

SPECIFICATIONS - DETAILED PROVISIONS
Section 01000 - General Safety Requirements

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SECTION 01000
GENERAL SAFETY REQUIREMENTS

1.01 RESPONSIBILITY

The contractor is responsible for ensuring that all activities in connection with the work including, but not limited to, labor, materials, and equipment, conform fully with the standards referenced herein. This requirement applies to all activities performed, operated, maintained or constructed by the contractor, sub-contractor, supplier, or any other agent of the contractor performing work. Further, the contractor, his subcontractor, suppliers, and any other agents shall not require any employee, or other worker in connection with the performance of the contract, to engage in work under conditions which are unsanitary, hazardous, dangerous to an employee's health or safety or otherwise in violation of any applicable federal, state, or local law or regulation in regard to occupational safety.

1.01 A SAFETY AND HEALTH

The Contractor shall conform to all applicable occupational safety and health standards, rules, regulations and orders established by local agencies, State of California, and California Division of Occupational Safety and Health Construction Safety Regulations (Cal OSHA), including obtaining permits required by California Code of Regulations, Title 8, Section 341 and 341 (a).

§1527. Washing Facilities, Food Handling, and Temporary Sleeping Quarters.

WASHING FACILITIES

- A. GENERAL. Washing facilities shall be provided as follows: A minimum of one washing station shall be provided for each twenty employees or fraction thereof. Washing stations provided to comply with this requirement shall at all times:
1. Be maintained in a clean and sanitary condition;
 2. Have an adequate supply of water for effective washing;
 3. Have a readily available supply of soap or other suitable cleansing agent;
 4. Have a readily available supply of single-use towels or a warm-air blower;
 5. Be located and arranged so that any time a toilet is used, the user can readily wash;
 6. When provided in association with a nonwater carriage toilet facility in accordance with Section 1526(c),
 7. Provide a sign or equivalent method of notice indicating that the water is intended for washing; and
 8. Be located outside of the toilet facility and not attached to it.

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- B. EXCEPTION to subsection (a)(1)(F)(2.): Where there are less than 5 employees, and only one toilet facility is provided, the required washing facility may be located inside of the toilet facility.
- C. EXCEPTION to subsection (a)(1): Mobile crews having readily available transportation to a nearby toilet and washing facility.
- D. WASHING FACILITIES FOR HAZARDOUS SUBSTANCES. Where employees are engaging in the application of paints, or coatings, or in other operations involving substances which may be harmful to the employees, washing facilities shall be provided in near proximity to the worksite and shall be so equipped as to enable employees to remove such substances. Facilities provided to comply with this requirement shall at all times:
 - 1. Be maintained in a clean and sanitary condition;
 - 2. Have an adequate supply of water sufficient for effective removal of the hazardous substance from skin surfaces; and
 - 3. Have a readily available supply of soap, and where necessary to effect removal, special cleansing compounds designed specifically for removal of the hazardous substance from skin surfaces; and
 - 4. Have a readily available supply of single use towels or a warm-air blower.

1.02 OTHER CODES AND STATUTES

In addition to the standards and requirements detailed herein, contractors and subcontractors shall comply with applicable provisions of Federal, State, and municipal safety, health, and sanitation statutes and codes. In the event there is a conflict between the provisions of the Safety and Health Regulations for Construction promulgated by the U.S. Department of Labor in Title 29 CFR Part 1926, Occupational Safety and Health Act (OSHA), or the California Occupational Safety and Health Act regulations in the California Labor Code Section 6300 et seq. (Cal. OSHA), the more stringent provision shall prevail.

1.03 SUBCONTRACTS

Contractors shall include provisions for compliance with the health and safety requirements, as referenced in this Section 01000, in the terms and conditions of all contracts, subcontracts, supply contracts, and all other contractor arrangements for performance of the work.

1.04 DIFFERING OPINIONS

Differing opinions between the contractor and District on adequacy of existing or proposed protective measures, equipment, procedures, or devices shall be resolved as follows:

- A. Upon receipt of a written notice from the District regarding an issue in question, (see Standard Form Exhibit “A”), the contractor shall not start or continue the measure, procedure, equipment, or devices, or expose employees to associated hazards until the differences have been resolved.
- B. Upon resolution of the differing opinions, either with or without input from an independent professional safety engineer, Certified Safety Professional (CSP), or other safety expert, the questionable measure, procedure, equipment, or device shall be brought into conformance with the written agreed-upon solution. Only personnel required to complete remedial work shall be exposed to the associated hazard, and then only in a manner conforming to all safety requirements.
- C. Obtaining engineering data or retaining the services of an independent professional engineer to assist in resolving the issue(s) remains a contractor responsibility.

1.05 PRECONSTRUCTION SAFETY MEETING

Representatives of the contractor shall meet with the District prior to the start of construction to review the respective safety requirements and to discuss implementation of all health and safety provisions pertinent to the work under contract, including safety training status of equipment operators, etc. The contractor shall be prepared to discuss, in detail, the measures he intends to take to control the possible hazards incident to the major phases of the work under contract and to comply with contractual obligations. This meeting will be devoted to discussing the manner in which the contractor intends to administer his health and safety program and delegate the responsibilities for implementing the program.

A Specific Operating Safety Procedure (EN-84) and an Injury & Illness Prevention Program must be submitted to the District at the Pre-Construction conference for acceptance by the District prior to the start of construction. The Contractor shall identify any safety organization, safety team, or safety person within the Contractor’s organization, complete with contact name and telephone number. For assistance in preparing your Injury and Illness Prevention Program, go to <http://www.dir.ca.gov/dosh/etools/09-031/index.htm>

The Injury & Illness Prevention Program shall be submitted in Electronic Format as follows: Submit all information in searchable PDF format; PC compatible using Windows XP operating system. All information provided shall be consolidated to one portable document file (PDF) in the latest version of Adobe Acrobat, with a Table of Contents and Bookmarks for each major section.

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1.06 SAFETY PROGRAMS

The prime contractor shall prepare a comprehensive written safety program covering all aspects of onsite construction operations and activities associated with each respective contract. Further, unless adequately covered in the original plan, a supplementary detailed plan will be submitted prior to start of each major phase of work or when requested by the District.

In no case will onsite work commence until the program or appropriate supplementary submittals have been approved by the District. Initial and supplementary submittals shall include a timetable for completing the required, detailed, and specific operating procedures with hazard analysis. Approval by the District of initial and supplementary programs submitted by contractor only signifies that the submittals generally conform to the requirements contained and referenced herein, and shall not constitute any acceptance or other obligation of the District for the contractor's responsibilities for said programs. Said approval does not relieve the contractor of the responsibility of providing employees with a safe and healthful work environment, or complying fully with all the above requirements. For a project-specific safety plan outline for Contractor's use, see Exhibit "B" (Specific Operating Procedure - including Hazard Analysis).

1.07 SAFETY PROGRAM REVIEW

Following the above preconstruction safety meeting and development of the Safety Program, a second meeting shall be held to review the contractor's written safety program. The contractor's principal onsite representative, the general superintendent, and his safety representative shall attend this meeting.

1.08 JOINT SAFETY POLICY MEETING

The District, the contractor's principal onsite representative, and designated staff members shall participate in scheduled monthly safety meetings. These meetings shall be used to review the effectiveness of the contractor's safety effort, to resolve health and safety problems relating to current operations, and to provide a forum for planning safe future construction activities. Meeting minutes shall be prepared by the Contractor and maintained in a manner prescribed by the District.

1.09 SAFETY PERSONNEL

When the contract does not require the services of a full-time safety engineer, the contractor shall designate a competent and dependable supervisory employee, acceptable to the District, to administer this safety program. However, should the contractor's safety effort be considered inadequate, the District has the option to require the contractor to employ a full-time qualified safety engineer in lieu of a safety representative. The hiring of a full-time safety engineer shall be at the sole cost and expense of contractor and said hiring shall not entitle contractor to additional compensation.

1.10 SAFETY INSPECTION

The contractor shall provide for weekly safety inspections of the worksites, materials, and equipment by competent employees. Detailed written inspection records shall be maintained and available for review by the District.

Prior to the use of any gauges which monitor atmospheric hazards, the contractor's competent person will verify that the gauge is in current calibration. This will be documented on the District's resident inspector's daily report form.

1.11 ACCIDENT/INJURY/ILLNESS INVESTIGATION AND REPORTING

DEFINITIONS:

A. Serious Accidents/Incidents

Any occurrence of a job-related nature including, but not limited to, suicide or homicide attempts, heart attacks, and occupational injuries or diseases which result in:

1. An employee or agent of District, contractor, subcontractor, or supplier suffering death, permanent total disability, complete and/or permanent loss of an eye, hand, foot, or major organ.
2. Hospitalization for five or more days of an employee or agent of District and/or contractor, subcontractor, or supplier, or one or more employees in critical condition.
3. Fires or property damage resulting in a loss of \$25,000 or more.
4. Third party injuries, death, or substantial property losses that result or could result in claims against the District.

B. Nonserious Accidents/Incidents

All other personal and/or property damage accidents/incidents except first aid cases and property damage losses below \$2,500.

C. Potential Serious Accidents/Incidents

Accidental occurrences or near misses with the potential to be a serious accident/incident such as major equipment failures, contact with high voltage lines, spills of or personal contacts with excessive amounts of toxic or hazardous materials, slides, cave-ins, etc.

1.12 INVESTIGATION/REPORTING

- A. Serious accident/incidents shall be reported immediately to the District and appropriate contractor field supervisor. Providing or obtaining appropriate medical and emergency assistance and notification of coroner, safety, and law enforcement agencies, and family members remain a contractor responsibility. Except for rescue and emergency measures, the scene of the accident/incident shall not be disturbed or the operation resumed until authorized by District. The contractor shall assist and cooperate fully with the District in conducting the investigations of the accident/incident and assure availability of all information, personnel, and data pertinent to the investigation. The contractor shall, when ordered by the District, conduct or have conducted a separate and complete independent investigation of the accident/incident, and submit a comprehensive report of findings and recommendations to the District.

The contractor shall arrange and be financially responsible for the independent investigation and any equipment or material inspections or tests, or diagnostic studies required by the District or contractor investigators. Further, Contractor's Report of Recordable Injury/Illness (See Exhibit "C") shall be completed and submitted to the District for each injured person.

- B. Nonserious accident/incidents will be reported immediately to the contractor's supervisor delegated authority to arrange for medical assistance and/or investigate the accident/incidents. Immediately following arrangements for required medical assistance, the responsible supervisor will investigate the accident/incident. Within three working days following the accident/incident, the contractor will submit to the District, a completed Contractor's Report of Recordable Injury/Illness (see Exhibit "C") for all personal injuries, and a comprehensive narrative report for property damage accidents.
- C. Potentially serious accident/incidents shall be reported immediately to the District. The contractor's involved equipment and/or worksite shall remain secured until the contractor has completed an acceptable comprehensive investigation. Within five days following the investigation, a detailed written investigation report will be submitted to the District.
- D. In the event of an injury, accident, near miss or notice of unsafe condition, EMWD will require the Contractor to perform a Root Cause analysis (RCA) and submit the results and recommendations to EMWD. EMWD reserves the right to evaluate the RCA to make sure it addresses the incident effectively. The RCA needs to be submitted within 30 days of the incident with an action plan to implement effective solutions to prevent reoccurrence. If not submitted within the expected timeframe, a portion of the monthly payment will be withheld. Contractors may use 5-Whys, Fishbone Diagram, Tap Root, Fault Tree, Failure Mode and Effect (FMEA) or any other process which results in root cause identification. In the absence of a RCA process, contractors may use the EMWD 5-Whys Guide Template, reference Exhibit F.

1.13 MONTHLY ACCIDENT STATISTICAL REPORT

After any incident or accident the contractor shall submit a standard form entitled Contractor Summary of Occupational Injuries/Illnesses Experience (See Exhibit “D”) or equivalent form acceptable to the District for the previous 12 month period.

1.14 HOUSEKEEPING

Good housekeeping, including provision and facilities for routine scrap removal, shall be maintained in all areas within the contractor’s scope of operation.

1.15 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

- A. Contractor shall comply with the Global Harmonization System (GHS) requirements in addition to complying with the Cal OSHA Hazard Communication regulation and EMWD’s Hazard Communication Program.
- B. Contractor shall identify the name(s) of the individual(s) who are responsible for ensuring compliance with the contractor’s Hazard Communication and Global Harmonization System policies. The name(s) of the individual(s) shall be provided at the pre-job conference with the District’s representatives.
- C. Contractor shall be solely responsible for providing and posting of Hazard Communication and GHS warning, symbols and/or placards at the job site. This applies to the chemicals, compounds and/or substances brought on to the District’s property and stored during the construction process.

