

STANDARD OPERATING PROCEDURE

Haul Truck Loading Procedures

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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 loading units interacting with haul trucks.

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.
 - 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 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 shovel is not permitted unless:
 - It is authorized by the project manager;
 - A JSA 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.
 - Never swing loads over equipment cabs.
 - 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 shovel operator is unclear if the truck has left the pocket, they must confirm via radio before swinging.

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- 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.
- Material falling from haul truck box resulting in equipment damage to the loading unit and/or personal injuries to loading unit operator.
 - Utilize bench loading whenever possible (position the excavator on a bench above the haul truck); ensure ground conditions are stable.
 - When using same level loading, ensure the cab of the excavator is parallel to the height of the tail on the haul truck dump body.
 - 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.
- 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.
 - Utilize dozer to push and rip materials for loading units.
 - Install ice lugs on loading units when needed in winter conditions.
 - Utilize same level loading in ground conditions that are not stable.
 - 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 haulage trucks from backing over and damaging tires.
- 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, always swing to the good side when working in congested areas or use a spotter.

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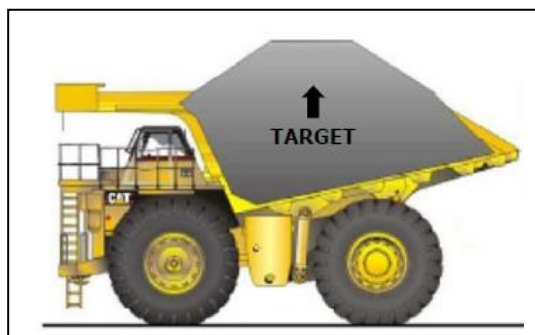
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- Haul truck operators shall be aware of traffic patterns in loading areas. Traffic patterns will be right hand drive in loading areas unless otherwise indicated by loading unit operator or supervisor.
- Inadequate communication between loading units 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.
 - 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.
 - Optimum hydraulic shovel face height (based on a Hitachi EX5500 Hydraulic Shovel) is 8-10 metres and should not exceed 10 metres. Face heights greater than 10 metres will require a dozer to push down the face to meet the 10 metre restriction.
 - At no time will the working face exceed 1.5 metres above the maximum height that the loading unit can reach.
 - During freezing conditions and or where a frost cap exists, or the material is blocky in nature, a dozer will be utilized to bring the face height down to a safe and manageable height.
- 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.



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- Contact with electric trailing cable resulting in equipment damages
 - Haul trucks must maintain a minimum of 3 metres from electric 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 HSE

Refers to the Health, Safety & Environment department

6.0 PROCEDURE

6.1 General Procedure

- Always conduct a thorough walk around of the machine and observe area for any hazards before operating. Report any defective components to supervision.
- Complete FLRA before commencing work and any time conditions change.
- Ensure operator's seat is properly positioned for optimal visibility and comfort. Seat belt must be fastened.
- Always sound horn and wait 5-10 seconds before moving equipment.
- Never swing to the blind side on start-up.
- When parking, ensure area is free of hazards, machine is level, lower all attachments, set brakes, apply hydraulic lock out (if equipped) and install operator out of cab sign.
- Loading unit must be kept under control and operated smoothly at all times.
- Avoid unstable or uneven loading positions that cause rocking or undercarriage damage.
- Never work under overhangs, call supervision for assistance.
- Never swing the bucket over people or the cab of any equipment.

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- The loading unit operator is responsible for maintaining order in the pit and determining safest traffic pattern.
- Do not spot haul trucks where there is excessive spill rock, call for support equipment to clean up area.
- Loading unit operators will not sweep material on the pit floor with the side of the bucket.
- Never propel with a full 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.
- Loads are to be centered in haul truck dump body. Loading unit operator will advise haul truck if load is not centred. Material that has been "tail loaded" and appears unsafe to dump will require a supervisor to assess. The supervisor will determine if the truck is safe to proceed to the dump.
- Pad dump body before loading large rocks lumps of material.
- Haul trucks are not to be overloaded. Overloads must be dumped in pit.
- Haul truck operators will remain in seat with seat belt fastened during loading.
- Waiting haul truck operators will stage facing loading unit until the area is clear for them to spot at loading unit.
- Haul truck operators will check both mirrors before reversing and spotting at the loading unit.

