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OWNER: Nuclear Services		PROC-FO-1004	REVISION: 14
SUBJECT MATTER AREA: Permitting		PREPARER: J. Hocutt	Page 1 of 25
PROCEDURE TYPE: Emergency <input type="checkbox"/>	Administrative <input checked="" type="checkbox"/> Alarm Response <input type="checkbox"/>	CONCURRENCE/DATE: A. J. Reed 1/13/20 [Approval Signature on File]	
TITLE: EXCAVATION/TRENCHING PERMITTING		APPROVED BY/DATE: Michael Logan 1/9/20 [Approval Signature on File]	
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USQD/UCD/CAT X No: PSW-MS-PROCFO1004-1652		EFFECTIVE DATE: 1/14/20	
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This document is approved for public release per review by:
David Lannom 1/13/20
 UCOR Classification and Date
 Information Control Office

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REVISION LOG			
Revision	Effective Date	Description of Changes	Pages Affected
14	1/14/20	Intent change. Added source document PROC-DE-1040, <i>Design Drawing Verification</i> ; clarify definition of excavation, CAMS IF-2020-0176. Grammatical changes.	8, 18, 21
13	10/24/19	Intent change. Complete rewrite to extract penetration permitting into separate procedures. Revised Form-147. New Form-3459. Title changed.	All
12		Intent change. Strengthening language on Competent Person for Excavation requirements. Add prohibition on excavation on IWS cover.	3, 5, 6, 7, 8, 9, 25, 26
11	1/10/19	Intent change. Clarification of when 31888 was not needed, addition of vacuum excavation less than 4ft depth to the permit exceptions, direction that locate markings may only be refreshed by original utility. Added SME approval to Form-3130.	3-5, 7, 10-12, 15-24, 26, 27
10	9/13/18	Intent change. Changed Section "V" to Section "W" of PROC-FS-1001. Changed concurrence in Competent Person Excavation training equivalence from S&H Programs Manager to SME. Added 31888, Excavation Hazard Awareness training, as a general requirement for workers in/around excavations. Added Planner to walk-down participants. Changed BWSC to new company name of Barge Design Solutions. Added "Date Engineering Copied" column to record who and when in Engineering was copied on the closed permit and added definition in Instruction of Actual Closure Date and who and when transmission to Engineering entry. Added requirement to complete Project Engineer log. Added Project Engineer log for recording whether returned Permit package required a Design Change.	4, 5, 7, 12, 18, 24, 29-32
9	4/12/18	Intent change. Expanding the description of an excavation to include area, perimeter and depth. Clarifying the difference between abandoned, inactive, and active lines and the requirement to differentiate them in the permit and drawings.	9, 10
8	8/31/17	Intent change. Clarification for penetrations and penetration permits reinforcing and clarifying that FMs are responsible for penetrations in their facilities and are responsible penetration permits in their facilities.	All
7	6/26/17	Intent change. Scope: Changed bullet 9 to make it clear that the depths of 3 inches in blacktop, aggregate or pavement was excluded. Changed to "Penetrations utilizing drilling equipment not exceeding 1.5 inches in depth into a building surface nor exceeding 3 inches into any blacktop, aggregate, or concrete pavement surface." EP Section III – Work Execution Discussion and Approval: added note before Step 20, "The LLLW TSR requires the LLLW FM or designee to review and approve all Excavation Permits generated at ORNL by any preparer (e.g., UCOR, UT-B, etc.);" added tag, <WM-LGWO-LLLW-TSR> to Step 23; removed LGWO/LLLW from Step 4 and replaced with "facility;" and removed LGWO/LLLW from Step 29 and replaced with "adjacent facility." Additionally, the procedure and form (Form-147) were updated to strengthen the responsibility to check the Excavation Permit package for all supporting drawings, figures and documents before passing it on and to clarify that a minimum of the FM, Responsible Engineer, WGS/STR and BWSC utility locate representative be included on the walk down after Section II and III reviews are in (previously essential attendees weren't specified from the list given to the IA).	All
6	3/20/17	Intent change. Total re-write. Procedure revised to define responsibilities, clarify actions required for TN 811 compliance, define how Issuing Authorities are designated, integrate the ORNL process from PROC-OR-1010, separate the Excavation Permit from the Penetration Permit, incorporate CPE duties into the procedure and delete the attachment for CPE functions; and get the procedure steps aligned with the revised Forms. New forms: Form-3129 and Form-3130. Revision 6 includes corrective actions for issue IF-2017-0031.	All
5	10/10/16	Intent change. IF-2016-0636. Review/Revise for TROTS action CAP.	All
4	6/15/15	Intent change. Entire procedure re-worded, clarified, and non-valued added material deleted. Revised Form-147.	All
3	5/1/14	Intent change. Clarification of exemption statement; inserted "Note" at section D.2 to prevent Competent Person and Issuing Authority conflict of interest; added "aggregate as a category of product to penetration definition in Attachment "A". Revised Form-147.	3-7, 13
2	8/22/13	Non-intent change. Removed reference to PROC-EH-2010 (procedure cancelled); updated/corrected other cross-references and terminology that are currently in-use.	All
1	4/25/12	Intent change. Modifications made in Scope – Exceptions to address I/CATS I0080233.	2
0	2/3/12	Initial release. Replaces BJC-FS-1004, Rev. 2, <i>Excavation/Penetration Permit</i> .	All

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PURPOSE This procedure establishes requirements for protection of personnel who work in or around excavations/trenches.