Chemicals, compounds and/or substances that are not used in the construction activities on the District’s property shall not be stored on the property. Prior to bringing any new chemicals, compounds and/or substances on to the District’s property that were not identified prior to the start of on site activities, the contractor shall notify the District’s representative of the new chemicals, compounds or substances.
- D. The independent contractor shall be solely responsible for enforcing the HAZCOM and GHS requirements with its subcontractors, vendors and/or consultants.
- E. **It is the responsibility of the contractor to provide Hazard Communication Training for its employees. The training shall include, at a minimum, the District’s substances, compounds and/or chemicals the workers can be exposed to during their time on the project; and the chemicals, substances and/or compounds the contractor brings on to the construction project.**
- F. Any safety or health concerns brought to the contractor’s attention by District personnel or consultants hired by the District, with respect to the Contractor Hazcom Coordination Procedure, shall be immediately addressed by the contractor. The contractor will be solely responsible for taking appropriate corrective action and notifying the District of the action taken.
- G. The contractor shall clean up any spills in accordance with the manufacturer’s recommendations, the SDS and/or EPA requirements.

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- H. The contractor shall properly dispose of any materials, chemicals, compounds and/or substances in accordance with current safety & health regulations. DO NOT PLACE ANY HAZARDOUS MATERIAL INTO THE DISTRICTS'S TRASH CONTAINERS OR DUMPSTERS. DO NOT BURY OR HIDE ANY CHEMICALS, COMPOUNDS AND/OR SUBSTANCES ON DISTRICT PROPERTY.

1.16 GENERAL

Intoxicating beverages and narcotics shall not be permitted or used on construction sites. Persons under the influence of alcohol or narcotics shall not be permitted on the site. Firearms shall not be permitted on the construction site without prior approval of the District.

1.17 CERTIFICATION

Design of major critical facilities, equipment, support structures, or systems, embankments, shoring systems, formwork (falsework) built or provided by the contractor for his use shall be certified as structurally suitable for the use intended under the specifications. This certification shall be made in writing by the manufacturer or a registered professional engineer competent in these fields and shall be submitted to the District prior to erection or use of such facilities, equipment or support systems.

1.18 EMWD LOCKOUT/TAGOUT PROCEDURE

The Contractor shall make himself familiar with the District's lockout/tagout procedure to isolate energy sources (mechanical, pneumatic, electrical, hydraulic, physical or chemical). The Contractor **MUST** coordinate through a qualified District representative (Inspector) a minimum of forty-eight (48) hours prior to requiring a lockout/tagout. The District Representative (Inspector) will arrange to have any energy source as described above locked out by an authorized employee in accordance with the District's procedure. In case there is any violation of the District's lockout/tagout procedure the Contractor will be directed to cease operations related to the unsafe condition, measure, procedure, equipment or device and will be issued a Notice of Unsafe Condition.

1.19 EXPERIENCE MODIFICATION RATING

The Contractor shall, prior to the Pre-Construction Safety Meeting, submit a current copy of the Experience Modification Rating for himself and any listed sub-contractor. This information will be reviewed at the Pre-Construction Safety Meeting.

1.20 WORKERS COMPENSATION RECORDS

The Contractor shall submit Workers Compensation Records for the past 2 years (Log and Summary of Occupational Injuries and Illnesses). This information will be reviewed at the Pre-Construction Safety Meeting.

1.21 CONFINED SPACE ENTRY REQUIREMENTS

When working in, or connecting to existing systems in operation, the required safety provisions for work in an operating system will be enforced, including provisions for working in confined air spaces. Contractor shall comply with EMWD's Confined space Entry Policy attached hereto (see Exhibit E).

END OF SECTION 01000

ATTACHMENTS

- [EXHIBIT "A" – \(EN-87\) NOTICE OF UNSAFE CONDITION](#)
- [EXHIBIT "B" – \(EN-84\) SPECIFIC OPERATING SAFETY PROCEDURE](#)
- [EXHIBIT "C" – \(EN-85\) REPORT OF INJURY](#)
- [EXHIBIT "D" – \(EN-89\) CONTRACTOR MONTHLY SUMMARY OF OCCUPATIONAL INJURIES/ILLNESSES EXPENSE](#)
- [EXHIBIT "E" – EMWD CONFINED SPACE ENTRY POLICY](#)
- [EXHIBIT "F" – 5 - WHYS GUIDE & TEMPLATE](#)

Exhibit "A"

NOTICE OF UNSAFE CONDITION

TO CONTRACTOR OF EMWD PROJECT:

 Spec. Number

 C.O. Number

As set forth in Section 01000 - General Safety Requirements, Eastern Municipal Water District standards require compliance with all applicable laws, ordinances and regulations, including orders pertaining to safety.

Your attention is directed to the unsafe condition prevailing at the following described site and your responsibility to utilize procedures in accordance with the applicable federal and state Construction Safety Orders, laws, and regulations.

Site and/or condition:

<input type="checkbox"/>	You are again directed to comply with all safety orders by making an immediate and proper response or correction.
<input type="checkbox"/>	You are directed to immediately cease operations related to the unsafe condition, measure, procedure, equipment or device(s). Furthermore, you shall not expose employees to associated hazards until a solution to these safety issues has been agreed upon (see Section 01000-1.04).

Issued by: _____
 Name and Title

Date: _____

Time: _____

cc: Construction Administrator
 Project File

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Exhibit "B"

SPECIFIC OPERATING SAFETY PROCEDURE (INCLUDING HAZARD ANALYSIS)					
PROJECT:			SPEC. NO.		
SPECIFIC OPERATING PROCEDURE NO.					
OPERATION:			PAGE		OF
GENERAL INSTRUCTIONS:					
DATE:		PERSONNEL REQUIRED:			
NOTE: SEE REVERSE SIDE FOR ADDITIONAL INFORMATION					
SAFETY EQUIPMENT AND APPAREL:					
PROCEDURE DEVELOPED BY:			APPROVED BY:		

OPERATION SEQUENCE	ASSOCIATED HAZARD	EQUIPMENT, TOOLS OR FACILITIES	SPECIAL INSTRUCTIONS OR LIMITATIONS	REFERENCE

1. **GENERAL:** Specific operating procedures (SOP) are designed as a planning tool. They are most effective when developed jointly by the supervisor and employees engaged in the specific activity and/or operation. They provide excellent reference material for toolbox meetings and for instructing new employees on respective assignments and responsibility.

Their effectiveness in reducing accidents and improving job performance is directly related to the efforts expended in their development and timely revision.

2. **ASSOCIATED HAZARDS:** For each job step, ask yourself what accidents could happen to the person doing the job step. You can get the answer by (1) observing the job, (2) discussing it with the operator, (3) recalling past accidents, or (4) a combination of the three. Ask yourself: can he be struck by or contacted by anything? can he strike against or come in contact with anything? can he be caught in, on, or between anything? can he fall? can he overexert? is he exposed to anything injurious, such as gas, radiation, welding rays, etc? (for example, acid, burns, fumes, dust).
3. **EQUIPMENT, TOOLS, AIDS, OR FACILITIES:** List type and number of tools and materials to be used, i.e., two jack hammers, one compressor, two 2" diameter hoses, 100 feet in length, etc.
4. **SPECIFIC INSTRUCTIONS OR LIMITATIONS:** For each potential accident or hazard, ask yourself how should the worker do the job step to avoid the potential accident, or what should he do or not do to avoid the accident. You can get your answers by (1) observing the job for leads, (2) discussing precautions with experienced job operators, (3) drawing on your experience, or (4) a combination of the three. Be sure to describe specifically the precautions a man must take. Don't leave out important details. Number each separate recommended precaution with the same number you gave the potential accident (see appropriate column) that the precaution seeks to avoid. Use simple do or don't statements to explain recommended precautions as if you were talking to the person.

For example: Only wirecore lifelines shall be used in highscaling operations. Block cable supported crane booms before removing section pins. Avoid such generalities as "Be careful," "Be alert," "Take caution," etc.

5. **REFERENCES:** Reference specific material i.e., a SOP on highscaling should reference "Safety Belts and Hardware," and "Lifelines," describe how to use a "Scaler's Hitch," etc.
6. **SAFETY EQUIPMENT AND APPAREL:** Specifically required safety equipment, devices, and apparel need to be listed, i.e., hard hat, eye and face protection, respirator protection, safety shoes, wearing apparel, hoist safety devices, air hose safety devices, etc.

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SAMPLE OF PIPELINE SPECIFIC OPERATING SAFETY PROCEDURE

SPECIFIC OPERATING SAFETY PROCEDURE (INCLUDING HAZARD ANALYSIS)				
PROJECT:	(Project Title)	SPEC. NO.	XXX	
SPECIFIC OPERATING PROCEDURE NO.	(Specify)			
OPERATION:	(Specify)	PAGE		OF
GENERAL INSTRUCTIONS:	(Contractor's Name) will supervise and be responsible for preventing contact with raw			
	Sewer or any other hazardous material and will also monitor and confirm minimum required trench slopes per OSHA			
	Requirements. All soil types and trench slopes will be decided by our field foreman who is onsite competent person.			
DATE:	(Today's Date)	PERSONNEL REQUIRED:	(Specify Here)	
NOTE: SEE REVERSE SIDE FOR ADDITIONAL INFORMATION				
SAFETY EQUIPMENT AND APPAREL: (Specify)				
PROCEDURE DEVELOPED BY:	(Signature)	ARRPROVED BY:	(Signature)	

SAMPLE OF PIPELINE SPECIFIC OPERATING SAFETY PROCEDURE

OPERATION SEQUENCE	ASSOCIATED HAZARD	EQUIPMENT, TOOLS OR FACILITIES	SPECIAL INSTRUCTIONS OR LIMITATIONS	REFERENCE
1.Excavation,Pipe Installation, backfill & compact	Potential unstable existing soil conditions	Trenches will be sloped or shored per OSHA requirements	Hard hats must be utilized by all field personnel. Access ladders placed per OSHA requirements for access in and out of trenches. Trenches blocked and/or barricades as needed for public safety.	
2. Mortaring & Bitchmastic Coatings	Possible skin contact	Safety Equipment to be utilized per requirements to meet field conditions.	SDS will be available on site to review exposure effects and follow first aid instruction.	
3. Traffic Control and lane closures	Public & Employee Safety	Arrow boards, Fencing, Traffic plates, proper construction signage.	Per requirements of OSHA and Cal-Trans traffic manual. Safety vests/orange shirts to be worn in all traffic areas.	
4. Remove Concrete	Flying concrete debris during demolition	Hard Hats, safety goggles and dust mask.	Proper ventilation must be maintained during saw cutting existing concrete.	
5. Hydrostatic Pressure Testing	High pressure testing equipment	Safety equipment to be utilized per requirements to meet field conditions.	SDS will be available on site to review exposure effects and follow first aid instruction.	

OPERATION SEQUENCE	ASSOCIATED HAZARD	EQUIPMENT, TOOLS OR FACILITIES	SPECIAL INSTRUCTIONS OR LIMITATIONS	REFERENCE
6. Chlorination	Possible skin contact	Safety equipment to be utilized per requirements to meet field conditions.	SDS will be available on site to review exposure effects and follow first aid instruction. Maintain adequate ventilation.	
7. Asphalt Paving	Burns	Safety equipment to be utilized per requirements to meet field conditions.	SDS will be available on site to review exposure effects and follow first aid instruction. Monitor all paving activities and implement safety requirement per field conditions for both employees and public safety.	
8. Concrete repair	Possible skin contact & air borne concrete while chipping	Safety equipment to be utilized per requirements to meet field conditions.	SDS will be on site to review exposure effects and follow first aid instruction. Maintain adequate ventilation.	
9. Dust control & saw cutting	Vision Impaired	Hoses & cords kept to a minimum length. Wear dust masks and safety glasses.	SDS will be available on site to review exposure effects and follow first aid instruction. Maintain adequate ventilation.	
10. Cutting torches	Explosive/Gases/Fire	Fire Extinguisher	Fire watch/Laborer	

OPERATION SEQUENCE	ASSOCIATED HAZARD	EQUIPMENT, TOOLS OR FACILITIES	SPECIAL INSTRUCTIONS OR LIMITATIONS	REFERENCE
11. Site Cleanness	Tripping	Keep tools organized and concentrated	End of work day pick up everything	
12. Emergency Vehicles	Getting to locations	Notify emergency services prior to construction	Instruct all employees on procedures for emergency traffic.	

Exhibit "C"

REPORT OF INJURY

CONTRACTOR'S REPORT OF RECORDABLE INJURY/ILLNESS

Each work related fatality, injury/illness, first aid cases accepted, shall be reported on this form. The completed form will be submitted to the District within 3 working days from the date of the incident or onset of illness. Responsibility for completion and submission of this form for all onsite injury/illness to contractor, subcontractor, or supplier forces rests with the general contractor. All form terms are as defined on the reverse side.

