HAUL TRUCK LOADING PROCEDURES

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

1.0 PURPOSE

- To establish a Company standard to safely and effectively carry out work as it applies to haul truck loading procedures.

2.0 SCOPE AND APPLICATION

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

3.0 HAZARDS AND CONTROLS

- Contact between haul trucks and loading units resulting in equipment damage and/or personal injury.
    - Ensure haul trucks are spotted adequately; loading unit operators will use proper horn signals and radio communication. Haul trucks will remain in the loading pocket until directed by the loading unit to move or reposition.
    - Before reversing and spotting at a loading unit, the haul truck operator must check both mirrors to confirm there are no hazards behind the truck (i.e. too close to the loading unit) and they are spotted correctly.
    - Haul truck self-spotting on good side of a hydraulic shovel is permitted under ideal conditions. Should hazards exist such as poor visibility, congested areas, or slippery conditions, the shovel operator will spot the haul truck.
    - Haul truck self-spotting on blind side of a hydraulic shovel is not permitted unless:
        - It is authorized by site management or their designate;
        - A formal hazard assessment has been developed for the procedure;
        - Operators are trained and competent to self-spot on the shovel blind side; and
        - Mining conditions warrant the procedure.
    - Mirrors shall be clean and positioned adequately for clear line of sight.
    - Ensure there is sufficient illumination for night loading; do not position light plants in areas that impair operator visibility.
    - Use caution in times of reduced visibility (i.e. fog, snow, rain, etc.); loading unit operator or supervisor will determine safe loading positions.

- Shovel operators are responsible for ensuring haul trucks have vacated the loading pocket prior to swinging machine. Shovel operators will visually follow out the truck to confirm it has left the pocket before swinging the machine. If the shovel operator is unclear if the truck has left the pocket, they must confirm via radio before swinging.
- Excavator operator to load to the good side whenever possible for better visibility.
- Excavators will bench load whenever possible (position the excavator on a bench above the haul truck). The top of the excavator tracks should not exceed the height of the haul trucks' dove tail.
- If excavator bench loading is not possible, same level loading may be conducted providing the excavator is positioned beside the haul truck and out of the line of fire.
- If excavator side loading is not possible, the excavator may load from the rear of the haul truck providing:
  a) an adequate berm (½ the height of haul truck tire) is in place in front of the excavator,
  b) the bottom of the excavator cab is level to the tail of truck box, and
  c) the excavator has a safe path of egress from the work area.

  If the bottom of the excavator cab cannot be level to the tail of the truck box, a formal hazard assessment must be completed to allow the task of same level loading from behind the haul truck.
- Ensure the excavator has a safe path of egress from the work area when loading haul trucks from behind.

- Material falling unexpectedly from loading unit's bucket resulting in personal injuries to haul truck operator.
  - Loading unit will pad truck box where necessary to load larger lumps/rocks; oversized rocks/frozen lumps shall be broke up or pushed out of the loading area.
  - Haul truck operators must be alert and seated in an upright position with feet firmly planted on the floor; operators must be prepared for unexpected movement of the haul truck during loading so as to avoid musculoskeletal injuries (sprain/strain injuries to the back and neck).
  - Haul truck operators are to remain in cab with all body parts inside cab during loading.
  - Never swing the bucket over people or the cab of any equipment.
- Material falling from haul truck box resulting in equipment damage to the loading unit and/or personal injuries to loading unit operator.
  - Excavators will bench load whenever possible (position the excavator on a bench above the haul truck). The top of the excavator tracks should not exceed the height of the haul trucks' dove tail.
  - If excavator bench loading is not possible, same level loading may be conducted providing the excavator is positioned beside the haul truck and out of the line of fire.
  - If excavator side loading is not possible, the excavator may load from the rear of the haul truck providing:

a) an adequate berm (½ the height of haul truck tire) is in place in front of the excavator,

b) the bottom of the excavator cab is level to the tail of truck box, and

c) the excavator has a safe path of egress from the work area.

If the bottom of the excavator cab cannot be level to the tail of the truck box, a formal hazard assessment must be completed to allow the task of same level loading from behind the haul truck.

- Loading unit operator shall be observant for any large lumps or material that may fall from the truck after loading; loads are to be centered in the haul truck's dump body. Large chunks/lumps of material will be broken up prior to loading.
- Excavator cab guards will be required if there is a significant possibility that the operator may be injured by flying or projecting objects. Guards will be required when loading rip rap and rocks.

