

## PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION

|                                     |             |   |
|-------------------------------------|-------------|---|
| <b>Definitions</b>                  | <b>20.1</b> | In this Part:   |
| "adjacent to an excavation"         |             | means within a distance less than or equal to the overall depth of the excavation, measured from a vertical line through the toe of the excavation face;  |
| "construction project"              |             | means any erection, alteration, repair, dismantling, demolition, structural or routine maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, concreting, the installation of any machinery or any other work deemed to be construction by the Board; |
| "demolition"                        |             | means tearing down, destruction, breakup, razing or removal of the whole or part of a building or structure, or of free standing machinery or equipment that is directly related to the function of the structure;  |
| "excavation"                        |             | means any cut, cavity, trench or depression in the earth's surface resulting from rock or soil removal;   |
| "fill"                              |             | <b>means any soil or other loose material that is constructed to form an embankment or a part of the foundation of a structure or improvement;</b>  |
| "formwork"                          |             | includes the foundation, supporting structure, and mould into which concrete will be placed;  |
| "formwork designer"                 |             | means the professional engineer responsible for the design of formwork;   |
| "qualified registered professional" |             | <b>means</b><br><b>(a) a professional engineer or a professional geoscientist as defined in the <i>Engineers and Geoscientists Act</i>, and</b><br><b>(b) in a forestry operation, includes a professional forester or registered forest technologist as defined in the <i>Foresters Act</i>;</b>                       |
| "stockpile"                         |             | <b>means any soil or other loose material that is placed in an area for storage but that is not intended to function as fill;</b>   |
| "tilt-up construction"              |             | means a system of building construction in which concrete wall panels are placed in position in the permanent structure and temporarily braced or supported;  |
| "trench"                            |             | means an excavation less than 3.7 m (12 ft) wide at the bottom, over 1.2 m (4 ft) deep, and of any length.  |

[Amended by B.C. Reg. 185/99.]

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### Explanatory Note

Several new definitions are proposed as the terms are being used in proposed changes to this Part.

The proposal for regulatory change in 2007 included adding a definition of "professional forester" in order for the OHSR to properly recognize the right of a professional forester to practice professional forestry which includes practicing forest engineering. After consideration of a joint submission from the Association of BC Forest Professionals and the Association of Professional Engineers and Geoscientists of BC, it is now proposed to define and use the broader term "qualified registered professional". This recognizes the right of appropriately qualified forest professionals to practice forest engineering under the authority of the *Foresters Act*. This term is used in joint practice documentation developed by these two Associations and has been

**PROPOSED AMENDMENTS FOR PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

incorporated into other legislation on the recommendation of the two Associations. For the purposes of the definition in the *Occupational Health and Safety Regulation* a qualified registered professional will be a professional engineer or professional geoscientist registered or licensed to practice under the *Engineers and Geoscientists Act* or a professional forester registered or holding a special permit to practice or a registered forest technologist registered to practice under the *Foresters Act*.

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## PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION

### SAFE WORK AREAS AND SAFE ACCESS

|                                     |                |  |
|-------------------------------------|----------------|--|
| <b>Fills</b>                        | <b>20.14.1</b> | <b>A fill must be planned, constructed, used and maintained so that no person working at the workplace is endangered by any failure or instability of the fill.</b>          |
| <b>Stockpiles</b>                   | <b>20.14.2</b> | <b>A stockpile must be planned, constructed, used and maintained so that no person working at the workplace is endangered by any instability of the stockpiled material.</b> |
| <b>Unstable face of a stockpile</b> | <b>20.14.3</b> | <b>The height of an unstable face of a stockpile must not exceed the maximum safe reach of the equipment being used to remove material from the stockpile.</b>               |

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### Explanatory Note

In August of 2005, the operator of an excavator building a new logging road was seriously injured when a recently placed section of road fill gave way under the excavator and the machine and operator slid and rolled down the slope. The investigation of this accident identified that the *Occupational Health and Safety Regulation* did not have any specific provisions addressing the safety of people required to work on or around a fill or stockpile in a workplace.

Fills are regularly part of a workplace as part of a road, or as a dyke, dam or embankment. Stockpiles are also part of many operations and may be of soil, gravel or other similar geotechnical material or of a product such as hog fuel or wood chips. A fill or stockpile is hazardous if the faces are not maintained at stable angles, or when heavy equipment is being used on the fill or the stockpiled material as there is a risk of the edge giving way and the equipment rolling or sliding down the slope endangering the operator, or from a substantial amount of the fill or stockpile material moving down slope and endangering anyone working on or below the fill or slope.