SCOPE This procedure provides a consistent approach to the development, review, approval, and implementation of permits issued to perform excavation/trenching activities by URS | CH2M Oak Ridge LLC (UCOR, an AECOM-led partnership with Jacobs) and Subcontractor personnel.

NOTE1: Well drilling activities including soil sampling, well drilling, penetrations through concrete slabs into soil, and geotechnical activities are covered in PROC-FO-3037, *Ground Penetration Permitting*.

NOTE 2: Existing permits do not need to be replaced with the new procedure revision unless a change to the permit takes place.

NOTE3: Safety of personnel and field performance is addressed in PROC-FO-3034, *Earth Moving Equipment Operation*.

Excavation/Trenching Permit Exceptions

A UCOR Excavation/Trenching Permit (ETP), Form-147, is required for all UCOR required excavation/trenching activities, except those noted below:

- Earth/rock excavations/trenches, 12 inches or less in depth, using hand-held tools such as shovels or hand augers (jackhammers, mattocks, picks, post-hole diggers, wrecking bars, post drivers, and similar tools using impact to loosen soil or drive bars/rods/posts must be approved for use by the Program Subject Matter Expert (SME).
- All vacuum excavation/trenching (air or water lance included) methods designed to prevent damage to utilities less than 4 feet in depth.
- Maintenance, removal, or replacement of roadways/driveways, railroad, or sidewalks within the existing right-of-way, 12 inches or less in depth provided there are no indications of installations in the area to be excavated.
- Designated soils borrow areas or temporary soil, coal, or aggregate storage piles where the original permanent grade has not been disturbed.
- Grading associated with roads and parking lots, including exposing covered storm drains or manhole covers identified on underground figures, sketches, and/or drawings, 12 inches or less in depth provided there are no indications of installations in the area to be excavated.
- Excavations/trenches in active designated landfills for the purpose of waste disposition or grading.
- Excavations/trenches at ongoing capping, previously capped, or soil placement operations where materials have been placed as part of the work process and this material needs to be moved, removed, or penetrated for rework, testing, erosion impacts, etc., and the original grade is not impacted.

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Emergency work conducted under PROC-FS-1001, *Integrated Work Control Program*, may be performed without a Permit. PROC-FS-1001 requires the appropriate SMEs to direct the work team in lieu of the Permit.

NOTE: “Subcontractors should contact their Subcontract Coordinators (SCCs)/Subcontract Technical Representatives (STRs) for assistance in understanding or complying with this procedure.”

**OTHER
DOCUMENTS
NEEDED**

- PROC-EH-2018, *Stop Work*
- PROC-FO-3034, *Earth Moving Equipment Operation*
- PROC-FS-1001, *Integrated Work Control Program*
- PROC-NS-1001, *Unreviewed Safety Question Determinations for Nuclear Category 2 & 3 Facilities*
- PROC-NS-1008, *Unreviewed Change Determinations for Radiological and Non-Nuclear Facilities*
- Form-147, Excavation/Trenching Permit (ETP)
- Form-3459, Issuing Authority Designation for Excavation/Trenching Permitting

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WHAT TO DO

A. Responsibilities

NOTE: Ensure that when excavating or trenching near areas with potential unknown gas hazards (e.g., methane), Industrial Hygiene (IH) personnel have conducted a hazard analysis of dangers from unknown gases (e.g., methane).

Project Manager
(PM)/SCC/STR

1. Ensure flow down of the requirements of this Procedure to Subcontractors.
2. Ensure the permit is completed and remains on site as part of the work package.

Project Operations
Managers/Excavation
&Trenching SME

3. Designates, with the SME approval, the project personnel who perform the duties of the Excavation Permit Issuing Authority (IA) under this procedure. The IA is designated using Form-3459, Issuing Authority Designation for Excavation/Trenching Permitting, and through the Local Education Administrative Requirements Network (LEARN) system under Module 31778, Excavation Issuing Authority Designation Form. The number of designated IAs should be sufficient to support project operations but limited in number with an objective of keeping the IA function independent from the Facility Manager (FM) function.

Project Engineer

4. Responsible for the following:
 - Ensuring the engineering reviews for ETPs are completed with any uncertainties in the information available noted in the Permit, along with any Engineering controls required for the work.
 - Identifying the work required to locate buried/embedded obstructions.
 - Overseeing UCOR performed utility locates and buried/embedded obstruction investigations and ensuring the personnel performing the work are competent through experience and training.
 - Maintaining technical documents and records of underground and facility installations performed by UCOR in accordance with UCOR Engineering procedures.

IA

5. Responsible for the following:
 - Coordinating the ETP process defined in this procedure for the project, including the maintenance of the Permit Log (Attachment B), facilitating required functional group reviews, and tracking the status of all open Permits.
 - Coordinating Tennessee One Call (TN811) functions for the project including updates to the TN811 ticket.
 - Confirming positive response has been provided for all TN811 utility locates.
 - Coordinating UCOR Permits and UCOR support with UT-Battelle (UT-B) and Consolidated Nuclear Security, LLC (CNS) at the Oak Ridge National Laboratory (ORNL) and Y-12 National Security Complex (Y-12) and their permitting processes.

