

## Section 2 - Scope of Work

This section of the proposal describes the proposed scope of work for the development of the Garden Grove Sanitary District's 2017 Sewer System Rehabilitation Plan.

### Task 1: Project Management

We will submit an initial project schedule with pertinent milestones for the major tasks involved in the project, particularly the Closed Circuit Television (CCTV) inspection work conducted in the field and the development of the Sewer System Rehabilitation Plan. The schedule shall be updated monthly or as required when there are major changes.

Per the RFP, we will complete the CCTV inspection work within a time frame of about 3 months (September 2017 through November 2017). Analysis and development of the Sewer System Rehabilitation Plan will be completed following the completion of the CCTV inspection work and will continue into the first quarter of 2018. Please see attached project schedule in Section 3 of this proposal.

A monthly update of the project schedule and a project status report will be submitted with our monthly invoice for the project.

### Task 2: Meetings

AKM as well as Empire Pipe Cleaning and Equipment, Inc. (Empire) staff will attend a kick-off meeting with Grove Sanitary District (GGSD) staff prior to the start of field work. At this meeting, we will discuss project objectives and the logistics of the field work, such as contact information, traffic control requirements, work hour limitations, and work plan.

We will meet to review the draft report submittal and discuss any comments GGSD staff may have. The comments will be addressed in the final report submittal.

Draft meeting minutes will be sent to GGSD for review via email within five working days after the meeting. Final meeting minutes will be submitted via email in PDF format within two working days following receipt of the final GGSD comments.

### Task 3: Data Collection and Review

We will review all records made available by GGSD staff, including but not limited to the previous Sewer System Rehabilitation Plans.

### Task 4: Preparation of the Condition Assessment

#### Task 4A: CCTV Inspection of 300,000 feet of Sewer

Closed Circuit Television (CCTV) inspections will be conducted of the 300,000 feet of sewer identified by the Garden Grove Sanitary District (GGSD) as shown in Exhibit A of the RFP. The inspections will be performed by Empire Pipe Cleaning and Equipment, Inc. (Empire) utilizing the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) guidelines.

We will obtain GGSD's most current Sewer GIS to use as the base data of this project. The pipe and manhole IDs will be uploaded to Empire's software before any field work is started. This will ensure that the same naming conventions are used for the CCTV recordings and that they will ultimately be compatible with the City's GIS system. We will initially work with the City of Garden Grove Information Technology (IT) staff to obtain the GIS data and clarify what IDs should be utilized.

Empire will provide personnel and equipment to clean approximately 300,000 LF of sewer lines as shown in the map provided as Exhibit A. The sewer system will be cleaned using high velocity water pressure and vacuum to remove the debris from the line. Standard cleaning will be from the downstream manhole toward the upstream manhole, utilizing water flow to bring back the debris to the downstream manhole at which time will be vacuumed. In the event the nozzle cannot make it to the next manhole a reverse setup will be attempted to clean the line. The sewer pipes will be cleaned to ensure that a quality inspection can be completed. Cleaning Crews

will document their findings on a cleaning log. Empire will require access to hydrants for water and manholes shall be accessible. GGSD will be responsible for locating and raising any manholes that are buried. Empire will use the proper cleaning tools based on the types of debris/solids that need to be removed. Traffic Control will be implemented based on the requirements outlined in the MUTCD Guidelines.

The sewer lines will be CCTV inspected in accordance with the NASSCO PACP Standard for CCTV Assessment and scope of work outlined in the RFP. Empire will provide sufficient crews to complete the inspections within the 3 month time frame requested by GGSD in the RFP and is available to start in September 2017. Manholes that are buried, locked, or paved over will be referred to the GGSD for assistance.

#### **Task 4B: Compile and Review Inspection Data**

We propose to utilize Innovyze's InfoMaster software program to compile the CCTV inspection data. The InfoMaster program is an ArcGIS-based asset integrity management and capital planning software for water and wastewater networks. It is a powerful tool that assists in characterizing the likelihood and consequence of failure for individual pipes in a network. InfoMaster is a National Association of Sewer Service Companies (NASSCO) certified product.

The inspection data collected for this project will follow the Pipeline Assessment and Certification Program (PACP) standards and can therefore be easily imported into the InfoMaster software, which already identifies with the same coding system that is required by PACP. InfoMaster is a GIS based software and has the capability to incorporate any asset data that is in GGSD's Sewer GIS as well as the CCTV inspection data.

Importing the CCTV inspection data into InfoMaster will allow us to plot the locations of the identified defects graphically on the Sewer GIS. We will also be able to more easily filter through the data to find the locations of the most severe defects or operations and maintenance issues. We will also be able to link the recorded video locations to the map, making it easier and more efficient for us to review them during the course of the project.

