabilitation of Sanitary Sewer Collection Systems Major tasks and work steps for installing, relaying or repairing wastewater house connections:

E-6

METHOD

1. If necessary to televise line in question with the minicam, coordinate this activity with Camera Crew. If problems with the line are indicated when line has been televised, the preferred construction method for repairing a house connection when a break in the street has been discovered, is to relay to the main. If the break is located between the property line and the back of the curb, replace that portion of pipe which is defective. In any event, if there is no clean-out present at this location, install a clean out at the property line upon completion of the work.

2. Analyze the job site. If possible, have all necessary transition pieces on hand at the job site. Set up traffic control following the Transportation Criteria Manual, Section 8 on Traffic Control and

erosion control per City of Bryant Standard Specifications. The Supervisor or person in charge of the work site will visually inspect site and insure that documentation is made to record pre-existing conditions. Documentation should consist of written field notes and photographs with the location, date, and name of the person documenting the site listed on the back of the photographs. Larger jobs may require use of a video camera to document pre-existing conditions. If it is noted that the street is under construction or is new, report this fact and field conditions to Technical Support staff by radio or telephone for assistance or possible special billing. Care should be taken to avoid working in the drip line or root system of protected trees. Notify Superintendent if property owners should be contacted to advise them of your plans and measures taken to protect trees.

3. Make a One Call Request and secure Permit if necessary.

4. Before any work begins, it is mandatory for each crew member in the work zone to properly wear and maintain all assigned personal safety equipment required for safe job performance. This procedure will be strictly enforced on all jobs at all times.

5. In wastewater ditches, it is essential that you ensure that the atmosphere is regularly checked, using gas detectors to ensure the crew's safety. Before entering a confined space, consult the Water and Wastewater Utility Standard Operating Procedure, which establishes guidelines for working in a Confined Space.

E-7 Cut sidewalk, driveway, or curb and gutter.

a. Isolate area to be removed. Insure personnel have necessary personal safety equipment in place during this operation.

b. Cut concrete with a jackhammer, ckop saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately.

E-8 Break or cut asphalt/concrete street.

a. The person in charge will make decision to cut rather than break the street; however, cutting is the preferred construction method. Crew should wear safety glasses and hearing protection during breaker operation as well as (APR) respirator and full face shield when using an abrasive saw.

b. Cut asphalt/concrete with an asphalt spade with jackhammer, chop saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately.

Appendix B: Day-to-Day Standard Operating Procedures

Dig hole to expose the house connection or service. Care should be taken to prevent additional damage to areas outside the trenchline as well as to other utilities.

a. If there is low risk of damaging underground utilities, preferred method is to use backhoe; and/or by hand with shovel, if not.

b. Depending on where problem is located:

1. If problem is located in the house connection portion of the service line (between the property line and the curb), dig down and expose to the "wye". Make repairs to the house connection and install a clean out at the property line, outside limits of sidewalk if there is no clean-out present.

2. If problem is in the service stub and is located in the street, dig down to the flowline, back to the main, and relay the line. Install a clean out at the property line, outside limits of sidewalk if there is no clean-out present.

8. On trenches 5 feet deep or greater, OSHA regulations require a trench safety system. Follow the manufacturer's Tabulated Data Sheet for shoring chosen as the trench safety system appropriate to the type of soil conditions prevalent on the job undertaken. This data sheet should be kept with the trench shoring equipment at all times. As an alternate method, sloping may be used following OSHA guidelines. Trench shoring or sloping should be used if there is any question about the safety of the trench, regardless of trench depth. A ladder is required in any trench 4 feet deep or greater, with additional ladders placed every 25 feet. The ladder should be a minimum height of 3 feet higher than the existing embankment. Insure that lighting is adequate to safely perform the necessary work.

9. If ground water is encountered, set up pump and dewater trench as necessary.

10. Preferred construction method is to insure service line is laid at a minimum 1% fall. Relay or Repair of Wastewater

Gravity Main Break for methods on how to establish proper grade. A 4 foot level may also be used to achieve this goal.

11 If existing material in place is found to be different than planned upon, insure you get appropriate couplings for the material in place.

12. Remove all unstable material and the old pipe.

13. Rebed the ditch to proper grade using one of the methods listed detailed specifications for construction methods and materials , Relay, or Repair of Wastewater Gravity Main Break.

14. Make sure the flowlines match when installing a section of pipe for replacement. If using a rubber coupling, ensure it is supported with a concrete cradle. The cradle should extend 3 inches beyond the width of the coupling. Insure there is no loose material under the concrete cradle as this should sit on a stabilized portion of the ditch (this may or may not sit on bedding material).

15. When replacing existing services to the main, the preferred construction method if PVC pipe is not encountered is to place a saddle in lieu of the old connection. This will prevent any future problems with the "Tee" section. It is recommended that you support the saddle with a concrete cradle. Depending on the condition of the line, it may be necessary to encase the entire connection.

CAUTION: Insure that hole in the pipe has been cut to proper dimensions prior to installing tap saddle. The hole should be centered in the direction and grade of the existing service.

Check to insure that the service is properly aligned and does not have any obstructions or jagged edges, using a rasp or grinding tool to remove obstructions or jagged edges. Make sure that the locator ring or shoulder is properly fitted inside the cut opening. Insure that all clamps have been properly installed and tightened. After the "Tee" or tap saddle has been properly installed, reconnect the service to the main, insuring that the gasket has been properly installed.

16. Finish laying all pipe. During pipe installation insure that no joints are glued and that all gaskets are properly placed in the bell end. When dealing with a pressurized system or when PVC Schedule 40 pipe is used, insure that restrained, mechanical joints of an acceptable pressure rating are used. Bed and blind pipe. If possible before backfilling pipe, retelevise line to insure all sags have been eliminated and that offset is correct. If scheduling of Camera Crew will not allow pipe to be retelevised before backfilling is complete, schedule this activity as soon as possible.

17. Bed and backfill pipe according to City of Bryant Standard Specifications. This should be done carefully to prevent damage to the newly placed pipe.

a. Bed and backfill pipe with gem sand, sand or washed rock in uniform lifts a minimum of 6 inches under the pipe to 12 inches or a maximum of 18 inches over the top of the pipe, depending on the depth of the pipe. On temporary repairs, do not use sand bedding material.

b. Lay polywrap or filter fabric over gravel or washed rock to prevent migration of backfill and possible trench failure.

18. Backfill any trench/subgrade located in right of way with select material, using the Utility in uniform layers not exceeding 6 inches in depth and tamping each layer in accordance with specifications (95% compaction is required).

a. Flexible base placed should be equal to existing material in place or a minimum of 10 inches, whichever is greater. It should be compacted in 6 inch lifts in accordance with specifications and should be placed to within 2 inches of the existing surface.

b. Apply temporary paving (cold mix) and compact to existing grade.

19. Remove spoil, insuring that all contaminated spoils are handled in an appropriate manner and hauled to an approved site for proper disposal. Clean up work site and remove erosion controls if possible. Always insure that work site is properly cleaned before removing any erosion controls. If backfill is behind the curb or in an easement, all areas to receive vegetation should be compacted in 6 inch lifts to 95% compaction, to within 4 inches from finished grade. This can be accomplished by using a jumping jack, air tamper, or other approved equipment. Dress the area for vegetation and restore to original condition per stipulations of the General Permit.

Maintain erosion controls in place until such time as vegetation has adequately covered disturbed area. Then remove them per City of Bryant Standard Specifications,

20. Remove traffic control devices following the Transportation Criteria Manual, Section 8 on

21. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel. Place doorhanger with information regarding work done, supervisor's name, and telephone number for any questions customer may have. If work is done after hours, write your name and telephone number in the appropriate space on the doorhanger as the person responsible for the work done. Also place the name and telephone number of the day zone supervisor so the customer can contact them if they have urgent needs or questions regarding the work done. Never place notice in customer's mailbox and use caution when entering private property at night.

22. If there are any changes in the location of this line or the type of materials used, send marked up as-builts or profile to Division Technical Support Staff so it can be sent to Maps and Records, TAPS, and Dispatch for updating system maps and records.

23. Fill out a Job Completion Report, Status Report, and if needed a Property Damage Report and/or Special Billing Report and other related, required documentation completely and in a timely manner. If a customer, plumber or third party is being special billed for this work, it is important that the proper notification is made to Dispatch so that Law Department is notified. Insure that reports for these charges reflect all actual time, equipment and materials so charges are accurate.

24. If permanent repairs were made by Public Works, upon receipt of the Fixed Priced Payment Order the Supervisor will insure that the work site is checked before payment approval is made. If there are any problems with the work done or with the way the site was left, Public Works should be notified in writing so that any unacceptable work can be rectified before payment for the job is approved.

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Day-to-Day Standard Operating Procedures

F INSTALL WASTEWATER CLEAN-OUT

F-1

Objective: This maintenance activity is performed, if necessary, upon completion of maintenance work done on a wastewater line. The clean-out is installed to allow an access point into the system so that blockage points may be verified and cleaned out. The clean-out also provides the means to inspect the customer's tie-in to the system.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD

HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP

AFTER WORK IS COMPLETED TO ENSURE SAFETY.