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|---|---|
| FM | <p>6. Ensuring the controls specified in the ETP prepared by the Excavation/Trenching Permit IAs are appropriate and in compliance with facility requirements.</p> |
| Safety and Health (S&H), IH, Radiological Protection (RP) | <p>7. Responsible for reviewing the Permit work scope and ensuring the necessary controls for performing the work safely have been incorporated into the Permit and work document.</p> |
| Environmental Compliance & Protection (EC&P) | <p>8. Responsible for reviewing the Permit work scope and other information sources to ensure that all environmental and historical requirements and applicable permits have been addressed in the Permit and work document.</p> |
| Requester | <p>9. Responsible for the following:</p> <ul style="list-style-type: none"> • Defining the scope of work and location of the work. • Performing a walkdown of the work area and field marking the work location boundaries. • Performing a walkdown of the work area with the IAs, FMs, S&H, Radiological Protection Technician (RPT), and work crew. (SME may be included in this walkdown.) |

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B. General Requirements

NOTE 1: These are general requirements to be understood by all involved in permitted activities.

NOTE 2: Only organizations that have made the original underground active/hazardous and abandoned utility locate markings shall restore or refresh those markings to avoid error and additional liability.

All

1. Before performing excavation/trenching, take necessary steps to locate buried/embedded obstructions. These steps may include review of documents, contacts with knowledgeable plant personnel, and use of audio and radio frequency transmitters and receivers, ground-penetrating radar (GPR), ultrasonic testing, metal detectors, contacting Tennessee One Call (TN811) for all ETPs, or other means to ensure safe excavation/trenching. Personnel performing subsurface surveys shall have experience in the proper operation of the equipment to be used.
2. As any Permit may not address all potential hazards associated with this activity, hazards should be controlled and documented in accordance with PROC-FS-1001, *Integrated Work Control Program*. If field work is required for preparation of the Permit, a hazard assessment can be conducted to evaluate the risks involved with permit preparation, and the same permit can be revised for any hazards identified during permit preparation before commencement of excavation/trenches work.
3. FM knowledge of the site is critical in determining whether a review by Nuclear Facility Safety is required. Inactive Waste Sites (IWS) would require such a review and Safety Basis documents covering areas with buried waste generally contain prohibitions against excavations/trenches.
4. No excavation/trench is allowed that will disturb any originally buried waste materials at an IWS. Excavations/Trenches may be approved at IWS sites that do not disturb the original buried waste materials.
5. The UCOR RP organization shall be contacted prior to ANY excavation/trench (soil or ground surface), including non-permit required excavations/trenches to determine if coverage may be required.
6. Excavation/Trenching activities by UCOR or UCOR subcontractors shall be performed in accordance with this procedure and 29 CFR 1926, Subpart P, and PROC-FO-3034, *Earth Moving Equipment Operation*.
7. For subsurface locates for utilities:
 - a. For East Tennessee Technology Park (ETTP) – Tennessee One Call (TN811) is the primary source for utility locate work with UCOR performing additional locates as determined by the Project Engineer.

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NOTE: UCOR IA is responsible for Tennessee One Call (TN811) for excavations/trenches at Y-12 and ORNL.

All

- b. For ORNL – UT-B is the primary source for utility locate work with UCOR performing additional locates as determined by the Project Engineer.
- c. For Y-12 – CNS is the primary source for utility locate work with UCOR performing additional locates as determined by the Project Engineer.
- d. Liquid and Gaseous Waste Operations (LGWO) FM is the point of contact for WASTE lines on campus.

C. Processing an Excavation/Trenching Permit (ETP)

NOTE 1: Support functions for ORNL and Y-12 to the IA are performed by the Project Engineer and EC&P staff.

NOTE 2: ETPs should be focused on localized areas and not on large areas (e.g., multiple acres, noncontiguous areas). Multiple excavations/trenches for the same job may be addressed by a single permit with the approval of the IA when excavation/trenching locations are within close proximity to each other.

ETP Section I – General Information

NOTE: Excavations/Trenches may affect the Safety Authorization Basis requirements and shall have an Unreviewed Safety Question Determination or Unreviewed Change Determination review completed and documented in the work control document, as required by PROC-NS-1001, *Unreviewed Safety Question Determinations for Nuclear Category 2 & 3 Facilities*, or PROC-NS-1008, *Unreviewed Change Determinations for Radiological and Non-Nuclear Facilities*, as applicable for the facility.

Requester

1. Complete ETP Section I, General Information
 - a. Determine description of work including area, perimeter, and depth of excavation/trench describing the excavation/trenching and whether entry will be required, location, schedule dates, and any other pertinent information regarding the excavation/trenching activity.
 - b. Identify the FM for excavation/trenching footprint, a Waste Group Supervisor (WGS) who is knowledgeable of the work and IA on the form and notify them of the proposed excavation/trenching and schedule.
2. Mark the proposed excavation/trenching location in the field with white paint, white stakes, or white flag field markings consistent with the area identified on figures, sketches, and/or drawings.
3. Once the proposed area of excavation/trenching has been marked, notify the IA.

