



Utility Tunnel Safety Program

ENVIRONMENTAL HEALTH & SAFETY

SECOND EDITION



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I. Purpose and Scope

- A. Purpose: The University of Oregon maintains an extensive tunnel system to facilitate the maintenance and repair of campus utility distribution systems. The tunnel system is a critical portion of the University's utility distribution system and must be maintained and used in a safe manner at all times. The purpose of the Tunnel Safety Program is to provide guidance for safely working in the University of Oregon tunnel system and sets forth the requirements for all University employees, associated contractors and vendors.
- B. Scope: This policy applies to University of Oregon spaces requiring a tunnel key for entry, and applies to all persons entering tunnel spaces on behalf of the University of Oregon. Only persons that have authorization from the Central Power Station (CPS) may enter the tunnel system. Unauthorized personnel will be considered trespassers.

II. Definitions

- A. **AUTHORIZED ENTRANT:** Any individual that has received authorization and training from the Central Power Station Manager or his designee, and has legitimate University of Oregon business at the time of entering the tunnel system.
- B. **TUNNEL SYSTEM:** The tunnel system is the underground system connecting buildings and conveying utilities across the University of Oregon campus. Entries into the tunnel systems begin when entering through the locked door, gate, or access-way that is at each tunnel entry.
- C. **CENTRAL POWER STATION (CPS):** The CPS is the University unit that is assigned the responsibility for the tunnel system.
- D. **URGENT WORK:** Work that, if not conducted immediately, will result in injury or harm to building users, and/or damage to facilities or equipment.
- E. **CONTROL ROOM OPERATOR (CRO):** Position composed of qualified CPS employees who operate utility systems including the systems in the University of Oregon Tunnel System. The CRO position is staffed 24 hours per day.
- F. **TUNNEL WORK AUTHORIZATION REQUEST (TWAR):** A formal request submitted by organizations for conducting work in the Tunnel System. An



approved TWAR is permission to conduct the work and is NOT permission to enter the Tunnel System.

III. Responsibilities

- A. Contractors: Contractors will be responsible for:
 - 1. Communicate the University Tunnel Safety Policy to all contractor employees and sub-contractor employees.
 - 2. Complying with the University Tunnel Safety Policy when conducting work in the Tunnel System.
 - 3. Ensure employees are trained tunnel entry procedures and precautions.
 - 4. Document tunnel entry training and provide the tunnel training documentation to CPS.
 - 5. Contractor Supervisors will ensure they know the locations of their workers and work parties within the tunnels, by point of reference (POR), the names of the workers in the group, the length of time expected to be in the tunnel, tunnel entry and exit locations, and the work to be performed in the tunnel.
 - 6. At the end of an employee's shift, Contractor Supervisors will get positive confirmation of safe exit from the tunnels from each of their workers working in the tunnels that day.
 - 7. Anytime a worker, or group of workers, is considered "overdue" or missing, the CRO will be notified and appropriate emergency procedures will be implemented.
 - 8. Contractor Supervisors will ensure permit required confined space procedures are followed when required. Contractors will follow their own permit required confined space program.

- B. CPS Control Room Operators (CRO): Responsible for operation of the CPS plant systems and directly control access to the tunnel systems. The CRO shall:
 - 1. Verify training records to ensure that potential tunnel entrants are trained.
 - 2. When necessary, the operators will train potential entrants and forward the record of training to Environmental Health and Safety.
 - 3. Maintain the tunnel entry/exit logs; provide keys to authorized entrants (and maintain a checkout log for those keys).
 - 4. Communicate with Utilities Standby Duty Administrator when entrants have not checked out and cannot be contacted.



- C. Utilities Standby Duty Administrator:
 - 1. Assist the CRO to attempt contacting workers and worker supervisors to account for individuals who have not checked out of the tunnels at the expected time.
 - 2. The Duty Administrator will come to the CPS and assist the CRO and other entities with investigation and recovery efforts.

