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### **21.1 Definitions**

In this Part

*"blast site"* means an area extending at least 15 m (50 ft) in every direction from a place where

- (a) explosives are stored outside of a magazine or are placed or primed, or
- (b) a misfire is known or believed to exist;

*"blaster"* means a person who is the holder of a valid blaster's certificate issued by the Board or acceptable to the Board;

*"blaster of record"* means the blaster who is designated to be in charge of a blasting operation;

*"blasting accessory"* means a non-explosive device, product or tool, including a blasting machine, fuse lighter, blasting galvanometer, crimper, powder punch and loading pole;

*"blasting log"* means a written record that contains the information referred to in section 21.4(1);

*"blasting operation"* includes preparing, placing, and firing a charge, handling a misfire, and destroying or disposing of explosives;

*"bootleg"* means the remnant of a blast hole which did not properly break when the blast was initiated; also called socket, butt or button;

*"charge"* means an explosive, whether or not the explosive has a primer, that is placed for the purpose of detonation or deflagration;

*"danger area"* means an area in which there may be danger to persons or property from flying material or other hazardous condition resulting from a blasting operation;

*"dangerous incident"* means an accident or near miss occurrence caused by or as a result of the use of explosives, and also includes an unexpected result or problem with explosive products;

*"day box"* means a container used at a worksite to store and transport explosives that is

- (a) weatherproof;
- (b) constructed with
  - (i) an outer surface that is made of non-combustible materials, and
  - (ii) an inner surface that is made of non-sparking materials, and
- (c) equipped with a lock or mechanism to enable locking;

*"detonator"* means any of the following:

- (a) a device containing a primary explosive that is used for initiating detonation in another explosive;
- (b) an exploding bridge wire detonator;
- (c) an exploding foil initiator;
- (d) a deflagration to detonation transition detonator;

*"electric detonator"* means a detonator, other than an electronic detonator, designed for, and capable of, initiation by means of an electric

current, including, for example, a resistorized electric detonator;

"*electric igniter*" means a device designed for, and capable of, initiating deflagration in another explosive by means of an electric current;

"*electronic detonator*" means a detonator that uses stored electrical energy as a means of powering a programmable electronic timing delay element, whether or not the detonator is wireless;

"*initiating device*" means a blasting machine, non-electric starter, fuse lighter and any other device used to initiate a deflagration or detonation but does not include a detonator or electric igniter;

"*explosive*" means a substance, or an item containing a substance, that is made, manufactured or used to produce a detonation or deflagration;

"*isolated location*" means an area where people other than the workers involved in the work project are not likely to be, and excludes frequently travelled roads, or a recreation area when it is likely to be used by people;

"*magazine*" means a licensed magazine within the meaning of the *Explosives Act* (Canada);

"*manufacturer-armed perforating gun*" means a perforating gun fitted with a detonator if

(a) the detonator is fitted by the manufacturer during the manufacture of the gun, and

(b) the gun as fitted with the detonator is an authorized explosive within the meaning of the *Explosives Act* (Canada);

"*misfire*" means a charge, or part of a charge, that failed to completely detonate or deflagrate, as applicable, and includes cutoffs and unexploded explosives in the muckpile or debris, but does not include a mislight;

"*mislight*" means a failure or perceived failure of a pull-wire lighter to ignite the safety fuse assembly;

"*perforating gun*" means a device that

(a) is used for perforating an oil and gas well in preparation for production, and

(b) contains charges, each of which is shaped to focus the effect of the explosive energy of the charge;

"*primer*" means an explosive to which a detonator is attached or into which a detonator is inserted;

"*radio frequency transmitter*" means an AM, CB, FM and VHF radio, TV, radar, cellular telephone, wireless or remote control device, global positioning system, radio navigational beacon and any other electronic transmitting device that radiates radio frequency waves;

"*safety fuse assembly*" means a manufactured blasting accessory consisting of a precut length of safety fuse, an igniter cord connector, and a detonator;

"*shunt*" means the act of closing an electrical circuit to prevent or minimize the potential for an electrical charge or current to unintentionally reach an explosive by

(a) using an electrically conductive, non-ferrous clip or foil,

(b) twisting together the lead wires or leg wires,

(c) using a shorting pin, or

(d) using other means recommended by the manufacturer;

"*springing*" means a blasting technique which opens up a pocket at the bottom of a blast hole so that successive larger charges may be loaded and blasted;

"*stemming*" means placing inert material in the portion between the top of the explosive column and the collar of a blast hole, intended to confine the explosive gases for an effective blast.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

## **21.2 Employer's responsibility**

Nothing in this Part relieves an employer of the responsibility to provide adequate direction and instruction of workers, and to assign work only to those workers who are competent.

### **21.2.1 Planning and conducting blasting operations**

(1) The employer must ensure that all activities of a blasting operation are planned and conducted in a manner consistent with this Regulation and

recognized safe blasting practices.

(2) Every person who has knowledge and control of any particular activity in a blasting operation must ensure that the activity is planned and conducted in a manner consistent with this Regulation and recognized safe blasting practices.

