COUNTY OF RIVERSIDE
STANDARD SAFETY OPERATIONS MANUAL

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SUBJECT:	CONFINED SPACE ENTRY GUIDELINES	**EFFECTIVE DATE:**	03/01/97
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PURPOSE: California Code of Regulations, Title 8, General Industry Safety Orders, Sections 5156, 5157 and 5158 set forth the requirements for practices and procedures to protect employees from the hazards of entry into confined spaces. This program establishes the Riverside County Confined Space Program in compliance with California statutes.

POLICY: To ensure County Employees who enter confined spaces are trained for the hazards they may encounter.

OBJECTIVE: Maintain County Employees safety and health, define the guidelines for confined space entry for all Departments/Agencies/Districts, and assure compliance with regulatory requirements.

SCOPE: All County Employees required to enter a confined space.

REFERENCE: California Code of Regulations, Title 8, Sections 3380 through 3384, 5144, 5156, 5157, and 5158. Riverside County Safety Manual documents 2004, and 2009.

CONFINED SPACE GUIDELINES
DOCUMENT NUMBER: 2003

I. INTRODUCTION

Confined space entry is a dangerous operation since hazards are not easily detected. Spaces, which appear clean, dry, empty and without hazards can be death traps. Confined space accidents are often tragic; they routinely involve multiple fatalities. Confined space accidents and deaths are preventable, and it is the Intention of Riverside County that they are prevented.

It is essential that employees not enter a confined space until:

- ☐ the space is properly tested;
- ☐ the entering employees are properly trained in the hazards and safety procedures; and
- ☐ employees are provided with the necessary equipment.

These guidelines set forth minimum requirements for safe entry, continued work in and exit from confined spaces at normal atmospheric pressure for employees of Riverside County.

II. GENERAL REQUIREMENTS

A. The Department / Agency / District will evaluate their work areas to determine if they have any areas that would be classified as confined spaces. (Note: Application of the decision flow chart in appendix "A" will aide the Department / Agency / District with the evaluation of their facilities for confined spaces).

B. If the Department / Agency / District determines it has confined spaces, they will inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the confined space. **(Note: A sign reading "DANGER – PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER" or using other similar language would satisfy the requirements for a sign).**

C. If the Department/Agency/District decides that its employees and other employees performing work in the area will not enter confined spaces, the Department/ Agency / District shall take effective measures to prevent all such employees from entering the confined spaces.

III. RESPONSIBILITIES

A. It is the Department / Agency / District head's responsibility to implement the work procedures noted in these guidelines. The Department / Agency / District head is also responsible for reviewing the confined space entry procedure**s** submitted by contractors. Contractor procedures must meet minimum State, Federal, and Riverside County requirements.

B. Supervisory personnel are responsible for insuring that:

1. Provisions and procedures contained in these confined space entry guidelines are fully met and all necessary documentation is maintained and available upon request.

III. RESPONSIBILITIES – continued

2. Employees who enter confined spaces shall have received training associated with hazard recognition, use of personal protective equipment (PPE), lockout/tagout precautions, atmospheric testing procedures including the instruments to do the testing, and emergency rescue procedures. All associated documentation of the training must be on file and up to date before the commencement of any confined space entry and/or work.

3. Confined space atmospheric testing has been completed before entry by a designated competent person. Also, a permit certifying that entry is safe, which has been signed and issued by the entry supervisor and posted at the site of entry.

4. Personal protective equipment, continuous air monitoring devices and emergency rescue equipment required by the hazards of the confined space have been provided and their use enforced.

C. It is the responsibility of each employee to follow the requirements set forth by their Department / Agency / District and these guidelines concerning confined space entry.

D. It is the responsibility of the Department / Agency / District to ensure each contractor used for confined space entry provides and is responsible for:

1. Having a complete written confined space entry procedure that meets all Local, State, and Federal regulations and County of Riverside requirements;

2. Provide properly trained personnel for confined space entry and rescue operations. Training must include hazard recognition, use of personal protective equipment, and lockout/blockout of energized equipment, atmospheric testing and rescue procedures. Documentation is to be made available to the County Safety Office upon request;

3. Appointing a responsible employee to be the attendant to monitor and control all operations in the confined spaces. This person must be aware of the contractor's confined space entry procedures and follow any county policies, which exceed the contractors' procedures;

4. All atmospheric testing before and during the confined space entry operations;

5. Providing all equipment and personal protective devices required and all necessary rescue equipment to ensure a safe confined space entry;

6. Approving, completing and issuing confined space entry permits; and

7. Providing the County with copies of material safety data sheets (MSDS) for all hazardous substances brought onto County job sites, prior to their use.

IV. PRE-ENTRY REQUIREMENTS

A. These rules must be implemented before entry into a confined space, in conjunction with the permit.

1. All lines, pipes or ducts going to the confined space must be disconnected, blinded or blocked off to prevent materials from entering and causing a hazard in the confined space. This has to be done so that inadvertent reconnection of the line is effectively prevented.

2. The space must be cleaned, purged, emptied or flushed of any possibly hazardous substances to the extent feasible.

3. The air must be tested with an appropriate device to detect oxygen deficiency and the presence of hazardous substances. Results must be recorded on the required confined space permit.

4. When interconnected confined spaces are isolated (or blinded off) as a unit, each confined space must be tested individually. The most hazardous condition found in any of the confined spaces will determine the procedures used in all of the confined spaces.

5. If the confined space has been isolated and the atmosphere is within limits, entry into and work within the confined space can proceed if the atmosphere is tested frequently enough to ensure that the atmosphere quality remains within specified limits.

6. If the tests show that oxygen deficiency or other atmospheric hazards (e.g., flammables or toxins) are present, the space must be ventilated. When atmospheric tests show that ventilation has made the space safe to enter, employees may do so. The atmosphere in the space must be routinely tested during entry to ensure that the atmosphere remains within limits.