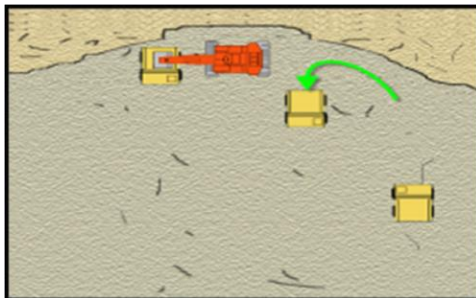
6.2 Horn Signals

- One horn – stop or go
- Two horns – back up
- Three horns – reposition
- One long continuous horn – Emergency
- 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.)

6.3 Loading Unit Set Ups

6.3.1 Hydraulic Shovels

- Optimum hydraulic shovel face height is 8-10 metres and should not exceed 10 metres. Face heights greater than 10 metres will require a dozer to push down the face to meet the 10 metre restriction.
- Hydraulic shovels will load both sides, one then the other, and confirm haul truck has left the loading pocket before swinging the machine.
- Traffic will be right hand drive unless otherwise communicated to all haul truck operators:



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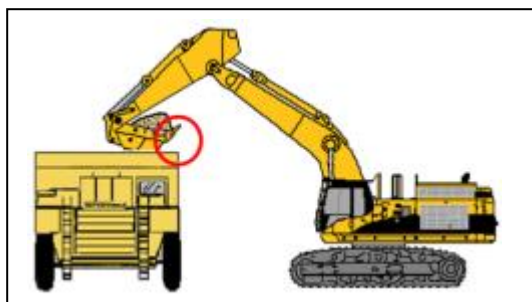
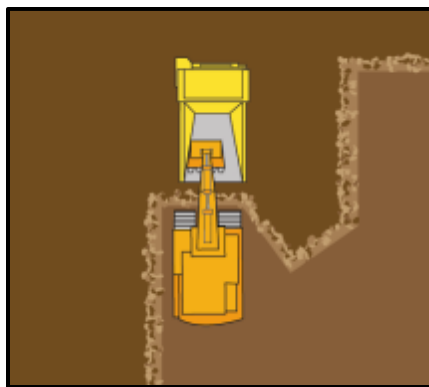
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- On the left side (good side) of the hydraulic shovel, the truck operator will back into loading position when the counterweight is toward truck or the shovel bucket is spotted to back under. The haul truck operator aligns the left side of the dump body with the hanging cones attached to the shovel.
- On the right side (blind side) of the hydraulic shovel, the truck operator will back into loading position **only when the shovel bucket is spotted to back under**. No truck operator will back into loading position without first being spotted by the shovel bucket (unless the conditions outlined in Section 3.0 Hazards and Controls have been met). The truck operator can stage and be ready to back up. In this case, the truck operator will align the right side of the dump body with the spotting cones.
- When in loading position, the truck will always be parallel to a hydraulic shovel's tracks.

6.3.2 Excavators

- Optimal dig face equal to the length of the excavator stick.
- Excavator operator to load to the good side whenever possible for better visibility.
- The excavator operator will determine and communicate the method of backing in to the loading position. Either the truck operators will back in parallel to the house of the excavator or will align the bucket teeth with the left side of the dump body, as illustrated.



6.3.2.1 Excavators – Bench Loading

- There are two main variations of excavator loading: bench loading, where the excavator sits on the bench above and loads the haul truck positioned below, and same level loading, where the excavator and the haul truck are on the same elevation.
- Bench loading is a preferred method of loading as long as the ground conditions are stable. This method provides the excavator operator with greater visibility.
- 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.

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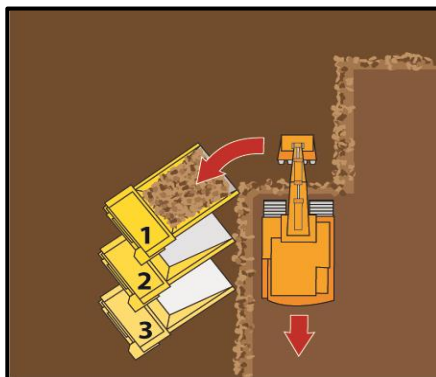
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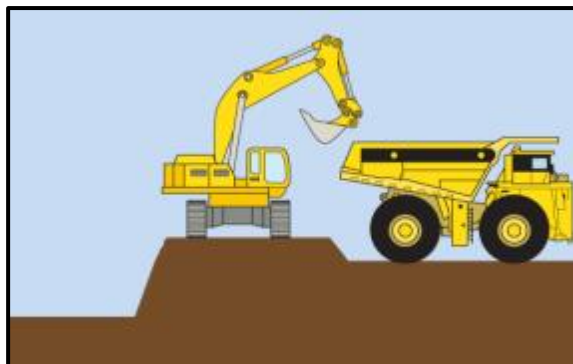
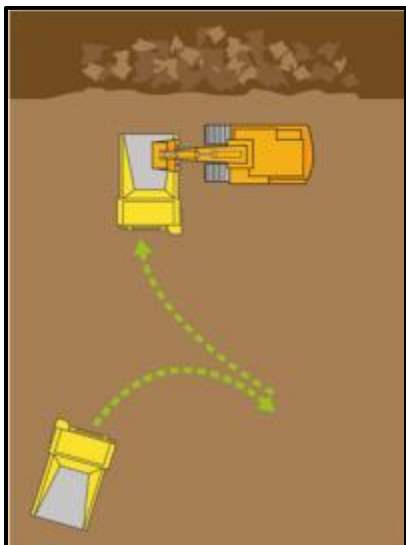
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6.3.2.2 Excavators – Same Level Loading