(3) The planning required under this section must

(a) include procedures for identifying and addressing potential misfires,

(b) include any exposure controls required by Part 5 or 6,

(c) identify any work activities or conditions at the workplace where there is a known or reasonably foreseeable risk to persons or property,

(d) be completed before work begins on the relevant activity, and

(e) be documented at the time of planning.

(4) If a change in workplace circumstances, including a change to work activities or conditions at the workplace, poses or creates a known or reasonably foreseeable risk to persons or property that was not previously identified,

(a) the planning documented under subsection (3)(e) must be amended to identify and address the risk and provide for the health and safety of persons at or near the workplace, and

(b) the amendment must be documented as soon as practicable.

(5) The planning documented under subsection (3)(e), and any amendment documented under subsection (4), must be readily available to workers.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.3 Dangerous incident reports**

(1) If a blasting accident occurs which causes personal injury, or if there is any other dangerous incident involving explosives, whether or not there is personal injury, the employer must

(a) report the incident immediately to the Board, and

(b) forward a written report of the incident to the Board without undue delay.

(2) The written report of the incident must contain

(a) the date, time and location of the incident,

(b) the names and certificate numbers of all blasters involved,

(c) the names and occupations of any persons injured,

(d) the types of explosives, including detonators, and initiating device used,

(d.1) the instrument used to test the electric blasting circuit,

(e) a factual account of events including the blaster's log records,

(f) the names of all employers responsible for workers present at the worksite when the incident occurred, and

(g) the action taken by each employer referred to in paragraph (f).

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

#### **21.4 Blasting log**

(1) The blaster of record must record in a blasting log

(a) the following preblast loading details:

(i) the time, date and location of the blast;

(ii) the name of the blaster of record and all other persons handling explosives;

(iii) the type and weight of explosives used;

- (iv) the number of detonators used;
- (v) the type of initiating device used, and
- (b) the results of the postblast site examination required under section 21.71, 21.74 or 21.82(5).
- (2) Blasting logs must be maintained at the worksite, available for inspection by an officer, workers and worker representatives.
- (3) The employer must ensure that blasting logs are kept for at least 5 years after completion of the blasting operation.
- (4) The blaster must maintain a personal log of all blasting work that the blaster has performed in the immediately preceding 5 years before the current date.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.5 Authority to blast**

- (1) Only the holder of a valid blaster's certificate issued by the Board or acceptable to the Board is permitted to conduct or direct a blasting operation, and then only if the work involved is within the scope of that certificate.
- (2) All work within the blast site must be done under the authorization of the designated blaster of record responsible for that area.
- (3) A blaster may be assisted by persons who do not hold blaster's certificates, but the blaster must have authority over the assistants and must exercise visual supervision over them and be responsible for their work during explosive loading, priming, fixing or firing.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.6 Other legislation**

Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

##### **21.6.1 General - explosives and blasting accessories**

Explosives and blasting accessories must be stored, transported, handled and used

- (a) in the manner recommended by the manufacturer, and
- (b) in accordance with this Regulation.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

##### **21.6.2 Technical data sheets and manufacturer's instructions**

The following must be readily available to workers at a worksite where explosives or blasting accessories are used in a blasting operation:

- (a) technical data sheets for all explosives;
- (b) manufacturer's instructions for all blasting accessories.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.7 Training**

A worker engaged in loading, unloading, or conveying explosives must be trained in the proper means for handling the explosives, the hazards of fire and mishandling and the procedures to follow in the event of a fire or explosion.

#### **21.8 Qualifications**

A candidate for a blaster's certificate must be at least 18 years of age and must forward written proof acceptable to the examining officer that

- (a) the candidate has taken a minimum of 8 hours of training relating to the safe handling of explosives,
- (b) the candidate has passed a background check, and
- (c) the candidate has
  - (i) at least 6 months of experience in blasting operations as an assistant to a blaster, or
  - (ii) the knowledge, qualifications and experience to make the candidate competent to handle explosives.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

**Note:** Blaster's certificates will normally be issued for a period of 5 years, and may be endorsed with any restriction that the Board deems necessary.

#### 21.8.1 Continuing professional development - blasters

Every year during the term of a blaster's certificate, the blaster must receive at least 6 hours of continuing professional development relating to blasting best practices.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### 21.9 Misrepresentation

A person must not make, or assist in making, any false representation for the purpose of obtaining a blaster's certificate for any person.

#### 21.10 Examination

Only persons authorized by the Board may conduct examinations for blaster's certificates.

#### 21.11 Recording certificates

The employer must ensure that the details on the certificate of a blaster are recorded and understood before permitting the certificate holder to carry out the duties of a blaster.

#### 21.12 Custody of certificates

(1) A blaster must retain the blaster's certificate and must keep it in a safe place at the worksite while carrying out the duties of a blaster.

(2) The blaster's certificate must be produced for inspection on the request of an officer.

(3) A copy of a blaster's certificate is not acceptable as proof of certification.

[Amended by B.C. Reg. 116/2022, effective August 22, 2022.]

#### 21.13 Suspension of duties

If a blaster has failed to comply with any of the blasting requirements in this Regulation, manufacturer's recommendations or recognized safe blasting practices, the employer must immediately investigate the incident and may suspend the blaster from performing the duties of a blaster.

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

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### 21.14 Submitting reports

The employer must submit to the Board a report of the investigation carried out under section 21.13.