- Material falling from haul truck canopy resulting in equipment damage.
  - Haul truck canopies shall be kept free from unnecessary buildup of material.
  - Loads are to be centered in the haul truck's dump body.

- Unstable, slippery or uneven ground conditions resulting in rollover of equipment, equipment contact, or equipment damage.
  - Use dozers to push and rip materials for loading units.
  - Install ice lugs on loading units working on ice covered and frozen areas.
  - Ensure haul trucks are spotted an adequate distance from loading unit so as to minimize potential for truck to slide into loading unit.
  - Ensure spillage is cleaned out of area so as to prevent haul trucks from backing over and damaging tires.
  - Loading unit operators will not sweep material on the pit floor with the side of the bucket.
  - When ascending or descending slopes, always have the front of the loading unit facing the direction of travel and have final drives to the rear of the machine.
  - Do not excavate material around final drives.
  - Never propel with a full bucket.
  - Avoid unstable or uneven loading positions that cause rocking or undercarriage damage.
  - Install a safety berm at all leading or exposed edges.
  - When an excavator is on the same level as the truck and is digging an excavation, there must always be a safety berm at the edge of the excavation to protect the truck from travelling over the edge.

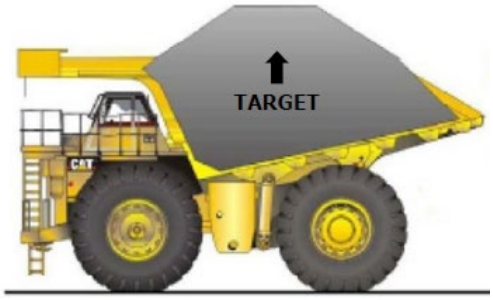
- Blind side obstacles and congested work areas.
  - Ensure swing area of loading unit is clear of obstructions.
  - Haul trucks must be spotted and have clear communication with loading unit operator for blind side loading.
  - Loading unit must verbally notify work area prior to moving or repositioning loading unit.
  - Loading unit must confirm there are no obstacles prior to moving or repositioning equipment.
  - Reassess work area for obstructions each time loading unit is repositioned.
  - Barricade or flag swing area when working in heavily congested work areas. Ensure the work area is setup so the excavator can swing without obstruction or use a spotter.
  - Haul truck operators shall be aware of traffic patterns in loading areas. Traffic patterns will be right hand drive in loading areas unless otherwise indicated by loading unit operator or supervisor.
  - Traffic patterns must be the same direction in loading areas with more than one loading unit, unless otherwise separated by berms.
  - Excavator operator will load to the good side whenever possible for better visibility.
  - Never swing to the blind side on start-up.
  - Waiting haul truck operators will stage facing loading unit until the area is clear for them to spot at loading unit.
  - Haul trucks will remain in the loading pocket until directed by the loading unit to move or reposition.

- Inadequate communication between loading units and haul trucks.
  - Ensure operators are using correct radio channel; perform radio check at the beginning of shift and periodically during the shift.
  - Loading unit operators will clarify horn signals to be used with haul truck operators. General horn signals include:
    a) One horn – stop or go.
    b) Two horns – back up.
    c) Three horns – reposition.
    d) One long continuous horn – Emergency.
    e) There may be a variation if there are two types of material being loaded. This must be communicated to all involved. (i.e. One horn, waste. Two horns, ore.).
  - Operators will communicate messages clearly and acknowledge transmission.

- Unstable dig face resulting in equipment damages and personal injuries.

- Loading unit operator shall continually monitor dig face stability; check for cracks, water seepage; material overhang.
- At no time will the working face exceed 1.5 metres above the maximum height that the loading unit can reach.
  - Optimal dig face height is 8-10 metres for a 5500 hydraulic shovel and 10-12 metres for a 8000 hydraulic shovel.
  - Optimal dig face height for an excavator is equal to the length of the excavator stick.
  - Optimal dig face height for an electric shovel is equal to height of the shovel's point sheaves.
- Active working dig faces exceeding 10 metres must be evaluated by the area supervisor for the requirement of a dozer to push down the face to ensure stability and safety for the loading area.
- During freezing conditions and or where a frost cap exists, or the material is blocky in nature, a dozer will be used to bring the face height down to a safe and manageable height.
- Never work under overhangs, call supervision for assistance.