We will prepare a database summarizing the findings of CCTV reports and recordings. At a minimum, the database will include the following:

- Inspection Number
- Inspection Location
- Inspection Date
- Manhole Identification Numbers
- Pipe Identification Numbers
- Direction of Camera during Inspection
- Size of Pipe
- Material of Pipe
- Length of Pipe
- Number of Occurrences of Each Structural and Operation and Maintenance Deficiency



The InfoMaster Program will allow us to easily account for the reverse inspections that are recorded. InfoMaster will combine the data for these reaches to create a comprehensive summary table.

#### Task 4C: Analyze Data and Select Reaches for Detailed Review

The CCTV recordings will be prioritized per the database summary. Although each reach is given a condition grade per the PACP standards, we will also base our prioritization on the type and number of defects identified in each recording. The pipes that are believed to be at higher risk of collapse and blockages, and therefore have a greater potential for causing a sanitary sewer overflow will be given the highest priority. For example, a pipe with a severe structural defect such as broken pipe, a hole in the pipe, or a large joint offset might be given a higher priority than a pipe with many other less severe defects such as cracks or fractures.

Based on the prioritized database, we will select representative reaches of the system to review the CCTV recordings in detail to ensure compliance with CCTV standards and procedures and further prioritize the sewers for replacement and/or repair. We do not anticipate that all the CCTV recordings will have to be reviewed in detail. Based on our experience, we expect to review up to 20 percent of the pipe reaches inspected. This amount may increase or decrease following review of the CCTV database.

#### Task 4D: Review CCTV Recordings of Selected Reaches

We will review the CCTV recordings for those reaches identified as a high priority in Task 4C. As stated, we expect to review up to 20 percent of the pipe reaches inspected. We will verify the completeness of the inspection recordings and reports, and update the inspection database as necessary.

#### Task 4E: Incorporate Findings into Summary Database

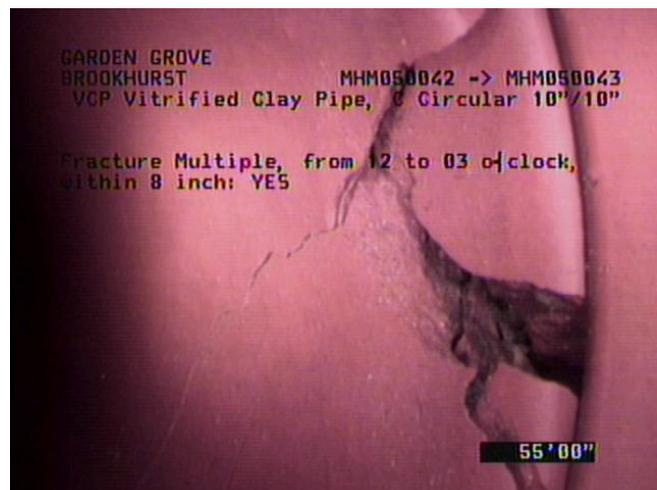
If additional deficiencies or discrepancies are found, we will make note of them and modify the summary database to include the changes.

#### Task 4F: Rank and Prioritize Reaches Inspected

We will identify and prioritize the condition deficiencies, therefore identifying the critical sewer mains in need of replacement, rehabilitation and/or repair. The focus will be on sewer pipes that are at risk of collapse or prone to more frequent blockages.

We will utilize the same ranking and prioritization system as GGSD's previous Sewer System Rehabilitation Plans. This will provide GGSD with the ability to determine the changes in condition in any particular pipe more easily. The priority categories used previously are as follows:

- Severe Condition – This category primarily includes structural defects of deformed pipe, hole in pipe, broken pipe, and large joint offsets.
- Major Condition – This category primarily includes structural defects of multiple fractures, medium joint offsets and major sags. Pipes with a large number of cracks are also included.
- Moderate Condition – Pipes in this category have fractures, cracks, small and medium joint offsets, and sags.
- Minor Condition – Pipes in this category have slight sags, cracks, and small joint offsets.
- O&M – This condition is for operational and maintenance problems and construction feature defects. There are no structural defects.
- No Defects – This condition is for pipes with no structural, operation and maintenance or construction feature defects.



#### **Task 4G: Develop Replacement and Rehabilitation Recommendations**

Pipe reaches and structures determined to fall in the “Severe” or “Major” categories will form the basis of rehabilitation and replacement recommendations. Cost estimates will be developed to remedy the condition deficiencies. We will review any recent project bids that GGSD has collected and use this as the basis for estimating the cost of the future improvements.