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

#### 21.15 Suspension of certificates

An officer may seize and forward to the Board a blaster's certificate if there is reason to believe that the safety of any person may be or has been endangered by the blaster.

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

**Note:** [Part 2](#) of the *Workers Compensation Act* gives authority to the Board to cancel or suspend a certificate or place other conditions on its use if the Board has reasonable grounds for believing that a person who holds a certificate has breached a term or condition of the certificate or has otherwise contravened Part 2 of the Act, or this Regulation. When the Board has taken or is considering taking action under Part 2 of the Act, the person affected will be provided with an opportunity to make representation to the Board, and will be advised in writing of the reasons for any decision.

#### 21.16 Detonators

(1) Detonators must be stored separately from

(a) other explosives, including detonating cord and electric igniters, and

(b) blasting accessories.

(2) Subsection (1) does not apply in relation to a manufacturer-armed perforating gun.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.17 Worksite storage**

(1) Explosives at a worksite must be guarded or stored in a locked and secured day box until used or returned to a magazine to prevent unauthorized access or removal.

(2) The quantity of explosives at a worksite, other than explosives in a magazine, must not exceed the quantity reasonably needed for one work shift.

(3) Subsection (2) does not apply to oil and gas downhole explosives operations.

(4) At a loading site, detonators must be stored in a crush-resistant, non-ferrous container that is clearly identified as containing explosives.

(5) Subsection (4) does not apply in relation to a manufacturer-armed perforating gun.

(6) When the specific purpose for which explosives were removed from a magazine has been carried out or is no longer required, any remaining explosives must be stored in a magazine as soon as practicable.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.18 Communication**

(1) The employer must ensure that the location of a magazine in which explosives are stored, and any restrictions on access or activity around the magazine area, are clearly communicated to all workers.

(2) Signs that indicate the presence of explosives in a day box must be

(a) displayed on the day box in a conspicuous manner when the day box contains explosives, and

(b) removed from the day box when the day box does not contain explosives.

(3) A vehicle containing explosives while in a workplace must display signs indicating the presence of explosives in a conspicuous manner, visible from all sides of the vehicle, and the signs must be removed when the vehicle no longer contains explosives.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.19 Magazine condition**

(1) The interior of a magazine must be

(a) kept clean, dry and organized,

(b) kept free of grit, combustible or abrasive material, any fire-producing, spark-producing or flame-producing device and any substance that might ignite spontaneously, and

(c) constructed, covered or lined to prevent the exposure of any ferrous metals or gritty materials.

(2) Precautions must be taken to exclude moisture from a magazine.

(3) Any article or substance likely to cause a fire or explosion must be kept out of and at a safe distance from a magazine.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.20 Cord**

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.21 Separate handling**

(1) Detonators must be kept and handled separately from other explosives until the last most practicable moment before assembling the charge.

(2) Subsection (1) does not apply in relation to a manufacturer-armed perforating gun.



[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.22 Vehicle operation**

- (1) A vehicle being used to transport explosives must be
  - (a) in sound mechanical condition and suitable for and capable of safely transporting explosives, and
  - (b) inspected and maintained in accordance with the vehicle manufacturer's recommendations.
- (2) Passengers, other than those assigned to assist in handling explosives, are not permitted on a vehicle transporting explosives.
- (3) The portion of a vehicle that contains explosives must be free of grit, combustible or abrasive material, any fire-producing, spark-producing or flame-producing device and any substance that might ignite spontaneously.
- (4) If an iron or steel part of a portion of a vehicle that will contain explosives could come into contact with the explosives or their packaging during transportation so as to increase the likelihood of an ignition, that part must be covered with material that will prevent the contact.
- (5) Subsection (4) does not apply to the transportation of perforating guns.
- (6) A person who is transporting a perforating gun by vehicle must ensure that
  - (a) the vehicle has a specially built rack or carrying case designed or constructed so that the perforating gun
    - (i) is securely held in place during transportation, and
    - (ii) is not subject to damage by contact with any other object or material carried in the vehicle, and
  - (b) the perforating gun is kept in the rack or carrying case during transportation.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.23 Flammable materials**

Reasonable quantities of flammable or combustible materials may be carried by a vehicle transporting explosives at the workplace provided such materials are contained in a manner which will not cause or transmit a fire or explosion, and are adequately separated from any explosives containers in the vehicle.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.24 Transportation of explosives**

- (1) During transportation by vehicle, explosives must be kept
  - (a) separate from the passenger compartment of the vehicle, and
  - (b) subject to section 21.22(6), in a fully-enclosed, locked, fire-resistant container, compartment or day box that is
    - (i) fixed within or secured to the vehicle to prevent detachment in the event of a rollover,
    - (ii) located above the vehicle deck in a manner that protects the container, compartment or day box from contact with roadside objects and drilling equipment,
    - (iii) located so that the contents are not endangered by any heat source,
    - (iv) locked when outside the worksite, and securely closed when in the worksite, except when opened for depositing or removing the contents of the container, compartment or day box, and
    - (v) attended by a qualified person at all times when the container, compartment or day box contains explosives.
- (2) Detonators and electric igniters must be transported in their original containers as shipped by the manufacturer.
- (3) Detonators and electric igniters, including deflagrating explosives manufactured and packaged as a primer with a shunted electric igniter, must be adequately separated from other explosives during transportation to prevent accidental initiation of the other explosives.
- (4) Subsection (3) does not apply in relation to a manufacturer-armed perforating gun.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.25 Mobile drilling rigs**

