
 <p>J-AAR EXCAVATING HEALTH, SAFETY & ENVIRONMENTAL PROGRAM</p>		Section: Safe Job Practices and Procedure – Trenching and Excavation					
		Initial HIRA score		20		Residual HIRA score	10
		Critical Task?	Yes	Location(s)	Jobsites	REVISION # 1	
		Description		Tasks which involve the excavation of materials and working in excavations		# OF PAGES:	6

SAFE WORK PRACTICES

General

- Before work begins on a trench or excavation soil type must be determined and valid locates must be obtained
- Operators who are digging in the vicinity of utilities must complete a J-AAR “Pre-Dig and Post Dig’ hazard assessment
- Mechanical excavation must not be used closer than 0.3M (1’) in any direction of a utility line. It must be hand dug or done using a hydro-vac.
- There are four soil types:
 - o Type 1 is hard, very dense and is only able to be penetrated manually with a small sharp object. It has low moisture content and has no signs of seepage. It can only be excavated by mechanical equipment
 - o Type 2 is very stiff, dense and is difficult to penetrate manually. It has low – medium moisture content and has a damp appearance after it is excavated
 - o Type 3 soil is soil that has previously been excavated; or soil that is stiff to firm or compact to loose consistency and has one or more of the following: signs of surface cracking; signs of water seepage; if it is dry, it may run easily into a well-defined conical pile; exhibits a low degree of internal strength
 - o Type 4 soil is soft – very soft and very loose in consistency. It is sensitive to disturbance and runs easily or flows/is wet muddy. Type 4 soils will also exert fluid pressure on structures.
- Trench safety depends greatly on the type of soil being disturbed. Trenches not protected by an engineered shoring system or trench box must be dug in different ways depending on soil type (no trench can have a vertical wall greater than 1.2m unless it is made of stable rock)
- Type 1 and 2 soils may have a vertical wall of 1.2m. a 1:1 slope is required once this height is reached
- Type 3 soils must be sloped at 1:1 from the floor of the trench upwards
- Type 4 soils must be sloped at least 1:3 from the floor of the trench
- Exhaust from equipment must not be allowed to accumulate in a trench of excavation.
- Every trench must be kept reasonably clear of water
- No person shall work in a trench unless another worker is above ground in close proximity to the trench.

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- No excavation shall be performed that will affect the stability of a building or structure until precautions have been taken to prevent damage or falling.
- For hydro poles, the base of the pole needs to be out of the 1:1 zone + 1m buffer, otherwise requires pole support or shoring.
- Precautions must be taken during an excavation to prevent rocks or loose materials from striking a worker.
- All excavated trench material (spoils) must be kept a minimum of 1 metre from the edge to the toe of the spoil pile. This includes equipment and materials.

Underground Hazards and Locates

- Ensure valid locates are available
- All utilities must be protected and supported

Overhead Powerlines

- All overhead lines should be marked
- Use a spotter if there is a chance of equipment encroaching a powerline
- Minimum distances: 750 or more volts, but no more than 150,000 volts- 3 meters. More than 150,000 volts, but no more than 250,000 volts- 4.5 meters. More than 250,000 volts- 6 meters

Access and Egress


- All ladders must be properly set up and secured
- If the trench poses a fall hazard of over 2.4m, ensure there is a proper barricade and signage

Equipment

- All heavy equipment must be inspected/recorded daily. If any equipment is found to be defective, tag it and remove from service immediately
- Regular inspection of a trench ought to be carried out by J-AAR supervision throughout the workday to ensure proper slope, shoring, etc

Trench box


- Trench boxes are not usually intended to shore up or support trench walls. They are meant to protect workers in case of a cave-in.
- Trenches must be backfilled immediately following the use of a trench box.

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- When using a trench box, the engineered drawings and specifications must be kept at the site and the trench box must be properly identified.
- As long as workers are in the trench, they should remain in the trench box.
- Inspect trench boxes for structural damage, cracks in welds and other damage.
- Check ground surface for tension cracks which may develop parallel to the trench at a distance one-half to three-quarters of the trench depth.
- Check the trench box often to make sure it is not shifting or settling more on one side than the other.


