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WORKING IN TRENCHES OR OPEN EXCAVATIONS







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The following is a step-by-step procedure on how to complete a specific task or meet a facility specific requirement. Standard Operating Procedures (SOPs) are written for all identified critical tasks. By virtue of the hazard or complexity associated with critical tasks it is paramount that the SOP be followed as written. SOPs contain a listing of high-level hazards associated with the task, for detailed hazard analysis reference the applicable Task Hazard Assessments. SOPs do not replace the requirements contained in the company Standards, Codes, and Processes nor does it replace the need to comply with required legislation. Section 8.0 references documentation that the worker shall understand before work commences.

1.0 PURPOSE

• To establish a company standard to safely and effectively carry out work as it applies to working in trenches or open excavations.

2.0 SCOPE AND APPLICATION

• This document applies to all company Heavy Construction Mining operations. Ensure all site-specific requirements are being met or exceeded before performing the task.

3.0 HAZARDS AND CONTROLS

- Unstable ground conditions leading to material or wall cave in with worker(s) or equipment in the trench.
 - Trenches and excavations will be designed as per 950C-C-014 Excavations and Trenching Code and in compliance with area legislation.
 - Stabilize soil using shoring or cutbacks based on soil classification.
 - Cutbacks must be designed per soil type for trenches more than 1.2 m deep.
 - Classification of soil types will be consistent with 950C-C-014 Excavations and Trenching Code, and in compliance with area legislation.
 - Soil classification must be documented and available at the worksite.
 - Temporary protective structures and shoring will be designed per 950C-C-014 Excavations and Trenching Code.
 - Temporary protective structures greater than 3 m deep will be designed, constructed and installed in accordance with the specifications of a professional engineer.
 - Spoil piles will be placed so the leading edge of the pile is at least 1 m from the edge of the trench/excavation with the slope of the pile no greater than 45 degrees and all loose materials scaled/trimmed from the spoil pile i.e. rock, lumps.
 - Loose materials will be scaled and trimmed from the sides of excavations or trenches if workers may be on or near the sides.
 - Supervision or a designated competent worker will monitor trenches and excavations for cracks, shifting, or signs of collapse.
 - Workers must exit immediately and notify a supervisor if collapse risk is suspected.
- Working in a restricted or confined space causing personal injury.
 - Assess whether the trench or excavation is a restricted or confined space. Follow 950C-C-029 Hazardous Space Entry Code.
 - Trenches and excavations may be considered a restricted space due to limited access and egress.



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- Trenches and excavations may be considered a confined space if hazards, in addition to limited access/egress, are identified. These hazards can include, but are not limited to, a hazardous atmosphere.
- Conduct atmospheric testing for oxygen levels, toxic gases, and explosive atmospheres.
- Obtain confined space permits where applicable.
- Hazardous atmospheres causing personal injury and equipment damage.
 - Conduct initial atmosphere testing to confirm if hazardous atmosphere is present. Conduct continuous atmosphere monitoring based on the presence or expectation of a hazardous atmosphere. Continuous atmosphere monitoring requirement will be determined by a formal hazard assessment (i.e. JSA) and permit.
 - Use calibrated gas detectors and document results.
- Adverse weather conditions cause equipment damage or personal injury.
 - Monitor weather forecasts and work area conditions.
 - Apply sand in icy areas. Wear appropriate task specific PPE (i.e. traction aids).
 - Dress appropriately and adjust work plans for extreme weather.
- Inadequate ground conditions and housekeeping cause slips, trips or falls.
 - Maintain clear walking paths around trenches and excavations.
 - Remove debris and ensure stable footing.
 - Inspect ground conditions regularly.
- Inadequate access or egress cause equipment damage or personal injury.
 - Provide safe entry/exit points for all trenches and excavations.
 - Trenches greater than 1.2 m deep must have a safe point of entering and leaving located not more than 8 m from the worker.
 - Walkways, ramps, stairways and ladders must be safely constructed and secured.
 - Always maintain 3-point contact on ladders.
 - Do not carry tools or materials when ascending or descending ladders.
- Water hazards causing personal injury.
 - Monitor for water seepage; use pumps as needed.
 - Divert surface water away from trenches and excavations.
 - Do not enter trenches and excavations with hazardous water accumulation.
- Working in congested areas causes personal injury or equipment damage.
 - Follow 962C-SOP-023 Excavators Working in Congested Areas.
 - Conduct walkarounds at the start of shift, after breaks, following repositioning and anytime operator is unsure of proximity of people, equipment or obstacles.
 - Operators will swing to "good side" whenever possible to enhance visibility.