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Requester 4. Upon completion of ETP Section I, General Information, add requester's name and date the form, and forward to the IA.

- IA 5. Assign a unique identifying number to the ETP and record it in the project Excavation/Trenching Permit Log.
- a. Attachment B, Excavation/Trenching Permit Log and Instructions, is an example of the Excavation/Trenching Permit Log and the minimum information which is recorded on the log. The log will, as a minimum, have information such as number, description, date of issue, subcontractor, estimated and eventually actual closure date, and FM.
 - b. Logs may be hardcopy or electronic.
6. Forward to the Responsible Project Engineer or designee.

ETP Section II – Engineering Review

- Project Engineer or Designee 1. Research all site and facility figures, sketches, and/or drawings, Engineering Service Orders, etc., of the excavation/trenching area and consult with Engineering disciplines for additional figures, sketches, and/or drawings and information they may have access to, site knowledge from maintenance personnel, or FM/staff familiar with the facility/location to identify subsurface features or utilities that are suspected to be present. Note all systems, structures, and components that could be affected by excavation activities and note them on the permit. Differentiate between abandoned (air gapped), active and inactive lines (inactive lines are not air gapped, may still be connected to active service lines and may contain materials), and clearly mark the difference. Include any known concealed utilities not on figures, sketches, and/or drawings. Note any potential energy isolation required.
- a. Figures, sketches, and/or drawings for the Y-12 footprint need to be requested through the UCOR Work Order CNS Contact.
 - b. Figures, sketches, and/or drawings for the ORNL footprint need to be requested from the ORNL Excavation Permit Coordinator.
2. Develop appropriate figures, sketches, and/or drawings defining the scope of the planned excavation/trenching, the location of the work, and the estimated depth of the excavation/trench. Include any known concealed structures or utilities differentiating between abandoned (air gapped), inactive and active lines (including non-hazardous communication, signal or monitoring circuits and piping or lines not carrying hazardous energies/materials, pressures or materials) not on figures, sketches, and/or drawings.
3. Check "Yes" in Section II of the ETP for any utilities on figures, sketches, and/or drawings that indicate the potential for underground, embedded, or concealed utilities suspected to exist at or adjacent to the excavation(s)/trench (s) OR mark the "No" column if the figures, sketches, and/or drawings do not show an interference with the planned excavation/trenching.

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- Project Engineer or Designee
4. **IF** excavation/trenching location requires support from an Offsite Utility Company or Organizations **THEN**, fill in the utility company name or write “None.”
 5. List referenced figures, sketches, and/or drawing numbers and note any differences in the information obtained from the figures, sketches, and/or drawings, and/or researched utilities as well as any relevant underground interferences (focus on assisting site excavation/trenching workers in preventing unplanned contact with underground interferences) in Section II, Comments, of the ETP. Attach marked-up copies of impacted reference figures, sketches, and/or drawings.
 6. Identify any actions necessary to protect the affected systems/structures/components in Section II of the ETP. In particular, note when information is insufficient to determine if concealed utilities are in the area.
 7. Identify whether any nearby facilities or structures will be affected by the excavation/trench (sidewalk, roadway, foundation, or utilities into or out) and the impact on the facilities.
 - a. Notify the adjacent facility FMs potentially affected by the excavation/trench and record their name(s) and phone numbers. Incorporate their facility information and mitigation for impacts in final figures, sketches, and/or drawings and files.
- Responsible Project Engineer
8. Incorporate all accumulated information into figures, sketches, and/or drawings.
 9. Route the ETP and associated figures, sketches, and/or drawings and other information to the Engineers for review and input on field conditions and controls needed to perform the work. Review by the Electrical and Fire Protection engineering disciplines is required for all ETPs. Review by the Civil or Structural engineer is dependent on the scope of the work and determined by the Project Engineer. Enter N/A in the Civil/Structural Engineer Signature area in Section II on Form-147 if Civil/Structural review is not required.
 10. Identify any UCOR field investigation work needed in support of the Permit for non-utility buried or embedded obstructions. This is in addition to Tennessee One Call (TN811), UT-B, or CNS investigations.
 11. Sign and date the ETP and forward it with any support figures, sketches, and/or drawings and files to the IA.
- NOTE:** For Section III, if the work control documents require concurrence or approval from the responsible representatives in that section, then the applicable section may not be required to be completed. For this section, input the statement, “Concurrence/Authorization is located in WPXX -XXXX”.

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ETP Section III – Work Execution Discussion & Approval

NOTE: Sections III a, b, c, and d on Form-147 may be completed concurrently.

- IA
1. Forward the ETP for Work Execution & Approval (Section III of the Permit). The review and approvals for Section III are as follows:
 - a. EC&P – required
 - b. S&H – required or enter Work Package Number into signature box
 - c. RP – required or enter Work Package Number into signature box
 - d. LGWO / Liquid Low-Level Waste (LLLW) FM – required for ORNL permits
 - e. FM of Excavation/Trench Site – required
 - f. FM of Adjacent Impacted Facility – as determined by the Project Engineer.