The transportation of explosives on a mobile drilling rig is permitted only if detonators and other explosives are stored in separate day boxes or magazines that are

- (a) located at least 60 cm (2 ft) apart, with the doors or lids facing at least 90° apart,
- (b) located above the vehicle deck in a manner that protects the day boxes or magazines from contact with roadside objects and drilling equipment,
- (c) located so that the contents are not endangered by any heat source,
- (d) locked when outside the worksite, and securely closed when in the worksite, except when opened for depositing or removing their contents, and
- (e) attended by a qualified person at all times when the day boxes or magazines contain explosives.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.26 Water transport**

Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

#### **21.27 Contact with metal**

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.28 Emergency procedures**

Before explosives are transported, the employer must establish suitable written emergency procedures, and must ensure that all workers who may be affected are adequately instructed in the procedures.

#### **21.29 Safe operation**

A person operating a vehicle that is transporting explosives must operate the vehicle in a safe manner, consistent with prevailing road and weather conditions.

[Enacted by B.C. Reg. 312/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.30 Vehicle load limit**

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.31 Firefighting equipment**

A vehicle transporting explosives must be equipped with at least 2 fire extinguishers that

- (a) have a rating of at least 4-A:40-B:C, and
- (b) are readily accessible for use.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.32 Trailer transportation**

Explosives must not be transported in a trailer, or in any type of semitrailer unless it is equipped with power brakes operable from the tractor cab.

#### **21.33 Railroad and highway crossings**

The operator of a vehicle transporting explosives must, before crossing

- (a) a railroad track protected by an automatic signal device, reduce the speed of the vehicle and establish that the crossing can be made in safety, and
- (b) a main highway, or a railroad track that is not protected by an automatic signal device, completely stop the vehicle and only proceed when the way is safely clear.

#### 21.34 Prior servicing

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### 21.35 Overnight parking

(1) When a vehicle carrying or containing explosives is to be parked overnight, the premises in which the vehicle will be parked must not be used for any other purpose which may involve any substance likely to cause explosion or fire.

(2) Such premises must be away from habitation and buildings that contain flammable materials.

(3) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

#### 21.36 General

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### 21.37 Defective explosives

Explosive or blasting materials or accessories that have deteriorated, or are believed to be defective, must not be used and must be handled and disposed of

(a) in a safe manner, and

(b) in accordance with the *Explosives Act* (Canada) and the regulations under that Act.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### 21.38 Cold temperatures

If the sensitivity of an explosive is affected by cold temperatures the explosive may be brought to a working temperature in a manner recommended by the manufacturer, but must not be warmed near an open fire or a steam boiler nor by direct contact with steam or hot water.

#### 21.39 Disposal of explosives

Explosives must not be abandoned and must be placed in suitable storage or disposed of in accordance with the manufacturer's recommendations.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### 21.40 Ignition sources prohibited

(1) Smoking is prohibited within 15 m (50 ft) of where explosives are stored, being handled, or are in loaded holes.

(2) Open flame ignition sources must not be permitted within 15 m (50 ft) of where explosives are stored, being handled, or are in loaded holes, unless the blaster of record gives consent.

#### 21.41 Containers

(1) Containers, known or suspected to contain explosives or explosive residue, must be handled with care to prevent undue impact or exposure to excessive heat or flame.

(2) All empty original disposable packaging for explosives must be destroyed safely or as recommended by the manufacturer.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### 21.42 Predrilling requirements

Before drilling begins

(a) in a previously blasted area, the surface to be drilled must be exposed and examined for misfires,

(b) faces or slopes must be cleared of loose material, or otherwise stabilized to prevent slides or falls of rock, and

(c) the location of utility services must be determined and clearly marked.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.43 Drilling prohibitions**

Except in accordance with section 21.76.1, drilling must not take place within

- (a) 15 cm (6 in) of any part of a bootleg, or
- (b) 6 m (20 ft) of any part of a hole containing explosives, unless prior written permission has been obtained from the Board.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.44 Drill hole size**

Each drill hole to be loaded with explosives must be of sufficient diameter to permit free insertion of the explosives to the bottom of the hole without ramming, pounding, cutting, or undue pressure.

##### **21.44.1 Anomalous drill hole**

- (1) A detailed report of each anomalous drill hole that requires changes to the blasting plan must be maintained at the worksite.
- (2) The anomalous drill hole report must contain
  - (a) the date, location, burden, spacing, depth, diameter, angle and marking of each drill hole, and
  - (b) any changes in geology, including
    - (i) the presence of subsurface water, mud seams or voids, and
    - (ii) similar details.
- (3) The blaster must review the anomalous drill hole report before loading begins.
- (4) Each anomalous drill hole referred to in subsection (1) must be clearly marked at the worksite.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.45 Priming**

A primer must not be made up until immediately before placing the explosives.

#### **21.46 Carrying**

Persons must not carry explosives in their clothing.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.47 Cartridges**

Wrappers must not be removed from cartridge explosives.