- D. CPS Plant Manager: Responsible for the tunnel system including the systems and equipment within the tunnel and supervising all CPS employees. The CPS Manager shall:
 - 1. Approve all access and all work conducted in the tunnel systems.
 - 2. Approve key authorization.
 - 3. Review this policy annually in conjunction with Environmental Health and Safety.

- E. Environmental Health and Safety (EHS): Responsible for
 - 1. Establishing and review this policy.
 - 2. Assist with training of entrants.
 - 3. Maintain Tunnel Safety Training Records.
 - 4. Advise CPS Staff and University employees on health and safety issues.
 - 5. Develop and update tunnels safety training in conjunction with the CPS.

- F. Campus Operations Supervisors: responsible for
 - 1. Communicate this policy with their staff and supporting contractors
 - 2. Train staff and contractors on tunnel entry procedures and precautions.
 - 3. Document tunnel entry training and provide the tunnel training documentation to CPS.
 - 4. Ensure that their employees comply with this policy.
 - 5. Supervisors will ensure they know the locations of their workers and work parties within the tunnels, by point of reference (POR), the names of the workers in the group, the length of time expected to be in the tunnel, tunnel entry and exit locations, and the work to be performed in the tunnel.
 - 6. At the end of an employee's shift, supervisors will get positive confirmation of safe exit from the tunnels from each of their workers working in the tunnels that day.
 - 7. Anytime a worker, or group of workers, is considered "overdue" or missing, contact the CRO and appropriate emergency procedures will be implemented.



8. Prior to beginning the task, Supervisors will determine whether or not the work will require a confined space permit and if needed ensure permit required confined space procedures are followed.
- G. Capital Planning Design & Construction (CPDC) Project Managers (PM) and Owner Representatives (OR) are responsible for:
1. Communicate this policy with their contractors.
 2. Training contractors on tunnel entry procedures and precautions.
 3. For conducting the tunnel entry briefing and the return of that form to CPS.
 4. They are also responsible to ensure that their Contractors comply with this policy.
- H. Authorized Tunnel Entrants: Responsible for following these procedures:
1. Including check-in/check-out procedures.
 2. Wearing appropriate personal protective equipment (PPE).
 3. Following confined space entry requirements, including areas that are labeled as permit required confined spaces.
 4. Reporting any safety hazards observed while working in the tunnel.

IV. Tunnel Work Assessment

A. Work Assessment

1. Prior to beginning any work in the tunnel system an assessment must be conducted by the employee’s supervisor to determine if the work or the conditions in the tunnel could create a potential atmospheric hazard, a potential for entrapment, or create any other safety or health hazard that would either require specialized equipment or create a permit required confined space.
2. When required, permit required confined space procedures will be followed.

V. Special Conditions

- A. Change of Project Scope: Should the scope of work change once in the tunnel, the entrant must:
1. Stop work.
 2. Exit the space and notify the CRO.



3. The employee's supervisor will re-evaluate the work.
4. Should the work meet the criteria for a permit required confined space then permit required confined space entry procedures must be followed.
5. Prior to any work in the tunnel that will involve modification to the tunnels, the installation of new equipment, conduit, wiring, and piping (including steam, water, sewer, gas, compressed air, etc.) approval must be obtained from the CPS Manager.

B. Memorandum of Understanding

1. Some outside organizations, such as Police, Fire Department and other agency services may establish a written memorandum of understanding with CPS.
2. Emergency Risk Services (ERS) and EHS will review any MOU established between CPS and outside agencies to ensure compliance with ERS guidance.

C. Conflict Resolution

1. The CPS Manager will immediately be notified of work conflicts between different University departments or between University personnel and outside contractors related to adhering to the Tunnel Safety Manual procedures.
2. The CPS Manager will consult with EHS and resolve tunnel work related issues in conformance with the procedures of this program, and other safety programs of the University.
3. Unauthorized Personnel: The CRO will be notified and a report made to Campus Police any time someone is observed within the tunnels that is not authorized. If an authorized entrant is observed not conforming to the procedures of this program the CRO will be notified and the CRO will report the incident to the CPS Manager for action.