7. No sources of ignition (e.g., sparks, hot surfaces, lit smoking materials) are permitted near the confined space until testing shows there is no chance of explosion or fire.

8. If any oxygen consuming equipment or procedures are used (e.g., salamanders, heaters, torches, furnaces) measures must be taken to ensure adequate combustion air and venting of exhaust gases.

9. To the extent possible provisions should be made for easy entrance and exit of the confined space. These provisions would include ladders, scaffolding or other such devices.

10. In spaces that cannot be exited easily and are equipped with automatic fire suppression systems that use toxic or oxygen displacing gases or total foam flooding the fire suppression system must be deactivated. If this is not practical or safe, provisions must be set up to use the proper respiratory equipment by tested and trained employees.

V. SEWER SYSTEM ENTRY REQUIREMENTS

A. Sewer entry differs in three vital respects from other confined space entries; first, there rarely exists any way to completely isolate the space (a section of a continuous system) to be entered; second, because isolation is not complete, the atmosphere may suddenly and unpredictably, become lethally hazardous (toxic, flammable or explosive) from causes beyond the control of the entrant or employer, and third, experienced sewer workers are especially knowledgeable in entry and work in their confined space because of their frequent entries. Unlike other employments where confined space entry is a rare and exceptional event, sewer workers' usual environment is a confined space.

1. Adherence to procedure. The Department/Agency/District should designate as entrants only employees who are thoroughly trained in sewer entry procedures and who demonstrate that they follow these entry procedures exactly as prescribed when performing sewer entries.

2. Atmospheric monitoring. Entrants should be trained in the use of, and be equipped with, atmospheric monitoring equipment which sounds an audible alarm, in addition to its visual readout, whenever one of the following conditions is encountered: oxygen concentration less than 19.5 percent; flammable gas or vapor at 10 percent or more of the lower flammable limit (LFL); or hydrogen sulfide or carbon monoxide at or above their permissible exposure limit (PEL) (10 ppm or 35 ppm, respectively, measured as an 8-hour time weighted average (TWA)). Atmospheric monitoring equipment needs to be calibrated according to the manufacture's instructions. Substance specific devices should be used whenever actual contaminants have been identified. The instrument should be carried and used by the entrant in sewer line work to monitor the atmosphere in the entrant's environment, and in advance of the entrants' direction of movement, to warn the entrant of any deterioration in atmospheric conditions. Where several entrants are working together in the same immediate location, one instrument, used by the lead entrant, is acceptable.

3. Surge flow and flooding. Sewer crews should develop and maintain liaison, to the extent possible, with local weather bureau and fire and emergency services in their area so that sewer work may be delayed or interrupted and entrants withdrawn whenever sewer lines might be suddenly flooded by rain, fire suppression activities, or whenever flammable or other hazardous materials are released into sewers during emergencies by industrial or transportation accidents.

4. Special Equipment. Entry into large bore sewers may require the use of special equipment. Such equipment might include such items as atmosphere monitoring devices with automatic audible alarms, escape self-contained breathing apparatus (ESCBA) with at least 10 minute air supply (or other NIOSH approved self-rescuer), and waterproof flashlights, and may also include boats and rafts, radios and rope stand-offs for pulling around bends and corners as needed.

VI. PERMIT REQUIREMENTS

A. If the Department/Agency/District decides its employees will enter a confined space, they will develop and implement an entry permit system for confined spaces, prior to anyone entering the confined space. The entry permit authorizing entry into a confined space will at a minimum identify the following:

1. The confined space to be entered;

2. The purpose of the entry;

3. The date and the authorized duration of the permit;

4. The authorized entrants within the confined space, by name or by such other means that will enable the attendant to determine quickly and accurately which authorized entrants are inside the confined space for the duration of the permit;

5. The personnel, by name currently serving as attendant;

6. The individual, by name currently serving as entry supervisor, with space for the signature or initials of the entry supervisor who originally authorized entry;

7. The hazards of the confined space to be entered;

8. The measures used to isolate the confined space, and to eliminate or control confined space hazards before entry;

9. The acceptable entry conditions;

10. The results of initial and periodic tests performed, accompanied by the names or initials of the testers and by an indication of when the tests were done;

11. The rescue and emergency services that can be provided on site and additional services that can be summoned and the means for summoning those services;

12. The communication procedures used by authorized entrants and attendants to maintain contact during entry;

13. Equipment (such as personal protective equipment, testing equipment, communications equipment, alarm systems and rescue equipment) to be provided;

14. Any other necessary information whose inclusion is necessary, given the circumstances of the particular confined space, to ensure employee safety; and

15. Any additional permits (such as for hot work) issued to authorize work in the confined space.

VI. LOCKOUT/ TAGOUT/ BLOCKOUT REQUIREMENTS

A. Per Title 8, California Code of Regulations, General Industry Safety Orders, Section 5157 requires that a confined space must be isolated and the equipment locked out before entry to prevent injury to entrants.

B. Per Title 8, CCR, GISO, section 3314, Lockout / Tagout/ Blockout means the use of devices, positive methods and procedures, which will result in the effective isolation or securing of prime movers, machinery and equipment from electrical, hydraulic, mechanical, pneumatic, chemical, thermal, or other energy source that might cause unexpected movement must be disengaged or blocked while employees are working on equipment.

C. The Department/Agency/District will provide a sufficient number of tags and padlocks, seals or other similarly effective means, which may be required to isolate equipment before work, begins in any confined space. Also, employees will be trained in the proper procedures for isolating and locking out confined spaces. **Refer to Document 2009, Lockout / Blockout guidelines, in the County of Riverside Safety Manual.**

VII. ATMOSPHERIC TESTING PROCEDURES

A. Atmospheric testing is required for two distinct purposes; evaluation of the hazards of the confined space and verification that acceptable entry conditions for entry into the confined space exists.