#### **21.48 Loading tools**

Explosives must not be loaded into a hole except with a loading tool made of wood, plastic or other non-sparking material.

#### **21.49 Electrical storms**

If there is any sign of thunder or lightning storm activity, all blasting activity must be suspended and the danger area must be cleared and guarded if explosives are present at the blast site.

#### **21.50 Guarding loaded holes**

- (1) Except as permitted by section 21.84, a hole which has been loaded, whether primed or not, but not fired by the end of the working day must not be left unattended.
- (2) A worker, whose sole responsibility is the security of the explosives, must be posted to ensure that loaded holes are not tampered with while the work crew is absent from the site.

#### **21.51 Vehicles**

Except as permitted by section 21.84, a vehicle or other mechanized equipment must not be driven over a loaded hole.

#### **21.52 Springing holes**

After a hole is "sprung" ample time must be left for the hole to cool before further loading or placing of explosives or blasting accessories takes place.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.53 Connecting detonating cord**

(1) When detonating cords are used, the cords must only be interconnected or attached to trunk cords at the last most practicable moment after all holes are loaded.

(2) When detonating cords are used to prime a charge, the cord must be cut from the supply reel before, or as soon as possible after the charge is placed.

(3) Detonators or detonator connectors must not be attached to a detonating line until everything is in readiness for the blast.

#### **21.54 Shock tubes**

(1) Shock tubes loaded into holes must not be pulled or snapped.

(2) Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.55 Pneumatic loading**

(1) Explosives may only be loaded pneumatically if the procedures and equipment used will prevent buildup of static electricity or hazards from stray electric currents.

(2) Prior written permission of the Board must be obtained before any pneumatic loading is carried out at a hole which contains an electric detonator or electronic detonator.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

#### **21.56 Safety fuse assemblies**

(1) Only safety fuse assemblies with antistatic protection may be used for safety fuse blasting.

(2) Safety fuse assemblies less than 1 m (3.3 ft) in length must not be used.

(3) Safety fuse assemblies must be handled with care to avoid pinching or kinking and damaged fuse assemblies must not be used.

#### **21.57 Lighting safety fuse assembly**

(1) When lighting a single safety fuse assembly a match may be used.

(2) When multiple safety fuse assemblies are to be lit, a suitable safety fuse lighting device must be used to ensure that a minimum 90 cm (3 ft) fuse length safety factor is maintained.

(3) An igniter cord must not be used for lighting a safety fuse assembly.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.58 Stray currents**

(1) Precautions must be taken to prevent premature initiation of electric detonators, electronic detonators and electric igniters from sources of electricity.

(2) Electric blasting circuits must be kept on the ground with bare connections sufficiently elevated to prevent current leakage.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

#### **21.59 Extraneous currents**

Except as permitted by the manufacturer, electric detonators or electric igniters must not be used when extraneous current exceeds 50 milliamps.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.60 Static electricity**

(1) Precautions must be taken during handling of electric detonators, electronic detonators and electric igniters to prevent premature initiation caused by static electricity.

(2) Detonator leg wires must not be thrown in the air or dragged along the ground.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

#### **21.61 Radio frequency precautions**

(1) If the electric blasting circuit is equipped with an electric detonator, minimum distances from radio frequency transmitters as detailed in *Institute of Makers of Explosives, Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators (Blasting Caps) Safety Library Publication No. 20, December 2011* as amended from time to time, must be maintained.

(1.1) If the blasting system is equipped with an electronic detonator or electric igniter, minimum distances from radio frequency transmitters as recommended by the manufacturer must be maintained.

(2) If the minimum distance has not otherwise been determined, electric blasting circuits are not permitted within

(a) 100 m (330 ft) of a CB radio or other mobile or portable radio frequency transmitter, and

(b) 1 000 m (3,300 ft) of an AM or FM radio, TV, or other fixed radio frequency transmitter.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

#### **21.62 Mobile transmitters**

(1) If absolute control of radio frequency transmitters cannot be maintained, for example, on public highways, warning signs must be posted to alert vehicle operators to turn off their transmitters.

(2) When electric blasting circuits are being connected, traffic control persons must be posted to instruct vehicle operators to turn radio frequency transmitters off.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

#### **21.63 Testing electric blasting circuits**

(1) The blaster of record must ensure that each electric blasting circuit is tested before firing.

(2) In seismic blasting, the blaster of record must ensure that each electric blasting circuit is tested after the blast hole is loaded with explosives and before a plug is placed into the hole.

(3) If the electric blasting circuit is equipped with an electric detonator or electric igniter, the blaster of record must ensure that before firing,

(a) the resistance of the circuit is measured using a blasting galvanometer or another instrument specifically designed for testing electric detonators and circuits containing them, and

(b) the resistance is recorded in the blasting log.

[Enacted by B.C. Reg. 14/2019, effective June 3, 2019.]

##### **21.63.1 Confirming electronic detonator integrity**

The blaster of record must ensure that before firing with the use of an electronic detonator, the signal integrity of the detonator is confirmed and recorded in the blasting log.

[Enacted by B.C. Reg. 14/2019, effective June 3, 2019.]