NOTE: The ETP walkdown may be performed as part of the Job Hazard Analysis (JHA) walkdown.

- IA
2. Conduct a walkdown of the excavation/trench site to review figures, sketches, and/or drawings and files. The walkdown of the work location shall include the IA, FM, WGS/STR/SCC, Project Engineer, Project Planner, and Barge Design Solutions (Barge underground locate service), and may include Competent Person Excavation, Professional Engineer, EC&P, S&H Rep. and IH, Field Radiological Engineer (FRE), or other experts the IA deems appropriate.

NOTE: ETP Sections III and IV may be performed in any order or concurrently.

- EC&P
3. Review Sections I - II of the ETP and other appropriate documents to determine potential for environmental impacts, appropriate mitigation measures, and to ensure that all environmental/historical requirements and applicable permits have been addressed or obtained.
 4. Review existing information sources concerning Resource Conservation and Recovery Act (RCRA) Solid Waste Management Units, RCRA Areas of Concern, Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Appendix C sites, or other known areas of environmental concern to ensure that the activity will not unknowingly disturb hazardous substances/contaminants.
 5. Discuss any environmental aspects that would prohibit or limit proposed excavation/trench activity with WGS/STR (or Designee), and FM.
 6. List special controls for the identified work scope in the Comments section of the ETP.
 7. Sign and date the ETP.

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|--|---|
| EC&P | 8. Return the signed ETP to the IA. |
| S&H Representative
AND Responsible IH
Representative | 9. Review Sections I - II of the ETP, and other appropriate documents, to determine potential for safety or industrial hygiene impacts.

10. Conduct a review for any safety or industrial hygiene issues in the excavation/trench area or adjacent facilities potentially impacted by the excavation/trench.

11. Discuss any safety or IH aspects that would prohibit or limit proposed excavation/trench activity with IA, WGS/STR (or Designee), and FM.

12. List special controls for the identified work scope in the Comments section of the ETP.

13. Sign and date the ETP and return it to the IA. |
| Radiological
Engineer | 14. Review Sections I - II of the ETP, and other appropriate documents, to determine potential for RP impacts.

15. Conduct a review for any RP issues in the excavation/trench area or adjacent facilities potentially impacted by the excavation/trench.

16. Discuss any radiological aspects that would prohibit or limit proposed excavation/trenching activity with IA, WGS/STR (or Designee), and FM.

17. List special controls for the identified work scope in the Comments section of the ETP.

18. Sign and date and return the ETP to IA. |
| LGWO/LLLW FM
(ORNL only) | 19. Review Sections I - II of the ETP, and other appropriate documents, to determine potential for LGWO/LLLW impacts.

NOTE: The LLLW Technical Safety Requirements (TSR) requires the LLLW FM or designee to review and approve all ETPs generated at ORNL by any preparer (e.g., UCOR, UT-B). |
| LGWO/LLLW FM
(ORNL only) | 20. Conduct a review for any LGWO/LLLW issues in the excavation/trench area or adjacent facilities potentially impacted by the excavation/trench.

21. Discuss any LGWO/LLLW impacts that would prohibit or limit proposed excavation/trenching activity with IA and WGS/STR (or Designee).

22. List special controls for the identified work scope in the Comments section of the ETP.

23. Sign and date and return the ETP to IA. <WM-LGWO-LLLW-TSR> |
| FM of
Excavation/Trenching
Site | 24. Review Sections I - II of the ETP, and other appropriate documents, to determine potential for facility impacts. |

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FM of
Excavation/Trenching
Site

25. Conduct a review for any facility issues in the excavation/trenching area or adjacent facilities potentially impacted by the excavation/trenching.
26. Discuss any impacts that would prohibit or limit proposed excavation/trenching activity with IA, WGS/STR (or Designee), and FM.
27. List special controls for the identified work scope in the Comments section of the ETP.
28. Sign and date and return the ETP to IA.

Adjacent FM (if
applicable)

29. Review Sections I - II of the ETP, and other appropriate documents, to determine potential for adjacent facility impacts.
30. Conduct a review for any facility issues in the excavation/trenching area or adjacent facilities potentially impacted by the excavation/trenching.
31. Discuss any impacts that would prohibit or limit proposed excavation/trenching activity with IA, WGS/STR (or Designee), and FM.
32. List special controls for the identified work scope in the Comments section of the ETP.
33. Sign and date and return the ETP to IA.

IA

34. Ensure ETP package is complete.

ETP Section IV – Utility Surveys – ORNL and Y-12

UCOR excavations at ORNL and Y-12 require additional input from the facilities.

NOTE 1: Utility surveys/identification shall be performed no more than 14 days prior to the start of work unless IA concurs where the site is fully under UCOR control and no outside utilities are involved.

NOTE 2: UCOR IA is responsible for Tennessee One Call (TN811) for excavations/trenching at Y-12 and ORNL.

NOTE 3: Only organizations that have made the original utility locate markings shall restore or refresh those markings to avoid error and additional liability.

IA (for ORNL)

1. Identify the organizations performing the utility locates. For UCOR excavations/trenching at ORNL, utility locates (document reviews and surveys) are normally conducted by UT-B in accordance with UT-B procedures. These are added to the UCOR Permit.