- Material loaded incorrectly in haul truck dump body resulting in equipment upset while dumping, mechanical issues or poor equipment performance.
  - Loads are to be centred in the haul truck's dump body.
  - Loading unit operator will visually check to confirm loads are centred and advise haul truck operator if they are not.



  - Material that is "tail loaded" may require additional controls such as dumping on level/elevated ground before leaving the loading area or using an excavator to remove the material.
  - Semi-rigid material such as dMFT or material that has the potential to stick, shift or "loaf" out of the box when dumping cannot be "tail loaded". In these situations the loading unit operator will notify supervision to determine the appropriate control prior to the truck leaving the loading area.
  - Loading unit operators will not overload trucks. An overload is the truck's payload + 10%. The truck operator will notify loading unit operator if truck is overloaded and proceed to dump the load in a safe location in the loading area.

- Contact with electric trailing cable resulting in equipment damages
    - Haul trucks must maintain a minimum of three (3) metres from electric shovel trailing cable.
    - Do not drive over electric trailing cable; contact supervisor immediately if contact has been made with trailing cable.

4.0 CHECKLIST

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

5.0 DEFINITIONS

5.1 Company

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

5.2 Company Personnel

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

5.3 Haul Truck

Non rigid and rigid frame off road vehicle.

5.4 HSE

Refers to the Health, Safety & Environment department

6.0 PROCEDURE

6.1 General Procedure

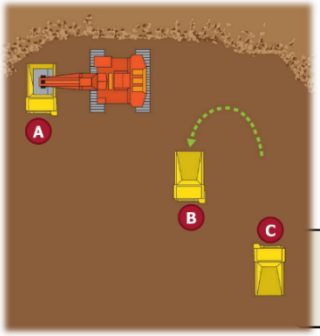
1) Complete a hazard assessment (i.e. FLRA) for the task. Notify supervision if unsure of task or if there are hazards outside the worker's control.
2) Complete a pre-use inspection of the equipment. Notify supervision if equipment is damaged, defective or unsafe to operate. Do not operate equipment that is unsafe.
3) Fasten seatbelt and adjust seat for visibility and comfort.
4) Complete radio check to verify radio is working.
5) Sound horn. Wait 5-10 seconds prior to starting equipment.
6) Complete equipment warmup procedures as required.
7) Confirm loading unit setup and implement as per procedures outlined in the following sections.

6.2 Shovels

6.2.1 Hydraulic Shovels

1) Hydraulic shovels will load both sides and confirm the haul truck has left the loading pocket before swinging the machine.
2) Traffic will be right hand drive unless otherwise communicated to all haul truck operators.
3) Shovel operators will position the spotting aids parallel with the machine tracks. Haul Truck operators will line up with the spotting aids to ensure they are reversing parallel to the tracks.
4) On the **hydraulic shovel left side (good side)**:
    a. The haul truck operator will turn into position, check both mirrors and verify the shovel's counterweight or bucket is visible in th**e haul truck's left side (good side) mirror.**
    b. Haul truck operator will align the left side of the dump body with the spotting aids on the counterweight (when swung 90 degrees & parallel to tracks) or on the shovel stick/bucket.
    c. Haul truck operator will reverse using the spotting aids for reference.
    d. Haul truck operator will stop when the cab lines up with the edge of the shovel house or when the shovel operator has sounded the horn. Haul truck operator will apply machine specific brake.
    e. Shovel operator will load haul truck and sound horn to release from the shovel pocket.
5) On the **hydraulic shovel right side (blind side)**:
    a. The haul truck operator will turn into position, check both mirrors and verify the shovel's bucket is visible in **haul truck's right side (blind side) mirror**.
    b. Haul truck operator will align the right side of the dump body with the spotting aids attached to the shovel stick/bucket and reverse under the bucket ensuring the truck remains parallel with the shovel tracks.
        i. Haul truck operator will NOT reverse unless the shovel bucket is visible in the haul truck's right side mirror.
    c. Haul truck operator will stop when the cab lines up with the edge of the shovel house or when the shovel operator has sounded horn. Haul truck operator will apply machine specific brake.
    d. Shovel operator will load haul truck and sound horn to release the truck from the shovel pocket.

Staging for Hydraulic Shovels



Hydraulic shovels are right hand drive unless otherwise stated.

NEVER back in on the right side without waiting to be spotted by the shovel.