#### **21.64 Capacity of blasting machines**

(1) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

(2) The capacity of a blasting machine must be clearly marked on the blasting machine and must not be exceeded.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### **21.65 Firing from power lines**

When firing is done from a power line, an approved blasting safety switch must be used, and the switch kept locked and inaccessible to anyone except the blaster.

#### **21.66 Responsibilities of blasters and employers**

(1) The blaster must take precautions for the protection of persons and property, including proper loading and stemming of holes, and where necessary, the use of cover for the blast or other effective means of controlling the blast or resultant flying material.

(2) The blaster must ensure that the danger area is clear of persons and is kept clear during the blasting period.

(3) The blaster must post workers who have the sole responsibility of guarding against entry into the danger area of the blast site, and the workers must be instructed as to their duties and responsibilities.

(4) Whistles, signs or other signals may not be used in place of the guards required by subsection (3).

(5) Before sounding the warning signals, the blaster must clear the danger area and post guards as required by subsections (2) to (4), and must ensure that all persons have reached a place of safety.

(6) The employer must ensure that the blaster carries out the blaster's responsibilities under subsections (1) to (4).

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.67 Firing lines**

Except in oil and gas downhole explosives operations, the firing lines or lead-in lines must not be attached to the initiating device or electric blasting circuit until all charges are placed and connected.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.68 Firing all holes**

(1) Charges must be fired in logical sequence.

(2) If any detonation could affect other charges placed nearby, all of the charges must be fired in one operation.

#### **21.69 Blasting signals**

(1) The blaster must ensure that an audible signalling device, distinct from other signalling devices in the area, is used to give the following warning signals:

(a) preceding the blast, 12 short whistle signals must be sounded at one second intervals;

(b) two minutes must elapse after the last warning signal before initiating the blast;

(c) following the blast and after the area has been examined and found safe, one prolonged whistle signal of at least 5 seconds duration must be sounded, to signify that permission is granted to return to the blast site.

(2) Subsection (1) does not apply to oil and gas downhole explosives operations, avalanche control, single underground headings, buried seismic work in isolated locations or other circumstances deemed appropriate by the Board, in which case the blaster must ensure that alternative warning procedures acceptable to the Board are used.

(3) Subsection (1)(b) does not apply with respect to the 2 minute warning in congested areas if alternative warning procedures acceptable to the Board are developed and implemented.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.70 Posting warning procedures**

The employer must ensure that the warning procedure and blasting signals to be used at the workplace are posted conspicuously at each blasting operation, and workers must be instructed in this information.

#### **21.71 After the blast**

After a blast is initiated, the blaster of record must not permit anyone to enter the blast site until

- (a) the blast site has been examined by the blaster of record for misfires and other hazards,
- (b) the "all clear" has been sounded, and
- (c) the blaster of record gives permission for work to proceed.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.72 Electrical blasting**

After a blast is electrically initiated the blaster must not enter the blast site until

- (a) the blaster has disconnected the firing lines from the initiating device and has shunted the lead wires, or
- (b) if the blast was initiated from a power line, the blaster has disconnected the firing lines and locked the switch open.

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.73 Misfires**

(1) If there is evidence or suspicion of a misfire after a blast is initiated, the blaster of record must not permit anyone to enter the danger area until the latest of the following:

- (a) if an electric detonator or electric igniter was used to initiate the blast, 15 minutes after the blaster of record disconnects the firing lines from the initiating device and shunts the lead wires;
- (b) if shock tube initiation was used to initiate the blast, 15 minutes after the blaster of record disconnects the lead-in-line from the initiating device;
- (c) if an electronic detonator was used to initiate the blast, 30 minutes after the blaster of record disconnects the firing lines from the initiating device and shunts the lead wires;
- (d) if a safety fuse assembly was used to initiate the blast, 30 minutes after the estimated time of detonation;
- (e) the waiting period stated in the relevant manufacturer's instructions.

(2) If there is evidence or suspicion of a misfire after a blast is initiated and a charge is known or suspected to be burning, the blaster of record must not permit anyone to enter the danger area until the later of the following:

- (a) one hour after the smoke clears;
- (b) the waiting period stated in the manufacturer's instructions.

[Enacted by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.74 Blast site examination**

Except as provided in section 21.82 (5), after a blast is initiated, the blaster of record must

- (a) examine the blast site to determine if there are any misfires, and
- (b) record the results of the examination in the blasting log.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

##### **21.74.1 Misfire marking**

Except as provided in section 21.84 or by work procedures accepted by the Board under section 21.85, if a misfire cannot be dealt with immediately, the misfire must be clearly marked and the danger area cordoned off and guarded.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

##### **21.74.2 Extracting explosives**



- (1) Extracting or attempting to extract a primer or explosive of the nitroglycerine type from a loaded hole is prohibited.
- (2) A blaster or a person authorized by the blaster may remove ammonium nitrate, water gel or emulsion type explosives from a blast hole only if
  - (a) the blast hole does not contain a detonator, and
  - (b) the removal procedure is carried out with caution, using
    - (i) moderate air or water pressure or a combination of moderate air and water pressure, and
    - (ii) a blowpipe made of non-metallic materials.
- (3) A blaster or a person authorized by the blaster may remove a device containing high melting explosive (HMX) that has been exposed to a temperature exceeding 150°C from a blast hole only if
  - (a) safe work procedures have been developed and communicated to workers involved in the removal, and
  - (b) the removal procedure is carried out with caution.
- (4) Until a misfire has been successfully detonated with a fresh primer,
  - (a) the unexploded charge that contains a primer must not be removed and no attempt to remove it may be made, and
  - (b) no other work may take place within the danger area.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.75 Cutoffs and unexploded explosives**

