



# Gap Analysis Tool



## Collection System Maintenance Grade 1

In the rows below, select "Do It All The Time", "Limited Experience" or "Never Do This" based on your current knowledge and experience. Based on your responses, you can assess your overall preparedness for each Domain.

	Do It All The Time	Limited Experience	Never Do This
<b>Domain 1 – Systems Operations, Inspections and Maintenance</b>			
<b>Sub-Domain 1.1 – Inspection, cleaning and maintenance of wastewater collection systems utilizing equipment.</b>			
1. Choose the most effective way to remove root systems, sand, and grit from sewer systems.			
2. Identify parts of a standard sewer and their functions.			
3. Understand methods and procedures of preventative maintenance.			
4. Understand mechanical cleaning systems.			
5. Understand the use of high-velocity sewer cleaners, mechanical rodding machines and hydraulic winches.			
6. Understand CCTV inspection equipment.			
7. Understand the necessity of sewer cleaning.			
8. Analyze situations and choose the most effective cleaning method.			
9. Understand how to make observations and problem solve during manhole cover inspections.			
10. Understand self-cleaning sewers and the appropriate wastewater velocity.			
11. Understand the concepts of preventive, predictive and reactive maintenance.			
12. Understand the type of sewer cleaning that calls for a trap.			
13. Understand the basic use of sewer chemicals for controlling grease, odor, roots, etc.			
<b>Sub-Domain 1.2 – Performing and giving assistance with pump station inspections, maintenance and repair and recording instrument readings.</b>			
1. Understand Lockout/Tagout procedures.			
2. Define important terms needed to properly execute an inspection.			
3. Read and analyze gauges, meters, and pumps.			
4. Understand warning labels.			
5. Recognize the basic components of a pump.			
6. Understand the basic functions of pump controls tag.			
<b>Sub-Domain 1.3 – Inspection and maintenance of easements, some of which may be remote or difficult to access.</b>			



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1. Describe what easement road maintenance includes.			
2. Describe how to exercise caution to prevent injuries, damage to private property or environmentally sensitive areas.			
3. Understand the need for easement maintenance.			
<b>Sub-Domain 1.4 – Participation in the construction and repair of the wastewater collection system.</b>			
1. Understand how to mark sewer pipe locations in accordance with Underground Service Alert guidelines.			
2. Identify hazardous gases.			
3. Understand construction practices and principles including excavation and shoring.			
4. Demonstrate how to calculate the volume of a sewer trench.			
5. Describe how to employ safe strategies when excavating trenches.			
6. Identify the correct tools to use for installation and repairs.			
7. Describe how to replace and repair damaged pipes or maintenance structures.			
8. Understand the purpose of raising maintenance structures to grade after paving activities.			
9. Understand sewer flow in an excavation.			
10. Recognize good safety practices when working in a manhole.			
11. Identify preparation steps to take before driving to a repair job and solving issues that may arise.			
12. Describe how to protect oneself and other employees during trench excavations.			
13. Identify a manhole cover and valve parts and functions.			
14. Identify information that is needed before one can execute a proper sewer repair.			
15. Understand the role of the Competent Person on the job.			
16. Identify the correct reasons for utilizing various repair methods such as excavation repair and trenchless repair.			
17. Understand the appropriate PPE (Personal Protective Equipment) related to construction and repair.			
<b>Sub-Domain 1.5 – Participation in the containment and cleanup of sanitary sewer overflows (SSOs).</b>			
1. Calculate spill volume of a sanitary sewer overflow.			
2. Understand the State of California Waste Discharge Requirements.			
3. Identify spills and overflow and containment/cleanup procedures.			
<b>Sub-Domain 1.6 – Participation in the safe removal and restoration of concrete and paved surfaces using a wide variety of construction equipment, hand and power tools.</b>			
1. Solve problems that arise with asphalt and concrete removal.			