1. **Evaluation Testing** The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity to identify and evaluate any hazardous atmospheres that may exist or arise so appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data, and development of the entry procedure should be done by or reviewed by, a technically qualified professional based on evaluation of all serious hazards.

2. **Verification testing** The atmosphere of a confined space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permits, specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing should be recorded on the permit in the space provided adjacent to the stipulated acceptable entry condition.

3. **Duration of testing** Measurements of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.

4. **Testing stratified atmospheres** When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

ATMOSPHERIC TESTING PROCEDURES – continued

5. **Order of testing** A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen deficient atmosphere. Combustible gases are tested for next because the threat of fire or explosion is both more immediate and more life threatening, in most cases, than exposure to toxic gases and vapors. If tests for toxic gases and vapors are necessary, they are performed last.

VIII. RESCUE AND EMERGENCY SERVICES

The Department / Agency / District will ensure that at least one standby person at the site is trained and immediately available to implement rescue and emergency procedures. The following requirements apply for employees entering confined spaces to do a rescue:

A. Each member of the rescue team will be properly trained and provided with the personal protective equipment and rescue equipment necessary for making rescues from confined spaces.

B. Each member of the rescue team will be trained to do the assigned duties and will also receive the training required of authorized entrants.

C. Each member of the rescue team will practice making permit space rescues at least once every 12 months. This can be accomplished by using simulated rescue operations in which they remove dummies, manikins or actual persons from an actual confined space or from representative confined spaces. Representative confined spaces will, with respect to opening size, configuration and accessibility simulate the types of confined spaces from which rescue is to be accomplished.

D. Each member of the rescue team will be trained in basic First Aid and in Cardiopulmonary Resuscitation (CPR). At least one member of the rescue team holding current certification in First Aid and CPR will be available when entering a confined space.

When arrangements are made to have persons other than your own employees do confined space rescues prior to any confined space entry you will:

- Inform the rescue service of the hazards they may confront when called on to do rescues at your facility.

- Give the rescue service access to all confined space from which rescue may be necessary so the rescue service can develop appropriate rescue plans and practice rescue operations.

- To facilitate non-entry rescue, retrieval systems or methods will be used whenever an authorized entrant enters a confined space, unless the retrieval equipment would increase the overall risk of entry or not contribute to the rescue of the entrant.

- If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or other similar written information is required, the MSDS or written information will be made available to the medical facility treating the exposed entrant.

IX. HOT WORK IN CONFINED SPACES

A. Whenever any type of hot work (such as welding, cutting, burning or heating operations) is to be done within a confined space, a permit for hot work will be used in addition and attached to the entry permit. The following requirements will be used when welding or cutting in a confined space:

1. Ventilation blowers must be used during all welding and cutting operations in a confined space.

2. No source of ignition will be introduced into the confined space until testing confirms no dangerous air contaminations due to flammable and/or explosive substances exist.

3. Compressed gas cylinders must remain outside the confined space. The flow of gas must be turned off at the cylinder valve when not in use. When torches and hoses are not being used, they must be removed from the confined space. Self-contained breathing cylinders and egress bottles are the only exception.

4. At least one trained person must stand by outside the confined space ready to give assistance in case of an emergency with a second person backing up the standby person.

5. Provisions must be made to permit rapid entry and exit. All access holes must be opened for good cross ventilation.

6. All personnel must leave the confined space work area after cancellation of welding and/or cutting and will not reenter until a complete air quality evaluation has been performed and documented.

7. Whenever an atmosphere free of dangerous air contamination and/or oxygen deficiency cannot be ensured through the implementation of the above procedures, each person within the confined space during the welding and/or cutting operation must be provided with air-supplied respirators. Respirators must be the demand type with a low-pressure alarm. The users must be trained in the proper use of the respirator and it must be documented. **(Reference Safety Manual Document 2004.)**

In all cases, arrangements will be made to provide sufficient surveillance and monitoring to ensure safe conduct of the work and a safe exit from the confined spaces when the work is completed.

X. TRAINING REQUIREMENTS

The Department/Agency/District will provide training so all employees who work, or will work in confined spaces acquire the understanding, knowledge and skills necessary for the safe performance of the duties assigned while working in a confined space.

X. TRAINING REQUIREMENTS - continued

A. Training will be provided to each employee:

1. Before the employee is first assigned duties in a confined space;

2. Before there is a change in assigned duties concerning confined space entry;

3. Whenever there is a change in confined space operations, that present a hazard which employee's have not previously been trained on; and

4. Whenever the employer has reason to believe either there are deviations from the confined space procedures or there are inadequacies in the employee's knowledge or use of the confined space procedures.

B. The Department/Agency/District will ensure that each employee who enters a confined space is trained to:

1. Recognize the characteristics of the confined space;

2. Anticipate and be aware of the hazards that may be faced during entry;

3. Recognize the adverse health effects that may be caused by the exposure to a hazard;

4. Understand the physical signs and reactions related to exposures to such hazards;

5. Know what personal protective equipment is needed for safe entry and exit from the confined space;

6. Use personal protective equipment (such as a safety harness and life line); and

7. Where necessary be aware of the presence and proper use of barriers that may be needed to protect an entrant from hazards.

The training will establish employee proficiency in the duties required by the confined space program and will introduce new or revised procedures, as necessary for compliance with the confined space program.

C. The Department / Agency / District will certify that the required confined space training has been accomplished. The certification will be available for inspection by employees and their authorized representatives. The certification document will contain:

1. Employees' name;

2. The signature of the employee and trainer; and

3. The date of training.

XI. APPENDICES

CONFINED SPACE GUIDELINES
DOCUMENT NUMBER: 2003

A. DEFINITIONS

B. CONFINED SPACE DECISION FLOW CHART

C. ILLUSTRATIONS OF CONFINED SPACES

D. ILLUSTRATION OF MANHOLE VENTILATION

E. EXAMPLE OF CONFINED SPACE PERMIT

F. EXAMPLE OF PRE-ENTRY CHECKLIST

G. INDIVIDUAL EMPLOYEE TRAINING DOCUMENTATION

APPENDIX A

DEFINITIONS

Attendant: an individual stationed outside the confined spaces who monitors the authorized entrants.