The intent of proposed new sections 20.14.1 and 20.14.2 is to ensure that during the construction of a fill or stockpile, or when maintenance or other activity is taking place on or around a fill or stockpile, the work or activity is done in a manner that minimizes the risk to a person on or near the fill or stockpile from a failure or instability. A fill or stockpile will normally be part of an improvement planned or designed by a qualified registered professional. In such cases, it is expected the qualified registered professional will provide direction for the construction, use and maintenance of the fill or stockpile. If the fill is not part of a plan or design by a qualified registered professional, the employer must ensure an appropriately qualified person provides direction for construction, use and maintenance of the fill or stockpile. The employer has the obligation to ensure any person working around a fill or stockpile is trained to do so safely. For complex operations, written work procedures or instructions should be provided.

Fills and stockpiles vary considerably in size and configuration. If mobile equipment is to be operated on the stockpiled material this will generally create a danger to the equipment operator if and when the equipment must go near the edge of the stockpile, and such activity will also create a danger to a person who is near the base of the stockpile in the event of a material flow, or if the equipment goes over the edge of the stockpile. If the sides of a stockpile are constrained by a structure, which is often the case where the employer or owner wants to minimize the footprint of the stockpile, then the retaining structure needs to be properly designed to ensure it will safely resist the lateral pressure from the stockpiled material pushing against it, as well as any load that may be exerted by equipment working on or in the stockpiled material. Generally, a stockpile formed by end dumping material one layer or one lift high would not require mobile equipment to go onto the stockpile so written procedures or instructions would not be expected. However, if a

**PROPOSED AMENDMENTS FOR PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

stockpile is formed by end dumping material in several lifts or is being used by removing the material one lift at a time this requires equipment to go onto the stockpile and moves the danger level up so that written procedures or instructions should be provided. If an employer has stockpiles comprised of substantially the same material, a generic set of written procedures or instructions may be developed for use at such stockpile locations.

Proposed section 20.14.3 is intended to ensure when material is being removed from a stockpile that the work is done in a manner so an unstable face can be trimmed as necessary to ensure the equipment working to remove the material will not be engulfed in the event the working face collapses. This provision is similar to the requirement of section 20.93 **Height limitations** which states: "In pits, quarries and similar excavations the height of unstable faces must not exceed the maximum safe reach of the excavating equipment being used."

DRAFT

## PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION

### EXCAVATIONS

#### Work standards

- 20.78** (1) Excavation work must be in accordance with the written instructions of a professional engineer if
- (a) the excavation is more than 6 m (20 ft) deep,
  - (b) support structures other than as specified in section 20.81 are used in the excavation,
  - (c) an improvement or structure is adjacent to the excavation,
  - (d) the excavation is subject to vibration or hydrostatic pressure likely to result in ground movement hazardous to workers, or
  - (e) the ground slopes away from the edge of the excavation at an angle steeper than 3 horizontal to 1 vertical.
- (2) The written instructions required in subsection (1) must
- (a) be certified by a professional engineer,
  - (b) be available at the site, and
  - (c) specify the support and sloping requirements, and the subsurface conditions expected to be encountered.

**(3) If the excavation work referred to in subsection (1) does not use support structures, the written instructions required by subsection (1) may be provided by a professional geoscientist.**

**(4) If the excavation work referred to in subsection (1) is part of a forestry operation and does not use support structures, the written instructions required by subsection (1) may be provided by a qualified registered professional.**

#### Sloping and shoring requirements

- 20.81** (1) Before a worker enters any excavation over 1.2 m (4 ft) in depth or, while in the excavation, approaches closer to the side or bank than a distance equal to the depth of the excavation, the employer must ensure that the excavation sides are sloped or supported as specified by a professional engineer, or that the sides of the excavation are
- (a) sloped at angles, dependent on soil conditions, which will ensure stable faces, but in no case may the slope or combination of vertical cut and sloping exceed that shown in Figure 20-1,
  - (b) benched as shown in Figure 20-2,
  - (c) supported in accordance with the minimum requirements of section 20.85, or
  - (d) supported by manufactured or prefabricated trench boxes or shoring cages, or other effective means.

**(1.1) If the excavation referred to in subsection (1) does not use support structures, the specifications required by subsection (1) may be provided by a professional geoscientist.**

**(1.2) If the excavation referred to in subsection (1) is part of a forestry operation and does not use support structures, the specifications required by subsection (1) may be provided by a qualified registered professional.**

- (2) If the end of a trench over 1.2 m (4 ft) in depth is not adequately sloped, end shoring must be installed unless

**PROPOSED AMENDMENTS FOR PART 20: CONSTRUCTION, EXCAVATION AND DEMOLITION  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

- (a) a worker in the trench is not required to approach closer to the end of the trench than a distance equal to the depth of the trench at that end,
  - (b) where, for the prevailing soil conditions at the end of the trench, the permissible spacing of uprights equals or exceeds the width of the trench, or
  - (c) otherwise authorized in writing by a professional engineer **or professional geoscientist**.
- (3) If end shoring is required, the walers for the end shoring must be installed to bear against the walers that extend along the sides of the trench, or in a manner that will provide equivalent structural restraint.
- (4) End shoring must be designed by a professional engineer if the end shoring waler length exceeds 1.8 m (6 ft).
- (5) Shoring must extend from at least 30 cm (1 ft) above ground level to as close to the bottom of the trench as the material being installed will allow, but in no case more than 60 cm (2 ft) from the bottom.
- (6) Shoring need not extend above ground level where traffic crossing plates need to be used, provided that other measures are taken to prevent excavated or other material from entering the excavation.