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2. Understand the use of jack hammers and surface cutting tools.			
3. Identify the correct tools used to complete a job.			
4. Identify when to use different backfill materials.			
5. Understand the importance of proper compaction.			
<b>How would you rank Domain 1 based on what you selected for each Sub-Domain?</b>			
<b>Domain 2 – Records, Documentation, and Mapping</b>			
<b>Sub-Domain 2.1 – Completion and maintenance of accurate, legible, and timely records of work performed.</b>			
1. Recognize work-related terms and acronyms and their meanings.			
2. Understand how to document activities and complete forms.			
3. Understand the need for accuracy and the consequence for inaccurate or incomplete (or non-existent) documentation.			
<b>Sub-Domain 2.2 – Reading and interpreting collection system maps for operations and maintenance.</b>			
1. Comprehend improvement plans to system maps.			
2. Read and interpret system maps to report to field locations.			
3. Identify basic structures (manholes, mains, laterals, siphons, etc.) and flow direction on a map.			
<b>How would you rank Domain 2 based on what you selected for each Sub-Domain?</b>			
<b>Domain 3 – Safety and Customer Service</b>			
<b>Sub-Domain 3.1 – Participation in establishing proper traffic control measures at work sites to protect workers and the public.</b>			
1. Define a clear work space to inform both workers and the public.			
2. Understand personal safety and health during traffic control.			
3. Implement proper traffic control measures.			
4. Identify traffic control measures that need to be taken at night.			
5. Identify various traffic control devices (advance warning signs, stop/slow paddles, flags, barricades, delineators, cones, drums, etc.) and when to use them.			
6. Identify the different types of temporary traffic control zones and how to correctly set up a temporary traffic zone with regard for public safety.			
7. Identify the correct safety equipment for self and others.			
8. Understand the appropriate PPE related to traffic control.			
<b>Sub-Domain 3.2 – Knowledge of all applicable regulations, policies, and procedures.</b>			



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1. Understand the protocol for reporting overflows and spills.			
2. Understand when high-visibility clothing or devices are required.			
3. Recognize safety and indicator markings related to sanitary sewers.			
4. Understand the Injury and Illness Prevention Program (IIPP) required by Cal OSHA and how it protects workers.			
5. Understand the purpose of the agency safety policy statement.			
6. Knowledge of the components of a Safety Data Sheet (SDS).			
7. Knowledge of First Aid and CPR.			
8. Understand basic elements of “Worker Right-To-Know” laws.			
<b>Sub-Domain 3.3 – Application of safety-related tasks related to excavation and trenching.</b>			
1. Recognize the color codes used for marking underground utilities.			
2. Identify the conditions when shoring is required.			
3. Understand how soil conditions affect trench stability.			
4. Know the minimum distance that the spoil must be kept from the edge of an excavation.			
5. Understand when, where, and how ladder(s) should be placed in a trench.			
6. Identify the different types of shoring equipment – e.g., hydraulic shores, screw jacks, pneumatic shores, solid sheeting, etc.			
<b>Sub-Domain 3.4 – Participation in confined space entries.</b>			
1. Remove access covers safely.			
2. Identify confined space roles (entrant, attendant, supervisor, rescue) and associated responsibilities.			
3. Identify gas types to be monitored when entering a confined space.			
4. Define a Permit Required Confined Space and understand how to complete a confined space permit.			
5. Identify how to assess and safely handle atmospheric hazards while inspecting confined spaces.			
6. Understand how to secure safe working spaces and conditions in confined spaces.			
7. Understand how to use a self-contained breathing apparatus.			
8. Understand the operation of a retrieval device for rescue purposes.			
9. Understand the appropriate PPE related to confined space.			
10. Understand the procedures for proper inspection of confined space equipment.			
<b>Sub-Domain 3.5 – Adhering to safe work practices to mitigate risk related to jobsite hazards.</b>			



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1. Understand how to read monitoring equipment accurately and respond to unsafe conditions.			
2. Recognize personal safety and health measures.			
3. Identify unsafe equipment.			
4. Understand how to employ safe practices in a wet well.			
5. Understand how to operate a high velocity cleaning machine safely.			
6. Identify the correct PPE that is needed to reduce safety risks.			
7. Identify potential problems and hazards that arise from poor design velocity.			
8. Identify proper lifting techniques.			
9. Identify the proper sequence for Lockout/Tagout procedures			
10. Recognize what type of fire each fire extinguisher should be used for – i.e., Class A, Class B, Class C, Class D.			
<b>Sub-Domain 3.6 – Responding to public inquiries and service requests in a courteous manner and providing information appropriate to the area of assignment.</b>			
1. Understand how to communicate effectively with members of the public.			
2. Understand how to respond to service calls and questions professionally.			
3. Demonstrate public professionalism and courtesy.			
4. Understand collection system operation and maintenance issues that may arise.			
5. Understand how to respond to requests according to professional work standards.			
<b>How would you rank Domain 3 based on what you selected for each Sub-Domain?</b>			
<b>Domain 4 – Vehicles, Equipment, and Grounds</b>			
<b>Sub-Domain 4.1 – Conducting pre/post trip inspections of vehicles and equipment (including ensuring that hand and power tools are in proper operating condition), and arranging for maintenance when required.</b>			
1. Describe what constitutes a pre- and post- trip inspection on commercial vehicles.			
2. Recognize who is responsible for different safety checks.			
3. Describe operator-related maintenance.			
4. Understand how to effectively avoid vehicle accidents.			
5. Identify vehicle types and when they are used.			
6. Identify and solve problems that may arise during a trip inspection.			
7. Understand how to inspect tires in an efficient and safe manner.			
8. Recognize when equipment poses a safety hazard.			
9. Identify and solve problems that arise with faulty equipment.			
<b>Sub-Domain 4.2 – Performing basic building and grounds maintenance at collection systems facilities.</b>			