F-2 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Workand/or Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

F-3 Job Site Safety Equipment:

Ladder (Extra Heavy Duty Industrial with IA Duty Rating), Safety Harness, Safety Rope, Gas Detector, Traffic Wand, Traffic Control Devices such as Flags, Flag Stands, Cones Barricades, and Arrowboard, Mesh Safety Fencing, Shoring and/or Trench Box.

F-4 Construction Equipment:

Backhoe, Jackhammer, Shovels, Tamper, Pipe Beveler, Rasp, and Small Hand Tools.

F-5 Erosion Controls: Sand Bag, Filter Dike and/or Silt Fence.

F-6 Construction Materials:

Tees, Wyes, Caps, Approved Pipe (appropriate to type of pipe in ground), Rubber Adapters and Stainless Steel Clamps (appropriate to type of material in ground), Brick or Concrete Support Blocks, Cement as Required, Select Backfill Materials (flexible base, gem sand, crushed rock, washed rock or two sack flowable fill), 9 mil Polywrap, Poly Tape, Clean Rags, and Cold Mix.

F-7 Reference Materials:

Tap Cards, As-Builts, Profiles, and Aperture Cards.

F-8 Major tasks and work steps for installing a clean-out:

1. Locate the house connection using information found on the Tap Card. If this information is not available, check as-builts or profile, if available. If none of these are available for consultation, use available electronic locating technology to locate the house connection.

2. Analyze the job site. If possible, have all necessary transition pieces on hand at the job site. Set up traffic control following the Transportation Criteria Manual, Section 8 on Traffic Control and erosion control per City of Bryant Standard Specifications The Supervisor or person in charge of the work site will visually inspect site and insure that documentation is made to record pre-existing conditions. Documentation should consist of written field notes and photographs with the location, date, and name of the person documenting the site listed on the back of the photographs. Larger jobs may require use of a video camera to document pre-existing conditions. If it is noted that the street is under construction or is new, report this fact and field conditions to Division Technical Support staff by radio or telephone for assistance or possible special billing. Care should be taken to avoid

3.working in the drip line or root system of protected trees. Notify superintendent and if possible, property owners should be contacted to advise them of your plans and measures taken to protect trees. Make a One Call Request and secure a Cut Permit if necessary.

4. Before any work begins, it is mandatory for each crew member in the work zone to properly wear and maintain all assigned personal safety equipment required for safe job performance. This procedure will be strictly enforced on all jobs at all times.

5. If due to depth of the house connection, you find that crew will be working in a confined area; it is essential that you ensure that the atmosphere is regularly checked, using gas detectors to ensure the

crew's safety. Before entering a confined space, consult the Water and Wastewater Utility Standard Operating Procedure, which establishes guidelines for working in a Confined Space.

6. If necessary, cut sidewalk, driveway, or curb and gutter. a. Isolate area to be removed. Insure personnel have all appropriate personal safety equipment in place during this operation.

b. Cut concrete with a jackhammer, chop saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately. After underground utility lines are located.

7. If necessary, break or cut asphalt/concrete street.

a. The person in charge will make decision to cut rather than break the street; however, cutting is the preferred construction method. Crew should wear safety glasses and hearing protection during breaker operation as well as (APR) respirator and full face shield when using an abrasive saw.

b. Cut asphalt/concrete with an asphalt spade with jackhammer, quickie saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately. After underground utility lines are located.

8. Dig hole to expose the house connection or service. Care should be taken to prevent additional damage to areas outside the trenchline as well as to other utilities. If there is low risk of damaging underground utilities, preferred method is to use backhoe; and/or by hand with shovel, if not.

9. On trenches 5 feet deep or greater, OSHA regulations require a trench safety system. Follow the manufacturer's Tabulated Data Sheet for shoring chosen as the trench safety system appropriate to the type of soil conditions prevalent on the job undertaken. This data sheet should be kept with the trench shoring equipment at all times. As an alternate method, sloping may be used following OSHA guidelines. Trench shoring or sloping should be used if there is any question about the safety of the trench, regardless of trench depth. A ladder is required in any trench 4 feet deep or greater, with additional ladders placed every 25 feet. The ladder should be a minimum height of 3 feet higher than the existing embankment. Insure that lighting is adequate to safely perform the necessary work.

10. Cut the city riser. Install fittings as necessary to make proper connection as per City of Bryant

Detailed specification for construction methods and meterials . Due to existing field conditions, modifications may need to be made as necessary to ensure a good connection.

NOTE: Never make a short radius 90 degree turn. Maintain a slow rolling radius by constructing a 90 degree turn with two 45 degree angle pieces or four 22 1/2 degree bends if there is enough room. DO NOT USE 90 DEGREE FITTINGS.

11. Tie the customer's service line to the yard line.

12. Bed and backfill pipe according to City of Bryant Detailed specifications for construction methods and materials. This should be done carefully to prevent damage to the newly placed connection and clean-out.

13. If applicable, backfill any trench/subgrade located in right of way with select material, using the Utility Criteria Manual in uniform layers not exceeding 6 inches in depth and tamping each layer in accordance with specifications (95% compaction is required).

a. Flexible base placed should be equal to existing material in place or a minimum of 10 inches, whichever is greater. It should be compacted in 6 inch lifts in accordance with specifications (100% compaction is required) and should be placed to within 2 inches of the existing surface.

b. Apply temporary paving (cold mix) and compact to existing grade.

c. If street is less than two years old, follow Section Criteria Manual for Cuts in New Streets.

14. Remove spoil, insuring that all contaminated spoils are handled in an appropriate manner and hauled to an approved site for proper disposal. Clean up work site and remove erosion controls if possible. Always insure that work site is properly cleaned before removing any erosion controls. If backfill is behind the curb or in an easement, all areas to receive vegetation should be compacted in 6 inch lifts to 95% compaction, to within 4 inches from finished grade. This can be accomplished by using a jumping jack, air tamper, or other approved equipment. Dress the area for vegetation and restore to original condition per stipulations of the General Permit. Maintain erosion controls in place until such time as vegetation has adequately covered disturbed area. Then remove them per City of Bryant Standard Specifications.

15. Remove traffic control devices following the Transportation Criteria Manual, on traffic Control.

16. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel. Place doorhanger with information regarding work done, supervisor's name, and telephone number for any questions customer may have. If work is done after hours, write your name and telephone number in the appropriate space on the doorhanger as the person responsible for the work done. Also place the name and telephone number of the day zone supervisor so the customer can contact them if they have urgent needs or questions regarding the work done. Never place notice in customer's mailbox and use caution when entering private property at night.

17. If there are any changes in the location of the line or the type of material used, send marked up as-builts or profiles to Technical Support Staff so it can be sent to Maps and Records, TAPS and Dispatch for updating system maps and records.

18. Fill out a Job Completion Report, Status Report, and if needed a Property Damage Report and/or special Billing Report and other related, required documentation completely and in a timely manner. If a customer, plumber or third party is being special billed for this work, it is important that the proper notification is made to Dispatch so that Law Department is notified. Insure that reports for these charges reflect all actual time, equipment and materials so charges are accurate.

19. If permanent repairs were made by Public Works, upon receipt of the Fixed Priced Payment Order the Supervisor will insure that the work site is checked before payment approval is made. If there are any problems with the work done or with the way the site was left, Public Works should be notified in writing so that any unacceptable work can be rectified before payment for the job is approved.

G INSTALL WASTEWATER MANHOLE

G-1 Objective: This maintenance activity is performed to provide access to the wastewater system due to the following: change of pipe size, branch connections, change of grade, or other special conditions. Manholes should be no farther than 500 feet apart.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP AFTER WORK IS COMPLETED TO ENSURE SAFETY.

G-2 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work and/or Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

G-3 Job Site SafetyEquipment:

Ladder (Extra Heavy Duty Industrial with IA Duty Rating), Safety Harness, Safety Rope, Gas Detector, Traffic Wand, Traffic Control Devices such as Flags, Flag Stands, Cones Barricades, and Arrowboard, Mesh Safety Fencing, Shoring and/or Trench Box.

G-4 Construction Equipment:

Backhoe, Jackhammer, Shovels, Hydrant Wrench, Water Pump, Suction and Discharge Hoses, Pipe Cutter (appropriate to material in ground), Wrenches, Tamper, Air Compressor, Laser, Surveyor's Level, String Line, Batter Board, Transit, Philadelphia Rod (Grade Rod), Pipe Beveler, Rasp, Trowel, Small Hand Tools, Chain, Sling, Jute, Air Plugs or Wing Plugs, Steel Plates, Generator with GFCI, Flood Lights, Hand Lights, Drop Lights with Heavy Duty Bulb U.A. Rated Explosion Proof, 5 Ton Crane, and Lift Truck.

Erosion Controls: Sand Bag, Filter Dike and/or Silt Fence.