D. Open Hatches and Doors: Sufficient measures to prevent unauthorized persons from entering the tunnel system will be taken when hatches or doors are open.

1. Temporary barriers may be used if the barrier will provide a reasonable physical deterrent to prevent unauthorized persons from entering the tunnel system.
2. Authorized tunnel entrants working in the tunnels may act as security as long as the workers are visually capable of monitoring an open hatch or door.

E. STOP WORK Authority: If a situation is Unsafe or the nature of the work is beyond the scope that has been authorized, all CPS Staff and anyone associated with the work in the tunnels can initiate a STOP WORK order.



1. The STOP WORK order can be directed at the job site or reported and initiated via the CRO.
2. In the event of a STOP WORK order:
 - a. All work related to the job will immediately cease.
 - b. On site supervisors will notify the CRO if a local STOP WORK order is directed.
 - c. The CRO will instruct workers to stop all work and exit the tunnels if necessary.
 - d. The CRO will assess any other work and ensure the affected work site does not endanger others.
 - e. The CRO will direct STOP WORK on other tunnel work sites impacted if deemed necessary.
 - f. The CRO may direct the evacuation of the tunnels if needed.
 - g. If the situation requires, the CRO will follow the Emergency Response Procedures of Appendix D.
 - h. If a STOP WORK order is issued the CPS Manager will be immediately notified. The CPS Manager will contact EHS, Project Managers and/or Supervisors depending on the circumstances and work affected.
 - i. The CPS Manager must grant permission to recommence work once a STOP WORK order has been in effect.

F. Tunnel Access Restrictions

1. Single Person Entry: No person shall enter the tunnel system alone; entries will only be authorized when at least two individuals are entering the space.
2. Eating and Smoking: Eating and smoking are not allowed in the tunnel system. Additionally, hands and face should be washed after exiting the tunnel system. Drinking Water is allowed and recommended for hydration.

VI. Training

- A. Tunnel System Training: All personnel requesting entry are required to attend “Tunnel System Training” and the training will be documented using the form outlined by the CPS Manager. The CPS Manager and EHS will coordinate the content of the Tunnel System Training. The CPS Manager will update the tunnel training documentation and submit changes to EHS when required to keep the training program current.



B. Tunnel Entrant Training

1. All entrants must receive training prior to entry into the tunnel system.
2. Training will consist of a review of the Tunnel Safety Policy, entry and exit procedures, personal protective equipment, and the hazards associated with the tunnel system.
3. Entrants must sign the training form (UO Tunnel Entry Briefing) to verify the Tunnel Entry training has been conducted and the Entrant is aware of the hazards and Tunnel Entry procedures.

C. Authorized Trainers

1. Authorized trainers are qualified Control Room Operators, CPS Manager, CPS Operations Supervisor, CPS Maintenance Supervisor, CPS Electrical Supervisor, CDPC PM, and individual designated by EHS. Additional trainers may be authorized by the CPS Manager.

D. Conducting Training

1. The applicable project manager is responsible for conducting and documenting tunnel safety training for contractors.
2. EHS shall assist with giving tunnel safety training.
3. Qualified CRO's will provide training to University employees and occasionally with contractors. CPS control room operators will give training as time and plant conditions allow.

VII. Tunnel Entry Authorization

A. Tunnel Work Authorization Request (TWAR)

1. All tunnel work accomplished by Non-CPS staff in tunnel system will be coordinated with a TWAR. This request will allow the vetting of CPS plant conditions and other tunnel related work to ensure proper safe conditions exist to support the requested work and will allow managers to de-conflict the requested work with operations and maintenance work in progress.
2. An approved TWAR is not required when the work is administrative in nature and does not involve modification to the tunnels, the installation of new equipment, conduit, wiring, and piping and will not involve maintenance,



repair, or replacement of any steam, water, sewer, gas, compressed air, or electrical equipment.

B. Tunnel Work Authorization Request Information: The following minimum information is required before access will be approved. The applicable project manager or University supervisor will route a TWAR to the CPS Manager.

