

Quarry Operations

Through Occupational Health and Safety inspections of various quarry operations within the province, it has become evident that there are a number of deficiencies or unacceptable practices being carried out. These deficiencies or unacceptable practices have the potential to cause both immediate and long term health problems if not addressed.

Some of the deficiencies noted are:

- 1) The heights of faces and benches are too high for equipment being used;
- 2) Lack of dust suppression systems for drills, crushers, conveyers, roads, etc.;
- 3) Lack of medical surveillance for workers;
- 4) Improper removal and storage of over burden from the quarry edge;
- 5) Lack of proper / adequate crusher, conveyor, equipment guarding;
- 6) Lack of Hearing Conservation Program implementation;
- 7) Lack of appropriate HEPA filtration systems/positive pressurization in operator's cabs.

These deficiencies have been noted in both sand / gravel operations and in hard rock operations.

Height of Faces / Benches:

Occupational Health and Safety Regulations - Section 409(2)(a) - Faces and slopes states:

"Except where the minister, in writing, permits otherwise, in a pit, quarry or similar excavation, the height of a face of which the material is not at a safe angle of repose shall not be greater than the height which can be safely reached by the equipment being used;"

- The bench / face height for quarry operations in consolidated rock shall not exceed 10 metres and, in any event, shall not be higher than can be safely reached with the equipment in use. Also, when the quarry is worked in 2 or more benches, it shall be worked at a 55 degree angle with catchment berms left in place to collect any material falling to the bench below.
- The bench / face height for quarry operations in unconsolidated rock (sand and gravel) shall not exceed 5 metres and, in any event, shall not be higher than can be safely reached with the equipment in use. Also, when the quarry is worked in 2 or more benches, it shall be worked at a 45 degree angle with catchment berms left in place to collect any material falling to the bench below.

Dust Suppression

Occupational Health and Safety Regulations - 413(4) Air Quality states: "A worker employed in surface rock-excavating workings shall be protected from harmful dust concentrations by"
(Please see regulation for details)

Section 414 under Rock Crushing Control Measures states: "Rock-crushing plants shall be equipped with dust controls and ..."

All Quarries shall have wet suppression systems, mechanical suppression systems, and/or a combination of methods/strategies installed to address dust that is generated from drilling / blasting activity, crushing activity, loading activity, and transporting / conveying rock.

An employer shall ensure that atmospheric concentrations of hazardous substances in the workplace are kept as low as is reasonably practicable and within American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit values (TLV). Where dust concentrations are not within ACGIH TLVs, a respiratory protection program shall be implemented in accordance with section 83 of the Regulations. Respirators shall be used as an interim control measure until personal exposures to airborne contaminants including dust and respirable crystalline silica are reduced to levels below the ACGIH-TLVs.

- Observation of visible dust shall not be the only indicator to demonstrate that respiratory protection is necessary. Invisible fine dust particles are the most hazardous, highlighting the importance of personal monitoring to identify job types and specific tasks requiring control measures.



Medical Examination

Occupational Health and Safety Regulations - Section 47(1) Silica Medical Surveillance states: "An employer shall establish and maintain a system for the surveillance of the health of his or her employees arising from silica dust exposure in accordance with the silica health surveillance guidance document prescribed by the minister;"

- All workers who work in a "silica dust exposure occupation" i.e. quarry operations, shall have a health assessment done on an annual basis. The initial health assessment shall be carried out under the direction of a physician and shall include, but is not limited to the following: Occupational history, respiratory questionnaire, pulmonary/lung function testing, chest x-ray (full size PA view) and a medical history and physical exam emphasizing the respiratory system. The frequency of some aspects of future assessments will be at the discretion of the physician, however a health assessment must be performed on an annual basis. Any records of personal exposure monitoring shall be kept with the health records of the worker.

Overburden Removal

Occupational Health and Safety Regulations - Section 409(1) - Faces and slopes states: "Where work is being carried on in an excavation the slopes shall be scaled and trimmed or otherwise stabilized to prevent slides of material or falls of rock; overhanging banks and trees or stumps and overburden shall be removed in the area within 5 metres from the edge of the excavation; and means shall be provided to prevent the erosion of the slope by surface water."

- Overburden material shall be removed away from the quarry edge, 5 metres, and appropriately stockpiled for quarry rehabilitation at a later date.

Curbs or Berms

Occupational Health and Safety Regulations - Section 655(1) Protective curbs or berms states: "An employer shall maintain a protective curb or berm of material at an open pit or quarry along the outer edge of

- (a) a ramp;
- (b) a roadway that is within 20 metres of a hazardous slope in the open pit or quarry;
- (c) a bench, where mobile equipment other than a drilling machine is operated within 8 metres of the edge of the bench;
- (d) waste dumps;
- (e) an access ramp
 - (i) used to feed a hopper, crusher, or conveyor system, or
 - (ii) when required by an officer;
- (f) a road that has a vertical fall of greater than 2.5 metres and is used for the haulage of quarried or mined material whether in its raw or concentrate form."



Conveyor Guarding

Occupational Health and Safety Regulations - Section 89(b) Machinery and Equipment General Requirements states:" Except as otherwise provided in these regulations, an employer shall ensure that machinery and equipment is fitted with adequate safeguards that ensure that an employee cannot access a hazardous point of operation;

Also, Under our Occupational Health and Safety Regulations - Section 531(7) Conveyors General Requirements states:" Nip-points along receiving hoppers and belts shall be effectively guarded."

- All exposed moving parts on conveyors that may constitute a hazard to workers shall be adequately guarded. Areas included but not limited to are: Tail pulleys, receiving hopper / skirt boards, take up pulleys, counterweight enclosures, head pulleys, drive pulleys, snub pulleys, return rollers / idler assembly, V-belts, power transmission equipment guards, radial drives on portable stackers, etc.

Hearing Conservation Program

Occupational Health and Safety Regulations Section 68(3) Noise Hazards states: "A hearing conservation program established under subsection (2) shall comply with the following minimum requirements:..." (Please see regulation for details)

- All workers required to work in areas in which noise levels exceed the criteria for permissible noise exposure established by the ACGIH Noise Threshold Limit Values (TLV's) shall wear hearing protection in accordance with CSA Z94.2. In addition, the workers shall be trained and educated in the health hazards of noise, the use of hearing protection, and shall have an annual hearing test completed.

Operator's Cabs

Occupational Health and Safety Regulations Section 45(2) Ventilation states: "Where a work or process gives off dust, fumes, vapour, mist or other impurity of a kind and quantity liable to be injurious or offensive to a worker, an employer shall provide, maintain and ensure the proper use of a ventilation system sufficient to protect the worker against inhalation of impurities and to prevent impurities accumulating in the work space."

- Operator's cabs shall be equipped with HEPA filtration systems to ensure that all air entering the cab is HEPA filtered. In addition, the cabs must be under positive pressure at all times during operation.

If you have any questions concerning the above or occupational health and safety please call (709) 729-2706 or Toll-free 1-800-563-5471; or visit the Service NL website, OHS Division at <http://www.gs.gov.nl.ca/ohs>.