# Nujo'tme'k Samqwan

*Etuaptmumk (Two-Eyed Seeing) development a safety/risk management program*

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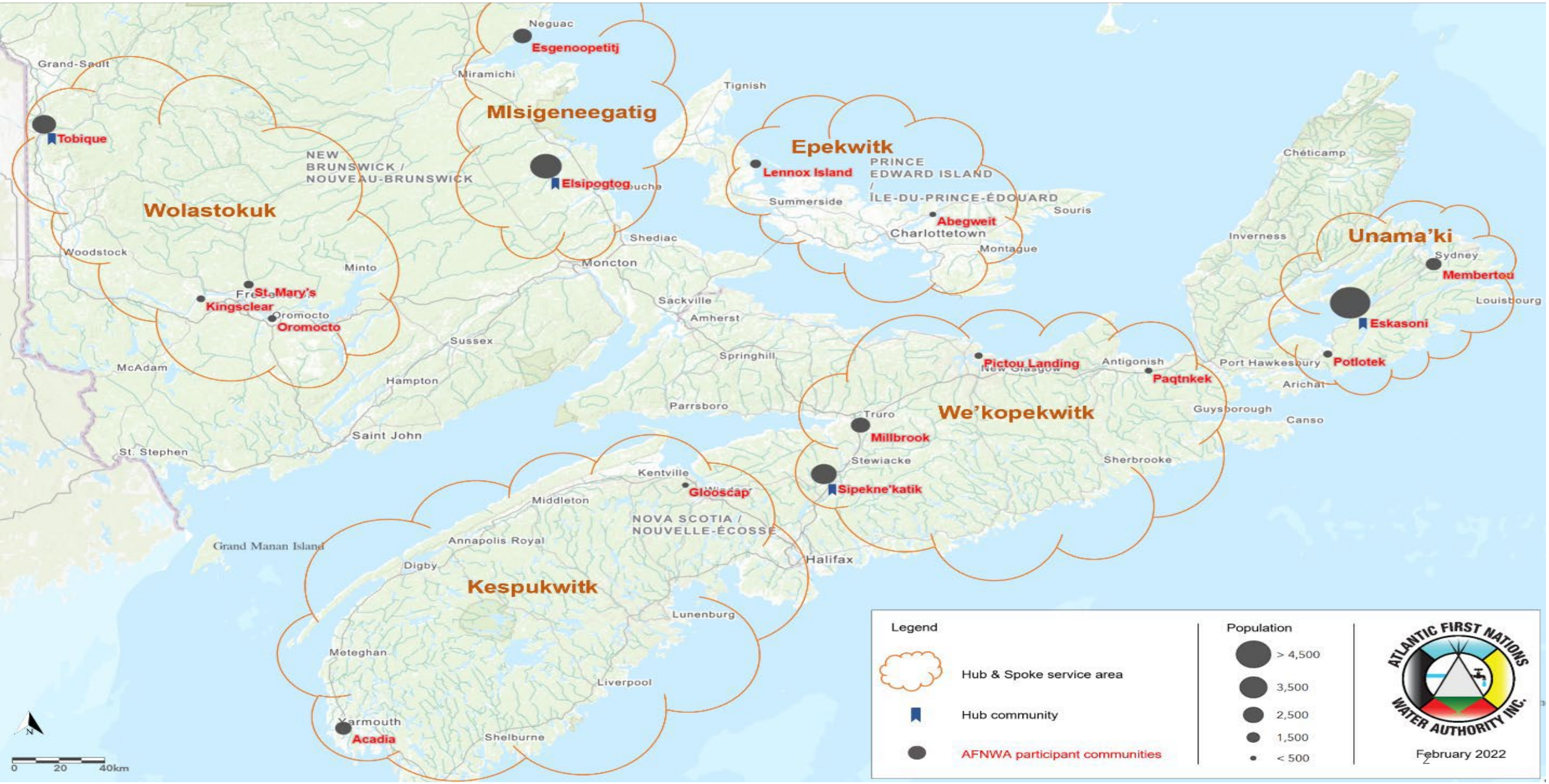
**AFNWA - Operator Training**
**May 11,12, 2023**

# Operations Hub and Spoke Model



# Mission

To provide safe, clean drinking water and wastewater in all participating First Nations communities in Atlantic Canada, delivered by a regional water authority owned and operated by First Nations.