CONTRACT SPECIFICATION (Number and Title)		DATE OF THIS REPORT	
EMPLOYER			
EMWD Resident Inspector			
INJURED EMPLOYEE'S NAME		OCCUPATION	
AGE	DATE EMPLOYED	DATES OF PREVIOUS INJURIES	
DESCRIBE INJURY/ILLNESS			
DATE OF INJURY	TIME	ATTENDING PHYSICIAN	INJURY CLASSIFICATION
STARTED LOSING TIME (Never Date of Injury)		DID INJURY RESULT IN DEATH OR PROBABLY PERMANENT DISABILITY?	
RETURN TO WORK (Date)*		DATE OF DEATH	
WORKDAYS LOST TIME*		DAYS OF RESTRICTED WORK OR TRANSFER TO OTHER JOB	
* Estimate date of return to full duty to avoid delay in submitting report (See reverse side for estimating instructions).			
DESCRIBE ACCIDENT (Include Who, What, Where, & How)			

SUPERVISORY OPINION	HOW COULD ACCIDENT HAVE BEEN PREVENTED?	
		(Signature) FOREMAN OR IMMEDIATE SUPERVISOR

NOTE: Information in this report is to be used for the prevention of accidents and is not intended as a basis for injury claims. Recordable injuries/illnesses and workdays lost and injury classification shall be as defined on reverse side of this form. **Information in this report shall also be recorded on CAL-OSHA form 200.**

DEFINITION OF TERMS

Work-related Injury/Illness:

All injuries/illnesses to contractor, subcontractor, or supplier employees that result from an event or exposure on any contractor controlled worksite associated with the respective contract.

Medical Cases: Injuries/illnesses are defined as medical cases if: (1) they can be treated only by a physician or licensed medical personnel, (2) they result in damage or harm to physical structure of a nonsuperficial nature (e.g., hairline fractures), (3) they impair bodily functions (i.e., normal use of senses, limbs, etc.), (4) they involve complications requiring follow-up medical treatment.

The following are generally considered medical treatment:

- Treatment of **INFECTION**
- Application of **ANTISEPTICS** during second or subsequent visits to medical personnel
- Treatment of **SECOND OR THIRD DEGREE BURN(S)**
- Application of **BUTTERFLY ADHESIVE DRESSING(S)** or **STERISTRIPS** in lieu of sutures
- Application of **SUTURES** (stitches)
- Removal of **FOREIGN BODIES EMBEDDED IN EYE**
- Removal of **FOREIGN BODIES** from wound; if procedure is **COMPLICATED** because of depth of embedment, size, or location
- Use of **PRESCRIPTION MEDICATIONS** (except a single dose administered on first visit for minor injury or discomfort)
- Use of hot or cold **SOAKING THERAPY** during second or subsequent visit to medical personnel

- Application of hot or cold **COMPRESS(ES)** during second or subsequent visit to medical personnel
- **CUTTING AWAY DEAD SKIN** (surgical debridement)
- Application of **HEAT THERAPY** during second or subsequent visit of medical personnel
- Use of **WHIRLPOOL BATH THERAPY** during second or subsequent visit of medical personnel
- **POSITIVE X-RAY DIAGNOSIS** (fractures, broken bones, etc.)

ADMISSION TO A HOSPITAL or equivalent medical facility for treatment or prolonged observation

First Aid Cases: Cases (1) limited to one-time treatment and subsequent observation and (2) involve treatment of only minor injuries, not emergency treatment of serious injuries. Further, any one-time treatment and follow up visit for the sole purpose of observation of minor scratches, cuts, burns, splinters and so forth which do not ordinarily require medical care are classified as first aid treatment. Such one-time treatment and follow up visit for the purpose of observation is considered first aid even though provided by a physician or registered professional personnel. Visits to a doctor for an examination or other diagnostic procedure to determine whether the employee has an injury is classified as a first aid case if no injury is discovered or medical treatment is rendered. Conversely, if treatment is described and medical care is provided even by someone other than a physician or registered medical personnel, injury is classified as medical.

Other examples of first aid cases not requiring reporting unless they result in loss of consciousness, restriction of work, or motion, or transfer to another job are:

- Application of **ANTISEPTICS** during first visit to medical personnel
- Treatment of **FIRST DEGREE BURN(S)**
- Application of **BANDAGE(S)** during first visit to medical personnel
- Use of **ELASTIC BANDAGES** during first visit to medical personnel
- Removal of **FOREIGN BODIES NOT EMBEDDED IN EYE** if only irrigation is required
- Removal of **FOREIGN BODIES** from wound, if procedure is **UNCOMPLICATED**, and is, for example, by tweezers or other simple technique
- Use of **NONPRESCRIPTION MEDICATIONS AND** administration of single dose of **PRESCRIPTION MEDICATION** on first visit for minor injury or discomfort
- **SOAKING THERAPY ON INITIAL VISIT** to medical personnel or removal of bandages by **SOAKING**
- Application of hot or cold **COMPRESS(ES)** during first visit to medical personnel
- Application of **OINTMENTS** to abrasions to prevent drying or cracking
- Application of **HEAT THERAPY** during first visit to medical personnel
- Use of **WHIRLPOOL BATH THERAPY** during first visit to medical personnel
- **NEGATIVE X-RAY DIAGNOSIS**
- **BRIEF OBSERVATION** of injury during visit to medical personnel

Note: The administration of a **TETANUS SHOT** or **BOOSTER**, by itself, is not considered medical treatment. However, these shot are often given in conjunction with the more serious injuries. Therefore, injuries requiring

tetanus shots may be reportable for other reasons.

Illness Cases: Occupational illness of an employee is any abnormal condition or disorder, other than one resulting from an occupational injury caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion, or direct contact.

Some conditions may be classified as either an injury or illness (but not both), depending upon the nature of the event that produced the condition. For example, a loss of hearing resulting from an explosion (an instantaneous event) is classified as an injury; the same condition arising from exposure to industrial noise over a period of time would be classified as an occupational illness. Similarly, irritation of the throat from exposure to chlorine fumes would be classified as an injury if it resulted from a ruptured tank and an illness if the exposure occurred over a period of time. The determination of illness or injury is based on the original event. Adverse reaction to a tetanus shot given for a laceration would be classified as an injury. Back cases should always be recorded as an injury. It should be noted that all occupational illnesses are reportable and recordable incidents regardless of the type of treatment provided.

Fatalities: Work-related fatalities are reportable and recordable regardless of the time between the injury and the death or the length of the illness. Lost workdays attributable to the incident are not counted and any charged should be removed from the record.

Lost Workdays: Lost workdays are defined as the number of workdays (consecutive or not), beyond the day of injury or onset of illness, the employee was away from work or limited to restricted work activity. The number of days away from work or days of restricted work activity does not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work, e.g., vacation days, days off, or holidays are not counted. Termination of employment may stop the count of lost workdays if unrelated to the employee's injury or illness. If termination is related to injury/illness, an estimate of actual workdays lost shall be made. Retirements unrelated to injury or illness stop the count of lost workdays. Otherwise days lost are estimated. Lost workday counts cease when injury or illness is determined as totally disabling. Lost workday count stops when position employee was in when injured is abolished due to work completion, e.g., a dozer operator lost workdays count would not continue beyond last day of dozer operations on the project even if the operator still could not perform the operator functions.

Restricted work: The number of workdays on which because of injury or illness: (1) the employee was assigned to another job on a temporary basis; or (2) the employee worked at a permanent job less than full time; Or (3) the employee worked at a permanently assigned job but could not perform all duties normally connected with it. Lost workday count stops when employee is permanently transferred to another permanently established position.

Contractor Controlled Worksite Associated with the Contract. The following and similar locations are considered contractor controlled worksites:

All areas within the boundaries of the construction site including shops, plants, storage areas, haul roads, borrow and fill areas.

All offsite locations (plants, shops, rock quarries, borrow areas, erection sites, etc.) used exclusively for supporting construction activities. All roads where traffic control is a contractor responsibility.

Exhibit "D"

CONTRACTOR MONTHLY SUMMARY OF OCCUPATIONAL INJURIES/ILLNESSES EXPENSE

Included on the form will be the contractors, subcontractors, and suppliers onsite injury/illness experience for the reporting 12 month period. All form terms are defined on the back of this form.

REPORTING PERIOD	STARTING ENDING									
CONTRACTOR SUBCONTRACTOR SUPPLIER – SPEC. NO	TYPE OF CONSTRUCTION	NO. EMPLOYEES	MAN- HOURS EXPOSURE	LOST WORKDAYS	RECORDABLE CASES			INCIDENT RATES		
					TOTAL	DEATHS	LOST WORKDAY CASES	TOTAL CASES	DEATH AND LOST WORKDAY CASES	LOST WORKDAY
1	2	3	4	5	6	7	8	9	10	11
GENERAL CONTRACTOR NAME SPEC. NO. SUBCONTRACTORS SUPPLIERS										
TOTAL										
CUMMULATIVE TOTAL										

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- Column 1. Name of General Contractor and General Specification No. only. Combine all subcontractor and/or supplier data under respective headings. Cumulative totals start from first day of onsite work under the specification.
- Column 2. Major classification or type of work for contractor (Water pipeline, sewer pipeline, pump station, treatment plant, lift station, etc.). Minor classification for supplier or subcontractor (concrete work, earthwork, repair work, etc.).
- Column 3. Average number of employees during reporting period. Include only onsite personnel. Number of subcontractor or supplier employees can be estimated by dividing number of estimated man-hours by 8 x number days of reporting period.
- $$\frac{\text{(Number of man-hours)}}{\text{(8 x number days of reporting period)}}$$
- Column 4. Actual man-hours of onsite exposure. Do not include vacation time, holidays, down periods, etc.
- Column 5. Lost workdays include actual days from work, restricted work days and days worked in another assigned position. (For detailed explanation of lost workdays and restricted work, see back of Exhibit "C").
- Column 6. Total of fatalities, lost workday cases, restricted work cases or transfer to other job cases, and medical cases reported on all forms "Contractor's Report of Recordable Injury/Illness," submitted during the reporting period covered by this form.
- Column 7. Fatalities are charged to date of injury or onset of illness regardless of date of death.
- Column 8. Includes all cases submitted during this reporting period of form "Contractors Report of Recordable Injury/Illness," that show figures under headings entitled, "lost time, or restricted work or transfer to other job." (see back of Exhibit "C").
- Columns 9, 10, 11 Incident rates are define as the number of injuries/illnesses or lost workdays related to a common exposure base-100 full-time workers or 200,000 man-hours (100 workmen x 40 hrs/week x 50 weeks/year = 200,000). These rates are calculated as follows:

$$\text{Total Cases (column 9)} = \frac{\text{Total cases (column 6) x 200,000}}{\text{Man-hours of Exposure (column 4)}}$$

$$\text{Death and lost workday cases (column 10)} = \frac{\text{Deaths (column 7) and lost workday cases (column 8) x 200,000}}{\text{Man-hours of Exposure (column 4)}}$$

$$\text{Lost workdays} = \frac{\text{Lost workdays (column 5) x 200,000}}{\text{Man workdays of exposure (column 4)}}$$

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Confined Space Entry Procedure

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Safety, Risk and Emergency Management

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1 Purpose

- 1.1 To establish a safe working procedure for District workers that meets or exceeds federal, state, or local rules and regulations. This program was developed in accordance with Cal/OSHA VPP Best Practices philosophy.
- 1.2 This Program is based on the regulatory requirements of the California Occupational Safety and Health Administration Title 8 California Code of Regulations (CCR) Article 108, Confined Space. The focus is to protect workers from exposure to hazards in confined spaces.

NOTE: This EMWD procedure meets and exceeds the requirements of Title 8 General Industry Safety Orders (GISO) and those of Title 8 Construction Safety Orders regarding Confined Spaces.

2 Scope and Application

- 2.1 This procedure contains specific requirements for work practices to protect workers from those hazards of entry into and work within a confined space. This procedure establishes that all confined spaces must be evaluated to determine whether it is permit or non-permit required prior to every entry.

3 Definitions

- 1 **Attendant** – An individual stationed outside the confined space who is trained as required by this procedure and who monitors the authorized entrants inside the permit required confined space. An attendant may not monitor more entrants or more permit spaces than the entry permit specifically authorizes.
- 2 **Authorized Entrant** – Any worker who is authorized by the District to enter a confined space to perform an assigned task. Authorized entrants may rotate duties, serving as attendants. Only trained persons may enter the confined space during the term of the permit.
- 3 **Blanking or Blinding** – The absolute closure of a pipe, line or duct, by fastening across its bore a solid plate or “cap” which completely covers the bore; which extends to at least the outer edge of the flange at which it is attached; and which is capable of withstanding the maximum upstream pressure.

