

Trenching and Excavation – Safety

Trenching and excavation are common activities in NCC T&D projects, particularly during underground cable installation, OHTL and substation construction. Understanding the differences and safety requirements for these operations is crucial for maintaining a safe work environment. Trenching and excavation operations involve removing material from the ground to create openings of varying depth and width. An excavation is any hole created by the removal of material, while a trench is a specific type of excavation where the depth exceeds the width. The NCC T&D HSE management system requires that these operations are conducted using rigorous safety measures to protect workers, equipment, and adjacent structures.

Key Considerations

- **Definitions:**
 - Excavation: A hole created by removing soil or other materials.
 - Trench: An excavation where the depth is greater than the width.
- **Scope:**
 - All trenching and excavation activities must adhere to established safety procedures, ensuring that support systems and hazard mitigations are in place before work begins.

Key Risks and Prevention Strategies

- **Collapse or Cave-In:**
 - Risk: Unstable soil or inadequate support systems may result in a collapse.
 - Prevention: Implement engineered support systems (such as shoring or timbering) designed by qualified professionals and restrict entry until all safety criteria are met.
- **Utility Hazards:**
 - Risk: Accidental contact with underground gas, electrical, or other services.
 - Prevention: Locate, mark, and manage all utilities before excavation. Hazardous services must be de-energized, disconnected, or supervised during operations.
- **Water Accumulation:**
 - Risk: Excess water may weaken soil stability.
 - Prevention: Use drainage controls to keep the excavation area reasonably free of water.
- **Adjacent Structure Impact:**
 - Risk: Excavation may compromise the stability of nearby buildings or structures.
 - Prevention: Conduct thorough assessments and implement protective measures to safeguard adjacent properties.

Equipment Requirements

- **Support Systems:**

All support systems (such as shoring, timbering, or other engineered systems) must be inspected and approved by qualified professionals before work commences.
- **Monitoring Tools:**

Essential equipment for monitoring soil stability and water accumulation must be maintained and regularly inspected for proper functionality.
- **General Equipment:**

Tools and machinery used during excavation should be in good working order and comply with NCC T&D maintenance standards.

PPE Requirements

- **High-Visibility Clothing:**

Workers must wear high-visibility garments (e.g., vests with reflective tape) that conform to established size and color specifications.
- **Additional Personal Protective Equipment:**

Depending on the hazard assessment, workers should also be provided with hard hats, safety boots, gloves, and any other necessary PPE.
- **Low-Light Operations:**

For work conducted in low-light or night conditions, supplementary lighting or additional retro-reflective accessories must be used to ensure maximum visibility.

- **Pre-Entry Inspection:**
Before any worker enters an excavation or trench, a comprehensive inspection must be performed to verify that all support systems, equipment, and PPE are properly in place and functioning.
- **Continuous Monitoring:**
A designated supervisor or responsible person must continuously monitor the excavation conditions during operations to promptly identify any changes or emerging hazards.
- **Documentation:**
Detailed records of all inspections, including dates, observations, and corrective actions taken, must be maintained in accordance with NCC T&D's HSE management system.

NCC T&D Project Leaders Key Responsibilities

Project Leaders must ensure that:

- **Pre-Work Assessment:** All excavation and trenching operations are evaluated for potential hazards and that appropriate support systems are implemented.
- **Access Control:** Entry is permitted only after a thorough pre-entry inspection confirms all safety requirements are met, and that a monitoring system is in place.
- **Utility Management:** All underground services are located, marked, and managed to avoid hazards during excavation.
- **Training Coordination:** Workers receive comprehensive training on excavation safety, proper PPE usage, and emergency response procedures.
- **Documentation:** Maintain accurate records of inspections, support system designs, and any incidents or corrective actions.

Worker Responsibilities

Workers engaged in trenching and excavation must:

- **Follow Procedures:** Adhere strictly to all safety protocols and use the provided PPE as required.
- **Conduct Inspections:** Verify that all equipment and support systems are in place and functioning properly before entering the excavation.
- **Report Issues:** Immediately notify a supervisor of any unsafe conditions or discrepancies during inspections.
- **Participate in Training:** Attend all required training sessions and refresher courses on excavation safety and PPE usage.

Key Elements

- **Safety Implementation:** Ensure engineered support systems and hazard mitigations are established before starting work.
- **Hazard Identification:** Clearly document risks such as collapse, utility interference, water accumulation, and impacts on adjacent structures.
- **Effective Communication:** Maintain continuous communication between workers inside the excavation and those monitoring conditions at the surface.
- **Inspection and Record-Keeping:** Regularly inspect the site and keep the excavation plan and related records accessible at all project locations.

Key Takeaways

- **Preparedness:** Strict adherence to safety protocols and pre-entry inspections is essential to prevent accidents.
- **Risk Management:** Effectively identify and control hazards related to soil instability, utilities, and water accumulation.
- **Defined Roles:** Clear responsibilities for project leaders and workers ensure a coordinated approach to safety.
- **Continuous Improvement:** Ongoing training, regular equipment inspections, and detailed documentation are critical for maintaining a safe work environment.

For more information, refer to NCC T&D's relevant IMS procedures or consult our HSE Department for expert guidance and training resources.