IA (for Y-12)

2. Identify the organizations performing the utility locates. For UCOR excavations/trenching at Y-12, utility locates are normally conducted by CNS in accordance with CNS procedures. Confirmation of the CNS review is documented by an approved CNS Excavation permit. These are added to the UCOR Permit.

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ETP Section IV – Utility Surveys – ETP and Outside the Blue Line

IA (for ETP and OUTSIDE Blue Line)

1. Identify the organizations performing the utility locates.
2. Contact Tennessee One Call (TN811) to coordinate all external stake holders for evaluation of underground facilities. Record the Ticket # and Date on the ETP.
 - a. If there has not been a positive response from all utilities listed on the Ticket after 72 hours, contact Tennessee One Call (TN811) again and have them pursue it with the responsible parties.
 - b. If there has not been a positive response after the second notification of Tennessee One Call (TN811), consult with the Project Engineer on whether to proceed with the ETP approval or hold for the utility confirmation.
3. Forward the ETP, with support figures, sketches, and/or drawings, to both the Electrical and Mechanical Utility Surveyors for utility identification and marking at the work location.

NOTE 1: Utility surveys/identification shall be performed no more than 14 days prior to the start of work unless IA concurs where the site is fully under UCOR control and no outside utilities are involved.

NOTE 2: Surveys such as audio and radio frequency transmitters and receivers, GPR, electrical detection surveys, etc., are conducted to provide indications of concealed utilities. They must not be considered as positive proof of the absence of utilities or the exact position or depth of a utility due to the technical limitations of available technology.

Electrical and Mechanical Utility Surveyors

4. Ensure the excavation/trench boundary is clearly marked at the work location. Request re-marking through the IA if needed.
5. Locate and mark utilities as shown on the figures, sketches, and/or drawings.
6. **IF** a utility cannot be positively located (present, known by visual or instrument detection) and are shown on figures, sketches, and/or drawings, **THEN STOP** and notify the IA and FM to discuss additional actions to ensure that any excavation/trenching can proceed in a safe manner (SME may also be consulted).
7. Record any special requirements needed for the excavation/trenching in the Comment section.
8. Sign and date the ETP.
9. Return the ETP to the IA.

IA

10. Contact Tennessee One Call (TN811) and provide a “positive response” to the facility-owned locates, for UCOR, as one of the Underground Facility Operators.

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- IA
11. Verify Tennessee One Call (TN811) has received “positive response” from all other Underground Facility Operators, mark the ETP accordingly, and include a copy of the response page with the ETP.
 12. Verify that all identified utility companies or organizations with utilities have marked their locations at the excavation/trenching site.
 13. Contact Tennessee One Call (TN811) and the specific utility companies or organizations if any markings are not identified at the excavation/trenching site and schedule to meet those utility company or organization for marking of the area.
 14. Review ETP and figures, sketches, and/or drawings, field markings of the Underground Facility Operators, work scope, work location boundaries, etc., to confirm:
 - a. The known underground utilities are mapped on figures, sketches, and/or drawings, and are properly field marked, and
 - b. There is no indication of other underground utilities present that are not mapped/marked.

IF any of the above criteria cannot be confirmed, **THEN** repeat the above procedural processes as necessary until confirmation can be obtained or confer with Responsible Project Engineer and FM to resolve the issue before proceeding.
 15. Perform/coordinate a final walkdown with a WGS/STR to verify the information in the permit prior to issue.
 16. **IF** all criteria above has been confirmed, complete Section IV of the ETP, **THEN** sign and date the ETP.

ETP Section V – Permit Issuance

- IA
1. Identify if an ORNL or Y-12 excavation/trenching permit is required for performing this work. If required, record the Permit identifier, the issue date, and the finish date in Section V.
- NOTE:** The Termination Date shall be no longer than 6 months (180 days) from the Issue Date.
- IA
2. Record the UCOR Excavation/Trenching Permit Issue Date and Termination Date of the ETP.

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NOTE: Provided the excavation/trenching work does not exceed the original marked boundaries and UCOR has maintained continuous exclusive control of the work site, updating the utility locates (TN811, UT-B or CNS) is not required.

- IA 3. **IF** an Extension beyond 180 days is required, **THEN** the IA shall review the permit information, utility locates, and site markings to determine if the work conditions support an extension of the permit.
- a. **IF** the extension is acceptable, **THEN** record the new Finish Date on the ETP, sign the ETP, and notify the FM and the WGS/STR of the extension.
 - b. **IF** site conditions have changed to the point of impacting the permit information, **THEN** a new permit shall be initiated.

NOTE: Only one extension is authorized.

- IA 4. **IF** the marked excavation/trench boundaries need to be enlarged/exceeded, **THEN** utility locates (TN811, UT-B, or CNS) must be updated prior to proceeding with excavation/trenching work outside the original permit boundaries.
- a. **IF** Tennessee One Call (TN811) is called **THEN** record the new Ticket #, and date and sign the ETP.

5. Sign and date the ETP issuing the Permit to WGS/STR.

- WGS/STR 6. Ensure all sections of the ETP are completed and supporting figures, sketches, and/or drawings, and documents are present, the ETP sections are signed, and Issue/Termination Dates are identified.
7. Sign and date accepting the ETP.
8. Notify the FM of the excavation/trenching site prior to starting work in accordance with PROC-FS-1001.
9. Perform excavation/trench work activities in accordance with the approved work documents.