- 4 Biological Hazards** – Microbial agents presenting a risk or potential risk to the wellbeing of humans through inhalation, ingestion, skin absorption, or injection.
- 5 Bump Test** – Testing an atmospheric monitoring device with a known concentration of gases that the monitor is intended to test. The test is used to verify that the monitor is within calibration parameters.
- 6 Calibration** – A manual or electronic adjustment of an atmospheric monitoring device to ensure testing parameter requirements of the manufacturer are met or exceeded.
- 7 Confined Space** – A location must have all three of the following definitions to be a “Confined Space.”
 - Is large enough and so configured that a worker can bodily enter and perform assigned work; and
 - Has limited or restricted means for entry or exit for example but not limited to: tanks, vessels, silos, storage bins, hoppers, vaults, pits, and ladder entry into pumping plants or subgrade facilities are spaces that may have limited means of entry; and
 - Is not designed for continuous worker occupancy. (Its primary function is other than human occupancy.)
- 8 Double Block and Bleed** – A method used to isolate a confined space from a line, duct or pipe by physically closing two main valves on a piping system, and opening a “vented to atmosphere” valve between them.
- 9 Emergency** – Any occurrence, including a failure of monitoring device or hazard control, internal or external to the confined space, which could endanger the entrant or other workers.
- 10 Engulfment** – The surrounding and effective capture of a person by a liquid or solid substance.
- 11 Entry** – An act by which a person intentionally passes through an opening into a confined space. The entrant is considered to have entered as soon as any part of the entrant’s body breaks the plane of an opening into the space.
- 12 Entry Permit** – A document established by the District, the content of which is based on the District’s hazard identification and evaluation for a confined space and is the instrument by which the District can verify that all precautions have been met prior to entry.

13 Entry Permit System – The written or printed document established by EMWD. The permit will be signed by the Entry Supervisor and posted at the entrance to the confined space.

The entry permit will include the name of the Attendant(s), the authorized Entrant(s), the work to be performed, the tools and equipment being taken into the confined space, the specific types of personal protective equipment to be used by the Entrants, air monitoring readings, the date of entry, time of entry, time the permit is issued and time the permit is scheduled to expire and be closed. Other information that the Attendant and/or Entry Supervisor deems to be necessary will be written on the permit.

14 Entry Supervisor – An appropriately trained worker who has been assigned the responsibility of ensuring a safe confined space entry. (An entry supervisor shall not enter the confined space as an entrant to perform work.)

15 Evacuation – An unaided emergency exit out of a confined space. This action may result from the entrant’s own decision or by a command from outside the space by the Attendant.

16 Fall Arrest/Rescue Device – A winch-type device that will quickly arrest a worker’s fall and absorb much of the free fall energy. The fallen worker may then be winched to safety using the hand crank system of the device. The cable from this device will attach to the safety harness. The type(s) of fall protection equipment, including personnel winches, will be determined by the Attendant and Entry Supervisor. The entrants will use the fall protection equipment when there is an exposure of a worker falling during entry or while exiting the confined space.

17 Gas Detector (Monitor) – Direct reading, four-gas monitor which measures oxygen content, LEL, carbon monoxide, and hydrogen sulfide. This also includes specialty monitors used to measure specific hazards (photo ionization detectors, metal oxide probes, radiation detectors, etc.).

18 Hazardous Atmosphere – An atmosphere which exposes workers above established exposure guidelines, to risk of death, incapacitation, injury or acute illness from one or more of the following causes:

- A flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL). Atmospheres that read >0% LEL up to 10% can still present a hazard and the source of the atmospheric reading must be determined and addressed;

- An airborne combustible dust at a concentration over the permissible exposure limit or that presents an explosion hazard by being above the minimum explosible concentration (estimated by visual observation as completely obscuring vision at a distance of 5 feet or less);
- An atmospheric oxygen concentration below 19.5% or above 23.5%;
- Carbon monoxide in excess of 25 PPM;
- Hydrogen sulfide in excess of 10 PPM;
- An atmospheric concentration (including any instantaneous reading) of any substance for which a Cal OSHA permissible exposure limit is exceeded and could result in worker exposure in excess of the permissible exposure limit. When an air contaminant for which OSHA or Cal/OSHA has not determined a permissible exposure limit which may be present in the permit space atmosphere, the District shall consult other sources of information, such as Safety Data Sheets which comply with the Hazard Communication Standard guidance in establishing the acceptable environmental conditions for entry by their workers; and
- Any atmospheric condition recognized as immediately dangerous to life or health (IDLH).

19 High Hazard Permit Required Confined Space Entry – A permit required confined space entry where the entrant performs work within the space without being attached to a retrieval device.

20 Hot Work Permit – The District’s written authorization to perform operations which could produce a source of ignition, such as riveting, welding, cutting, use of abrasive tools, burning, or heating.

21 Immediately Dangerous To Life or Health (IDLH) – Immediately dangerous to life or health (IDLH) means any condition which poses an immediate threat of loss of life; may result in irreversible injury and/or immediate-severe health effects; may result in eye damage; irritation or other conditions which could impair escape from the permit space.

22 Immediate-Severe Health Effects – Any acute clinical sign(s) of a serious, exposure-related reaction manifested immediately or within 72 hours after exposure.

23 Large Enough And So Configured That A Worker Can Bodily Enter – The entryway and space is large enough for any part of the worker’s body to enter in a manner that could cause harm. The entire body of a worker does not need to enter for harm to occur.

24 LEL – UEL – LEL: Lower Explosive Limit. Minimum concentration of a particular gas or vapor necessary to support its combustion in air.

UEL: Upper Explosive Limit. Maximum concentration of a particular gas or vapor necessary to support its combustion in air.

25 Non-Entry Condition – Any condition or set of conditions whose hazard potential exceeds the limits stated in the entry permit.

26 Non-Entry Rescue Team – A group of two or more workers designated and trained to perform non-entry rescues at confined spaces within the District.

27 Non-Permit Confined Space (NPCS) – A confined space that does not contain or, with respect to atmospheric hazards, would not normally contain any hazard capable of causing death or physical harm, and where all other serious hazards have been controlled.

Before declaring a confined space, a NPCS, the confined space is to be treated as a Permit Required Confined Space, including testing of the atmosphere in the confined space.

28 Oxygen Deficient Atmosphere – An atmosphere containing less than 19.5% oxygen by volume.

29 Oxygen Enriched Atmosphere – An atmosphere containing more than 23.5% oxygen by volume.

30 Permissible Exposure Limit (PEL) – PELs are the allowable 8-hour time-weighted average air contaminant concentrations established by the U.S. Department of Labor, Occupational Safety and Health Administration, and Cal/OSHA regulations, or adopted by Cal OSHA.

31 Permit Required Confined Spaces (PRCS) – A confined space which must include one or more of the following conditions:

- Contains or has a known potential to contain a hazardous atmosphere;
- Contains a material with the potential for engulfment of an entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor, which slopes downward and tapers to a smaller cross-section; and/or

- Contains any other recognized serious safety or health hazard including but not limited to: electrical, moving parts, surface chemical, hot temperature or hot surface, biological hazard (including microbiological, insect, or animal).
- 32 Rescue Service** – Qualified third party personnel designated to rescue workers from permit spaces. It may include rescuer entry into the confined space. District personnel shall not perform entry rescue.
- 33 Retrieval** – Aided assistance in exiting the confined space not requiring entry by a rescuer or attendant. Non-entry rescue.
- 34 Retrieval Line** – An approved line or rope secured at one end of the worker by a full-body harness, and with its other end secured to either a lifting (or other retrieval) device, or to an anchor point located outside the entry portal.
- 35 Safety Line** – A line secured at one end of the worker by a full-body harness with the other end secured to a “fall arrest” device. The main function is to prevent injury in the event of a fall.
- 36 Shall** – Denotes a mandatory requirement.
- 37 Supervisor** – A confined space entry trained individual who has the job title as an EMWD Manager or Supervisor.
- 38 Threshold Limit Values (TLV)** – TLVs are the worker exposure levels, usually stated as time-weighted averages, of chemical and physical agents to which it is believed an average worker may be exposed day after day for a working lifetime and result in no adverse effect. TLVs are determined by the American Conference of Governmental Industrial Hygienists (ACGIH). The TLVs are based on an 8-hour Time Weight Average (TWA) of 5-day 40-hour work week.
- 39 Toxic Atmosphere** – An atmosphere containing a concentration of a substance above the published or otherwise known safe levels that is capable of causing harm to a worker.
- 40 Vertical Rescue** – Methodology to move the entrant to safety while all or a portion of the entrant’s weight is supported by life-safety rope or cable. This methodology would include diagonal rescue where a portion of the entrant’s weight is supported by a surface within the space.
- 41 Warning Barriers** – A physical system that prevents or provides adequate notice that entry into area is prohibited by non-authorized workers or members of the public. Acceptable barriers include cones, saw horses, delineators, temporary fencing, etc.

4 Program Requirements

4.1 Pre-Entry Evaluation To Determine Confined Space Status

The Entry Supervisor shall evaluate all structures and openings that meet confined space criteria and identify and record the potential hazards associated with each one prior to all entry operations. This information will be made available to affected workers, their representatives and supervisors. Appendix B is the Confined Space Evaluation Form shall be used.

4.2 Hazard Identification and Basic Requirements

The District has established an entry permit program to ensure that entrants are protected from confined space hazards. Under the entry permit program, each department that issues entry permits shall:

4.2.1 Hazard Identification

Identify and evaluate each hazard of the permit space(s), including determination of severity.

4.2.2 Hazard Control

Implement procedures and practices by which the confined spaces can be entered safely according to this procedure.

4.2.3 Worker Training

Training on the subject of confined space entry that includes how to identify confined spaces, assessment and control of confined space hazards, entry procedures, roles and responsibilities, rescue, and use of equipment necessary to perform confined space entry. Ensure that workers attend required training prior to performing confined space entries.

4.2.4 Equipment

Maintain devices, personal protective equipment, and safety gear necessary to provide, maintain, and ensure the ability to safely enter and work in confined spaces. Includes consideration for safe entry, including testing, monitoring, communication, rescue, and personnel protective equipment.

4.2.5 Non-Entry Rescue

Ensure the procedures and equipment necessary to perform non-entry rescues from confined spaces are provided and implemented.

4.2.6 Protection from External Hazards

Ensure the use of parked vehicles, other barriers, or personnel necessary to protect entrants from external hazards from traffic, pedestrians, plant operations, or other conditions or actions which could pose risk from outside of the confined space being entered.

4.3 Permit System

The District shall use a permit(s) in a standardized form through which the issuing department identifies all conditions that must be evaluated to ensure safe entry into any confined space. Departments who authorize entry into a permit space shall include the following information on the checklist portion of the permit:

- 4.3.1** Actual or potential hazards of the permit space;
- 4.3.2** Methods for isolation, lock-out/block-out, purging, blocking or blinding, ventilating, cooling, and flushing to remove or control hazards;
- 4.3.3** Maintenance of acceptable environmental conditions by the entry supervisor through verification, testing and monitoring equipment, and procedures;
- 4.3.4** Non-Entry Rescue equipment to be provided on-site which includes: communication procedures, equipment, and personal protective equipment such as harnesses, safety lines, and retrieval device.
- 4.3.5** The identity of permit space, location, purpose, date of entry, and duration.
- 4.3.6** A list of authorized entrants, attendants, and entry supervisor, the entry supervisor's signature, verifying that all actions or conditions for safe entry have been met.
- 4.3.7** Upon completion of the entry covered by the permit, and after all entrants have exited, the permit space and all work has been performed, the permit shall be signed off as complete and further entry closed out.
- 4.3.8** All hot work in confined spaces will require a hot work permit before an entry permit is issued. The hot work permit is a part of the WELDING AND CUTTING SAFETY PROCEDURE.

4.4 Department Requirements

Each affected Department shall be required to become familiar with this procedure and ensure all aspects of the procedure are implemented and followed by their workers. The

following items are found in the District's procedure and shall be implemented by the individual departments to fit each specific application:

- 4.4.1** Evaluation of each facility within the department's jurisdiction for the purpose of establishing its confined space designation (PRCS or NPRCS) prior to every entry.
- 4.4.2** Document each pre-entry evaluation. Documentation shall include a site description, location, configuration, initial gas detector readings, and initial classification (i.e., permit required or non-permit required confined space). Please see Appendix B for the Confined Space Evaluation Form;
- 4.4.3** Prepare and maintain an inventory of confined spaces using the format in Appendix F.
- 4.4.4** Determine site/type specific confined space entry and rescue procedures for each type of confined space without regard to confined space classification; and
- 4.4.5** Ensure that each worker required to work within the procedure is thoroughly trained as required.

4.5 Entering and Inspection of Confined Spaces

These precautions must be reviewed by workers working in confined spaces to ensure safe entry:

- 4.5.1** Always test atmosphere with gas detector prior to opening or removing access cover.
- 4.5.2** Use appropriate tools or hoist when removing access covers to confined spaces to avoid injury from lifting heavy covers.
- 4.5.3** Prevent injuries by following written procedures.
- 4.5.4** Ensure proper PPE is identified and available for personnel working in confined spaces.
- 4.5.5** Always clean sand and dirt from the edge of access cover rim so it does not accidentally fall and enter the eyes of entrants and allows for ease in replacing the cover after work is complete.
- 4.5.6** Before entering a confined space, always visually inspect the condition of the steps or rungs (if applicable).
- 4.5.7** Set up tripod/fall retrieval device.

- 4.5.8** Enter the confined space slowly and cautiously.
- 4.5.9** Test each step or rung with a gradual application of weight. If damaged steps or rungs are encountered, cease entry and re-evaluate safe work procedures before continuing.
- 4.5.10** Do not carry tools or other objects when entering or exiting a confined space.
- 4.5.11** Be sure to stand clear of the drop zone while tools or objects are being lowered into the space. Whenever possible, exit the space while items are being lowered.
- 4.5.12** Never drop tools or supplies into a confined space. Pass by hand if possible, or tie object to a hand line, or place in a bucket. Use half hitches to prevent objects from falling from bucket.
- 4.5.13** Never clutter access area to prevent objects from falling, bouncing, being pushed, or dragged into opening.