# Safety and Protection: *Msit No'kmaq*




**Framework to establish how to proactively manage systems to provide clean and safe water:**

- Acceptable treatment processes
- Appropriate monitoring practices
- Achievable water quality standards
- Reporting processes in case of an incident

# What is a risk?

A situation involving exposure to danger

# What is risk Management?

The process of identifying, assessing and safely managing or controlling the risk

# What are the risks that pose the greatest threat to Operators?

1. Trenching/excavation
2. Fall protection
3. Traffic safety
4. Chemicals
5. Electrical
6. Lockout/Tagout

**A range of operational and maintenance risks, as well as infrastructure concerns represent the main risks.**

# What is the difference between trenching and excavation?

**The Occupational Health and Safety Act (OHSA) defines Excavation** as “any man made cut , cavity, trench or depression in the earth’s surface formed by earth removal “

**Trenching** is a construction method that involves digging a narrow trench in the ground for the installation, maintenance, or inspection of underground infastructure (pipes, valves,conduits, cables.

Excavation

•**3.12 (1)** Before the commencement of work on a tunnel, excavation or trench, the employer shall mark the location of all underground pipes, cables and conduits in the area where the work is to be done.

•**(2)** Where an excavation or trench constitutes a hazard to employees, a highly visible barricade shall be installed around it.

•**(3)** In a tunnel or in an excavation or trench that is more than 1.4 m deep and whose sides are sloped at an angle of 45° or more to the horizontal

- **(a)** the walls of the tunnel, excavation or trench, and
- **(b)** the roof of the tunnel

•shall be supported by shoring and bracing that is installed as the tunnel, excavation or trench is being excavated.

•**(4)** Subsection (3) does not apply in respect of a trench where the employer provides a system of shoring composed of steel plates and bracing, welded or bolted together, that can support the walls of the trench from the ground level to the trench bottom and can be moved along as work progresses.

•**(5)** The installation and removal of the shoring and bracing referred to in subsection (3) shall be performed or supervised by a qualified person.

•**(6)** Tools, machinery, timber, excavated materials or other objects shall not be placed within 1 m from the edge of an excavation or trench.

Safety Nets

•**3.13 (1)** If there is a risk that tools, equipment or materials could fall onto or from a temporary structure, the employer shall provide a protective structure or a safety net to protect from injury any employee on or below the temporary structure.

•**(2)** The design, construction and installation of a safety net referred to in subsection (1) shall meet the standards set out in ANSI Standard ANSI A10.11-1979, *American National Standard for Safety Nets Used During Construction, Repair and Demolition Operations*, dated August 7, 1979.

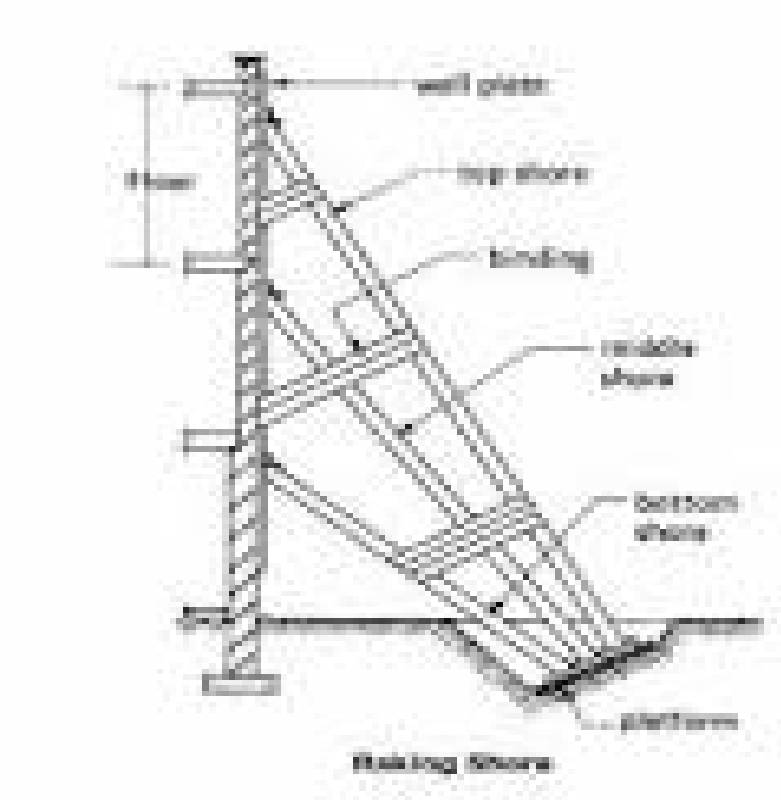
There are several methods of excavating  - once you go over 4 ½ feet YOU MUST  use mitigation methods to prevent cave in.