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### **Explanatory Note**

The proposal to add section 20.78(3) and section 20.81(1.1), and to modify section 20.81(2)(c) is to ensure the OHSR does not limit the scope of practice of a geoscientist qualified to undertake this type of work. Some professional geoscientists practice in the area of engineering geology and regularly assess terrain stability, cut slopes, excavations and fills, and provide a professional opinion on the safety of activity to take place in or near the affected areas. A professional geoscientist is not permitted to be professionally responsible for the design or specification of support structures for a fill or for excavation work, but may be responsible for specifying sloping requirements to provide for safe work conditions on or around a fill or for excavation work. While it is expected the majority of the design and certification of fills, stockpiles and excavation work will continue to be done by engineers, the purpose of this change is to ensure appropriately qualified professional geoscientists are not restricted from undertaking responsibility for this type of work when it is within the scope of their professional practice.

The proposal to add sections 20.78(4) and 20.81(1.2) is to recognize that the planning or design for a forestry operation, including roads and other transportation systems, as well as the supervision of construction and maintenance of infrastructure in such operations may be done by licensed professionals other than a professional engineer. The *Engineers and Geoscientists Act* does not apply to a forest professional doing work within the scope of practice covered by the *Foresters Act*. The *Foresters Act* entitles a professional forester or a registered forest technologist to practice professional forestry, including forest engineering. The limited application of these two proposed new sections (to excavations in a forestry operation that do not use support structures) is based on a recommendation received jointly from the Association of BC Forest Professionals and the Association of Professional Engineers and Geoscientists of BC. The scope is limited to specifying cut and fill slopes and does not extend to instructions related to retaining or reinforcing structures. Instructions related to retaining or reinforcing structures must be provided by a professional engineer. Note the definition of a qualified registered professional includes a professional geoscientist. An appropriately qualified professional geoscientist may provide specifications for cut slopes or fills but would not provide instructions related to retaining or reinforcing structures for a slope or fill.

## PART 22: UNDERGROUND WORKINGS

### GENERAL REQUIREMENTS

**Notice of project**

- 22.6** (1) No later than 30 days before commencing an underground project, written notification of the project must be given to the Board by the owner or another person engaged by the owner to be the prime contractor, except that if there is more than one prime contractor employed on the project the notice must be given by the owner.
- (2) The notification must include
- (a) the name of the project,
  - (b) the address or location of the project referenced to the nearest town and public highway,
  - (c) the name and address of the owner and of any other person engaged to be the prime contractor, and of the bonding company, if appropriate,
  - (d) the name of the person in charge of the project,
  - (e) a brief description of the project including
    - (i) the type of underground working,
    - (ii) the mining method,
    - (iii) the type, number of units, and engine horsepower (watts) of the mining equipment,
    - (iv) the starting date and approximate duration of the project,
    - (v) the approximate peak labour force, and
    - (vi) the proposed hours of work,
  - (f) the details of proposed temporary or permanent ground support, including the proposed timing of such support, and whether the owner or another person engaged to be the prime contractor will be responsible for its design and installation,
  - (g) the plans, drawings and fan specifications for the ventilation systems that will be used during construction, and
  - (h) a report produced by a professional engineer **or professional geoscientist** that provides
    - (i) a description of the geological hazards associated with the work,
    - (ii) drawings showing profiles, transverse sections and plans for the proposed underground workings, including the potential for encountering gassy ground, explosive dusts, rock falls, running ground or rock bursts, and
    - (iii) a detailed statement from the owner or another person engaged to be the prime contractor as to how geological hazards will be dealt with.
- (3) Any hazards discovered during the work which were not included in the report required by subsection (2) (h) must be reported immediately to the Board.

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#### Explanatory Note:

The proposal to add reference to *professional geoscientist* in section 22.6(2)(h) is being done at the request of the Association of Professional Engineers and Geoscientists of BC. Some geoscientists are involved in the practice of engineering geology and regularly assess soil, rock and related geological conditions and provide a professional opinion on the safety of activity to take place in or near such areas. A professional geoscientist is not permitted to be professionally responsible for the design or specification of support structures, but may be responsible for specifying conditions and procedures necessary to provide for safe work conditions in or near an

**PROPOSED AMENDMENTS FOR PART 22: UNDERGROUND WORKINGS  
IN THE OCCUPATIONAL HEALTH AND SAFETY REGULATION**

underground working. While it is expected the majority of the design and certification requirements for an underground working will continue to be done by engineers, the purpose of this change is to ensure appropriately qualified professional geoscientists are not restricted from undertaking responsibility for this type of work when it is within the scope of their professional practice.

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