G-5 Construction Materials:

Approved Manhole Sections, Approved Pipe (appropriate to type of pipe in ground), Appropriate Ring and Cover, Grade Rings (Donuts), Stainless Steel Clamps (appropriate to type of material in ground), Rubber Gaskets, Sleeves, Joint Lubricant, Brick or Concrete Support Blocks, Concrete or Cement as Required, Select Backfill Materials (flexible base, gem sand, crushed rock, washed rock or two sack flowable fill), 9 mil Polywrap, Poly Tape, Clean Rags, and Cold Mix.

G-6 Reference Materials:

Quads, As-Builts, Profiles, and Aperture Cards.

G-7 tasks and work steps for installing a wastewater manhole:

1. Analyze the job site. If possible, have all necessary transition pieces on hand at the job site. Set up traffic control following the Transportation Criteria Manual, Section 8 on Traffic Control and

erosion control per City of Bryant Standard Specifications. The Supervisor or person in charge of the work site will visually inspect site and insure that documentation is made to record pre-existing conditions. Documentation should consist of written field notes and photographs with the location, date, and name of the person documenting the site listed on the back of the photographs. Larger jobs may require use of a video camera to document pre-existing conditions. If it is noted that the street is under construction or is new, report this fact and field conditions to Division Technical Support staff by radio or telephone for assistance or possible special billing. Care should be taken to avoid working in the drip line or root system of protected trees. Notify superintendent and if possible, property owners should be contacted to advise them of your plans and measures taken to protect trees.

2. Make a One Call Request and secure a Cut Permit if necessary.

3. Before any work begins, it is mandatory for each crew member in the work zone to properly wear and maintain all assigned personal safety equipment required for safe job performance. This procedure will be strictly enforced on all jobs at all times.

4. In wastewater ditches, it is essential that you ensure that the atmosphere is regularly checked, using gas detectors to ensure the crew's safety. Before entering a confined space, consult the Water and

Wastewater Utility Standard Operating Procedure, which establishes guidelines for working in a Confined Space.

5. If necessary, set up a pump around to provide a clean, dry area for the repair work.

6. Break or cut asphalt/concrete street.

a. The person in charge will make decision to cut rather than break the street; however, cutting is the preferred construction method. Crew should wear safety glasses and hearing protection during breaker operation as well as (APR) respirator and full face shield when using an abrasive saw.

b. Cut asphalt/concrete with an asphalt spade with jackhammer, quickie saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may

begin immediately. After underground utility lines are located excavation with heavy construction equipment may begin.

7. If necessary, cut sidewalk, driveway, or curb and gutter.

a. Isolate area to be removed.

b. Cut concrete with a jackhammer, quickie saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately. After underground utility lines are located excavation with heavy construction equipment may begin.

8. The Supervisor is responsible for providing Public works with updates as needed. However, if due to an emergency, your crew will be working in an easement or creekbed; MS4. should be notified before beginning work. Insure that appropriate erosion controls and possible spill confinement measures are taken.

9. Install wastewater manholes per City of Bryant Detailed Specifications for Construction Methods and Materials.

10. Excavate a minimum of 12 inches below the outside diameter (O.D.) of the existing main. Care should be taken to prevent additional damage to areas outside the trenchline. If there is low risk of damaging underground utilities, preferred construction method is to use backhoe; and/or excavate by hand with shovel, if not.

11. On trenches 5 feet deep or greater, OSHA regulations require a trench safety system. Follow the manufacturer's Tabulated Data Sheet for shoring chosen as the trench safety system appropriate to the type of soil conditions prevalent on the job undertaken. This data sheet should be kept with the trench shoring equipment at all times. As an alternate method, sloping may be used following OSHA guidelines. Trench shoring or sloping should be used if there is any question about the safety of the trench, regardless of trench depth. A ladder is required in any trench 4 feet deep or greater, with additional ladders placed every 25 feet. The ladder should be a minimum height of 3 feet higher than the existing embankment. Insure that lighting is adequate to safely perform the necessary work.

12. If ground water is encountered, set up pump and dewater trench as necessary.

13. Establish a method of maintaining proper grade. Refer to Section VI.A. of this manual regarding Install, Relay or Repair of Wastewater Gravity Main Break on page 103 of this manual, which establishes methodology for maintaining proper grade.

14. Build manhole invert at the proper elevation. Preferred construction method is to maintain a minimum 0.10 foot (approximately 1.25 inches) fall through the manhole, when possible. Otherwise, follow the slope of the pipe.

15. The pipe coming into the manhole should be supported with bricks, ensuring that these are located outside the perimeter of the manhole base. The manhole base should have an inside diameter of 4 feet and an outside diameter of 6 feet. This can be achieved by marking the center point with a nail and scribing a 2 foot radius.

16. The concrete should be a minimum of 8 inches thick below the bottom of the outside diameter of the pipe. The roll of the invert should be half the diameter of the pipe with a slight taper toward the edge. Keep the invert the same diameter as the pipe, and never "Tee" in straight. There should be no hard corners—always smooth corners with a smooth trowel finish. As a construction guide.

17. Where field conditions will allow, precast base sections can be used as approved on the Utility's Standard Product List. All manhole bases constructed in place should be constructed with Class A concrete with a 2 to 3 inch slump maximum (a stiff, dry mix). Curing time of 72 hours should elapse before manhole sections are stacked on the base, unless high early strength concrete is used, for which curing time will be a minimum of 12 hours.

18. After curing time has elapsed, make a mortar mix (a sand and cement mix) with proportions of 3:1 (i.e. 3 parts sand to 1 part cement). This will be a stiff mix used as a sealant on interior and exterior walls of the manhole and at the seams of the foundation. Begin stacking precast sections or poured in place The first section of the manhole should be set on 1 inch of the prepared mortar mix, which has been placed on the concrete base. After the first section has been placed on the mortar mix, subsequent sections will be stacked before mortar hardens. These joints will be gasketed (not mortared) in place. Then go back and rewipe the bottom section with the mortar mix at the foundation to ensure a good seal.

19. All subsequent gasketed joints should be sealed by liberally lubricating and installing an appropriate "0 Ring". Lubricate the groove and bottom of each subsequent joint with pipe soap. Ensure safe construction practices are observed when stacking manhole sections in place. Backfill should take place as each section is installed. Bed and backfill pipe according to City of Bryant Standard Specifications, Pipe and Appurtenances, . This should be done carefully to prevent damage to the newly constructed manhole.

20. Install rings and cone sections as necessary, measuring from existing pavement or ground elevation. Try to set top of cone within 6 inches of grade or within a maximum of 12 inches on new construction.

21. If applicable, backfill any trench/subgrade located in right of way with select material, using the Utility Detailed Specifications in uniform layers not exceeding 6 inches in depth and tamping each layer in accordance with specifications (95% compaction is required).

a. Flexible base placed should be equal to existing material in place or a minimum of 10 inches, whichever is greater. It should be compacted in 6 inch lifts in accordance with specifications (100% compaction is required) and should be placed to within 2 inches of the existing surface.

b. Apply temporary paving (cold mix) and compact to existing grade.

c. If street is less than two years old, follow the City of Bryant Construction Method and Material Manual for Cuts in New Streets.

22. Mortar ring and cover and wipe the chimney inside and out on all grade rings (donuts) used in adjustment of castings.

23. Do not subject manhole to traffic for at least 12 hours. This may be plated off or barricaded, depending upon location and traffic.

24. Remove spoil, insuring that all contaminated spoils are handled in an appropriate manner and hauled to an approved site for proper disposal. Clean up work site and remove erosion controls if possible. Always insure that work site is properly cleaned before removing any erosion controls. If backfill is behind the curb or in an easement, all areas to receive vegetation should be compacted in 6 inch lifts to 95% compaction, to within 4 inches from finished grade. This can be accomplished by using a jumping jack, air tamper, or other approved equipment. Dress the area for vegetation and restore to original condition per stipulations of the General Permit. Maintain erosion controls in place until such time as vegetation has adequately covered disturbed area. Then remove them per City of Bryant Standard Specifications.

25. Remove traffic control devices following the Transportation Criteria Manual, on Traffic Control.

26. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel. Place doorhanger with information regarding work done, supervisor's name, and telephone number for any questions customer may have. If work is done after hours, write your name and telephone number in the appropriate space on the doorhanger as the person responsible for the work done. Also place the name and telephone number of the day zone supervisor so the customer can contact them if they have urgent needs or questions regarding the work done. Never place notice in customer's mailbox and use caution when entering private property at night.

27. If there are any changes in the location of the line, the type of material used, or a new manhole built, send marked up as-builts or profiles to Division Technical Support Staff so it can be sent to Maps and Records, for updating system maps and records.

28. Fill out a Job Completion Report, Status Report, and if needed a Property Damage Report and/or Special Billing Report and other related, required documentation completely and in a timely manner. If a customer, plumber or third party is being special billed for this work, it is important that the proper notification is made to Dispatch so that Law Department is notified. Insure that reports for these charges reflect all actual time, equipment and materials so charges are accurate.