Simply put – the use of a Trench Box is the easiest and quickest and by far the safest and recommended best practice. AFNWA has purchased 7 Efficiency Structural Aluminum “Build a box” kits. These are light weight, modular, easily transported and set up and can be pre-constructed to fit different applications such as over a main and lateral, around a protruding abutment, etc. They are stackable, and easily lifted and lowered by a back hoe, or excavator. Additionally we purchased an engineered aluminum walkway system with non-slip deck and handrails so that operators can walk into the trench boxes . Note a ladder that extends a minimum of 3 rungs must also be used as a safety measure.

AFNWA has also purchased 20’ tandem aluminum trailers to transport the boxes, lengths of pipe, etc


EXH. FAN 5

Another method to make trenches safe is shoring. This is the use of temporary props or supports that are used in conjunction with planks, sheeting or other materials that are propped against the walls to support them. This method can be much more time consuming, and if not done correctly is more prone to failure.



Sloping is another method to  make safer trenching. The angle of the slope (walls) must be at a minimum of 1 to 1  (45 degrees) in good soil., and wider with deteriorating soil conditions. A class one ladder that extends at least 3 rungs above the trench must be used

In stable rock and **engineer approved** soil conditions, a straight walled trench may be permissible. This is to be the exception not the rule and a ladder must be used. Wire netting can also be used to protect operators from falling rock, debris.

OSHA standards require safe access and egress to all excavations, including ladders, steps, ramps or other safe means of exit for employees working in trench excavations four feet or deeper. These devices must be located within 25 feet of all workers. Keep heavy equipment away from trench edges.

Never enter an unprotected trench, and make sure that any trench deeper than 5 feet has a protective system in place unless your work site is made of stable rock. Don't stand near any vehicle being loaded or unloaded, and don't place excavated soil within 2 feet of a trench edge.

Always wear PPE and conduct repeated safety inspections. Make sure that there is an OSHA-certified Competent Person available to address any existing issues and make recommendations for site safety and management.

Be aware of the excavation regulations and guidelines that your site should be following, as well as the protective systems that they are required to put into place. It's important that you know how to protect yourself when on-site and that safety begins with proper training.

**What poses the greatest risk in excavating and trenching works?**

Cave-ins pose the greatest risk in trenching and excavation operations, and are much more likely than other excavation-related accidents to result in worker fatalities. Other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment.

**What is a best practice that should ALWAYS be done prior to any excavation?**

Electrical Locates and load verifications.
This can be done by contacting your electrical provider (NS Power, NB Power, etc)  This will ensure there are no known underground electrical feeds. By knowing the voltage/amperage this allows you to better manage risks!
Additionally – local locates should be done, checked to ensure no electrical feeds are between the pole and the utility being serviced that your electrical provider may not be aware of.

**What other steps should be taken prior to excavating?**

Safety Plan (First aid, evacuation protocols, emergency stop signal, bumped and calibrated gas detector, PPE (boots, safety vest, hard hat, gloves, eye protection….)

Know your contractors and look out for each other!!!

NEVER assume anything – always ask !!

Look after each other and be safe!

If it doesn’t look or feel right – get clarification  - ask questions.

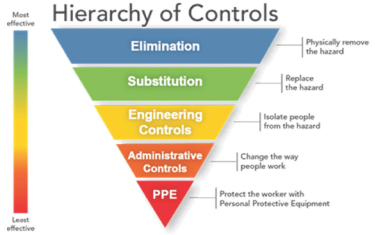
Use a spotter ( over head lines, guide wires, asbestos pipes, children/animals/looky lews…

Prepare for the unexpected – rescue plan, first aid kit/nearest medical, ensure first aid is up to date

**BE SAFE AND WORK SAFE!!!!!**

# Field Level Hazard Assessment (FLHA)

STOP & THINK
Resume Work — Look Around & Identify Hazards — Assess Hazards — Control Hazards




| Hazard Rating | Severity or Impact | | | |
|---|---|---|---|---|
| | 4 | 3 | 2 | 1 |
| | Catastrophic | Critical | Marginal | Negligible |
| Probability 5 Frequent | 20 | 15 | 10 | 5 |
| Probability 4 Likely | 16 | 12 | 8 | 4 |
| Probability 3 Occasional | 12 | 9 | 6 | 3 |
| Probability 2 Remote | 8 | 6 | 4 | 2 |
| Probability 1 Highly Unlikely | 4 | 3 | 2 | 1 |

