Safe Work Procedures

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# 4.1 - FIRE EXTINGUISHER USE

## Potential Health or Safety Concerns;

• Damage to Equipment/property (Smoke Damage, Burning)

• Injuries to workers and public (Burns, Smoke Inhalation)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Must be able to demonstrate correct use of a Fire Extinguisher

Using A Fire Extinguisher

**A**. Call for help before attempting to extinguish a serious fire. The fire may take hold much faster than you're capable of dealing with it, and if help is on the way, it removes one less concern for you.

**B.** Check for your own safety before starting to extinguish a fire. There are some key things to check for before you start fighting a fire using a fire extinguisher:

1. Are you physically capable of extinguishing a fire? Some people have physical limitations that might diminish or eliminate their ability to properly use a fire extinguisher.
2. Look for your exit points. Ensure that there is a clear exit for immediate escape, should this become necessary. At all times, keep your mind focused on the availability of a safe retreat. If this is threatened at all, leave at once. Do not attempt to put out a fire where it is emitting toxic smoke; if you suspect or simply don't know if the smoke is toxic, leave it to the professionals.
3. Remember that your life is more important than property, so don't place yourself or others at risk.

**C.** Check the type of extinguisher. Extinguishers are labeled ABC or D. Ensure you use the right extinguisher for the appropriate type of fire.

1. Ordinary Combustibles – Fires started with paper, wood, drapes and upholstery require a Class A type extinguisher.
2. Flammable and Combustible Liquids – Fires originating from fuel oil, gasoline, paint, grease in a frying pan, solvents and other flammable liquids require a Class B type extinguisher.
3. Electrical Equipment – Fires started with wiring, overheated fuse boxes, conductors, and other electrical sources require a Class C type extinguisher.
4. Metals – Certain metals such as magnesium and sodium require a special dry powder Class D type extinguisher.

*When using at home. A multi-purpose dry chemical labeled ABC puts out most types of fires: wood, paper, cloth, flammable liquids and electrical fires. If you intend to buy more than one, you may want to purchase a BC for the kitchen, an A for the living room and an ABC for the basement and garage.*

**D.** Ready the fire extinguisher. Almost all fire extinguishers have a safety pin in the handle. This pin usually looks like a plastic or metal ring, sometimes colored red that is held in place by a plastic seal. The distinctive features will vary depending on the type of fire extinguisher you have. You must break the seal and pull the safety pin from the handle before you can use the fire extinguisher by squeezing the lever, which discharges the fire extinguishing agent.

**E.** Aim for the base of the fire. Shooting into the flame is a waste of the fire extinguisher, as you’re not putting out the source of the flames. It’s vital to stop the fire at its source, or to remove or dampen the fuel from the fire, in order to put it out. By focusing the extinguisher’s spray at the base of the fire or the source, you’re extinguishing the fuel.

**F.** Remember the simple acronym P.A.S.S. to help you use the fire extinguisher effectively. P.A.S.S. stands for: Pull, Aim, Squeeze, Sweep, explained below the printable diagram.

1. Pull the safety pin from the handle. The pin is located at the top of the fire extinguisher. Once removed, it releases the locking mechanism, allowing you to discharge the extinguisher.
2. Aim the extinguisher nozzle or hose at the base of the fire. As explained, this removes the source or fuel of the fire. Keep yourself low.
3. Squeeze the handle or lever slowly to discharge the agent. Letting go of the handle will stop the discharge, so keep it held down.
4. Sweep side to side approximately 6in or 15cm over the fire until expended. The sweeping motion helps to extinguish the fire. Stand several feet or meters back from the fire: fire extinguishers are manufactured for use from a distance.
5. The fire may flare up somewhat as extinguishing begins due to the flames being pushed away from the burning material (the real target) by the agent and gust of propellant. Do not be alarmed so long as it dies back promptly.

# 4.2 - MOUNTING/DISMOUNTING EQUIPMENT

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Back, Knees, Legs, Hands)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Flag Suit (Class 2-3), Ear/Eye Protection, (Dust mask or respiratory protection if required). Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employee must show competency in mounting and dismounting equipment correctly.

### Recommended Procedures and Precautions to Offset Hazards

1. Clean boots of mud before climbing onto equipment.
2. Keep steps on equipment clean and free of mud and clay.
3. Use handrails and steps on equipment to mount and/or dismount.
4. Always face the machine when getting on or off the equipment.
5. Maintain three-point contact at all times (two hands and one foot, or one hand and two feet).
6. Do not jump from the machine or attempt to get off while it is in motion.
7. Use extra caution under wet, muddy, or icy conditions.
8. If additions are required to ensure a three-point contact, inform the supervisor or shop personnel as soon as possible.

# 4.3 - LIFTING/SHOVELLING

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (back, shoulders, arms, hands)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Flag Suit (Class 2-3), Ear/Eye Protection, (Dust mask or respiratory protection if required). Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must show competency in proper lifting and shoveling techniques.

### Recommended Procedures and Precautions to Offset Hazards

1. Plan ahead before lifting or shovelling a pile.
   1. Knowing what you're doing and where you're going will prevent you from making awkward movements while holding/shovelling something heavy.
2. Lift close to your body.
   1. You will be a stronger, and more stable if the object/shovel is held close to your body rather than at the end of your reach. Make sure you have a firm hold on the object/handle and keep it balanced close to your body.
3. Feet shoulder width apart.
   1. A solid base of support is important while lifting/shovelling. Holding your feet too close together will be unstable, too far apart will hinder movement. Keep the feet about shoulder width apart and take short steps.
4. Bend your knees and keep your back straight.
   1. Practice the lifting motion before you lift the object, and think about your motion before you lift. Focus on keeping your spine straight--raise and lower to the ground by bending your knees. Try not to twist when shovelling.
5. Lift with your legs.

a. Your legs are many times stronger than your back muscles--let your strength work in your favour. Again, lower to the ground by bending your knees, not your back. Keeping your eyes focused upwards helps to keep your back straight. Face the direction you are shovelling the pile. Take a step in the direction you’re putting the pile instead of twisting your body.

1. If you're straining, get help.
   1. If an object/pile is too heavy, or awkward in shape, make sure you have someone around who can help you lift/shovel.
2. Don't twist or bend.
   1. Face in the direction you are walking/shovelling.

4.4 - FORKLIFT OPERATIONS

## Potential Health or Safety Concerns;

• Damage to Equipment/Materials

• Injuries to workers and public (pinch points, debris)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection.

Alberta #2 First Aid Kit, Fire Extinguisher in area, Equipment checklist, Refer to Hazard Assessment, ERP.

**Training Required;**

Employees must be certified to operate a forklift and have a minimum class 5 GDL if going onto a roadway for any length of time.

### Recommended Procedures and Precautions to Offset Hazards

* Check all fluid levels on the machine and do walk around to make sure it is fit to operate, look for and know the lifting capacity of the forklift.
* Enter forklift using 3-point contact method.
* Sit in operator’s seat and familiarize yourself with controls.
* Complete the Equipment Checklist
* Fasten safety restraints and start engine.
* With engine running, test hydraulic and see that all equipment is functioning properly.
* When safe to do so raise forks and put machine in gear.
* `Move towards object that you will be hoisting, if it is a pallet guide your forks into the space of the pallet that is used for lifting and carrying.
* When forks are all the way into the pallet, stop moving forward, apply the brakes and lift pallet. (stay aware of the forks potentially striking another object if sticking out the other side of the pallet/load)
* If loading onto a truck or trailer, carry load as low as possible until you have reached the vehicle/trailer, apply brakes and lift forks to the desired height.
* With the forks tipped slightly backwards, move forklift forward until load is above the vehicle/trailer.
* Set the load down to the deck, tip the forks forward and take the weight off of the forks. When safe to do so back away from the load (you may have to move the forks up or down and possible tilt them to free yourself form the load)
* When separated from the pallet, keep moving in reverse until you have reached desired distance between yourself and the vehicle/trailer.
* Proceed towards parking area for the forklift, put forks down on the ground and turn off engine.
* Dismount machine using 3-point contact.
* Always be aware that the forklift has rear steering and can turn sharply with ease. The drive wheels must clear any objects before you can start a turn whether moving forward or reversing.

**4.5 - SKID-STEER (BOB CAT) OPERATIONS**

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers and public (pinch points, debris)

## Equipment, PPE and Apparel to be used;

CSA Approved 6”footwear, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection.

Alberta #2 First Aid Kit, Fire Extinguisher in area, Equipment Checklist. Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent to operate a Skid Steer/Bob Cat, prior to use and have a minimum class 5 GDL if operating on a roadway for any length of time.

### Recommended Procedures and Precautions to Offset Hazards

*The Machine May Only Be Started and Operated by Trained and Authorized Personnel*

* Perform walk around checking fluid levels and a visual inspection prior to start up.
* Always fasten seat belt and lower the seat bar before operating the machine.
* Ensure the parking brake is on.
* Complete Equipment Checklist.
* Start Unit and allow for proper warm-up at slow idle.
* Check backup alarm and lights. Use a spotter when practicable when on the job site.
* Always carry bucket as low as possible.
* Do not travel or turn with lift arms up.
* Load, unload and turn on flat, level ground.
* Truck operators must be clearly informed prior to dumping into truck box.
* The bucket must be kept level while lifting. Failure to do so may result in falling debris onto the cab.
* Do not exceed the maximum lifting weight. This may cause the machine to tip.
* Do not leave operator seat with engine running, lift arms up or parking brake not engaged.
* Operators must be aware of all people and obstructions in operating area.
* Operator to notify supervisor of any maintenance requirements.
* Park on level ground, with arms lowered, bucket on the ground and emergency brake on in a safe area, away from traffic when finished for the day.

**4.6 - JUMP START A BATTERY**

*IMPORTANT: PUT OUT ALL CIGARETTES AND FLAMES*

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Arching, Battery acid)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Eye Protection.

Alberta #2 First Aid Kit, Fire Extinguisher in area. Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must show competency prior to jump starting any battery.

### Recommended Procedures and Precautions to Offset Hazards

* A battery can be safely jumped using the procedures outlined below. Otherwise there is a danger of the battery exploding and spraying sulphuric acid over anyone nearby.
* Ensure the parking brake is engaged.
* Turn off ignition and all accessories.
* Make sure the batteries are the same voltage. (Six-volt batteries have three filler vents; 12 volt batteries have six.)
* If 12 volt and six-volt batteries are connected, the smaller 6-volt battery would be damaged. It could explode.
* Remove filler caps and top up batteries with water. Do not try to start a car with a frozen battery.
* If the battery is low or dry, the surge could buckle the plates.
* If the battery has capped vent holes, remove caps to lessen chance of pressure buildup of hydrogen gas.
* Cover vent holes with cloth so that no one is splashed with acid in case of explosion.
* Identify the positive terminal of both batteries. These are coloured red, or have a “+”, “P” or “POS” written on the battery case, post or clamp.
* Attach on jumper cable between the two positive terminals.
* Attach one end of the second jumper cable to the negative terminal of the booster battery and the other end to some part of the engine in the car being started. This final connection should be at least a foot from the battery (to avoid sparks which could cause an explosion) and must be on a piece of metal that is not painted, chrome-plated, heavily rusted or coated with grease.
* The likelihood of a spark when connecting the cables comes with the last connection that completes the circuit.
* Try to start the car. If it fails to start immediately, start the car holding the booster battery so it will not run down.
* After the car with the discharged battery is running normally, remove the cable connection at the engine block first, then the other end of the same cable from the booster battery.
* The reason for moving from the block first is the same as previously stated – breaking the circuit is when you might have a spark and you want to be distant from the source of volatile gases.
* Then remove the negative from the booster battery.
* Finally, disconnect positive from booster and positive from car being started.

Note:

*Some vehicles have an opposite polarity system – that is, positive is ground and negative is live. In this case, reverse the jumping procedure, connecting the negative terminals first. Then connect the positive terminal of the booster battery with the engine block of the car with the positive ground.*

# 4.7 - TOWING EQUIPMENT

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers and public (Pinch Points, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6”footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Eye Protection.

Alberta #2 First Aid Kit, Fire Extinguisher in area. Refer Hazard Assessment and ERP.

**Training Required;**

Employees must show competence prior to towing any equipment/vehicles and have a correct driver license for the vehicle they are operating.

### Recommended Procedures and Precautions to Offset Hazards

1. Inspect the sling to make sure it meets the required standards (meant for pulling only).
2. Inspect sling for weak, stretched webbing, and cracks within the hooks.
3. Hook sling onto disabled equipment on the lowest point possible.
4. Place hook in a manner that it cannot slip out when tightening.
5. Back mobile piece of equipment (that is to do the pulling) close to the disabled one so the sling can be connected. Always use a spotter if you must back through an intersection.
6. Place sling on the pulling point of the mobile equipment.
7. Have a spotter on the ground to give directions.
8. When sling is tight, look to see if everyone is out of harm’s way.
9. When safe to do so apply power (slowly) to the mobile machine.
10. Never jerk the sling (it will most likely snap)
11. Once you have pulled the disabled machine out, create some slack in the sling.
12. Have a spotter un-hook both ends of the sling.

NOTE:

*\*\*Never tow in reverse as this will damage the towing unit\*\**

# 4.8 - WORKING NEAR POWER LINES

*Before any work takes place or equipment is operated within 7 meters of an energized power line, the following MUST be established:*

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers and public (electrocution)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection (if required). Alberta #2 First Aid Kit, Burn Packs, Fire Extinguisher in area, Refer to Hazard Assessment and ERP and Table 2.1 below.

**Training Required;**

Employees must show a clear understanding of the risks of working near power lines.

### Recommended Procedures and Precautions to Offset Hazards

1. The employer/supervisor MUST contact the utility owner or representative to:

1. Determine the voltage of the line, and
2. To establish the appropriate safe limit of approach distance listed in Schedule 4 of the OHS Code.

2. The employer/supervisor must notify the utility owner if the work is to encroach on the established safe limit of approach, and obtain the utility owner’s assistance in protecting the workers involved.

3. The employer must ensure that earth or other materials are not placed under or beside an overhead line if doing so reduces the safe clearance to less than the safe limit of approach distances in Schedule 4.

4. All workers must follow the direction of the employer in maintaining the appropriate safe clearance and notify the supervisor if they feel the appropriate safe clearance cannot be maintained.

*Never Work Near Power Lines Unless The Safe Limits Of Approach Are Known And Can Be Maintained.*

*Limits of Approach*

Table 2-1 Limits of Approach Distances from Overhead Power Lines for Persons and Equipment

|  |  |
| --- | --- |
| **Operating voltage of overhead power line between phase conductors** | **Safe limit of approach distance for persons and equipment** |
| 0 – 750 V insulated or polyethylene covered conductors (1) | 0.3 m |
| 0 – 750 V bare, uninsulated | 1.0 m |
| Above 750 V insulated conductors (1) (2) | 1.0 m |
| .75 kV - 40 kV | 3.0 m |
| 69 kV - 72 kV | 3.5 m |
| 138 kV - 144 kV | 4.0 m |
| 230 kV - 260 kV | 5.0 m |
| 500 kV | 7.0 m |

Notes:

(1) Conductors must be insulated or covered throughout their entire length to comply with these groups. (2) Conductors must be manufactured to rated and tested insulation levels. Limits of approach are set to keep you working safely on the jobsite. The danger with of overhead lines is that there is no protection on the wire. Electricity is looking for a path to the ground, so if contact is made you or your equipment can be its path. Follow these steps when encountering an overhead line:

* Determine voltage (contact owner).
* Determine safe limits of approach (verify with owner).
* Ensure there is enough clearance to keep workers and equipment safe from their highest point (example: truck box fully raised, boom fully extended, etc.)
* Mark location of all overhead lines on plans and drawings.
* Set up signs warning of overhead power lines (from both directions). NOTE: in extreme circumstances (poor visibility, very low line, etc.) the utility owner may be willing to mark the line with ribbons, PVC pipe, or other means. They may be willing to relocate the line if determined necessary. Request if needed.
* When trucks are dumping within 25 meters on either side of an overhead line, they MUST do so moving AWAY from the line where reasonably practicable. Mark the 25 meter zone (with a paint line, cones, ribbons, etc.) and make drivers aware.
* Keep all unnecessary personnel, vehicles, and equipment away from power lines
* Ground personnel MUST keep clear of all equipment working near power lines, as electricity may be transferred through them if the equipment contacts a line while they are in contact with the equipment.
* If working under a power line or near the limits of approach cannot be avoided, a signal person MUST be used to direct the operator.

**Guiding Loads**

The only job of a designated signal person (or spotter) is to keep the equipment from contacting the power line. The signaller MUST know the limits of approach and be able to signal the operator quickly and easily if there is danger of contacting the power line. The signaller must stand out from the other workers, and use clear signals easily understood by the operator.

**Accidental Contact**

Power lines don’t always jump or spark when down. A downed line may not have any sign that it is energized.

Stay back at least 10 meters. Call 911 for help.

Just like ripples caused by throwing a rock into a pond, electricity travels through the ground in waves that lose power the further they travel. If a line comes down near you, SHUFFLE WITH BOTH FEET IN CONTINUOUS CONTACT until you are at least 10 meters away.

* Do not touch someone being shocked by a downed line or you will run the risk of being shocked.
* Stay inside your vehicle or on your equipment if a downed line touches it.
* If people try to help, tell them to stay away.
* Wait for the utility workers to turn off the power and tell you it’s safe to leave.
* Do not try to help someone trapped in a vehicle touching live wires.

*Refer to OH&S part 17 Overhead Power Lines*

# 4.9 - GRAVEL RAKER’S

## Potential Health or Safety Concerns;

• Damage to Equipment (Sprayed rocks)

• Injuries to workers (back, shoulders, arms, hands, crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6”foot wear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Eye Protection,

Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must demonstrate competency in proper raking techniques.

### Recommended Procedures and Precautions to Offset Hazards

1. Work inside the safe work zone as set up with barricades or flag people (do not stand beyond this area to rake seam).
2. To prevent back injury, maintain an upright position when working.
3. Warn other workers of the hazard of walking behind the rake while it is being used.
4. Watch for traffic, moving equipment (rollers) or vehicles at all times
5. Avoid using rake to move large amounts of material.
6. Keep rake clean and in good working order (tighten loose bolts and screws).
7. When building a take-off pad, make sure chipper is out of the way and does not back up until you have finished. Indicate to the chipper operator or supervisor when you have finished.
8. When finishing or ending a mat, make sure rollers stay back, indicate to the operator when you have finished.
9. Place the rake in a safe place when it is not being used. Make sure it cannot be stepped on, tripped over or hit by machinery.
10. If rakes are carried on the chipper, they must be in a secure area and not interfere with any operation of the machine or its operator.

# 4.10 - CHALLENGER SWEEPER

## Potential Health or Safety Concerns;

• Damage to Equipment/vehicles (Flying debris, Accidents)

• Injuries to workers and public (Flying debris, dust)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6”foot wear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the sweeper and have the correct class of driver license.

***WARNING:***

*If operating a new sweeper, see important information contained in the operation manual for your piece of equipment.*

*Please refer to the chassis manufacturer’s documentation for information on operating the chassis.*

### Recommended Procedures and Precautions to Offset Hazards

**STARTING THE ENGINE**

1. Read the auxiliary engine instruction manual before operating engine.
2. Check the auxiliary engine oil and coolant levels and hydraulic oil level.
3. Complete the Equipment Checklist.
4. Ensure the chassis transmission is in parking position and all sweeping functions are off.
5. Turn the ignition key to the PREHEATING position to allow glow plugs to heat up. Wait for 5 to 10 seconds (do not preheat glow plugs when the engine is warm) and turn the key to the START position. Release it soon as the engine starts.
6. Self-propelled pick-up sweepers are equipped with the Murphy automatic shut-off system. This system protects the auxiliary engine and hydraulic pump for major defects. If the system detects low oil pressure, high coolant temperature, or low hydraulic oil levels, it will shut off the engine. The unit can be reset at any time by turning the ignition key off and then back on again.
7. Should the protection system stop the engine, check for the problem and repair as required.
8. If the engine stalls during normal operation and no faults are detected, shut off all sweeping functions, restart the motor and run it at idling speed to prevent excessive heat buildup.
9. When the auxiliary engine is no longer required to run the sweeping functions, let the engine run at low idle for few minutes before shutting engine down. This allows the engine and hydraulic pump to properly cool all fluids.

**SWEEPING**

1. Increase the auxiliary engine RPM (1500-2000).
2. Turn on beacon light.
3. Press lower part of the broom/conveyor lower switch to lower the main broom and conveyor and supply power to (activate) switches which control rotation of main broom/conveyor and two side brooms. When main broom and conveyor are in sweeping position, the hopper light goes on indicating the sweeper is ready for sweeping. The main broom and conveyor will not start unless the hopper is fully lowered.
4. Press lower part of broom/conveyor rotation switch to rotate the main broom and conveyor.
5. If dust control system is required, press water pump switch to spray water through the nozzles. Depending on how much material will be swept and how dry it is, adjust water flow to each nozzle group by opening or closing ball valves. Water should only control the dust and not create mud. Too much water will decrease sweeping quality.
   1. **NOTE*:*** *It is recommended to make a broom pattern inspection daily to ensure the brooms are properly set (see Adjustments in the Service section for proper broom pattern). Broom wear will increase and sweeping efficiency will decrease with excessive broom pressure, while a pattern too light will cause improper sweeping.*
6. Press lower part of side brooms switches to lower and activate rotation of the side brooms for normal sweeping operation. When side brooms are activated, you can adjust the down pressure of the side brooms by using the potentiate meters. In the “10” position, the brooms are not touching the street surface and in the “0” position, the brooms have maximum pressure on the ground. For heavy debris, set potentiate meters at #1 or #2 and for light debris at #5 or #6. Proper broom pressure is very important. Using high down pressure on the ground will cause rapid broom wear and excessive power consumption.
7. SELF PROPELLED PICK-UP Sweepers are equipped with electric side broom tilt controls. Adjust the angle of the side broom to best fit the shape of the surface gutters.
   1. IMPORTANT: Be sure side broom angle is correct before adjusting gutter broom down pressure.
   2. **NOTE:** *Speed of the truck depends on the amount of material which has to be swept. The more material that is being picked up, the slower the sweeper has to move. In extremely heavy material, use brakes to slow down the sweeper.*
   3. **NOTE*:*** *Conveyor stall indicator (buzzer and light) activation will indicate that too much material is transported on the conveyor, the hopper is full, or too large of an object was picked up by the sweeper and stalled the conveyor. Slow down your ground speed to allow the conveyor to recover. It the buzzer remains on, check if hopper is full by looking into hopper through the rear window or inspection door.*
8. To clean conveyor from excessive amount of material or big objects, push broom/conveyor rotation switch to center position. Wait for the main broom and conveyor to stop rotating, then press lower part of broom/conveyor rotation switch to rotate the conveyor in REV direction. Once the conveyor is free of debris, release the switch. 9. To stop sweeping, turn the water pump off and simply depress the upper part of the broom/conveyor switch and hold for a couple of seconds. This will lift and stop the conveyor/broom as well at the gutter brooms. To resume sweeping, turn the water pump on and simply depress the lower part of the same switch and hold for a couple of seconds. The broom/conveyor and the gutter brooms will lower to their previous setting and start rotating.

**NOTE:**

*Before shutting the auxiliary engine off, it is recommended to neutralize the gutter rotation switches as well as the rear broom rotation switch*. *Flush the conveyor system regularly.*

*Hook up water system (hydrant or water pump) by way of hose and cam lock. Run water and the conveyor system simultaneously to remove debris*

**DUMPING**

**IMPORTANT**: *When hopper is full, it must be dumped before sweeping can continue.*

1. Shut off the water pump. Lift the side brooms, conveyor, and rear broom by pressing the conveyor lift button to the UP position and hold for approximately 2 seconds. This one – button stop feature is designed so that the operator can turn off the sweeping functions on the sweeper using only one button. Do not operate hopper until conveyor and main broom are raised to the upper position.
2. Drive to an appropriate dump area.

***WARNING:***

*To prevent accidental damage or injury the unit must be level before dumping or raising the hopper.*

*Always check for overhead clearance before raising the hopper. Serious damage or injury may result otherwise.*

**NOTE**: *At night, the broom lights may be used to assist in backing up.*

1. When in position, place the sweeper transmission lever in parking position and apply the chassis parking brake.
2. Elevate the hopper to requested dump height by pressing hopper lift switch. The hopper is capable of being dumped at any height.

**NOTE:** *If dumping into a truck, ensure that there is clearance between the hopper door and the truck box.*

1. Press hopper tilt switch to dump the contents
2. When hopper is empty, return it back to it home position by pressing the hopper tilt the other way switch.
3. Lower the hopper to its transport position by pressing hopper lift switch.

**NOTE*:*** *Hold hopper lift and hopper tilt switched for 2-3 seconds after the hopper tilts and lower to its home position. This ensures that the hopper door has closed and hopper is sitting on the sweeper frame.*

1. Make use of a spotter when practicable to maneuver through intersections or in tight areas of operations.
2. Park in a safe area, away from traffic when possible.

# 4.11 - ROSCO SWEEPER

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers and public (Flying debris)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, (Dust mask or respiratory protection if required). Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the sweeper and have the correct class of driver license.

### Recommended Procedures and Precautions to Offset Hazards

*The Machine May Only Be Started And Driven By Trained And Authorized Personnel.*

PRIOR TO THE START OF WORK:

* Carry out inspection and servicing work.
* Keep the surfaces and the driver position free from obstructions, grease, dirt, ice, etc.
* Check indicator and warning flasher system, as well as the horn and lighting.
* Check the parking brake.
* Check the tire pressure. (With excessive air pressure there is the danger of an explosion)
* Check the fuel level. Never drive unit if the fuel tank is empty.
* There is an increased risk of fire when fuel is handled, only authorized personnel are permitted to fuel, lubricate, and service.
* Check the level of the water tank.
* Check broom condition and ensure it is free of foreign objects.
* Complete the equipment checklist.

Before starting work, assess the work area for:

* Obstructions within the working and driving area
* The load-bearing capacity of the ground and the required safeguards for public traffic
* Become aware of all the equipment and controls of the machine and their function (IT WILL BE TOO LATE ONCE YOU ARE ALREADY WORKING)
* Ensure that nobody is in front of, underneath or behind the machine.
* Do not allow anybody to stand within the danger zone of the machine.
* Ensure adequate visibility, clean and adjust the required mirrors properly.
* Keep the control and safety signs clean.
* Following servicing work, check that all tools have been removed from the machine and that all safety devices have been reattached and placed in their protective position.
* The diesel engine should only be started from the driver’s position.
* The controls must be in the basic position prior to starting the diesel engine.

Be sure the parking brake is applied, and the Forward/Reverse control is in the neutral position before starting the broom.

**ENGINE START**

Ensure adequate ventilation prior to starting.

* Follow engine start procedure as described in the Operating Manual.
* Be sure all controls and gauges are operating properly before starting a job.
* Do not operate the broom if any of the warning buzzers /lights are on.

Prior To Moving Off

Always use the safety belt and ensure all doors are closed.

**The carrying of additional persons is not permissible.**

* Allow the machine to warm up under medium load.
* Ensure that steering functions and brakes/emergency brakes are functioning properly.
* In the event of functional defects in the steering and brakes, stop the machine immediately and have the faults rectified.
* When moving off, ensure that no lumps of soil have stuck to the tires.
* Check the vicinity to see whether anyone is present.
* In emergency situations and in the event of danger, the machine can be made to stop immediately by actuating the parking brake.
* Become accustomed to using the hydro-static transmission to assist in braking.
* The drive speed must always be adapted to the ambient conditions.
* Never leave the driver’s position when driving.
* Steer the machine clear of steep edges and embankments, so that it cannot slip or topple.
* Always ensure an adequate distance when negotiating underpasses, bridges, tunnels, overhead cables, etc. Desist from every mode of operation that may affect the stability of the machine.
* Avoid sudden curves when going up and downhill and when traversing across slopes (danger of toppling)

**DRIVING**

Watch for bystanders and never allow anyone to reach into the broom while it is operating.

**Danger of accident:**

* Do not drive downhill with the diesel engine at idle speed or with the drive lever in the neutral position.
* If any of the controls fail during operation, stop the broom immediately.
* Do not go under the broom when the engine is running.
* Control of the sweeping action can be obtained by using the brush down pressure control valve. Sweep only with the tips of the brush bristles.
* For most normal sweeping operations, the Float position works best.
* When traveling downhill, put the broom in low range and keep engine RPM at maximum.
* Do not switch off the ignition switch while driving.
* Use a spotter when practicable when moving through intersections.

**GEARSHIFT**

Danger of accident:

* The hydro-static drive system propels the Sweeper forward and reverse with dynamic braking.
* Control for the drive is provided by a manually operated lever at the driver’s platform located on the right side of the seat.
* The sweeper must come to a complete STOP before changing direction of travel. Failure to do so will result in damage
* The HIGH – LOW speed selector switch is located on the control panel on the operator’s right side. Use HIGH speed for road travel and LOW speed for sweeping operation.
* The sweeper must come to a complete STOP before using HIGH-LOW selector switch. Failure to do so will result in damage

**STOPPING**

Danger of accident and injury:

* Idle down and apply parking brake.
* If the driver leaves the driver position even for a brief period, switch off the engine.
* Service only when the engine is at a standstill.

Prior to switching the engine off:

* Apply the parking brake.
* Reduce engine speed to minimum.
* Direction lever locked.
* Observe all gauges.