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1. Understand the scope of Building and Grounds Maintenance.			
2. Identify Inspection and operation of equipment found at collection systems facilities.			
3. Understand how the facility supports the maintenance of the collection system.			
<b>How would you rank Domain 4 based on what you selected for each Sub-Domain?</b>			
<b>Domain 5 – Math for Collections Systems</b>			
<b>Sub-Domain 5.1 – Selecting the appropriate formula and completing basic calculations needed for collections systems maintenance.</b>			
1. Use formula to calculate distance.			
2. Use formula to calculate velocity and flow rate.			
3. Use formula to calculate volume of basic shapes such as cylinder, rectangle and square.			
4. Use formula to calculate surface area of a basic shapes such as square, circle, and rectangle.			
5. Use formula to calculate slope.			
6. Understand how to execute basic unit conversions in calculations.			
7. Understand how to calculate trench depth and width, benching, flow rates, and pipe slope.			
<b>How would you rank Domain 5 based on what you selected for each Sub-Domain?</b>			

You may want to focus your studying in the areas where you selected "Limited Experience" or "Never Do This". See CSM Grade 1 *Blueprint and Suggested Reference s* document to get started.

## Knowledge, Skills Abilities -- Gap Analysis Tool

<b>Collection System Maintenance Grade II</b>	<b>Do It All The Time</b>	<b>Limited Experience</b>	<b>Never Do This</b>
200. May perform essential duties identified on the Test Content Specifications for Collection Systems Grade I.			
201. Directs, instructs, oversees and provides feedback to personnel performing Collection System Maintenance Grade I duties.			
202. Inspects, trouble-shoots, and maintains proper collection system operation using advanced techniques and instruments including but not limited to closed-circuit TV, smoke testing, and related procedures.			
203. Supervises and oversees all aspects of confined space entries and completes confined space entry permit.			
204. Provides detailed oral, written or electronic information on a daily basis on activities including but not limited to timesheets, field activity reports, condition assessment reports, confined space entries permits and crew performance feedback reports.			
205. Provides assistance to agencies and private organizations in locating and identifying utilities and manholes.			
206. Plans routine traffic control measures at work sites and performs non-routine traffic control under general supervision.			
207. Investigates and directs the resolution of routine complaints and requests for service in a safe, efficient and timely manner, including providing feedback to the customer.			
208. Monitors crew performance to ensure adherence to safe work practices and compliance with all applicable regulations, policies, and procedures.			
209. Participates in the development and propagation of SOPs (standard operating procedures) including safe work practices and procedures.			

## Knowledge, Skills Abilities -- Gap Analysis Tool

<b>Collection System Maintenance Grade II</b>	<b>Do It All The Time</b>	<b>Limited Experience</b>	<b>Never Do This</b>
210. Attends and participates in technical group meetings; stays abreast of new trends and innovations in the field of wastewater collection system operation and maintenance.			
211. Direct and oversee the containment and clean-up of sanitary sewer overflows (SSOs) and provides notification and field documentation for the reporting of sanitary sewer overflows.			
Total Per Category			

If you have mostly "do it all the time" boxes checked, you may want to explore the next higher grade.

If you have a mix of the "do it all the time" & "limited experience", this is likely the right grade.

If you have mostly "never do this," you may want to explore a lower grade or get more experience.