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- Swing radius must be identified via flagging or barricades when operating in close proximity to people, other equipment or in high traffic areas.
- Operators will ground equipment implements when not in operation.
- Maintain positive communication with equipment and machine operators when entering a trench or excavation.
- Ensure proper barricades and signage are in place.
- Equipment and vehicles shall be parked parallel to trenches or excavations whenever possible.
- Ground personnel and light vehicles will follow 962C-SOP-042 Approaching Equipment.
- Equipment and tools in and around trenches or excavations.
 - Keep tools, equipment and materials at least 1 m away from the edge of trenches or excavations.
 - Inspect tools and equipment used in trenches or excavations prior to use.
 - Ground excavator implements when checking grade, proximity to facilities, etc.
 - Never travel underneath raised equipment implements.
 - Never work under raised equipment.
 - Maintain line of sight with equipment operators.
- Contact with buried facilities causes personal injury or equipment damage.
 - Buried facilities will be clearly marked and located per most recent as-built drawings.
 - Excavator implements must stay a minimum distance of 1 m from the facilities in trenches and excavations.
 - Workers will use hand tools, rakes and shovels within 1 m around facilities placed in trenches and excavations.
- Inadequate communication causing personal injury or equipment damage.
 - Ensure positive communication between workers, supervisors and equipment operators via radio, verbal or hand signals.
 - Ensure all personnel understand communication protocols.

4.0 CHECKLIST

- Attend all preparatory meetings (IE: daily PSI; job scope; review of JSA's and SOP's for the job).
- Complete FLRA cards before starting the work.
- □ Ensure all personnel involved in the task are aware of the hazards and the controls to be used, as identified in the SOP's; JSA's; and FLRA's.
- Conduct a pre-job inspection of all equipment to be worked on and tools to be used.
- □ Standard of Training required for working on this job: On-the job training.

5.0 DEFINITIONS

5.1 Company

Means North American Construction Group Ltd. (NACG) and all directly or indirectly owned subsidiary companies, including joint ventures.





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5.2 Company Personnel

Includes the Company's employees, officers, directors, agents, associates, consultants/contractors, temporary employees and third-party processors.

5.3 HSE

Refers to the Health, Safety & Environment department.

5.4 Trench

Long narrow dug out area of ground that is deeper than its width at the bottom.

5.5 Excavation

Dug out area of ground; does not include tunnel, underground shaft or open pit mine.

6.0 PROCEDURE

- 1) Conduct a formal hazard assessment (JSA) prior to commencing work scope. All workers to complete individual hazard assessments (i.e. FLRA) for their tasks.
- 2) Determine if the work area will be deemed a restricted space, confined space or neither.
- 3) Review emergency response procedures with all personnel.
- 4) Obtain permits as required (ground disturbance, confined space, etc.).
- 5) Ensure trench walls have adequate shoring, cutbacks or temporary protective structures if trench is greater than 1.2 m deep and workers are present.
- 6) Establish safe entry and exit points for personnel and equipment.
- 7) Ensure buried facilities have been located and marked.
- 8) Mark trenches and open excavations with signage, barricades and flagging.
- 9) Conduct a pre-operation inspection of equipment prior to the commencement of work.
- 10) Conduct a walk around inspection of equipment at the beginning of shift, after breaks, when repositioning equipment and anytime equipment operator is unsure of proximity to people, other equipment or obstacles.
- 11) Flag swing radius of equipment when working in close proximity to people, other equipment or high traffic areas.
- 12) Identify spotters and implement in areas of limited visibility.
- 13) Supervision to inspect trench prior to workers entering and then regularly throughout the shift. Increase inspections based on weather and activities or as per permit and formal hazard assessment. Monitor weather and ground conditions when trenches and/or excavations are occupied by workers.
- 14) Conduct continuous or periodic atmosphere testing and monitoring if required per permit or formal hazard assessment.



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7.0 NOTES

If this task is to be done by a method different than described in this SOP, the work must **STOP** and the alternate method must be **DOCUMENTED** with an adequate hazard assessment tool such as a JSA. The document must be **APPROVED** by a supervisor before such procedures are implemented.

8.0 REFERENCES

- Alberta Occupational Health and Safety Code Part 5, Confined Spaces
- Alberta Occupational Health and Safety Code Part 8, Entrances, Walkways, Stairways and Ladders

- Alberta Occupational Health and Safety Code Part 32, Excavating and Tunneling
- 950C-C-014 Excavation and Trenching Code
- 950C-C-029 Hazardous Space Entry Code
- 962C-SOP-022 Digging and Design of Trenches and Excavations
- 962C-SOP-023 Excavators Working in Congested Areas
- 962C-SOP-042 Approaching Equipment

9.0 APPENDICES

• No appendices.