ALWAYS back in parallel to the tracks.

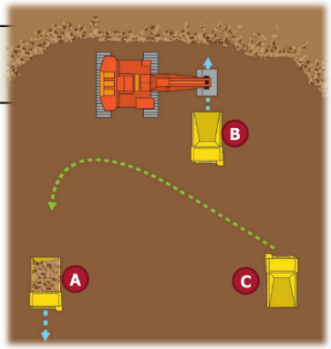
1. A is being loaded.
2. B positions to wait to be spotted by the shovel.
3. C waits their turn.

Staging for Hydraulic Shovels

1. A leaves for dump.
2. B moves into position as shovel spots truck.
3. C moves into position to prepare to back into position.

Once spotted by the shovel, the truck on the right side can back in.

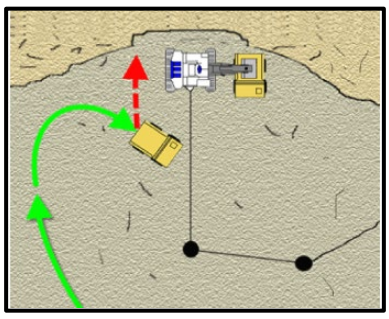
The waiting truck can now self-spot on the left side.

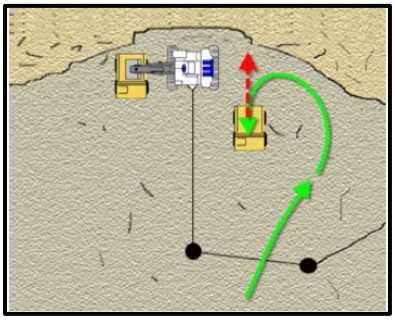


6.2.2 Electric Shovels

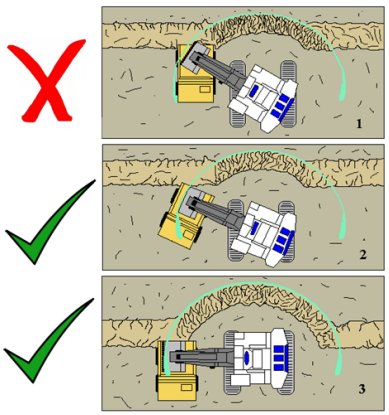
1) Electric shovels will load both sides and confirm the haul truck has left the loading pocket before swinging the machine.

2) Traffic will maintain a heart-shaped travel pattern, as illustrated. Any variation will be communicated by the shovel operator and confirmed by truck operator.





3) On the **electric shovel left side (blind side)**:
    a. The haul truck operator will turn into position, check both mirrors and verify the shovel's counterweight or bucket is visible in th**e haul truck's left side (good side) mirror.**
    b. The haul truck operator will align the left side of the dump body with the spotting cones attached to the shovel and reverse into position.
    c. The haul truck operator will stop when shovel operator has sounded horn. Haul truck operator will apply machine specific brake.
    d. Shovel operator will load haul truck and sound horn to release from the shovel pocket.
4) On the **electric shovel right side (good side)**:
    a. The haul truck operator will turn into position, check both mirrors and verify the shovel's counterweight or bucket is visible in th**e haul truck's right side (blind side) mirror.**
    b. The haul truck operator will align the right side of the dump body with the spotting cones attached to the shovel and reverse into position.
        i. Haul truck operator will NOT reverse unless the shovel bucket is visible in the haul truck's right side mirror.
    c. The haul truck operator will stop when shovel operator has sounded horn. Haul truck operator will apply machine specific brake.
    d. Shovel operator will load haul truck and sound horn to release from the shovel pocket.
5) Haul trucks will maintain proper loading angle depending on depth of electric shovel dig face, as illustrated.



6.3 Excavators

There are two main variations of excavator loading:

1) Bench loading, where the excavator sits on the bench above and loads the haul truck positioned below, and

2) Same level loading, where the excavator and the haul truck are on the same elevation.

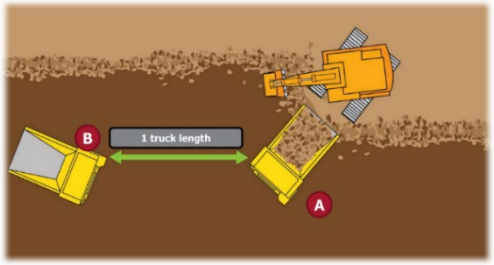
Bench loading is the preferred method of loading as long as ground conditions are stable. This method provides the excavator operator with greater visibility and protection.

