

Confined Space Entry & Utility Tunnels – Appendix F: Utility Tunnel Safety

Utility Tunnel Safety

PCC's Sylvania Campus has a widespread tunnel structure that houses many utility distribution systems. Maintenance and repairs are performed on the utility systems within the tunnels. The purpose of the Utility Tunnel Safety program is to provide requirements for any employees, contractors, or vendors that operate within the tunnels.

This program also applies to any campus utility tunnels, except sections specifically designated as "confined spaces" or "permit-required confined spaces". Sections of the tunnels designated as such, can only be entered by trained personnel in accordance with the various Confined Space Entry Procedures found in Section IV. B. through I. of this Plan.

I. RESPONSIBILITY

Responsibility for the Utility Tunnel Safety Program rests at all levels in the College and is described as follows:

1. Facilities Management Services

- Approving all access and work conducted in the tunnel systems by its employees and contractors.
- Approving key authorization into the tunnel systems.
- Verifying training records to ensure potential tunnel entrants are trained and follow the procedures of this program.
- Effectively enforcing compliance of the tunnel safety procedures.
- Notifying EH&S when employees enter the tunnel systems if necessary.
- Ensuring that the equipment required to enter and work in tunnels are in proper working conditions and made available for use.
- Ensuring that *Form 3: Utility Tunnel Safety Work Plan* is followed and filled out, including check-in/check-out procedures, wearing appropriate personal protective equipment (PPE), safe work procedures and reporting any safety hazards observed while working in the tunnel.
- Communicating the Tunnel Safety procedures and requirements to all contractor and sub-contractor employees who intend to enter the tunnel systems.
- Establishing an Emergency Plan for employees and contractors working in tunnels and executing the plan upon notification from Public Safety that the tunnel entrants have not exited the tunnels or have reported an emergency.

2. Planning & Capital Construction

- Approving all access and work conducted in the tunnel systems by its employees and contractors
- Approving key authorization into the tunnel systems
- Verifying training records to ensure potential tunnel entrants are trained and follow the procedures of this program
- Effectively enforcing compliance of the tunnel safety procedures.
- Notifying EH&S when employees enter the tunnel systems if necessary.

- Ensuring that the equipment required to enter and work in tunnels is in proper working condition and made available for use.
- Ensuring that *Form 3: Utility Tunnel Safety Work Plan* is followed and filled out, including check-in/check-out procedures, wearing appropriate personal protective equipment (PPE), safe work procedures and reporting any safety hazards observed while working in the tunnel.
- Communicating the Tunnel Safety procedures and requirements to all contractor and sub-contractor employees who intend to enter the tunnel systems.
- Establishing an Emergency Plan for employees and contractors working in tunnels and executing the plan upon notification from Public Safety that tunnel entrants have not exited the tunnels or have reported an emergency.

3. EH&S

- Establishing and reviewing the Utility Tunnel Safety Program.
- Assisting with training of tunnel entrants and maintaining tunnel safety training records, if training is conducted by EH&S.
- Conducting inspections, hazard assessment and periodic audits to ensure employee safety and compliance with this program when necessary.
- Advising staff on health and safety issues when working in tunnel systems.
- Keeping / maintaining tunnel safety training and inspection records.

4. Public Safety

- Receiving calls from tunnel entrants prior to tunnel entry, and after entrants have left the tunnels (calls should indicate names of entrants and approximate exit time)
- Contacting tunnel entrants' management if tunnel entrants are not heard from after 30 minutes have elapsed beyond the noted exit time; Requesting tunnel entrants' management to initiate their Emergency Plan.
- Notifying emergency services and/or FMS in the event of an emergency (medical or utility) identified in the tunnel system.

5. Authorized Entrant to Tunnel Systems:

- Notifying appropriate management of entry and proposed exit times (FMS and their contractors notify FMS Management; P&CC and their contractors notify P&CC Management).
- Completing *Form 3: Utility Tunnel Safety Work Plan* before entry.
- Following the check-in/check-out procedures and the Utility Tunnel Safety Program requirements.
- Wearing appropriate personal protective equipment (PPE)
- Reporting any safety hazards observed while working in the tunnel to the FMS and/or EH&S.

II. PROCEDURES FOR GENERAL ENTRY

The following sequence of steps must be followed when entering the tunnel system:

1. The appropriate FMS or P&CC manager/supervisor shall be notified prior to the entry of any individual into a tunnel or section thereof.
2. Prior to entering the utility tunnels, entrants will review and discuss the scope and sequence of the work. *Form 3: Utility Tunnel Safety Work Plan* should be reviewed.
 - a. Pre-planning shall include a discussion with all affected personnel of all potential hazards, means and methods of hazard control and emergency pre-plans:
 - Identities and locations of energized steam lines,
 - Identities and locations of energized compressed air lines
 - Identities and locations of energized high-voltage electrical conductors
 - Locations of exposed hot surfaces
 - Signs and symptoms of heat exhaustion and heat stroke
 - Lighting
 - Means of communication
 - Means of entry and egress
 - Hazards created by work activity (chemical products and welding/cutting)
 - External hazards (work in roadways, walkways)
 - Identities of any job-site specific hazards
 - Means to control hazards (personal protective equipment, ventilation/local exhaust, lockout/tagout procedures)
 - Steam line de-energization and lockout procedures
 - Potential emergency situations and pre-plans
 - The locations of entry and egress from potentially dangerous work conditions will be identified to all personnel working in the tunnel.
 - b. All PPE required to control job-specific hazards shall be identified in job planning and worn by all personnel. Personnel protective equipment shall include but not be limited to:
 - Long pants to protect from burns and cuts
 - Closed toe footwear
 - Portable flashlight
 - Two-way radio or cell phones capable of receiving and transmitting messages in the tunnel system (may be limited by line of sight).
 - Work being done may require additional PPE worn pertaining to the job such as safety glasses, goggles, full face shield, hard hat, leather gloves, or safety shoes.
 - c. Tunnel entrants will notify Public Safety at (971) 722-4902 and indicate the estimated duration of their work within the Tunnels.
3. The "buddy system" will be used by employees entering the utility tunnel system when working on energized systems (See Section IV.)

4. When affected employees enter restricted access areas, they shall do the following:
 - Contact dispatch by two-way radio or telephone
 - Specify tunnel space entering, building location etc.
 - Specify estimated time duration in tunnel
 - Purpose/work to be accomplished while in restricted access area
 - Notify dispatch by two-way radio or telephone once work is completed and area exited.
 - When hot work is performed in a restricted access area, the requirements of *H&SM Ch 16: Hot Work Plan* shall be followed. When hot work is performed, forced ventilation shall be provided and the atmosphere shall be monitored for flammable gases, oxygen content and carbon monoxide. Standard size welding gas cylinders shall not be taken into utility tunnels.
5. Any hatches at ground level, that must be open while performing work, must have guarding to prevent falls. Guarding can be in the form of temporary barriers if the barriers are of a significant physical nature to prevent others from entering or falling into the hatch opening. Hatches must be closed and secured at the end of work completion.
6. Notifying Public Safety upon exiting the tunnels.

III. EMERGENCY PROCEDURES

At the first indication of any type of emergency, all employees/contractors should leave the tunnel. In addition, the following should be done:

- Emergency exit routes should be planned and confirmed prior to start of work.
- Any time there is a non-worker related emergency in the tunnels, all workers should exit the tunnel by way of the shortest and safest route.
- If a worker can shut off or place equipment in safe mode before leaving, then they should do so.
- When all everyone has exited the tunnel, an assessment of the condition of each employee should be made and additional medical assistance sought if necessary.
- Do not re-enter the tunnels until the unsafe conditions have been resolved.
- Rescue measures may be necessary if an employee/contractor in the tunnel is considered overdue to report in or missing or becomes incapacitated and is unable to exit without assistance. Contact Public Safety immediately.
- Contact Public Safety at (971) 722-4444 for any medical emergencies.

IV. LIMITED COMMUNICATION AREAS

Entry into limited communication areas requires notification to FMS on entry and exit including anticipated time in the area. If work is to be performed in a limited communication access area that requires employee(s) to remain in the area for an extended period of time (i.e., 1 hour or more), a buddy system should be used as described below.

- Buddy system - Working in a two-person team is a requirement when actively working on energized systems whereby communication is never lost between the two employees. Workers may enter utility tunnels alone for the purpose of inspections or general maintenance such as cleaning, light bulb changing, connecting to piping for locating purposes or checking steam traps.

V. RECLASSIFICATION AS A PERMIT-REQUIRED CONFINED SPACE

Certain conditions or activities may introduce hazards into the tunnels, causing them to be re-classified as a permit-required confined space. The following work activities should be evaluated prior to starting, to determine if reclassification of the space is triggered:

- Hot work (cutting, welding, brazing)
- Hot Tapping
- Energized electrical work
- Purging or bleeding lines
- Introduction of more than one gallon of any type of chemical at any one time

VI. RELATED / ADDITIONAL REQUIRED TRAINING

Prior to an initial entrance into the tunnel system, workers must complete the following training:

- A review of tunnel systems, entry and exit procedures, PPE, and hazards associated with the tunnel system.
- Asbestos Awareness.
- Confined Space (if activity triggers the permit-required confined space classification).
- Personal Protective Equipment.
- Heat Stress.
- Additional training as needed to perform specific tasks such as lockout/tagout, bloodborne pathogens, high voltage electrical safety.

VII. RECORDKEEPING

- Tunnel Safety training records will be maintained in Cornerstone. Records should include the employee's name and date of training.
- All Utility Tunnel Safety Work Plans that are active and approved shall be maintained and/or retained by the department authorizing the work.
- Records of air monitoring tests, gas tests, and air flow measurement if conducted shall be retained by EH&S.
- Records of inspections of the roof, walls and ground support system of tunnel systems (Grounds Control Inspection) shall be maintained.
- Historical documents and revisions of the Utility Tunnel Safety Program, records of periodic inspections, audits, and tunnel hazard assessments conducted by EH&S must be retained indefinitely.