29. If permanent repairs were made by Public Works, upon receipt of the Fixed Priced Payment Order the Supervisor will insure that the work site is checked before payment approval is made. If there are any problems with the work done or with the way the site was left, Public Works should be notified in writing so that any unacceptable work can be rectified before payment for the job is approved.

H REPAIR OF WASTEWATER MANHOLE

H-1 Objective: This maintenance activity is performed to repair manholes which have been damaged.

Typical repairs made to manholes are to cracked bases, tie-ins to an existing manhole, adjustments to manholes that exceed 2 foot allowable ring adjustment, coating the inside, or resealing or replacing a ring and cover. These are caused by infiltration or leaks due to erosion, soil movement, corrosion due to chemical or sulfide damage, improper construction or repair, or combinations of any of the above.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP AFTER WORK IS COMPLETED TO ENSURE SAFETY.

H-2 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work and/or Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

H-3 Job Site Safety Equipment:

Ladder (Extra Heavy Duty Industrial with IA Duty Rating), Safety Harness, Safety Rope, Gas Detector, Traffic Wand, Traffic Control Devices such as Flags, Flag Stands, Cones Barricades, and Arrowboard, Mesh Safety Fencing, Shoring and/or Trench Box.

H-4 Construction Equipment:

Backhoe, Jackhammer, Shovels, Hydrant Wrench, Water Pump, Suction and Discharge Hoses, Pipe Cutter (appropriate to material in ground), Wrenches, Tamper, Air Compressor, Laser, Surveyor's Level, String Line, Batter Board, transit, (Grade Rod), Pipe Beveler, Rasp, Trowel, Small Hand Tools, Chain, Sling, Jute, Air Plugs or Wing Plugs, Steel Plates, Generator with GFCI, Flood Lights, Hand Lights, Drop Lights with Heavy Duty Bulb U.A. Rated Explosion Proof, 5 Ton Crane, and Lift Truck.

H-5 Erosion Controls:

Sand Bag, Filter Dike and/or Silt Fence.

H-6 Construction Materials:

Approved Manhole Sections, Approved Pipe (appropriate to type of pipe in ground), Appropriate Ring and Cover, Grade Rings (Donuts), Stainless Steel Clamps (appropriate to type of material in ground), Rubber Gaskets, Sleeves, Joint Lubricant, Brick or Concrete Support Blocks, Concrete or Cement as Required, Select Backfill Materials (flexible base, gem sand, crushed rock, washed rock or two sack flowable fill), 9 mil Polywrap, Poly Tape, Clean Rags, and Cold Mix.

H-7 Reference Materials:

Quads, As-Builts, Profiles, and Aperture Cards.

H-8 Major tasks and work steps for repairing a wastewater manhole:

1. Analyze the job site. If possible, have all necessary materials on hand at the job site. Set up traffic control following the Transportation Criteria Manual, on Traffic Control and erosion control per City of Bryant Standard Specifications. The Supervisor or person in charge of the work site will visually inspect site and insure that documentation is made to record pre-existing conditions. Documentation should consist of written field notes and photographs with the location, date, and name of the person documenting the site listed on the back of the photographs. Larger jobs may require use of a video camera to document pre-existing conditions. If it is noted that the street is under construction or is new, report this fact and field conditions to Division Technical Support staff by radio or telephone for assistance or possible special billing. Care should be taken to avoid working in the drip line or root system of protected trees. Notify Public Works. and if possible, property owners should be contacted to advise them of your plans and measures taken to protect trees.

2. Make a One Call Request and secure a Cut Permit if necessary.

3. Before any work begins, it is mandatory for each crew member in the work zone to properly wear and maintain all assigned personal safety equipment required for safe job performance. This procedure will be strictly enforced on all jobs at all times.

4. In wastewater ditches, it is essential that you ensure that the atmosphere is regularly checked, using gas detectors to ensure the crew's safety. Before entering a confined space, consult the Water and Wastewater Utility Standard Operating Procedure, which establishes guidelines for working in a Confined Space.

5. If possible, isolate manhole by diverting the flow. If necessary, set up a pump around to provide a clean, dry area for the repair work.

If necessary to break or cut asphalt/concrete street:

a. The person in charge will make decision to cut rather than break the street; however, cutting

is the preferred construction method. Crew should wear safety glasses and hearing protection during breaker operation as well as (APR) respirator and full face shield when using an abrasive saw.

b. Cut asphalt/concrete with an asphalt spade with jackhammer, chop saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately. After underground utility lines are located, excavation with heavy construction equipment may begin.

6. If necessary to cut sidewalk, driveway, or curb and gutter.

a. Isolate area to be removed.

b. Cut concrete with a jackhammer, chop saw or hoe ram. Normally, excavation should not proceed until utilities are located and clearance given. However, during emergencies after all site preparations are made and erosion controls are in place, with supervisory approval hand excavation using extreme caution may begin immediately. After underground utility lines are located, excavation with heavy construction equipment may begin.

7. The Supervisor is responsible for providing Public works. with updates as needed. However, if due to an emergency, your crew will be working in a creekbed MS4. should be notified before beginning work. Insure that appropriate erosion controls and possible spill confinement measures are taken.

8. For repairs to manhole bottoms, the following should be done:

a. Thoroughly clean the area (down to sound concrete) with a high pressure spray, removing all grease or damaging chemicals.

b. Prepare a mortar mix and repair or reshape the bottom of the base of the invert with the mortar mix (prepared, as always, with potable water). This should be a dry mix shaped to the bottom. Try to maintain a minimum 0.10 foot (approximately 1.25 inches) fall through the manhole, when possible. Otherwise, follow the slope of the pipe. Form a flow channel, creating a smooth flow line. Never "Tee" in straight. There should be no hard corners--always smooth corners with a smooth trowel finish.

c. Seal around all pipe connections, using quickset mortar, and cure for at least 4 hours before opening manhole to flow.

9. For tie-ins, the following should be done: a. The preferred method is to scribe a circle on the outside of the manhole at the proper elevation and location.

b. Drill 1/2 inch diameter holes around the circumference of the scribed line of the pipe 2 inches on center.

c. Chip holes out and remove the plug with care so as not to damage the manhole section. This can be done by using a chipping hammer or jackhammer.

d. Enter manhole and chip or rough-cut a flow channel for the new line or build the channel out of brick and mortar.

e. Channelize invert to accommodate the new pipe.

10. Brick may be used as a filler or for structural integrity, as needed.

11. For adjustments to manholes that exceed the 2 foot allowable ring adjustment, the following should be done:

a. Saw cut the pavement by marking an 8 1/2 foot square around the top of the manhole, centered on the manhole.

b. Break and remove the asphalt with a jackhammer or hoe ram.

c. Begin to excavate down the side of the manhole to 1 foot below the cone section.

d. Remove the ring and cover and any adjustment grade rings (donuts).

e. Safely remove the cone section with an approved method such as wedging a steel beam inside the cone section or by using an approved lifting device. Tie a chain or 3/4 inch cable sling to the steel beam (or whatever you used to wedge inside the cone section). Attach chain or sling to the lifting device (lift truck, backhoe, etc.). If using a backboom on a backhoe to lift, weight the front with sufficient ballast to insure backhoe will not be pulled over by the force exercised when lifting begins

f. Pull the cone section out and remove it from the manhole.

g. Clean the spigot end, removing any old mortar or debris.

h. Preferred construction method is to install a new gasket. If a proper gasket is not available, clean the seam and remortar as you set the new section.

i. If new section dimensions are not the same as the old section in place, or if the groove does not match up, mortar a new section riser of the appropriate length in place.

j. Replace cone section with new gasket or mortar it in place. Reinstall ring and cover using adjusting grade rings (donuts) as necessary to bring top of manhole to finish grade.

k. If existing ring and cover is bolted using 9/16 inch bolts, ring and cover should be replaced with new approved 15/16 inch bolted ring and cover.

1. Insure all adjusting grade rings are wiped inside and out with an approved mortar mix. Allow the mortar mix to cure as long as possible before beginning backfill operations.

m. Backfill any trench/subgrade located in right of way with select material, using the Utility Criteria Manual, Construction Methods and Materials in uniform layers not exceeding 6 inches in depth and tamping each layer in accordance with specifications (95% compaction is required).

1. Flexible base placed should be equal to existing material in place or a minimum of 10 inches, whichever is greater. It should be compacted in 6 inch lifts in accordance with specifications (100% compaction is required) and should be placed to within 2 inches of the existing surface.

2. Apply temporary paving (cold mix) and compact to existing grade.

3. If Street is less than two years old, refer f the Utility Criteria Manual for Cuts in New Streets.

n. Do not subject manhole to traffic for at least 12 hours. This may be plated off or barricaded, depending upon location and traffic.