1. University entity and/or Company Name
2. Purpose and scope of work
3. Drawings or photos identifying the project area and the work to be undertaken.
4. Primary contact and number of personnel entering tunnel
5. Location of work
6. Identify entry and exit points
7. Start date and duration of the project
8. Lockout/Tagout Requirements
9. Supervisor Name and Supervisor Phone Number

C. TWAR Approval

1. The TWAR will be routed in hard copy to the CPS Manager and should be provided no less than 2 working days prior to the desired initial tunnel entry date to start work.
2. Requests to enter the tunnel system by Non-CPS staff to conduct work in the tunnel system will be denied by the control room operators if a TWAR has not been approved.
3. The CPS Manager or a designated CPS Supervisor will review and approve a TWAR. Once approved the TWAR will be placed in the “Tunnel Work Authorization Request” section of the Tunnel Entry Log binder and retained until the work is complete.
4. CPS Staff will utilize CPS Work Lists approved by the CPS Plant Manager for authorizing tunnel entry for CPS related work.

D. Urgent and Unexpected Tunnel Entry

1. Situations requiring timely access to the tunnels for unexpected work or repairs will be accommodated but should not be the norm.
2. The same information in the TWAR will be given to the CRO when requesting entry.



3. The CRO will contact the CPS Plant Manager or CPS Supervisor for permission for the tunnel access request.

VIII. Entering and Exiting the Tunnels

A. Authorized Personnel

1. Only authorized tunnel entrants following the procedures outlined in this program are allowed into the tunnels.
2. Students, faculty, staff, the public, and outside contractors, unless performing official business of or for the University, shall not to be given access to the tunnels.

B. Buddy System

1. All work performed in the tunnels will be conducted by a minimum of two workers together.
2. Workers in the tunnels will move and work in pairs, as a minimum. Work groups larger than two workers are considered to meet the “pairs” requirement as long as the entire group stays within eyesight of each other.
3. Each group must maintain a radio and ability to communicate with CPS.

C. Protective Equipment Requirements:

1. Supervisors will ensure all proper protective equipment and PPE is utilized while workers are in the tunnel system. The following is a list of items required to be used while in the tunnel system:
 - a. Personal Protective Equipment (PPE): Head protection, e.g. hard hat. Other PPE shall be worn as work requirements dictate (e.g. eye protection, hearing protection).
 - b. All workers entering the tunnels will have a working flashlight, or other portable light source, for use in case of loss of normal permanent lighting in the tunnels.
 - c. Appropriate clothing for the work that will be performed which must include long pants long sleeve shirts and shoes appropriate for area transiting and work being performed. No opened toed shoes are allowed.
 - d. A UO radio.



- e. Any other equipment related to safety e.g. lockout/tagout locks, air monitoring equipment, etc. for the job to be performed safely.

IX. Tunnel Check-In and Tunnel Keys

A. Issuing Authority

1. The CPS Manager or designee will be responsible for authorizing key assignment.

B. Checking Out a Tunnel Key

1. The CRO will issue keys to authorized tunnel entrants with authorized work related to the tunnels.
2. Individuals will report to the CPS control room to log into the tunnel and check out the key.
3. Those assigned a key will check in and out with the control room and supply the required information via radio, telephone or other direct communication method. Voice mails and Email are NOT considered direct communication methods.
4. Keys will be returned to the CPS Control Room at the end of the scheduled shift.

C. Key Control

1. CPS Plant Manager will determine those individuals who have a valid need for a tunnel key for an extended time period beyond a work shift.
2. In no case shall any key be assigned for longer than 90 days.
3. After the designated custody time, individuals approved to have tunnel keys for extended periods of time may come to the CPS Control Room and have keys re-issued.
4. The CRO will re-issue the key after visually verifying the possession of the key. The authorization of keys for extended time will be limited to CPS Staff and select individuals.