#### **Task 4H: Identify Operation and Maintenance Deficiencies**

Operation and maintenance (O&M) defects such as grease accumulation, root intrusion, and debris/deposits will be considered separately. Often times, these defects will require additional cleaning or root cutting, but will not necessarily need replacement. Maps of each type of O&M issue will be prepared showing the locations in which they were identified. Recommendations for additional cleaning or root cutting will be made as needed.

#### **Task 4I: Prepare Sewer System Rehabilitation Plan**

We will prepare the GGSD’s 2017 Sewer System Rehabilitation Plan report. The report will summarize all work completed, documenting the CCTV inspections, the condition assessment, and the rehabilitation and replacement recommendations.

#### **Deliverables:**

Deliverables will include:

- Four (4) hard-bound copies of the draft assessment report
- Four (4) hard-bound copies of the final assessment report
- External portable hard drive of all the CCTV inspection data, including video recordings, CCTV inspection reports in PDF, PACP exchange database, and jpg images

All work will be completed at AKM Consulting Engineers only office in Irvine, California.

#### **Task 5 Optional: Traffic Control Design**

Based on discussions with GGSD staff, it is unknown if traffic control design will be required by the City. We have therefore included traffic control design as an optional item. Traffic Control Engineering, Inc. (TCE) will be responsible for the development of traffic control strategies in coordination with the City of Garden Grove. TCE will develop final traffic control plans consistent with City and Caltrans standards including signing, legends, and other construction detour standards.

The assumptions to complete the traffic control design are as follow:

- Traffic and all roadways to be restored during non-working hours.
- No temporary striping or traffic signal design included.
- Detailed location specific traffic control plans will be prepared at all signalized intersections on arterial streets.
- Typical lane closure plans will be prepared for mid-block lane closures on arterial streets.
- All other project side streets shall follow MUTCD Guidelines for lane closure traffic control.

The proposed project area consists of the following signalized intersections for which traffic control plans will be prepared:

<u>Street</u>	<u>Location</u>
Garden Grove Bl.	@ Beach Bl.
Garden Grove Bl.	@ Dale St.
Garden Grove Bl.	@ Newland St.
Garden Grove Bl.	@ Magnolia St.

Garden Grove Bl.	@ Casa Linda Ln.
Garden Grove Bl.	@ Gilbert St.
Garden Grove Bl.	@ Galway St.
Garden Grove Bl.	@ Kerry St. / Brookhurst Way
Garden Grove Bl.	@ Brookhurst St.
Garden Grove Bl.	@ Nutwood St.
Garden Grove Bl.	@ Century Blvd. / Nelson St.
Garden Grove Bl.	@ Main St.
Garden Grove Bl.	@ Euclid St.
Garden Grove Bl.	@ 9 <sup>th</sup> St.
Trask Ave.	@ Beach Bl.
Trask Ave.	@ Newland St.
Trask Ave.	@ Yockey St.
Trask Ave.	@ Magnolia St.
Trask Ave.	@ FWY 22 exit 9
Trask Ave.	@ FWY 22
Trask Ave.	@ Brookhurst St.
Trask Ave.	@ Taft st.
Trask Ave.	@ Euclid St.
Lampson Ave.	@ Dale St.
Lampson Ave.	@ Magnolia St.
Lampson Ave.	@ Brookhurst St.
Lampson Ave.	@ Euclid St.
Lampson Ave.	@ 9 <sup>th</sup> St.
Magnolia St.	@ Stanford Ave.
Brookhurst St.	@ Stanford Ave.
Euclid St.	@ Marian Dr.
Euclid St.	@ College Ave.
Euclid St.	@ Stanford Ave.
Euclid St.	@ Acacia Pkwy.

Typical mid-block lane closure plans will be prepared for the following locations:

<u>Street</u>	<u>Location</u>
Trask Ave.	e/o Beach Bl. to Taft Ave.
Garden Grove Bl.	e/o Beach Bl. to w/o 9th St.
Lampson Ave.	Nutwood St. to w/o 9th St.
Dale St.	Lampson Ave. - Trask Ave.
Gilbert St.	Stanford Ave. - Garden Grove Blvd.
Brookhurst St.	Lampson Ave. - s/o Garden Grove Blvd.
Nutwood St.	s/o Chapman Ave. to Garden Grove Blvd.
Main St.	Lampson Ave. - Garden Grove blvd.
Euclid Ave.	s/o Chapman Ave. to Stanford St.
Nelson St.	Lampson Ave. to Stanford St.
Acacia Pkwy.	Nutwood St. to 9th St.

If the aforementioned traffic control plans will be required by the City of Garden Grove, the start date of the CCTV inspections will be impacted. Traffic control plans will be developed and submitted to the City for approval prior to the start date of the field work.