4.6 Contractor Entry Into Confined Spaces

When contractor workers (not under the District's direct supervision) enter PRCS, ensure the following:

- 4.6.1** Inform the contractor that the workplace contains confined spaces and that confined space entry must be in compliance with EMWD Confined Space Entry Procedure as well as that of the contractor.
- 4.6.2** Apprise the contractor of the characteristics of the confined space, including the known hazards, access/egress, and any experiences with the space;
- 4.6.3** Coordinate entry operations with the contractor, when both District personnel and contractor personnel will be working in or near a confined space (the contractor shall have procedures for coordinating such entry operations, to prevent endangerment of the workers of any other employer); and
- 4.6.4** Debrief the contractor at the conclusion of the entry operations regarding any hazards confronted or created in the confined space during entry operations.

4.7 Recordkeeping

- 4.7.1** A written record must be made of the results of each atmospheric test performed. Utilize the form in Appendix D.

- 4.7.2** The Confined Space Evaluation form (Appendix B) shall be kept at the site for the duration of the work, and made accessible to entrants, attendants, supervisors, other affected workers, and their representatives.
- 4.7.3** A copy of the Confined Space Entry Permit shall be posted or readily available at the job site during confined space operations.
- 4.7.4** The above documentation must be kept on file by respective departments for a minimum of three years.

4.8 Training

4.8.1 All workers involved in confined space operations (including entrants, attendants, and confined space entry supervisors) must receive training in the appropriate procedures and requirements described in this program. No person shall enter a confined space unless trained and qualified to do so.

4.8.2 Supervisors shall also be trained in the following:

- The possible toxic materials, lockout block out, flammable atmosphere conditions, oxygen deficiencies or enrichment, and other actual or potential hazards in confined spaces into which personnel must enter;
- Be knowledgeable of the type of operations workers will be performing in a confined space and of their impact on air quality, flammability, and/or availability of oxygen, and ensure that workers take appropriate precautions;
- Provide appropriate approved equipment; and
- Ensure necessary forms are available to record the confined space activities; review completed records; ensure the records are filed; and provide affected workers and/or their representatives access to review them and record testing results.

4.9 Joint Use Facilities

Prior to entry by District personnel into confined spaces, such as manholes which may be jointly owned or shared with another entity, the entry supervisor shall coordinate entry operations with other affected users or owners so that workers or operations of one employer do not endanger another employer's personnel.

4.10 Entry Supervisor Review

NOTE: Entry Supervisors may contact Safety and Risk Management during the planning phase of such operations to provide guidance on safe entry conditions, hazard control, and personal protective equipment.

Before the start of work, the supervisor must:

- 4.10.1 Review the work assignment with workers, indicating any potential hazards involving the confined space(s);
- 4.10.2 Describe the scope of work, equipment and materials needed, and any operating instructions required to complete the job.
- 4.10.3 Identify any potential health risks and/or physical hazards or conditions, such as the history of spills, fall hazard, the use of solvents, welding operations or flooding within the work area, and methods to control those hazards;
- 4.10.4 Coordinate confined space entry activities with other employers, such as contractors or sub-contractors so that no workers of any employer will be endangered during confined space operations.

NOTE: Examples of methods to control hazards are lockout and blockout points, clearance points, fall protection or ventilation.

4.11 Attendant/Entrant Review

An attendant and entrant is responsible for:

- 4.11.1 Understanding the nature of all actual or potential hazards that may be encountered during entry into a confined space. If anything is not clearly understood, an attendant/entrant shall ask questions;
- 4.11.2 Inspecting the safety equipment for confined space entry to ensure that it is in operational condition;
- 4.11.3 Ensure that the atmospheric monitoring instruments (e.g., for oxygen, LEL, carbon monoxide, hydrogen sulfide) are maintained in an operational status. Instruments shall be tested and calibrated according to the manufacturer's specifications or more frequently. A daily bump test shall be performed against all gases or vapors for which an instrument is configured.

- 4.11.4** When the space is located such that work may encroach upon a public street or highway, establish a safe work area by erecting barricades, cones, warning signs and wearing appropriate reflective clothing;
- 4.11.5** The communication system between the Attendants and the facility, and between the Attendants and the authorized Entrants must be checked prior to entry;
- 4.11.6** Energy sources (except for those necessary to perform the work at hand) that could present a hazard to those in a confined space shall be locked out and blocked out in accordance with the EMWD Lockout/Blockout Procedure.
- 4.11.7** The space shall be isolated and ventilated to prevent dangerous gases or chemical substances from entering the confined space; and
- 4.11.8** All non-permit required, and permit-required confined spaces shall be considered to have unacceptable atmospheres until proven safe by atmospheric testing. Ventilation must be maintained at all times.

4.12 Atmospheric Testing

- 4.12.1** Prior to any confined space entry, the atmosphere shall be tested with an appropriate, tested / calibrated direct reading instrument in accordance with the manufacturer's requirements, see Appendix G.

Testing for atmospheric hazards shall be in the following order:

- Oxygen content;
- Flammable gases & vapors; and
- Potential toxic air contaminants.

4.12.2 Testing of Manholes and Other Spaces Prior to Opening

- Prior to fully opening a confined space, insert the probe into an available opening and draw a sample of the atmosphere into the meter, allowing sufficient time to obtain a representative sample.
- If the space opening has no hole, open the space only enough to insert a non-sparking item, such as a piece of wood or brass, then insert the probe.
- If atmospheric conditions are acceptable, then fully opening the confined space.

4.12.3 Test Atmosphere from Top to Bottom of Space:

- Testing of confined spaces shall be conducted throughout the entire portion of the space to be occupied. Some airborne contaminants may be heavier or lighter than air and can collect at the bottom or top of spaces. It is required that testing shall be done before ventilation and after the prescribed ventilation period. Testing shall continue for the duration of the entry.

4.13 Sampling

4.13.1 For testing, insert the probe into the top of the confined space and draw a sample of the atmosphere into the meter allowing sufficient time to allow the meter to register and analyze. This may vary depending upon the type of meter and length of sample tubing. Sample collection procedures shall follow the manufacturer's recommended procedure that is summarized in Appendix G.

4.13.2 When monitoring for entries involving a descent into atmospheres which may be stratified, the atmospheric envelope should be tested a distance of approximately four (4) feet in the direction of travel and to each side.

4.13.3 If a sampling probe is used, the entrant's rate of progress shall be slowed to accommodate the sampling speed and detector response time.

4.14 Acceptable Atmosphere

If testing indicates an acceptable atmosphere, continuous ventilation is required prior to and during any entry. Be sure to place the blower where fresh uncontaminated air is drawn into the structure. The ventilation shall remain in operation during the complete entry.

4.15 Unacceptable Atmosphere

If after any needed ventilation, testing continues to indicate atmospheric contaminants outside of acceptable entry levels, the space shall not be entered. Refer to Permit Required Confined Space Entry Procedure section for additional information.

4.16 Guarding The Opening

When covers are removed, a railing, temporary cover, or temporary barrier that will prevent an accidental fall through the opening and protect each worker working in the space from foreign objects entering the space shall guard the opening.

5 Entry Instructions

5.1 When operations are to be conducted which may impact air quality (such as welding, spray coating, abrasive blasting, or use of chemicals), additional precautions are to be taken. Consideration shall be given to safe entry conditions, hazard control and personal protective equipment during the planning phase of such operations.

5.2 Prior to any entry into a PRCS, the Entry Supervisor shall assure that all provisions of a Confined Space Permit (Appendix C) have been completed and the following specific provisions have been met:

5.2.1 Supervisor review of hazards

5.2.2 Equipment inspection

5.2.3 Instrument daily bump test and or calibration

5.2.4 Work area preparation

5.2.5 Lockout/blockout and isolation

5.2.6 Atmospheric testing

5.2.7 Ventilation

5.2.8 Check “List of Requirements for Entry, Working In, and Exiting Confined Space” (Appendix A)

NOTE: The supervisor of the workers may be the Entry Supervisor, or the responsibility of the Entry Supervisor may be delegated.

5.2.9 Assemble and test the retrieval equipment before entry into a PRCS.

5.2.10 The *Entry Supervisor* is to check that the appropriate entries have been made on the Permit, that the Permit specified tests have been conducted, and that the specified procedures and equipment are in place before endorsing the Permit and allowing entry to begin.

5.2.11 When the Permit is signed, the authorized entrant(s) may enter the PRCS.

NOTE: Following the information specified in the Entry Permit, the Attendant continuously maintains an accurate count of authorized entrants in the confined space.

5.2.12 If the PRCS poses no actual or potential atmospheric hazards, and if all serious safety and health hazards within the space are eliminated without entry into the space, the Permit Required Confined Space (PRCS) may be re-classified as a Non-Permit Confined Space (NPCS) for as long as the hazards remain eliminated. Reclassification of a space requires use of the evaluation form in Appendix B. Ventilation is still required.

NOTE: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards at EMWD. For example, carbon monoxide may still be generated in a space while being controlled by ventilation.

5.2.13 The Entry Supervisor shall document the basis for determining that all hazards in a permit space have been eliminated, through a certification on the permit that contains the date, the location of the space, and the signature of the person making the determination. The permit will then remain posted for the duration of the entry.

5.2.14 If hazards arise within a PRCS that has been reclassified as an NPCS, each worker in the space shall exit the space. The Entry Supervisor shall then reclassify the entry as a PRCS and a new permit shall be initiated.

6 Duties and Responsibilities

6.1 Authorized Entrants

The authorized entrants are required to:

6.1.1 Understand the hazards that may be encountered during entry, including information on the mode, signs or symptoms, and consequences of exposure. Know methods of hazard mitigation.

6.1.2 Properly inspect and use equipment as required by the permit.

6.1.3 Follow responsibilities identified in entry instructions.

6.1.4 Maintain communications with the Attendant.

6.1.5 Alert the Attendant whenever:

- The entrant recognizes any warning sign or symptom of exposure; or
- A prohibited condition is detected.

6.1.6 Exit the permit space whenever:

- An order to evacuate is given by the Attendant;
- There is a warning sign or symptom of exposure;
- A prohibited condition is detected; or
- An alarm is activated.

6.2 Attendants

The Attendants are required to:

- 6.2.1** Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- 6.2.2** Be aware of possible behavioural effects of hazard exposure on authorized entrants.
- 6.2.3** Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the permit accurately identifies who is in the permit space.
- 6.2.4** Remain immediately outside the permit space during entry operations until relieved by another attendant.
- 6.2.5** Communicate with authorized entrants as necessary to monitor entrant status and alert entrants of the need to evacuate the space.
- 6.2.6** Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - If the Attendant detects a prohibited condition;
 - If the Attendant detects the behavioural effects of hazard exposure in an authorized entrant;
 - If the Attendant detects a situation outside the space that could endanger the authorized entrants; or
 - If the Attendant cannot effectively and safely perform all the duties required under the permit.
- 6.2.7** Summon rescue and other emergency services as soon as the Attendant determines that authorized entrants may need egress assistance from permit spaces.
 - Perform non-entry rescues as determined during pre-job planning; and

- Perform no duties that might interfere with the Attendant's primary duty to monitor and protect the authorized entrants.

6.3 Entry Supervisors

The Entry Supervisors are required to:

- 6.3.1** Understand the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of exposure to hazardous conditions, materials or atmospheres;
- 6.3.2** Determine when to terminate the entry and cancel the permit;
- 6.3.3** Determine, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained;
- 6.3.4** Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- 6.3.5** Verify for high hazard confined space entries that rescue services—other than self-rescue or non-entry rescue—are available and that the means for summoning them are operable; and
- 6.3.6** Remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations.

6.4 Rescue Duties

Departments are responsible to ensure that these procedures are followed when workers are working in a confined space:

- 6.4.1** Recognition of actual or potential emergencies;
- 6.4.2** Notification of EMS and/or Central Control/IOC of rescues;
- 6.4.3** Request for additional workers if needed. NOTE: Workers may come from any department;

- 6.4.4 Proper use of safety equipment;
- 6.4.5 Required First Aid/CPR training; and
- 6.4.6 Non-Entry Rescue Methods.
- 6.4.7 High hazard permit required confined space entries where self-rescue or non-entry rescue cannot be performed, a standby rescue team must be available at the site. Contact Safety, Risk and Emergency Management for all high hazard entries.

7 Ventilation Requirements

Ventilation is one of the most important rules of safety concerning confined space entry. Though ventilation can provide good quality make up air, it cannot reduce other hazards that are associated with permit space(s). The ventilation requirements that must be met prior to entry are as follows:

7.1 Pre-Entry Requirements

- 7.1.1 Various sizes of permit spaces are located through the District. When initial air sampling determines a hazardous atmosphere is present, forced air ventilation shall be performed until the hazard within the space has been eliminated. A continuous supply of fresh air shall be provided while entrant(s) is/are in the confined space. When a hazardous atmosphere is found the confined space must have ten (10) complete air changes before sampling the air inside the confined space again.