Switch engine off when safe to do so:

* Do not switch the engine off from full load operation.
* Allow the engine to continue to run at idle speed for 1-2 minutes for temperature compensation.

**LEAVING THE MACHINE**

* The driver may only leave the machine when it has been properly parked. The Highway Code regulations must be observed.
* Apply the parking brake, directional lever locked, the engine is switched off, and key is removed.
* Lock all panels and doors.
* Park in area where the machine is not hindering traffic.
* Do not park the machine in way of embankments or edges.
* Do not park the machine on loose or freshly deposited earth.
* On inclines, always park the machine on the hill side and secure with wheel chocks.

**MONITORING**

During use, watch the control and display devices at regular intervals.

Where an alarm lamp/buzzer indicates a fault, determine the cause and have it rectified.

Watch the temperature display, if it should rise excessively, determine the cause and have it rectified. At excessive working temperature an audible signal should be given.

Check the instruments for air and oil pressure. Check the filling levels of fuel, oil, water, and additive. Top up the tanks well in advance. Never drive when the fuel tank is empty. Check air filters, clean or replace if necessary.

# 4.12 - COLD MILLING MACHINE OPERATION

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers and public (Pinch Points, Debris, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Reflective Vest (Class 2-3), Ear/Eye Protection, (Dust mask or respiratory protection if required). Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Milling machine and have the correct class of driver license.

### Recommended Procedures and Precautions to Offset Hazards

*The machine may only be started and operated by trained and authorized personnel*

* Read and observe the operating manual and safety instructions
* Stand clear of moving parts
* Always use steps, platforms and handrails provided. Being sure to use both arms when climbing (three points of contact)
* Use a spotter to move through intersections or tight areas.
* Always park in a safe area, away from traffic when possible.

Prior to the start of work

* Carry out servicing and inspection
* Check that fluids are at operating levels
* Ensure adequate visibility, clean and adjust mirrors accordingly
* Check horn, backup alarm, lighting, and emergency stop buttons are working properly
* Attach and secure levelling devices and controls
* Ensure that the operators’ platform and instrument panels are clear of obstacles
* Ensure that nobody is in front of, underneath or within the danger zone of the machine
* Assess the work area for obstructions like manholes, valves, etc.
* The work zone is to be signed/barricade accordingly to ensure the safety of the public
* Load-bearing capacity of the ground must be sufficient
* Complete the equipment checklist

Engine start

* Walk Around the machine prior to getting on the machine
* Use three points of contact when climbing onto the operating platform.
* Ensure guard rails are closed when on operating platform.
* Ensure adequate ventilation prior to start-up
* Follow engine start procedure as described in the Operating manual

Operation

* Be aware of unusual noises, smoke or other unusual circumstances. Stop the machine in the event of a fault.
* Check that all controls and signalling elements function correctly
* The operator will drive in a safe and controlled manner, being aware of their surroundings at all times.
* Operator will not move the milling machine until the ground personnel have signaled that it is safe to do so
* Be aware of overhead obstructions and stay well clear of power lines.

**Warning:**

*If the machine should touch high-voltage lines. Do not attempt to get off the machine If possible, move the machine away from the danger zone. Warn others not to come near or touch the machine. Do not attempt to get off the machine before the touched/damaged cable is turned off.*

* Move the machine on sufficiently solid ground
* When operating the milling machine over obstacles, for example, in and out of cuts or off trailers. Always keep the machine level via the height adjustments.
* Before engaging the conveyor system, the operator will.
* Determine that no one is near any of the conveyors moving parts
* Be sure that no persons or property are in the discharge area

**Warning:**

*Never work on or near the conveyor while the machine is running*

### Operations of Milling Machine

**Engaging Milling Drum**

* Make sure that the back drum door is closed and the safety pins are secure
* The side plates must be all the way down
* Ensure that all personnel are clear of the machine. Eye contact is maintained with ground workers.
* The drum must not be in contact with the ground
* The operator will sound the horn twice as a warning that the drum is about to be engaged

**Lowering the Milling Machine into the Cut**

* The operator will lower the machine slowly and as evenly as possible
* Lower until the drum is just above or just touching the surface

**Warning:** *Always lower the machine manually into the cut before turning on the automatics. Lowering the machine with the automatics will cause the machine to dive into the ground too fast. Causing an unsafe condition that could result in injury or damage to the machine.*

* When the machine has been lowered to, or near to, the desired depth. The automatics can then be turned on.

**Moving Leg to the In Position W35, W50 and W120**

The back leg on the righthand side can be moved from beside the machine, to inside the machines frame, allowing the grinder to cut closer to obstacles.

* Make sure the milling drum is turned off
* You must be on a stable and level surface
* Lower the machine evenly until the weight of the machine is resting on the cutting drum

**Warning:** *Lowering the machines weight onto the milling drum may damage the asphalt. This should only be done on asphalt scheduled for repair.*

* Continue to lower the machines right side only, until the wheel/track raises fully

**Warning:** *Do not lower the left leg any further. This will cause the machine to become unstable.*

* Pull leg pin
* Flip the wheel/track direction lever.
* Move the leg to the in position. Keep your hands away from pinch points.
* Replace leg pin
* Raise the right leg until the wheel/track touches the ground.
* Raise the machine evenly until the drum is out of the ground and at a safe traveling height.

### SAW CUTTING

**Engaging Milling Drum**

* The side plates must be all the way down
* Ensure that all personnel are clear of the machine. Eye contact with ground workers
* The drum must not be In contact with the ground
* Water must be used at all times when cutting
* The operator will lower the machine slowly and as evenly as possible
* See sub section changing teeth

**CHANGING TEETH**

**WARNING:** *milling teeth can be very hot. PPE must be worn at all times. Avoid direct contact*

* Run water system prior to tooth change to cool the bits
* The machine will be raised to service height
* Lower leg supports
* The rear drum door will be raised fully and safely latches are to be secured before anyone enters the drum area
* Tools will be inspected for any defects and replaced as needed
* When striking the bit with either the hand held hammer or pneumatic hammer (see use of compressed air in section 3.2 of the safe work practices). Position yourself so that the path of the exiting bit is away from your body.
* Ensure that your hands are safe from being struck or pinched.

# 4.13 - CHIPSPREADER

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Accidents)

• Injuries to workers and public (Pinch points, Debris, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Chip spreader and have the correct class of driver license.

### Recommended Procedures and Precautions to Offset Hazards

*The machine may only be started and operated by trained and authorized people.*

Prior to the start of work:

* Carry out inspection and servicing work.
* Complete Equipment Checklist.
* Keep the surfaces and the operator position free from obstructions, grease, dirt, etc.
* Check indicator and warning flasher system, as well as the horn and lighting.
* Check the tire pressure. (With excessive air pressure there is the danger of an explosion)
* Check the fuel level. Never operate until the fuel is empty. Fill fuel tank fully in the evening.
* There is an increased risk of fire when fuel is handled, only authorized personnel are permitted to fuel, lubricate, and service.
* Before starting work, assess the work area for:
* obstructions within the working and driving area
* the load-bearing capacity of the ground and the required safeguards for public traffic.
* become aware of all the equipment and controls of the machine and their function (IT WILL BE TOO LATE ONCE YOU ARE ALREADY WORKING)
* Ensure that nobody is in front of, underneath or behind the machine.
* Do not allow anybody to stand within the danger zone of the machine.
* Ensure adequate visibility, clean and adjust the required mirrors properly.
* Keep the control and safety signs clean.
* Following servicing work, check that all tools have been removed from the machine and that all safety devices have been reattached and placed in their protective position.
* The controls must be in the basic position prior to starting the diesel engine.

Engine start

* Ensure adequate ventilation prior to starting.
* Follow engine start procedure as described in the Operating Manual.

1. Unsafe operation of equipment may cause injury. Read, understand and follow the manuals when operating or performing maintenance.
2. The front hoppers should be fully closed up and latched using the safety chains on the left side of the machine when the unit is travelling between job sites to avoid possible damage to the outer ends of the hoppers.
3. Keep machine on road or relatively uniform surface at all times to avoid loss of traction and/or possible damage to the front hoppers or rear of conveyors.
4. Place truck gearshift in neutral as soon as the truck is connected to the spreader.
5. Under most operating conditions the spreader should be allowed to tow the truck. However, certain steep upgrade or downgrade conditions may require the truck to assist the spreader. The spreader must pull the truck even while the truck is assisting. Do not attempt to push the spreader with the truck.
6. Refer to the spreader manual instructions on towing, damage to the hydraulic motors may occur.
7. Never use the spreader to tow any other equipment than what is done under normally operating conditions.
8. Avoid loading the machine with material in the hoppers if at all possible. Added weight in either, the front or rear hoppers affects traction and breaking.
9. Always install locking control box and chock wheels when leaving machine unattended.
10. Before operating, do an inspection of the machine for condition of the tires, fluid leaks, fluid levels, fuel level, loose bolts, improper hose routing, etc. Be sure that the machine is in a safe condition to operate.
11. Never exceed the maximum inflation pressures indicated on the tire’s sidewall.
12. Stay off hopper while machine is moving. Machine movements could cause a fall resulting in injury or death.
13. Turning ignition switch to “OFF” results in emergency stop.
14. Do not engage “Park Brake” until the machine is at a full stop.
15. Always place the mode selector switch in the “Park” position when the spreader is stopped.
16. Shut machine off and wait for all movement to stop before leaving operator’s seat or servicing.
17. Do not reset computer while spreader is in motion, violent stop will occur.
18. Augers and belts may start automatically at any time. Do not attempt to clear any jam with the engine running.

**Warning:**

* Never place hands between the spread roll or gate and rear of hopper. The gate could move at any time and cause severe injury.
* Do not travel with the seat unlatched; seat movement could occur causing disorientation and possible loss of control.
* Remain clear of all moving parts.
* Always use steps, platforms and handrails provided.
* Always have shields, covers and guards in place when operating.
* Since all functions except power steering and brakes are electronically controlled, turning the ignition key to “OFF” results in and emergency stop.
* Keep loose clothing away from conveyor area.

**Trouble Shooting**

Should a piece of foreign material become lodged in gates, push the gate override button to open the appropriated gate above the set point to allow the piece to pass. Releasing the override will return the gates to the previous position.

Adjust spreader hitch height as necessary to accommodate different trucks.

Operate the conveyor belt switches so as to maintain an even distribution of aggregate in the front hopper.

Set rear conveyor gates to deliver as much material as possible to the conveyors without spillage and conveyor speed should be set to deliver slightly more material to the front hopper than is being spread. Conveyors should run 80% of the time. Automatic conveyor controls will sense lack of or sufficient material in the front hopper and will start/stop conveyors.

Belt speed controls located on the right catwalk operator position allows the varying of the speed of each conveyor independently to provide a uniform distribution of material to the front hopper.

The normal operation would be to:

* Turn on the Master gate switch and also all of the individual switches.
* The gates would then be turned on or off from the thumb switches on the control handle.
* If it is desired to turn the gates off instantly, the GATE MASTER switch can be turned off before the thumb switch, and then the thumb switch turned off.
* Be sure to turn the GATE MASTER switch back on again before opening the thumb switch or no gates will open with the bus bar.
* For shoulder work or patch work, turn off the spread roll for the hopper and increase the application rate as required. Doing so will prevent unnecessary wear of the spread roll where gates are closed.

**NOTE:**

* All maintenance and adjustments must be carried out by trained and authorized personnel.
* Refer to the operating manual to setup the computer.
* Report all or any abnormalities to the supervisor.
* Park in a safe area, away from traffic when possible.

# 4.14 - RUBBER WHEELED ROLLER

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Accidents, Rollover)

• Injuries to workers and public (Blind Spots/Pinch points, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, Dust mask if required, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Roller and have the correct class of driver license.

### Recommended Procedures and Precautions to Offset Hazards

PRIOR TO STARTING:

* First time users are to read operating manual and safety instructions.
* Walk around machine. Inspect for oil leaks, low tires, or damage.
* Check fluid levels and perform servicing work
* If using water sprinkling system, check water level
* Complete Equipment Checklist.

**Warning**: *Prior to opening the water filler cap the water tank must be vented.*

ENGINE START

Ensure adequate ventilation prior to starting.

* Mount or dismount following the proper procedures outlined in the safety manual
* Follow engine start procedure as described in the Operating Manual.
* The controls must be in the basic position prior to starting the diesel engine.
* Allow the machine to warm up under medium load.
* Check to see that all gauges are working, and readings are normal.

OPERATING

Always use the safety (seat) belt and ensure all doors are closed. The carriage of additional persons is not permissible.

* Ensure that no one is within the safety zone of the machine.
* Move the roller slowly forward and apply brakes to see if they are working properly.
* In the event of functional defects in the steering and brakes, stop the machine immediately and have the faults rectified.
* Ensure that no lumps of soil have stuck to the tires.
* Be aware of all equipment, personnel, slopes, banks, and general working area at all times.
* Avoid sharp turns. Danger of rolling over.
* Always ensure an adequate distance when negotiating along shoulders, underpasses, bridges, tunnels, overhead cables, etc.
* The roller MUST come to a complete stop before changing the direction of travel.
* Only use the transport gear when traveling long distances. Work assignments may only be carried out with the 1st and 2nd gears.
* Do not drive downhill with the diesel engine at idle speed or with drive lever in the neutral position.

PARKING

Ensure the stability of the ground is adequate before parking.

* Apply parking brake.
* Lock direction lever.
* Reduce engine speed to a minimum.
* Allow engine to cool before turning off.
* After turning off the engine. Do a walk around and inspect for leaks, low tires or damage. Advise supervisor of any problems.
* Always park in a safe level area, away from traffic when possible.

# 4.15 - OPERATION OF A PACKER

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Accidents, Rollover)

• Injuries to workers and public (Blind spots, Pinch points, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Packer and have the correct class of driver license.

### Recommended Procedures and Precautions to Offset Hazards

1. Before equipment is started, walk around the machine. Visually inspect for oil leaks, low tires, vandalism or any damage to equipment. Advise supervisor of any abnormalities.
2. Mount and/or dismount the packer following the proper procedures outlined in the Safety Manual.
3. Complete the Equipment Checklist.
4. Operators are required to start their equipment prior to the start of their shift. Arrive early and allow for warm up.
5. Climb into the machine and be seated (seat belt fastened) prior to starting the equipment. Start at idle speed. Check to see that all gauges are working, and readings are normal, then climb out and inspect lights.
6. Move equipment slowly forward and apply brakes to ensure they are working properly. Check to see that back up alarm is working. Report any concerns to your supervisor.
7. If the packer is equipped with a blade, before moving the packer check the operation of the blade by raising and lowering it.
8. Due to poor visibility when operating the packer, be aware of all equipment, personnel, surveyors, slopes, banks, stakes and survey markers on site and in the general working area at all times.
9. Whenever possible, travel facing oncoming traffic.
10. Use a spotter when practicable to move through intersections and tight areas.
11. Avoid sharp turns, particularly on rough or gravelly surfaces. Be sure to look first, even if turn is a minor one.
12. When travelling along slopes, NEVER make sharp turns. On a slope, a sharp turn can change the packer’s centre of gravity possibly causing a rollover.
13. On vibratory equipment, always shut off the vibrator prior to stopping and turn it on after the packer is in motion. NEVER have the vibrator on when the equipment is not in motion.
14. On packers with blades, carry the blade low to the ground when not actually engaging the ground.
15. In the event of a rollover, shut off the engine immediately and notify your supervisor.
16. Extreme care must be used in the operation of packers when compacting edges one meter in height or more. Packers should be at least 1.5 meters from the edge of any bank due to vibration.
17. Apply brakes, lower all attachments and set parking brake before getting off equipment. Allow the equipment to cool off at the end of a shift prior to turning off the engine.
18. Always park in a safe level area, away from traffic when possible. After parking equipment at the end of a shift, walk around the machine. Visually inspect the packer, again, for oil leaks, low tires, or damage. Advise your supervisor of any problems

# 4.16 - FIBER MAT MACHINE

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers and public (Pinch points/Debris, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6”footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3)t, Ear/Eye Protection, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Fiber Mat machine.

### Recommended Procedures and Precautions to Offset Hazards

*The machine may only be started and operated by trained and authorized people. Danger of accident and injury!*

PRIOR TO THE START OF WORK**:**

* Carry out inspection and servicing work.
* Keep the surfaces and the operator position free from obstructions, grease, dirt, etc.
* Check indicator and warning flasher system, as well as the born and lighting.
* Check the tire pressure. (With excessive air pressure there Is the danger of an explosion)
* Check the fuel level. Never operate until the fuel is empty. Fill fuel tank fully in the evening.
* There is an increased risk of fire when fuel is handled, only authorized personnel are permitted to fuel, lubricate, and service.
* Complete Equipment Checklist

PRECAUTIONS PRIOR TO STARTING THE MACHINE

Before starting work, assess the work area for:

* Obstructions within the working and driving area
* The load-bearing capacity of the ground and the required safeguards for public traffic
* Become aware of all the equipment and controls of the machine and their function
* Ensure that nobody is in front of, underneath or behind the machine.
* Do not allow anybody to stand within the danger zone of the machine.
* Ensure adequate visibility, clean and adjust the required mirrors property.
* Keep the control and safety signs clean.
* Following servicing work, check that all tools have been removed from the machine and that all safety devices have been reattached and placed in their protective position.
* The controls must be in the basic position prior to starting the diesel engine

ENGINE START

Ensure adequate ventilation prior to starting,

* Follow engine start procedure as described in the Operating Manual.
* Complete the equipment checklist.

START UP (Lateral Control Box)

* Turn master battery breaker on.
* Start engine by turning the key 1/3, then slacken. Let it warm up for 20 min.
* Turn the switch to the speed position to increase the speed of the engine.
* Press “ON” the general control.
* Start up the binder pump; turn the switch to position 1”.
* Adjust the height of the pin to connect to the distributor (Tow).
* Once connected and locked, lift the prop.
* Connect the lights and air brake.
* Lift the spray bar at its maximum position. (Lateral/Rear Control Box)
* Double check connections and pintle pin and chains.

RECYCLING/STIRRING OF THE BINDER WITHIN THE STORAGE TANK (DISTRIBUTOR)

* Connect the binder (emulsion) hoses from the distributor to the fiber mat machine.
* Check that the spray bar is at the upper position.
* Open the spraying blocs
* Put the drive supports in position.
* Put the electronic general control to 1”. (Rear Box)
* Put the water pump to start. (Rear Box)

BINDER CIRCULATION THROUGH THE SPRAY-BAR

* First check rear circulating glycol pre-heat bars are up to temperature.
* Choose Mixing (Control Box)
* Check that the binder pump is turning.
* Open the supply valve and decanting valve.

SPRAYING (Rear Control Box)

* Choose the Spray bars. (Menu purple F3, F4, F5)
* Select the nozzles and the fibre cutters.

1. If the RED round on the seen APPEARS, the nozzle is selected.
2. If the RED round on the screen DISAPPEARS, then the nozzle is not selected.

* Adjust the binder spread rate on the screen. (Menu purple F2)
* Adjust the fibre spread rate on the screen. (Menu purple F6)
* Time delay (Menu red F2)

1. Press on the key to choose the working mode
2. With the cross: no time delay
3. Without the cross: time delay

* Dope (Menu red F3)

1. With the cross: no dope
2. Without the cross: dope

* Open the dope supply valve of the spray bar if the choice is with dope, then remove the protective nozzle covers.
* Adjust the working height of the spray-bar to about 27 cm.
* To begin spraying turn the nozzles general control switch to position spraying.

STOP SPRAYING (Rear Control Box)

* Turn the nozzles general control switch to position mixing.
* End of spray nozzles Selection: Turn the spray nozzles Switches to position off.

*Flushing of binder circuit, flushing of spray-bar cleaning of pump (rear box)*

* Quit the automatic mode, (Menu purple FI)
* Select manual mode. (F5)
* Choose Circulation- open the valves 1 and 3. (Menu red F2, F4)
* Put the speed of the binder pump at 250 ltr/ min. (Menu red F2)
* Start the binder pump. (Menu red F3)
* Close the supplying valve.
* Open the Cleaning valve.
* Wait 5 minutes.
* Close the deportment valve. Close the back to tank valve. (Menu red F4)
* Close the cleaning valve.
* Stop the binder pump (Menu light blue F3)
* Open the exhaust valve
* Put 2 or 3 litres of cleaning product in the filter.
* Close the exhaust valve.
* Start the binder Pump for 2 cr3 seconds. (Menu light blue F3)
* Open the purge valve and stop the machine.

PERMANENT SHUT DOWN

* Put the wheels straight
* Lower the drive supports.
* Lift the spay-bars to the upper position.
* Close the left and right spraying bloc.
* Turn off the contact key to stop the engine
* Turn of the battery breaker, (Master Switch)

MANUAL SPRAYING

* Quit the automatic mode. MENU #1 F1 (Menu light blue F3)
* Select manual mode. (F5)
* Choose the hand lance. Rear Box (Menu blue F2)
* Put the speed of the binder pump at 50 ltrs/min. Rear Box (Menu light blue F2)
* Start the binder pump. Rear Box (Menu light blue F3)
* Open the supplying valve.
* Open the supplying valve of the hand lance.
* Open the hand lance valve.

FLUSHING OF THE SPRAY PIPE

* Shut down the supplying valve of the hand lance.
* Open the cleaning valve of the hand lance.
* Open the main valve to empty the binder remaining in the pipe. Thereafter close the valve.
* Close the cleaning valve of the hand lance.
* Open the valve of the hand lance to purge the air. Then close the valve.

FILLING DOPE

* Put the battery breaker to the on position.
* Start up the engine.
* Operator must wear all PPE when handling the dope.
* Put the suction hose in the dope can.
* Open the air valve to start the filling pump.
* Check the filling level
* Close the dope suction valve.
* Close the air valve to start the filling pump.
* Remove the suction hose of the dope can.
* Stop the engine.
* Turn the battery breaker to the off position.

# 4.17 - SCREED OPERATION

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers and public (Pinch Points)

## Equipment, PPE and Apparel to be used;

CSA Approved 6”footwear, Hard Hat, Gloves, Reflective Vest (class 2-3), Ear/Eye Protection Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Screed.

### Recommended Procedures and Precautions to Offset Hazards

PRIOR TO STARTING:

* First time users are to read operating manual and safety instructions.
* Walk around machine. Inspect for oil leaks or damage.
* Check fluid levels and perform servicing work

General Care

1. Check lines and hoses for wear.
2. Check steps and safety rails to ensure they are not loose.
3. Keep screed clean of asphalt build up and free from grease and oil.
4. Have secure holder for levels and probes.

Checking Crown

1. Raise screed and lock in raised position.
2. Place paver in neutral or stop position and apply emergency brake.
3. With one person on either side of the screed, pull string tight across the bottom of the screed at both the front and the back.
4. Remove the crown adjustment wrench from the storage position and adjust crown to the desired position.
5. Replace wrench in storage position.

Paving Operations

1. Guide paver into starting position making sure area is free of workers and tools.
2. Stand free of screed as it is lowered.
3. Check for clearance before extending extensions to desired positions.
4. Adjust screed for “Take Off’”.
5. Indicate to paver operator when ready to “Take Off”.
6. Do not allow tools or workers to clutter the screed area.
7. Watch for rollers at all times.
8. At the end of the mat, retract the extensions.

# 4.18 - DISTRIBUTION TRUCK

## Potential Health or Safety Concerns;

* Damage to Equipment (Accidents, Spills)
* Injuries to workers and public (Fire, Burns, Pinch Points)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest Or coveralls (Class 2-3), Ear/Eye Protection, Face Shield when handling lines, valve or product. Alberta #2 First Aid Kit, Burn kit, Fire Extinguisher, Spill Kit, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Distributor Truck and have the appropriate class of license and Q endorsement if required. National Safety Certification course completion required, and an operator competency completed. Operator must be trained in the hot oil loading procedures, as well as having a good understanding of the unit’s Operator’s Manual

### Recommended Procedures and Precautions to Offset Hazards

*Prior To Starting (Operator must have TDG certificate and a valid Class License)*

* Operator must have a current TDG certificate and be familiar with SDS documents to understand the safe handling procedures of different types of oil. Ensure that there is a current copy of the applicable SDS in the truck.
* Do a walk around, ensure lights and directional/warning lights are working, check belts, tires etc.
* Check the fuel and oil level, hydraulic fluid level, and the cooling system level
* A written Drivers Vehicle Inspection Report must be filled out (Pre/Post Trip)
* Ensure that all safety equipment is in working order i.e. seat belts and back up alarms. Seat belt and applicable PPE must be worn when operating a truck.
* Ensure that truck is equipped with a first aid kit with burn treatment kit, fire extinguisher (should be close by when heating oil), flares, and flags
  + *Burn treatment if splashed with hot oil, rinse and cool immediately, Do not “Rub” excessively if burn is deep or oil is stuck on. Keep clean, wrap with a non-stick cover, and get medical attention based on severity of the burn*.
* Assess the area for hazards i.e. traffic, pedestrians, and overhead lines
* Assess for environmental hazards like inclement weather, potential run-off to drainage system or waterways. If rain is imminent, discuss with supervisor.
* When dismounting or mounting the truck face the steps provided on the truck and use the hand holds. Maintain three-point contact

**Operation**

* Before heating the oil ensure that, all valves are in the off position, the oil in the tank completely covers the heating pipes, and the controls are set for proper circulation and ventilation.
* Turn propane on just before igniting burners so no gas build up occurs in the heating ducts
* While heating oil never leave the truck unattended
* Constantly monitor temperature, heat oil within the confines of recommended temperature
* Extinguish all heating sources after reaching recommended temperature. Close valves on propane bottles
* In wind conditions position the truck so the motor and chimney exhaust is not blowing toward tank ventilation
* Set up fresh oil signs before spraying
* Spray bar ends must be visible in the mirrors at all times
* When practicable use a spotter when moving through intersection and tight areas.
* Always park in a safe area away from any water sources.

**Testing Burners**

* + - 1. Ensure sufficient oil or water is in the tank to cover both heating tubes. (This can be seen from top of tank)
      2. Turn on Main Power switch
      3. A pre-trip inspection must be conducted
         1. Special attention needs to be given to the heating tubes. Burners to ensure there is no build up on them.
      4. Use Panel at back to ignite burning. Start with Bottom burner first.
      5. Look in sight hole for flame.
         1. If no flame Shut down and wait 1 to 3 minutes before starting process over
         2. If problem persist contact your foreman and the mechanic.

# 4.19 - WATER TRUCK AND HYDRANT

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Accidents, Damage to hydrant)

• Injuries to workers and public (Pinch Points, Water Damage)

## Equipment, PPE and Apparel to be used;

Water hydrant connector, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher. Refer Hazard, TAS Assessment and ERP.

**Training Required;**

Employees must show competence prior to operating the unit and have the correct class license and Q Endorsement if required.

**City of Edmonton**

1. The user must have a copy of the current valid hydrant permit and hydrant operating procedures in his unit or vehicle at all times.
2. The hydrant number and location are to be reported to EPCOR water services at

780-412-6800

1. Open and close hydrants only with a key approved by EPCOR.
2. Do not access any hydrants if a coloured disk is already present.

### Recommended Procedures and Precautions to Offset Hazards

1. Check hydrant for any visible defects. Report all defects.
2. Remove one of the small nipple caps, then check to see that all the other caps are tight.
3. Place the Blue disk over the nipple cap threads and then install the flushing valve (gate valve) on the threads of the cap that was removed making sure the flushing valve is in the closed position.
4. Open the hydrant slowly by turning the operating nut in a counter clockwise direction until you hear a hissing noise. Stop at this point and allow the hydrant barrel to fill.
5. Attach a short hose to the flushing valve then attach the meter
6. Slowly open the flushing valve to allow any air to escape. Once all the air has escaped close the flushing valve and continue to slowly open the hydrant operating nut until fully open.
7. Use only the flushing valve to control the flow of water.
8. When closing the hydrant, always close slowly in a clockwise direction to avoid water hammer.
9. At no time is a hydrant to be left unattended, pressured up and accessible to the public.
10. Any problems are to be reported immediately

# 4.20 - LANDOLL TRAILER

## Potential Health or Safety Concerns;

• Damage to Equipment (Equipment damage)

• Injuries to workers and public (Pinch Points, Equipment shifting, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (class 2-3), Ear/Eye Protection (if required) Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must show competence prior to using the trailer and have the correct class license and Q Endorsement if required.

### Recommended Procedures and Precautions to Offset Hazards

**LOADING/UNLOADING**:

* Attach truck to trailer
* Attach hoses, glad hands and safety chains.
* Set PARK BRAKE on truck and supply air to trailer.
* Chock front wheel of truck.
* Start operation of hydraulic power system.
* Move undercarriage forward using the Axle Control Lever.
* Using the Trailer Tilt Lever tilt the front of the bed up until the trailer touches the ground.

*Keep all persons clear while tilting trailer, there is a danger of injury by being pinched by trailer bed.*

* Winch or drive the load onto the trailer. Ensure that the load is steering straight.
* Ensure that the loads centre of gravity is ahead of the axles. The load should never place more weight on the kingpin than on the rear axles during loading and unloading.
* To adjust trailer to transport position, alternate between tilting the front of the bed down and moving the undercarriage rearward.

**Warning:**

* Ensure That The Centre Of Gravity Is Ahead Of Axles. Failure To Do So Can Cause The Back End Of The Truck To Lift Off The Ground. Resulting In A Runaway Or Injury
* After bed tilt angle is fully lowered and undercarriage has been moved to the transport position. Adjust the load to the desired transport position.
* Secure load.
* To unload, reverse the procedures. Keeping in mind that the loads centre of gravity must be forward of the axles.
* Always park in a safe area, away from traffic when possible.