An authorized entrant: an employee who is authorized to enter a confined space.

Blanking or Blinding: the absolute closure of a pipe, line or duct by fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.

Confined Space: a space that:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work;
2. Limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that has limited means of entry.); and
3. Not designed for continuous employee occupancy.

Double Block and Bleed: the closure of a line, duct, or pipe by closing and locking or tagging two in line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency: any occurrence (including any failure of hazard control or monitoring equipment) or an event internal or external to the confined space that could endanger entrants.

Engulfment: the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry: the action by which a person passes through an opening into a confined space. Entry includes work activities in that space and is considered to have occurred as soon as any part of the entrants' body breaks the plane of the opening into the space.

Entry permit (permit): the written or printed document provided by the employer to allow and control entry into a confined space and it contains all necessary information.

Entry Supervisor: the person responsible for determining if acceptable entry conditions are present at a confined space where entry is planned, for authorizing entry and overseeing entry operations and for canceling entry. **(NOTE:** An entry supervisor may also serve as an attendant or as an authorized entrant. Since that person is trained and equipped as required for each role, he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during an entry).

Hazardous Atmosphere: an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (escape unaided from a confined space) injury, or acute illness from one or more of the following causes:

1. Flammable gas, vapor, or mist more than 10 percent of its lower flammable limit (LFL);

DEFINITIONS - continued

2. Airborne combustible dust at a concentration that meets or exceeds its LFL; (**Note:** This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 M) or less).
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
4. Atmospheric concentration of any substance which a dose is published in Group 14 for Radiation and Radioactivity, or a permissible exposure limit is published in CCR Title 8, Section 5155 for airborne contaminants, which could result in employee exposure more than its dose or permissible limit;

   (**NOTE:** An atmospheric concentration of any substance that cannot cause death, incapacitation, impairment of ability to self rescue, injury or acute illness due to its health effects is not covered by this provision); and

5. Any other atmospheric condition that is immediately dangerous to life or health. (**NOTE:** For air contaminants which a dose is not published in Group 14 for Radiation and Radioactivity or a permissible exposure limit is not published in CCR Title 8, Section 5155 for Airborne contaminants, other sources of information such as Material Safety Data Sheets, published information and internal documents can provide guidance in establishing acceptable atmospheric conditions).

Hot Work Permit: the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) with a source of ignition.

Immediately Dangerous to Life or Health (IDLH): any condition that poses an immediate or delayed threat to life or would cause irreversible adverse health effects or would interfere with an individual's ability to escape unaided from a confined space.
(NOTE: Some materials – hydrogen fluoride gas cadmium vapor, for example – may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim “feels normal” from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be “immediately dangerous to life or health.

Inerting: the displacement of the atmosphere in a confined space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. (**NOTE:** This procedure produces an IDLH oxygen-deficient atmosphere).

Isolation: the process by which a confined space is removed from service and completely protected against the release of energy and material into the space. This can be done by blanking or blinding, misaligning or removing sections of lines, pipes, or ducts, a double block and bleed system, lockout or tagout of all sources of energy, or blocking or disconnecting all mechanical linkages.

Line Breaking: the intentional opening of a pipe, line or duct that is or has been carrying flammable, corrosive, toxic material, an inert gas, or any fluid at a volume, pressure or temperature capable of causing injury.

Non permit Confined Space: a confined space that does not contain with respect to atmospheric hazards, or have the potential to contain any hazard which could cause death or serious physical harm.

DEFINITIONS – continued

Oxygen Deficient Atmosphere: an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen Enriched Atmosphere: an atmosphere containing more than 23.5 percent oxygen by volume.

Permit-Required Confined Space (permit space): a confined space that has one or more of the following characteristics:

1. Contains, or has a potential to contain, a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. An internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
4. Contains any other recognized serious safety or health hazard.

Permit-Required Confined Space Program (permit space program): the employers overall program for controlling, and where appropriate, for protecting employees from permit space hazards, and for regulating employee entry into confined spaces.

Permit System: the employer's written procedure for preparing and issuing permits for entry and for returning the confined space to service following cancellation of entry.

Prohibited Condition: any condition in a confined space that is not allowed by the permit during the period when entry is authorized.