13. Coating manholes is a maintenance task which is currently being performed by contract labor.

14. For resealing or replacing ring and cover, the following should be done:

a. If existing ring and cover is still serviceable, temporarily remove it so that all old grout and mortar mix can be removed from the top of the cone section and ring.

b. Thoroughly clean this section, using a brush, small chisel, and hammer. Insure surface is clean before covering the top of the cone section.

c. Place a minimum 1 inch thick bead of mortar (use enough to bring section to finish grade).

d. Rewipe ring with generous amount of mortar and mound it around the edge.

e. Set the ring, insuring it comes to the top and sloping it to the outside edge of the cone section. If this is placed in the street or a paved alley, leave the mortar down 2 to 3 inches, or the thickness of the existing pavement.

f. If this is placed in any other area (creekbed, right of way, etc.), use a bolted ring and cover.

15. Once the above referenced tasks have been completed, follow standard operating procedures by removing spoil, insuring that all contaminated spoils are handled in an appropriate manner and hauled to an approved site for proper disposal. Clean up work site and remove erosion controls if possible. Always insure that work site is properly cleaned before removing any erosion controls. If backfill is behind the curb or in an easement, all areas to receive vegetation should be compacted in 6 inch lifts to 95% compaction, to within 4 inches from finished grade. This can be accomplished by using a jumping jack, air tamper, or other approved equipment. Dress the area for vegetation and restore to original condition per stipulations of the General Permit. Maintain erosion controls in place until such time as vegetation has adequately covered disturbed area. Then remove them per City of Bryant Standard Specifications, Detailed Specifications and Construction Methods and Materials.

16. Remove traffic control devices following the Transportation Criteria Manual.

17. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel. Place doorhanger with information regarding work done, supervisor's name, and telephone number for any questions customer may have. If work is done after hours, write your name and telephone number in the appropriate space on the doorhanger as the person responsible for the work done. Also place the name and telephone number of the day zone supervisor so the customer can contact them if they have urgent needs or questions regarding the work done. Never place notice in customer's mailbox and use caution when entering private property at night.

18. If there are any changes in the location of the line, the type of material used, or a new connection to the manhole; send marked up as-builts or profiles to Division Technical Support staff so it can be sent to Maps and Records, for updating system maps and records.

19. Fill out a Job Completion Report, Status Report, and if needed a Property Damage Report and/or Special Billing Report and other related, required documentation completely and in a timely manner. If a customer, plumber or third party is being special billed for this work, it is important that the proper notification is made to Dispatch so that Law Department is notified. Insure that reports for these charges reflect all actual time, equipment and materials so charges are accurate.

20. If permanent repairs were made by Public Works, upon receipt of the Fixed Priced Payment Order the Supervisor will insure that the work site is checked before payment approval is made. If there are any problems with the work done or with the way the site was left, Public Works should be notified in writing so that any unacceptable work can be rectified before payment for the job is approved.

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Day-to-Day Standard Operating Procedures

I REHABILITATION, RELAY, REPAIR, OR ABANDONMENT OF WASTEWATER FORCE MAIN

I-1

Objective: This maintenance activity is performed when it becomes necessary to rehabilitate, relay, repair or abandon a wastewater force main which may be damaged, causing leaks due to improper construction, soil movement, impact to the main, or deterioration of the pipe. Other causes of damage to these mains may consist of inadequate thrust restraint, chemical or sulfide damage, or combinations of any of the above.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP AFTER WORK IS COMPLETED TO ENSURE SAFETY.

I-2 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work and/or Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

I-3 Job Site Safety Equipment:

Equipment: Ladder (Extra Heavy Duty Industrial with IA Duty Rating), Safety Harness, Safety Rope, Gas Detector, Traffic Wand, Traffic Control Devices such as Flags, Flag Stands, Cones Barricades, and Arrowboard, Mesh Safety Fencing, Shoring and/or Trench Box.

I-4 Construction Equipment:

Backhoe, Jackhammer, Shovels, Hydrant Wrench, Water Pump, Suction and Discharge Hoses, Pipe Cutter (appropriate to material in ground), Wrenches, Tamper, Air Compressor, Laser, Surveyor's Level, String Line, Batter Board, Transit, (Grade Rod), Pipe Beveler, Rasp, Trowel, Small Hand Tools, Chain, Sling, Jute, Air Plugs or Wing Plugs, Steel Plates, Generator with GFCI, Flood Lights, Hand Lights, Drop Lights with Heavy Duty Bulb U.A. Rated Explosion Proof, 5 Ton Crane, Vactor Truck, and Lift Truck.

I-5 Erosion Controls:

Sand Bag, Filter Dike and/or Silt Fence.

I-6 Construction Materials:

Approved Pipe (appropriate to type of pipe in ground and to the working pressure of the system in place) such as Coated Ductile Iron or PVC with a minimum PSI of 250 pressure rating , Fittings, Rubber Gaskets, Sleeves, Joint Lubricant, Brick or Concrete Support Blocks, Concrete or Cement as Required, Select Backfill Materials (flexible base, gem sand, crushed rock, washed rock or two sack flowable fill), Clean Rags, 9 mil Polywrap, Poly Tape, and Cold Mix.

I-7 Reference Materials:

Quads, As-Builts, Profiles, and Aperture Cards.

6. On trenches 5 feet deep or greater, OSHA regulations require a trench safety system. Follow the manufacturer's Tabulated Data Sheet for shoring chosen as the trench safety system appropriate to the type of soil conditions prevalent on the job undertaken. This data sheet should be kept with the trench shoring equipment at all times. As an alternate method, sloping may be used following OSHA guidelines. Trench shoring or sloping should be used if there is any question about the safety of the trench, regardless of trench depth. A ladder is required in any trench 4 feet deep or greater, with additional ladders placed every 25 feet. The ladder should be a minimum height of 3 feet higher than the existing embankment. Insure that lighting is adequate to safely perform the necessary work.

7. Locate the break(s) in the wastewater force main. If leak cannot be visually detected, contact Leak Detection personnel for assistance.

8. Determine type of break (beam, split, corrosion, blow-out, etc.).

9. Request repair material from the pipe yard if item is not available on maintenance truck. Supervisor may have to make arrangements to have material(s) picked up and delivered to the site.

10. Make the appropriate repair.

a. If the area to be repaired is small enough, the preferred method of repair is to cut in a nipple (a 3 foot minimum length is required) and use two sleeves. An alternate repair method is to use a repair clamp, if rehabilitation is scheduled within 3 years or when making temporary repairs to

keep the public in service until permanent repairs can be made. Thoroughly clean the section of the pipe to which the sleeves/clamp will be applied and install the sleeves/clamp, making sure that the pipe surface is as smooth as possible. Insure that even pressure is applied to the clamping bolts to get a good seal.

b. If the line to be repaired is C900 PVC, Cast Iron, or Ductile Iron; and the line is split:

1. Cut out damaged section at least one foot past the split area and clean the pipe ends to be fitted. Always wear safety glasses, hearing protection, full face shield, and an (APR) respirator when using any saw or cutting tool!

2. Measure the section of pipe to be replaced.

Major tasks and work steps for rehabilitation, relay, repair or abandonment of a wastewater force main:

1. If possible, coordinate and schedule the shut down of the lift station prior to containment and repair with Pumps and Controls staff during regular working hours or after hours, weekends, and holidays. NOTE: If you determine or suspect through records or visual inspection a restrained joint system is in place, refer to The City of Bryant Detailed Specifications for Construction Methods and Materials manual regarding Installation of Restraint Systems.

2. Analyze the job site. If possible, have all necessary materials on hand at the job site. Set up traffic control following the Transportation Criteria on Traffic Control and erosion control per City of Bryant Standard Specifications, . The Supervisor or person in charge of the work site will visually inspect site and insure that documentation is made to record pre-existing conditions. Documentation should consist of written field notes and photographs with the location, date, and name of the person documenting the site listed on the back of the photographs. Larger jobs may require use of a video camera to document pre-existing conditions. If it is noted that the street is under construction or is new, report this fact and field conditions to Division Technical Support staff by radio or telephone for assistance or possible special billing. Care should be taken to avoid working in the drip line or root system of protected trees. Notify Public Works Department. and if possible, property owners should be contacted to advise them of your plans and measures taken to protect trees. Contain any wastewater spillage as quickly as possible by setting up a pump around, if possible, or by calling in pump trucks to haul effluent to approved disposal sites.

3. Make a One Call Request and secure a Cut Permit, if necessary.

4. Before any work begins, it is mandatory for each crew member in the work zone to properly wear and maintain all assigned personal safety equipment required for safe job performance. This procedure will be strictly enforced on all jobs at all times.

5. Dig hole to expose main. Care should be taken to prevent additional damage to areas outside the trenchline.

a. If there is low risk of damaging underground utilities, preferred method is to use backhoe; and/or by hand with shovel, if not.

b. Trench should extend at least 12 inches below damaged or broken pipe.

3. Measure and cut Ductile Iron or C900 PVC replacement pipe. Any metal components need to be wrapped with 9 mil polywrap. Insure that polywrap is sealed and secured on the end with poly tape. At this time a field determination needs to be made whether a restraint system is required or not.