- (1) If there is evidence or suspicion of cutoffs or unexploded explosives in the muckpile or debris,
  - (a) all loose unexploded explosives that do not contain a detonator must be collected and destroyed in a safe manner and in accordance with the manufacturer's recommendations, and
  - (b) the blaster must direct the hand removal of as much broken material as possible before metallic tools or equipment is used.
- (2) Metallic equipment must not be used during misfire procedures unless
  - (a) the blaster directs the use of the equipment,
  - (b) the area is adequately illuminated, and
  - (c) everyone, except the blaster and the equipment operator, is removed from the danger area.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.76 Excavating and scaling**

- (1) Excavation of blast rock must be carried out with caution by a person trained and competent in the recognition of misfires.
- (2) Loose rock must be scaled from faces in the worksite and the area stabilized before other work resumes.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

##### **21.76.1 Drilling for refiring**

When drilling is necessary to expose a misfire, the blaster must

- (a) accurately determine the angle of the hole that contains the misfire,
- (b) direct the angle and depth of the hole being drilled, and
- (c) ensure that the hole being drilled is at least 60 cm (2 ft) from any part of the misfire.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

##### **21.77 Drilling for refiring**

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.78 Safety fuse assembly reblast**

If a misfire that contains a safety fuse assembly is reblasted, persons must not enter the danger area until 30 minutes after the detonation, unless the blaster of record confirms detonation.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.79 No relighting**

Relighting a safety fuse assembly is prohibited.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.80 Drilling for refiring**

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.81 Extracting explosives**

Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.82 Underwater blasting**

- (1) Only explosives and blasting accessories recommended by the manufacturer for underwater blasting may be used for underwater blasting.
- (2) Whenever explosives are being used in underwater blasting operations, a blasting flag (international code "Bravo", a solid red flag) must be displayed.
- (3) Precautions must be taken to prevent damage to structures in the danger area.
  - (3.1) Underwater blasts must be initiated by the blaster of record.
- (4) The blaster of record must not initiate an underwater blast
  - (a) if a diving operation or water craft is within the danger area, and
  - (b) without the diving supervisor's permission.
- (5) After an underwater blast is initiated, the blast site must be examined for misfires and other hazards by
  - (a) the blaster of record, or
  - (b) a competent diver who
    - (i) has been trained in the recognition of misfires and other blasting related hazards, and
    - (ii) is under the direction of the blaster of record.
- (6) A blaster must ensure that misfires are handled properly and that other blasting related hazards are removed.

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.83 Special effects blasting**

Special effects blasting must be carried out under the direction of a blaster certified in this specialty to a standard acceptable to the Board.

#### **21.84 Seismic blasting**

- (1) If seismic blasting is carried out in an isolated location, loaded holes may be left unattended only if
  - (a) the blaster has first ensured that all leg wires are shunted, drill cuttings are spread out and levelled, the leg wires are coiled as close to the ground as possible while never exceeding 15 cm (6 in) above the ground level, and the holes are suitably user identified, and recorded in the blasting log, and
  - (b) the holes are blasted within 30 days.
- (2) Repealed. [B.C. Reg. 207/2021, effective December 1, 2021.]
- (3) In a seismic blasting operation, a misfired or unfired charge may be left unfired only if

- (a) it cannot be conventionally and safely detonated,
  - (b) it is in an isolated location,
  - (c) it is at a depth sufficient to minimize the risk of injury to workers or other persons,
  - (d) its location is effectively marked, and
  - (e) a permanent record of its location is kept.
- (4) Seismic water tank trucks having open flame water heaters must not be used to transport explosives unless
- (a) the distance between the heat tube and the outside of the tank is at least 35 cm (14 in),
  - (b) a heater, if woodburning, has a fire box of a type that fully contains the fuel and two dampers mounted in the heat tube, one at the vent end and the other at the fire box, so the flame may be shut in instantly in the event of an accident, and
  - (c) the detonator storage is located on the opposite side of the vehicle from the explosive magazine, and both are built to type 6 magazine standard.
  - (d) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]
- (5) In a seismic operation where there is no alternate route, a vehicle may be driven over a loaded hole if
- (a) bypassing the hole is not practicable,
  - (b) operational planning minimizes the requirement to travel through a loaded area,
  - (c) safe work procedures are developed and communicated to all workers before they start work at the site,
  - (d) loaded holes are in compliance with subsection (1),
  - (e) explosive charges are at a minimum depth of 6 m (20 ft), and
  - (f) all radio transmission equipment is turned off, or the transmission capability is disabled by disconnecting the microphone.
- (6) In a seismic blasting operation, the blaster of record must ensure that explosives are initiated by 2 detonators if the total weight of the explosives in the hole is
- (a) 4 kg (8.8 lbs) or more, or
  - (b) more than 0.5 kg (1.1 lbs) and
    - (i) the hole is less than 5 m (16.4 ft) deep,
    - (ii) the condition of the soil may compromise the loading of the explosives in the hole, or
    - (iii) the blasting operation is accessible only by helicopter.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 381/2004, effective January 1, 2005.]