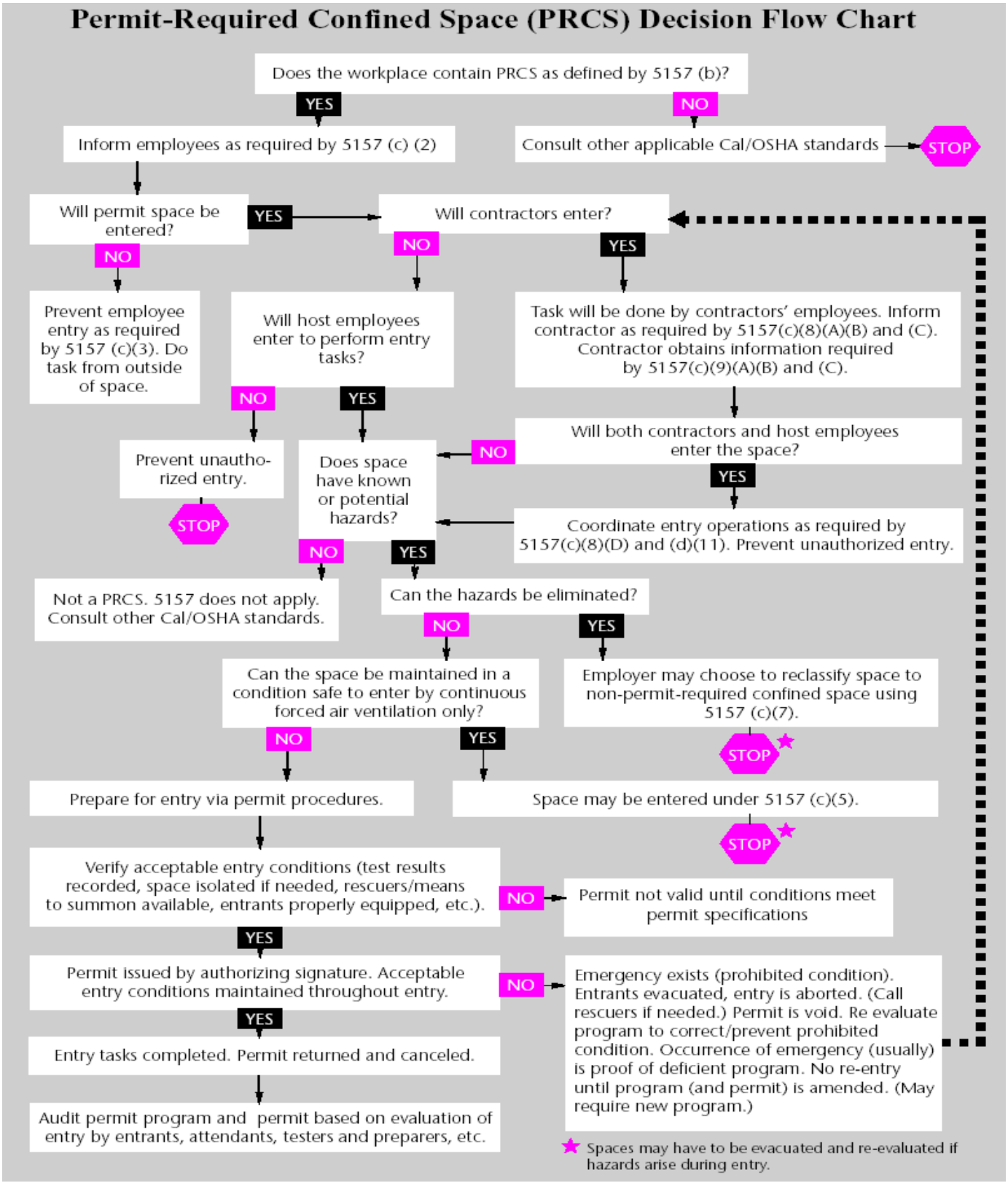
Rescue Service: the personnel designated to rescue employees from confined space.

Retrieval System: the equipment (including a retrieval line, full-body harness, wristlets if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing: the process by which the hazards that may confront entrants of a confined space are identified and evaluated. Testing includes specifying the tests that are to be done in the confined space. **If electronic or thermal equipment is used to perform such tests, and the possibility exists of an explosive substance or a hazardous atmosphere due to flammable gases and vapors, then the testing equipment must be approved for use in such explosive or flammable conditions as required by section 2540.2.** (**NOTE:** Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately before, and during entry.