4. Place restraints if needed. Refer to the Detailed Specifications manual regarding Installation of Restraint Systems, then place glands or followers on ends of replacement pipe and on pipe ends to be fitted.

5. Center sleeves and seat gasket on both ends of each sleeve, making sure that the tapered end of the gasket is towards the fitting.

6. Slide retainers into place and tighten bolts. Bolts must be tightened in a consistent manner so that an even constant pressure is maintained on the gasket. Failure to take the time to tighten bolts evenly, using a crisscross pattern, can result in a subsequent main failure. It is important to use the manufacturer's recommended torque, and do not tighten bolts too much to avoid breaking the follower.

c. Concrete Steel Cylinder: Solicit and follow the pipe manufacturer's recommendations for repair. The preferred method is to use a weld-on saddle. The size of the saddle should be determined in the field. If the break is larger than the available weld-on saddle, a plate with saddle can be welded onto the pipe and the tensioning rods welded back into place over the plate. Finish repair by remortaring pipe inside and out and using a diaper as needed.

d. Asbestos Cement (AC): Before beginning repairs on A/C pipe, consult the Water and Wastewater Utility Standard Operating Procedure for AC line

e. In all cases it is important that the pipe interior is protected from entry of animals, rags, and any other extraneous solids. Any materials that may enter the main should be removed

immediately, before they get further into the line and cannot be removed. Rags and other foreign materials allowed to remain in the line during a repair can later clog up services or cause other problems such as a reduction in flow capacity or an increase in the head that must be overcome by the pumps.

f. Documentation of type of repair and materials used should be given to Division Technical Support staff so it can be sent to Maps and Records, TAPS and Dispatch for updating system maps and records.

11. The repaired section should be temporarily supported with blocking.

12. After insuring there are no additional leaks, wrap all iron pipe and fittings with 9 mil polywrap to prevent corrosion. Insure that polywrap is sealed and secured on the end with poly tape.

13. Perform a final visual inspection. Remove all temporary blocking and begin bedding with a minimum amount of cover to hold the pipe in place. Then begin bringing lift station pumps on, one at a time until the force main is in operation. This should be done slowly to avoid the water hammer effect.

14. During activities to rehabilitate, relay or repair a wastewater force main, if it is determined that it is necessary to abandon a lift station or a wastewater force main, the following should be done:

a. Plug both ends of the line on the section to be abandoned.

b. If necessary, the wet well should be cleaned with a vac-con truck.

c. Fill the wet well up with sand to within 36 inches of finish grade. Insure sand is thoroughly consolidated, compacting as each lift is placed.

d. Remove the top 18 to 24 inches of structure, then place a concrete cap.

e. Backfill the lift station site or structure.

15. Bed and backfill pipe according to City of Bryant Standard Specifications. This should be done slowly to prevent damage to water main and to reduce chances of knocking down the support installed.

a. Bed pipe with gem sand, sand or washed rock in uniform lifts a minimum of 6 inches under the pipe to 12 inches or a maximum of 18 inches over the top of the pipe, depending on the depth of the pipe. On temporary repairs, do not use sand bedding material.

b. Lay polywrap or filter fabric over gravel or washed rock to prevent migration of backfill and possible trench failure.

16. Backfill any trench/subgrade located in right of way according to the Utility Criteria Manual in uniform layers not exceeding 6 inches in depth and tamping each layer in accordance with specifications (95% compaction is required). a. Flexible base placed should be equal to existing material in place or a minimum of 10 inches, whichever is greater. It should be compacted in 6 inch lifts in accordance with specifications (100% compaction is required) and should be placed to within 2 inches of the existing surface.

b. Apply temporary paving (cold mix) and compact to existing grade.

c. If street cut is needed use the Utility Criteria Manual for Cuts in New Streets.

17. Remove spoil, insuring that all contaminated spoils are handled in an appropriate manner and hauled to an approved site for proper disposal. Clean up work site and remove erosion controls if possible. Always insure that work site is properly cleaned before removing any erosion controls. If backfill is behind the curb or in an easement, all areas to receive vegetation should be compacted in 6 inch lifts to 95% compaction, to within 4 inches from finished grade. This can be accomplished by using a jumping jack, air tamper or other approved equipment. Dress the area for vegetation and restore site to original condition per stipulations of the General Permit. Maintain erosion controls in place until such time as vegetation has adequately covered disturbed area. Then remove them per City of Bryant Standard Specifications.

18. Remove traffic control devices following the Transportation Criteria Manual,

19. Notify Dispatch that job is complete and service has been restored.

20. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel. Place doorhanger with information regarding work done, supervisor's name, and telephone number for any questions customer may have. If work is done after hours, write your name and telephone number in the appropriate space on the doorhanger as the person responsible for the work done. Also place the name and telephone number of the day zone supervisor so the customer can contact them if they have urgent needs or questions regarding the work done. Never place notice in the customer's mailbox and use caution when entering private property at night.

21. Fill out a Job Completion Report, Main Failure Report, Status Report, Property Damage Report, Special Billing Report and other related, required documentation. Be sure to fill out forms completely and in a timely manner. If customer, plumber or third party is being special billed for this work, it is important that the proper notification is made to Dispatch so that Law Department is notified. Insure that reports for these repairs reflect all actual time, equipment and materials so charges are accurate.

22. If permanent repairs were made by Public Works, upon receipt of the Fixed Price Payment Order the Supervisor will insure that the work site is checked before payment approval is made. If there are any problems with the work done or the way the site was left, Public Works should be notified in writing so that any unacceptable work can be rectified before payment for the job is approved.

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J. UNBLOCK OR CLEAR WASTEWATER STOP UP OR BACK UP AND CONTAIN MANHOLE OVERFLOW

J-1

Objective: This maintenance activity is performed to unblock or clear a wastewater stop up or back up and to contain any resulting manhole overflow. Stop ups and back ups may be caused by grease buildup due to illegal discharges, sags or low velocity in the line, a collapsed line, root intrusion, or blockages due to introduction of extraneous materials in the line.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP AFTER WORK IS COMPLETED TO ENSURE SAFETY.

J-2 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work and/or Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

J-3 Job Site Safety Equipment:

Ladder (Extra Heavy Duty Industrial with IA Duty Rating), Safety Harness,

Safety Rope, Gas Detector, Silt Fencing, Traffic Wand, Traffic Control

Devices such as Flags, Flag Stands, Cones Barricades, and Arrowboard, Mesh

Safety Fencing, Shoring and/or Trench Box.

J-4 Construction Equipment:

Jet Machiene, Vacuum Truck, Flat Tape, Pumps, Hoses, and a variety of High Pressure Flushing Nozzles.

J-5 **Construction Materials:**

Clean Rags, Tape, and Spray Paint.

J-6

Major tasks and work steps for unblocking or clearing a wastewater stop up or back up or containing a manhole overflow:

1. Upon receipt of a complaint regarding a stop up, back up, or a manhole overflow; the Supervisor or his crew will go to the site to verify the extent of the problem. Upon positive verification of this problem on the "City side". The Supervisor or crew leader may then request a Vac truck or other equipment at this location as necessary.

2. Analyze the job site. If needed, set up traffic control following the Transportation Criteria Manual, on Traffic Control and erosion control per City of Bryant. The Supervisor or person in charge of the work site will visually inspect site and insure that documentation is made to record pre-existing conditions. Documentation should consist of written field notes and photographs with the location, date, and name of the person documenting the site listed on the back of the photographs. Larger jobs may require use of a video camera to document pre-existing conditions. Care should be taken to avoid working in the drip line or root system of protected trees. Notify property owners should be contacted to advise them of your plans and measures taken to protect trees.

Optimizing Operation, Maintenance, and Rehabilitation of Sanitary Sewer Collection Systems

1. If the obstruction is located in the main, the following should be done:

a. The supervisor or crew leader will request a Vac-Con truck or other equipment for this site. If the manhole is overflowing, you can contain area by diverting to a lower manhole. Proceed with containment measures setting up a pump around or a gravity flow flume and insuring that sanitary measures are observed while performing this operation.

b. Once the truck arrives, insure truck is loaded with water. ENGAGE THE TRUCK IN THE DOWNSTREAM MANHOLE WITH THE NOZZLE POINTING UPSTREAM. INSURE PROPER NOZZLE IS USED. DEPENDING ON THE SIZE OF THE LINE AND THE SUSPECTED MATERIAL ENCOUNTERED.

c. Operate the high pressure hose back and forth several times to dislodge the blockage. INSURE THAT HIGH PRESSURE HOSE IS OPERATED SLOWLY BACK AND FORTH TO DISLODGE AND WASH MATERIAL AWAY FROM THE WALLS.

d. Vac-Con truck operator should note type of material being washed down the line after flushing has begun. If large quantities of grease are present, the operator needs to slow operations down and slowly clean line several times. Operator should note reel counter so that distance of the blockage can be located.