# 4.21 - EZ 2 LOAD TRAILER

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers and public (Pinch Points, Equipment shifting, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (class 2-3), Ear/Eye Protection (if required). Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must show competence prior to using the trailer and have the correct class license and Q Endorsement if required.

### Recommended Procedures and Precautions to Offset Hazards

LOADING:

* Attach truck to trailer
* Set park brake on truck
* Attach hoses, glad hands, electrical and safety chains.
* Supply air to trailer.
* Lower ramps to the ground via the raise/lower valve located at the rear drivers side of the trailer

**Warning*:*** *Ensure that all is clear at the rear of the trailer. The ramps will fall suddenly. Operator to stay in-place until the ramps have lowered fully. Ensuring no one enters the danger zone*

* Release Deck Locks by manually rotating them to the vertical position. They are located at the front of the headboard.
* Move the tilt deck lever (located in the toolbox) to the raise position. The lever should remain in the raise.
* Load equipment. Once equipment has been loaded, move the tilt deck lever to the lower position to lower the deck.
* Inspect deck locks to ensure they have latched securely.
* Secure load.
* Raise ramps to the vertical position via raise/lower valve at the drivers side rear of the trailer. Operator to stay in-place until ramps have raised fully.

*UNLOADING:*

* Set park brake on truck and supply air to trailer.
* Lower ramps to ground (see air ramp operation above)
* Remove tie downs.
* Release deck locks by rotating them to the vertical position.
* Move tilt deck lever (located in the toolbox) to the raise position.
* Unload equipment.
* Once unloaded, move the tilt deck lever to the lower position.

\*\*VERIFY THAT THE DECK LOCKS ARE SECURE\*\*

* Raise ramps (See air ramp operation above)
* Always park in a safe area, away from traffic when possible.

# 4.22 - HITCHING/UNHITCHING TRAILERS

## Potential Health or Safety Concerns;

• Damage to Equipment (Kink Pin, Air lines)

• Injuries to workers and public (Pinch Points, Equipment shifting, Crushing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (class 2-3), Ear/Eye Protection, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must show competence prior to using the trailer and have the correct class license and Q Endorsement if required.

### Recommended Procedures and Precautions to Offset Hazards

1. While doing your walk around be sure that back up alarm is working properly.
2. After walk around is complete, grease fifth wheel with a liberal amount of grease for proper lubrication to the jaws and plate. If using a pintle style hitch, grease receiver to prevent wear.
3. Always use a spotter if available otherwise check behind the vehicle to make sure there are no obstructions in your path where you want to back up.
4. When safe to do so, shift the truck into reverse and proceed to move in reverse towards the trailer.(*utilizing a spotter whenever possible*).
5. When you are close to the trailer, get out of your truck using the 3-point contact and check to make sure the truck and trailer are at comparable heights.
6. Release tractor brake and shift into reverse, let clutch out slowly and begin backing under the trailer until you hear the pin latch, or the hitch is under the pintle doughnut.
7. Do a tug test by applying the trailer brakes, shifting truck into a forward gear.
8. Release tractor brake (or pull electric safety pin) and let clutch out slowly, if the engine starts to labour / stall or if trailer brakes skid, the trailer should be hitched securely.
9. Apply brakes again, get out and lift landing gear.
10. Connect hoses to the trailer and charge the system and ensure electrical plugs have been installed.
11. Apply brakes, get out and check to see if jaws are latched, if so get back in truck.
12. When safe to do so, release all brakes and proceed.
13. When trailer has been fully charged with air, apply trailer brake using the spike

# 4.23 – MANUAL SLACK AIR BRAKE ADJUSTMENT

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicle (Brake Failure, Accidents)

• Injuries to workers and public (Pinch Points, Moving Equipment, Possible Brake Failure)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to adjusting slack adjusters and have the correct class of driver license as well as a Q Endorsement.

### Recommended Procedures and Precautions to Offset Hazards

* Park unit on level floor or ground.
* Lower all attachments (if unit is so equipped) to floor or ground.
* Place transmission in neutral.
* Make sure air pressure is a minimum of 100 lbs.
* Apply parking brake and block wheels with wheel chocks at the front and rear of tandems.
* Ensure the unit is secure.
* When unit is secured, release the park brake.
* Shut the unit off.
* Shut off master switch, if the unit is so equipped.
* Adjust brakes using proper tools.
* Place a (correct sized) wrench on the adjusting screw, push slack adjuster to free locking collar. Adjust screw until shoes are tight to drum, and then back screw off one-half turn. Make sure that the locking collar comes up when finished.
* To ensure that the brake shoes are not dragging or are in contact with the drum, tap it with the wrench. If you hear a dull thud, the brake shoes are still in contact with the drum. If you hear a clear ringing sound, the brake shoes are clear.
* When finished have an assistant apply the brakes. Make sure that the slack adjuster is at no more than 90-degree angle to the brake chamber.
* If the Slack adjuster is at more than a 90-degree angle to the brake chamber, have a licensed mechanic check the brake system for misalignment or wear.
* When adjustment is complete, ensure that the braking system is working properly before going to work.

*Test the braking system to ensure everything is in proper working condition.*

# 4.24 - AUTO SLACK AIR BRAKE ADJUSTMENT

## Potential Health or Safety Concerns;

• Damage to Equipment (Brake Failure, Accidents)

• Injuries to workers and public (Pinch Points, Moving Equipment, Possible Brake Failure)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to adjusting slack adjusters and have the correct class of driver license as well as a Q Endorsement.

### Recommended Procedures and Precautions to Offset Hazards

* Park unit on level floor or ground.
* Lower all attachments (if unit is so equipped) to floor or ground.
* Place transmission in neutral.
* Make sure air pressure is a minimum of 100 lbs.
* Apply parking brake and block wheels with wheel chocks at the front and rear of tandems.
* Ensure the unit is secure.
* When unit is secured, release the park brake.
* Shut the unit off.
* Shut off master switch, if the unit is so equipped.
* Adjust brakes using proper tools.
* Automatic slack adjusters are designed to self adjust, but sometimes they fail or are incorrectly installed. You must check them during pre-trip inspections and at brake checks.
* To check automatic adjusters make an 80 to 90 PSI application. If your truck doesn’t have an application gauge, turn off the engine, pump the reservoir down to between 90-100 PSI, and then fully apply the brakes.
* Check the stroke. If it meets or exceeds the length specified in the table below, make an emergency adjustment and take the vehicle to a service depot when out of town, or your shop if returning to it.

When adjustment is complete, ensure that the braking system is working properly before using the vehicle.

\*LS – Long Stroke

|  |  |  |
| --- | --- | --- |
| Chamber Type | Inches | Centimetres |
| 20 | 1 3/4 | 4.5 |
| 24 | 1 3/4 | 4.5 |
| 24 LS\* | 2 | 4.08 |
| 30 | 2 | 5.08 |
| 30 LS\* | 2 | 5.08 |

# 4.25 - POWER LOSS ON STEEP GRADE

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Accident, Distracting Drivers)

• Injuries to workers and public (Pinch Points, Thrown from Machinery, Crushing)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to operating any equipment and have the correct class of driver license.

### Recommended Procedures and Precautions to Offset Hazards

To ensure the safety of the traveling public and workers in the area, the operator of any equipment that has a power loss while on a steep grade should follow the procedure listed below:

1. Sound horn (if equipped). One long blast will warn workers in the area that you have a problem.
2. If you experience a loss of power on your piece of equipment while working on a steep grade, immediately attempt to activate the braking system. This may include the pedal brake, the emergency brake (if so equipped), or the parking brake.
3. If the braking system does not slow the piece of equipment down, attempt to turn the equipment so that it is at right angles to the ditch. Steer the piece of equipment into the ditch, if it is safe to do so without causing serious injury to yourself or others.
4. If you experience a loss of power, DO NOT attempt to restart the equipment by placing the shifter into neutral as this may cause the equipment to accelerate.
5. If the machine is in reverse, attempt to turn it to a right angle to the hill and drive it into the ditch, if it is safe to do so without causing serious injury to yourself or others.

# 4.26 - INSTALLING DELINEATORS

## Potential Health or Safety Concerns;

* Be aware of traffic movements
* Locate all underground utilities; telephone, gas lines, power lines television cables, etc.
* Be careful of ground hazards; don’t slip, trip or fall.
* Utilize safe lifting techniques
* Use caution when working around drill auger. Watch for pinch points.
* Always follow instructions from the drill operator.
* Use traffic accommodation when required.

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to installing Delineators.

### Recommended Procedures and Precautions to Offset Hazards

* Locate underground utilities in advance.
* Fully equip yourself before leaving for worksite.
* Put up work zones signs. Use flag persons and cones if required. Remove all signage when work complete.
* Identify guidepost locations.
* Park in safe location with regards to traffic.
* Use proper hand digging or safe drilling practices.
* If pulling defective posts use proper lifting and pulling techniques.
* Always be alert to traffic movements.
* Ensure good footing when working on a side slope.
* Cleanup work area when completed.

# 4.27 - MAJOR SIGN REPAIR

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Falling debris, Accidents)

• Injuries to workers and public (Pinch Points, Falling objects, Tool malfunctions)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to repairing any sign/using sign truck and have correct class of license.

### Recommended Procedures and Precautions to Offset Hazards

* Contact One-Call to check for power and utility lines prior to commencing work.
* Be aware of traffic movement.
* Be cautious of sloped work areas.
* Be aware of sparks from cut-off saw that could cause grass fire.
* Hard hats are to be worn.
* Tag lines should be used to control sign movement when installing new, or removing damaged, signs.
* Wear CSA approved eye protection when using cut-off saw.
* Never move drill truck with load attached to boom.

### Key Steps Occurring

* Locate underground utilities near work area if doing underground excavation.
* Set up work signs and flagging protection when needed.
* Position drill truck relative to the work area. Level and stabilize drill truck.
* Measure appropriate distance for sign location from highway.
* Where cuts or scores must be painted with Galvicon, proper procedure and WHMIS precautions to be followed.
* Erect sign using proper rigging and tag lines.
* Use of sign truck. Operator must be properly trained.

# 4.28 - GUARDRAIL INSTALL AND REPAIR

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Accidents)

• Injuries to workers and public (Pinch Points, Back, Arm, Hands, Flying Debris, Crushing)

Equipment, PPE and Apparel to be used**;**

Hand tools, Cutting Torch, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment checklist, Refer to Hazard Assessment, TAS and ERP.

**Training Required;**

Employees must be deemed competent prior to installing or repairing guardrail.

### Recommended Procedures and Precautions to Offset Hazards

* Hazard assessment must be done with phone numbers listed for all utility companies involved.
* Warn and control traffic as needed. (Follow TAS if included).
* Ensure that all utility services have been located. Precautions for overhead power lines need to be taken ( Refer to 4.8 in this section). Hazard assessments are to be done prior to starting the installation or repair (telephone, power, gas lines).
* Utility Locate Sheets must be with the operator before digging.
* Wear welding gloves and goggles when removing damaged guardrail with the use of an acetylene torch (Operator of torch must be trained.)
* When cutting galvanized beam, wear approved respirator.
* Watch for hot chunks of metal.
* Watch for unstable footing as work is often carried out on uneven or wet ground.
* Remove damaged guardrail post using a pick or crowbar, ensuring the post is secured to the pick and watch for pinch points.
* Use proper lifting practices to lift guardrails or posts.
* To minimize heavy lifting, two workers should lift longer pieces of beam.
* When attaching new flex beam to posts, with flex beam suspended watch for pinch points and ensure the beam is secured to the picker.
* Compact earth round the base of the post using tamper in a safe manner.
* Use hearing protection when operating, or working near, impact tools.
* Upon completion, carefully load waste material and tools. Remove traffic signs if they were required. Watch for back strains, cuts and traffic hazards.
* Install and repair guardrails under good visibility conditions whenever.

# 4.29 - LAYING OF COLETANCHE (USING HYDRAULIC BEAM)

## Potential Health or Safety Concerns;

• Damage to Equipment (Shifting rolls, Stress on equipment)

• Injuries to workers (Pinch Points, Back, Legs, Arms, Hands)

Equipment, PPE and Apparel to be used**;**

Excavator, Hydraulic Beam, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Fire retardant coveralls (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the hydraulic beam.

### Recommended Procedures and Precautions to Offset Hazards

1. Attaching of hydraulic beam, pre-check excavator and mounting of hydraulic beam to be done by operator who accompanies rented excavator.
2. Attaching hydraulic Beam to roll, Use a spotter and align rams and ensure they are secure and Level.
3. Position roll to enable placement of material. After first roll is placed, additional rolls need to have 20cm overlap.
4. Operator will walk excavator while unrolling material. Ensure workers are clear of hydraulic beam and excavator. Use tag lines to assist in steadying of hydraulic beam when it is required.
5. Finishing of Roll. When nearing end of roll, lower hydraulic beam close to ground and have operator use hydraulics to finish off roll. Ensure operator has all workers in his sight before moving beam away.

# 4.30 - LAYING OF COLETANCHE (USING ROLL STANDS)

## Potential Health or Safety Concerns;

• Damage to Equipment (Bent Stands)

• Injuries to workers (Pinch Points, Back, Arms, legs, Hands)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment Checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to using the Roll Stands.

### Recommended Procedures and Precautions to Offset Hazards

1. Placement of roll stand, Use two workers to position each stand (546mm to 550mm spacing required)
2. Position roll onto stand. Use a spotter, other workers to stay clear. Reposition roll stand (s) as required.
3. Hook up gator pull bar. Ensure all workers are ready prior to unrolling material. Gator is to maintain walking pace.
4. Finishing roll. Un-clamp and cut material as required using hooked utility knife

# 4.31 - LAYING OF COLETANCHE (Manual Beam)

## Potential Health and Safety Concerns;

Damage to equipment

Injury to worker (Pinch Points, Back, Legs, Arms, Hands)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Fire Retardant Coveralls (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment checklist, Excavator, Manual Beam, Clamps, Tag Lines, Properly Rated Hoisting Devices, Hooked utility Knife, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Laying Coletanche Material.

### Recommended Procedures and Precautions to Offset Hazards

1. Inspection of excavator to be done by operator
2. Inspection and installation of hoisting components to be done by operator and ACP representative
3. Use one designated spotter with tag lines
4. Align mandrel inserts with BGM mandrel and ensure they are secure and level
5. Secure beam position with alignment bolts
6. While beam is on ground, remove protective plastics with appropriate knife and locate flap
7. Adjust brake so that there is sufficient contact of brake pad with disc in order to ensure controlled release of BGM
8. Have workers clamp onto material while roll remains on ground, attach extension of rope to clamp
9. Workers and spotter vacate area outside of 2m radius
10. Operator lift roll just enough to clear ground
11. Workers pull rope attached to clamps and expose approximately 3m of material
12. Operator lowers roll to ground
13. Workers remove rope and operator raises roll off ground
14. Workers grab clamps and pull out material
15. Maintain speed no more than a walking pace
16. Once desired length is achieved, spotter signals operator to lower roll until ground contact is made and roll is secured
17. Un-clamp and cut material as required using appropriate cutting tool

### Key steps Occurring

1. Inspection of manual beam and hoisting devices
2. Attach beam to excavator
3. Attaching beam to roll
4. Position roll to enable, placement of material
5. Secure clamps to roll
6. Pull out desired length
7. Cut material from roll
8. Proceed to job procedure for seam material

# 4.32 - LOADING-UNLOADING OF GATOR

Potential Health & Safety Concerns;

• Damage to Equipment

• Injuries to workers and public (Pinch Points, Equipment roll over, Crushing)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Gator and have the correct class of driver license if going onto any roads.

### Recommended Procedures and Precautions to Offset Hazards

1. Unloading of gator. Park trailer on level ground, remove ratchet strap and locking pin. Always use spotter to assist.
2. Roll up ratchet straps and Place in toolbox. Try to roll straps up on dry ground and fasten with tie wire.
3. Loading of gator. Tilt trailer into down position, Ensure trailer is all the way down
4. Drive gator (use lowest gear) onto the center of the trailer and install pin and tighten ratchet straps.
5. Do a walk around checking lights, brakes and that the load is secure.

# 4.33 - LOADING OF COLETANCHE ROLLS

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points) and public

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to loading Coletanche rolls.

### Recommended Procedures and Precautions to Offset Hazards

1. Attach loading beam to forklift. Always use a spotter.
2. Insure spotter is standing off to the side. Attach beam to roll
3. Attach clamps to roll. Spotter now stands to the side, use both hands to attach, check tightness of clamps and ensure you’re communicating clearly with the operator.
4. With the spotter off to the side. Lift roll onto truck and trailer. Keep load close to ground level until you are lined up at the truck.
5. Ensure all workers are behind forklift as you land the roll. Place 2X4 along roll to prevent movement.

# 4.34 - SEAMING OF COLETANCHE (HAND TORCHES)

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Burns, Cuts)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Fire Retardant Coveralls (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to seaming Coletanche with hand torches.

### Recommended Procedures and Precautions to Offset Hazards

1. Cut material to required size. Make sure blade is sharp. Always pull blade avoiding body parts.
2. Heat under side of patch and slowly lower into position. Always be aware of where the flame is. Use trowel to assist in placement of patch.
3. Pre-heat edges to assist in trowelling (buttering) of the edges to ensure a good bond is made.

*\*\* do no heat top side of patch!!*

# 4.35 - SEAMING OF COLETANCHE (USING LAPPER)

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Burns, Back Strains)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/ Fire Retardant Coveralls (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Seaming Coletanche with Lapper.

### Recommended Procedures and Precautions to Offset Hazards

1. Ensure seam is clean and dry. Maintain good footing and use assistance to lift overlap as needed.
2. Position lapper under seam. Always stay aware of location of flame and ensure propane supply line is kept clear of open flame.
3. Start seaming process (worker walks slowly with lapper). Clear communication is to be maintained and 20lb rollers to be used a minimum of 2 ft. behind lapper to ensure good bond.

# 4.36 - UNLOADING / STAGING COLETANCHE ROLLS

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to unloading/staging Coletanche rolls.

### Recommended Procedures and Precautions to Offset Hazards

1. Line up over centre of roll using a spotter at all times. Stay clear of Loader/Excavator and Truck/Trailer.
2. Attach chain and lifting straps. Make sure straps are well choked and chain is centered.
3. Ensure everyone is clear and that your spotter is in position. Lift roll slowly and maneuver into position.

# 4.37 - WELDING USING FLAMELESS WELDER

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Burns, Back Strains)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Fire Retardant Coveralls (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to using the Flameless Welder.

### Recommended Procedures and Precautions to Offset Hazards

1. Check blower fuel ignition (sound) and that fire extinguisher are charged. Inspect all hoses and connections.
2. Start blower and connect line.
3. Ensure valves are closed on flameless welder first and open valve on propane bottle.
4. Open valves on flameless welder, use igniter to light welder. (ALWAYS light on membrane)
5. Lean machine back until rests on support leg and allow for a warmup period. Never leave machine unattended when it is heated.
6. Position lapper at start of the seam; begin welding while slowly walking backwards.
7. Peed is crucial, too slow – you will burn the material, to fast- you will not get the desired bond required.
8. After welder passes an area, a worker walks the 20lb roller over the area to ensure a good bond is achieved.

*Always ensure propane line is clear of welder!*

1. Shut down. Always turn propane off at the bottle first.
2. Lay welder back onto support leg and run blower until burner goes out and it cools foot down. Shut off Blower.
3. Unhook propane lines and ensure area is clean.

# 4.38 - ELECTRICAL LOCKOUT

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Electric shock, Burns)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to any Electrical Lockout taking place.

**General**

The purpose of the lockout procedures established at the company is to protect, in the simplest and most positive manner possible, any employee working on or around equipment which could be inadvertently started.

Most equipment in the plant can be safely locked out by the individual employee on several of the major pieces of plant equipment in order for it to be rendered safe.

### Recommended Procedures and Precautions to Offset Hazards

No employee is to work on, enter or approach the unguarded parts of any machinery until he has locked out the power supply with a padlock in such a manner as to make it impossible for the machine to be started.

The normal lockout procedure for electrically powered equipment is:

* Inform the Supervisor and the person immediately responsible for the operation of the equipment of your intention to lock it out.
* Have the equipment shut down in the normal manner and visually ensure that it has stopped. Do not use, disconnect switches to stop machinery.
* Turn the power supply disconnects switch/breaker for the equipment to the ‘OFF’ position. Then place your personal lock on the switch. An attempt should be made to put the switch back to the 'ON' position to ensure that it is correctly locked out.
* The employee working on the locked out equipment must keep the key for the padlock on his person until he has completed working on the job and removes his safety lock.
* Immediately upon completion of the job, all locks are to be removed and power restored to the equipment. The last employee to remove his lock will inform the supervisor and the person immediately responsible for the operation of the equipment that he is finished.

# 4.39 - LOCKOUT PROCEDURE

**Lockout for Servicing or Repair of Equipment and Vehicles**

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Moving Equipment/Vehicles)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to any Equipment/Vehicle Lockout taking place.

**Lockout of facility equipment**

1. If the equipment is operating, shut it down by the normal shutdown procedure (only workers knowledgeable in the operation of the equipment should perform shutdowns).
2. Isolate equipment from power supply (shut off main power, engage emergency stop button, turn off breaker, etc.).
3. Place physical lock on power supply (if applicable).
4. Place a “Do Not Operate” tag in the most visible area near the power switch. Tag must have the following information:
5. Name of person locking the equipment out;
6. Contact information for person who locked equipment out, and;
7. Reason for lockout.

**Lockout for equipment or vehicles to be repaired (Operations)**

1. If the equipment is operating, shut it down by the normal shutdown procedure (only workers knowledgeable in the operation of the equipment should perform shutdowns).
2. Engage battery disconnect switch (if applicable).
3. Remove keys and place in lock box.
4. Install “Do Not Operate” tag in a highly visible area in cab or on driver side door (steering wheel, door handle, etc.)
5. Fill out repair requisition with reason for lockout and repair needed.

**Lockout for equipment or vehicle being repaired (Technicians)**

1. If the equipment is operating, shut it down by the normal shutdown procedure (only workers knowledgeable in the operation of the equipment should perform shutdowns).
2. Remove keys and place in toolbox or keep on person (if possible).
3. Batteries may be disconnected if not required for diagnostics.
4. Install “Do Not Operate” steering wheel cover/tag.

**Lockout for hydraulic systems**

1. Workers should always follow instructions in the operators manual for servicing hydraulic systems. Where appropriate, a certified technician should perform repairs and maintenance.
2. Engage/place safety stops (if applicable).
3. Lower implement to ground or onto safety stops.
4. Shut off the engine that controls the hydraulic pump.
5. With the key on (engine off), move hydraulic levers back and forth to relieve pressure.
6. When applicable, blanking devices should be used.

**Release from Lockout/Tag out**

1. Before locks and/or tags are removed and energy is restored to the machine or vehicle, inspect the work area to ensure that non-essential items have been removed and that machine or vehicle components are operationally intact.
2. Ensure workers are a safe distance from any potential hazard.
3. Each lock and tag should be removed from each energy-isolating device by the worker who applied the lock and/or tag.
4. Notify affected workers that locks and/or tags have been removed.

# 4.40- MASTIC APPLICATION

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers (Burns, Pinch Points, Moving Equipment/Vehicles)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Kevlar Sleeves, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent before any Mastic application taking place.

**Scope**

The following procedure applies to all employees who work with mastic application.

**References**\*

* Crafco SDS – Crafco Mastic, Polypatch, and Matrix products;
* Crafco PDS – Crafco Mastic One (Part No. 33339)
* Crafco Specifications – Patcher II (200 GAL) Diesel-Fueled
* Patcher II Parts Manual – Crafco Patcher II Tow-Behind Trailer (578720)

\* all items listed above will be on-site with application crew

**Special Terms**

SDS………………………...SAFETY DATA SHEET (CRAFCO INC.)

PDS…………………………PRODUCT DATA SHEET (CRAFCO INC.)

CSA CANADIAN STANDARDS ASSOCIATION

PPE PERSONAL PROTECTIVE EQUIPMENT

TAS…………………………TRAFFIC ACCOMMODATION STRATEGY

**Procedures**

*Assembling of Vehicles, Equipment, Material and Personnel*

## Potential Health and Safety Concerns

• Mounting / dismounting equipment (one-ton truck and Patcher II)

• Material heat and steam from main reservoir (maximum heat potential: 232°C)

• Heat transfer oil from jacketed reservoir (maximum heat potential: 260°C)

• Material burner (lit by a constant-duty, high-voltage transformer which powers an electric spark lighter working in-conjunction with diesel burner)

• Lifting

• Loading/unloading packaged material onto/from one-ton truck

• Loading packaged material into Patcher II trailer unit

• Rear-discharge gate and heated-chute (hot material)

• Cleaning main reservoir of excess/unused material

• Draining heat transfer oil system

## Equipment, PPE and Apparel to be Used

• CSA-approved, steel-toed boots (6” minimum)

• Thermaprene heat-resistant gloves (18” minimum)

• Long sleeves and pants

• High-visibility traffic vest / sweater

• CSA-approved hard hat

• Eye protection (safety glasses, not sunglasses)

• Hearing protection (hard hat-mounted earmuffs or foam ear plugs)

• Clean high-visibility (lime green) coveralls (for flaggers)

• One-ton truck and Patcher II tow-behind mastic applicator

• Half-ton truck for signage transport and TAS set-up

• Arrow board and cones/delineators (if necessary)

• Back-pack leaf blowing unit

• Fire extinguisher

• First aid kit and portable eye wash station\*

Refer to Hazard Assessment and ERP.

### Recommended Procedures and Precautions to Offset Hazards

1. When mounting and dismounting vehicles or equipment, use caution and 3-point contact at all times.

2. Use proper lifting procedures and/or devices when lifting heavy objects.

3. Ensure both the engine and the burner have been shut down before refilling the fuel tank.

4. Ensure the heat transfer oil level is checked daily by the operator. DO NOT overfill the amount of transfer oil required. Add oil to the top mark on the dipstick if required, no more.

5. Use caution around the loading and draining hatches on the Patcher II. Ensure that the latching systems for each hatch are working properly and keep the lids securely closed. Ensure the safety shut-off component is operational and automatically stops the agitator when the lid is opened.

6. Use caution heating the material in the Patcher II and never leave the machine unattended while in the process of primary heating. Note the manufacturer’s specifications when heating the transfer oil – “at 260°C the heating oil will expand approximately 18%.

7. Use the electric overnight secondary heaters to keep the material flowable. This allows for lower primary heating temperatures and more efficient cleaning conditions.

8. Before loading the Patcher II, ensure the vented expansion tank has been opened to compensate for the expanding heat transfer oil.

9. When loading the Patcher II, ensure you are in a well-ventilated area. Do not leave the hatch lid open after adding the material – close it each time.

10. When applying the mastic material, ensure all employees are clear of the rear-discharge gate and the heated chute (this is a gravity-feed unit).

11. When application work is complete, ensure that the Patcher II’s burner, return mixer, and engine have been turned off. Allow 15-20 minutes for material to cool down before de-mobilizing.

12. Once the machine has been powered down, drain as much material from the rear-discharge gate as possible (an empty machine is optimal) using a tank scraper tool.

13. Ensure the tank is completely empty when storing over long durations.

14. Before initial machine start-up after a long duration, ensure all water/moisture has been removed from both tanks. Heat the transfer oil and material tanks to 149°C for 2-3 hours to evaporate all moisture.

## Traffic Accommodation

### Potential Health and Safety Concerns

• Traffic speed

• Traffic volume

• Pedestrians

Equipment, PPE and Apparel

• Approved traffic accommodation strategy (TAS) including signs, arrow board, cones/delineators

• Compressed air horn

• Communication device (e.g. two-way radios)

### Recommended Procedures and Precautions to Offset Hazards

1. Be alert and watch for traffic and pedestrians at all times.

2. Plan escape routes for the flaggers.

3. Monitor traffic volume. If the traffic volume becomes too heavy to manage safely, remove the crew from the hazardous area. Plan to return to the affected area at a time when traffic volumes are lower.

4. Use a full set of signs, properly placed in good visible locations.

5. Keep the arrow board moving at the same rate as the work zone progress (if applicable – some work zones will be stationary)

6. Cone-off the affected lane, narrowing traffic lanes well in advance of the work zone.

7. Use compressed air horn to alert workers in the work zone if a vehicle has entered the work zone, or if there is any concern for workers’ safety.

8. Keep two-way radios available, and charged, for communication at times when a clear line of sight is not available. Ensure the crew foreman has a radio as well to maintain optimal communication between flaggers and crew.

9. Plan work to maintain the highest level of safety possible for both workers and the general public.

# 4.41 - CRACK SEALING

## Potential Health and Safety Concerns

• Climbing on and off vehicles

• Lifting

• Propane

• Crack sealing material

• Diesel fuel

• Handling hot material

## Equipment, PPE and Apparel

• CSA approved, 6” steel-toed boots

• Gloves, traffic vest (Class 2-3)

• Face shield (for hot pour)

• Clean High Visibility (Lime Green) coveralls for flag people

• Crack sealing truck with tank /pour pots

• Lifting equipment (for barrels)

• Water cooler

• Fire extinguisher

• Squeegees

• Long sleeves Shirt or Kevlar sleeves

Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to Crack Sealing and have the required class license.

### Recommended Procedures and Precautions to Offset Hazards

1. When climbing on and off vehicles caution must be used to prevent falls. Use hand holds while climbing on and off equipment.