APPENDIX B

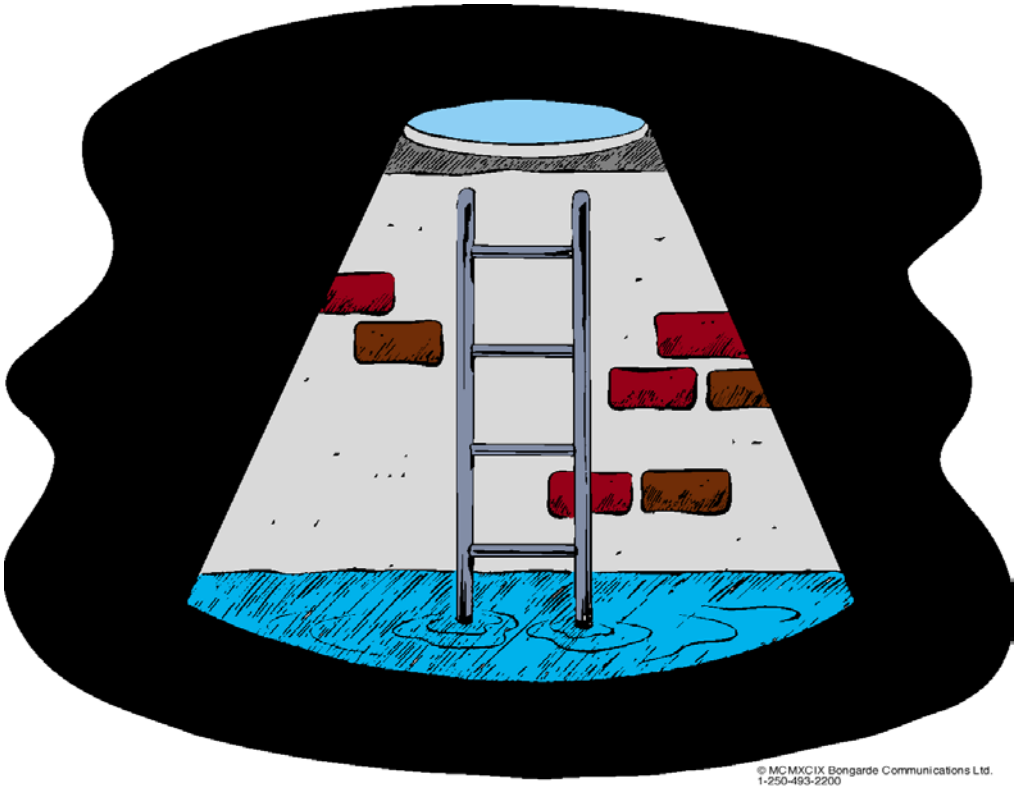
CONFINED SPACE DECISION FLOW CHART


Permit-Required Confined Space (PRCS) Decision Flow Chart
Does the workplace contain PRCS as defined by 5157 (b)?
YES
NO
Inform employees as required by 5157 (c) (2)
Consult other applicable Cal/OSHA standards
STOP
Will permit space be entered?
YES
Will contractors enter?
NO
NO
YES
Prevent employee entry as required by 5157 (c)(3). Do task from outside of space.
Will host employees enter to perform entry tasks?
Task will be done by contractors' employees. Inform contractor as required by 5157(c)(8)(A)(B) and (C). Contractor obtains information required by 5157(c)(9)(A)(B) and (C).
NO
YES
Prevent unautho-rized entry.
Does space have known or potential hazards?
NO
Will both contractors and host employees enter the space?
YES
STOP
Coordinate entry operations as required by 5157(c)(8)(D) and (d)(11). Prevent unauthorized entry.
NO
YES
Not a PRCS. 5157 does not apply. Consult other Cal/OSHA standards.
Can the hazards be eliminated?
NO
YES
Can the space be maintained in a condition safe to enter by continuous forced air ventilation only?
Employer may choose to reclassify space to non-permit-required confined space using 5157 (c)(7).
NO
YES
STOP
Prepare for entry via permit procedures.
Space may be entered under 5157 (c)(5).
STOP
Verify acceptable entry conditions (test results recorded, space isolated if needed, rescuers/means to summon available, entrants properly equipped, etc.).
NO
Permit not valid until conditions meet permit specifications
YES
Permit issued by authorizing signature. Acceptable entry conditions maintained throughout entry.
NO
Emergency exists (prohibited condition). Entrants evacuated, entry is aborted. (Call rescuers if needed.) Permit is void. Re evaluate program to correct/prevent prohibited condition. Occurrence of emergency (usually) is proof of deficient program. No re-entry until program (and permit) is amended. (May require new program.)
YES
Entry tasks completed. Permit returned and canceled.
Audit permit program and permit based on evaluation of entry by entrants, attendants, testers and preparers, etc.
★ Spaces may have to be evacuated and re-evaluated if hazards arise during entry.

APPENDIX C

ILLUSTRATIONS OF CONFINED SPACES


WARNING!
AUTHORIZED
ENTRY ONLY
© MCMXCIX Bongarde Communications Ltd.
1-250-493-2200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APPENDIX D

ILLUSTRATION OF MANHOLE VENTILATION

CONFINED SPACE GUIDELINES
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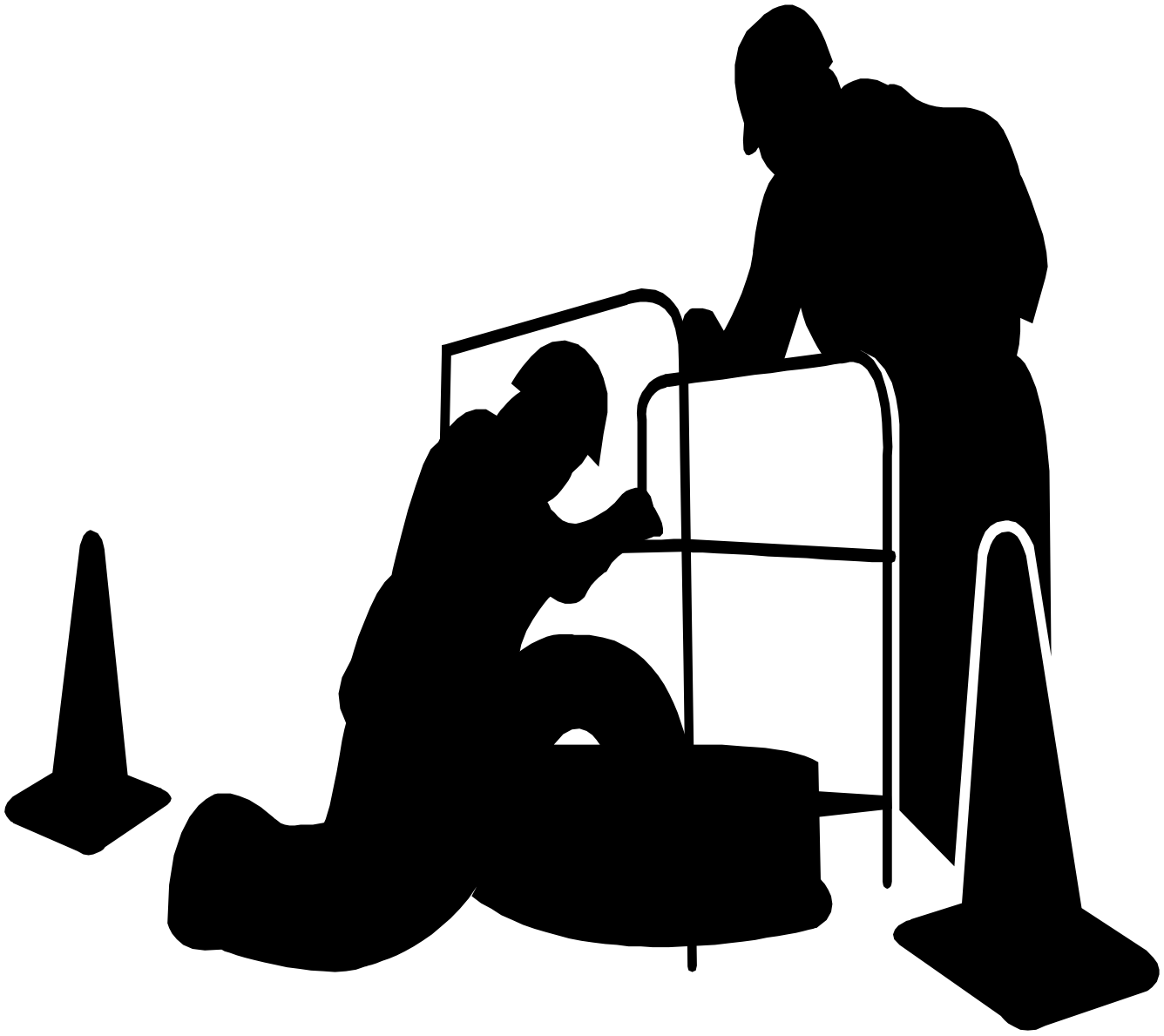