| Emergency Numbers Other Than 911 |
|---|
| **NSPI:** 1-800-428-6230 or 902-428-6230. |
| **Heritage Gas:** 1-866-313-3030 |
| **Department of Environment:** 1-800-565-1633 |
| **Maritimes Northeast:** 1-888-444-6677 |
| **Cape Breton & NS Railway:** -800-890-2812 |
| **Bell:** 1-844-224-8304 |
| **CC Safety:** (902)221-0199 - Paul Cormier |
| **AFNWA Safety:** (902)297-1366 -Dan MacDonald |

| | |
|---|---|
| High Hazard | Work does not commence / continue until mitigation plan is developed and approved by the Manager / Supervisor directing the work. |
| Moderate Hazard | Work can commence / continue with mitigation plans and programs in place to reduce the hazards. |
| Low Hazard | Work can commence / continue with mitigation and continued improvement plans. |
| Very Low Hazard | Work can commence / continue however work will be revaluated if conditions / hazards change. |

**Probability** - The likelihood that an incident will occur, regardless of what the outcome might be. Measured using the five level scales:

**5) Frequent** - Will likely happen often in the next year.

**4) Likely** - Will likely occur in the next year.

**3) Occasional** - Will likely happen sometime in the next several years.

**2) Remote** - Unlikely, but event could be experienced in the next several years.

**1) Highly unlikely** – Possible, but not likely to ever occur.

**Severity -** The most likely outcome in the event of an incident. Measured using the four level scales:

**4) Catastrophic** - May cause death, permanent disabling injury or loss of facility

**3) Critical** - May cause severe (hospitalization or lost time) injury not resulting in permanent disability.

**2) Marginal** - May cause non-serious injury or minor occupational illness resulting in lost workday(s) or minor property damage.

**1) Negligible** - Would not result in an injury and would not affect employee health or cause significant property damage.

**Questions to be considered when completing the FLHA might include:**

- Is the area safe to work in?
- Will activities of other crew members interfere and create a hazard?
- Do workers understand work assignments?
- Are energy sources eliminated or controlled?
- Have proper tools and equipment been provided?
- Are tools and equipment in safe operating condition?
- Has proper personal protective equipment been provided?
- Are workers knowledgeable on how to properly use all equipment?
- Can the workers communicate effectively with each other?
- Are there restrictions due to high noise, vision or language barriers?
- Are workers aware of hazardous substances in the work area?
- Are safety controls required to safely complete the work?
- Are workers aware of the pre-job hazard assessment and signed off?
- Have workers been encouraged to make suggestions for the FLHA?
- Have workers been advised to report any unsafe acts or conditions?
- Has the safety of the public been considered?

**Have All Employees and Contractors Signed off on the FLHA?**

# Field Level Hazard Assessment(FLHA)

STOP & THINK
Resume Work — Look Around & Identify Hazards — Assess Hazards — Control Hazards

| Work to be completed: | | Date / Time: |
|---|---|---|
| Location: | Muster point: | Re-assess Date / Time: |

| Excavation / Trench Dimensions. Note: If Irregular draw on an attached FLHA | Length: | Width: | Depth: |
|---|---|---|---|

Check off those that apply to this job or circle not applicable(N/A). List the items in the hazard column, indicate the priority ranking and identify the plans to eliminate or control. Use another FLHA if required.

| BASIC TRENCH CONSIDERATIONS | CLEARANCE / LOCATES: | HOISTING AND RIGGING: | CONTRACTOR TRAFFIC CONTROL: |
|---|---|---|---|
| ☐ N/A Depth less than 4' or shored / slope | ☐ N/A Water and sewer | ☐ N/A Annual inspection | ☐ N/A Set up number |
| ☐ N/A Adequately dewatered | ☐ N/A Electrical | ☐ N/A Pre-use inspection | ☐ N/A Signers cert # |
| ☐ N/A Excavated fill piled back from trench | ☐ N/A Gas | ☐ N/A Operators competent | ☐ N/A Planning checklist (PPCL) |
| ☐ N/A Access / egress acceptable | ☐ N/A Communications | ☐ N/A Signaler required / ident | ☐ N/A All traffic control signed FLHA |
| ☐ N/A Pressurized mains assessed | ☐ N/A Rail (within 30' of rail) | ☐ N/A Capacity is not exceede | ☐ N/A Side roads covered |
| ☐ N/A Public access concerns addressed | ☐ N/A Customer owned | ☐ N/A Chain rated 80 or above | ☐ N/A Public access restricted |
| ☐ N/A Soil conditions | ☐ N/A Right-of-way | ☐ N/A Tag lines available | ☐ N/A Delineation in place |