## Knowledge, Skills Abilities -- Gap Analysis Tool

<b>Collection System Maintenance Grade III</b>	<b>Do It All The Time</b>	<b>Limited Experience</b>	<b>Never Do This</b>
300. Have a working knowledge and understanding of the essential duties identified on the Test Content Specifications for Collection Systems Grades I and II.			
301. Plans, coordinates, and evaluates the performance of Collection System Maintenance Grades I and II personnel.			
302. Coordinates wastewater collection system with other utilities, agencies, private organizations, government entities and the general public to address complex or non-routine issues.			
303. Participates in the evaluation of the performances of the wastewater collection system such as but not limited to energy efficiency, material costs, sanitary sewer overflows (SSOs) and preventive and predictive maintenance programs.			
304. Participates in the development and implementation of training programs for Collection System Maintenance Grade I and II personnel.			
305. Verifies the work of Collection System Maintenance Grade I and II personnel for accuracy, proper work methods, complaints, and compliance with applicable standards and specifications			
306. May work with contractors performing a variety of construction, inspection and maintenance projects.			
307. Analyze and review system data to recommend priorities, schedules, and workload performance measures.			
308. Develops and directs the execution of complex or non-routine traffic safety plans under the California Manual on Uniform Traffic Control Devices for Streets & Highways (MUTCD).			
309. Responds to exceptional and/or non-routine inquiries in a professional, courteous and timely manner.			
310. Assists and participates in the development, and ensures adherence to the wastewater collection safety program.			

## Knowledge, Skills Abilities -- Gap Analysis Tool

<b>Collection System Maintenance Grade III</b>	<b>Do It All The Time</b>	<b>Limited Experience</b>	<b>Never Do This</b>
311. Participates in fact-gathering to respond to liability claims.			
312. Participates in the investigation of violations of employer policies or agency ordinances.			
313. Coordinates and participates in technical/professional group meetings; stays abreast of new trends and innovations in the field of wastewater collection system operation and maintenance.			
314. Direct and oversees the containment and clean-up of sanitary sewer overflows (SSOs) as well as reports sanitary sewer overflows.			
Total Per Category			

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 If you have mostly "never do this," you may want to explore a lower grade or get more experience.

## Knowledge, Skills Abilities -- Gap Analysis Tool

<b>Collection System Maintenance Grade IV</b>	<b>Do It All The Time</b>	<b>Limited Experience</b>	<b>Never Do This</b>
400. Have a working knowledge and understanding of the essential duties identified on the Test Content Specifications for Collection Systems Grades I, II and III.			
401. Administers and manages the work performance and duties of Collection System Maintenance Grades I, II, and III personnel.			
402. Responsible for assigned services and activities associated with the operation, maintenance and repair of the wastewater collection system.			
403. Manages the development and implementation of goals, objectives, and policies for the wastewater collection program.			
404. Directs and supports supervisors and staff to ensure high performance in a customer service-oriented work environment that encourages achieving desired goals and objectives.			
405. Evaluates the performance of the wastewater collection system such as staffing levels, energy efficiency, material costs, sanitary sewer overflows (SSOs), and predictive/preventive maintenance programs.			
406. Plans, directs, coordinates, prioritizes, and reviews the work plan for the wastewater collection system.			
407. Participates in hiring process, conducts performance evaluations, works with employees to achieve performance goals and objectives, implements disciplinary procedures, and conducts general labor relations activities.			
408. Develops, implements, oversees and makes recommendations for wastewater collection equipment selection and maintenance program.			
409. Ability to negotiate and resolve wastewater collection system operational issues that involve other utilities, agencies, private organizations, government entities and the general public to address complex or non-routine issues.			
410. Provides responsible and complex technical support to upper management and prepares/presents staff reports including organizational studies.			

## Knowledge, Skills Abilities -- Gap Analysis Tool

<b>Collection System Maintenance Grade IV</b>	<b>Do It All The Time</b>	<b>Limited Experience</b>	<b>Never Do This</b>
411. Originates and administers the work of contractors/consultants/engineers for a variety of wastewater collection system construction and/or maintenance projects.			
412. Responsible for the development and administration of safety training programs for wastewater collection system staff; and ensures compliance with safe working practices, rules and regulations.			
413. Administers training to wastewater collection system staff in their areas of work such as but not limited to inspection and repair procedures, methods, and equipment.			
414. Oversees and participates in the development and administration of the wastewater collection system annual budget; tracks and forecasts resources needed for staffing, equipment, materials, and supplies; monitors and approves expenditures and implements adjustments.			
415. Initiates, develops and administers wastewater collection programs, policies, and procedures to ensure a safe, effective and efficient operating system.			
416. Attends and participates in professional group meetings; stays abreast of new trends and innovations in the field of wastewater collection system operation and maintenance; ensure the availability of opportunities for all staff to participate in professional development.			
417. Responds to difficult and sensitive public inquiries in a professional and courteous manner, and develops formal reports and responses to the media.			
418. Reviews and responds to liability claims and participates in the investigation of violations of employer policies or agency ordinances.			
419. Oversees the process of containing and clean-up of spills emanating from the collection system and certifies documentation for sanitary sewer overflows.			
Total Per Category			

If you have mostly "do it all the time" boxes checked, you may want to explore the next higher grade.

If you have a mix of the "do it all the time" & "limited experience", this is likely the right grade.

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