- IA 10. Monitor work progress on open ETPs to ensure timely closure of the permits.

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ETP Section VI – Feedback

WGS/STR

1. Verify that all work involving excavation/trenching activities is complete and the site is left in a safe and environmentally restored condition.
2. Notify the FM of the excavation/trench site of the completion of the work in accordance with PROC-FS-1001.
3. Document any unexpected obstructions, modifications to the utility system, or other unusual conditions in the work package status log.
4. Sign and date Section VI of the ETP. Return a copy of the ETP and any notes, observations, figures, sketches, and/or drawings, or photos showing locations of buried features to the IA.
5. Submit a copy of the ETP and all supporting documents to the IA and file the original ETP with the Work Plan (WP) to Work Control.

IA

6. Use the copy of the completed ETP and any special notes, observations, or figures, sketches, and/or drawings for closure in the Excavation/Trenching Log.
7. Enter the closure date into the Excavation/Trenching Log.
8. Forward the copy of the completed ETP and any special notes, observations, or figures, sketches, and/or drawings to Engineering and note the date and ID of recipient in the log.

Responsible Project Engineer or Designee

9. Ensure copies of figures, sketches, and/or drawings are provided to Engineering to reflect any changes in the installation or the presence of previously unknown utilities or obstructions and log the permit and any design change requirements on the Project Engineering Permit Package Log (Attachment C).
10. Evaluate the effected changes for configuration management applicability and log the Permit and whether a Design Change (Design Change Notice or Engineering Instruction) was required in the Project Engineering Excavation/Trenching Permit Package Design Change Log.

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D. Field Implementation of the Excavation/Trenching Permit

WGS/STR

1. Ensure work is performed in accordance with PROC-FS-1001, the Permit, and the associated work documents.

NOTE: Only organizations that have made the original utility locate markings shall restore or refresh those markings to avoid error and additional liability.

2. **IF** at any time,
 - the field markings are difficult to see (partially or completely) and need to be remarked, **OR**
 - the scope of work changes or field conditions change that are not covered by the ETP or Penetration Permit (PP) or the work control document, **OR**
 - the area of excavation/trenching requires expansion beyond the established boundaries, **THEN**

STOP/SUSPEND WORK in accordance with PROC-EH-2018, *Stop Work*, and contact the IA.

RECORDS

Records generated by this procedure and listed below shall be dispositioned in accordance with PROC-OS-1001, *Records Management, Including Document Control*:

- Form-147, Excavation/Trenching Permit (ETP)
- Form-3459, Issuing Authority Designation for Excavation/Trenching Permitting
- Excavation/Trenching Permit Logs

SOURCE DOCUMENTS

- 10 CFR 1021, National Environmental Policy Act; Implementing Procedure
- 29 CFR 1926, Subpart G, Signs, Signals, and Barricades
- 29 CFR 1926, Subpart P, Excavations
- DOE Order 440.1B, Admin Change 1, *Worker Protection Management for DOE Federal Employees*
- UCOR-4350, *URS / CH2M Oak Ridge LLC (UCOR) Training Requirements Matrix (TRM), Oak Ridge, Tennessee*
- PROC-DE-1040, *Design Drawing Verification*
- PROC-FO-3033, *Out of Commission Isolation Process for Structures, Systems, and Components*

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Attachment A
DEFINITIONS/ACRONYMS
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Active Designated Landfills or Burial Sites – A landfill or burial site that has been developed and approved for use and where the addition of new waste is authorized to be buried.

Benching (Benching System) – Method of protecting employees from cave-ins by excavating the sides of a trench to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Cave-In – The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the trench, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and/or immobilize a person.

CFR – Code of Federal Regulations

Confined Space – A space that:

- Is large enough and so configured that an employee can enter and perform assigned work;
- Has limited or restricted means for entry or exit (for example: tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- Is not designed for continuous employee occupancy.

CNS – Consolidated Nuclear Security, LLC. The current Y-12 plant M&O contractor.

Environmental Compliance and Protection (EC&P) – The Environmental Compliance and Protection organization at each of the sites that provides oversight and/or environmental support to the organization issuing the permit.

Engineering – The Engineering organization that provides engineering support to the organization issuing the permit and has access to the appropriate figures, sketches, and/or drawings to allow an engineering review. Projects located on sites that are owned by non-UCOR companies may need to obtain these services through the landlord organization.

Environmentally restored – The use of like material (i.e., vegetation, asphalt, gravel) to stabilize the soil and prevent erosion into nearby storm drains and surface waters.

ETP – Excavation/Trenching Permit

ETTP – East Tennessee Technology Park

Excavation – Any man-made cut, cavity 12 or more inches into the soil that is wider than it is deep.

Excavation Permit Log – A listing of the excavation permit numbers and the associated permit information. The Permit Log may be hardcopy or electronic.