| TRENCH SHIELDS: | EXCAVATION / TRENCH SOLID ROCK: | SHORING: |
|---|---|---|
| ☐ N/A Engineer approved | ☐ N/A Engineer approved | ☐ N/A Engineer approved |
| ☐ N/A Documentation available/ manufacturer instructions | ☐ N/A Documentation available | ☐ N/A As built Eng. inspect complete |
| ☐ N/A No visible cracks in the welding or shell plating | ☐ N/A No loose rock / materials | ☐ N/A Documentation available |
| ☐ N/A No bent or cracked lateral struts or strut pockets | ☐ N/A Rock bolts / mesh / other | ☐ N/A Pre-use inspection complete |
| ☐ N/A No incomplete assembly of the box such as a missing strut | LADDERS: | ☐ N/A Timber shoring |
| ☐ N/A Safe working limit information is marked on the shield | ☐ N/A CSA Grade 1 or 2 ladders | ☐ N/A Damaged / defective lumber |
| ☐ N/A No excessive rust and corrosion of critical connecting parts | ☐ N/A 3 rungs above landing | ☐ N/A No signs of crushing |
| ☐ N/A Trench does not extend above shield | ☐ N/A 2 ladders if more than 7 emp. | ☐ N/A No loose or displaced cleats |
| ☐ N/A On bottom of trench (design height / 900mm - lesser of two) | ☐ N/A 2 ladders over 6 M deep | ☐ N/A No displacement of struts |
| ☐ N/A Properly secured | ☐ N/A Ladder within 15m of worker | ☐ N/A Engineer re-approved if altered |

| MOBILE EQUIPMENT: | SUPPORT / BRACING A UTILITY: | WESTVILLE TRAFFIC CONTROL: | ATMOSPHERIC CONDITIONS: |
|---|---|---|---|
| ☐ N/A Pre-use inspection | ☐ N/A Bracing / supporting of poles | ☐ N/A Planning checklist | ☐ N/A CO |
| ☐ N/A Operators competent | ☐ N/A Supporting infrastructure | ☐ N/A Accredited TWS / TCP | ☐ N/A H2S |
| ☐ N/A Safe distance from excav/trench | ☐ N/A Approval obtained | GENERAL CONSIDERATIONS: | ☐ N/A O2 |
| ☐ N/A Extra load excav/trench considered | ☐ N/A Engineer approved | ☐ N/A Access ramp required | ☐ N/A LEL |
| ☐ N/A Safe distance from utilities | ☐ N/A As built Eng. inspect comp. | ☐ N/A Signage | ☐ N/A NOx |
| ☐ N/A Other | ☐ N/A Documentation available | ☐ N/A Barricades | ☐ N/A Other |

| HAZARDS: | | | |
|---|---|---|---|
| ☐ N/A Noise | ☐ N/A Sharp objects | ☐ N/A Slippery conditions | ☐ N/A Contact with equipment |
| ☐ N/A Vibration | ☐ N/A Dust /mist /fumes | ☐ N/A Protruding objects | ☐ N/A Suspended loads |
| ☐ N/A Temperatures | ☐ N/A Hazardous products | ☐ N/A Cutting / welding | ☐ N/A Drainage |
| ☐ N/A Weather | ☐ N/A Heavy / awkward lift | ☐ N/A Fire / smoke | ☐ N/A New employees |
| ☐ N/A Repetitive | ☐ N/A Falling objects | ☐ N/A Electrical shock | ☐ N/A New work process |
| ☐ N/A Tight areas | ☐ N/A Holes /Fall Hazards | ☐ N/A Unstable ground | ☐ N/A Communications |

**Identify and Prioritize the tasks and hazards below, then identify the plans to eliminate/control the hazards. Use another FLHA if required.**

| TASKS | HAZARDS | RATING | PLANS TO ELIMINATE/CONTROL |
|---|---|---|---|
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Please print (Individual and / or crew) and initial prior to commencing work. If people are added to crew include on form. Use another FLHA if required.

| Workers Name (Including Contractor) (print) | Initials | Workers Name (Including Contractor) | Initials |
|---|---|---|---|
| | | | |
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| | | | |
| | | | |

| | |
|---|---|
| Name(s) of Signaler(s) | |
| Trench Shield Assessment Completed by: | |
| Supervisor's Name / Signature / Contact #: | |

**Original** - Superintendent **Yellow** - Remains in book ***Note: All names must be legible.***

# Wela'lin!

# Woliwon!

# Questions ?