APPENDIX E
EXAMPLES OF CONFINED SPACE PERMITS

CONFINED SPACE GUIDELINES
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§5157. Permit-Required Confined Spaces Confined Space Entry Permit

Date and Time Issued: _____ Date and Time Expires: _____
Job site/Space I.D.: _____ Job Supervisor:_____
Equipment to be worked on: _____ Work to be performed: _____
Stand-by personnel: _____

1. Atmospheric Checks: Time _____ Oxygen _____%
   Explosive _____% L.F.L. Toxic _____PPM
2. Tester's signature: _____
3. Source isolation (No Entry):

	N/A	Yes	No
Pumps or lines blinded, disconnected, or blocked	( )	( )	( )

4. Ventilation Modification:

	N/A	Yes	No
Mechanical	( )	( )	( )
Natural Ventilation only	( )	( )	( )

5. Atmospheric check after isolation and Ventilation:
   Oxygen _____% > 19.5 %
   Explosive _____% L.F.L < 10 %
   Toxic _____PPM < 10 PPM H(2)S
   Time _____ **Testers signature:** _____
6. Communication procedures: _____
   _____
7. Rescue procedures: _____
   _____
8. Entry, standby, and back up persons:

	Yes	No
Successfully completed required training?	( )	( )
Is it current?	( )	( )

9. Equipment:

	N/A	Yes	No
Direct reading gas monitor - tested	( )	( )	( )
Safety harnesses and lifelines for entry and standby persons	( )	( )	( )
Hoisting equipment	( )	( )	( )
Powered communications	( )	( )	( )
SCBA's for entry and standby persons	( )	( )	( )
Protective Clothing	( )	( )	( )
All electric equipment listed Class I, Division I, Group D and Non-sparking tools	( )	( )	( )

10. Periodic atmospheric tests:

Oxygen	_____%	Time ____	Oxygen	____%	Time ____
Oxygen	_____%	Time ____	Oxygen	____%	Time ____
Explosive	_____%	Time ____	Explosive	____%	Time ____
Explosive	_____%	Time ____	Explosive	____%	Time ____
Toxic	_____%	Time ____	Toxic	____%	Time ____
Toxic	_____%	Time ____	Toxic	____%	Time ____

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor)_____
Approved By: (Unit Supervisor)_____
Reviewed By (Cs Operations Personnel) :

_____ _____
(printed name) (signature)

This permit to be kept at job site. Return job site copy to Safety Office following job completion.

Copies: White Original (Safety Office)
Yellow (Unit Supervisor)

CONFINED SPACE GUIDELINES
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Hard(Job site)

POST AT POINT OF ENTRY
Confined Space Permit

_____ _____ _____
Location Organization Date

Confined Space ID#_____

Permit Expiration Date/Time:_____

Scheduled Work to be Done:_____

Persons Authorized to Enter:_____

Standby Attendant(s):_____

Sampling Equipment Used

TYPE:	SERIAL#	DATE CALIBRATED	BY WHOM
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Tests Conducted	Permissible Entry Level	Time	Results	Time	Results
% of Oxygen	19.5% to 23.5%	_____	_____	_____	_____
Lower Explosive Limit	Under 10%	_____	_____	_____	_____
Carbon Monoxide	+35 PPM	_____	_____	_____	_____
Hydrogen Sulfide	+10 PPM	_____	_____	_____	_____

+8 hr. Time Weighted Avg.: Employees can work in area 8 hrs.

Level of Hazard: q Caution q Warning q Danger (Do not enter)

Emergency Procedures
If an emergency should occur - first summon help. Do not enter confined space until qualified help arrives and entry can be made safely. If a person appears to be unconscious for no apparent cause, you must assume that toxic gases or oxygen deficiency could exist - do not enter without full protective gear and self-contained breathing devices.

EMERGENCY CALL NUMBER_____

This permit is not valid until the confined space entry checklist is completed.

Signed: _____
Entry Supervisor Phone/Beeper

This confined space entry permit, when properly authorized, allows the person to whom it is issued to enter the area specified. The work will not be started unfit this permit and the checklist are complete, all requirements have been met and any discrepancies corrected. The permit will be retained in the departments files for one year.

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Permit-Required Confined Spaces, Appendix D-2. Entry Permit

ENTRY PERMIT
PERMIT VALID FOR 8 HOURS ONLY. ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED
DATE: - SITE LOCATION and DESCRIPTION _____
PURPOSE OF ENTRY _____
SUPERVISOR(S) in charge of crews Type of Crew Phone #
_____
_____
COMMUNICATION PROCEDURES _____
RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM) _____
_____
*** BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY***

REQUIREMENTS COMPLETED	DATE	TIME
Lock Out/De-energize/Try-out	_____	_____
Line(s) Broken-Capped-Blanked	_____	_____
Purge-Flush and Vent	_____	_____
Secure Area (Post and Flag)	_____	_____
Breathing Apparatus	_____	_____
Resuscitator - Inhalator	_____	_____
Standby Safety Personnel	_____	_____
Full Body Harness w/"D" ring	_____	_____
Emergency Escape Retrieval Equip	_____	_____
Lifelines	_____	_____
Fire Extinguishers	_____	_____
Lighting (Explosive Proof)	_____	_____
Protective Clothing	_____	_____
Respirator(s) (Air Purifying)	_____	_____
Burning and Welding Permit	_____	_____