To determine how long it will take to achieve ten (10) complete air changes in the confined space, the following information must be known:

- The cubic feet of space inside the confined space; and
- The cubic feet per minute (CFM) the ventilator is rated for.

NOTE: Multiple bends in the ventilation hose will reduce the actual CFM capacity of the ventilating blower (each 90° bend reduces the rated CFM capacity of a ventilation blower by up to 50%).

To determine the cubic feet of space inside the confined space for square or rectangular spaces:

Multiply the Length x Width x Height. EXAMPLE: A confined space is 20' x 15' x 30'.

$$20' \times 15' \times 30' = 9,000 \text{ cubic feet}$$

The rating of the ventilator shows the cubic feet of air the blower will discharge. For this example, let's assume the ventilator has a rating of 1,500 CFM.

To find out how long it will take to make one complete air change inside the confined space, divide 9,000 cubic feet by 1,500 CFM. The answer is 6. Therefore, it will take 6 minutes to make one complete air change inside the confined space.

Ten (10) air changes are required. Multiply 6 minutes by 10, the required number of air changes in the confined space:

$10 \times 6 = 60$. It will take 60 minutes to achieve 10 complete air changes.

If the confined space is round, multiply π (3.14) times the radius squared, times the length of the cylinder (pipe, tunnel, etc.) = cubic feet of space. $\pi r^2 h = \text{volume}$

EXAMPLE: π (3.14) x radius² x length of cylinder or height of tank (pipe, tunnel, etc.) = cubic feet of space. Assume a pipe has a 3' diameter and is 30' long. One-half of the 3' diameter is 1.5 feet (the radius). 1.5^2 (1.5 x 1.5) = 2.25 square feet.

To simplify: $3.14 \times 2.25 = 7.07$ square feet. (The actual number is 7.0686, but we rounded up.)

7.07 square feet x 30' (the length of the cylinder) = 212 cubic feet.

To find out how long it will take to make one complete air change inside the confined space, divide 212 cubic feet by 1,500 cfm. The answer is, 0.14 minutes (8 or 9 seconds) for one complete air change.

Ten (10) complete air changes are required. Therefore, 10×0.14 minutes per air change = 1.4 minutes.

Round up and let the ventilator push fresh air into the confined space for 2 minutes before testing the atmosphere inside the confined space again.

To achieve a greater efficiency of air exchanges, when it is possible, move the end of the hose around by using a rope. Pull the end to the hose up into the upper corners of the confined space. Also move the end of the hose around near the bottom of the confined space to move the gases or air around so it will be diluted or exhausted out of the confined space.

After 10 complete (or near complete) air changes have been made, lower the hose on the air monitor into the confined space and sample the air at different levels. The end of the air monitor hose shall be lowered 2 to 4 feet each time to sample the air at different levels inside the confined space.

A continuous supply of fresh air shall be provided while entrant(s) is/are in the confined space.

7.2 Work in Progress

7.2.1 A continuous supply of fresh air shall be provided while entrant(s) is/are in the confined space.

7.2.2 Entrant must exit confined space if blower stops.

7.2.3 Five (5) air exchanges per hour for a permit space are suggested.

7.3 Recordkeeping

The Entry Supervisor shall document the time that the blower was started and when the blower was shut-off on the permit.

8 Safety Equipment

No worker shall perform any work in a permit space unless all the necessary safety equipment is available and all proper safety procedures are followed. Requirements for safety equipment and use are as follows:

8.1 Fall / Retrieval Device and Approved Support Device

A fall/retrieval device and tripod or other adequate anchorage shall be required for all top-opening entries into a permit space.

8.1.1 Tripod

- The tripod shall be capable of set-up on surfaces that are not level.
- The tripod shall be capable of locking in place with safety chains attached to base of legs.
- Non-slip feet on legs of tripod.
- It is recommended that tripods are adjustable up to 9 feet tall.

8.1.2 Other anchorage points used shall be capable of supporting a 5,000 pound static load and the means of attachment shall be rated for fall protection and retrieval hoist loads.

8.1.3 Fall/Retrieval Device

- Fall/retrieval device may have a “fall-arrest” capability.
- Additional block to tackle hoist may be added for retrieval purposes.
- Self-Retracting Lifelines (SRL) shall be the required fall protection device used in conjunction with permit required confined space entry. Certain spaces may require the use of a winch type retrieval device as a primary means of extraction with an SRL as a secondary means of fall arrest/retrieval.

8.2 Personal Protective Equipment

- 8.2.1** A hard hat shall be worn at all times in a confined space.
- 8.2.2** To provide as much body protection as possible, coverall or uniforms may be worn when working in a confined space.
- 8.2.3** Special safety equipment such as boots, waders, dry suit, gloves, safety goggles/glasses and ear protection shall be worn as needed.
- 8.2.4** A fall/retrieval device or other approved devices shall be provided for lifting worker(s) out of top opening confined spaces.
- 8.2.5** Rescue lifelines or wristlets may be utilized in certain permit required confined spaces where the use of a fall retrieval device is not possible.
- 8.2.6** A full body harness will be required with this program. This harness must meet ANSI Standard A10.14 and EMWD Fall Protection Procedure guidelines.
- 8.2.7** Intrinsically safe electrical equipment is required for confined spaces.
- 8.2.8** Respiratory protection equipment will be required as necessary based on an evaluation of potential contaminants in the space.

8.3 Equipment Inspection

- 8.3.1** All equipment needed for working in a permit space shall be periodically inspected and repaired or replaced if necessary. It must also be inspected prior to each entry into a confined space by both the Entry Supervisor and the Entrant(s).
- 8.3.2** If a necessary piece of equipment is in questionable condition, work shall halt until the equipment is repaired or replaced.

8.3.3 Manufacturer recommendations shall be followed for all equipment.

9 Permit Classification System

The “permit classification system” is based on existing or potential hazards relative to the confined space. The classification is based upon the characteristics and configuration of the space, oxygen level, flammability, and toxicity. The classification *shall be determined by the most hazardous condition* of entering, working in, and exiting a confined space. Refer to checklist of requirements for entry.

9.1 Permit Required Confined Space

Permit Required Confined Space (PRCS) is one that presents a situation that may be immediately dangerous to life or health (IDLH) or may cause serious injury or illness to an entrant.

9.1.1 These include, but are not limited to, oxygen deficiency, explosive or flammable atmospheres, physical hazards, and/or concentrations of toxic substances.

9.1.2 Special requirements for PRCS are as follows:

- A minimum of two (2) Attendants are required outside PRCS at all times. The Entry Supervisor may act as the second attendant.
- One (1) Attendant must be provided for each entrant, and maintain communication with the entrant at all times (i.e., at manhole, hatch, opening, etc.). This 1:1 ratio is needed to provide non-entry rescue or retrieval.
- Second Attendant must remain onsite in the area of the permit required confined space entry; and
- Entrant shall utilize approved safety harness and lifeline/retrieval device.

Common types of PRCS are sewer manholes, sewer lines, Lift Station wells, junction structures, valve vaults, meter vaults, pumping plant wet wells, vats, pits, large pipe and ducts, and various types of storage tanks. Situations may arise that make Non-Permit Confined Space (NPCS) a PRCS.

9.2 Non-Permit Required Confined Space

A Non-Permit Required Confined Space (low hazard) is one in which the potential hazard would not require any special modification of the work procedure except for the following:

- 9.2.1 If no Attendant is used, Central Control will be notified of location, entry time, estimated working time, and interval for safety checks. They will also be notified when work is completed.
- 9.2.2 Entrant will have constant and reliable communications with Central Control (via hand-held radio).
- 9.2.3 Entrant will have safe, a stable means of entry and exit (ladder, etc.).
- 9.2.4 Atmospheric testing, monitoring and ventilation are required.

9.3 Special Consideration Spaces

- 9.3.1 Any below grade facility or area with restricted access (i.e., ladder access, entry configuration hazard) that is ventilated full time, has the potential to become a confined space and shall be entered after a worksite hazard analysis has been conducted. These sites shall be treated as confined spaces until the hazard has been removed or mitigated via a JSA conducted by a qualified person.
- 9.3.2 Trenches and other earthworks are normally not considered confined spaces. Situations can arise, however, which would make these structures confined spaces. A broken gas main, force main or sewer main may need to be classified as a confined space if a determination has been made that atmospheric hazards are present.

Note: Due to onsite chemicals and gasses ALL trenches and excavations at Regional Water Reclamation facilities are potential confined spaces and must be tested for atmospheric hazards prior to entry.

- 9.3.3 **Any confined space that cannot be entered according to the strict provisions and requirements of this procedure can only be entered once a site-specific written procedure has been developed. This procedure shall include the development of a JSA and must identify all hazards and the alternative measures of personal protection that will be utilized to protect the entrants in the confined space. The written procedure must be reviewed and approved by the Safety, Risk and Emergency Management Department prior to entry operations.**
- 9.3.4 All sewer manholes within the District's boundaries shall be considered permit required confined spaces and entered based on an evaluation of all hazards present.

Facilities with an engineered means of ingress/egress (stairwell into lower levels, entry points that would allow self-rescue) which may be ventilated full time are to be considered workplaces with the potential for a hazardous atmosphere. Examples of these

sites would be sewer lift station drywells and wet wells with engineered stairwells and influent pump station/head works buildings with multiple entry/exit points. These facilities shall not be considered confined spaces but shall be evaluated for worker exposures through a worksite hazard analysis (JSA, SOP) conducted by the department seeking access.

APPENDIX A

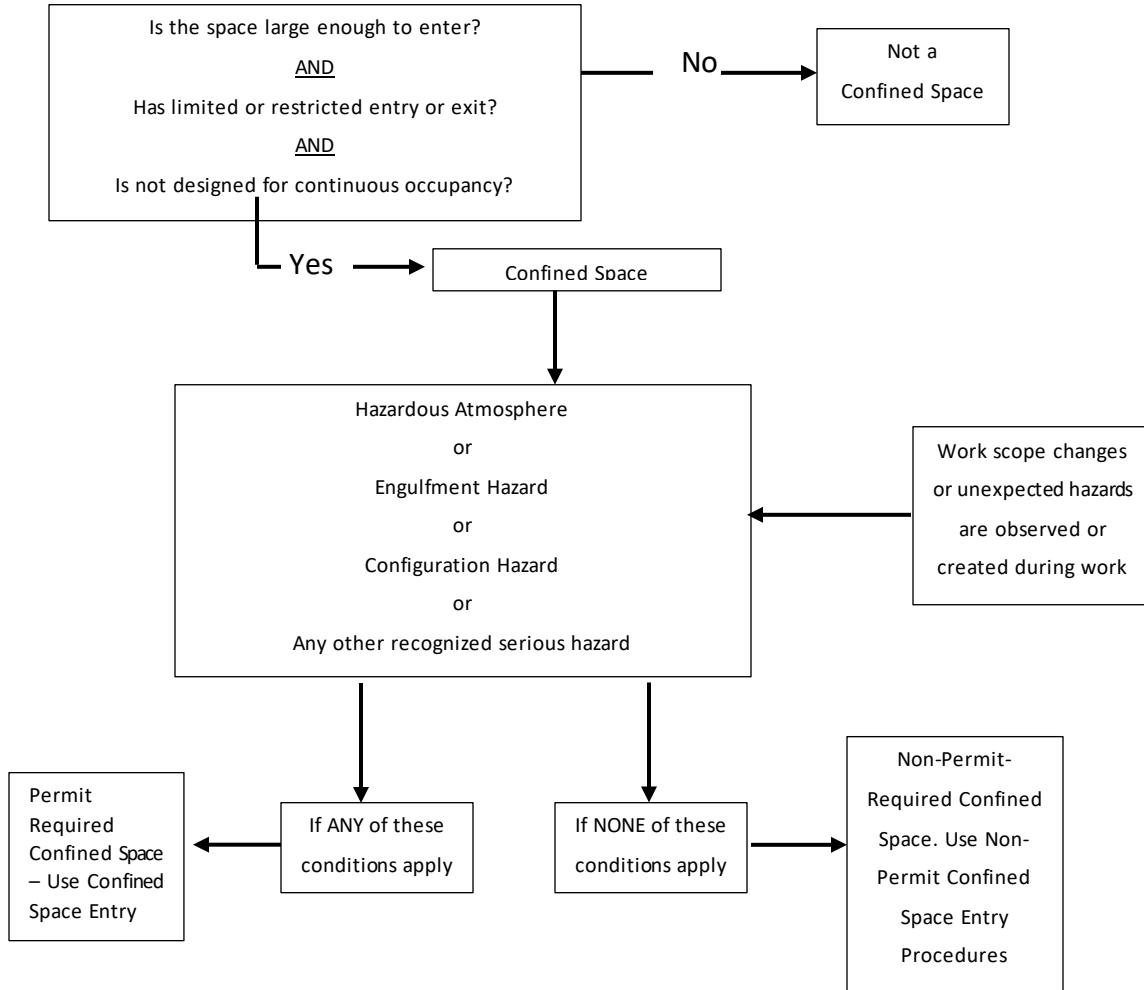
CHECKLIST OF REQUIREMENTS FOR ENTRY, WORKING IN AND EXITING CONFINED SPACES

CHECK	PRCS	NPCS
PRE-ENTRY EVALUATION	X	X
PERMIT	X	O
ATMOSPHERIC MONITORING	X	X
MONITORING	X	X
TRAINING OF PERSONNEL	X	X
LABELING AND POSTING	X	X
ISOLATE / LOCK-OUT/BLOCK-OUT	X	O
PURGE / VENTILATE	X	X
CLEANING PROCESSES	O	O
SPECIAL EQUIPMENT / TOOLS	X	O
SITE SAFETY BRIEFING	X	X
ATTENDANT	X	O
COMMUNICATIONS / OBSERVATION	X	X
NON-ENTRY RESCUE PLAN	X	X
HEAD PROTECTION	X	X
HEARING PROTECTION	O	O
HAND PROTECTION	O	O
FOOT PROTECTION	O	O
BODY PROTECTION	O	O
RESPIRATORY PROTECTION	O	N/A
TRIPOD	X	O
HARNES	X	O
LIFELINE	X	O
RESCUE EQUIPMENT	X	O
RECORDKEEPING	X	X

X = REQUIRED

O = OPTIONAL – Determination to be made based on entry requirements.