Back Filling

- Inspect all equipment before use. Any equipment found to be defective should be tagged and removed from service. Let J-AAR supervision know immediately.
- Do not proceed with backfilling until all required inspections and testing has been completed.
- Ensure there is communication between workers in the excavation and operators.
- Ensure areas to be backfilled are clear of debris.
- Do not backfill around areas where cast in place concrete has been poured less than 24 hours ago.
- Do not use vibratory equipment in areas which could cause harm to other workers (trench collapse, exhaust build up, etc.)
- Do not push final backfill onto pipe without it being properly braced.


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JOB HAZARD RISK ASSESSMENT

Initial HIRA Score	Hazards	Controls	Residual HIRA Score
20	No shoring/sloping	<ul style="list-style-type: none"> Every trench deeper than 1.2 meters requires proper slope or an engineered supportive device/shoring 	10
20	Improper Sloping	<ul style="list-style-type: none"> Soil type needs to be determined before commencing work. If proper slope cannot be maintained than engineered supports need to be used 	10
20	Underground hazards	<ul style="list-style-type: none"> Ensure J-AAR crews are in possession of valid locates before work commences Ensure there is adequate ground markings before commencing work If a utility may pose a hazard, the utility owner should disconnect, if possible No machine digging within 1' of utilities 	10
20	Struck by	<ul style="list-style-type: none"> Ensure spotters are used where an operator/driver's line of sight may become obstructed Workers should not enter an excavator's swing zone without first communicating with the operator Operators should do their best to be aware of changing site conditions 	10
20	Exposure to Atmospheric Hazards	<ul style="list-style-type: none"> Exhaust should not be allowed to accumulate in a trench Equipment at the top of the trench should be staged in a way that does not allow the 	10

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		accumulation of exhaust in the trench	
15	Access/Egress	<ul style="list-style-type: none"> Ensure the correct ladder is selected, inspected, and set up correctly If a trench box is being used ensure the ladder is properly located 	10
15	Objects Stored Improperly	<ul style="list-style-type: none"> A level area extending at least 1m from the top of an excavation should be kept clear or equipment and material 	5
15	Vehicle and pedestrian traffic	<ul style="list-style-type: none"> Ensure trenches and excavations are properly secured All reasonable precautions must be taken to ensure the safety of everyone effected by the work 	5
15	Improper Planning	<ul style="list-style-type: none"> Ensure engineered supports are in good condition, available, and appropriately sized Ensure equipment on site is the correct size to move material/equipment required Ensure all workers involved are competent for the tasks assigned to them 	5
10	Water accumulation	<ul style="list-style-type: none"> Trenches must be adequately dewatered before work commences 	5

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SAFE WORK PROCEDURES

Planning

1. Ensure valid locates are on site
2. Ensure all workers involved in the task are competent for the work assigned to them
3. Ensure all equipment and PPE required is available
4. Inspect all equipment and PPE. If anything is found to be defective, tag it and remove from service immediately
5. Complete the J-AAR Daily Dig Permit. Ensure all controls identified are implemented before beginning work
6. Ensure jobsite is secure and not a hazard to the public.

During the task

1. Post danger due to signs as required
2. Ensure secure and safe means of access and egress
3. Ensure a site-specific material storage and staging plan is implemented
4. Ensure trenches are kept reasonably free of water/snow/ice
5. Do not remove material from under any adjacent existing structures
6. J-AAR supervision should inspect the trench/excavation throughout the day
7. Ensure shoring/other engineered protective devices are used as necessary throughout the operation. If the soil is type 4, protection must be installed preemptively
8. Maintain any stamped drawings/manuals onsite throughout the duration of work
9. Ensure the excavation is secured at the end of the day if it is still open. Proper barricades and signage must be used

Completion

1. Ensure all equipment/tools/materials are safely stored
2. Housekeeping as required