2. Use proper lifting equipment when lifting drums.

3. Use caution around breakaway valves on propane tank. Make sure propane bottles are secure and check for leaks after filing. Ensure that propane equipment meets standards and follow manufacture’s specifications.

4. Wear proper clothing, including gauntlet gloves, at all times.

5. Know the WHMIS information and proper handling precautions for crack sealing material being used.

6. Release all pressure on the tank before opening. (Cold pour tanks should not be operated at higher than 10PSI and pressure relief valves should be inspected to ensure they are in working order)

7. Know how to use fire extinguisher and its location. Avoid water contact with hot pour. Watch for overheating; know safe operating temperature and flash point of material.

8. Know how to use winch line on hinge pin to release tow vehicle from tar kettle in case of fire. Check status frequently.

9. Ensure there is radio contact between flag persons and truck driver.

10. A signal or noise devise should be used to warn crew of possible traffic danger.

11. Be aware of traffic at all times.

12. When completing crack sealing at the end of the work zone, equipment must remain on the roadway until material is cured. At this time equipment can be removed and flaggers can vacate their station.

## Traffic Accommodation

## Potential Health and Safety Concerns

• Traffic

## Equipment, PPE and Apparel

• Signs

• Arrow board

• Cones

### Recommended Procedures and Precautions to Offset Hazards

1. Watch for traffic at all times

2. Use a full set of signs

3. Use arrow board on four lanes

4. Use flag people on two lanes

**4.42 - GUIDE POSTS**

## Potential Health and Safety Concerns

• Climbing on and off vehicles

• Traffic

• Tools

• Underground lines

• Overhead power lines

• Side hills

• Rough terrain

• Gopher holes

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to installing guideposts.

### Recommended Procedures and Precautions to Offset Hazards

• Use three point contact when mounting and dismounting equipment.

• Ensue tools are in good condition

• Contact First Call to check for lines

• Check for overhead lines and maintain clearance to OH&S regulations

• Be aware of traffic

• Watch footing

# 4.43 - SIGN MAINTENANCE

## Potential Health and Safety Concerns

• Swinging boom (Pinch Points, Falling tools)

• Equipment, Traffic

• Injury to worker and public (Pinch Point, Back strain, Arms, Hands, Flying Debris)

## Equipment, PPE and Apparel

• Drill truck or pickup truck with revolving light

• Hole auger

• Chain saw or Swede saw

• Hammer

• Sign ladder / man basket (if needed)

• Posts

• Tamper

• Shovel (spade)

• Level

• Sign

• PPE/Safety Items : Gloves, safety vest (Class 2-3), hard hat, CSA approved 6” footwear, chainsaw pants, eye and ear protection, harness if using bucket, Alberta #2 First AID Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to conducting Sign Maintenance.

### Recommended Procedures and Precautions to Offset Hazards

1. Contact Alberta One-Call to check for power and utility lines.

2. Utility Locate Sheets must be with the operator before digging.

3. *Hazard Assessment must be done with phone numbers listed for all utility companies involved.*

4. Make sure there are no hazards. Check ditch for wet or slippery conditions, broken glass, loose rocks, etc.

5. Stay clear of boom. Be aware of where boom is at all times.

6. Always be aware of traffic movements.

7. When lifting, use proper lifting practices.

8. Safety vests (Class 2-3) to be worn at all times. Do not wear loose clothing.

9. Revolving light should be turned on for truck.

10. All saws should be sharp.

11. If using a drill truck, be sure to use outrigger pads for stabilizers.

12. When shovelling dirt away from auger, go in same direction as auger is rotating.

13. Be careful with feet around hydraulic tamper. Keep feet clear of tamper.

14. When drilling post holes with powered augers (i.e.: gas powered hand augers and drill trucks) workers will ensure that no one is smoking in the area during the drilling operations, in the event of a utility strike.

### Key Steps Occurring

1. Secure tools, equipment and material to truck.

2. Survey location on highway and secure safe work zone for drill truck.

3. Safely park as far away from driving lanes as possible with revolving light on.

4. Stay out of radius on boom when swinging to and from truck.

5. Use proper techniques when removing auger material and always remove from out turn of the auger.

6. Use eye and ear protection when using the air impact wrench.

7. Do not position yourself between tamper and post.

### Maintenance of solar power equipment signs

• From time to time signs equipment with solar power lights require maintenance of the batteries/bulbs and cleaning of the solar panel.

• This procedure requires use of ladders or man lift. Please refer to Safe Work Procedures for Ladder Safety.

# 4.44 - STEEL POST GUARDRAIL INSTALLATION AND REPAIR

## Potential Health and Safety Concerns

• Back injuries

• Cuts

• Traffic

• Hearing damage

• Fumes from cutting up galvanized guardrail

• Pinch points

• Crush points

## Equipment, PPE and Apparel

• Drill truck

• Turchi hydraulic post pounder

• Steamer (in winter)

• Cutting torch

• Impact tools

• Guardrail

• Steel posts

• Guard rail bolts

• Pick

• Hand tools

• Signs (when required)

• Arrow boards (when required)

• Cones (when required)

• Hard hats

• Gloves

• 6” Steel-toed footwear

• Coveralls

• Vest (Class 2-3)

• Heavy-duty ear-muff hearing protection when using the Turchii

• Safety glasses/goggles

• Alberta #2 First AID Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to installing Steel Post Guardrail.

### Recommended Procedures and Precautions to Offset Hazards

1. *Hazard assessment must be done with phone numbers listed for all utility companies involved.*

2. Warn and control traffic as needed.

3. Ensure that all utility services have been located. Precautions for overhead powerlines need to be taken. Hazards assessments are to be done prior to starting the installation or repair (telephone, power, gas lines)

4. Utility locate sheets must be with the operator before digging.

5. Wear welding gloves and goggles when removing damaged guardrail with the use of an acetylene torch (operator must be trained)

6. Watch for hot chunks of metal.

7. Watch for unstable footing as work is often carried out on uneven or wet ground.

8. Reference the “Turchii Hydraulic Post Pounder” section of the Safety Manual to ensure proper unloading/loading procedures are adhered to.

9. Remove damaged guardrail post using a Texoma winch or post-puller on Turchii. Ensure the post is secured to the grabber and watch for pinch points.

10. Use proper lifting practices to lift guardrails or posts.

11. To minimize heavy lifting, two workers should lift longer pieces of beam.

12. When attaching new flex beam to posts, with flex beam suspended watch for pinch points and ensure the beam is secured to the picker.

13. Use hearing protection when operating, or working near, impact tools, especially when using the Turchi Hydraulic Post Pounder.

14. Upon completion carefully load waste material and tools. Remove traffic signs if they were required. Watch for back strains, cuts and traffic.

15. Install and repair guardrails under good visibility condition whenever possible.

# 4.45 - PLOWING AND SANDING

## Potential Health and Safety Concerns

• Railway crossings

• Parked or stalled vehicles

• Bridge abutments, expansion joints, frost cracks in pavement

• Freezing rain/ice on hills and curves

• Ice-covered or steaming windshields

• Dirty or snow-covered rear lights.

• Changing plow blades if plow frame is not blocked properly.

• Faulty mirrors or broken and/or dirty mirrors

• Blowing snow limiting visibility

• Meeting traffic, passing or being passed causing blowing snow which causes poor visibility.

• Moving parts of the sander

• Raised sander hopper with frozen material on grizzly

• Walking on top of grizzly

• Culverts, medians, curbs, grates, drains

• Flying rocks from spinner

## Equipment, PPE and Apparel

• Hard hat, vest coveralls (Class 2-3), safety glasses, safety goggles, CSA approved 6” steel-toed boots, work gloves

• Revolving and/or flashing amber lights when /when required

• Signs

• Single or tandem axle snow plow truck

• One or two-way snow plow / wing plow

• Right hand wing attachment (optional)

• Appropriate winter clothing

• Each unit shall carry the following: Alberta #2 first aid kit, fire extinguisher, flashlight with red cone (for emergency traffic control), operable radio system with telephone access, list of local emergency numbers, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to conducting any Plowing and Sanding Operations and have the correct class license (Q endorsement if required).

### Recommended Procedures and Precautions to Offset Hazards

1. Prior to seasonal requirements for plowing and sanding, all drivers should review these procedures for Plowing and Sanding. Operators shall be made aware of snow-plow hazards while working on the road.

2. Trucks could be equipped with either a one-way, two-way plow and with or without a wing. It is important that the operator is familiar with the type of equipment being used and know the safe operating procedures associated with them. Maximum speed for plowing is 40km or as per contract.

3. Wings are not to be used when plowing through any urban area where vehicles may be parked. When plowing with either right or left mounted wings. Plow trucks must not be used to plow the side slope or ditch, as wings are not designed nor intended for that purpose. Plow trucks and their attachments must remain on the road surface. Wings are not to be used to plow past guard rail or cable barriers and must not come in contact with any curbs.

4. Before starting out on the road, the driver must inspect his unit for proper operation. Included in this inspection are: mirrors, lights, clean windows.

5. Both one-way and two-way plows are to be equipped with warning flags at either end of the plow, identifying the width of the plow.

6. Hours of continuous operation by any one driver shall not exceed permit conditions (12 hours of consecutive driving).

7. Warning lights are to be used when engaged in snow removal/ice control operations, with the primary consideration being operator and public safety.

8. When the snow is piled in the medians that impede motorist visibility, it may be necessary to remove it.

9. Special safety considerations may be required for this operation.

### Ice Control

1. Shall always be performed in such a way to avoid damage to other highway user’s vehicles. Some conditions can create greater challenges (i.e. in cases of freezing rain it can cause extremely hazardous conditions). In these types of conditions there will be a MAXIMUM SPEED OF 60KM.

2. When loading sanding units, operators must be sure not to exceed the manufacturer’s weight restrictions.

### Plowing Intersections

1. Try to avoid doing intersections at the end of a shift when operators could be tired and fatigued.

2. Ensure that lights and mirrors are clean and in good working condition.

3. Ensure the back-up alarm is in working order.

4. Plowing is to be done in such a manner as to minimize the potential risk to other highway users.

5. Ensure that the plow is raised when plowing over rail crossings. Push snow to the right prior to the tracks.

### Plowing Overpasses

1. Use caution so as not to drop snow off the edge of the overpass when vehicles are underneath.

2. Beware of curbs and bridge abutments and expansion joints they may protrude.

3. Wings are not to be used on bridge decks or expansion joints.

4. Ensure that the plow is at the correct angle and raised when approaching an expansion joint.

5. Avoid contact with bridge curbs / guardrail. This practice will wear out the plow and damage highway fixtures.

6. Ensure lights and mirrors are clean and in good working order.

### Snow plowing and Ice Control with Graders

## Potential Health and Safety Concerns

• Railway crossings

• Parked or stalled vehicles

• Bridge abutments, expansion joints, frost cracks in pavement

• Freezing rain/ice on hills and curves

• Ice-covered or steaming windshields

• Dirty or snow-covered rear lights.

• Changing plow blades if plow frame is not blocked properly.

• Faulty mirrors or broken and/or dirty mirrors

• Blowing snow limiting visibility

• Meeting traffic, passing or being passed causing blowing snow which causes poor visibility.

• Culverts, medians, curbs, grates, drains

## Equipment, PPE and Apparel

• Grader

• Hard hat, vest coveralls (Class 2-3), safety glasses, safety goggles, CSA approved 6” steel-toed boots, work gloves

• Revolving and/or flashing amber lights when /when required

• Signs

• One or two-way snow plow / wing plow

• Right hand wing attachment (optional)

• Appropriate winter clothing

• Each unit shall carry the following: Alberta #2 first aid kit, fire extinguisher, flashlight with red cone (for emergency traffic control), operable radio system with telephone access, list of local emergency numbers, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to conducting any Plowing Operations and have the correct class of license.

### Recommended Procedures and Precautions to Offset Hazards

1. Grading of the road surface will be done during periods of good visibility and/or low traffic volumes.

2. Prior to seasonal requirements, operators should review the Operator Training Modules. Operators should be aware of Snow plow hazards while working on the road.

3. Prior to starting, the operator must inspect his unit for proper operation.

4. Grading is to be performed with the flow of traffic (unless traffic accommodation has been provided).

5. Grader must be operated only with all required flags / signs and warning lights in place. Warning lights must be on at all times.

6. Grading is to be done in such a way as to minimize the risk to other highway users.

7. Ensure that lights and mirrors are kept clean and in good working order.

8. Ensure that backup alarm is working properly.

9. Take your time and work in a safe manner.

10. Show caution when getting in or out of the grader. Slips and falls can happen easily.

11. Extra caution must be used as traffic may tend to pass the grader on the right hand side, colliding with the wing.

### Plowing Rail Crossings

1. When plowing up to rail crossings slow down and push the snow off the right shoulder prior to the tracks. Never plow across the tracks.

2. Never leave the plow down when crossing over the tracks. Raise the plow off the road surface and move across the tracks until the plow is clear and a safe distance from the track before lowering the plow. Continue plowing away from the crossing.

3. When doing this procedure, exercise caution at all times while in the vicinity of the crossing, watching for any train traffic that may be approaching or in the area.

Striking Railway Tracks with Plow

1. Contact your supervisor immediately.
2. Supervisor must contact:

* CN Rail immediately 1-800-668-6222
* Alberta Rail Net 1-800-814-0046

1. If unable to contact supervisor, you contact:

* CN Rail at 1-800-668-6222, and
* Alberta Rail Net at 1-800-814-0046

**EMERGENCY NUMBER**

CN RAIL: 1-800-668-6222

ALBERTA RAIL NET: 1-800-814-0046

# 4.46 - REMOVING AND REPLACING HOPPER/GRAVEL BOXES

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Falling Debris)

## Equipment, PPE and Apparel

• Truck

• Loader

• Hanging Chains

• Safety Glasses

• Hard Hat

• Safety Vest (Class 2-3)

• CSA Approved 6” footwear

• Gloves

• Hearing Protection

• Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to removing or replacing Hopper. Deemed competent to operate loader and have correct class of license (Q - Endorsement if required) .

### Recommended Procedures and Precautions to Offset Hazards

1. Conduct hazard assessment for task at hand
2. Review safe work procedure for the task at hand and thoroughly review step by step tasks, ensure all employees involved understand the tasks assigned to them
3. Ensure work area is clean and free of obstacles before work beings. Stage all equipment to create as minimal amount of travel as possible with a suspended load
4. Follow lock out tag out procedure
5. Complete Equipment Checklist
6. Remove all axillary lines (hydraulic and air lines) that connect the sanding box to the tandem
7. Remove securement pins, and replace with the quick release bar
8. Position the loader perpendicular to the tandem, have a second person secure the hoisting chains and tag line to the lifting points on the gravel box
9. Slowly raise add tension to the lifting chains by raising the boom of the loader until they are taught
10. Unhook from safety latches connecting the hoist to the box
11. Using a spotter and your signal person, slowly raise the box from the frame of the truck, once the box is raised have the driver pull forward to a clear location
12. Keep suspended load close to the ground and slowly move the box to the desired location
13. Once the box is at its desired location, slowly lower the box to rest on dunnage, unhook chains and tag lines from the box

Additional information: In the event that there is a change in the anticipated plan, ensure that it is discussed amongst all crew members prior to completing the task.

If another task comes up that must be addressed or takes priority, ensure that all safety devises are restored, and that the truck remains locked out, notify the shop foreman, mechanic and all workers who have access to the area of the potential hazards.

# 4.47 - OPERATING DRILL TRUCK

## Potential Health and Safety Concerns

• Damage to Equipment

## • Injuries to workers (Pinch Points, Debris, Underground utilities)

## Equipment, PPE and Apparel

• Truck with earth auger

• Hard Hat

• Safety Vest (Class 2-3)

• CSA approved 6” footwear

• Gloves

• Safety Glasses

• Hearing Protection

• Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to operating Drill Truck and have correct license and Q endorsement as required.

### Recommended Procedure and Precautions to Offset Hazards

1. Only properly trained employees will operate this unit.

2. Always inspect attachments before using them.

3. Hazard Assessment must be completed before commencing any work.

4. Phone numbers for all utility companies involved must be with the operator.

5. Utility locate s MUST be with the operator before any drilling will be done

6. Ensure proper Traffic Control Standards are implemented.

7. Assess power line safe work limits (a minimum of 7 meters from all power lines).

8. For working around power lines refer to the appropriate sections of the OH&S code, Part 17, Section #225.

9. Select level ground wherever possible and use the outriggers.

10. When folding boom or auger follow manufacture’s procedures.

**NOTE: *Drilling of any holes, including those dug using a crowbar, hand auger or any hand tool, and the use of the drill truck, requires a utility locate to be done before drilling.***

11. When drilling with Augers workers will insure no one is smoking during operations, in case the event of a utility strike.

# 4.48 - OPERATION OF CHIPPER OR MULCHER

## Potential Health and Safety Concerns

• Damage to Equipment

• Injury to workers

• Crushing of limbs or body

• Hearing loss

• Lacerations

• Debris in eyes

• Slips and falls

• Puncture wounds from flying debris

## Equipment, PPE and Apparel

• Gloves

• Eye and face protection

• Hard hat

• CSA approved, construction grade 1, 6” steel-toed boots

• Tight fitting clothing

• Safety vest (Class 2-3)

• Hearing protection

• Refer to Hazard Assessment/ERP and complete equipment checklist

**Training Required;**

Employees must be deemed competent prior to operating Chipper/Mulcher.

### Recommended Procedures and Precautions to Offset Hazards

1. When operating a chipper or mulcher, ALL PROPER PPE MUST BE WORN.

2. Chipper or mulcher must be on a solid, level surface.

3. Ensure that all guards and covers are in place before operating the chipper or mulcher.

4. Refer to the manufacturer’s manual for operating instructions.

5. When operating the chipper or mulcher, the crew should consist of a minimum of two (2) people.

6. Never stand directly in front of the chute when feeding material. Position your body to the side of the material being fed into the chipper to reduce the potential for injury due to kickback.

7. Keep hands away from and off the feed table.

8. Feed material into the chipper at a smooth rate. Do not jam material into the feed table.

9. When material is being fed into the chipper, stand away from the feed chute. Watch for sticks or branches to swing sideways.

10. Do not allow the discharge chute to become plugged.

11. If material becomes stuck or jammed, Shut The Engine Off before investigating and/or solving the problem.

12. When cleaning and/or unclogging the unit, shut the unit off and remove the spark plug wires before beginning the procedure.

**NEVER USE YOUR HANDS TO CLEAR MATERIAL FROM INSIDE THE DRUM OR CHUTE**. Use a stick or rod to clear material.

13. If the unit is to be towed, be sure not to exceed the manufacturer’s specified speed limit. Ensure that the proper; hitch is in place and is closed, locked and safety chains cross and attached. Once electrical connection is made the lights need to be checked to ensure they are working.

# 4.49 - SPRAY PATCHING

**Assembling of Vehicles, Equipment, Material and Personnel**

## Potential Health and Safety Concerns

• Damage to Equipment/Vehicles

• Injury to workers

• Mounting and dismounting Equipment

• Lifting

• Propane

• Heat Distributor

• Loading and off-loading distributor

• Loading spray patch machine

• Clearing the feed auger on truck or spray patch machine

• Working with long hoses and booms

## Equipment, PPE and Apparel

• CSA approved, 6” steel-toed boots

• Gloves, traffic vests(Class 2-3), and hard hats

• Clean High Visibility (Lime Green) coveralls for flag people

• Truck and distributor trailer

• Truck for rock and to pull spray patch machine

• Arrow board and sign truck

• Water cooler filled with water

• Fire extinguisher

• Ear protection

• 1-ton truck and trailer

• Small steel drum vibrating roller

• Eye Protection (Safety Glasses)

• Alberta #2 First Aid Kit, Burn Kit, Refer to Hazard Assessment/ERP and complete equipment checklist

**Training Required;**

Employees must be deemed competent prior to operating Spray Patch Machine and have required driver license for hauling unit.

### Recommended Procedures and Precautions to Offset Hazards

1. When mounting and dismounting vehicles or equipment, use caution and 3-point contact at all times.

2. Use proper lifting procedures and/or devices when lifting heavy objects.

3. Use caution around break away valves on propane tanks. Make sure propane bottles are secure and check for leaks after filling. Ensure propane equipment meets safety standards and follow manufacturer specifications.

4. Use caution heating the distributor and never leave the distributor unattended while in the process of heating. Don’t exceed manufacturer’s specifications when heating product in the distributor.

5. When loading the distributor, make sure you are in a well-ventilated area. Do not leave the hose used to load the product unattended.

6. When off-loading into the spray patch machine, have two people available to ensure safe procedures are followed.

7. Before loading the spray patch machine, ensure that the air pressure bleed valve has been opened and that the pressure gauge reads zero (0) before opening the loading hatch and the spray patch tank.

8. If it becomes necessary to dislodge or free debris from the tailgate auger or the spray patch machine, ensure that the spray patch machine is shut off and that the key is removed from the ignition. The key is to be placed in the care of the individual who is cleaning or freeing the augers.

9. Ensure propane is removed from distributor trailer before transport.

## Standard operating procedure for starting the AMZ:

1. Complete Hazard Assessment for the tasks at hand (spray patching)
2. Pre-Trip AMZ for safe travel paying close attention to lights, pintle hitch, tires, brakes, loose debris, and hanging hoses/sprayer arm, ensure all items are secured. Ensure tank is depressurized and that all valves are closed.
3. Starting procedure of AMZ once on-site: Remove securement devices from sprayer arm, starting from the driver side working towards the passenger side, have a second person remove the last securement device to prevent the sprayer arm form swinging uncontrollably. Pre-trip the AMZ for safe operation, check all fluids, belts, hoses, and valves (ensure all valves are still closed), look at all controls and make sure they are still intact after travel
4. Once pre-trip has been completed the operator is to ensure no one is in the line of fire (rock may come through hose once the unit is started) have a helper (truck driver) hold the wand pointing into the ditch, the operator of the AMZ is to turn the key to start the unit and allow it to build air pressure in the tank.
5. Once air pressure has been built (100psi) Power down the AMZ by having the operator turning the key off.
6. While the machine is off, Over a 5 gall bucket the operator will switch the main valve (diesel/wspe selection valve) to point towards the large tank, open the control valve to flush the diesel out of the lines into the bucket.
7. Remove bucket from sprayer location (there is a nice location below the main valve to secure bucket until further use)
8. Install sprayer nozzle on the end of the wand use zip ties as a secondary securement method for the banjo clamps
9. The driver is to enter his truck and raise the box to the desired height this is chosen by the operator of the AMZ whom can see the rock, and location of tailgate in reference to the hopper.
10. The AMZ operator will then notify the driver he is filling the hopper of the AMZ with rock
11. The operator of the AMZ is to start the machine by turning the key

## Standard operating procedure for end of day with the AMZ

1. Operator of AMZ will turn the key off and power down the machine
2. Driver will lower the gravel box and prepare for transport (lower trap and clean off excess rock form end gate and hopper)
3. Operator will switch main valve to point away from the WSPE tank (towards the operator) to select diesel flush
4. Driver will then grab the 5 gal bucket and set it on a flat surface below the sprayer nozzle
5. The operator will then open the material flow valve and allow diesel to flush the lines until diesel comes out clean
6. Operator will then close both material valves and open air pressure release valves (one for both tanks)
7. Once the air pressure has reached zero (0) close both valves
8. Remove nozzle and place in storage box
9. It is the drivers responsibility to secure the sprayer arm for transport (it is there drivers responsibility due to the fact he would be the one ticketed for insecure load while travelling)

## Safe Work Procedure for spray patch

1. Hazzard assessment is to be completed prior to commencement of work, use of PPE will be dictated by the controls in the Hazard Assessment
2. Make sure flaggers and traffic control devices are in place as per TAS plan
3. Pull into work zone
4. Follow start up procedure of the AMZ
5. Unload roller and blower and park the truck and trailer in a safe location (an approach)
6. Have a spill kit readily accessible, one for the AMZ and one for the Roller
7. Tandem and AMZ will drive forward toward the first crack. The driver and Operator will have agreed upon hand signals to indicate start and stop.
8. The operator will then move the wand across the crack to blow it out
9. The operator will then move the wand across the same crack and open his/her material valve allowing WSPE to flow out and onto the crack
10. The operator will make a third pass spraying a combination of rock and WSPE to fill the crack
11. A 4th pass will be made to spray just rock on the crack to aid in preventing wheel tracking
12. The operator will signal the driver to pull forward to the next crack (see step 7) repeat steps 7-12 continually until zone is done
13. Maintain a 10 metre buffer zone with the roller and all other parties on site. Cracks are to be rolled twice in the same direction as they were sealed with the vibrator turned on. Never exiting the closed lane or entering into an open/active lane of traffic. Repeating this step at every crack that has been sealed.
14. Blower is then to proceed cleaning off excess stone off the lane into the ditch/curb away from traffic flow. Repeating this step for every crack that has been sealed until zone is completed.
15. Follow end of day procedure for AMZ, load roller and blower onto trailer following proper loading/unloading procedure, exit the work zone
16. Flaggers are to pick up or turn the signs at the end of the day or end of zone (depending on situation)
17. Once returned to the yard, empty diesel flush bucket into larger containment vessel.

### Traffic Accommodations

## Potential Health and Safety Concerns

• Traffic speed

• Traffic volume

## Equipment, PPE and Apparel

• Approved traffic control strategy including signs, arrow board, cones

• Compressed air horn

• Communication device (e.g. two-way radios)

### Recommended Procedures and Precautions to Offset Hazards

All traffic accommodations must meet or exceed TRAFFIC ACCOMMODATION

IN WORK ZONES specifications

1. Be alert and watch for traffic at all times
2. Plan an escape route
3. Monitor traffic volume. If the traffic volume becomes too heavy to manage safely, remove the crew from the hazardous area. Plan to return to the affected area at a time when traffic volumes are lower.
4. Use a full set of signs, properly placed in good visible locations.
5. Keep the arrow board moving at the same rate as the work zone progress.
6. Cone off the affected lane, narrowing traffic lanes well in advance of the work (may not be required in mobile work zones)
7. Use compressed air horn to alert workers in the work zone if a vehicle has entered the work zone, or if there is any concern for workers’ safety.
8. Keep two-way radios available, and charged, for communication at times when a clear line of sight is not available.
9. Plan work to maintain as high a level of safety as possible for both workers and materials.

# 4.50 - CULVERT LINER INSTALLATION

## Potential Health and Safety Concerns

• Damage to Equipment/Vehicles

• Injury to workers/public

• Handling of pipe (steel and/or plastic)

• Personnel working near suspended pipe

• Working in wet and muddy conditions

• Welding and cutting (UV exposure)

• Working in open excavations and steep slopes

• Traffic volume and accommodation

• Moving equipment across public roads

• Equipment working on the shoulder of the road

• Rip rap and grouting of pipe after installation

• Work around concrete pump truck

## Equipment, PPE and Apparel

• CSA approved, 6”steel toed boots

• Hard hats, gloves, traffic vests (Class 2-3), safety glasses

• Traffic accommodation, signs, stop/slow paddles

• Welding helmet and safety goggles

• Fire suppression equipment

• Welder, cutting torch, grinder

• Sufficient matting to keep workers out of mud and water

• Chains, nylon and cable slings

• Shovels, hand saws, tampering bars, seeders

• Hydraulic excavators, Picker trucks, concrete trucks, and concrete pump truck

• Alberta #2 First Aid Kit, Burn Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to culvert installation and have required driver license.

### Recommended Procedures and Precautions to Offset Hazards

1. Hazard assessments are to be completed for each location due to changing environmental, geographic, and working conditions.

2. Line locates for possible utility lines to be done prior to starting job.

3. Handling of all pipes will be done by qualified operators using proper rigging procedures. Work will be carried out in a safe manner away from traffic.

4. If pipe is stored on the right of way of the highway, it will be marked to increase visibility to riders of ATVs and snowmobiles.

5. Moving and placing pipe for preparation work and connections will be done in a manner that ensures the safety of all ground personnel. The rigging used will meet or exceed the rated lifting capacity of the lifting device.

6. At no time will workers allow themselves or others to be under a suspended load. All suspended loads will be kept as close to the ground as possible when being moved or positioned for work.

7. When welding, cutting, or grinding, all workers must wear all appropriate PPE and be aware of UV exposure.

8. Before entering culverts to remove debris in preparation for liner, ensure adequate airflow through the culvert. If there is not sufficient airflow, proper ventilation must be supplied before worker(s) enter pipe.

9. When excavations have been dug to better access the ends of the culvert, ensure the OH&S standards are followed. Use extra caution when entering or exiting the excavation.

10. To accommodate varying traffic volumes, always use a full set of signs as determined by the Alberta Traffic Act. Ensure the signs are in good condition and visible to the traffic.

11. Ensure at least two members of the crew are flag trained. Use certified flag persons if you must move equipment across a road or if you must park equipment on the shoulder of the road while working.

12. When rip rap material (4-6” rock) is being thrown to the pipe, no worker shall work or stand in direct proximity to the pipe. Work at the pipe may recommence once the close placement of the rock has begun.

13. When grouting the pipe and working with concrete trucks and concrete pump trucks on the shoulder of the road, ensure proper signage and flag people are in place.

14. When grouting the pipe, all proper PPE must be worn.

# 4.51 - SAW CUTTING ASPHALT

## Potential Health and Safety Concerns

• Damage to Equipment/Vehicles

• Injury to workers/public

• Lifting (strains)

• Dust (Eye contact, inhalation)

• Noise (hearing)

• Traffic (pinch points, collisions)

## Equipment, PPE and Apparel

• Truck

• Saw Cutting Unit

• Water Container

• Crane or Ramp

• Hard Hat

• Vest (class 2-3)

• CSA approved 6” footwear

• Safety Glasses/Goggles/Face Shield

• Hearing Protection

• Dust Mask or respirator (if needed)

• Alberta #2 First Aid Kit, Burn Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to any saw cutting and have required driver license for hauling equipment to site.