PPENDIX B
 CONFINED SPACE ENTRY PERMIT DECISION DIAGRAM



If the space being evaluated is determined to be a PERMIT-REQUIRED Confined Space, there are 3 options to consider:

- 1) Deny entry to all employees;
- 2) Evaluate the space and develop a procedure for safe entry.
- 3) Reclassify the space to non-permit required confined space by removing the hazard as follows:
 1. If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space.
 2. If testing and inspection during entry demonstrate that the hazards within the permit space have been eliminated.
 3. If hazards arise within a de-classified space, all employees within that space shall exit immediately and the space shall be re-evaluated.
 4. The entry supervisor shall document the basis for determining that all hazards in a permit-required space have been eliminated, through a certification that contains the date, location, and signature of the person making the determination. A copy of this certification shall be made available to each employee entering as de-classified space.

APPENDIX C CONFINED SPACE EVALUATION FORM

Survey Date:		Evaluator (Name):	
Site Location:			
Site Description:			
Method of Entry (circle which apply): Steps Ladder Top-Opening Doorway Stairway Side Opening			
Number of entry / exit points: _____		Frequency of entry: _____	
Existing ventilation? Yes <input type="checkbox"/> No <input type="checkbox"/>	Potential Atmospheric Hazards? Yes <input type="checkbox"/> No <input type="checkbox"/>	Potential for Engulfment Yes <input type="checkbox"/> No <input type="checkbox"/>	Other IDLH Hazards? Yes <input type="checkbox"/> No <input type="checkbox"/>
Possible Atmospheric Hazards: Oxygen deficiency <input type="checkbox"/> Enrichment <input type="checkbox"/> Flammable <input type="checkbox"/> Toxic <input type="checkbox"/> Specific hazard for flammable and toxic: Comments:			
Possible Content Hazards: Previous contents category: <input type="checkbox"/> Flammable <input type="checkbox"/> Corrosive <input type="checkbox"/> Toxic <input type="checkbox"/> Irritant <input type="checkbox"/> Oxidizer <input type="checkbox"/> Dust <input type="checkbox"/> Chemical Physical state: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> N/A Comments:			
Potential Energy: <input type="checkbox"/> Electric <input type="checkbox"/> Hydraulic <input type="checkbox"/> Pneumatic <input type="checkbox"/> Mechanical <input type="checkbox"/> Fire control system <input type="checkbox"/> Physical (Heat/Cold) <input type="checkbox"/> Chemical <input type="checkbox"/> N/A Comments:			
Configuration of Space: <input type="checkbox"/> Interior shape & slope <input type="checkbox"/> Low overhead clearance <input type="checkbox"/> Drop offs <input type="checkbox"/> Complex layout <input type="checkbox"/> Stability <input type="checkbox"/> Structural integrity <input type="checkbox"/> Inward converging walls <input type="checkbox"/> Tank <input type="checkbox"/> Vessel <input type="checkbox"/> N/A Tank/Vessel: <input type="checkbox"/> Pressure released <input type="checkbox"/> Drained <input type="checkbox"/> Cleaned			
External Hazards: <input type="checkbox"/> Traffic <input type="checkbox"/> Machinery <input type="checkbox"/> Equipment <input type="checkbox"/> Processes <input type="checkbox"/> Terrain <input type="checkbox"/> Material <input type="checkbox"/> N/A Comments:			
Other Hazards: <input type="checkbox"/> Animals <input type="checkbox"/> Insects <input type="checkbox"/> Biological organisms <input type="checkbox"/> Non-ionizing radiation <input type="checkbox"/> Ionizing radiation <input type="checkbox"/> Other <input type="checkbox"/> N/A Comments:			
Is the only hazard atmospheric? Yes <input type="checkbox"/> No <input type="checkbox"/>	Atmospheric test results Without Ventilation		Atmospheric test results With Ventilation
Will removing check valves, piping, pumps, blind flanges or meters create the potential for atmospheric or engulfment hazards? Yes <input type="checkbox"/> No <input type="checkbox"/>	O ² _____ >19.5% <23.5%	CO _____ <25 ppm	O ² _____ >19.5% <23.5%
	H ² s _____ <10 ppm	LEL _____ <10%	CO _____ <25 ppm
			H ² s _____ <10 ppm
			LEL _____ <10%
CONFINED SPACE		PERMIT REQUIRED CONFINED SPACE	
Can be bodily entered	Yes <input type="checkbox"/> No <input type="checkbox"/>	Hazardous Atmosphere?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Limited or restricted entry?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Potential for engulfment?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Designed for continuous human occupancy?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Internal configuration hazard?	Yes <input type="checkbox"/> No <input type="checkbox"/>
		Other serious safety hazard?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Reasons for entering space & typical activities:			
Who usually enters space? <input type="checkbox"/> Maintenance <input type="checkbox"/> Production <input type="checkbox"/> Contractors <input type="checkbox"/> Other			
Eligible for Alternate Procedure?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Eligible for reclassification?	Yes <input type="checkbox"/> No <input type="checkbox"/>
External connections to space: Comments:			

Evaluation Results:

- Not a Confined Space
 Permit Required Confined Space
 Non-Permit Required Confined Space
 Permit Required Confined Space Eligible for Reclassification

APPENDIX D - CONFINED SPACE PERMIT

A CONFINED SPACE EVALUATION FORM MUST BE COMPLETED PRIOR TO UTILIZING THIS FORM. THE EMWD POLICY REQUIRES AN EVALUATION FORM, PERMIT, AND RECORD OF GAS ANALYSIS TO BE FILLED OUT AND AVAILABLE AT EVERY PERMIT REQUIRED CONFINED SPACE ENTRY.

LOCATION: _____	DATE ISSUED: _____
DESCRIPTION OF CONFINED SPACE: _____	TIME: _____
PURPOSE OF ENTRY: _____	COMPLETION DATE: _____
DEPARTMENT: _____	TIME: _____

IDENTIFY CONFINED SPACE PERSONNEL BELOW	AUTHORIZED			
	ENTRANT		ATTENDANT	
	YES	NO	YES	NO
CREW MEMBERS				

SPECIAL REQUIREMENTS	YES	NO	SPECIAL REQUIREMENTS	YES	NO
	LOCK-OUT / BLOCKOUT				SAFETY HARNESS
LINES BROKEN-CAPPED OR BLANKED			FALL / RETRIEVAL DEVICE		
LINES / SYSTEM PURGED AND VENTED			TRIPOD		
DOUBLE BLOCK AND BLEED			LIFELINES		
AREA SECURE			SELF-CONTAINED BREATHING DEVICE		
VENTILATION – FULL TIME			FIRE EXTINGUISHER		
MONITORING AND TESTING			PPE		
HOT WORK PERMIT / PRE-JOB			RECORD OF GAS ANALYSIS		
CHECKLIST OF REQUIREMENTS REVIEWED			YES <input type="checkbox"/>	NO <input type="checkbox"/>	

ATMOSPHERIC MONITORING INSTRUMENT MANUFACTURER	TYPE OR MODEL – INCLUDE SERIAL NUMBER		
1.			
2.			
3.			
DAILY CALIBRATION/BUMP TEST/OPERATIONAL CHECK	YES <input type="checkbox"/>	NO <input type="checkbox"/>	

VENTILATION BLOWER MANUFACTURER	TYPE OR MODEL – INCLUDE SERIAL NUMBER			
1.				
2.				
3.				
VENTILATION BLOWER CAPACITY(S)	CFM	1.	2.	3.
VENTILATION BLOWER OPERATION TIME	START	:	STOP	:

COMMUNICATION PROCEDURES: RESCUE PROCEDURES: Non-entry rescue <input type="checkbox"/> Confined space rescue team <input type="checkbox"/> Self rescue <input type="checkbox"/> <p style="text-align: center;"><i>CHECK ALL THAT APPLY</i></p>

MANAGEMENT EMPLOYEE	ENTRY SUPERVISOR: _____
AUTHORIZING ENTRY: _____	DATE: _____
DATE: _____	TIME: _____
TIME: _____	

NOTE: Signature by Entry Supervisor verifies that actions and conditions for safe confined space entry have been met.

APPENDIX F

RIVERSIDE COUNTY FIRE DEPARTMENT FACILITIES WITH CONFINED SPACE RESCUE EQUIPMENT AND TRAINING

Station #2 – Moreno Valley
24935 Hemlock
Moreno Valley CA, 92557
(951) 242-3101

Hazardous Materials Station
Station #34 – Winchester
32655 Haddock Street Winchester, CA 92596
(951) 926-6430

Station #73 – Rancho California
27415 Enterprise Circle West
Temecula, CA 92590
(951) 699-0351

Station #76 – Menifee Lakes
29950 Menifee Road
Menifee, CA 92584
(951) 679-2241

Station #97 – Rosetta Canyon
41725 Rosetta Canyon Drive
Lake Elsinore, CA 92530
(951) 245-0420

Station #90 – North Perris City
333 Placentia Avenue
Perris, CA 92571
(951) 657-4935

APPENDIX G

CONFINED SPACE INVENTORY AND LABELING

Inventory

Each department having responsibilities over a District facility shall develop and maintain a confined space inventory that includes at least the information shown in the table below. Area refers to the general unit or section of a plant or facility. Location is the specific place where the confined spaces entry point is located. It may be designated on a map, using Maximo asset numbers, P&ID reference numbers, name of equipment, or any other specific method. Description is the type of opening such as manway, manhole, duct, ladder, hatchway, tank top, etc.

The hazards of each space shall be described by as many of the Hazard Code designations as exist and/or for which there is a potential to exist in the confined space. The confined space evaluation form (Appendix B) shall be used as reference and/or this inventory used to aid in filling the evaluation form in Appendix B. Hazard code 4 has several categories which shall be used as 4a, 4b, 4c, etc.

The Special Considerations column may be used as needed for notes or to describe issues related to the space, its entry or hazards.

To be included in the inventory:

Tanks, sewers, basins, pits, electrical vaults, piping/valve vaults, large diameter pipe or duct, vats, vessels, silos, storage bins, hoppers, and ladder entry into pumping plants or subgrade facilities or other spaces that may have limited means of entry,

#	AREA	LOCATION	DESCRIPTION	HAZARD CODE	SPECIAL CONSIDERATIONS
1	East of Chlorine Contact	West of Fence Line	Manhole - Drain	1, 2, & 4c,b	
2	Contact Basin	Contact Basin	Contact Basin # 3	1, 2, & 4c,b	
3	Contact Basin	Contact Basin	Contact Basin # 2	1, 2, & 4c,b	

Hazard Codes

- 1 Contains or has the potential to contain a hazardous atmosphere—toxic or oxygen <19.5% or > 23.5%.
- 2 Contains a material that has the potential for engulfing an entrant including cave-in of excavations.

- 3** Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section.
- 4** Contains any other recognized serious safety or health hazard.
 - a** Electrical
 - b** Moving parts
 - c** Surface chemical
 - d** Hot temperature or hot surface
 - e** Biological hazard (including microbiological, insect, or animal)

Labeling and Signage

Confined spaces shall be labeled to provide a reasonable warning for workers to keep out unless they have a permit. A sign reading “DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” and using an additional sign with similar language when appropriate would satisfy the requirement for a sign. In areas such as aeration basins where confined spaces exist in sub-walking surface in a large area, perimeter signs may be used as well as designated access point such as hatchways or ladder swing gates. Perimeter sign wording shall be considered for each area and shall describe the access point of confined space entry. Example: “All basins below pedestrian grating are considered confined spaces—DO NOT ENTER.”