- 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 cab of the excavator must be parallel to the height of the tail of the dump body. This can be done by matching fleets or building a loading pad, as illustrated. This method of loading should only take place when all other loading options are not possible.



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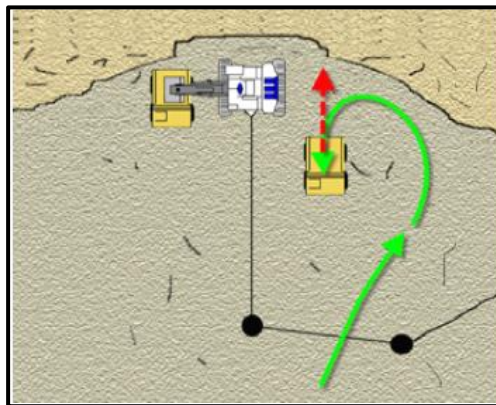
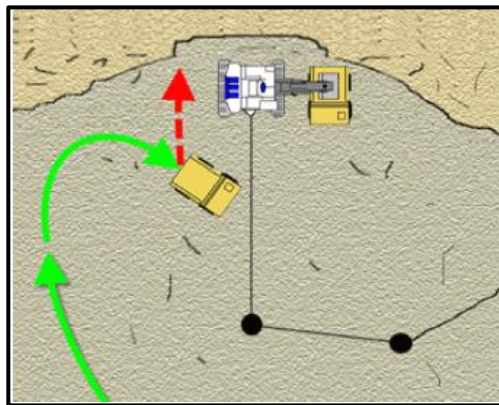
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- When an excavator is on the same level as the truck and is digging an excavation, there must always be a safety berm at the edge of the excavation to protect the truck from travelling over the edge.

6.3.3 Electric Shovels

- Optimal dig face height is equal to height of the shovel's point sheaves.
- Trailing cable will be clearly marked by cable stands.
- Haul trucks will maintain a distance of 3 meters from all power cable.
- Shovel operator will load one side, then the other.
- Traffic will maintain a heart shaped travel pattern, as illustrated. Any variation will be communicated by the shovel operator and confirmed by truck operator.



- On the left side of the electric shovel, the truck operator will back into loading position only when the counterweight is toward truck or the shovel bucket is spotted to back under. The haul truck operator aligns the left side of the dump body with the spotting cones attached to the shovel.
- On the right side, the truck operator will back into loading position only when the counterweight can be seen clearly in convex mirror, using counterweight flags as reference, or when the shovel bucket is spotted. In this case, the truck operator aligns the right side of the dump body with the spotting cones.
- Haul trucks will maintain proper loading angle depending on depth of electric shovel dig face, as illustrated.

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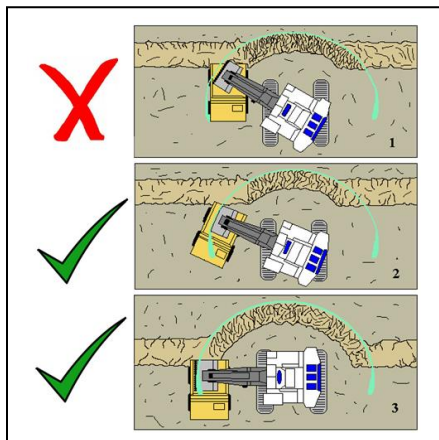
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7.0 NOTES

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

8.0 REFERENCES

- Alberta Occupational Health and Safety 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}
- 962-SOP-009 {Removal of Material Build up in Haul Trucks}

9.0 APPENDICES

- There are no appendices.