### Recommended Procedures and Precautions to Offset Hazards

1. Ensure that the area to be cut is clear of tools, equipment and debris.

2. Ensure that all guards are working and in place.

3. Use proper lifting technique.

4. Use water to control dust.

5. Use hearing protection.

6. Use proper TAS.

7. Set up proper traffic accommodation.

8. Inspect blade before use for damage.

9. If blade is damaged replace it.

10. Hook up water to saw.

11. Clean area to be cut of debris.

12. Stay clear of blade while starting engine.

13. Make sure water is flowing properly.

14. As much as possible avoid standing directly in line with rotating blade.

15. Avoid lifting rotating blade out of cut.

16. Re-start the blade after setting blade back into cut line.

### Wet Vs Dry Sawing

All asphalts and concrete contain Silica to varying degrees. When planning any saw cutting job, it should include Wet Sawing to suppress the dust which contains the Silica.

Some jobs may not allow water to be used for dust suppression. If this is the case, then the job must include ventilation, masks and decontamination etc. as set out Section 28 of the OHS Code.

# 4.52 - CABLE BARRIER REPAIR

## Potential Health and Safety Concerns

• Damage to equipment/vehicles

• Injury to workers/public

• Back injuries

• Cuts

• Traffic accidents

• Pinch points

• Tensioned cable

## Equipment, PPE and Apparel

• Steamer (in winter)

• Pick

• Hand tools

• Signs (when required)

• Arrow boards (when required)

• Cones (when required)

• Hard hats

• Gloves

• CSA approved 6” steel-toed boots

• Coveralls (Class 2-3)

• Vest (Class 2-3)

• Safety glasses

• Cut off saw

• Reciprocating saw

• Skid steer

• Drill truck

• Chain hoist

• Hand Winch (come along)

• Jack All

• Cable Grip

• Alberta #2 First Aid Kit, Burn Kit, Fire Extinguisher, Applicable Equipment Checklists, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to participating in cable barrier repairing and have required driver license for hauling equipment to site.

### Recommended Procedures and Precautions to Offset Hazards

1. Hazard assessment must be completed for the planned tasks.

2. Warn and control traffic as needed using the appropriate TAS.

3. If replacing bases (post sockets), ensure that all utility services have been located.

4. Utility Locate Sheets must be with the operator before digging.

5. Remember that the cable Is under tension. Use extreme caution when dealing with snagged cables, cutting turnbuckles, and re-tensioning procedures.

6. Remove damaged posts using a pick or crowbar. Watch for pinch points and ensure that picks and bars are jammed into the post so as not to slip. Alternately posts can be removed using a jackal.

7. When drilling is being done to install post sockets, smoking is not permitted.

8. When installing new post sockets, compact the earth around the socket using tamper in a safe manner.

9. Watch for unstable footing as work is often carried out on uneven or wet ground.

10. When using a jackal, make sure that the jack is firmly planted on the ground. Shimming material such as wood may be used on uneven ground to level the base. Ensure that a firm grip is maintained on the jack handle when the jack is under load.

11. Use proper lifting practices at all times.

12. For heavy lifting, two workers should lift or a mechanical lifting method should be considered.

13. Once the new posts have been installed the cable can be lifted and secured with the hairpins and lock plates. Use caution and avoid pinch points.

14. Using the Tension meter the cable tension can now be adjusted. Refer to the Gilbraltar Installation Guide.

15. When installing the Tension meter, ensure that firm grip is maintained when locking it in place to avoid having the handle swing back and strike you.

16. On occasion the cable may become entangled with a vehicle and cannot be removed. In these instances as a last resort, the turnbuckle may have to be cut, or the terminal end tripped to release the cable. Cutting a turnbuckle is done using a chop saw. This is typically done by emergency services.

17. Before cutting a turnbuckle, have all workers on site move a safe distance away from the cable in the event that it fly’s sideways.

18. A terminal end may have to be tripped for an emergency or repairs.

19. Remove the terminal keeper wire.

20. Standing off to the side of the terminal post, strike the open face of the post near the top of the post with a sledge hammer. Ensure that the worker is wearing safety glasses.

21. Resetting the terminal end must be done with a truck mounted winch (i.e. tow truck) to allow slow consistent tension to be applied to the cable.

22. The truck should be positioned so the pull is low and in line with the cable barrier. This can be accomplished using a snatch block.

23. Due to the high tension involved, all equipment used to reset the terminal end should be thoroughly inspected prior to beginning the task.

24. Once the cable has been drawn back enough to allow it to be reset into the terminal end, workers should approach from the side with caution to place the cable end into the anchor.

25. Workers must never hang onto any cables that are under tension in the event that the cable breaks.

26. Insure cable grips are load rated and clean, if showing signs of stressing or breaks follow the defective tool practice

# 4.53 - TURCHI HYDRAULIC POST PLANTER

## Potential Health or Safety Concerns;

• Damage to Equipment/Materials

• Injuries to workers (Hands, Arms, Back, Eyes, Hearing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to using the Turchi and have required driver license for hauling equipment to site.

### Loading Procedure

Safe Transport Guidelines

Before starting to move the machine, check that the path along which it will be transported and the areas where it will be positioned are free of obstacles. Idle the machine down prior to loading.

1. Remove and tools and accessories fitted.

2. Lower the antenna (if not already done).

3. Again ensure that the engine is idled down.

4. Using the winch system on the trailer, slide the deck to the desired location (\*\*denoted by hash marks on the sides of the trailer where the ramps will be placed\*\*).

5. Secure the ramps to the sides of the trailer, aligning them with the existing reference hash marks. Double-check that the ramp hooks are firmly fastened to the deck prior to loading.

6. Maneuver the Turchi so that the machine tracks are aligned with the secured ramps. ENSURE THAT THE LOADING OPERATOR IS STANDING IN A SAFE LOCATION – CLEAR OF ALL AREAS WHERE THE TURCHI COULD POTENTIALLY ROLL OFF OF THE RAMPS.

7. Slowly move the Turchi onto the ramps, keeping a constant, low speed to gradually climb onto the trailer. Ensure that track-ramp contact is maintained, and that the Turchi is loading on in a straight manner.

8. Once the Turchi is on the trailer, slide the deck back into the “transit” position using the winch system. Remove the ramps from the sides of the trailer and put them in their “transit” positions under the trailer. CHAIN DOWN THE TURCHI AT 4 POINTS, USING 4 SEPARATE CHAINS AND 4 SEPARATE LOAD BINDING DEVICES.

9. Employees engaged in this loading procedure will act in accordance with the proper Turchi loading practices outlined in the ACP Applied Products Safety Manual.

### Machine Operating Procedures

**Safe Operating Guidelines**

1. Before operation of equipment check, that all controls are in neutral position. Check that there are no leaks, vandalism, or damage to the equipment.

2. Turn the ignition key slightly so the luminous device of the spark plug turns on. Wait a few seconds, then turn the ignition key on full to start the diesel engine.

3. Adjust the engine RPM using the lever next to the tower control panel.

4. Before proceeding with moving the tower, check that there is no one in the vicinity of the machine.

5. Operator must read instruction manual, receive training, and be physically and mentally capable before operation of system.

6. Operator must ensure that there are no other persons around the system during operation and must never leave it running without supervision.

7. Do not position the machine on slopes or unstable ground.

8. Do not position the machine in the proximity of electric lines.

9. Strictly prohibited to remove the movable or fixed guards when the machine running.

**WARNING:** During slide lifting it is prohibited to stand in proximity of the sunk post and extreme care must be taken, since if the post was not sunk perfectly vertically a whiplash effect might result and cause serious injury to the operators standing in the surrounding area.

10. Operator must be equipped with the required PPE. Failure to do so can result in hearing loss, injury, or death.

11. Never touch or stand close to the moving parts of a machine.

a) Accessories, jewellery, baggy clothing, etc. can hinder operation and result in serious injury.

b) Hydraulic oil becomes extremely hot during operation and can result in serious burns.

c) If machine is not equipped with a safety micro-switch on the edge of the tracks exercise extreme caution when moving machine as tracks can cause serious injury to lower limbs of the operators.

The operator (or anyone present) may never stand in proximity of the drilling area.

### Unloading Procedure

Safe Transport Guidelines

1. Unchain the Turchi from the trailer (WHEN IN TRANSIT, IT MUST BE SECURED AT 4 POINTS, USING 4 SEPARATE CHAINS AND 4 SEPARATE LOAD BINDING DEVICES).

2. Using the winch system on the trailer, slide the deck to the desired location (\*\*denoted by hash marks on the sides of the trailer where the ramps will be placed\*\*).

3. Secure the ramps to the sides of the trailer. Double-check that the ramp hooks are firmly fastened to the deck prior to loading.

4. Ensure that the Turchi tracks are aligned with the ramps prior to beginning descent from the trailer. Slowly move the Turchi onto the ramps, keeping a constant, low speed to gradually descend from the trailer. Ensure that track-ramp contact is maintained, and that the Turchi is off-loading in a straight manner.

5. Ensure that the path along which it will be transported and the areas where it will be positioned are free of obstacles

6. Employees engaged in this loading procedure will act in accordance with the proper Turchi loading practices outlined in the Safety Manual.

### Maintenance and Repair

**General Safety Rules**

Failure to perform an inspection, maintenance and lubrication operations may cause serious damage to persons and/or things.

1. The maintenance and lubrication operations may not under any circumstances be carried out with the system running and, where possible, should be performed outside the danger zone.

2. During maintenance, the system must be set in emergency by pressing the mushroom buttons on the machine.

1. Highlighted and located on the control panel, these devices allow immediate stopping of the machine.
2. Follow Lock-out/Tag-out procedures during maintenance.

**Routine Maintenance**

1. Every work shift will check the following:

1. Fuel level in the diesel engine tank
2. Grease the hammer using the special grease gun (use grease for high temperatures).

2. Every 40 hours:

1. Grease the cylinder joints.
2. Check the oil level in the hydraulic circuit.
3. Lubricate the hammer sliding guides and the longitudinal extraction guides.

3. Every 50 hours: clean and lubricate the chain with diesel oil.

4. Every 150 hours:

1. Check the state of wear of the chains and very carefully check the fasteners.
2. Check that the union bolts of the hydraulic system are tight.
3. Check the state of wear of hydraulic pipes.
4. Check the oil level and top up if necessary.
5. Check and if necessary replace the diesel oil and hydraulic oil caps.
6. Check and if necessary replace, if very dirty or damaged, the Plexiglas guards.

5. Every 500 hours replace the filter cartridge of the hydraulic circuit.

6. Every 1000 hours replace the carriage lifting chain.

7. Every 2000 hours change the hydraulic oil.

**Lubrication**

1. Ensure the system is off and not connected to energy sources by engaging the emergency stop, and removing the keys from the ignition.

2. Before proceeding with any lubrication, clean all parts with solvent to prevent the lubrication from pushing dirt into the joints which can cause abrasive wear.

3. To lubricate the chains, slacken them so that the lubricant can penetrate between the links.

a. Use diesel oil for cleaning and subsequent lubrication.

4. The sliding pins and surfaces must always be greased with a special brush.

**Washing**

1. Ensure the system is off and not connected to energy sources by engaging the emergency stop, and removing the keys from the ignition.

2. Clean the machine only with water and detergent, or compressed air.

3. The following parts must be cleaned with compressed air or a jet of water.

1. Hammerhead unit (air and/or water)
2. Track area (air and/or water)
3. Diesel engine air intake filters (air)

4. For chains, normal lubrication is sufficient. If however there is excessive dirt, you need to use fuel oil or kerosene and then immediately dry the chain with compressed air.

# 4.54 - HYDRAULIC BREAKER-EXCAVATOR ATTACHMENT

## Potential Health or Safety Concerns;

• Damage to Equipment/Materials

• Injuries to workers (Hands, Arms, Back, Eyes, Hearing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to using the Hydraulic Breaker and have required driver license for hauling equipment to site.

### General Safety Guidelines

1. Before carrying out adjustments or calibration, please ensure that the equipment is turned off and the breaker is lying on level ground in a stable position.

Do Not Use the ring on the casing through which the greasing tube passes as a lifting ring for the breaker itself or for other heavy objects.

2. Do not touch the hot parts of the hydraulic breaker with bare hands.

3. Depressurize the breaker’s hydraulic system, and beware of high pressure hydraulic oil spray escaping from the outlet or inlet pipe.

4. Keep a safe distance from the breaker under working conditions.

### Machine Operating Procedures

**Safe Operating Guidelines**

1. Before starting, check that the hoses are free from any obstacles.

2. Make sure the tool is properly greased.

3. Upon commencement of operation, keep the engine of the excavator to 2/3 its maximum potential.

4. Operator must read instruction manual, receive training, and be physically and mentally capable before operation of system.

5. Operator must ensure that there are no other persons around the system during operation and must never leave it running without supervision.

The breaker must NOT be used:

1. To pry up material.
2. As a ripper.
3. As a lever to rotate the excavator.
4. On steep/unstable ground.

This will prevent significant damage to the piece of equipment.

### Maintenance and Recharge

**General Rules**

1. Every 500 hours, the breaker should be dismantled and all the seals and the nitrogen accumulator diaphragm should be replaced.

2. The maximum clearance between the bushing and the tool must not exceed 5% of the diameter of the tool itself.

3. When working at temperatures below -15 °C raise the nitrogen pressure to 20% above the normal value.

### Routine Maintenance

1. Every 8 hours of work an employee/operator must:

1. Lubricate the tool shaft.
2. Lubricate the parts which slide inside the bushing.
3. Make sure all the tie rods are in working order.
4. All visible screws are tightened.
5. Carry out a general check-up of the breaker and replace any worn parts.
6. Check the flow in the breaker’s hydraulic circuit.
7. Check the operating pressure and oil temperature of the breaker, and make sure the blows are regular.
8. Check the hydraulic oil filters in the excavator, and replace if necessary.
9. Check all hydraulic hoses and, if necessary, replace them.

2. Every 80-100 hours an employee/operator must inspect:

1. The tool and retaining axle for signs of excess wear or burring.
2. The wear on the insert bush.

Nitrogen Recharge and Servicing Instructions

1. After every 500 hours of work the accumulator should be dismantled and the rubber diaphragm replaced.

1. As a general rule, if the accumulator loses pressure, the rubber diaphragm should be replaced
2. After each recharge, replace the dealing ring and wrap some Teflon tape around the inflating screw to prevent it from loosening.
3. Replace the O-ring between the accumulator and the breaker head.

# 4.55 - FALL ARREST / OVERHEAD WORK

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Falls)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, Certified Fall Arrest System, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to using Fall Arrest Equipment/Harness.

## Important:

If the full body harness has been subjected to fall arrest or impact forces it must be immediately removed from service and destroyed. Extreme working conditions (harsh environments, prolonged use, etc.) may require increasing the frequency of inspections. All harness need to be inspected prior to use and record on the appropriate tracking sheet. Any worker working above 3 metres must be equipped with fall arrest in case of a fall. (part 9 OH&S code)

### Procedure

Where workers cannot be protected from falls by guardrails or travel restraint, they must be protected by at least one of the following methods: Fall-restricting system, Safety net or Fall-arrest system.

In the event of a fall, these systems must keep a worker from hitting the ground, the next level below, or any other objects below. A fall-restricting system is designed to limit a workers free-fall distance to 0.6 metres (2 feet).

• Temporary fixed supports used for anchorage with a fall restricting system must support at least six kilo newtons (1,350 pounds) without exceeding the allowable unit stress for each material used.

• Components described under fall-arrest systems can be used for fall-restricting systems.

• Fall-restricting systems generally fasten to an eternal connection on your harness, then to a wire rope grab or fixed ridged rail system used for climbing ladders.

**A fall-arrest system**

• Must include a CSA-approved full-body harness

• Must include a lanyard equipped with an energy absorber unless the energy absorber could cause a falling worker to hit the ground or an object or a level below the work

• Must include an adequate fixed support; the harness must be connected to it via a lifeline, or via a lanyard and a lifeline

• Must prevent a falling worker from hitting the ground or any object or level below the work

• Must not subject a falling worker to a peak fall-arrest force greater than 8 kilonewtons (1800 pounds force).

• All fall protection equipment must be inspected for damage, wear, and obvious defects by a competent worker before each use

• Any worker required to use fall protection must be trained in its safe use and proper maintenance.

**Anchor Systems**

There are three basic types of anchor systems for fall protection:

1) Designed fixed support – load-rated anchors specifically designed and permanently installed for fall protection purposes as an integral part of the building or structure (for example, roof anchors on high-rise buildings)

2) Temporary fixed support – anchor systems designed to be connected to the structure using specific installation instructions (for example, nail-on anchors used by shinglers)

3) Existing structural features or equipment not intended as anchor points but verified by a professional engineer or competent person as having adequate capacity to serve as anchor points (for example, roof top mechanical rooms, structural steel, or reinforced concrete columns).

Designed fixed support can be used to anchor a fall-arrest system, fall-restricting system, or travel-restraint system if the support has been installed according to the OH&S code and practical to use.

Temporary fixed support can be used as anchorage if it meets the following conditions:

• It can support at least 8 kilo-newtons (1,800 pounds) without exceeding the allowable unit stress for each material used

• When used with a fall-arrest system incorporating an energy absorber, it can support at least 6 kilo-newtons (1,350 pounds) without exceeding the allowable unit stress for each material used

• When used with a travel-restraint system, it can support at least 2 kilo-newtons (450 pounds) without exceeding the allowable unit stress for each material used.

In all cases, a safety factor of at least two (minimum load X2) should be applied when determining the minimum load that an anchor point must support. As a general rule with fall-arrest systems, choose an anchor capable of supporting the weight of a small car (about 3,600 pounds). When existing structural features or equipment are used as anchor points, avoid corners or edges that could cut, chafe, or abrade fall protection components. Where necessary, use softeners such as wood blocking to protect connecting devices, lifelines, or lanyards from damage.

### Inspection Steps

**Step 1** Inspect harness hardware (buckles, D-rings, back pad, loop keepers); these items must not be damaged, broken, distorted, and must be free of sharp edges, burrs, cracks, worn parts, or corrosion. PVC coated hardware must be free of cuts, rips, tears, holes, etc. in the coating to ensure non-conductivity. Ensure buckles work smoothly. If present, inspect the quick connect buckles by ensuring that the release tabs work freely and that a click is heard when the buckle engages. Inspect parachute buckle spring.

**Step 2** Inspect webbing; material must be free of frayed, cut, or broken fibers. Check for tears, abrasions, mold, burns, or discoloration. Inspect stitching; Check for pulled or cut stitches. Broken stitches may be an indication that the harness has been impact loaded and must be removed from service.

**Step 3** Inspect labels; all labels should be present and fully legible.

**Step 4** Inspect each system component or according to manufacturer’s instructions.

**Step 5** Record the inspection date and results in the tracking sheet.

**Step 6** If inspection reveals a defective condition, remove unit from service immediately.

**Note:** Some harnesses are equipped with a “stand up D-ring” in the dorsal (back) D-ring location. If the spring in the D-ring is damaged or lost and the D-ring no longer stands up, this does not compromise the harness integrity. As long as the D-ring passes inspection criteria in Step 1, it is safe to use. Only parties certified and authorized in writing may make repairs to this equipment.

### Emergency Rescue

The OH&S code requires that before workers use any fall-arrest system or safety net on a project, the employer must develop written rescue procedures. It’s important that a worker involved in a fall arrest be brought to a safe area as quickly as possible without causing injury or putting rescuers at risk.

In many cases, the rescue plan can be simple. A ladder or elevating work platform can be used to reach suspended workers and get them down safely. Other workers may be hauled back up to the level from which they fell or pulled in through a nearby window or other opening.

In other cases, procedures may be more complicated. For instance, workers trapped on a failed swing stage, or hanging from it, may need to be rescued by specially trained and equipped personnel from the local fire department. Aerial ladder trucks or other high-reach equipment may be necessary. In extreme cases, the fire department may use rappelling techniques to reach trapped workers and lift or lower them to a safe level.

Plans should cover the on-site equipment, personnel, and procedures for different types of rescue. Any off-site rescue services that might be required should be contacted and arranged in advance to familiarize them with the project. The Hazard Assessment can be used to indicate the nearest hospital and the phone numbers of fire, ambulance, and police services.

Site management must ensure that;

• Everyone on site is aware of the rescue plan

• Equipment and other resources are available

• Designated personnel are properly trained.

• Rescue Plan must be readily available on site.

**FALL PROTECTION PLAN**



**Site Identification**:

**Project No.**:

**Supervisor**:

This Plan must be completed by the Site/Crew Supervisor for **each** work site location where:

* work will be done while workers are not protected by permanent guardrails, and from which a fall of 3 meters (10 feet) or more may occur, or
* a safety monitor & control zone system has been selected as the means of fall protection, or
* Alberta OHS has determined that a fall may result in an unusual risk of injury.

...................................................................................................................................

**IDENTIFICATION OF FALL HAZARDS**

Please put a check mark in the box by the corresponding hazard(s) and provide a description of the exact location(s).

[ ] SWINGSTAGE [ ] CRUSHER [ ] ROOF TOP [ ] Bridge

[ ]

SCAFFOLD [ ] WORK PLATFORM [ ] FLOOR OPENING [ ] CONVEYOR

[ ] OTHER (describe)

Description of exact location(s) of Fall Hazard(s)

**IDENTIFICATION OF FALL PROTECTION**

Please put a check mark in the box by the corresponding system(s).

[ ] GUARDRAIL [ ] FALL ARREST [ ] FALL RESTRAINT [ ] COVER

[ ] SAFETY NET [ ] CONTROL ZONE [ ] SAFETY MONITOR

[ ] OTHER (Identify)

**Fall Protection System Assembly / Disassembly instructions:**

**Instructions for use:**

**Maintenance instructions:**

**Inspection instructions:**

**Rescue Procedures:**

**Name of Safety Monitor (if used):**

..................................................................................................................................................

Have you reviewed the Fall Protection requirements and this completed Plan with all affected crew members? YES [ ] NO [ ]

**Plan Completed By (Name)** **Date:**

**Please forward one copy to the Regional Safety Supervisor, and post one copy at the work site.**

# 4.56 - CHOP SAW CUTTING

## Potential Health or Safety Concerns;

• Damage to Equipment/Materials

• Injuries to workers (Hands, Arms, Back, Eyes, Hearing)

## Equipment, PPE and Apparel to be used;

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class 2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to using the Chop Saw.

### **Safe Operating Guidelines**

1. Before using gas operated Chop Saws, employees must review the operator’s manual for that Model of Chop Saw.
2. Inspect the Chop Saw for any obvious defects that may affect its safe operation.
3. When fuelling the Chop Saw ensure that it is the correct mixture of fuel for the saw. If it requires engine oil ensure that it is full with the correct weight of oil. Add fuel in a well ventilated area with no ignition sources nearby and that the saw is not hot from recent use. Designate a fuelling area away from the cutting site.
4. Ensure that the cutting disc is inspected for any defects or cracks. If the cutting disc is broken or has any defects, DO NOT USE. Replace the cutting disc with a new one. Failure to do so may result in catastrophic failure resulting injury of the operator or other workers in the area.
5. Because Chop Saw use generates sparks, a Hot Work Permit is required to be completed and on site. Update cutting permit as required.
6. Ensure that the correct cutting disc is installed for the material being cut. Different materials require different cutting discs.
7. Prior to commencing cutting ensure that the operator is wearing the identified PPE for the task and that workers are not in the immediate area.
8. If identified on the Hazard Assessment and /or Hot Work Permit that fire is a hazard, ensure that there is a device or method on hand to extinguish the fire.
9. When cutting ensure that your feet are planted firmly and hold the saw with both hands, cutting slowly letting the saw do the work. Depending on the material being cut, several shallow passes will be more effective. Do not force the saw. Always cut holding the saw directly in front of you and no higher than your midsection.
10. When the cutting is complete shut the saw off and wait for the cutting disc to come to a complete stop before setting it down. Use caution that you do not touch hot surface’s on the saw.

# 4.57 - REPLACEMENT OF WOOD BRIDGE PLANKS

## Potential Health and Safety Concerns

• Back injuries

• Cuts

• Traffic

• Pinch Points

• Crush points

• Traffic

## Equipment, PPE and Apparel

• Skid Steer

• Impact tools

• Pick

• Hand tools

• Signs (as required)

• Arrow boards (as required)

• Cones (as required)

• Hard hats

• Gloves

• CSA Approved 6” Steel-toed boots

• Vest (Class 2-3)

• Safety glasses/goggles

• Knee pads

• Hearing protection, Alberta #2 First Aid Kit, Equipment checklists as required, Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to installing wood bridge planks.

### Recommended Procedures and Precautions to Offset Hazards

1. Hazard assessment must be completed for the planned tasks.

2. Warn and control traffic as needed referencing the correct TAS

3. Watch for unstable footing as work is often carried out on uneven or wet ground.

4. To remove planks use a long handle goose neck bar. Be aware of pinch points.

5. If using a Skid Steer to remove the planks, worker must stay clear as the planks can pop up unsuspectingly.

6. When lifting planks use caution to avoid back strains.

7. To minimize heavy lifting, two workers should lift longer pieces of planks.

8. Use hearing protection when operating, or working near, impact tools.

9. If using a palm nailer to re-nail the planks ensure that the air hoses are locate out of the way.

10. Upon completion carefully load waste material and tools. Use caution to prevent back strains. Remove traffic signs if they were required.

### Key Steps Occurring

1. Set up work zone or detour as required.

2. Remove planks with goose neck bar or skid steer.

3. Prepare and place new planks in position.

4. If required nail planks in place.

5. Load and secure old material onto trucks.

6. Remove TAS signage.

# 4.58 - INSTALLATION OF GROUND MOUNT BASES

## Potential Health and Safety Concerns

• Back injuries

• Cuts

• Traffic

• Pinch Points

• Crush points

• Overhead and underground utility strikes

• Slips & Falls

## Equipment, PPE and Apparel

• Drill Truck/Texoma

• Back/Track Hoe

• Pick/Shovels/Tamper

• Hand tools

• Signs (as required)

• Arrow boards (as required)

• Cones (as required)

• Hard hats

• Gloves

• CSA Approved 6” steel-toed boots

• Vest (Class 2-3)

• Safety glasses/goggles

• Ladder

• Load rated lifting devices

• Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklists, Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to installing ground mount bases and have required driver license.

### **Recommended Procedures and Precautions to Offset Hazards**

1. Hazard assessment must be completed for the planned tasks.

2. Warn and control traffic as needed referencing the correct TAS

3. Ensure that all utility services have been located. Precautions for overhead power lines need to be taken. Hazards assessments are to be done prior to starting the installation or repair (telephone, power, gas lines, fibre optics)

4. Utility locate sheets must be with the operator before digging.

5. Watch for unstable footing as work is often carried out on uneven or wet ground.

6. Ensure proper unloading/loading procedures are adhered to.

7. Use proper lifting practices to lift posts.

8. Be aware and alert and use a spotter when the drill truck or hoe is being manoeuvred on the worksite.

9. When any digging is in progress, smoking is prohibited on the worksite in the event of a utility strike.

10. When the bases are being lifted use caution and remain back during the lift.

11. Remain clear of the hole while the base is being lowered into place.

### Key Steps Occurring

**Installing Ground Mount Bases**

1. Ensure that all utilities have been located and that documentation is on site.

2. Set up work zone and flagging as required for the site, with proper PPE being utilized by all workers and subcontractors on site.

3. Determine exact locations for the ground mount bases.

4. Ensure that the Drill Truck/Texoma is level, and stable prior to commencing drilling operations.

5. Do not attempt to remove the excavated soil with shovels while the drill is rotating. Wait until the operator stops the drill or removes the drill from the hole.

6. Once the excavation is complete, set the base into the hole and level the base.

7. Never enter the excavation to prep the bottom or conduct any work.

8. In the event that the bottom of the hole is not suitable to level the base, remove the base and add material by hand from above to obtain correct grade.

9. Once the base is level, begin back-filling and tamping to secure the base.

# 4.59 - BOX BEAM GUARDRAIL INSTALLATION & REPAIR

## Potential Health and Safety Concerns

• Back injuries

• Cuts

• Traffic

• Pinch Points

• Fumes from cutting up galvanized guardrail

• Tension on Box Beam (release of)

• Crush points

## Equipment, PPE and Apparel

• Steamer (winter repairs)

• Turchi

• Loader

• Cutting torch

• Impact tools

• Guardrail

• Steel posts

• Picker Truck

• Guard rail bolts

• Pick

• Hand tools

• Signs (as required)

• Arrow boards (as required)

• Cones (as required)

• Hard hats

• Gloves

• CSA Approved 6” steel-toed boots

• Vest (Class 2-3)

• Safety glasses/goggles

• Chop saw

• Alberta # 2 Fire First Aid Kit, Fire Extinguisher, Equipment checklists, Refer to Hazard Assessment and ERP

**Training Required;**

Employees must be deemed competent prior to installing Box Beam Guardrails and have required driver license.