Note: Items that do not apply enter N/A in the blank.
****RECORD CONTINUOUS MONITORING RESULTS EVERY 2 HOURS**
CONTINUOUS MONITORING Permissible** _____

TEST(S) TO BE TAKEN	Entry Level							
PERCENT OF OXYGEN	19.5% to 23.5%	_____	_____	_____	_____	_____	_____	_____	_____
LOWER FLAMMABLE LIMIT	Under 10%	_____	_____	_____	_____	_____	_____	_____	_____
CARBON MONOXIDE	+35 PPM	_____	_____	_____	_____	_____	_____	_____	_____
Aromatic Hydrocarbon	+ 1 PPM * 5PPM	_____	_____	_____	_____	_____	_____	_____	_____
Hydrogen Cyanide	(Skin) * 4PPM	_____	_____	_____	_____	_____	_____	_____	_____
Hydrogen Sulfide	+10 PPM *15PPM	_____	_____	_____	_____	_____	_____	_____	_____
Sulfur Dioxide	+ 2 PPM * 5PPM	_____	_____	_____	_____	_____	_____	_____	_____
Ammonia	*35PPM	_____	_____	_____	_____	_____	_____	_____	_____

***Short-term exposure limit: Employee can work in the area up to 15 minutes.**
+ 8 hr. Time Weighted Avg.: Employee can work in area 8 hrs (longer with appropriate respiratory protection).
REMARKS:_____

GAS TESTER NAME & CHECK #	INSTRUMENT(S) USED	MODEL &/OR TYPE	SERIAL &/OR UNIT #
_____	_____	_____	_____
_____	_____	_____	_____

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

SAFETY STANDBY PERSON(S)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK #
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

SUPERVISOR AUTHORIZING - ALL CONDITIONS SATISFIED_____
DEPARTMENT/PHONE _____
AMBULANCE 2800 FIRE 2900 Safety 4901 Gas Coordinator 4529/5387

APPENDIX F

EXAMPLE OF PRE-ENTRY CHECKLIST

PRE-ENTRY CHECKLIST

(All applicable items will be "Yes" for the permit to be valid)	YES	NO	DOES NOT APPLY
A. Procedure Provided, Reviewed, and Enforced?	____	____	_____
1. All procedures reviewed and understood?	____	____	_____
2. Training completed?	____	____	_____
3. Person on site at all times to enforce all procedures?	____	____	_____
4. Material Safety Data Sheets (MSDS) reviewed?	____	____	_____
B. Welding, Cutting, Open Flame Present?	____	____	_____
1. Welding permit obtained and posted?	____	____	_____
C. Confined Space Isolated?	____	____	_____
1. Lockout and Tagout Procedure followed?	____	____	_____
2. Power sources "OFF"? Locked out?			
3. Electrical hazards isolated, removed, tagged?	____	____	_____
4. Rotating equipment locked out, removed, or disconnected?	____	____	_____
5. Lines carrying materials to and from confined space blanked off section removed or locked by two valves and drained?	____	____	_____
6. Drain valve locked open and tagged?	____	____	_____
7. Contents removed and space flushed?	____	____	_____
D. Confined Space Atmosphere Prepared and Monitored?	____	____	_____
1. Purged?	____	____	_____
2. Flanges/access doors removed? Manholes opened?	____	____	_____
3. Continuous ventilation provided?	____	____	_____
4. Oxygen level maintained over 19.5% but less than 23.5%?	____	____	_____
5. Continuous air monitoring equipment provided? Operational?	____	____	_____
E. Personal Protective Equipment Provided?	____	____	_____
1. Specific instructions given for its use?	____	____	_____
2. Airlines, self-contained breathing apparatus or other approved respirators provided?	____	____	_____
3. Safety harness with "D' ring and life line provided?	____	____	_____
4. Head, hearing, hand, foot and body protection provided?	____	____	_____
5. Lighting equipment of approved type provided and grounded?	____	____	_____
6. Fire extinguishers readily available?	____	____	_____
7. Walking /working surfaces protected from slippage?	____	____	_____
F. Attendant Present?	____	____	_____
1. Standing outside of **confined** space, trained and prepared to respond to emergencies as instructed?	____	____	_____
2. Rescue equipment provided at the confined space?	____	____	_____
3. Emergency alarms or communications available?	____	____	_____

NOTE: This list of items is not intended to be all-inclusive. Certain jobs may require additional specifications.
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APPENDIX G

INDIVIDUAL EMPLOYEE TRAINING DOCUMENTATION

CONFINED SPACE GUIDELINES
DOCUMENT NUMBER: 2003

INDIVIDUAL EMPLOYEE TRAINING DOCUMENTATION

NAME OF TRAINER/INSTRUCTOR: _____

TRAINING SUBJECT: CONFINED SPACE PROGRAM GUIDELINES, I.E., (Confined space recognition, and hazards)

TRAINING MATERIALS USED: _____
_____
-
_____

NAME OF EMPLOYEE: _____

DATE OF TRAINING: _____

I, _____ hereby certify that I have received training as described above in the following areas:

[ ] Recognizing the characteristics of a confined space.

[ ] Hazards that may be faced during entry into a confined space Recognizing the adverse health effects that may be caused by the exposure to a hazard.

[ ] Understanding the physical signs and reactions related to exposures to such hazards.

[ ] What personal protective equipment is needed for safe entry into and exiting from a confined space.

[ ] How to use personal protective equipment (such as a respirator, safety harness).

[ ] How to use atmospheric testing equipment.

I fully understand the items **presented in** this training **class**, and agree to comply with the instructions received, and the Confined **S**pace Program.

_____ _____
Employee Signature Date

_____ _____
Trainer/Instructor Date

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