1. Pipe weir should be installed on the downstream side of the manhole and should match the size of the main.

2. The vac-con truck should have the vacuum tube in place to suction all debris from the manhole and to prevent it from continuing downstream.

3. Continue operations until all grease has been cleaned from the line. After the line is cleaned, the line should be televised to determine the efficiency of the cleaning and the cause of the problem.

4. In the event the line cannot be readily cleaned, it may be advisable to set up a pump around or a gravity flow flume.

e. If large quantities of grit or dirt are noted during flushing activities, this may indicate a collapse or joint separation in the main.

1. If grit alone is present, keep flushing and removing until the water is clear.

2. The presence of dirt may indicate serious problems with the line. If the supervisor or crew leader feels it is possible to get a camera through the line, he should schedule this line for televising as soon as possible. The Supervisor I will notify TV Inspection personnel by radio or telephone to schedule the camera crew. The Supervisor I should be at the site when the camera is introduced into the line so immediate action can be taken to correct the problem at this site. As always, inform affected customers of work already done and work to be scheduled so exposure to complaints by dissatisfied customers are reduced. If the Supervisor I deems that it is necessary to schedule repair of this site at a later date, he will notify TV Inspection personnel to schedule the camera crew and will list this job on the Jobs Pending Completion List in his zone for further action. If possible, the Supervisor I should be at the site when the camera is introduced into the line; however, if this is not possible, he may request a video and report for this job from TV Inspection personnel. Results from any job scheduled in this manner should be received within five (5) working days. If results are not forthcoming within this time frame, the Supervisor I should get with TV Inspection personnel to verify the delay. If exact location of the stop up has been set as a criteria to perform this job, insure the Sonde Detector (sound detector) is used with the camera.

3. Make a One Call Request and request delivery of a backhoe to the site to begin excavation.

4. Once vac-con truck operations have been completed, refer to Section for disposal of material removed from the manhole.

5. If blockage occurs in a wastewater gravity main, it may be necessary to Relay or Repair Wastewater Gravity Main. If problem continues to occur.

f. Once line has been repaired, clean line and schedule TV Inspection to verify corrective action and/or possible special billing. Before leaving the site ensures proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel.

g. If the stop up or back up results in a manhole overflow, Manholes upstream of this location should be checked for possibilities of further back ups. If this is the case, all affected manhole lids should be removed to relieve surcharging in the line. Refer to appropriate main blockage procedure, depending upon the problem or material encountered.

1. Refer to quad and set up a pump around or gravity flow flume to handle the wastewater flow until the blockage is cleared. As always, insure sanitary methods are observed while performing this operation.

2. Use the vac-con truck to handle the flow until the blockage is cleared. Insure wastewater removed is poured into a wastewater manhole. Do not pour solid debris into the manhole.

3. If the overflow results in a back up in or on private property, then get site cleaned up and document this event with photograph.

4. Rake and dispose of any large pieces of fecal matter, toilet paper, or other debris which may be present in the area by placing them in a plastic bag and disposing of them at properly.

5. If overflow was discharged into a storm sewer or waterway, waters of the state extra care should be taken and clean up should be meticulous, open fire hydrant(s) to discharge into the waterway. Walk downstream along the course of the waterway for approximately one mile or until wastewater forms a pool. Observe any signs of distress to fish or other wildlife for Overflow Report.

6. Restore site to a sanitary condition and dispose of debris at an approved dumpsite as directed by A,D,E,Q and A,D,H, guidelines.

7. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel.

8. Complete the Overflow and Job Completion Report. Overflow Report must be turned in to A,D.E,Q within 24 hours.

K. VAC-CON TRUCK OPERATION

K-1 Objective: This maintenance activity is performed to remove debris and hazardous material from wastewater lines or to perform routine scheduled preventative maintenance. Obstructions occur due to illegal discharges, vandalism, poor condition of the pipe, or poor design.

It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform, skin, or tools by using appropriate personal protective equipment as may be necessary due to field conditions at the job site. IT IS ESSENTIAL THAT GOOD HYGIENE PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP AFTER WORK IS COMPLETED TO ENSURE SAFETY.

K-2 Personal Safety Equipment:

Hard Hat, Back Brace (For Heavy Lifting), Safety Glasses, Full Face Shield, Safety Vests, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work and/or Rubber Boots, (APR) Respirator, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

K-3 Job Site Safety Equipment:

Ladder(Extra Heavy Duty Industrial with IA Duty Rating), Traffic Wand, Traffic Control Devices such as Flags and Cones.

May Need: Safety Harness, Safety Rope, Gas Detector, Silt Fencing, Flag Stands, Barricades, and Arrowboard.

K-4 Construction Equipment:

Vac-con Truck and a variety of High Pressure Flushing Nozzles.

K-5 Construction Materials:

Clean Rags, Tape and Spray Paint.

K-6 License Requirement:

Anyone operating the vac-con truck is required to have a Class A-CDL driver's license.

K-7 Inspection:

As with any vehicle or major equipment, the operator should perform a pre-use inspection before beginning work activities. Refer to Vehicle Inspection Check List.

K-8 VAC-CON OPERATION:

Vac-con operation and proper positioning of this vehicle will vary depending on type and model of the truck being used. Extreme caution should be used when operating the boom around power lines and trees. Prior to going to the job site, the operator should perform a vehicular inspection before the vehicle leaves the service center to ensure all components are functioning according to the Owner's Operating Manual. This manual should be used to train operator personnel and to consult for proper operating procedures.

Once the vac-con truck arrives at the job location, the following procedures should be followed:

1. Strobe light and 4-way flashers should be operating upon the vac-con truck's arrival to the work site. The operator will insure that all necessary safety procedures that may be required because of traffic and roadway conditions are observed.

2. The operator will size up the job location for clearance. This includes width and height of work area and other various hazards such as traffic (pedestrian or vehicular), parked cars, trees, power poles/lines, ground conditions, etc.

3. Prior to positioning the vac-con truck, the operator should ensure that the water tank is filled at the closest point available to the job site.

4. The operator will then position the truck for proper operation and set the emergency brake.

5. ENGAGE THE TRUCK IN THE DOWNSTREAM MANHOLE WITH THE NOZZLE POINTING UPSTREAM. INSURE PROPER NOZZLE IS USED, DEPENDING ON THE SIZE OF THE LINE AND THE SUSPECTED MATERIAL ENCOUNTERED.

6. Operate the high pressure hose back and forth several times to dislodge any blockage. INSURE THAT HIGH PRESSURE HOSE IS OPERATED SLOWLY BACK AND FORTH TO DISLODGE AND WASH MATERIAL AWAY FROM THE WALLS.

7. Vac-con truck operator should note type of material being collected from the line after va-con operations have begun. If large quantities of grease are present, the operator needs to slow operations down and slowly clean line several times. If necessary to locate distance of the blockage, operator should note reel counter reading or can mark the hose with a piece of tape at the top, deducting the depth of the vertical distance in the manhole.

a. Pipe weir should be installed on the downstream side of the manhole and should match the size of the main.

b. The vac-con truck should be in place with the vacuum tube in place to suction all debris from the manhole and to prevent it from continuing downstream.

c. Continue operations until all grease and debris have been cleaned from the line. After the line is cleaned, the line should be televised to determine the efficiency of the cleaning and the cause of the problem.

d. In the event the line cannot be readily cleaned, it may be advisable to set up a pump around or a gravity flow flume.

e. The presence of dirt in the line may indicate serious problems with the line. measures to be taken when dirt is observed in the line.

8. The operator will follow the manufacturer's recommended operating procedures as stipulated in the owner's Operating Manual, proceeding to engage the vac-con, vac-con unit, and pump. VAC-CON TRUCK OPERATION IS A TWO MAN OPERATION AND REQUIRES THE PRESENCE OF A QUALIFIED OPERATOR.

9. Before leaving the site ensures proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel.

2. PAPER WORK:

1. Once the truck is loaded and before leaving the work site, the operator should initiate the manifest.

2. Before the load is dumped at the Bryant Wastewater Treatment Plant to dry, the operator will give a copy of the manifest to the Plant Manager or his assistant.

The crew leader will fill out the Job Completion Report, Manhole Inspection Report and the Overflow Report, if necessary.

3. DUMPING PROCEDURE:

1. The operator delivers load to designated drying basin at the Bryant Wastewater Treatment Plant.

2. The operator checks to see if the drying basin is empty.

a. If the basin is empty continue with unloading.

b. If the basin is full, determine if another load should be dumped before unloading.

NOTE: When any hazardous materials, petroleum products, pesticides, etc. are encountered; consult with Supervisor for proper procedure for disposal. If there are any safety concerns, then the Safety Supervisor should be notified.

5. If possible, drain most of the liquid contained in the vac-con truck tank into an approved sanitary sewer manhole at the work site before proceeding to the Bryant Wastewater Treatment Plant to dump solids into the drying basin. The operator should slowly drain any liquid remaining in the tank.

6. When all liquid has been discharged from the tank, the operator will release latches on the rear hatchway of the tank. Once the hatch is completely open, the operator will engage the hydraulic dump of the holding tank and proceed to slowly dump solids into the screen.