D. Forfeiture of Key Privileges

1. If procedures are not followed, the CPS Manager may revoke an individual's key privilege and tunnel access.



2. Physical Loss of a key is a Security risk and may result in charges to re-key the tunnel system to be levied against the responsible contractor or University department.

E. Boundary Tampering and Re-Keying

1. The CPS Manager will grant permission to re-key any tunnel system lock, the removal or addition of any doors, gates, or other barriers.

F. Check-in and Tunnel Entry

1. All parties working in the tunnel shall get permission from the CRO in person or by telephone (62215) prior to entry. Entering the tunnel system without CRO permission is forbidden.
2. All tunnel entrants will report to the CRO when entering the tunnel system.

G. Communications

1. The CRO and Tunnel Entrants shall communicate on Channel 1.
2. Tunnel Entrants shall use a working channel if radios are used for work related communications within the tunnels.
3. Channel 1 will be monitored by the CRO.

H. Logging in Tunnel Entrants

1. The CRO will verify a TWAR exists for the work being conducted or permission has been given for tunnel access by the CPS Manager or designee.
2. The CRO will then grant permission to enter the Tunnels to the requesting party and enter the appropriate information in the Tunnel Entry Log Book when a person or group enters the tunnel.

I. Tunnel Security

1. Tunnel doors are to be secured at all times. Hatches are to be secured at the end of the day. Security is not to be compromised.



J. Exiting the Tunnel and Check-out

1. At the end of the work shift, supervisors will get positive confirmation of safe exit from the tunnels from each of their workers working in the tunnel that day.
2. Anytime a worker or a group of workers is considered “overdue” or missing, appropriate emergency procedures will be implemented.
3. For Security, Entrants will lock any gate, door or manhole that they pass through, ensure that lights are turned off as they exit an area, and make note of any hazards observed during the course of their transit and work.
4. Entrants will notify the Control Room Operator of any safety hazards, such as steam or sewer leaks, asbestos issues, inappropriate wiring, vermin infestations, vandalism, evidence of unauthorized entry, equipment failure or any other hazard observed within the tunnel. The CPS Control Room Operator will be responsible for notifying the appropriate individual for follow-up action.
5. The CRO will collect issued keys from the persons exiting the tunnel system and update the Key log book.

K. Failure to Report Exiting of the Tunnels

1. The CRO will attempt to contact any tunnel entrant that has not reported exiting the tunnels at the time expected.
2. If contact cannot be made with the workers, the CRO will contact the Utilities Standby Duty Administrator. Both the CRO and Duty Administrator will attempt to contact the individual(s), the supervisor, and project manager to determine the status of the individual(s).
3. If individual(s) cannot be accounted for, the CRO will call the University of Oregon Police Department and then immediately notify the CPS Plant Manager.
4. The Utilities Standby Duty Administrator will report to the CPS and assist as needed with investigation and recovery efforts
5. Emergency Response procedures will be followed as required.

L. Housekeeping and Work Site Responsibility

1. Projects are to be cleaned up at the end of each day. University organizations and Contractors conducting work in the tunnels are responsible for any damage to other systems and tunnel infrastructure during the course of work.



- 2. No hazards which could cause injury or impede movement and access in the tunnel system will be left adrift in the tunnels.
- 3. No Hazardous materials will be left unattended in the tunnels.

M. Signage

- 1. Each tunnel entry will be signed as follows:

<p>University of Oregon Tunnel System</p> <p>RESTRICTED ACCESS</p> <p>All entrants must be trained and authorized for tunnel entry. Obtain Permission to Enter From CPS Radio Channel-1 or call (541) 346-2215</p> <p>NO TRESPASSING (Entry without authorization)</p>
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- 2. CPS will be responsible for installing and maintaining the tunnel entry signs.

Revision History – Utility Tunnel Safety Manual		
Version #:	Revision Date:	Description of changes:
2.0	5/20/15	Effective date; organize Utilities Standby Administrator, Capital Planning Design & Construction (CPDC) Project Managers (PM), Owner Representatives (OR), and Authorized Tunnel Entrants duties list; correct Responsibilities section Letters