[Amended by B.C. Reg. 14/2019, effective June 3, 2019.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

**Note:** Some electrical equipment, such as cellular telephones and other types of mobile telephone equipment continuously transmit a radio signal when turned on, so such devices must be turned off when it is necessary to drive over a loaded hole.

#### 21.85 Avalanche control

- (1) Charges must not be placed manually on site by workers or projected by any means for the purpose of avalanche control, until the proposed work procedures have been submitted to and accepted by the Board.
- (2) Explosives must not be primed until the last most practicable moment which means that point in time when the explosives are as close to the control route as possible, in a safe, sheltered location excluded from public access.
  - (2.1) An employer must ensure there is an effective means for a worker to separate the primed charge to be deployed from the other primed charges in order that the pull-wire lighter is not accidentally placed on the safety fuse assembly of one of the other primed charges.
- (3) The pull-wire lighter must not be placed on the safety fuse assembly until immediately before placing the charge.
- (4) The employer must ensure that procedures are reviewed annually and that proposed changes to the procedures are submitted to the Board for

approval before implementation.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.86 Definitions**

In this Division:

*"proximate structure"* means a school, hospital, medical clinic or other potentially occupied structure within the applicable proximity zone;

*"proximity zone"* means, as applicable, a distance that is not more than,

(a) in the case of a school, hospital or medical clinic, 300 m (984 ft) from the blast site, and

(b) in the case of any other potentially occupied structure, 150 m (492 ft) from the blast site;

*"written plan"*, in respect of a blasting operation under this Division, means the plan required under section 21.91.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.87 Application of Division**

This Division applies to blast sites that have a proximate structure within the applicable proximity zone where explosives are used primarily for rock excavation, boulder breakage or any other purpose that is likely to generate flying material.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.88 Notice of project**

(1) The owner or the person engaged by the owner to be the prime contractor must ensure that the Board receives a written notice of project at least 24 hours before the beginning of a blasting operation that has an anticipated duration of 3 or more days.

(2) Before blasting begins, a copy of the notice of project must be posted at the blast site.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.89 Emergency notice**

Despite section 21.88, if in an emergency it is not practicable to comply with that section, the Board must be notified, and a copy of the notice posted, as soon as possible but no later than 24 hours after the blasting operation has begun.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.90 Notice to occupants of proximate structures**

(1) The employer conducting a blasting operation must ensure that the following persons are notified in writing at least 48 hours before any blasting begins:

(a) the senior administrator or person in charge of each school, hospital or medical clinic within the applicable proximity zone;

(b) the occupants of any other potentially occupied structure within the applicable proximity zone.

(2) The notice required under subsection (1) must include

(a) a description of the work to be done,

(b) the date and approximate time blasting will begin,

(c) the anticipated duration of the blasting operation,

(d) an explanation of the blasting signals to be used and the meaning of those signals, and

(e) the name and phone number of the employer conducting the blasting operation.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.91 Written plan**

A written plan must

(a) be developed by a blasting professional who

(i) has at least 5 years of experience in blasting operations in an urban environment, including knowledge of and expertise in blast design to control vibration, air overpressure, flying material and other potential hazards, and

(ii) holds a valid blaster's certificate as referred to in Division 2 or is a registered member in good standing of

(A) the Association of Professional Engineers and Geoscientists of the Province of British Columbia,

(B) the Applied Science Technologists and Technicians of British Columbia, or

(C) a similar professional association, in British Columbia or another province in Canada, that requires its members to adhere to a code of ethics,

(b) provide for effective monitoring of ground vibration and air overpressure, and

(c) specify the limits for peak particle velocity, frequency response and air overpressure that are not to be exceeded.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.92 Suspension of blasting**

If, in respect of peak particle velocity, frequency response or air overpressure, a limit specified under section 21.91(c) is exceeded, all blasting must be suspended until a person who meets the requirements of paragraph (a) of that section has

(a) determined why the limit was exceeded, and

(b) updated the written plan, if necessary.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]

#### **21.93 General requirements**

(1) All material to be blasted must be covered by blasting mats in good working condition.

(2) The blast hole diameter must not exceed 75 mm (3 in).

(3) The bench height to burden ratio must be at least 2 to 1.

(4) In respect of blast holes,

(a) all blast holes must be effectively stemmed with small crushed aggregate rock or an energy confinement device, and

(b) the use of drill cuttings alone does not meet the requirements of paragraph (a).

(5) Safety fuse assemblies must not be used.

(6) When using ammonium nitrate/fuel oil, slurries, water gels or other bulk explosives, the employer must ensure that

(a) the work is conducted in accordance with recognized safe blasting practices and manufacturer's instructions,

(b) the critical hole diameter is not smaller than the minimum critical hole diameter recommended by the manufacturer,

(c) the fumes of the detonated product do not affect workers or other persons at or near the blast site, and

(d) additional precautions are taken in fractured ground and in wet holes.

[Enacted by B.C. Reg. 207/2021, effective December 1, 2021.]