7. When all solids that can be discharged by gravity have fallen from the tank, the operator will clean any remaining solids from tank with a high pressure hose hooked up to the high pressure port on the vac-con truck and flush remaining solids from the tank. The operator should insure materials going into the drying basin do not push filter barricade out of place.

8The operator should clean the tank thoroughly. When the tank is cleaned, he will lower the tank back onto the truck to its normal position and will close and latch the rear hatchway.

9. The operator must leave the area around the drying basin litter free, picking up any trash or debris he may have left at this site, and placing all trash or debris in the trash can provided at the site.

10The operator should insure screens are secured and that silt fencing is replaced as necessary.

11 The operator then notifies his supervisor and the Night/Weekend Supervisor that a load has been delivered to the drying basin.

12 Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel.

13. Before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel.

L. SMOKE TESTING

L-1 Objective: Miscellaneous water and wastewater tasks to be discussed in this section include scheduling of smoke testing, which may be necessitated by broken wastewater lines, infiltration problems, odor complaints, and reports of small animals or vermin in wastewater lines.

When Line Maintenance personnel are notified of infiltration problems, odor complaints which are sewer related, and reports of the introduction of small animals or vermin into wastewater lines; they will schedule smoke testing with TV Inspection personnel. The following procedures should be followed:

1. When a broken wastewater line needs to be located, the Supervisor will schedule a smoke test, furnishing a copy of the profile and approximate location of section of the line to be tested.

a. All smoke tests should be set up three days in advance so that TV Inspection personnel can distribute notification to affected customers.

b. It is preferable to schedule smoke tests during dry weather.

c. If possible, the Supervisor should be on site when the smoke test is conducted. If it is not possible to be on site during the test, the Supervisor must follow up within 24 hours to insure locations are properly marked for any necessary further action.

2. When smoke testing is performed due to infiltration problems, this may be scheduled by Line Maintenance crews, the Supervisor, and/or Engineering Support staff.

a. All smoke tests should be set up three days in advance so that TV Inspection personnel can distribute notification to affected customers.

b. It is preferable to schedule smoke tests during dry weather.

c. If possible, the person scheduling the smoke test should be on site when it is conducted. If it is not possible to be on site during the test, you may contact TV Inspection personnel by radio or telephone for results.

d. Any illegal connections found as a result of smoke testing should be reported to waste water superintendent for further action.

3. Odor complaints are received from customers calling in to City hall or public works or to the code enforcement offices, from pl When odor complaints are received, the crew that responds to the complaint should try to identify if the source of the odor problem is sewer related. Additionally, complaints received regarding the introduction of small animals or vermin into wastewater lines will be dealt with in the following manner:

a. If the source of the odor is evident (a missing clean out cap or a loose, broken, or missing manhole cover, or any other problem that can be found to cause the problem in this area), the crew will take appropriate action to correct the reported problem.

b. If the source of the odor is not evident, Engineering Support staff should be notified for further investigation of this complaint and possible need to set up a smoke test, following guidelines established above.

c. Division Technical Support staff will be responsible for all investigations when source of problem may be located on private property.

d. Line Maintenance zone crews will be responsible for all other investigations and scheduling of smoke testing.

Day to Day Standard Operating Procedures

M. CCTV (Closed Circuit Television) Operations

M-1 Objective: This maintenance activity is performed to locate and identify structural defects and complete quality assurance and quality control following post-construction.

"It should be noted that contact with raw sewage is a potential health hazard and care should be taken to prevent contamination of uniform and skin or tools by using appropriate personal protective equipment as mat be necessary due to field conditions at the job site".

IT IS ESSENTIAL THAT GOOD HYGIEN PRACTICES BE USED DURING OPERATIONS AND APPROPRIATE CLEANUP AFTER WORK IS COMPLETED TO ENSURE SAFETY.

M-2 Personal Safety Equipment

Hard Hat, Safety Glasses, Full face Shield Safety Vest Work Gloves, Rubber Gloves at least 14 mil,Steel toed Boots, Rubber Boots, (ARP) Respirator, Environmental Coveralls, Antibacterial Hand Cleaner and Ear Protection.

M-3 Job Site Safety Equipment

Ladder, Traffic Wand 4 Gas Monitor and Traffic Control Devises such as Flags and Cones.

May need Safety Harness, Safety Rope, Silt Fencing, Flag Stand, Barricade, and Arrow board.

M-4 Inspections:

As with any vehicle or major equipment, the operator should perform a pre-use inspection before beginning work activities. Refer to vehicle inspection check list.

M-5 CCTV OPERATIONS:

NOTE: OPERATOR SHOULD SCHEDULE THE LINES TO BE TV'd TO BE CLEANED OF ALL DEBRIS PRIOR TO BEING TV'd.

1. Operation of the CCTV camera system requires a 2 (two) person crew.
2. Complete vehicle check list, inspect inside and out of the vehicle,fuel tanks are full, check equipment(note any repairs needed) , and check lights and flashers.
3. Review maps for lane size and traffic patterns to ensure necessary traffic control equipment is present.
4. Ensure pipe segments have been previously cleaned with Vac-Con crew

Day to Day Standard Operating Procedures

CCTV(Closed Circuit Television) Operations

5. Set up traffic control for manhole location and align rear of vehicle with camera cable over manhole structure so camera can be guided into line for inspection.
6. Lower camera into manhole and face it into the downstream pipe. Adjust (tiger tail) to protect camera cable.
7. For inlet drop manholes use electrical crane and clam shovel to assist getting the camera into the raised pipe segment.
8. Begin remote reading footage counter from pipe segment invert.
9. Move camera through the pipe line segment in a downstream direction at a uniform rate. Camera should not travel at a rate more than 30 feet per minute. Stop when necessary to document the sewers condition.
10. If television camera will not pass through the entire segment the camera operator will reset the equipment at the downstream manhole and attempt to inspect the pipe from the opposite direction.
11. Document all conditions in color CD or DVD format.
12. Detailed logging of all defects encountered shall be entered electronically during inspections.
13. Identify all lateral connections and pipe opening restoration or blockage.
14. End remote reading footage counter from pipe segment invert.
15. Rewind the camera cable and return the reel assembly to the locked travel position.
16. If traffic control requires adjustment for the next set up, pick up the cones and reset the taper.
17. Complete CCTV log, Print detailed logging for pipe segment. If structure needs immediate attention notify Superintendent that the pipe segment needs rehabilitation.

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Standard Operating Procedure For Grease trap Inspections

N. (FOG) or Fats Oils and Grease "25%" Rule.

N-1 OBJECTIVE Is to ensure that inspections of grease traps/interceptors are completed and documented uniformly. The 25% Rule is a general rule to assess the proper maintenance and cleaning of grease removal facilities and not the sole determining factor of compliance.

N-2 Personal Safety Equipment:

Hard hat, Back Brace, Safety Glasses, Full Face Shield Safety Vest, Work Gloves, Elbow Length Rubber Gloves, Steel Toed Work And /or Rubber Boots, Environmental Coveralls, Isopropyl Alcohol, and Ear Protection.

N-3 Job Site Safety Equipment:

Traffic Wand, Traffic Control Devises such as Flags and Cones.

N-4 Method:

To inspect a grease trap using a clear plastic tube "sludge judge" and to document results.

N-5 Tools and Equipment:

1. Facility specific equipment necessary to open grease traps or a grease interceptor.

2. Safety equipment if necessary to redirect traffic (cones ect,)

3. Measuring devise (such as Dip stick pro, sludge judge) available through USA Blue book or Granger inc.

4. Cleaning Materials (Paper towels, Rags ect.) to clean measuring devise. First aid kit, antibacterial hand cleaner.

N-6 Preparation:

1. Locate and gain access to grease trap or interceptor.

2. Place safety equipment around the grease trap or interceptor as needed to prevent pedestrian or vehicular accident during inspection.

3. Use appropriate tool to remove the grease trap lids or grease interceptor manhole covers.

4. Complete visual inspection of the condition of the devise and record information on appropriate inspection form.

Standard Operating Procedure for Grease Trap Inspections

N-7 Procedures for Checking Grease & Solids Accumulations in a Grease Trap

1. Push the tube down so that the valve opens at the bottom of the plastic tube.
2. Slowly insert the plastic tube into the grease trap until it touches the bottom of the tank.
3. Pull up to close the valve and pull the tube out.
4. Measure the height of the grease layer(H1) and the settled solids (H2).
5. Record the measurement on the grease trap inspection form.
6. Release the content back into the grease trap by pulling up on the rope.
7. Check the 25% rule: H1+H2 >0.25xHO
8. H.O. is the design hydraulic depth (the depth from invert of out let pipe to the bottom of the tank.)
9. Replace lid or cover on Grease trap or Interceptor and make sure it's secure.
10. Clean measuring equipment and stow away.

Measuring devise "SLUDGE JUDGE"

Grease Layer (H1)

Water (HO)

Solids(H2)