### Recommended Procedures and Precautions to Offset Hazards

1. Hazard assessment must be completed for the planned tasks.

2. Warn and control traffic as needed referencing the correct TAS

3. Ensure that all utility services have been located. Precautions for overhead powerlines need to be taken. Hazards assessments are to be done prior to starting the installation or repair (telephone, power, gas lines)

4. Utility locate sheets must be with the operator before digging.

5. Wear welding gloves and goggles when removing damaged guardrail with the use of an acetylene torch (operator should be trained)

6. When cutting galvanized beam, wear approved respirator.

7. Watch for hot chunks of metal.

8. Watch for unstable footing as work is often carried out on uneven or wet ground.

9. Ensure proper unloading/loading procedures are adhered to.

10. Use proper lifting practices to lift box beam or posts.

11. To minimize heavy lifting, two workers should lift longer pieces of beam.

12. Use hearing protection when operating, or working near, impact tools.

13. Upon completion carefully load waste material and tools. Remove traffic signs if they were required. Watch for back strains, cuts and traffic.

14. Install and repair box beams under good visibility condition whenever possible.

### Key Steps Occurring

1. Remove plates holding the Box Beam on top of the steel posts.

2. Lift Box Beam up and to the side.

3. Pull damaged posts and replace as required.

4. Tamp the surrounding material to secure the posts.

5. Return the Box Beam onto the top of the posts.

6. Re-install the steel plates securing the Box Beam to the posts.

# 4.60 - RAW MATERIALS STOCKPILING & REMOVAL

## Potential Health and Safety Concerns

• Back injuries

• Pinch Points

• Crush points

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher in area, Respiratory protection if required, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Stockpiling or removing materials. Must also be deemed competent operating the loader.

### **Recommended Procedures and Precautions to Offset Hazards**

**Stockpiles**

1. A safe slope away from the top of the stockpile to the base must be maintained.
2. Stockpiling during the winter presents special problems. Frozen layers may persist throughout the summer months, producing top heavy walls and overhangs, especially when rain saturated. A fissure may occur well back of the working face releasing tons of material. Sharp edges must be broken down to minimize this hazard.
3. All employees are responsible for informing their immediate Supervisor of any unusual or apparent dangerous formation developing in any stockpile. Supervisors will direct the corrective action to be taken in such instances.

**Moving Stockpiles**

1. During the absence of a Supervisor, the front-end loader operator is in complete charge of loading operations. Supervisor’s directions will be communicated with the hired truckers as well as company drivers. In the event of non-compliance with their instructions, loading operations will cease and the plant supervisor or superintendent informed immediately.
2. Loader operators must work the entire width of the stockpile face and strictly avoid the creation of concave, tunnel or overhanging workings.
3. Personnel must not approach stockpile faces on foot while loading operations are in progress.
4. All truck drivers will wait their turn in line well away from the stockpile and loading operations point.
5. When called for loading, drivers will position their vehicles facing away from the stockpile. Drivers shall remain inside their vehicle cabs during loading operations.
6. In the event of vehicle breakdown or the need for adjustments, the vehicle is to be moved well clear of the stockpile before adjustments or repairs are made.

Regulations are no substitute for the exercising of good judgment and common sense. Be alert to changing conditions which surround you.

# 4.61 - ATTACHING CABLE CLIPS AND CLAMPING

## Potential Health and Safety Concerns

• Back injuries

• Pinch Points

• Crush points

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to attaching clips and clamping.

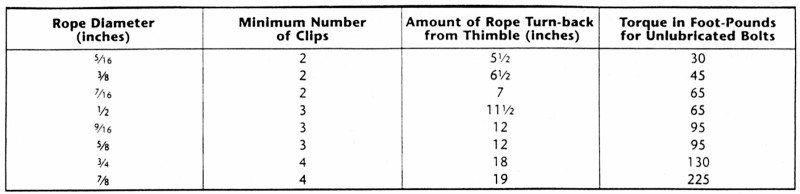
### **Recommended Procedures and Precautions to Offset Hazards**

1. Wire the thimble to the rope at the desired point, then bend the rope around the thimble and secure temporarily by wiring the rope members together.

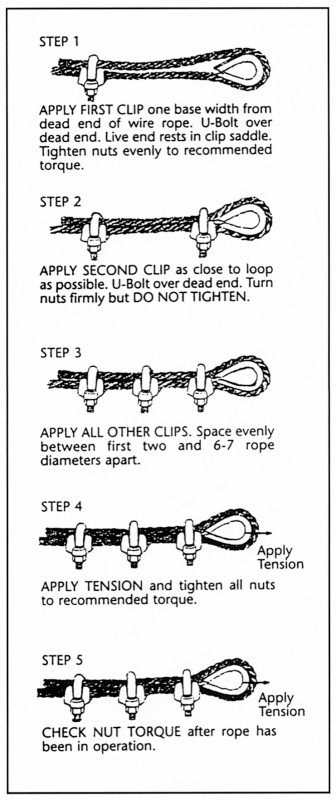
2. Frist attach the clip farthest from the thimble and tighten (be sure the base of the saddle rests upon the live end of the rope and the “U” bolts on the shorter end). All clips must be attached in this manner

3. The clip nearest the thimble goes on next. Do not tighten yet. If one or more additional clips are to be attached, place them at an equal distance apart between the slips already attached.

4. Before tightening, place some stress on the rope to take up the slack and equalize the tension on both sides of the clip. (Do not apply too much stress or the clip attached in Step 1 will not hold). Tighten all clips.



### Clip Assembly



# 4.62 - CONFINED SPACE ENTRY

## Potential Health and Safety Concerns

• Back injuries

• Pinch Points

• Crush points

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Fire retardant coveralls (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment checklist, Confined Space Entry Permit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent and have the appropriate training before entering a confined space.

## Recommended Procedures and Precautions to Offset Hazards

**Manhole and/or Sewer**

The following rules must be followed before entry into a Confined Space:

1. Obtain permit from Supervisor.

2. A minimum of two employees will be present with alarm system, cell phone or radio for communication in the event of emergency.

3. All barricades, man ways or openings removed shall be roped and/or marked as per OH&S Regulations.

4. In all traffic areas full road signage is required.

5. Explosion proof lighting that will provide sufficient illumination shall be used.

6. Be in possession of all safety equipment including an explosion proof flashlight, proper gloves, CSA approved rubber boots, and eye protection.

7. The confined space atmosphere will be tested by trained personnel to confirm that the atmosphere is above minimum OH&S requirement which is 19.5% for oxygen. Refer to the hazard assessment and the entry permit to determine if other testing is required.

8. If the atmosphere is okay, then proceed while testing the atmosphere continuously, or ventilate the confined space continuously and test the atmosphere every 15 minutes.

9. When a hazardous atmosphere is detected or is present, do not enter. Contact Supervisor and Safety Officer to develop a proper procedure or alternative method of completing the job.

10. Wear full body harness, attached to hoisting device and tripod, which is CSA approved.

11. Hoisting device manned continually.

**Confined Space Entry (Asphalt Tanks)**

The following rules must be followed before entering into an asphalt tank.

1. Obtain permit from Supervisor.
2. Proper personal protective equipment must be worn.
3. A minimum of two employees will be present with an alarm system, cell phone or radio for communication in the event of emergency.
4. An orange flag will be posted to show that an employee is in the tank as well as a sign in/out sheet completed.
5. Lighting that will provide sufficient illumination shall be used.
6. Be in possession of all safety equipment including a flashlight.
7. Prior to entry, the space will be ventilated and ventilation will continue for the duration of the job.
8. Wear a body belt / harness attached to a rope.
9. Exit/Entrance must be manned continually.
10. RESCUE PROCEDURE: In the event of an injury, get help first, then assist the injured person in exiting the tank. In the case of a serious injury (unconsciousness, fracture, etc.) call 911.

### Rescue Procedure

In the event of an injury in a confined space, provide First Aid, call for help if required and assist the injured person in exiting the confined space. In the event of a serious injury (unconsciousness, fracture, shock, stroke, etc.) call 911, ask for help and ambulance. Stay with the injured person and provide First Aid.

**NOTE:**• Any changes or deviations to these rules must be approved by the Safety Manager and Supervisor prior to entry.

• Failure to adhere to this policy will result in disciplinary action.

# Confined Space Entry Permit

**CONFINED SPACE ENTERY PERMIT Permit number \_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_**

Location and Description Purpose of Entry

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| Scheduled a.m.  Start \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_p.m.  dd/mm/yy Time | Scheduled a.m.  End Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_p.m.  dd/mm/yy Time |

Worker(s) in charge of entry :

Entrants Attendants

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Pre-Entry Authorization (Check those items below which are applicable to your confined space entry permit)

☐ Oxygen Deficient Atmosphere ☐ Engulfment ☐Energized Electric Equipment

☐ Oxygen Enriched Atmosphere ☐ Toxic Atmosphere ☐ Entrapment

☐ Welding/Cutting ☐ Flammable atmosphere ☐ Hazardous chemical

SAFETY PRECAUTIONS

☐Self-contained breathing apparatus ☐lifelines ☐Signs posted ☐Lighting

☐Airlines Respirator ☐Respirators ☐Clearances secured ☐Ventilation

☐Fire Extinguishers ☐Ground Fault Interrupter ☐Protective Gloves ☐Barricade Job Area

☐Remarks \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Environmental Conditions**

|  |  |
| --- | --- |
| Test to be taken Date/Time  Oxygen \_\_\_\_\_\_\_\_\_% \_\_\_\_\_\_\_\_\_\_a/p  Lower Explosive Limit \_\_\_\_\_\_\_\_\_% \_\_\_\_\_\_\_\_\_\_\_a/p  Toxic Atmosphere \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Instruments Used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Re-Testing Date/Time  Oxygen\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_% \_\_\_\_\_\_\_\_\_\_\_\_\_\_a/p  Lower Explosive Limit \_\_\_\_\_\_\_\_\_% \_\_\_\_\_\_\_\_\_\_\_\_a/p  Toxic Atmosphere \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Instruments Used\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

Workers Conducting Safety Checks Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Entry Authorization (all actions and/or conditions for safe entry have been performed)**

Person in charge of entry \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(please print)

**Entry cancellation (Entry has been completed and all entrants have left the space)**

Person in charge of entry \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (please print)

# Confined Space Hazard Assessment Work Sheet

Location of work:

Description of tasks to be completed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Entry Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Atmospheric Hazards: Yes No

Explosive atmosphere (gases, Vapours, fine dusts) ☐ ☐

Oxygen Deficiency ☐ ☐

Oxygen enrichment ☐ ☐

Toxic gases or vapours ☐ ☐

Dust, mists, fumes ☐ ☐

Smoke ☐ ☐

Biological agent’s ☐ ☐

Other ☐ ☐

If yes to 1 or more of the above, specify atmospheric hazards

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Safety Hazards Yes No

Entry/Exit

* Small/Narrow openings ☐ ☐
* Steep openings ☐ ☐
* Entry/Exit at height ☐ ☐
* Angled openings ☐ ☐
* Exits into traffic or machinery ☐ ☐

Machinery/mechanical equipment ☐ ☐

Piping and distribution systems ☐ ☐

Residual chemicals or materials ☐ ☐

Pressure systems ☐ ☐

Electrical hazards ☐ ☐

Poor visibility ☐ ☐

Physical obstacles ☐ ☐

Walking/working surfaces ☐ ☐

Temperature Extremes

Heat stress ☐ ☐

Cold Stress ☐ ☐

Humidity ☐ ☐

Noise ☐ ☐

Vibration ☐ ☐

Radiation ☐ ☐

Type\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Other ☐ ☐

Type\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Work Related Hazards Yes No

* Hot work ☐ ☐

Type\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Sandblasting ☐ ☐
* Bonding operations ☐ ☐
* Grinding ☐ ☐
* Cutting ☐ ☐
* Use of solvents, corrosive chemicals or cleaners ☐ ☐
* Use of paint. spray painting ☐ ☐
* Repairs ☐ ☐

If yes Describe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Yes No

* Installation ☐ ☐

If yes Describe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Emergency rescue/first aid ☐ ☐
* Other ☐ ☐

If yes type \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Human Factors

Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Time : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Persons Involved in assessment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4.63 - LIGHTING OF TAR KETTLE**

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Burns, Strains)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Fire retardant coveralls (Class2-3), Kevlar sleeves or heat resistant gloves, Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to lighting and using a Tar Kettle.

**Recommended Procedure and Precautions to Offset Hazards**

* Never leave tar kettle unattended after it has been fired up. There is the danger of fire and/or explosion due to high heat or low tar level in pot.
* Check tar kettles, especially after a heavy rain to ensure no water has entered into the kettle. If water is seen inside tar kettle, it will need to be completely dry, by bailing it out. Then use a cloth or rag to absorb the remaining small amount.
* **Note:**Water left inside tar pot will be converted to steam causing violent eruptions, throwing hot tar high into the air.
* Ensure tar level is high enough to absorb heat from burner. Tar kettle temperature should not exceed 325F. Reduce burning rate as tar levels drop.
* Turn tar pails upside down each morning to remove any water before running hot tar into them.
* Clean off tar pot once a week to minimize fire hazard.
* An ABC-rated fire extinguisher must always be mounted on tar kettle or be available on truck.

**4.62.1 - Lighting of Tar Kettle**

1. Ensure bottom burner valve is shut off.

2. Ensure main propane tack valve is shut off.

3. Note: If bottom valve has been open, wait five (5) minutes before continuing. The reason being that there is a possibility of propane being able to leak into the firing chamber and this build-up could create an explosion.

4. If both valves have been shut off, then proceed.

5. Light tiger torch:

1. Turn bottle valve to torch on
2. Crack open valve at torch head
3. Ignite with safety gas lighter

6. Place tiger torch in burning chamber, open main propane valve, then open bottom burner valve.

7. Remove torch and adjust propane flow to burner as necessary.

8. Caution: If the propane is turned too high, burner may blow out.

9. If too windy, burner may blow out.

10. If burner goes out, turn both valves off, wait five (5) minutes before proceeding to relight.

11. To shut down; shut off propane bottle valve first and then burner valve.

# 4.64 - EXCAVATION AND TRENCHES

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Utility Strikes, Suffocation, Falling Debris, Hit by Equipment)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Respiratory protection if required, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent and familiar with O.H&S Code, Part 32. prior to participating in Excavation and Trenching activities.

### **Recommended Procedures and Precautions to Offset Hazards**

**Excavation**

Subject to the OH&S Code, Part 32, “Excavating and Tunnelling”, the following is also observed by Canadian Road Builder Inc. and its divisions:

The following must be established:

1. A precise location of the work

2. The date the work is to be carried out.

3. A concise explanation of the work to be performed.

4. The following precautions must be taken:

5. All underground services within the work site must be traced by Alberta One-Call (1-800-242-3447) or http://albertaonecall.com/ and the locations of the services must be marked out.

6. Safety barriers must be put in place before digging starts.

7. Shoring/sloping of excavated areas must be in accordance with procedure for trenches and OH&S Code, Part 32, “Excavating and Tunnelling”, and Code Schedule 9 “Sharing Component Dimensions”.

**Trenches**

A necessary consideration in the planning of sewer, pipeline, and similar sub-surface work by the trenching method is preventing trench wall cave-in and soil movement. Either or both may result in death or serious injury to workers, plus damages to adjacent structures and utilities.

The hazards associated with trenching include:

1. Death by suffocation or crushing when falling soil buries a worker.

2. Materials falling on a worker in the trench.

3. Failure of apparently adequate shoring due to unexpected loads.

4. These loads are usually superimposed on the shoring structure or ground surface at the edge of the trench. Failure may also result from vibration due to traffic.

5. Use of defective shoring material.

6. Failure to maintain shoring properly after changes caused by operation or after damage by washouts or heavy rains.

7. Failure to place removed soil at a safe distance from the edge of a trench. (must be minimum 1m. away, with minimum 45 slope).

8. Workers working too close together or too close to the equipment.

9. Making ourselves familiar with these hazards, being able to recognize them as hazards, and being prepared to take some positive action to eliminate them, could very well save a life.

Tables 4.7/T1 and 4.7/T2 showing trench depths and widths can be used as a guide to ensure proper width and depth ratios for any trench 1.8 m or greater in depth.

Please refer to the appropriate section of the Occupational Health and Safety Code, Schedule 9 for lumber sizes for adequate shoring.

# 4.65 - OPERATION AND MAINTENANCE OF EARTHWORKS EQUIPMENT (Swing Type)

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Utility strikes, Hit by Equipment)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Earthworks Equipment and have required driver license.

### Recommended Procedure and Precautions to Offset Hazards

*Definitions*

1. Check - compare with a predetermined standard or normal condition of operation.

2. Earthwork Equipment (swing type) - earthwork equipment used in the operation of earth removal and placement shall include draglines, guardrails, clamshell-equipped cranes, backhoes, shovels, pile drivers, augers and all other similar types of machinery.

3. Examine - verify by visual and manual examination and by measurement and gauging of working and loaded components and surfaces, that the machinery or equipment is in a safe, satisfactory condition to do its job. Strip, dismantle, clean and take action as necessary to carry out the examination.

4. Inspect - verify that the machinery or equipment is in working order in so far as can be judged by visual examination, while if appropriate, the machinery is running normally, or the equipment is operating.

5. Non-destructive Test - a procedure used to detect internal surface and concealed defects or flaws in materials using techniques that do not damage or destroy the items being tested.

6. Operator - a worker designated to control the equipment or machinery such that it safely performs the function for which it is intended on a project. An operator shall be either:

(a) An apprentice

i) Who enters into a contract of apprenticeship in accordance with Part 3 of the Apprenticeship and Industry Training Act under which he is to receive from or through his employer instruction and continuous employment based on the amount of work available in the trade designated Heavy Equipment Operator (crane and hoist equipment), or

(b) A journeyman

i) Who is the holder of a Certificate of Qualification for the trade of Heavy Equipment Operator (crane and hoist equipment) or

ii) Who is, in the opinion of the Director of Apprenticeship and Certification, an experienced and skilled worker in the trade of Heavy Equipment Operator (crane and hoist equipment) whether or not the person holds a Certificate of Qualification for this trade.

7. Project Supervisor/Superintendent - Contractor’s representative at the site who is responsible for continuous field supervision, co-ordination, completion of the work and the prevention of accidents with respect to the earthwork equipment (swing type).

8. Supplier - A person, who rents, leases, erects, installs or provides any earthwork equipment (swing type) or any parts or maintenance for such equipment in respect of a project or work site.

9. Test - carry out a procedure including, if appropriate, operation of the equipment, but not dismantling, as necessary to determine that it is correctly assembled, functioning properly and likely to do so.

**Journeymen Operators, Apprentices and Maintenance Personnel**

1. A project supervisor/superintendent shall appoint only those persons to be operators as defined in SM4.8 (6) and who are competent to operate earthwork equipment (swing type) without constant supervision.

2. During apprenticeship training in the field, the apprentice shall be under the supervision of a journeyman operator at all times until capable of operating earthwork equipment (swing type) without constant supervision.

3. The project supervisor/superintendent of earthwork equipment (swing type) shall be in possession of, and make available to every operator a copy of the “Procedures for the Operation and Maintenance of Earthwork Equipment (swing type)”.

4. Every operator shall be physically capable of controlling earthwork equipment (swing type) without threat to the health or safety of others and shall, upon request, produce evidence of such status.

5. In addition to the foregoing requirements, any person designated as an earthwork equipment (swing type) operator shall:

(a) Demonstrate, to his supervisor, an understanding of these procedures, and

(b) Conduct a maintenance check to ensure the equipment can safely handle all tasks and loads in all conditions that may be experienced on the current shift of operations, and

(c) Be familiar with the earthwork equipment (swing type) to be operated, operator shall be given sufficient time to adequately check out and test the equipment. Before operating the equipment, review the equipment’s logbook and verify that any repairs or adjustments have been effective.

6. Effective from the date of implementation of these requirements, each apprentice and operator shall maintain an operator’s logbook, to be signed by their supervisor at the end of each work week or at the termination of employment, in which shall be entered:

(a) Training records, and

(b) A record of experience on earthwork equipment (swing type), the models of equipment operated and all related work.

7. The project supervisor/superintendent of earthwork equipment shall engage certified mechanics, journeymen operators, or other competent technicians to set up equipment, dismantle and execute corrective maintenance. The supervisor shall engage certified technicians, technologists or professional engineers as required testing or examining as required following repairs.

**Earthwork Equipment (swing type)**

1. Earthwork equipment (swing type) shall be modified, installed, operated, inspected, tested, maintained and repaired to meet the manufacturer’s specifications and standards which are not less than the applicable Canadian Standards Association codes.
2. Earthwork equipment (swing type) shall be used in accordance with the Occupational Health & Safety Act and Regulations. The Director of Inspection shall be notified whenever operations may be undertaken that are outside the requirements of these procedures.
3. When replacement parts are used, such parts shall be of material and workmanship at least equal to the original materials and workmanship, of adequate strength and free from patent defect.
   1. Repairs are allowed by other than the original manufacturer provided such work complies with the requirements of the applicable standards and are approved by a professional engineer.
4. Earthwork equipment shall be provided with a means of preventing unauthorized operation while the equipment is unattended.

### Operation

It shall be the duty of the operator to:

1. Read and understand all safety precautions and warnings pertaining to the machine being operated.

(a) Know the signals for controlling equipment operations. Signals shall be given by one worker.

(b) Before digging, know the exact location of all buried utilities, and have them clearly marked.

2. Ensure the machine is equipped with proper fire extinguisher which has been inspected as recommended.

3. Ensure all covers and guards are in place and secure.

4. Ensure cable is not tangled, kinked or frayed (cable machine).

5. Check for adequate tail swing clearance before operating.

6. Be at the controls when operating the machine.

7. Check for proper operations of all controls and protective devices while moving slowly in an open area.

(a) Left and right steering

(b) All brakes

(c) Engine governor control level

(d) Other devices such as lights, backup alarms and horns

8. Clean windshield, mirrors, steps, grab bars and operator’s compartment.

9. Ensure no one will be endangered when operating a machine.

10. Never swing over the cab when loading trucks. Operator to also make sure the driver remains out of the truck during loading.

11. Back machine away from an excavation before parking

12. Lower machines equipment/attachments before leaving the operator’s cab when parking.

13. Operate the equipment in accordance with the requirements of the Electrical Protection Act when in the vicinity of power lines.

14. Swing the boom to the upper side of a hill to avoid tipping – except when using the boom as a support (hydraulic machine).

15. Ensure no one straddles the cable (cable machine).

16. Ensure tracks are kept clean and blocked in a manner to prevent freeze down.

17. Check unusual noises or problems on the equipment and deal with them accordingly.

**It shall be the responsibility of the project supervisor/ superintendent to:**

1. Know the exact location of all buried pipes and cables and have them marked.
2. Know the requirements of the Electrical Protection Act with regard to overhead power lines and buried cables.
3. Ensure that all truck drivers and other persons remain out of the cab during loading.
4. Ensure machines and other equipment are kept at a safe distance from the edge of an excavation or trench.
5. Ensure that all equipment is parked properly and secured against unauthorized operation.

### Inspection, Examination and Testing

1. Where competency to carry out an examination or inspection or conduct a specific test or administer a testing procedure is governed by the Engineering, Geological and Geophysical Professions Act and pursuant Regulations, then only those persons certified to carry out the procedures shall be used, and the procedures shall be carried out under the direct supervision of a registered professional engineer.

2. It shall be the responsibility of the owner or supplier of earthwork equipment (swing type) to:

(a) Arrange for competent persons to conduct all daily, weekly or other inspections, tests, maintenance and/or repairs as prescribed by the manufacturer’s specifications, and

(b) Arrange for competent persons to conduct all structural, mechanical, electrical, operational or rigging repairs when required, and

(c) Ensure that an up-to-date equipment log is maintained which shall include records of:

i) Inspections

ii) Repairs

iii) Where applicable, tests of safety devices

iv) Size and types of wire rope in use

v) Rigging information

vi) Hours of service (hour meter recording if applicable)

vii) Any other operational information required by owner or supplier

3. Responsibilities of the owner or supplier may be transferred to a lessee or contractor by written contract or rental agreement.

4. The project supervisor/superintendent shall:

(a) Allow sufficient time to complete all testing and maintenance that is or may be required.

(b) Inspect or test, or supervise the inspection or testing of, the equipment at the commencement of each shift, as required by the manufacturer’s specifications.

5. It shall be the duty of the operator in charge of earthwork equipment to:

(a) Inspect or test, or supervise the inspection of testing of, the equipment at the commencement of each shift, as required by the manufacturer’s specifications.

(b) Maintain, with the equipment, an up-to-date record which shall describe:

i) Apparent and possible defects or deficiencies, and

ii) Any matter or incident which may affect the safe operation of the equipment

(c) Report those items recorded to the responsible person.

(d) Inspect to determine that the proper repairs or investigations have been carried out.

(e) Inspect to determine that the equipment tracks, wheels and bases or outrigger pads are on firm footings, adequate for the job and that such conditions will remain for the job duration.

### Maintenance Plan

1. A maintenance schedule should be set up on an hourly, daily, weekly, monthly and/or yearly basis in accordance with the manufacturer’s specifications.

2. All components shall be maintained in accordance with the manufacturer’s specifications.

(a) Repairs and modifications shall be entered into the maintenance history record.

(b) All maintenance shall be done in a safe manner and comply with Occupational Health & Safety regulations, or other applicable regulations.

**Maintenance**

**General**

1. Equipment shall be serviced to not less than the manufacturer’s specifications.

2. It may become necessary to vary maintenance schedules because of the differences in equipment and conditions of assembly, installation and operation.

3. Raised booms or other equipment components shall be secured with blocking or approved safety supports during maintenance.

4. During maintenance activities, equipment shall be locked out or when lockout is not possible a sign posted on controls identifying that the equipment is not operational.

**Daily**

In addition to any other requirements, at the start of every shift the operator shall:

1. Make per-operational check before starting engine including:

1. All fluid levels (fuel, crankcase oil, coolant)
2. Battery electrolyte level
3. Belts, radiator hoses (in place and not damaged or frayed)
4. Bolts/mountings around engines
5. Coolant and oil seals
6. Air cleaner and connections
7. Drain cocks
8. Evidence of vandalism

Checking walkways, handrails and ladders

2. Make an operational check after starting engine and bring up to operating temperature including:

(a) Engine

Oil pressure is normal

Oil level is sufficient (if manufacturer recommends checking while engine is running)

Temperature is normal

Battery is not discharging

Air cleaner is functioning properly as indicated by the gauge or light

(b) Air and Hydraulic Systems

i) Pressure is correct for operation (if equipped with a gauge)

ii) Hoses have no cuts, abrasions or bulges and are tight and leak-proof

(c) Hydraulic System

Oil level in hydraulic reservoir is normal

No visible leaks in seals

Filters are functioning properly as indicated by the gauge or warning light or alarm

(d) Filters

Check for contaminants

Replace if scheduled or near schedule

(e) Tires (where applicable)

Check for cuts, abrasion, wear and adequate pressure

(f) Lights

All bulbs and fuses are intact and functional

(g) Crawler Tracks (where applicable)

Tracks are in good condition, adequate for the terrain and the operation to be carried out

(h) Fastening Devices

Ensure there are no loose bolts/fasteners

Ensure that boom pins and keepers are in place

Guards

Visually check all guards to ensure that they are in place and functional

(j) Rigging and Rigging Accessories

Visually check sheave for excessive wear

Ensure that sheave rotates freely

(k) Controls

Equipment is operational and will hoist, swing and travel and raise and lower the load line

Cab lock is functional

(l) Braking and Clutch System

Clutch does not slip

Emergency and/or parking brakes are operational

(m) Steering

On mobile carriers: there is correct alignment and no excessive slackness

On crawlers: both tracks will operate in the same direction; tracks can operate independently; tracks can move in opposite directions; and all tracks lock

On rough terrain units: all steering modes operate, e.g., conventional, 4-wheel and crab

(n) Lifting or Hoisting Devices

Wire-rope is not worn or kinked

Visually check boom dogs/pawls

Automatic kick outs in boom stops are operational

Boom dogs/pawls or brake band on lattice booms are functioning

Boom raising and lowering functions are normal (if possible check with a load)

Hooks raise and lower normally

(o) Swinging/Slewing

Check that the upper works swing smoothly and excess power is not required

(p) Boom Telescoping (where applicable)

Ensure hydraulic boom will telescope with sections extending equally or sequentially as per manufacturer’s instruction

(q) Load Weighing and Moment Devices

Check by using test circuits

(r) Safety and Warning devices

Maintain oil and grease as per manufacturer’s specifications

### Weekly or Monthly as Specified

1. In addition to any other requirements, where the manufacturer has specified a weekly or monthly inspection of the equipment or its components, the operator or other competent person shall:
2. Lower the boom to facilitate all required inspections.
3. Inspect the structural boom components and pins for wear.
4. Visually inspect travelling components of the equipment for wear, alignment or defects:
   1. Rollers and tracks
   2. Tires and wheels
5. Inspect wire rope for wear, corrosion or fatigue and kinks, bends or other deformities such as severed strands or parting or ropes.
6. Inspect pendent and other stationary ropes for tension, proper thumbing’s and proper connections at anchored points.
7. Inspect all braking systems and components including bands, drums and pins for wear and controls for ease of function.

### Yearly

At intervals in accordance with the manufacturer’s specifications or relevant regulation, whichever is the sooner, the owner or supplier shall provide for an examination which may include:

1. Non-destructive test of all load-carrying equipment such as boom, boom mounting, sheaves, blocks, shackles, hooks, chains and slings.
2. Examine attachment of equipment to carrier at point of rotation.
3. Examine all winches and test line-pull for compliance with manufacturer’s specifications.
4. Non-destructive testing should be scheduled for the fall season (October/November) to ensure structurally adequate equipment throughout the cold weather.
5. Results of testing and inspections performed shall be confirmed in writing immediately.