The excavator operator will determine and communicate the loading method.

Haul trucks will stage approximately one (1) truck length away and face the action. They will not reverse into position until the bucket is presented for spotting. Excavator operator will sound horn when the haul truck is in the loading position, signaling the truck to stop. The haul truck will stop and apply machine specific brake.

Excavators - Staging

When waiting on deck, haul trucks must stage facing the action approximately **1 truck length** from the truck being loaded.



6.3.1 Excavators – Bench Loading

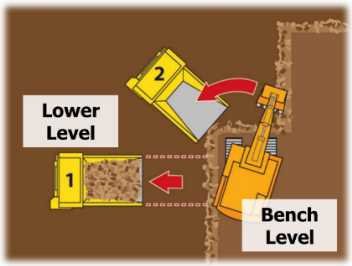
In the following illustration the haul truck would back in under a spotted bucket. This allows the excavator to load through the tail of the dump body. As the excavator advances through the cut haul trucks are spotted as shown.

Bench Loading

The bench loading procedure may vary for the Excavator.

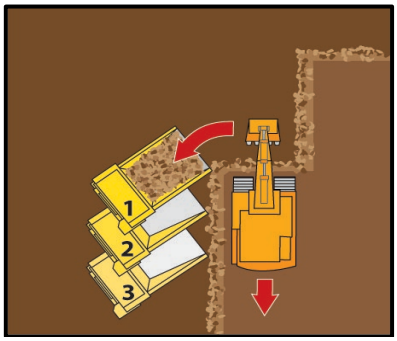
Preferred Method

Loading through the tail of the truck's dump body.



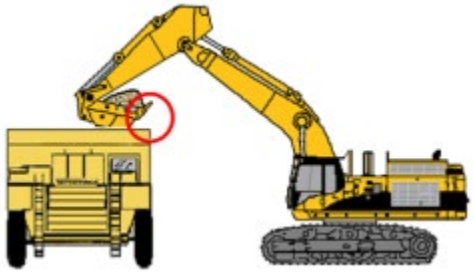
1) Loading straight in through the truck box.

2) Loading over the truck's side rails.



6.3.2 Excavators – Same Level Loading

If the excavator is **same level loading where the loading unit is loading from the side** of the haul truck, the haul truck operator will spot using the excavator's raised bucket teeth as the guide. The excavator will not swing over the cab.



If the excavator is **same level loading where the loading unit must load from behind the haul truck**, the bottom of the excavator cab must be level to the height of the tail of the haul truck dump body. This can be done by matching fleets or building a loading pad. This method of loading should only take place when all other loading options are not possible. At all times, a berm (½ the height of haul truck tire) must be in place to prevent the haul truck from reversing into the excavator and there must also be a safe egress path for the excavator.

Same Level Loading

Excavator may be up on a materials pile that is on the same elevation as the truck.

- ❑ If the Excavator must load the truck from behind, the cab of the Excavator needs to be **parallel to the height** of the truck's dump body tail.
- ❑ This method provides the Excavator operator better visibility of the material placed in the truck and helps protect the excavator from contact with the truck as it backs up.

For safe loading, match the Excavator's size with the truck's size.

When an excavator is on the same level as the truck and is digging an excavation, there must always be a safety berm at the edge of the excavation to protect the truck from travelling over the edge.

6.3.3 Excavators – Drive by Loading

Drive by loading may be completed on a bench or on the same level as the haul truck. This loading method must be approved by the area supervisor prior to implementation.

1) Excavator operator will provide clearance for the haul truck to travel past the excavator.

2) Haul truck will stop cab to cab with excavator.

3) Excavator will load the haul truck. At no time will the haul truck drive under a raised bucket. At no time will the excavator operator swing the bucket over the cab of the haul truck.

7.0 NOTES

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

8.0 REFERENCES

- Alberta Occupational Health and Safety Act, Regulation and Code – {Part 36, Section 541 Mine Walls}
- Health, Safety and Reclamation Code for Mines in British Columbia
- 962C-SOP-036 Haul Truck Dumping Procedures
- 962C-SOP-009 Removal of Material Build up in Haul Trucks
- 962C-SOP-016 Operating Haul Trucks General

9.0 APPENDICES

- There are no appendices.