Facility Manager (FM)/Owner – The person with overall responsibility and authority for oversight of facility and occupational safety, for facility safeguards and securities, for facility planning and scheduling, and for work execution of facility maintenance and project activities performed within or adjacent to their assigned facilities. The FM serves to prepare, log, manage, and issue Penetration Permits. Also has the responsibility for serving as the primary point of contact and work authorization authority for all activities performed in their assigned facilities. May also serve as a Subcontract Coordinator for subcontracted activities performed in their areas of responsibility.

FRE – UCOR Field Radiological Engineer

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Attachment A
DEFINITIONS/ACRONYMS
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GPR – Ground Penetrating Radar

IH – UCOR Industrial Hygiene

Issuing Authority (IA) – The UCOR person authorized by management to issue excavation/trenching permits (FMs issue penetration permits for their facilities). The IA will have a working knowledge of the facility and understand the known and potential hazards and consequences involved with the excavation operation. The IA must have knowledge of the areas of responsibility. The IA can be:

- Construction engineer
- Knowledgeable person authorized by recognized management authority.
- The Park Shift Superintendent/Laboratory Shift Superintendent may serve as IA on off shifts, weekends, or during emergency situations, if they are knowledgeable and have appropriate experience and understand the known and potential hazards and consequences.

IWS – Inactive Waste Sites

JHA – Job specific hazard analysis

LEARN – Local Education Administrative Requirements Network

LGWO – Liquid and Gaseous Waste Operations

LLLW – Liquid Low-Level Waste

ORNL – The Oak Ridge National Laboratory

Open Excavation/Trench – An excavation at least one foot wide and 4 ft deep where engulfment/entrapment might occur.

Protective System – A method of protecting employees from cave-ins, material that could fall or roll from an excavation face into the excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

RCRA – Resource Conservation and Recovery Act

Record of Decision (ROD) – A ROD is a public document that identifies the appropriate cleanup option selected after completion of a Remedial Investigation/Feasibility Study.

Registered Professional Engineer – A person who is registered as a professional engineer in the state where the work is to be performed.

Requester – The UCOR person who initiates the permit.

Routine Grading – Surface grading to remove grass or to spread road material such as gravel or asphalt.

RP – Radiological Protection

Safety & Health (S&H) Representative – A UCOR Safety and Health person with safety training and experience who is knowledgeable through experience and education with excavation/trenching work, and who can determine if additional measures must be considered (such as hand digging) so work can proceed in a safe manner.

SME – Subject Matter Expert

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Subcontract Coordinator (SCC) – The UCOR personnel with responsibility for executing the technical requirements and monitoring the activities of subcontractors.

Subcontract Technical Representative (STR) – The UCOR person with responsibility for performance of the technical requirements of the subcontractor.

Subcontractor – A company, corporation, or individual that has a contract with UCOR and has overall responsibility for all work associated with that contract or purchase order.

Subsurface Survey – Inspection of a site where excavation activities are to be performed. The inspection includes using a device to identify the presence of underground obstacles/utilities. The service group or subcontractor performing the subsurface survey will mark utility location in a positive manner.

TSR – Technical Safety Requirements

Trench – A dig that is deeper than it is wide and that poses an engulfing threat to personnel. Personnel are not allowed to work in trenches greater than 4 ft deep without an evaluation by a qualified CPE.

UCOR – URS | CH2M Oak Ridge LLC

Underground Facilities – A term used by Tennessee One Call (TN811) to refer to underground utilities or structures.

UT-B – UT-Battelle. The current ORNL M&O contractor.

Work Group Supervisor (WGS) – A UCOR or Subcontractor individual who will supervise work performed.

Y-12 – Y-12 National Security Complex

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Attachment B
INSTRUCTIONS FOR THE EXCAVATION/TRENCHING PERMIT LOG
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Permit Number (XXXX-(ETP or PP)-YY- NNNN)	XXXX = Site (ORNL, Y12, ETP) or facility number ETP = Excavation/Trenching Permit; YY = calendar year (e.g., 99 = 1999; 00 = 2000) NNNN = consecutive number (e.g., 0001)
Project/Job Title (Subcontractor)	Descriptive Job Title or Project Name If subcontractor is performing the work, put name in parenthesis.
Facility/Area	Facility or Area number.
Requester	Name of person requesting and processing the permit.
Issuing Authority	Name of Issuing Authority or FM.
Date Permit Issued	The date that permit is logged in (i.e., when permit number is assigned).
Estimated Closure Date	The date that the permit expires.
Actual Closure Date	The date that the completed excavation permit paperwork is signed off and returned to the IA.
Date Engineering Copied	The date that the completed permit is copied back to Engineering and the ID of who it transmitted to.

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Attachment C
INSTRUCTIONS FOR THE PROJECT ENGINEERING PERMIT PACKAGE LOG
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Permit Number (XXXX-(ETP or PP)-YY- NNNN)	XXXX = Site (ORNL, Y12, ETTP) or facility number ETP = Excavation/Trenching Permit; YY = calendar year (e.g., 99 = 1999; 00 = 2000) NNNN = consecutive number (e.g., 0001)
DC Required (Y/N)	Engineering determines if a Design Change (DCN or EI) is required due to the information provided with the permit.
DC #	Record Design Change # if a DC is required. The DC itself will be tracked in the Vault system.
CM Applicability	Record any comments on the Configuration Management Applicability for the Design Change.