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July 27, 2017

**Garden Grove Sanitary District**  
13802 Newhope Street  
Garden Grove, California 92843

Attention: Ms. Rebecca Li, PE – Associate Engineer

**Subject: Fee Proposal for 2017 Sewer System Rehabilitation Plan Phase 1**

Dear Ms. Li:

AKM Consulting Engineers is pleased to submit this fee proposal for the subject project in response to your request for proposal dated June 26, 2017. Our proposal is valid for a period of 90 days from the date of this proposal.

Sub-consultant services and out of pocket expenses (blue printing, reproduction and printing, delivery, etc.) will be invoiced at cost plus 10% in order to cover costs associated with administration, coordination and management of subcontractors. Mileage will be invoiced at \$0.65 per mile.

We appreciate the opportunity to submit this fee proposal and look forward to working with the Garden Grove Sanitary District on this most important and challenging project. If you have any questions or require any additional information, please do not hesitate to contact the undersigned.

Very truly yours,

**AKM Consulting Engineers**

Zeki Kayiran, PE  
Principal

**AKM CONSULTING ENGINEERS  
RATE SCHEDULE  
July 2017**

<b>Principal</b>	<b>\$205</b>
<b>Principal Engineer</b>	<b>\$205</b>
<b>Project Manager</b>	<b>\$205</b>
<b>Project Engineer</b>	<b>\$185</b>
<b>Senior Construction Manager</b>	<b>\$175</b>
<b>Senior Engineer</b>	<b>\$175</b>
<b>Associate Engineer</b>	<b>\$135</b>
<b>Financial Analyst</b>	<b>\$100</b>
<b>Construction Manager</b>	<b>\$150</b>
<b>Staff Engineer</b>	<b>\$120</b>
<b>Senior Field Engineer / Inspector</b>	<b>\$135</b>
<b>Field Engineer / Inspector</b>	<b>\$120</b>
<b>Assistant Engineer</b>	<b>\$87</b>
<b>Senior Designer / Senior CADD Technician</b>	<b>\$90</b>
<b>Designer / CADD Technician</b>	<b>\$85</b>
<b>Engineering Technician</b>	<b>\$80</b>
<b>Engineering Aide</b>	<b>\$55</b>
<b>Data / Word Processing</b>	<b>\$66</b>
<b>Office Support</b>	<b>\$55</b>

Out of pocket expenses (blueprinting, reproduction and printing, delivery, etc.) will be invoiced at cost plus 10%. Subcontracted services will be marked up 10% in order to cover costs associated with administration, coordination and management of subcontractors. Mileage will be invoiced at \$0.65/mile. This schedule of rates is in effect until April 30, 2018, at which time it may be adjusted.

**STAFF HOUR & FEE ESTIMATE**  
Garden Grove Sanitary District  
2017 Sewer System Rehabilitation Phase 1  
July 27, 2017

	Project Manager	Project Engineer	Associate Engineer	QA/QC	Office Support	Subconsultant	Total Hours	Expenses	Total Cost
<b>Task 1 - Project Management</b>									
Project Management	16	12				\$0	28		\$5,500
<b>Task 2 - Meetings</b>									
Meetings	8	8		4		\$0	20	\$100	\$4,040
<b>Task 3 - Data Collection and Review</b>									
Data Collection and Review	4	8	8			\$0	20	\$100	\$3,480
<b>Task 4 - Preparation of the Condition Assessment</b>									
CCTV Inspection of 300,000 feet of Sewer	4	16				\$409,200	20		\$412,980
Compile and Review Inspection Data	4	8	32			\$0	44		\$6,620
Analyze Data and Select Reaches for Detailed Review	2	8	24			\$0	34		\$5,130
Review CCTV Recordings of Selected Reaches	8	32	180			\$0	220		\$31,860
Incorporate Findings into Summary Database			24			\$0	24		\$3,240
Rank and Prioritize Reaches Inspected		16	40	4		\$0	60		\$9,180
Develop Replacement and Rehabilitation Recommendations	12	24	80	8		\$0	124		\$19,340
Identify Operation and Maintenance Deficiencies	12	16	40	4		\$0	72		\$11,640
Prepare Sewer System Rehabilitation Plan	24	80	32	8	24	\$0	168	\$1,500	\$28,764
<b>Total Hours</b>	110	252	460	28	24		834		
<b>Rate (\$/Hr)</b>	\$205	\$185	\$135	\$205	\$66				
<b>Grand Total</b>	\$22,550	\$46,620	\$62,100	\$5,740	\$1,584	\$409,200		\$1,700	\$549,494
<b>Task 5 - Traffic Control Design (Optional)</b>									
Traffic Control Design (Optional)	16	24				\$132,000	40		\$139,720
<b>Grand Total with Optional Item</b>	\$3,280	\$4,440	\$0	\$0	\$0	\$541,200		\$1,700	\$689,214