# 4.66 - OPERATION AND MAINTENANCE OF EARTHWORKS EQUIPMENT (Non Swing Type)

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Utility strikes, Hit by Equipment)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Earthworks Equipment and have required driver license.

### Recommended Procedure and Precautions to Offset Hazards

*Definitions*

Refer to Operating and maintenance of Earthworks Equipment (Swing Type)

Earthwork Equipment (non-swing type) - earthwork equipment used in the operation of earth removal and placement shall include track-type tractors, motor graders, wheel tractor-scrapers (self-propelled and pull type), compactors, wheel and track-type loaders, tractor-mounted backhoe/front wheel loader and other non-swing types of equipment and attachments.

**Operators, Trainees and Maintenance Personnel**

1. A project supervisor/superintendent shall appoint only those persons to be operators and who are competent to operate earthwork equipment (non-swing) without constant supervision.
2. During training in the field, the trainee shall be under the supervision of a competent operator at all times until capable of operating earthwork equipment without constant supervision.
3. The project supervisor/superintendent of earthwork equipment shall be in possession of, and make available to every operator a copy of the “Procedures for the Operation and Maintenance of Earthwork Equipment (non-swing)”.
4. Every operator shall be physically capable of controlling earthwork equipment without threat to the health or safety of others and shall, upon request, produce evidence of such status.
5. In addition to the foregoing requirements, any person designated as an earthwork equipment operator shall:
   1. Demonstrate, to their supervisor, an understanding of these procedures, and
   2. Conduct a maintenance check to ensure the equipment can safely handle all tasks and loads in all conditions that may be experienced on the current shift of operations, and
   3. Be familiar with the earthwork equipment to be operated, otherwise shall be given sufficient time to adequately check out and test the equipment, and
   4. Before operating the equipment, review the equipment log book and satisfy themselves that any repairs or adjustments have been completed.
6. Effective from the date of implementation of these requirements, each trainee and operator should maintain an operator’s log book, to be signed by their supervisor at the end of each work week or at the termination of employment, in which shall be entered:
   1. Training records, and
   2. A record of experience on earthwork equipment, the models of equipment operated and all related work.

**Earthwork Equipment**

1. Earthwork equipment shall be modified, installed, operated, inspected, tested, maintained and repaired to meet the manufacturer’s specifications and standards which are not less than the applicable Canadian Standards Association codes.
2. Earthwork equipment shall be used in accordance with the Occupational Health & Safety Act and Regulations. The Director of Inspection shall be notified whenever operations may be undertaken that are outside the requirements of these procedures.
3. When replacement parts are used, such parts shall be of material and workmanship at least equal to the original materials and workmanship, of adequate strength and free from patent defect.
4. Earthwork equipment shall be provided with a means of preventing unauthorized operation while the equipment is unattended.
5. Earthwork equipment shall be provided with a rollover protective structure, seat, belts, backup alarms and other required safety and protective devices as per General Safety Regulations.

### Operation

1. It shall be the duty of the operator to:
2. Read and understand all safety precautions and warnings pertaining to the machine being operated, and be familiar with the legal regulations applicable to the work being performed and the location of the work site.
3. Know the signals for controlling equipment operations. Signals shall be given by one worker.
4. Before digging, know the exact location of all buried utilities, and have them clearly marked.
5. Ensure the machine is equipped with proper fire extinguisher which has been inspected as recommended.
6. Ensure all covers and guards are in place and secure.
7. Ensure cable is not tangled, kinked or frayed (cable machine).
8. Check for adequate turning or manoeuvring clearance before operating.
9. Be at the controls when operating the machine.
10. Check for proper operations of all controls and protective devices while moving slowly in an open area.
    1. Left and right steering
    2. All brakes
    3. Engine governor control level
    4. Other devices such as lights, backup alarms and horns
11. Clean windshield, mirrors, steps, grab bars and operator’s compartment.
12. Ensure no one will be endangered when operating a machine.
13. Back machine away from an excavation before parking
14. Lower machines equipment/attachments before leaving the operator’s cab when parking.
15. Operate the equipment in accordance with the requirements of the Electrical Protection Act when in the vicinity of power lines.
16. Use proper side hill operation procedures, as the manufacturer recommends.
17. Ensure no one straddles the cable (cable machine).
18. Ensure tracks are kept clean and blocked in a manner to prevent freeze down.
19. Check unusual noises or problems on equipment and record in equipment log book and inform supervisor/superintendent.

**It shall be the responsibility of the project supervisor/ superintendent to:**

1. Know the exact location of all buried utilities, have them marked and know the requirements of all applicable regulations.
2. Know the requirements of the Electrical Protection Act with regard to overhead power lines and buried cables.
3. Ensure machines and other equipment are kept at a safe distance from the edge of an excavation or trench.
4. Ensure that all equipment is parked properly and secured against unauthorized operation.

### Inspection, Examination and Testing

1. Where competency to carry out an examination or inspection or conduct a specific test or administer a testing procedure is governed by the Engineering, Geological and Geophysical Professions Act and pursuant Regulations, then only those persons certified to carry out the procedures shall be used, and the procedures shall be carried out under the direct supervision of a registered professional engineer.

2. It shall be the responsibility of the owner or supplier of earthwork equipment to:

1. Arrange for competent persons to conduct all daily, weekly or other inspections, tests, maintenance and/or repairs as prescribed by the manufacturer’s specifications, and
2. Ensure that an up-to-date equipment log is maintained which shall include records of:
3. Inspections
4. Repairs
5. Where applicable, tests of safety devices
6. Hours of service (hour meter recording if applicable)
7. Any other operational information required by owner or supplier

3. Responsibilities of the owner or supplier may be transferred to a lessee or contractor by written contract or rental agreement.

4. The project supervisor/superintendent shall:

1. Allow sufficient time to complete all testing and maintenance that is or may be required.
2. Inspect or test, or supervise the inspection or testing of, the equipment at the commencement of each shift, as required by the manufacturer’s specifications.

5. It shall be the duty of the operator in charge of earthwork equipment to:

1. Inspect or test, the equipment at the commencement of each shift, as required by the manufacturer’s specifications.
2. Maintain, with the equipment, an up-to-date record which shall describe:
3. Apparent and possible defects or deficiencies, and
4. Any matter or incident which may affect the safe operation of the equipment
5. Report those items recorded to the responsible person.
6. Inspect to determine that the proper repairs or investigations have been carried out.
7. Inspect to determine that the equipment tracks, wheels and bases are on firm footings, adequate for the job, and that such conditions will remain for the job duration.

### Maintenance Plan

1. A maintenance schedule should be set up on an hourly, daily, weekly, monthly and/or yearly basis in accordance with the manufacturer’s specifications and as set out in chapter 7 of the Safety Manual.

2. All components shall be maintained in accordance with the manufacturer’s specifications.

1. Repairs and modifications shall be entered into the maintenance history record.
2. All maintenance shall be done in a safe manner and comply with Occupational Health & Safety regulations, or other applicable regulations.

**Maintenance**

General

1. Equipment shall be serviced to not less than the manufacturer’s specifications.
2. It may become necessary to vary maintenance schedules because of the differences in equipment and conditions of assembly, installation and operation.
3. Raised blades or other equipment components shall be secured with blocking or approved safety supports during maintenance.
4. During maintenance activities, equipment shall be locked out or when lockout is not possible a sign posted on controls identifying that the equipment is not operational.

Daily

In addition to any other requirements, at the start of every shift the operator shall:

1. Make per-operational check before starting engine including:

1. All fluid levels (fuel, crankcase oil, coolant)
2. Battery
3. Belts, radiator hoses (in place and not damaged or frayed)
4. Bolts/mountings around engines
5. Coolant and oil seals
6. Air cleaner and connections
7. Drain cocks
8. Evidence of vandalism
9. Checking walkways, handrails and ladders

2. Make an operational check after starting engine and bring up to operating temperature including:

1. Engine
2. Oil pressure is normal
3. Oil level is sufficient (if manufacturer recommends checking while engine is running)
4. Temperature is normal
5. Battery is not discharging
6. Air and Hydraulic Systems
7. Pressure is correct for operation (if equipped with a gauge)
8. Hoses have no cuts, abrasions or bulges and are tight and leak-proof
9. Hydraulic System
10. Oil level in hydraulic reservoir is normal
11. No visible leaks in seals
12. Filters are functioning properly as indicated by the gauge or warning light or alarm
13. Filters
14. Check for contaminants
15. Replace if scheduled or near schedule
16. Tires (where applicable)
17. Check for cuts, abrasion, wear and adequate pressure
18. Lights
19. All bulbs and fuses are intact and functional
20. Crawler Tracks (where applicable)
21. Tracks are in good condition, adequate for the terrain and the operation to be carried out
22. Fastening Devices
23. Ensure there are no loose bolts/fasteners
24. Ensure that boom pins and keepers are in place
25. Guards
26. Visually check all guards to ensure that they are in place and functional
27. Controls
28. Equipment is operational and will travel and raise and lower smoothly, under control
29. Braking and Clutch System
30. Clutch does not slip
31. Emergency and/or parking brakes are operational
32. Steering
33. On mobile carriers: there is correct alignment and no excessive slackness
34. On crawlers: both tracks will operate in the same direction; tracks can operate independently; tracks can move in opposite directions; and all tracks lock
35. On rough terrain units: all steering modes operate, e.g., conventional, 4-wheel and crab
36. Safety and Warning devices
37. Maintain oil and grease as per manufacturer’s specifications

Weekly or Monthly as Specified

In addition to any other requirements, where the manufacturer has specified a weekly or monthly inspection of the equipment or its components, the operator or other competent person shall:

1. Inspect the structural components and pins for wear.
2. Visually inspect travelling components of the equipment for wear, alignment or defects:

(a) Rollers and tracks

(b) Tires and wheels

1. Inspect all braking systems and components including bands, drums and pins for wear and controls for ease of function.

Yearly

At intervals in accordance with the manufacturer’s specifications or relevant regulation, whichever is the sooner, the owner or supplier shall provide for the required examination.

# 4.67 - OPERATION AND MAINTENANCE OF THE TRAFFIC CONTROL ZONE

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers/Public (Hit by Equipment/Vehicles, Harassment/Violence from Drivers, Weather Conditions)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Flagger suit (Class2-3), Ear/Eye Protection, Stop/Slow paddle (1.6 m pole), Air horn, Cones, Delineators, pilot truck, crash attenuator, Alberta #2 First Aid Kit, Fire Extinguisher on site, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be certified and deemed competent prior to Flagging operations.

***NEVER TURN YOUR BACK TO TRAFFIC***

### Recommended Procedures and Precautions to Offset Hazards

*Flagging Functions*

Flagging is provided at work sites either to stop traffic intermittently as necessitated by work progress or to maintain continuous traffic flow past the work site at reduced speeds to help protect the work crew. The flag person must, at all times, be clearly visible to approaching traffic for a sight distance sufficient to permit proper response by the motorist to the flagging instructions and to permit traffic to reduce speed before entering the work site area.

The flag person has three (3) basic functions--all of equal importance:

1. To guide traffic safely through a work area
2. To protect the lives of the public and fellow employees working on and near the public right-of-way
3. To answer courteously and intelligently reasonable questions

*Selection of Flag-people*

The flag person makes the most public contacts each day of all persons engaged in the construction activity. Therefore, it is important that the flag person be carefully selected and trained. Flag people should possess and maintain the following qualifications:

* Intelligence and common sense
* Good physical condition, especially sight and hearing
* Mental alertness
* A courteous but firm manner
* A pleasing personality
* Neat appearance
* Sense of responsibility for safety of the public and fellow workers
* Patience

Flag people must be given instruction and training so that they will know how to perform their duties effectively. The following points must be emphasized: importance of their job, attitude, clothing, tools, location or position, and action or motions for directing vehicles.

*Flagging Equipment*

When on duty, flag people should be appropriately dressed to alert the motorist. This includes; hard hat, Air horn, Steel toe boots, and lime green flagging coveralls with orange and silver piping should be used strictly for flagging. All equipment must have reflector material attached except if it will never be used during dusk or night conditions.

Hand-signalling devices, such as STOP/SLOW paddles, red flags and lights are used in controlling traffic through work areas.

The sign paddle bearing the clear messages STOP or SLOW provides motorists with more positive guidance than flags and should be the primary hand-signaling device. Flag use should be limited and at spot locations which can best be controlled by a single flagger.

Sign paddles should be at least 18 inches across at the smallest dimension. A rigid handle must be provided. This combination sign may be fabricated from sheet metal or light semi-rigid material. The background of the STOP face shall be red with white letters and borders. The background of the SLOW is orange with black letters and borders.

Flags used for signalling purposes must be a minimum of 24 inches by 24 inches square, made of heavy duty red material and securely fastened to a staff 3 feet in length.

*Flag-people Location*

One consideration in selecting the flagging position is to maintain color contrast between the flag person and background. Flag people must be clearly visible to the approaching motorist at all times. Therefore, the flag person must stand alone, never permitting anyone to congregate nearby.

While awaiting traffic, the flag person should stand in a conspicuous position on the right edge of the travelled lane facing the direction of the approaching traffic. If there is a closed lane next to the shoulder, the flag person should stand in that lane just outside (to the right of) the lane of traffic. At a “spot” work site the flag person may have to stand on the shoulder to the left of the travelled lane or opposite the barricaded section in order to operate effectively, never in an open traffic lane. Visibility should not be impaired by curves, hills and parked vehicles or equipment.

Flagging stations must be adequately protected and preceded by proper advance warning signs. Flagging stations used during non-daylight hours must be adequately illuminated. The adequacy of the floodlight placement and illumination can best be determined by driving through and observing the floodlighted area from each direction on the roadway.

Advance flag persons are required at some sites, and particularly where there is limited sight distance to the work area. Therefore, flagging stations must be located far enough in advance of the work site so that approaching traffic will have sufficient distance to reduce speed before entering the work site area and the flag person will have sufficient time to warn workers of approaching danger, such as out-of-control vehicles. This distance is related to approach speed and physical conditions at the site; however, 100 meters is generally a desirable minimum. In urban areas when speeds are low, and streets closely spaced, the distance may be reduced, depending upon prevalent conditions.

*Flag-people Co-ordination*

Where flag people are not visible, one of the following methods may be used to assure that the assignment of right-of-way to traffic is co-ordinate.

Pilot Cars - during a one-lane, two-way operation with the flag person on the opposite end not visible, a pilot car may then be used to escort vehicles through the work area. Communication must be kept between flaggers and pilot truck at all times.

Walkie Talkies - are an effective alternative to pilot cars. Flag people can communicate with each other and ensure that traffic is only moving in one direction at one time. A description of the last car in the convoy can be easily given using the make, color and license number of that vehicle. If at any one time during this type of operation a flag person is in doubt as to which direction has the right-of-way, all traffic shall be stopped until the right-of-way is firmly established.

Crash Attenuator – are used on highway jobs when speeds are 80 or above, as this speed isn’t safe for flag personal to be present. When driving crash attenuator a safe distance between operation and the attenuator are to be maintained (between 50 to 400 meter depending on speed).

*Use of Law Enforcement Personnel*

In general, standard traffic control devices and flag people usually suffice in controlling traffic in and around most work sites. Conditions may occur; however, which require additional traffic control methods or personnel. In that event, law enforcement personnel (police officers) may be available to assist in emergencies or on a per-arranged basis in an off-duty capacity.

If needed, procedures for obtaining off-duty police personnel for work site traffic control during non-emergency periods should be developed. The procedures should spell out the process for obtaining the services of off-duty police officers, whom to contact and how; including such items as the amount of compensation to be paid, union requirements (if any) and the appropriate dress and equipment of a flag person.

Procedure for coordinating police traffic control efforts with whoever is responsible for the work site operation should be determined. Many conflicts can be avoided by clarifying work site roles and responsibilities before rather than after the fact.

Special conditions where police assistance is almost always required need to be identified. For example, use of police officers could be mandatory for traffic control when the work site is located in close proximity to a signalized intersection.

Formal recognition of the valuable assistance police officers can provide during normal daily patrols should be emphasized. With a minimum of additional orientation, police officers can spot and notify appropriate officials of any need to repair or reset damaged traffic control devices. This is especially useful and important for locating hazardous situations that were either overlooked or have developed since the end of the last regular workday.

Although every effort should be made to maintain traffic with standard traffic control devices and flag people, situations do arise where police assistance may be desirable, and in some cases, essential.

*Inspection of Traffic Control Zone*

Maintenance Inspection

A formal inspection and maintenance procedure includes:

* A plan
* Inspection procedures
* An evaluation form
* A repair program
* Documentation in a report

The signing and delineation materials must be continuously monitored and maintained because devices can be accidentally moved by:

* Traffic
* Construction activity
* Wind
* Vandalism

The objective of maintenance is to keep all traffic control devices in good condition and in the proper position to:

* Minimize accident potential
* Minimize potential litigation
* Check vandalism
* Accommodate adverse weather conditions; dusk, rain, snow, fog

On all projects, someone should be designated to be in charge of maintaining traffic controls. On large projects, use is made of traffic control teams.

The frequency of inspection should be based on:

* Project size and duration
* Extent of liability
* Severity of hazards

Flag-person Complaints Against Motorists (Assaults - Driver Violations)

The procedure for laying a complaint against a motorist is as follows:

1. Gather as much information as possible about the offender, i.e., license number, vehicle make, colour, description of driver and names of witnesses.
2. Call the local Police Complaint line or 911 in the event of an emergency.
3. Relate complete details of the incident to the police.
4. Notify a safety officer who will respond to the work site and assist the employee involved.
5. If required, the safety officer may escort the employee to a police station for reporting; however, under normal circumstances, the police should respond to the work site.
6. Report any injuries to the police or 911, and an ambulance will automatically be dispatched.
7. The police will evaluate all evidence and determine:

(a) What charges apply

(b) What charges to lay

(c) Take appropriate action

1. Make detailed notes of the incident as soon as possible and retain them in a safe place. You will require them should the matter go to court. Provide a copy for the investigating police officer.
2. Witness fees are not paid for attending court; however, you will not lose your regular pay.
3. In instances where there is insufficient evidence present to substantiate a charge via the police, but the flag person insists on laying his/her own, the following will apply:

* Telephone the Clerk of the Court, for your local courthouse to arrange for a suitable day and time to meet with court officials.

# 4.68 - POTHOLES

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Tack oil)

• Injuries to workers (Pinch Points, Strains, Sprains, Burns, Crushing)

Equipment, PPE and Apparel to be used**;**

Shovels, Hand/Plate Tamper, Propane torch, Cones, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Kevlar sleeves, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to repairing Potholes.

### **Recommended Procedures and Precautions to Offset Hazards**

1. No work will be performed when the visibility is less than 700 meters.
2. Normally, two workers will be used when patching potholes. One worker will be the safety spotter for the other.
3. Use three-point contact when mounting and dismounting equipment.
4. Use machinery for heavy lifting.
5. Secure propane bottles properly and check for leaks prior to use.
6. Personnel to wear safety glasses when heating patching material.
7. Hand tools must be used safely.

### **Traffic Accommodations**

### **Recommended Procedures and Precautions to Offset Hazards**

1. Obstructions of traffic on a two-lane highway is to be held to a minimum. The patching truck is to be parked on the side of the road, off the travel lane, whenever possible and must have the revolving light turned on.
2. On high traffic volume four-lane highways, an arrow board truck may follow the patching truck. The arrow board truck and the patching truck are to work from the extreme outside edge of the travel lane.
3. The worker patching the pothole is to enter onto the travel lane only when it is safe from vehicle traffic and must stay alert for unexpected vehicles at all time.
4. The second worker is to spot and warn the first worker if any traffic enters the work area.
5. Workers must work on one lane at a time and must not stray outside the lane on which they are working.
6. Workers must work facing the traffic and must **NEVER** turn their backs to oncoming traffic.
7. Where there are numerous potholes within a short distance, a set of advance warning signs will be posted in accordance with the acceptable standard.
8. Cones may be used to enhance the visibility of the patching truck.

# 4.69 - CULVERT STEAMING AND CLEANING

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Slips and Falls, Steam burns, Hit by Equipment)

Equipment, PPE and Apparel to be used**;**

Steamer, Hand tools, CSA Approved 6” footwear (hip waders), Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to cleaning culverts and have required driver license.

### **Recommended Procedures and Precautions to Offset Hazards**

1. Use proper warning signs for the situation
2. Work with a partner, not alone.
3. Be aware of water volume and direction of water flow. Be aware of the direction of the wand that it isn’t directed towards co- workers or skin.
4. Maintain good delivery of steam by ensuring steamer is running to maximum output and that hoses and pipe connections are not leaking.
5. Be cautious of steam burns
6. Be Cautious of slipping hazards while working on ice. When steaming culverts to remove ice dams be aware of water volumes and depths. Have proper footwear.
7. Ensure your footing is firm and you’re standing in a safe location in the event of a high water volume being release from behind the dam
8. When clearing large culvert end where workers may have to enter the culvert to complete the task consideration should be given to confined space procedures, including confined space permit, as per OH&S.
9. Use caution with the placement of jerry cans and spillage while refuelling.
10. Keep all equipment guards in place.
11. Never allow spectators or other workers in areas where steam could escape.
12. Check hose on the Hotsy for defects to avoid hose failure

### Key Steps Occurring

* Assess each culvert individually
* Do a hazard assessment for each one
* Length of pipe required
* Location of culvert ends.
* Read and understand steamer operator manual.
* Start steamer unit and run to steaming temperature.
* Use the buddy system to watch for running water.

# 4.70 - ASPHALT PATCHING BY GRADER

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles

• Injuries to workers (Pinch Points, Slips and Falls, Burns)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Flagging suit (Class2-3), Ear/Eye Protection, Kevlar sleeves, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Grader and have required driver license.

### **Recommended Procedure and Precautions to Offset Hazards**

* Advance Warning Signs
* Tacking
* Follow manufactures directions for operating units equipped with burners

### **Truck Haul**

### Additional requirements;

## Potential Health and Safety Concerns

* Backing up accidents
* Overhead power lines

## Equipment, PPE and Apparel to be Used

* Back up alarms
* Signs
* Marking overhead lines

### Recommended Procedures and Precautions to Offset Hazards

* Flag person and/or spotter
* Signing/marking overhead lines
* Use back up alarms
* Use appropriate signs

### **Grader**

### Additional Requirements;

## Potential Health and Safety Concerns

* Backing up accidents
* Turning around in inopportune time

## Equipment, PPE and Apparel to be Used

* Backup alarms

### Recommended Procedures and Precautions to Offset Hazards

* Use of back up alarms
* Communication

### **Roller**

### Additional Requirements;

## Potential Health and Safety Concerns

* Parking or operating too close to the shoulder
* Parking or operating on a hill
* Loading and unloading equipment

## Equipment, PPE and Apparel

* Back up alarms

### Recommended Procedures and Precautions to Offset Hazards

* Care and attention
* Check brakes to see that they hold
* Drums should be dry
* Seat belts for units equipped with ROPS

### **Line Spotting**

### Additional Requirements;

## Potential Health and Safety Concerns

* Traffic marking paint
* Traffic

## Equipment, PPE and Apparel

* Vest (Class 2-3)
* Coveralls (Class 2-3)
* Hard hat (CSA Approved)
* Gloves

### Recommended Procedures and Precautions to Offset Hazards

* Traffic control
* Use spotter/flag person
* Cleanliness
* SDS sheet

# 4.71 - CLEARING SNOW WITH A LOADER

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Icy conditions, Poor visibility)

• Injuries to workers and Public (Pinch Points, Slips and Falls, Crushing)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Flagger suit (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Loader and have required driver license.

### Recommended Procedures and Precautions to Offset Hazards

* During poor visibility or when situations warrants, signing and/or flag person set up as soon as practical
* Do walk around unit to check oil, fuel, tires, glass, blades, and hydraulic hoses.
* Ensure your work area is secure and free from hazardous objects

# 4.72 - RE-GRAVELLING AND GRADER WORK

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Poor visibility, Overhead powerlines)

• Injuries to workers and Public (Pinch Points, Slips and Falls, Crushing)

Equipment, PPE and Apparel to be used**;**

Cones, Signs, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Flagger suit (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Grader and have required driver license.

### Recommended Procedures and Precautions to Offset Hazards

1. Ensure all staff and operators know and understand their duties
2. Ensure all staff and operators are informed about on site and possible hazards at loading site
3. Keep windrows flattened when possible, if not, mark with signs or pylons
4. Extra precautions must be considered in night time operations
5. Be aware of traffic in tight areas & switch backs in the road. Consider extra signage for these areas.

# 4.73 - SAND SCREENING AND STOCKPILING

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Poor visibility, Backing up, Overhead powerlines)

• Injuries to workers (Pinch Points, Slips and Falls, Eye irritation)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Dust mask, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Grader or Conveyor and have required driver license.

### Recommended Procedures and Precautions to Offset Hazards

### **Sand Screening**

1. Be sure required guards on moving parts are in place.
2. Conveyors are equipped with Emergency Shutdown systems which must be tested and confirmed to be working before operations commence on a daily basis.
3. Position screener in the desired location, making sure the screener is level to ensure stability. Watch for obstructions and overhead lines.
4. Stay clear of moving parts.
5. Loose clothing should not be worn when operating this equipment.
6. In the event of a mechanical brake down or plugged hopper, do not climb on to conveyor unless the motor has been shut off and/or unit has been locked out.
7. When using a ladder to gain access to the conveyor make sure to use a spotter.
8. When standing on the ground, one must be sure to stand away from the conveyor belt to prevent being struck by falling debris such as rocks.
9. The conveyor operator is at ground level, they must constantly be aware of loader movements.
10. The conveyor operator must stay clear of the discharged must stay clear of the discharge end of the conveyor is shut off or locked out.
11. The loader operator must use caution when clearing screening from the discharge end of the conveyor. This should only be done when the conveyor is shut off or locked out.
12. The screener must be completely shut down or locked out prior to performing routine maintenance.
13. Should repositioning of the sand screener be required, proper methods should be used. Pushing the screener into position by applying the loader bucket to the side wall of the screener wheel must not be done.

### **Stockpiling**

1. When positioning or raising the conveyor, operators must first assess the location of the nearby overhead power lines. This must be done prior to the positioning of the equipment.
2. Position the screener in desired location, ensuring the unit is situated on firm, level ground to ensure stability.
3. When using two loaders at the same time, operators must use caution and develop a routine procedure in which they operate clear of each other.
4. Ensure both sand and salt are relatively dry to prevent materials from caking in the hoppers. In the event of caking/bridging, use extreme caution.
5. Eye protection must be worn by the conveyor operator to prevent possible eye irritation caused by salt entering the eye.
6. Loader operators entering the enclosed salt shed must enter and exit the building as quickly as possible to prevent exposure to exhaust fumes.
7. This activity also includes the special precautions as identified in the sand screening portion of this operation.

# 4.74 - ROUT AND SEAL

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Flying debris, Tar, Compressed air)

• Injuries to workers (Pinch Points, Slips and Falls, Burns, Possible Dust/Silica exposure)

Equipment, PPE and Apparel to be used**;**

Hot lance, Power router, Tar kettle, Air compressor, Hand tools, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest/Flagging suit (Class2-3), Ear/Eye Protection, Face shield, Kevlar sleeves, Half Mask with N95 or better filter, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Router and Tar kettle and have required driver license.

### Recommended Procedure and Precautions to Offset Hazards

1. Review SDS sheets
2. When routing cracks, have a firm grip on router handles to maintain control **at all times ensure operator is wearing a properly fitted mask with N95 or better filter**.
3. Clean debris from cracks and roadway showing caution when using air pressure.
4. Extreme caution to be used near hot lance; potential burns and high air pressure present.
5. Proper housekeeping
6. Workers must be trained in Hot Tar Kettle operation prior to use.
7. Attention to gauges is of utmost importance because of explosion factor is high. (Refer to manufacture’s specifications.)
8. Use proper propane handling techniques.
9. Be aware of traffic at all times.
10. Remove all traffic devices when job is complete.

# 4.75 - GRADING GRAVEL SURFACES

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Poor visibility, Difficult terrain, Overhead power lines)

• Injuries to workers and Public (Pinch Points, Slips and Falls, Crushing)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Dust mask, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Grader and have required driver license.

### Recommended Procedures and Precaution to Offset Hazards

1. Before loading or unloading the grader, the operator will perform an inspection to ensure adequate warning devices are installed.
2. Whether the grader is driven or hauled to the worksite, enroute concerns should be discussed with the Foreman, including any permit requirements.
3. If the grader is to be loaded onto a trailer, this must only be done with the trailer on a level surface. Where possible, the operator will drive the unit onto the trailer while the truck driver acts as spotter. Securing of the load is the responsibility of the truck driver.
4. Once on site, a site Hazard Assessment must be conducted to determine what hazardous conditions are present.
5. If the grader was hauled to the work site, unloading should be off road where possible and with responsibilities similar to those when the grader was loaded.
6. No grading work will take place until the work zone is signed as per the specifications applicable. The specific signs are listed for Alberta Transportation in their Traffic Accommodation Manual.
7. All grader operators must wear the seat belt provided in the unit. If work must be done in the standing position, the cab door must be kept closed and, where this is not possible, the restraining chain must be secured across the door opening.
8. Respiratory protection from road dust must be considered if the grader is operated for an extended length of time with the door open.
9. On steep slopes, the operator must be extremely cautious working near the shoulder, must reduce speed, and, again, be wearing a seat belt.
10. Windrowed materials must leave room for a minimum of one lane of traffic through the zone.
11. Back blading may be required to remove excess material from the edge of structures such a bridge decks, cattle guards and railroad crossings.
12. Unloading any additional gravel at the work zone must be under the direction of a designated signaller.