Signs shall be legible and maintained to address weathering or work environments that cause deterioration.

Signs shall be placed so they remain visible while confined space operations are under way. Sign placement on the entry doors, covers or hatchways shall be avoided since they would no longer be visible when the doors, covers or hatchways are removed during confined space operations.

APPENDIX H

GAS DETECTOR (MONITOR) MANUFACTURER'S REQUIREMENTS

Industrial Scientific Ventis MX4

Zero, Calibration, and, Bump testing

Gas detection instruments are potentially life-saving devices. When completed regularly, the procedures defined below help to maintain proper instrument functionality and enhance operator safety.

Procedures

Configuration – The configuration process allows qualified personnel to review and adjust a unit's settings.

Bump Test – (or “functional test”). Bump testing checks for sensor and alarm functionality. The installed sensors are briefly exposed to expected concentrations of calibration gases that are greater than the sensors' low alarm set points. When one or more sensors “pass” the test, they are “functional” and the unit will alarm. Each sensor's “pass” or “fail” result is indicated on the unit's display.

Note: a bump test does not measure for sensor *accuracy* (see “Calibration”).

Zero – *Zeroing* sets each installed sensor to recognize the ambient air as clean air. If the ambient air is not truly clean air, any gasses that are present and relevant to the installed sensor types will be measured and displayed as zero. Readings will be inaccurate until the unit is correctly zeroed in truly fresh air or with a zero-air cylinder.

Calibration – All sensors gradually degrade over time. This diminishes a sensor's ability to measure gas concentrations accurately; however, regular calibrations adjust the instrument to compensate for this decline in sensitivity. During calibration, the installed sensors are exposed to expected concentrations of calibration gases and, when needed, the instrument will self-adjust to ensure the accurate measurement and display of gas concentration values.

Note: When a sensor has degraded beyond an acceptable level, no further adjustment is possible and the sensor will no longer pass calibration.

Peak Readings – The instrument stores the highest detected gas readings, the “peak readings” or “peaks”. Bump testing and calibration will often register new peak readings. Therefore, the clearing of the peak readings should *follow* each calibration. The instrument operator may also

wish to clear the peak readings after a bump test, before a change in location, or after an alarm is addressed and cleared.

Note: The peak readings and the data log readings are stored independently of one another; therefore, clearing the peak reading does not affect the data log. Powering the instrument off or changing its battery does not affect the peak reading. These checks and balances help promote operator safety, and serve to contain the peak readings in a “black-box” manner. In the event of a gas-related incident, this black-box record can be useful to the safety team or a prospective investigator.

Recommendations

Industrial Scientific Corporation (ISC) minimum frequency recommendations for each procedure are summarized in the table below. These recommendations are based on field data, safe work procedures, industry best practices, and regulatory standards to help ensure worker safety. Industrial Scientific is not responsible for setting safety practices and policies. These policies may be affected by the directives and recommendations of regulatory groups, environmental conditions, operating conditions, instrument use patterns and exposure to gas, and other factors.

Procedure	ISC Recommended minimum frequency
Configuration	Before first use and as needed thereafter.
Calibration	Before first use and monthly thereafter.
Bump test	Prior to each day’s use.

Between regular calibrations, ISC also recommends a calibration be performed immediately following each of these incidences: the unit falls, is dropped, or experiences another significant impact; is exposed to water; fails a bump test; or has been repeatedly.

Remote Sampling

Aspirated monitor

In confined space, an air sample should be taken in four-foot (1.22 m) intervals.

Guidelines for using a motorized pump and sampling line.

When sampling with a motorized pump and sampling line, Industrial Scientific recommends the following:

- Choose the tubing type based on the target gases. If the target gases are known, use Teflon-lined tubing when sampling for these gases: chlorine (Cl₂), chlorine dioxide (ClO₂), hydrogen chloride (HCl), and volatile organic compounds (VOCs). For other known target gases, urethane tubing or Teflon-lined tubing may be used.

When the target gases are unknown, use Teflon-lined tubing.

- Know the length of the sample line as it is a factor in determining sampling time. A sample line may consist of tubing, a probe, or a probe and tubing. It should also have a dust filter–water stop installed at the line’s end that will extend into the sample area. Sample-line length is defined as the distance from the dust filter–water stop will extend into the sample area. Sample-line length is defined as the distance from the dust filter–water stop opening to the point where the line connects to the pump’s inlet. Ensure sample-line length does not exceed the pump’s maximum draw.
- Before and after each air sample, perform a test of the full sampling line.
- Use a thumb to block the end of the sampling line at the water-stop opening. This should cause a pump-fault alarm.
- Remove the thumb from the water-stop opening. After the alarm cycle completes, the pump should resume normal operation.

Note: If a pump fault does not occur, check and correct for cracks or other damage, debris, and proper installation in these areas: all sampling line connections, the pump’s inlet cap and inlet barrel, and the dust filter- water stop items at the end of the sampling line and inside the pump inlet barrel.

- Based on sample-line length, calculate the minimum time recommended for the air sample to reach the instrument’s sensors. As shown below, use a base time of 2 minutes, and add 2 seconds for each 30 cm (1 ‘) of line length. Watch the display screen for gas readings and, if present, allow them to stabilize to determine the reading.

Minimum sample time for common sample-line lengths				
Sample-line length	Base time (minutes)	+	Sample-line-length factor (seconds)	= Minimum sample time (mm:ss)
3.05 m (10 ‘)	2 min	+	(10 x 2 s)	= 02:20
6.10 m (20 ‘)	2 min	+	(20 x 2 s)	= 02:40
9.14 m (30 ‘)	2 min	+	(30 x 2 s)	= 03:00
12.10 m (40 ‘)	2 min	+	(40 x 2 s)	= 03:20
15.24 m (50 ‘)	2 min	+	(50 x 2 s)	= 03:40
18.29 m (60 ‘)	2 min	+	(60 x 2 s)	= 04:00
21.34 m (70 ‘)	2 min	+	(70 x 2 s)	= 04:20
24.38 m (80 ‘)	2 min	+	(80 x 2 s)	= 04:40
27.43 m (90 ‘)	2 min	+	(90 x 2 s)	= 05:00
30.48 m (100 ‘)	2 min	+	(100 x 2 s)	= 05:20

5-Whys Guide & Template

The 5-Whys is a simple brainstorming tool that can help teams identify the root cause(s) of a problem. Once a general problem has been recognized, ask “why” questions to drill down to the root causes. Asking the 5-Whys allows teams to move beyond obvious answers and reflect on less obvious explanations or causes.

Step-by-Step Instructions

1. State the problem you have identified as a specific problem to resolve.
2. Start asking “why” related to the problem. Like an inquisitive toddler, keep asking why in response to each suggested cause.
3. Ask as many whys as you need in order to get insight at a level that can be addressed (asking five times is typical). You will know you have reached your final "why" because it does not make logical sense to ask why again.

It is said that only by asking "Why?" five times successively, can you delve into a problem deeply enough to understand the ultimate root cause. By the time you get to the 4th or 5th why, you will likely be looking squarely at management practices (more than five whys may be required for complex problems).

This methodology is closely related to the Cause & Effect (Fishbone) diagram, and can be used to complement the analysis necessary to complete a Cause & Effect diagram.

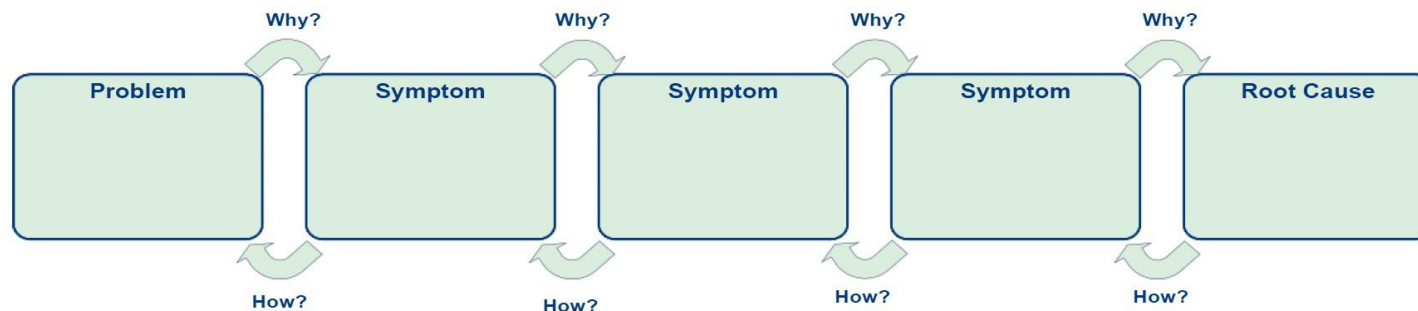
Example:

Problem: Parents don't feel that they receive timely and relevant communication from school.

- 1) Why? Parents don't regularly check our school website.
- 2) Why? They might not know that the information is there?
- 3) Why? We haven't told parents that the information is there.
- 4) Why? We haven't had time to meet with parents or prepare any materials to share with parents about the website.
- 5) Why? It's not something we normally plan for.

Possible solution: We need better tools and strategies for communicating with parents.

5-Why Analysis Template



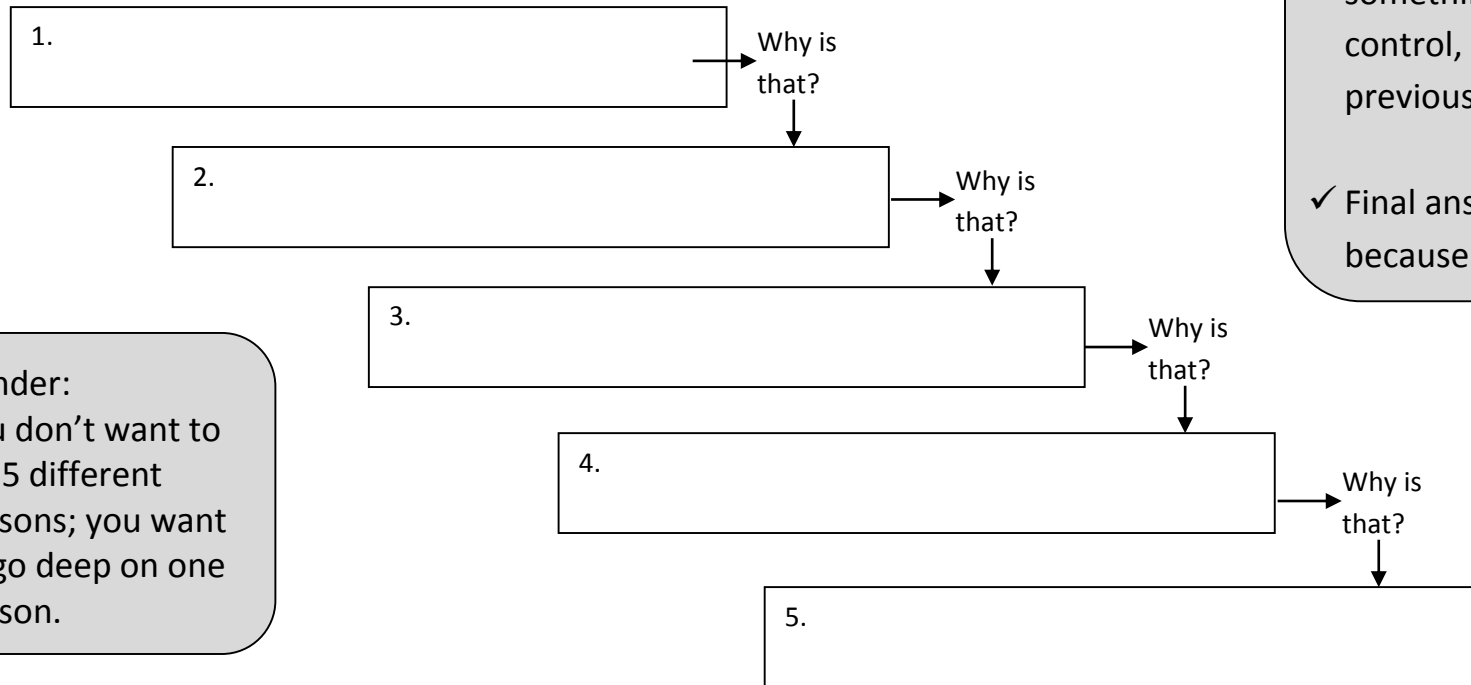


Asking Powerful Questions

5 Whys Worksheet

Define the Problem:

Why is it happening?



Caution:

- ✓ If your last answer is something you can't control, go back up to the previous answer
- ✓ Final answer cannot be because of a person

Reminder:

- ✓ You don't want to list 5 different reasons; you want to go deep on one reason.

Identified Root Cause:

Action/ Plan to Address the Problem:

Action Plan Double Check:

1. Does your action plan indicate who is responsible for each action element?
2. Does your action plan involve a plan for communicating to relevant stakeholders?
3. Are the various elements of your action plan connected to a time frame? When will each piece be accomplished? Are deadlines set?
4. How will you assess whether the changes brought about within your plan have made a difference? How will you know if you solved the problem?

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