**NOTE:** *Care must be taken to ensure the driver of the gravel truck responds to any hazards identified through the site-specific hazard assessment, i.e. power lines, etc.*

1. Graders will back up only when safe to do so and must turn around only where they are visible to other drivers for a considerable distance. Do not turn around when cresting a hill.
2. Grader operators must have access to a radio and/or telephone for summoning assistance if they experience problems while working alone.
3. When exiting the machine or parking the grader, the operator must find a level surface, ground the blade and set the parking brake.
4. Upon return to the yard, the grade must be fuelled, a post trip inspection carried out and the grader parked in the proper area or structure.

# 4.76 - TIRE INFLATION

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Tire blow-out, Flying debris)

• Injuries to workers (Flying debris, Slips and Falls)

Equipment, PPE and Apparel to be used**;**

Clip-on air chuck, 6-8 ft hose with fill valve, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to inflating tires.

### Recommended Procedure and Precautions to Offset Hazards

1. Check for broken or damaged lock rings and rims. These items must be repaired or replaced by qualified tire personnel only.
2. Check for maximum tire pressure as indicated on the tire side wall.
3. Check air pressure of the tire. The tire must not be inflated until the air pressure has been checked.
4. If tires have less than 80% of the maximum air pressure in them, they must be inflated by a qualified tire person; for tires with a *gross loaded weight over 4000 lbs*
5. Service personnel must not inflate tires that are flat.
6. Tires must not be inflated over the maximum tire pressure on the tire side wall.
7. Maintenance personnel must be standing in a safe zone out of the trajectory area, listening and watching while inflating a low tire.
8. Maintenance personnel will be trained in the above practices before inflating tires.
9. Training in tire inflation will occur at start up meetings.

NOTE: Spilt Rims are only to be inflated by trained personnel.

# 4.77 - CHANGING PLOW BLADES

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Crushing/Pinching, Strains and Sprains, Cuts, Abrasions, Flying Debris, Burns, Excessive Noise Levels))

Equipment, PPE and Apparel to be used**;**

Wheel Chokes, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Kevlar sleeves, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to changing a Plow Blade.

### Recommended Procedures and Precaution to Offset Hazards

1. Use proper PPE to prevent injury.
2. Choke wheels.
3. Ensure that the plow is firmly lowered onto jack stands.
4. When changing blades on a wing ensure that the wing is secure firmly using the safety chain.
5. Wash or sweep debris from plow.
6. Use proper lifting techniques for removal and installation of plow blade. Whenever possible this procedure should be done by two people.
7. Ensure proper use of the cutting torch and the monthly hot work permit is in place and reviewed.
8. Check for proximity of flammable materials prior to using cutting torch.

# 4.78 - SAND BLASTING

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Slips and Falls, Cuts, Flying Debris, Noise Levels)

Equipment, PPE and Apparel to be used**;**

Sandblasting Helmet, Dust Mask, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest / Coveralls (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Sandblaster.

### Recommended Procedure and Precaution to Offset Hazards

1. Only Certified or Trained personnel are to operate the sand blaster.
2. Let others in the area know that you will be sand blasting.
3. Ensure yourself and others in the area are wearing proper PPE.
4. 2 or more people are required to operate the sand blaster
5. Have a good sight line to the other person
6. Always store sand and equipment in a dry place.

# 4.79 - JACK HAMMER OPERATIONS

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Flying Debris)

• Injuries to workers and Public (Pinch Points, Slips and Falls, Flying Debris, Back Strain)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required**

Employees must be deemed competent prior to operating a Jack Hammer.

### Recommended Procedure and Precaution to Offset the Hazards

1. It is recommended that you have a spotter
2. Only proper trained personal should be handling the jack hammer
3. Use your legs for lifting not your back
4. Let others in the area know that you will be jack hammering
5. Ensure yourself and others are wearing proper PPE
6. Always know where your hands and feet are at all times as these are at a higher risk of pinch points
7. Have a good grip on the hammer at all times
8. Have your legs shoulder width apart and good footing before starting.

# 4.80 - FORMING PARTIAL DEPTH

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Slips and Falls, Flying Debris, Concrete Burn)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to constructing Partial Depth Form.

### Recommended Procedure and Precaution to Offset Hazards

1. When demolition and sandblasting is completed to prepare the partial depth area measure and calculate the size of plywood required to cover the entire area (larger patches incorporating more than a 600mm by 600mm will require either; stud work, wailer or strong back material.)

2. When patch is large enough to cover the extend past the area by 4 to 6 inches hammer drill in anchors, if unsure of this procedure ask your foreman or supervisor to provide the adequate spacing in order to successfully keep the patch form work in place during the concrete placement and curing time

# 4.81 - MIXING GROUT

## Potential Health or Safety Concerns;

• Damage to Equipment (Overheating of Drill)

• Injuries to workers (Pinch Points, Slips, Falls, Burns)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Mixing Grout.

### Recommended Procedure and Precautions to Offset Hazards

1. Place water in bucket until there is 2 inches of water in the bucket.

2. Slowly introduce the pre-bagged grout into the bucket while spinning mixer paddle on the ½” drill.

3. Mix ratio should be followed for the type of product used, some applications will require more slump then others.

4. When the drill becomes overloaded due to the stiff grout introduce water if the gout is too runny simply add more grout.

5. Clean all equipment after mixing is completed

# 4.82 - VERTICAL JACKING/LIFTING OF BRIDGE

## Potential Health or Safety Concerns;

• Damage to Equipment (Over Stressing Jacks, Falling Debris)

• Injuries to workers and Public (Pinch Points, Slips and Falls, Falling Debris)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Jacking/Lifting of a bridge.

### Recommended Procedures and Precautions to Offset Hazards

1. Before any work begins an engineered drawing and lift procedure need to be in place.

2. Be sure that the bearing soils or material used to support the jacking of the bridge is sound and will not fail under the intended load.

3. All plates, posts, jacks, scaffold and other lift equipment must be inspected before use.

4. When lifting the bridge structure, ensure that hardware holding the bridge together i.e. stringers, caps, piles or columns to, girders are free or removed every job will be different. Be sure not to remove hardware that is to remain in place during the procedure.

5. When jacking always lift ½” at a time, place plates to shore up the material and then proceed to jack another ½” inch. Always release the jack between the ½” jacking stroke after plates are in place, then simply place plates under the jack to give the jack the required stroke it needs. When multiple jacks are used use pressure gauges to determine if the weight is evenly dispersed along all the jacking stations. (This method of jacking prevents undo stress to the bridge members and in turn prevents damage to the structure.)

6. When returning the bridge to its’ original position reverse the steps and lower the bridge ½” at a time.

# 4.83 - WASHING DELINEATORS AND SIGNS

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Distracted Drivers)

• Injuries to workers (Pinch Points, Slips and Falls, Steam/Hot Water Burns, High Pressure Water Cuts)

Equipment, PPE and Apparel to be used**;**

Truck, Pressure Washer, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating Grader and have required driver license.

### Recommended Procedures and Precaution to Offset Hazards

1. Use proper warning signs for the situation (i.e. Frequent Stop sign mounted on rear of truck.)
2. Work with a partner, not alone.
3. Never point high pressure water stream at anyone or exposed skin.
4. Be cautious of burns from hot water and steam.
5. Use caution with the placement of jerry cans and spillage while refueling.
6. Keep all equipment guards in place.
7. Activate revolving light/strobes when actively working on highways.
8. Some areas may require the use of a pilot vehicle with truck mounted arrow board to move traffic over

**Key Steps Occurring**

1. Read and understand the operator’s manual for the pressure washer.
2. Complete hazard assessment.
3. Ensure that the hose to the wand is in good condition and routed safely to the operator and secured to prevent falling onto the roadway.
4. Start the washer unit and run to temperature.
5. Keep the truck as far to the right or left when actively working with the revolving light/strobes activated.
6. Ensure that when using a pilot vehicle, it remains at least 150 meters behind with the arrow board activated.
7. Consideration should be given to conducting washing operations at night for some areas when traffic is at a minimum.

# 4.84 - TRUCK MOUNTED ATTENUATOR (STATIONARY)

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Being Struck by a Third Party)

• Injuries to workers (Pinch Points, Slips and Falls, Crushing)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Equipment checklist, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Truck Mounted Attenuator and have required driver license.

### Recommended Procedures and Precaution to Offset Hazards

1. Operators of TMA’s must be trained by an experienced supervisor or delegate and be deemed competent to operate the TMA.

2. When preparing to establish a work zone, proper positioning of the TMA within the work zone is critical to its effectiveness. The TMA location should provide sufficient warning to approaching traffic, and maximum protection for workers.

3. Work zones are established and set up as outlined in the TAS.

4. When positioning the TMA it must be a minimum of 50 m from the workers to allow for roll out distance in the event that it is impacted.

5. The TMA must be positioned so that it is always parallel to traffic with the parking brake applied.

6. The TMA must have the steering wheels straight or parallel with traffic, to avoid the unit moving left or right in the event of an impact.

# 4.85 - JACKALL

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Slips and Falls, Crushing)

• Never work under a raised load unless properly supported.

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating the Jackall

### Recommended Procedure and Precaution to Offset Hazards

1. Jack and base must be stable so jack cannot move during use.

2. Lifting

1. Reversing lever to “UP”
2. The lifting Mechanism can be raised automatically to load.
3. Lift nose must be set fully and squarely against load.
4. Alternately raising and lowering of the handle will now raise load one step at a time.
5. Always keep a firm grip on the handle
6. Keep hand away from the lifting mechanism and ensure jack is perpendicular to load while raising or lowering load.

3. Lowering

1. The lifting mechanism will automatically drop the base once load is reduced to approximately 50lbs. /23kgs.
2. Always place handle in the “UP” position before flipping reversing lever.
3. Grasp handle firmly while lowering. Never remove grasp while lever is in lowering position.
4. Alternately lowering and raising the handle will now lower the load step-by-step

4. Make sure load cannot shift

5. Jackalls are last means for lifting. Ensure you have exhausted all other resources.

6. Never work under a raised load unless additional rigid supports sufficient to support the load are used and any wheels are blocked. Keep your Jack clean and well oiled. CAPACITY is within 12 inches (30cm) of the base. Capacity decreases as distance from base increases.

# 4.86 - AERIAL PLATFORM

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Slips and Falls, Unbalanced Platform, Overhead Powerlines)

• Always ensure unit is on a stable even surface.

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Fall Arrest Harness & Gear, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to operating an Aerial Platform.

### Recommended Procedures and Precautions to Offset Hazards

1. Equipment should be inspected by each operator prior to use each day as outlined in the operator’s manual for the specific piece of equipment. Inspection should be in accordance with the manufacturer's instructions by a worker trained as to the manufacturer’s procedures

2. Safety Certification must be present on machine and current.

3. The maximum rated load of the lifting device must be confirmed by a competent person and marked on it, and the maximum rated load must not be exceeded

4. Operator operating devices covered by this guideline should consider the job task to be performed and evaluate the job site location for potential hazards. The following should be considered:

1. All overhead dangers should be identified, controlled or resolved prior to the commencement of work
2. Equipment operated within specified distances to overhead energized high voltage sources is prohibited by section 225 (1) Must be 7 meters or greater.
3. Ground stability should be tested and confirmed. Equipment should only be operated on a firm level surface capable of withstanding the weight and all forces applied by the machine (with special care taken looking for unseen hazards such as underground vaults, storage tanks, parking etc.)
4. The travel path should be clear of all hazards such as ditches, drop offs, holes, bumps, debris, or any other potential obstructions
5. Wheel chocks should be used when parked on inclined surfaces
6. Grad-ability should not exceed specifications in the operator’s manual
7. Outriggers or stabilizers should be used in accordance with the operator’s manual.
8. The basket or platform should not be loaded or operated beyond its rated maximum weight, height or reach as specified in the operator’s manual
9. Boarding or exiting a mobile elevating device should be accomplished with three-point contact
10. Objects or production equipment with the potential of falling from an aerial platform should be secured with an adequate safety lanyard and/or system
11. The operator should resolve all hazards to establish complete control of the work site and a smooth, level path of travel, capable of withstanding the weight and all forces applied by the machine
12. When working a mobile elevating device in areas of vehicular traffic, proper signage should be in place and pay duty officers on set as required
13. The operator’s manual should be referenced as to the safe or permissible number of people and equipment working on a mobile elevating device

5. Fall protection shall be used when a worker is at risk of being ejected from the platform. The fall protection provided by the guardrail must be augmented by a fall arrest or a travel restraint system attached to the platform or device.

6. A mobile elevating device shall not be moved unless all workers on it are protected against falling by a full body harness or a safety belt attached to specified attachment points on the platform (Refer to Fall Protection Procedure)

7. Personnel should not sit or climb on the guardrail of the basket/platform

8. Personnel should not climb up to an already elevated platform

9. Do not alter or disconnect or disable any safety device

10. Smoking while near the batteries or fuel supply of any mobile elevating devices is prohibited and may cause an explosion

11. When parked for the night, the platform should be in the lowered position, wheels chalked and keys removed

# 4.88 – LONG-WHEELED TRAILER

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Loads Shifting, Striking other vehicles)

• Injuries to workers and Public (Pinch Points, Slips and Falls, Crushing)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to using a Long-Wheeled Trailer.

### LOADING AND UNLOADING

* Keep trailer as straight as possible
* Apply brakes
* Release trailer levelling valves
* Release booster air pressure
* Start Honda motor
* Raise deck release support legs and confirm that they are moving
* Lower deck to the ground
* Release goose neck pin
* Continue lowering to top of lift pins
* Lower support arm
* Disconnect air lines and electrical from jeep to trailer
* Pull ahead as straight as possible
* Reverse to reconnect
* DO NOT OPERATE WITH AIR PRESSURE IN THE BOOSTER WHEN THE TRAILER IS EMPTY

**4.89 - CLEANING PUGGMILLS**

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Slips and Falls, Abrasions, Burns)

Equipment, PPE and Apparel to be used**;**

Tiger Torch, Scraper, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Kevlar Sleeves, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to cleaning Puggmills.

## Recommended Procedures and Precautions to Offset Hazards;

## *Control Location:*

## *Standing in Operator’s position.*

## Facing the back of truck, the engine RPM is controlled by the left top of joystick. Chute switch (open-close) is the first switch on the right side. Gate open-close is controlled by the right joystick.

## Facing the front of the truck, Mill control (forward-reverse) is under the taillights, first switch on the left. Mill speed control is the right knob below the main panel. Water pump switch is under taillights (on-off).

## *Cleaning of Puggmill;*

1. With machine shut off
2. Remove lid from puggmill
3. Remove water pipe and emulsion outlets and clean them
4. Scrape all areas that are accessible
5. Make sure all switches are in off position and levers in neutral
6. Start up machine
7. Engage puggmill controls to turn puggmill shaft over to get to uncleaned areas
8. Shut machine’s motor off
9. Continue process until all areas are scraped clean
10. Start up machine and turn on puggmill. Using water from machinery, flush out all scraped material
11. After flushing, shut off machine and recheck puggmill for cleanliness
12. Replace water pipe and emulsion outlets
13. Replace lid after cleaning
14. Replace cement feed extension hose – push on firmly and fully into place.
15. If using tiger torch to assist in warming up materials prior to removal, always stay aware of hoses and lines.

# 4.90 - CLEANING SPREADER OR RUT BOX ON STANDS

## Potential Health or Safety Concerns;

• Damage to Equipment (Dropped, Hitting other Equipment)

• Injuries to workers (Pinch Points, Slips and Falls, Crushing)

• Never work under a raised spreader box unless properly supported.

Equipment, PPE and Apparel to be used**;**

Loader, Lifting Chains, Tiger Torch, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Kevlar Sleeves, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to commencing the cleaning of Spreader Box or operating the Loader and have the correct driver license.

## Recommended Procedures and Precautions to Offset Hazards

1. Use the specified load rated chain for lifting the box (check for damages)
2. Center the chain on the hook on the loader bucket (Equal length on both sides)
3. Move the loader into position, only trained operators are to use the loader
4. Stay out from under the loader bucket and hook the chain ends to the lift points on the box. The open end of the hook should point to the outside end of the box
5. Slowly lift the bucket and the box off the ground up to the height required
6. Move the loader forward and line up the centre ski of the box with the centre of the stand. Try to line it up on centre side to side and front to back
7. Move the sides stand into place.
8. Slowly lower the box and keep the centre ski lined up on the stand continue to lower the box until almost all the weight is on the stands. Have a worker shake the box from side to side to test stability
9. If it’s good remove the chain hooks and move the loader out of the way.
10. If the box is unstable, lift it back up and reposition and level the stands. Try setting the box down again. If still unstable reposition and try again until the box is stable on the stands
11. Remove all Guards, Splash Shields, Primary Rubber and Catwalk
12. Scrape down all surfaces
13. If using a Tiger Torch to assist with removal of materials, ensure a Fire Extinguisher is close by and Kevlar Sleeves are used. Always stay aware of where heat is applied so not to damage any rubber components or plastic bushings
14. Once all cleaning is completed, reinstall all Guards, Primary Rubber, Splash Shields and Catwalk.
15. The Rut box procedure is the same except for the omission of the centre stand.

**4.91 - COVERING MANHOLES, Water valve and/or Catch basins**

## Potential Health or Safety Concerns;

• Damage to Equipment

• Injuries to workers (Pinch Points, Slips and Falls, Back Strains)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to being able to cover any Manholes, Water valves or Storm drains.

## Recommended Procedures and Precautions to Offset Hazards

1. Park your vehicle to protect yourself from traffic and ensure your revolving lights/strobes are on
2. You may have to strike the cover to loosen it. Use caution as you can crack it.
3. Use pic axe to lift and slide it out. Make sure you are using proper lifting practices or ask for assistance.
4. Lay out the plastic on the ground and set or roll cover over onto it.
5. Manholes should be up on edge.
6. Wrap the plastic around cover and if desired tape the plastic.
7. Scrape off any material that is on the rim of the manhole, water valve or catch basin cover holder.
8. Roll the cover back into the hole and lay it down Make sure the plastic is tucked in and push the cover into place with your foot.
9. Use small pry bar to remove water valve.
10. Use the pick-axe to remove catch basins
11. Wrap each with plastic and twist the plastic together underneath and tape it if desired.
12. Drop the water valve cover back into its holder
13. Carefully place catch basin back into its holder. Be careful NOT TO DROP IT THROUGH

**4.92 - HOOKING UP SPREADER BOX TO TRUCK AND LAYING OF MICROSURFACING**

## Potential Health or Safety Concerns;

• Damage to Equipment (Improper connection)

• Injuries to workers (Pinch Points, Slips and Falls, Abrasions, Burns)

• Miscommunication (Pinch Points, Slips and Falls, Abrasions, Burns)

Equipment, PPE and Apparel to be used**;**

Scraper, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Hooking Up and/0r Laying of Micro Surfacing (Slurry).

## Recommended Procedures and Precautions to Offset Hazards

1. The operator or designated person must stand in the operator position on the truck and by using hand signal and/or voice communication guide the driver back to the box
2. The ground person or personnel must first hook up the lift chains, making sure they are secure.
3. Next the drag chains and shift bar can be hooked up, let the operator know when you are done this step.
4. Finally, the auger hydraulic lines are connected
5. The operator will then lift the box
6. A scraping on the box can now be completed. Make sure the operator knows that you are scraping the box. Use verbal communication and eye contact.
7. Ground personnel will move out of the way and the operator will signal the truck to move ahead.
8. The scrapings will now be shovelled out of the way, either to the curb or to the center of the road as designated by the operator.
9. The truck can now be backed up to where the previous truck left off and the new truck can begin laying material
10. The operator will signal the driver to back up while spraying water manually and by tire spray, when necessary.
11. The operator will stop the truck at the desired spot and begin to lower the box. Just as the box touches down the truck will roll ahead about 1-2 inches to aid in creating a smooth seam. The truck will then move ahead until the slack is gone from the drag chain.
12. The ground personnel will now disconnect only the lift chains and secure them out of the way
13. The operator will begin the mixing process and dump material into the box and at the desired time notify the truck to move by saying “Go”. He will then spray some water on the joint to aid in creating a smooth joint and turn on the water spray.
14. The ground personnel will be in their assigned positions, either at each corner of the box or at the joint, to hand squeegee it smooth. *Do Not Look At The Truck or Machine,* as you may get splashed.
15. Ground personnel must try to stay close to the spreader box to help smooth any imperfections and or smooth out the longitudinal joint.
16. When the truck is empty the operator will shut down the mixing operation turn off the water spray and tell the driver to stop.
17. Depending on where the end of the pass is the ground personnel will either disconnect the hydraulic lines, drag chains and shift bar or hook up the lift chains so that the box can be moved out of the way and then unhooked by reversing the coupling procedure. Keep hands clear of pinch points between the box and truck/lift bar.
18. The operator may have to back up the truck 1-2 inches to create slack in the drag chains so that they can be unhooked.
19. After making sure the truck is unhooked from the box and all necessary equipment is taken off, the operator will signal the driver to return to the stockpile area to reload.

# 4.93 - LOADING PORTLAND CEMENT

## Potential Health or Safety Concerns;

• Damage to Equipment (Improper connection)

• Injuries to workers (Pinch Points, Slips and Falls, Abrasions, Cement Burns)

• Miscommunication (Pinch Points, Slips and Falls, Abrasions, Cement Burns)

Equipment, PPE and Apparel to be used**;**

Scraper, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Hooking Up and/0r Laying of Micro Surfacing (Slurry).

## Recommended Procedures and Precautions to Offset Hazards

* Ensure you are wearing the appropriate PPE.
* Use proper lifting procedures
* Place bag on bag breaker screen severing it in half using a shovel if required.
* Lift up one end of bag then the other leaving cement on screen being careful not to leave pieces of bag.
* Push cement through screen with shovel
* Replace cover after putting required number of bags.

# 4.94 - LOADING SLURRY TRUCK WITH EMULSION

## Potential Health or Safety Concerns;

• Damage to Equipment (Improper connection)

• Injuries to workers (Pinch Points, Slips and Falls, Abrasions, Burns)

Equipment, PPE and Apparel to be used**;**

Transfer Hose, CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Kevlar Sleeves, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent prior to Loading Emulsion and have the correct class of license.

## Recommended Procedures and Precautions to Offset Hazards

1. Drive truck up behind oil tank.
2. Hook up hose to lower valve on side of truck
3. Close lower gate valve on truck’s tank
4. Open gate valve on end of hose
5. Open butterfly valve on truck
6. Engage Emulsion pump
7. Set truck RPM to desired setting from 1000 to 2000 RPM
8. Climb up on top of truck to monitor oil level in tank
9. At specified level climb down and close valve on hose then close butter fly valve.
10. Disengage emulsion pump and return engine to idle.
11. Remove hose from truck and drain remaining oil into bucket
12. Replace cam-lock cap
13. Open lower gate valve on truck

# 4.95 - SPREADING OR DUMPING MATERIAL

## Potential Health or Safety Concerns;

• Damage to Equipment (Improper connection)

• Injuries to workers (Pinch Points, Slips and Falls, Abrasions)

• Miscommunication (Pinch Points, Slips and Falls, Abrasions)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat, Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP. In some cases, Caution Overhead Powerline signs may be necessary.

**Training Required;**

Employees must be deemed competent prior to Hooking Up and/0r Laying of Micro Surfacing (Slurry).

## Recommended Procedures and Precautions to Offset Hazards

1. Upon arrival at the site, instruct the truck driver where you want them and the best way to get there.
2. Ensure all parties know and understand all signals being used.
3. Person helping the driver should be familiar with moving and operating part of the equipment.
4. Make sure drivers path is clear of employees, equipment and debris.
5. Signal them to back up only when this has been done. Check for properly functioning back up alarms.
6. Only one person should guide trucks backing up and should stay as stationary as possible, so the driver does not lose sight of the signaller; Stand to the rear driver’s side, never stand directly behind truck.
7. If the driver loses sight of signaller, they must stop the truck.
8. No person, including spotter, is to walk or stand along side of truck while trucks are dumping in case truck tips over.
9. Driver/guide should ensure that truck is level and on stable ground prior to dumping.
10. Once driver had reached the spot where material is needed, let driver know if you would like the driver to dump, or spread, If driver is not sure of site condition to 100% dump/spread, then driver should call their supervisor for instruction. Reposition to dump load safely if possible or worst case, leave without dumping.
11. Instruct driver to watch for powerlines above or any other hazards.
12. If there are powerlines, someone should guide driver and should stay back a minimum of 10 feet. Powerline clearance is minimum 7 meters.
13. Once the area is clear proceed to dump/spread the material.
14. In the event of end gate not opening. Complete steps below;
    1. Lower box
    2. Once box is completely lowered have driver engage gate release again and check to see if it has released.
    3. If gate fails to release again, place end gate in locked position and notify supervisor whom will in turn call the mechanic to repair truck.
15. Once the driver had completed dumping. Spread the material, be sure they check truck for loose material and ensure box is completely down before leaving, unless directed otherwise.

# 4.96 - TANDEM DUMPING PROCEDURE

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (Improper connection, Vehicle Damage)

• Injuries to workers and Public (Pinch Points, Slips and Falls, Crushing)

• Miscommunication (Pinch Points, Slips and Falls, Crushing)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Hard Hat (ground personnel), Gloves, Reflective Vest (Class2-3), Ear/Eye Protection, Alberta #2 First Aid Kit, Fire Extinguisher, Refer to Hazard Assessment and ERP. In some cases, Caution Overhead Power signs may be necessary.

**Training Required;**

Employees must be deemed competent prior to Tandem Dumping.

## Recommended Procedures and Precautions to Offset Hazards

* Complete Pre trip Inspection form (as per section 10 of Alberta commercial vehicle safety regulations)
* Check for overhead hazards at dumpsite
* Follow backing up procedure

1. Open trap
2. Back slowly to specific dumping location and release are suspension (Dump only on solid stable surface). Ensure personnel and equipment are clear of discharge and tip over area (10m radius)
3. Dis-engage Air Trip (unlock) End Gate. Air system requires minimum 90 PSI.
4. Raise box to the maximum Stage 2 of lift cylinder to begin material dump
5. Once material is dumping, raise box reminder of cylinder height Idle ahead until end gate swings freely
6. Come to a complete stop, lower box to frame and engage end gate latch. Move a head on site to a safe location and visually inspect inside box (from catwalk) and end gate. Then clean any loose debris.

*If end gate dose not open*

1. At stage 2 of cylinder, lift if end gate does not open lover box to frame. Check system air pressure ten re-activate End Gate release. Put vehicle in neutral and apply park brake. Get out and check if End Gate mechanism has been released. STAY ON DRIVERS SIDE OF MACHINE> DO NOT WALK BEHIND TRUCK,
2. Once end gate mechanism has been released, operator should proceed with standard dumping procedure (As above)
3. If end gate does not open and is fully latched truck should be taken out of service and driven to shop for service. If it is partially latched, truck should be moved to a safe area cones placed and left for mechanic to diagnose

# 4.97 – HOT WORK PERMIT PROCEDURE

## Potential Health or Safety Concerns;

• Damage to Equipment/Vehicles (cause by fire/Smoke)

• Injuries to workers and Public (damage to health and burns cause by fire/heat/smoke)

• Damage to environment/Property (cause by fire/Smoke)

Equipment, PPE and Apparel to be used**;**

CSA Approved 6” footwear, Gloves, Reflective Vest (Class2-3), Alberta #2 First Aid Kit, Fire Extinguisher, Fire retardant clothing may be required bases on the work being conducted. Refer to Hazard Assessment and ERP.

**Training Required;**

Employees must be deemed competent in the task at hand prior to conducting any hot work.

**Definitions**:

*Hot Work*: Any work involving open flame, producing hot surfaces, and /or generating sparks or molten material of sufficient energy to ignite combustible and/or flammable materials. Including soldering, arc and torch welding, cutting and grinding.

*Designated Hot Work Area*: an area designed and constructed for hot work and does not require a Hot Work Permit. There areas are: Welding Bay in shops, Field areas where there are no flammable or combustible material within the potential reach of hot work.

*Fire Watchperson:* Is a person who has been designated to watch an area for signs of fire and who is equipped and able to put out fires with fire extinguishing equipment and can summon emergency assistance if required. (the fire watchperson is not the person doing the hot work)

*Risk:* Based on both the probability of a fire starting and the possible consequence of a fire.

Example: If hot work is conducted on colentache lining and immediately following the work, the area is clear of all flammable items, fire watch isn’t required. Hot work was done on skid steer bucket with no flammable or combustible material within 7 meters and the Skid steer is immediate put back to work , no fire watch is required.

## Recommended Procedures and Precautions to Offset Hazards

* Asses whether hot work can be eliminated or substituted with a safer method.
* Asses the risk involve, and determine whether they are at an acceptable level or id further control are necessary.
* Complete hot work permit and submit to supervisor for review.
* The supervisor will ensure that the permit is completed correctly and all controls are in place.
* If necessary fire watchperson will be assigned.
* If assigned: the fire watchperson will maintain a continuous fire watch during the hot work activities, and if required for at least one hour following the completion of hot work.
* Should the post work assessment determine ongoing risk, an intermittent or continuous fire watch for an additional 3 hours will be established.
* On completion of fire watch or hot work the permit will be reviewed and closed by the supervisor.
* The closed permit will submitted to the safety department.